Aircraft Flight Manual

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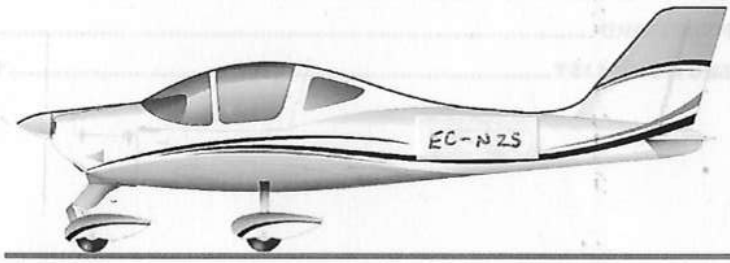

TECNAM P2002-JF

MANUFACTURER: *COSTRUZIONI AERONAUTICHE* ***TECNAM*** *S.p.A.*
AIRCRAFT MODEL: ***P2002-JF***
EASA TYPE CERTIFICATE NO: **A .006** (DATED 2004, MAY 27TH)

SERIAL NUMBER: ..... 154 .....

BUILD YEAR: ..... 2011 .....

REGISTRATION MARKINGS: .. EC-NZS

This manual contains information to be furnished to the pilot as required by EASA in addition to further information supplied by the manufacturer.

This manual must always present on board the aircraft

The aircraft is to be operated in compliance with information and limitations contained herein.

This Aircraft Flight Manual is approved by ***European Aviation Safety Agency (EASA)***

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SECTION 0

INDEX

1. RECORD OF REVISIONS

Any revision to the present Manual, except actual weighing data, is recorded: a Record of Revisions is provided at the front of this manual and the operator is advised to make sure that the record is kept up-to-date.

The Manual issue is identified by Edition and Revision codes reported on each page, lower right side.

The revision code is numerical and consists of the number "0"; subsequent revisions are identified by the change of the code from "0" to "1" for the first revision to the basic publication, "2" for the second one, etc.

Should be necessary to completely reissue a publication for contents and format changes, the Edition code will change to the next number (“2” for the second edition, “3” for the third edition etc).

Additions, deletions and revisions to existing text will be identified by a revision bar (black line) in the left-hand margin of the page, adjacent to the change.

When technical changes cause expansion or deletion of text which results in unchanged text appearing on a different page, a revision bar will be placed in the right-hand margin adjacent to the page number of all affected pages providing no other revision bar appears on the page.

These pages will be updated to the current regular revision date.

In order to be constantly updated on change on this document from TECNAM, It is the responsibility of the owner to register on TECNAM website at:

www.tecnam.com

NOTE: It is the responsibility of the owner to maintain this handbook in a current status when it is being used for operational purposes.

Rev	Revised page	Description of Revision	Tecnam Approval			EASA Approval or Under DOA Privileges
			DO	OoA	HDO	
0	-	First issue	M. Landi	M. Oliva	L. Pascale	EASA approval no. 10041442
1	0-4	Amend ROR	G. Paduano	M. Oliva	L. Pascale	DOA privileges
	0-6	Amend LOEP	G. Paduano	M. Oliva	L. Pascale	DOA privileges
	9-3	Amend Supplement list	G. Paduano	M. Oliva	L. Pascale	DOA privileges
	-	Supplement A12 amended: see supplement ROR and LOEP	G. Paduano	M. Oliva	L. Pascale	DOA privileges
2	0-4	Amend ROR	G. Paduano	M. Landi	M. Oliva	EASA approval no. 10022116
	0-6	Amend LOEP	G. Paduano	M. Landi	M. Oliva	EASA approval no. 10022116
	2-5 2-11	Update fuel pressure limits	G. Paduano	M. Landi	M. Oliva	EASA approval no. 10022116
	3-8 thru10	Update emergency procedures	G. Paduano	M. Landi	M. Oliva	EASA approval no. 10022116
	4-9 and 11	Update normal procedures	G. Paduano	M. Landi	M. Oliva	EASA approval no. 10022116
	6-12 thru14	Update equipment list	G. Paduano	M. Landi	M. Oliva	EASA approval no. 10022116
	9-3	Amend Supplement list	G. Paduano	M. Landi	M. Oliva	EASA approval no. 10022116
	-	Supplement A13 amended: see supplement ROR and LOEP	G. Paduano	M. Landi	M. Oliva	EASA approval no. 10022116
3	0-4	Amend ROR	G. Paduano	M. Landi	M. Oliva	EASA approval no. 10048554
	0-6	Amend LOEP	G. Paduano	M. Landi	M. Oliva	EASA approval no. 10048554
	9-3	Amend Supplement list	G. Paduano	M. Landi	M. Oliva	EASA approval no. 10048554
	-	Supplement A14 amended: see supplement ROR and LOEP	G. Paduano	M. Landi	M. Oliva	EASA approval no. 10048554
	-	Supplement A15 amended: see supplement ROR and LOEP	G. Paduano	M. Landi	M. Oliva	DOA privileges
4	0-4	Amend ROR	D. Ronca	C. Caruso	M. Oliva	DOA privileges
	0-6	Amend LOEP	D. Ronca	C. Caruso	M. Oliva	DOA privileges
	2-5	Update coolant temperature limits	D. Ronca	C. Caruso	M. Oliva	EASA approval no. 10053863
	2-11	Update fuel pressure limits	D. Ronca	C. Caruso	M. Oliva	DOA privileges
	3-9 thru 11	Update coolant temperature limits on the procedures	D. Ronca	C. Caruso	M. Oliva	DOA privileges
5	6-12 thru14	Update equipment list	D. Ronca	C. Caruso	M. Oliva	DOA privileges
	9-3,4	Amend Supplement list	D. Ronca	C. Caruso	M. Oliva	

Rev	Revised page	Description of Revision	Tecnam Approval			EASA Approval or Under DOA Privileges
			DO	OoA	HDO	
6	6-12 thru13	Update equipment list	D. Ronca	C. Caruso	M. Oliva	DOA privileges
7	-	Supplement A18 amended: see supplement ROR and LOEP	D. Ronca	C. Caruso	M. Oliva	Approved under DOA Privileges (ref. EASA.21J.335) Approval no. MOD2002/195.170703
	6-12 thru14	Update equipment list	D. Ronca	C. Caruso	M. Oliva	
8	9-3	Updated Supplements List	A. Sabino	C. Caruso	M. Oliva	Approved under DOA Privileges (ref. EASA.21J.335) Approval no. MOD2002/197.170728
9	4-7	Inserted fire detector test	G. Valentino	D. Ronca	M. Oliva	Approved under DOA Privileges (ref. EASA.21J.335) Approval no. MOD2002/198.180828
	4-7 thru 12	Editorial review				
	6-12 thru 13	Updated equipment list				
	7-10	Inserted fire detector light				
	8-7	Editorial review				
	9-4	Updated Supplements List				
10	6-12 to 16	Equipment list amended	A. Sabino	D. Ronca	M. Oliva	Approved under DOA Privileges (ref. EASA.21J.335) Approval no. MOD2002/205.181114
11	0-1,5,6	Amended RoR and LoEP	A. Sabino	D. Ronca	M. Oliva	Approved under DOA Privileges (ref. EASA.21J.335) Approval no. MOD2002/214.190228
	5-12	Typos on cruise performance reference altitudes corrected				
	6-15	Amended equipment list				
	7-9	Added table with fuel quantity indicator calibration.				
	9-3,4	Amended supplements list				
12	0-1,5,6	Amended RoR and LoEP	G. Valentino	D. Ronca	M. Oliva	Approved under DOA Privileges (ref. EASA.21J.335) Approval no. MOD2002/216.190506
	4-5	Amended normal procedure				
	7-9	Added table with fuel quantity indicator calibration.				
13	0-1,5,6	Amended RoR and LoEP	A. Glorioso (OJT) G. Valentino	D.Ronca	M.Oliva	Approved under DOA Privileges (ref. EASA.21J.335) Approval no. MOD2002/220.190807
	2-11	Correction of oil pressure markings Remove of fuel quantity markings				

Rev	Revised page	Description of Revision	Tecnam Approval			EASA Approval or Under DOA Privileges
			DO	OoA	HDO	
14	0-1, 5 thru 10	Update Cover and Amended RoR and LoEP	A. Glorioso	D. Ronca	M. Oliva	Approved under DOA Privileges (ref. EASA.21J.335) Approval no. MOD2002/223.191111
	5-13, 14	Correction values of ISA temperature				
	6-12, 13, 14	Amended equipment list				
	9-2, 3	Typo error and update supplements list				
15	0-1, 6thru 9	Update Cover, Amended RoR and LoEP. Corrected Foreword.	G.Valentino	D. Ronca	M. Oliva	Approved under DOA Privileges (ref. EASA.21J.335) Approval no. MOD2002/224/200512
	1-7	Updated note/caution for specific loadings.				
	2-9	Optimization of caution related to oxygen use.				
	2-11	Explanation of minimum oil pressure indication.				
	2-14	Typo error.				
	4-11	Cruise procedure optimization				
	6-1, 7 thru 18	Weight and balance determination for flight procedure optimization.				
	9-3	Updated supplements list				
	-	Supplements A11, A12 and A13 amended: see ROR and LOEP of each Supplement				
16	0-1, 6, 7, 8	Update Cover and Amended RoR and LoEP	G.Valentino	D. Ronca	M. Oliva	Approved under DOA Privileges (ref. EASA.21J.335) Approval no. MOD2002/228/201016
	6-17	Alternative P/N for DME antenna.				
	9-3	Updated supplements list				
17	0-1 thru 4, 6 thru 8	Update Cover and Amended RoR and LoEP Typo errors (aircraft model in page titles)	G.Valentino L. De Salvi (OJT)	D. Ronca	M. Oliva	Approved under DOA Privileges (ref. EASA.21J.335) Approval no. MOD2002/229.210112
	2-5,11	Added fuel pump and CT/CHT green arc specification.				
	9-3	Updated supplements list				
18	0-1, 6 thru 8	Update Cover and Amended RoR and LoEP	L. De Salvi	D. Ronca	M. Oliva	Approved under DOA Privileges (ref. EASA.21J.335) Approval no. MOD2002/231.210921
	1-6	Update oil stick minimum level				
	2-12	Other Instrument Marking Updated				
	6-12, 14, 17	Update Equipment List and Typo Errors				
	9-3, 4	Updated Supplements List				

2. LIST OF EFFECTIVE PAGES

The List of Effective Pages (LOEP), applicable to manuals of every operator, lists all the basic AFM pages: each manual could contain either basic pages or one variant of these pages when the pages of some Supplements are embodied.
Pages affected by the current revision are indicated by an asterisk (*) following the revision code.

3rd Edition, Rev.0	***June 20th 2012***
3rd Edition, Rev. 1	***December 20th 2012***
3rd Edition, Rev. 2	***June 10th 2013***
3rd Edition, Rev. 3	***February 28th 2014***
3rd Edition, Rev. 4	***July26th 2015***
3rd Edition, Rev. 5	***July27th 2015***
3rd Edition, Rev. 6	***February 02th2016***
3rd Edition, Rev. 7	***May 19th2017***
3rd Edition, Rev. 8	***July 28th 2017***
3rd Edition, Rev. 9	***August 28th 2018***
3rd Edition, Rev. 10	***November 14th 2018***
3rd Edition, Rev. 11	***February 28th 2019***
3rd Edition, Rev. 12	***May 06th 2019***
3rd Edition, Rev. 13	***August 07th 2019***
3rd Edition, Rev. 14	***November 11th 2019***
3rd Edition, Rev. 15	***May 12th 2020***
3rd Edition, Rev. 16	***October 16th 2020***
3rd Edition, Rev. 17	***January 12th 2021***
3rd Edition, Rev. 18	***September 21th 2021***

Section	Pages	Revision
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	Page 9	Rev. 15
	Pages 2 thru 4	Rev. 17
	Pages 1,6 thru 8	Rev. 18
Section 1	Pages 1 thru 5, 8 thru 14	Rev 0
	Page 7	Rev. 15
	Page 6	Rev. 18
Section 2	Pages 1 thru 4, 6 thru 8, 10, 13, 15 thru 22	Rev 0
	Pages 9,14	Rev 15
	Page 5,11	Rev 17
	Page 12	Rev 18
Section 3	Pages 1 thru 7, 16 thru 18	Rev 0
	Page 12 thru 15	Rev 1
	Pages 8, 10	Rev 2
	Pages 9 thru 11	Rev 4
Section 4	Pages 1 thru 4, 6	Rev 0
	Page 5	Rev 12
	Pages 7 thru 10, 12	Rev 9
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	Page 12	Rev 11
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	Pages 7 thru 11, 13, 15 thru 16, 18	Rev 15
	Page 12, 14, 17	Rev 18
Section 7	Pages 1 thru 8, 11 thru 14	Rev 0
	Page 10	Rev 9
	Page 9	Rev 12
Section 8	Pages 1 thru 6, 8	Rev 0
	Page 7	Rev 9
Section 9	Page 1	Rev 0
	Page 2	Rev 14
	Page 3, 4	Rev 18
Supplements LOEP: make reference to the Supplements Cover Pages		

3. FOREWORD

The ***P2002-JF*** is a twin seat, single engine aircraft with a tapered, low wing. fixed main landing gear and steerable nose wheel.

Section 1 supplies general information and it contains definitions, symbols explanations, acronyms and terminology used.

Before using the airplane, you are recommended to read carefully this manual: a deep knowledge of airplane features and limitations will allow you for operating the airplane safely.

For further information, please contact:

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Via MAIORISE

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4. SECTIONS LIST

General	Section 1(a non-approved Chapter)
Limitations	Section 2- **EASA Approved Chapter**
Emergency Procedures	Section 3- **EASA Approved Chapter**
Normal Procedures	Section 4- **EASA Approved Chapter**
Performances	Section 5- **EASA Approved Chapter (partially)**
Weight and Balance	Section 6 (a non-approved Chapter)
Systems	Section 7 (a non-approved Chapter)
Ground Handling, Servicing and Maintenance	Section 8 (a non-approved Chapter)
Supplements	Section 9 (*)

(*) EASA approved parts, if any, are reported on the supplements

SECTION 1 - GENERAL

INDEX

1 INTRODUCTION

The Aircraft Flight Manual has been implemented to provide the owners with information for a safe and efficient use of the aircraft TECNAM P2002JF.

The ***P2002-JF*** is a twin seat, single engine aircraft with a tapered, low wing. fixed main landing gear and steerable nose wheel.

This Flight Manual has been prepared to provide pilots and instructors with information for the safe and efficient operation of this very light aeroplane.

1.1 CERTIFICATION BASIS

This type of aircraft has been approved by the European Safety Aviation Agency in accordance with CS-VLA dated 14 November 2003, and the Type Certificate No. A.006, 27th May 2004.

Category of Airworthiness: Normal

Noise Certification Basis: EASA CS-36 1st edition dated 17th October 2003, with reference to ICAO/Annex 16 3rd edition dated 1993, Vol.1 Chapter 10.

1.2 WARNING – CAUTION – NOTE

Following definitions apply to warnings, cautions and notes used in the Aircraft Flight Manual.

WARNING

The non-observation of the corresponding procedure can lead, as immediate effect, to a significant reduction of the flight safety.

CAUTION

The non-observation of the corresponding procedure can lead to an equipment damage which leads to a reduction of the flight safety in a short or longer time interval.

NOTE

Draws the attention to a procedure not directly related to safety of flight.

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2 THREE-VIEW AND DIMENSIONS

2.1 THREE VIEW

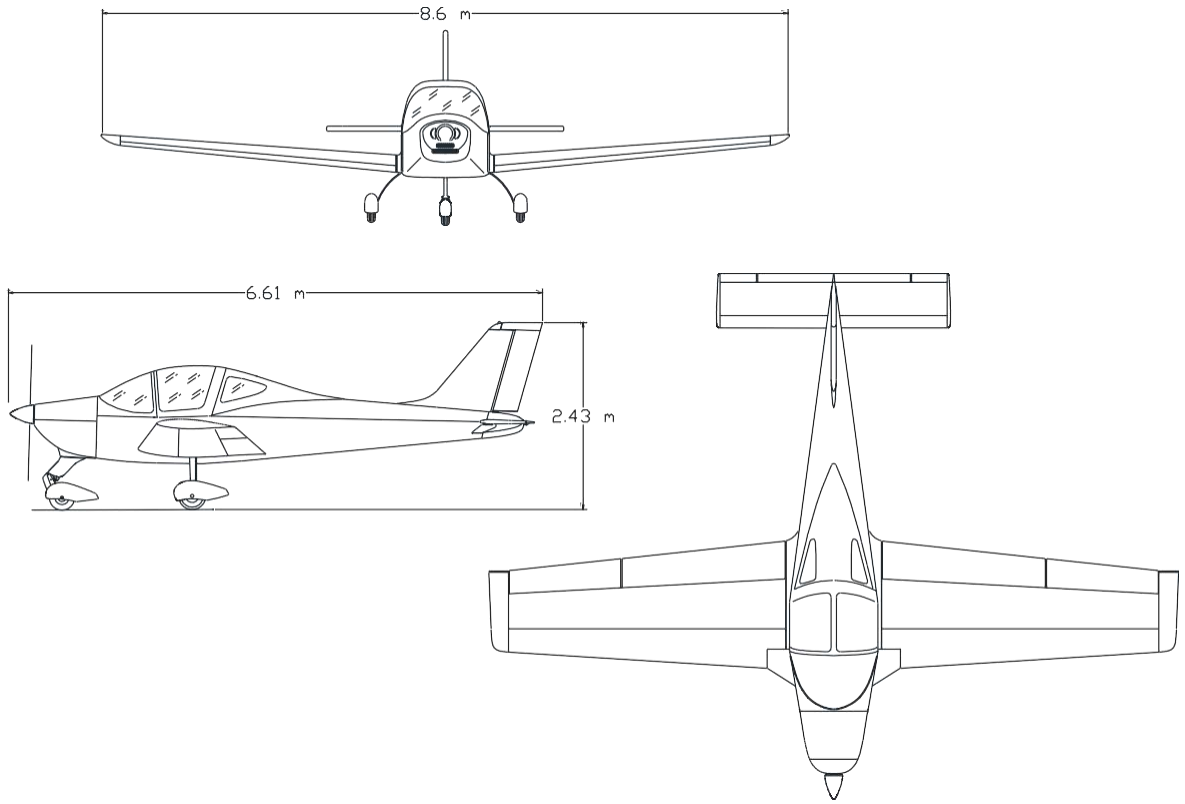

Fig. 1.1 – General views

- Dimensions shown refer to normal operating tire pressure.
- Propeller ground clearance *320mm*
- Propeller ground clearance with deflated front tire and nose wheel shock absorber compressed by *102mm*
- Minimum ground steering radius *5.5m*

2.2 DIMENSIONS

Overall dimensions	
Wingspan	8.6 m
Length	6.61 m
Overall height	2.43 m
Wing	
Wing surface	11.5 m^2
Taper Ratio	0.6
Dihedral	5°
Aspect ratio	6.4
Main Landing Gear	
Track	1.85 m
Wheelbase	1.62 m
Tire (Air Trac)	5.00-5
Wheel hub and brakes (Cleveland)	199-102
Nose Landing Gear	
Tire (Sava)	4.00 – 6
Optionally: Air Trac 5.00-5	

3 GENERAL FEATURES

3.1 CONTROL SURFACES TRAVEL LIMITS

Ailerons	Up 20° Down 15 ° (± 2°)
Stabilator (refer to Trailing Edge)	Up 3° Down 15° (± 1°)
Stabilator trim tab (refer to Trailing Edge)	Up 2°; Down 9° (± 1°)
Rudder	RH 30° LH 30° (± 2°)
Flaps	0°; 40° (± 1°)

3.2 ENGINE

Manufacturer	Bombardier-Rotax GmbH
Model	912 S2
Certification basis	FAR 33 - Amendment 15
Austrian T.C. No.	TW 9-ACG dated 27th November 1998
Engine type	4 cylinder horizontally-opposed twins with overall displacement of 1352 c.c., mixed cooling, (water-cooled heads and air-cooled cylinders), twin carburetors, integrated reduction gear with torque damper.
Maximum power (at declared rpm)	73.5kW (98.5hp) @5800rpm (max.5') 69.0kW (92.5hp) @5500rpm (cont.)

3.3 PROPELLER

Manufacturer	Hoffmann Propeller
Certification Basis	CAR Part 14
Type Certificate	SO/E 30 dated 10 December 1999
Model	HO17GHM A 174 177 C
Number of blades:	2
Diameter	1740 mm (no reduction allowed)
Type	Fixed pitch – wood

3.4 FUEL

Approved fuel:	MOGAS ASTM D4814 MOGAS EN 228 Super/Super Plus (Min RON 95) AVGAS 100LL (ASTM D910) *(see also Section 2)*
Fuel tanks	Two wing tanks integrated within the wing's leading edge. Equipped with finger strainers outlet and with drain fittings.
Capacity of each wing tan	50 litres
Tanks overall capacity	100 litres
Overall usable fuel	99 litres
Overall unusable fuel	1 litre

3.5 LUBRICATION

Lubrication system	Forced type with external reservoir
Oil	Lubricant specifications and grade are detailed into the "Rotax Operators Manual" and in its related documents.
Oil capacity	Max. 3.0 litres – min. 2.0 litres (*)

(*) :In accordance with SB-912-04 R1 the minimum oil level is recommended to 2.50 liters.

3.6 COOLING

Cooling system	Mixed air and liquid pressurized closed circuit system
Coolant liquid	Coolant type and specifications are detailed into the "Rotax Operator's Manual" and in its related documents.

3.7 WEIGHTS

See Section 2.

3.8 STANDARD WEIGHTS

Empty Weight: see weighing record on Section 6

3.9 SPECIFIC LOADINGS

	MTOW 580 kg	MTOW 600 kg	MTOW 620 kg
Wing Loading	50.4 kg/m^2	52.2 kg/m^2	53.9 kg/m^2
Power Loading	5.9 kg/hp	6.1 kg/hp	6.3 kg/hp

Reference is made to each MTOW: *580 kg*, *600 kg* (if Supplement A11 Increased MTOW @600kg is applicable) and *620 kg* (if Supplement A12 Increased MTOW @620kg is applicable).

4 ACRONYMS AND TERMINOLOGY

4.1 GENERAL AIRSPEED TERMINOLOGY AND SYMBOLS

KCAS	Calibrated Airspeed is the indicated airspeed expressed in knots, corrected taking into account the errors related to the instrument itself and its installation.
KIAS	Indicated Airspeed is the speed shown on the airspeed indicator and it is expressed in knots.
KTAS	True Airspeed is the KCAS airspeed corrected taking into account altitude and temperature.
V_A	Design Manoeuvring speed is the speed above the which it is not allowed to make full or abrupt control movement.
V_{FE}	Maximum Flap Extended speed is the highest speed permissible with flaps extended.
V_{NO}	Maximum Structural Cruising Speed is the speed that should not be exceeded, except in smooth air and only with caution.
V_{NE}	Never Exceed Speed is the speed limit that may not be exceeded at any time.
V_S	Stall Speed.
V_{S0}	Stall Speed in landing configuration (flaps and landing gear extended).
V_{S1}	Stall speed in the given flap and landing gear configuration.
V_X	Best Angle-of-Climb Speed is the speed which allows best ramp climb performances.
V_Y	Best Rate-of-Climb Speed is the speed which allows the best gain in altitude over a given time.
V_R	Rotation speed: is the speed at which the aircraft rotates about the pitch axis during takeoff

4.2 METEOROLOGICAL TERMINOLOGY

ISA	International Standard Atmosphere: is the air atmospheric standard condition at sea level, at 15°C (*59°F*) and at 1013.25hPa (*29.92inHg*).
QFE	Official atmospheric pressure at airport level: it indicates the aircraft absolute altitude with respect to the official airport level.
QNH	Theoretical atmospheric pressure at sea level: is the atmospheric pressure reported at the medium sea level, through the standard air pressure-altitude relationship, starting from the airport QFE.
OAT	Outside Air Temperature is the air static temperature expressed in degrees Celsius (°C).
T_S	Standard Temperature is 15°C at sea level pressure altitude and decreased by 2°C for each 1000 ft of altitude.
H_P	Pressure Altitude is the altitude read from an altimeter when the barometric subscale has been set to 1013 mb.

4.3 ENGINE POWER TERMINOLOGY

RPM	Revolutions Per Minute: is the number of revolutions per minute of the propeller, multiplied by 2.4286 yields engine RPM.

4.4 AIRCRAFT PERFORMANCE AND FLIGHT PLANNING TERMINOLOGY

Crosswind Velocity	is the velocity of the crosswind component for the which adequate control of the airplane during takeoff and landing is assured.
Usable fuel	is the fuel available for flight planning.
Unusable fuel	is the quantity of fuel that cannot be safely used in flight.
G	is the acceleration of gravity.
TOR	is the takeoff distance measured from actual start to wheel liftoff point.
TOD	is total takeoff distance measured from start to 15m obstacle clearing.
GR	is the distance measured during landing from actual touchdown to stop point.
LD	is the distance measured during landing, from 15m obstacle clearing to actual stop.
S/R	is the specific range, that is the distance (in nautical miles) which can be expected at a specific power setting and/or flight configuration per kilogram of fuel used.

4.5 WEIGHT AND BALANCE TERMINOLOGY

Datum	"Reference datum" is an imaginary vertical plane from which all horizontal distances are measured for balance purposes.
Arm	is the horizontal distance of an item measured from the reference datum.
Moment	is the product of the weight of an item multiplied by its arm.
C.G.	Center of Gravity is the point at which the airplane, or equipment, would balance if suspended. Its distance from the reference datum is found by dividing the total moment by the total weight of the aircraft.
Standard Empty Weight	is the weight of the aircraft with engine fluids and oil at operating levels.
Basic Empty Weight	is the standard empty weight to which it is added the optional equipment weight.
Useful Load	is the difference between maximum takeoff weight and the basic empty weight.
Maximum Takeoff Weight	is the maximum weight approved to perform the takeoff.
Maximum Landing Weight	is the maximum weight approved for the landing touchdown (for ***P2002-JF*** it is equivalent to the Maximum Takeoff Weight).
Tare	is the weight of chocks, blocks, stands, etc. used when weighing an airplane, and is included in the scale readings. Tare is deducted from the scale reading to obtain the actual (net) airplane weight.

5 UNIT CONVERSION CHART

MOLTIPLYING		*BY ➔*	*YIELDS*	
TEMPERATURE				
Fahrenheit	[°F]	$\frac{5}{9} \cdot (F - 32)$	Celsius	[°C]
Celsius	[°C]	$\left(\frac{9}{5} C\right) + 32$	Fahrenheit	[°F]
FORCES				
Kilograms	[kg]	2.205	Pounds	[lbs]
Pounds	[lbs]	0.4536	Kilograms	[kg]
SPEED				
Meters per second	[m/s]	196.86	Feet per minute	[ft/min]
Feet per minute	[ft/min]	0.00508	Meters per second	[m/s]
Knots	[kts]	1.853	Kilometres / hour	[km/h]
Kilometres / hour	[km/h]	0.5396	Knots	[kts]
PRESSURE				
Atmosphere	[atm]	14.7	Pounds / sq. in	[psi]
Pounds / sq. in	[psi]	0.068	Atmosphere	[atm]
LENGTH				
Kilometres	[km]	0.5396	Nautical miles	[nm]
Nautical miles	[nm]	1.853	Kilometres	[km]
Meters	[m]	3.281	Feet	[ft]
Feet	[ft]	0.3048	Meters	[m]
Centimetres	[cm]	0.3937	Inches	[in]
Inches	[in]	2.540	Centimetres	[cm]
VOLUME				
Litres	[l]	0.2642	U.S. Gallons	[US Gal]
U.S. Gallons	[US Gal]	3.785	Litres	[l]
AREA				
Square meters	[m^2]	10.76	Square feet	[sq ft]
Square feet	[sq ft]	0.0929	Square meters	[m^2]

6 LITRES / US GALLONS CONVERSION CHART

Litres	US Gallons
5	1.3
10	2.6
15	4.0
20	5.3
25	6.6
30	7.9
35	9.2
40	10.6
45	11.9
50	13.2
60	15.9
70	18.5
80	21.1
90	23.8
100	26.4
110	29.1
120	31.7
130	34.3
140	37.7
150	39.6
160	42.3
170	44.9
180	47.6
190	50.2
200	52.8

US Gallons	Litres
1	3.8
2	7.6
3	11.4
4	15.1
6	22.7
8	30.3
10	37.9
12	45.4
14	53.0
16	60.6
18	68.1
20	75.7
22	83.3
24	90.9
26	98.4
28	106.0
30	113.6
32	121.1
34	128.7
36	136.3
38	143.8
40	151.4
45	170.3
50	189.3
55	208.2

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SECTION 2 – LIMITATIONS

INDEX

1. INTRODUCTION

Section 2 includes operating limitations, instrument markings and basic placards necessary for safe operation of ***P2002-JF*** aircraft, its engines and standard systems and equipment.

2. SPEED LIMITATION

The following table addresses the airspeed limitations and their operational significance:

SPEED			KIAS	KCAS	REMARKS
V_{NE}	Never exceed speed		142	140	Do not exceed this speed in any operation.
V_{NO}	Maximum Structural Cruising Speed		114	110	Do not exceed this speed except in smooth air, and only with caution.
V_A	Design Manoeuvring speed		100	97	Do not make full or abrupt control movement above this speed, because under certain conditions the aircraft may be overstressed by full control movement.
V_{FE}	Maximum flaps extended speed	*FULL*	69	71	Do not exceed this speed for indicated flaps setting.
		T.O.	101	98	

3. AIRSPEED INDICATOR MARKINGS

Airspeed indicator markings and their colour code are explained in the following table.

MARKING	KIAS	EXPLANATION
White arc	**33 – 69**	Positive Flap Operating Range (lower limit is V_{SO}, at specified maximum weight and upper limit is the maximum speed permissible with landing flaps extension).
Green arc	**41 – 114**	Normal Operating Range (lower limit is V_{S1} at specified maximum weight and most forward c.g. with flaps retracted and upper limit is maximum structural speed V_{NO}).
Yellow arc	**114 – 142**	Manoeuvres must be conducted with caution and only in smooth air.
Red line	**142**	Maximum speed for all operations.

4. POWERPLANT LIMITATIONS

Following table reports the operating limitations for aircraft engine installed:

ENGINE MANUFACTURER: Bombardier Rotax GmbH.

ENGINE MODEL: 912 S2

MAXIMUM POWER:

	Max Power kW *(hp)*	Max rpm. Prop. rpm *(engine)*	Time max. (minutes)
Max. T.O.	73.5 *(98.5)*	2388 *(5800)*	5
Max. Cont.	69 *(92.5)*	2265 *(5500)*	-

NOTE *With full throttle, at fixed point in no wind conditions, the maximum propeller's rpm should be 2100 ± 100.*

Temperatures:

Max CHT*	135° C
Max CT	120° C
Min/Max Oil	50° C / 130° C
Oil normal operating range (approx.)	90° C / 110° C

* *applicable for Engines up to serial no. 4924543(included) and repaired engine which doesn't change the cylinder head n°3 with new one (part no. 413195)*

Oil Pressure:

Minimum	0.8 Bar / 12psi	(below 1400 rpm prop)
Normal	2 – 5 Bar / 29-73psi	(above 1400 rpm prop)
Maximum	7 Bar / 102 psi	(above 1400 rpm prop)

Engine starting: allowable temperature range

OAT Min	-25° C
OAT Max	+50° C

WARNING *In event of cold starting operation, it is permitted a maximum oil pressure of 7 bar for a short period.*

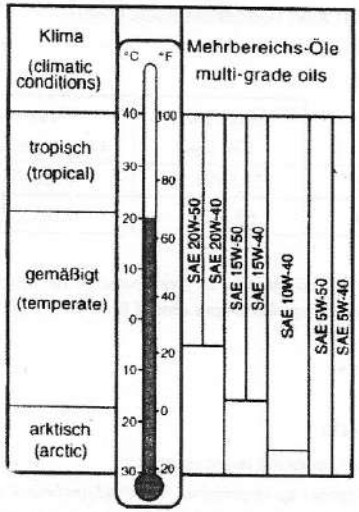
Fuel pressure:

Minimum	2.2 psi (0.15 Bar)
Maximum	5.8 psi (0.40 Bar) or 7.26 psi* (0.5 Bar)

**only applicable for fuel pump part no. 893110, 893114* or 893115.

5. LUBRICANT

Use viscosity grade oil as specified in the following table:



WARNING

Use of Aviation Grade Oil with or without additives is not permitted

6. COOLANT LIQUID

Coolant type and specifications are detailed into the "Rotax Operator's Manual" and in its related documents.

7. PROPELLER

MANUFACTURER:	Hoffmann Propeller GmbH
MODEL:	HO17GHM A 174 177 C
TYPE:	Wood twin blade fixed pitch
DIAMETER:	1740 mm (no reduction permitted)

8. MAXIMUM OPERATING ALTITUDE

Maximum operating altitude is 14000 ft (4260 m) MSL.

CAUTION

Flight crew is required to use supplemental oxygen according to applicable Air Operation Rules.

9. AMBIENT TEMPERATURE

Ambient temperature: from -25°C to +50°C.

WARNING

Flight in expected and/or known icing conditions is forbidden.

10. POWERPLANT INSTRUMENTS MARKINGS

Powerplant instrument markings and their colour code significance are shown below:

INSTRUMENT		RED LINE Minimum limit	GREEN ARC Normal operating	YELLOW ARC Caution	RED LINE Maximum limit
Propeller	rpm	----	580 - 2265	2265 - 2388	2388
Oil temp.	°C	50	90 - 110	50 - 90 110 - 130	130
CHT(4)	°C	----	0(6) - 135	----	135
CT	°C		0(6) - 120		120
Oil pressure	bar	0.8(3)	2 - 5	0.8 - 2 5 - 7 (1)	7 (5)
Fuel press.	psi	2.2	2.2-5.8 or 7.26(3)	----	5.8 or 7.26(3)

1- In event of cold starting operation, it is permitted a maximum oil pressure of 7 bar for a short period.

2 - *reserved*

3 – when fuel pump part no. 893110, 893114 or 893115 is installed

4 - Applicable for Engines up to serial no. 4924543(included) and repaired engine which doesn't change the cylinder head n°3 with new one (part no. 413195)

5 – For aircraft equipped with Sorlini indicator, minimum and maximum limit are provided with red arcs

6 – For aircraft equipped with Sorlini indicator, due to an indicator physical limitation, green arc starts from 50°C

11. OTHER INSTRUMENTS MARKINGS

INSTRUMENT	RED LINE Minimum limit	GREEN ARC Normal operating	YELLOW ARC Caution	RED LINE Maximum limit
Voltmeter	10,5 Volt	12 - 14 Volt	----	----
Suction Gage	----	4,5 – 5,5 inHg	----	----

12. WEIGHTS

Condition	Weight
Maximum take-off weight	*620 kg*
Maximum landing weight	*620 kg*
Maximum zero wing fuel weight	*620 kg*
Maximum baggage weight (*2.26 m* aft from datum):	*20 kg*

13. CENTER OF GRAVITY

Datum	Propeller support flange without spacer
Levelling	Seat track supporting trusses (ref. to sect.6 for the procedure)
Forward limit	1.693 m (26.0% MAC) aft of datum for all weights
Aft limit	1.782 m (32.5% MAC) aft of datum for all weights

WARNING

The pilot is responsible for ensuring that the airplane is properly loaded. Refer to Section 6 for appropriate instructions.

14. APPROVED MANEUVRES

The aircraft is certified in normal category in accordance with EASA CS-VLA regulation.

- ✓ Non aerobatic operations include:
- ✓ Any manoeuvre pertaining to "normal" flight
- ✓ Stalls (except whip stalls)
- ✓ Lazy eights
- ✓ Chandelles
- ✓ Turns in which the angle of bank is not more than 60°
- ✓ Recommended entry speeds for each approved manoeuvre are as follows:

Manoeuvre	Speed [KIAS]
Lazy eight	*100*
Chandelle	*114*
Steep turn (max 60°)	*100*
Stall	Slow deceleration (*1 kts/s*)

WARNING

Acrobatic manoeuvres, including spins and turns with angle of bank of more than 60°, are not approved for such a category.

WARNING

Limit load factor could be exceeded by moving abruptly flight controls at their end run at a speed above V_A (Manoeuvring Speed: 100 KIAS).

15. MANEUVRES LOAD FACTOR LIMITS

Maneuver load factors limits are as follows:

Positive	Negative
+ 3.8 g	**- 1.9 g**

Maneuver load factors limits with flaps extended are as follows:

Positive	Negative
+ 1.9 g	**0 g**

16. FLIGHT CREW

Minimum crew for flight is one pilot seated on the left side.

17. MAXIMUM PASSENGER SEATING

With the exception of the pilot, only one passenger is allowed on board of this aircraft.

18. KINDS OF OPERATION EQUIPMENT LIST

This paragraph reports the KOEL table, concerning the equipment list required on board under CS-VLA regulations to allow flight operations in VFR Day.

Flight in VFR Day is permitted only if the pre-scribed equipment is installed and operational.

Additional equipment, or a different equipment list, for the intended operation may be required by national operational requirements and also depends on the airspace classification and route to be flown.

- Altimeter
- Airspeed Indicator
- Heading Indicator
- Fuel Gauges
- Oil Pressure Indicator
- Oil Temp. Indicator
- Cylinder Heads Temp. Indicator
- Outside Air Temp. indicator
- Tachometer
- Chronometer
- First Aid Kit
- Hand-held fire extinguisher
- Emergency hammer

WARNING

Flight in expected and/or known icing conditions, in proximity of storms or in turbulence is forbidden.

NOTE

Additional equipment can be required to fulfill national or specific operational requirements. The owner is responsible for fulfilling these requirements.

NOTE

Equipment list is addressed in Section 6.

19. FUEL

TWO TANKS:	*50 liters each*
TOTAL FUEL CAPACITY:	*100 liters.*
USABLE FUEL Q.TY:	*99 liters*
UNUSABLE FUEL Q.TY:	*0.5 liters each (1.0 litres total)*

Compensate uneven fuel tank levels by acting on the fuel selector valve located into the cabin.

APPROVED FUEL:

- ✓ MOGAS ASTM D4814
- ✓ MOGAS EN 228 Super/Super plus (min. RON 95)
- ✓ AVGAS 100 LL (ASTM D910)

CAUTION

Prolonged use of Aviation Fuel Avgas 100LL results in greater wear of valve seats and greater combustion deposits inside cylinders due to higher lead content. Make reference to Rotax Maintenance Manual which prescribes dedicated checks due to the prolonged use of Avgas.

20. DEMONSTRATED CROSS WIND SAFE OPERATIONS

The aircraft controllability during take-offs and landings has been demonstrated with a cross wind components of *22 kts*.

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21. LIMITATION PLACARDS

The following limitation placards must be placed in plain view on the aircraft.
Near the airspeed indicator a placard will state the following:

MANEUVERING SPEED V_A = 100 KIAS

On the left hand side of the dashboard a placard will state the following:

THIS AIRPLANE IS CLASSIFIED AS A VERY LIGHT AIRPLANE APPROVED FOR DAY VFR ONLY, IN NON-ICING CONDITIONS. ALL AEROBATIC MANEUVERS INCLUDING INTENTIONAL SPIN ARE PROHIBITED. SEE FLIGHT MANUAL FOR OTHER LIMITATIONS.

NO SMOKING

Near baggage compartment a placard will state the following:

FASTEN TIE-DOWN NET MAXIMUM WEIGHT *20 KG* MAX. PRESS *12.5 kg/dm²*

On the wing root there is the following placard:

NO STEP

For other placards see Maintenance Manual doc. 2002/30.

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SECTION3–EMERGENCY PROCEDURES

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1. INTRODUCTION

Section 3 includes checklists and detailed procedures to be used in the event of emergencies. Emergencies caused by a malfunction of the aircraft or engine are extremely rare if appropriate maintenance and pre-flight inspections are carried out.

Before operating the aircraft, the pilot should become thoroughly familiar with the present manual and, in particular, with the present section. Further, a continued and appropriate training should and self study should be done.

In case of emergency the pilot should acts as follows:

1. *Keep control of the aeroplane*
2. *Analyse the situation*
3. *Apply the pertinent procedure*
4. *Inform the Air Traffic Control if time and conditions allow.*

Two types of emergency procedures are hereby given:

a. "Bold faces" which must be known by heart and executed in the correct and complete sequence, as soon as possible as the failure is detected and recognized;

   These procedures characters are boxed and highlighted, an example is shown below:

BEFORE ROTATION: ABORT TAKE OFF

1.	**Throttle**	***IDLE***
2.	**Rudder**	***Keep heading control***
3.	- -	
4.	- -	

b. Other procedures which should be well theoretically know and mastered, but that are not time critical and can be executed entering and following step by step the AFM appropriate checklist.

NOTE

For the safe conduct of later flights, any anomaly and/or failure must be communicated to the National Authorities in charge, in order to put the aircraft in a fully operational and safe condition.

NOTE

In this Chapter, following definitions apply:
***Land as soon as possible**: land without delay at the nearest suitable area at which a safe approach and landing is assured.*
***Land as soon as practical**: land at the nearest approved landing area where suitable repairs can be made.*

2. AIRPLANE ALERTS

The alert lights, located on the instrument panel can have the following colours:

GREEN: to indicate that pertinent device is turned ON

AMBER: to indicate no-hazard situations which have to be considered and which require a proper crew action

2.1. ELECTRIC POWER SYSTEM MALFUNCTION

Generator Light Illuminates

NOTE Generator light may illuminate for a faulty alternator or when voltage is above 16V, in this case the over-voltage sensor automatically shuts down the alternator

.

1. Generator switch: *OFF*
2. Master switch: *OFF*
3. Generator switch: *ON*
4. Master switch: *ON*

If the problem persists

5. Generator switch: *OFF*
6. Non-vital electric equipment: *Shed*

WARNING

A fully charged battery is capable to supply enough power to supply normal electric-loads including operation of flap and trim for about 20 minutes

2.2. ELECTRICAL FUEL PUMP FAILURE

If the electrical fuel pump light is *OFF* the reasons can be:

- *Electrical fuel pump not electrically fed*
- *Light inoperative*

Apply the following procedure:

1. Electrical fuel pump switch: *OFF*
2. Electrical fuel pump switch: *ON*
3. Fuel pressure: *CHECK raise*

If fuel pressure doesn't build up:

1. **Land as soon as possible monitoring fuel pressure**.

2.3. TRIM SYSTEM FAILURE

Locked Control

Should trim control be inoperative, act as follows:

2. Breakers: *CHECK*
3. Trim switch LH/RH: *CHECK for correct position*
4. Speed: *adjust to control aircraft without excessive stick force*
5. **Land aircraft as soon as possible**.

Runaway

In event of trim runaway, act as follows:

1. Trim disconnect switch: *OFF*
2. Speed: *adjust to control aircraft without excessive stick force*
3. **Land aircraft as soon as possible**.

2.4. AIRPLANE EVACUATION

With the engine secured and propeller stopped (if practical):

1. **Parking brake:** ***ON***
2. **Seat belts:** ***unstrap completely***
3. **Headphones:** ***REMOVE***
4. **Canopy:** ***OPEN***
5. **If canopy is locked or doesn't slide:** ***break using the hammer***
6. ***Escape away from flames/ hot engine compartment/ spilling fuel tanks.***

3. ENGINE SECURING

Following procedure is applicable to shut-down the engine in flight:

1. Throttle Lever	***IDLE***
2. Magnetos	***OFF***
3. Fuel Selector	***OFF***
4. Electrical fuel pump	***OFF***
5. Generator switch	***OFF***

4. ENGINE FAILURE

4.1. ENGINE FAILURE DURING TAKE-OFF RUN

1. **Throttle:** ***IDLE (fully out)***
2. **Rudder** ***Keep heading control***
3. **Brakes:** ***apply as needed***

When safely stopped:

4. Magnetos: *OFF*.
5. Fuel selector valve: *OFF*
6. Electric fuel pump*:* *OFF*
7. Generator & Master switches: *OFF*.

4.2. ENGINE FAILURE IMMEDIATELY AFTER TAKE-OFF

1. **Speed:** ***keep minimum 51 kias***
2. **Find a suitable place to land safely.**

WARNING

The immediate landing should be planned straight ahead with only small changes in directions not exceeding 45° to the left and 45° to the right.

3. **Flaps:** ***as needed.***

WARNING

Stall speed increases with bank angle and longitudinal load factor. Acoustic stall warning will in any case provide a correct anticipated clue of incipient stall.

At, or right before touch down

4. **Throttle:** ***IDLE (fully out)***
5. **Magnetos:** ***OFF.***
6. **Fuel selector valve:** ***OFF***
7. **Electric fuel pump:** ***OFF***
8. **Generator & Master switches:** ***OFF***

WARNING

A single engine aircraft take off should always be preceded by a thorough take off emergency pilot self-briefing. Decision to try an engine emergency restart right after take off should be taken only if environmental situation requires it: pilot shall never ignore the priority of attentively follow an immediate emergency landing.

After possible mechanical engine seizure, fire or a major propeller damage, engine restart attempt is not recommended.

4.3. ENGINE FAILURES DURING FLIGHT

4.3.1 Low Fuel Pressure

If the fuel pressure indicator falls below the **2.2 psi***(0.15 bar)*:

1. Electric fuel pump: *ON*
2. Fuel selector valve: *change the fuel feeding tank*
3. Check both fuel quantity indicators

If fuel pressure doesn't build up:

4. **Land as soon as possible monitoring fuel pressure**.

If engine stops:

5. **Land as soon as possible applying forced landing procedure (See Para. 7)**

4.3.2 Oil Pressure limits exceedance

If oil pressure exceeds upper limit (7 bar):

1. Throttle Lever *REDUCE engine power as practical*
2. OIL PRESS and OIL TEMP *CHECK within limits*
3. **Land as soon as practical**

If oil pressure is under the lower limit (0.8 bar):

1. Throttle Lever *REDUCE Minimum practical*
2. **Land as soon as practical**

If oil pressure continues to decrease:

3. **Land as soon as possible** applying forced landing procedure (See Para. 7)

4.3.3 High Oil Temperature

If oil pressure is low see para. 4.3.2 Low Oil Pressure.

If oil pressure is within limits:

1. Throttle Lever *REDUCE Minimum practical*

If oil temperature does not decrease

2. Airspeed *INCREASE*

NOTE

If oil temperature does not come back within limits, the thermostatic valve (if embodied), regulating the oil flow to the heat exchangers, could be damaged or an oil leakage can be present in the oil supply line.

3. Land as soon as practical

If engine roughness, vibrations, erratic behaviour, or high CHT /CT is detected:

4. **Land as soon as possible** applying forced landing procedure (See Para. 7)

4.3.4 CHT/CT limit exceedance

If CHT is above 135°C or CT is above 120 °C:

1. Throttle Lever *REDUCE Minimum practical*
2. **Land as soon as practical**

If CHT/CT continues to rise and engine shows roughness or power loss:

3. **Land as soon as possible** applying forced landing procedure (See Para. 7)

5. IN-FLIGHT ENGINE RESTART

WARNING

After a mechanical engine seizure, fire or a major propeller damage engine restart is not recommended.

NOTE

It is preferred to restart the engine at an altitude below 4000ft and at the suggested speed of 69 KIAS or more

1.	Carburettor heat	*ON if required*
2.	Electrical fuel pump	*ON*
3.	Fuel quantity indicator	*CHECK*
4.	Fuel Selector	*change the fuel feeding tank*
5.	Magnetos	*BOTH*
6.	Magnetos	*START*
7.	Throttle lever	*SET as required*

CAUTION

After engine restart, if practical, moderate propeller rpm and throttle increase to allow OIL and CHT/CT temperatures for stabilizing in the green arcs.

NOTE

If the fuel quantity in the tank which feeds the stopped engine is low, select the opposite side fuel tank by means of the fuel selector.

In case of unsuccessful engine restart:

1.	Engine	*SECURE (see engine securing procedure on Para. 3)*
2.	**Land as soon as possible** applying forced landing procedure (See Para. 7)	

6. SMOKE AND FIRE

6.1. ENGINE FIRE ON THE GROUND

1.	**Fuel Selector**	***OFF***
2.	**Electrical fuel pump**	***OFF***
3.	**Magnetos**	***OFF***
4.	**Throttle lever**	***FULL POWER***
5.	**Cabin Heat**	***OFF***
6.	**Generator & Master Switches**	***OFF***
7.	**Parking Brake**	***ENGAGED***
8.	**Aircraft Evacuation**	***carry out immediately***

6.2. ENGINE FIRE DURING TAKEOFF

BEFORE ROTATION: ABORT TAKE OFF

1.	**Throttle Lever**	**IDLE**
2.	**Rudder**	***Keep heading control***
3.	**Brakes**	***As required***

With aircraft under control

1.	**Fuel Selector**	***OFF***
2.	**Electrical fuel pump**	***OFF***
3.	**Magnetos**	***OFF***
4.	**Cabin Heat**	***OFF***
5.	**Generator & Master Switches**	***OFF***
6.	**Parking Brake**	***ENGAGED***
7.	**Aircraft Evacuation**	***carry out immediately***

6.3. ENGINE FIRE IN-FLIGHT

1. **Cabin heating:** ***OFF***
2. **Fuel selector valve:** ***OFF***
3. **Electric fuel pump:** ***OFF***
4. **Throttle:** ***FULL FORWARD until the engine stops***
5. **Magnetos:** ***OFF***
6. **Cabin vents:** ***OPEN***

WARNING

Do not attempt engine restart

7. **Land as soon as possible** applying forced landing procedure(See Para. 7).

6.4. CABIN FIRE / ELECTRICAL SMOKE IN CABIN DURING FLIGHT

1. **Cabin heating:** ***OFF***
2. **Cabin vents:** ***OPEN***
3. **Canopy:** ***OPEN, if necessary***
4. **Try to choke the fire. Direct the fire extinguisher towards flame base**

If smoke persists:

1. Generator & Master switches: *OFF*
2. **Land as soon as possible** and evacuate the aircraft

CAUTION

If the MASTER SWITCH is set to OFF, consider that flaps extension and pitch trim operation would be not possible.

6.5. ELECTRICAL SMOKE/FIRE IN CABIN ON THE GROUND

1. **Generator Switch:** ***OFF***
2. **Throttle Lever:** ***IDLE***
3. **Magnetos:** ***ALL OFF***
4. **Fuel Selector Valve:** ***OFF***
5. **MASTER SWITCH:** ***OFF***
6. **Aircraft Evacuation** ***carry out immediately***

7. LANDING EMERGENCY

7.1. FORCED LANDING WITHOUT ENGINE POWER

1. Flap: UP
2. Airspeed: *69 KIAS*
3. Find a suitable place to land safely, plan to approach it upwind.
4. Fuel selector valve: *OFF*
5. Electric fuel pump: *OFF*
6. Magnetos: *OFF*
7. Safety belts: *Tighten*
8. Canopy locks: *CHECK LOCKED*

When certain to land

9. Flaps: *as necessary*
10. Generator and Master switches: *OFF*.

NOTE

*Glide ratio is **12.8** therefore in zero wind conditions every 1000ft Above Ground Level it is possible to cover ca. 2 NM(ca. 4 km).*

7.2. POWER-ON FORCED LANDING

1. Airspeed: *69 KIAS*
2. Flaps: *UP*
3. Locate the most suitable terrain for emergency landing, plan to approach it upwind.
4. Safety belts: *Tighten*
5. Canopy locks: *CHECK LOCKED*

When certain to land, right before touch down

6. Flaps: *as necessary*
7. Fuel selector valve: *OFF*
8. Electric fuel pump: *OFF*
9. Magnetos: *OFF*
10. Generator and Master switches: *OFF*

7.3. LANDING WITH A FLAT NOSE TIRE

1. Pre-landing checklist: *Complete*
2. Flaps: *Land*
3. Land and maintain aircraft *NOSE HIGH* attitude as long as possible.

As aircraft stops

4. Engine securing: *Perform (see Para. 3)*
5. Airplane evacuation: *Perform (see Para. 2.4)*

7.4. LANDING WITH A FLAT MAIN TIRE

If it's suspected a main tire defect or it's reported to be defective:

1. Pre-landing checklist: *Complete*
2. Flaps: *Land*
3. Land the aeroplane on the side of runway opposite to the defective tire to compensate the change in direction which is to be expected during final rolling
4. Touchdown with the GOOD TIRE FIRST and hold aircraft with the flat tire off the ground as long as possible by mean of aileron and rudder control.

As aircraft stops

5. Engine securing: *Perform (see Para. 3)*
6. Airplane evacuation: *Perform (see Para. 2.4)*

8. RECOVERY FROM UNINTENTIONAL SPIN

If unintentional spin occurs, the following recovery procedure should be used:

1.	**Throttle:**	***IDLE (full out position)***
2.	**Rudder:**	***full, in the opposite direction of the spin***
3.	**Stick:**	***centralize and hold neutral***

As the spin stops:

4.	**Rudder:**	***SET NEUTRAL***
5.	**Aeroplane attitude:**	***smoothly recover averting speeds in excess of V_{NE} and maximum load factor (n=+3.8)***
6.	**Throttle:**	***Readjust to restore engine power.***

WARNING

Keep full rudder against rotation until spin has stopped.

One complete turn and recovery takes around 500 feet.

9. OTHER EMERGENCIES

9.1. UNINTENTIONAL FLIGHT INTO ICING CONDITIONS

WARNING

Carburettor ice is possible when flying at low engine rpm in visible moisture (outside visibility less than 5 km, vicinity of fog, mist, clouds, rain, snow or hail) and OAT less than 10°C.Airbox carburettor heater is designed to help prevent carburettor ice, less effectively functions as a de-icing system.

1. Carburettor heating: *ON*
2. Immediately fly away from icing conditions (changing altitude and direction of flight, out of clouds, visible moisture, precipitations)
3. Controls surfaces: *continue to move to maintain their movability*
4. Propeller speed: *increase rpm.*
5. Cabin heat: *ON*

WARNING

In case of ice formation on wing leading edge, stall speed would increase.

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SECTION 4 – NORMAL PROCEDURES

INDEX

1. INTRODUCTION

Section 4 contains checklists and the procedures for the conduct of normal operation.

2. AIRSPEEDS FOR NORMAL OPERATIONS

Following airspeeds are significant for normal operations, with reference to each MTOW: 580 kg, 600 kg (if Supplement A11 - Increased MTOW @600 KG - is applicable) and 620 kg (if Supplement A12 - Increased MTOW @620 KG - is applicable).

		MTOW		
	FLAPS	**580kg**	**600 kg**	**620 kg**
Rotation Speed (in take-off, V_R)	**T/O**	*42 KIAS*	*42 KIAS*	*42 KIAS*
Best Angle-of-Climb Speed (V_X)	**0°**	*56 KIAS*	*56 KIAS*	*56 KIAS*
Best Rate-of-Climb speed (V_Y)	**0°**	*66 KIAS*	*66 KIAS*	*66 KIAS*
Approach speed	**T/O**	*66 KIAS*	*66 KIAS*	*66 KIAS*
Final Approach Speed	**FULL**	*51 KIAS*	*51 KIAS*	*51 KIAS*
Manoeuvring speed (V_A)	**0°**	*96 KIAS*	*98 KIAS*	*100 KIAS*
Never Exceed Speed (V_{NE})	**0°**	*138 KIAS*	*141 KIAS*	*142 KIAS*

3. PRE-FLIGHT INSPECTIONS

Before each flight, it is necessary to carry out a complete aircraft check comprising an external inspection followed by a cockpit inspection as below detailed.

3.1. CABIN INSPECTION

A Aircraft documents (ARC, Certificate of Airworthiness, Noise certificate, Radio COM certificate, AFM): *check current and on board*

B Weight and balance: *calculate (ref. this AFM sect. 6) check within limits*

C Safety belts: *connected to hard points, check condition*

D Magnetos: *OFF, keys extracted*

E Master switch: *ON*

F Voltmeter: check (10-12 V); Ammeter check (red).

G Lights: *all ON, check operation*

H Acoustic stall warning: *check operation*

I Master switch: *OFF*

J Baggage: *check first aid kit, canopy hammer, ELT, fire extinguisher, luggage stowage and fastened with restraint net.*

3.2. AIRCRAFT WALK-AROUND

To perform the aircrafr walk-around, carry out the checklist according to the station shown in Figure 4-1.

WARNING

Visual inspection is defined as follows: check for defects, cracks, detachments, excessive play, unsafe or improper installation as well as for general condition. For control surfaces, visual inspection also involves additional check for freedom of movement and security. Red lubber lines on bolts and nuts shall be intact.

WARNING

Fuel level indicated by the cockpit-televels should be verified by visual check of actual fuel quantity embarked in the tanks.

NOTE

Fuel drainage operation must be carried out with the aircraft parked on a level surface. Set Cockpit Fuel Selector Valve to on prior to drain fuel circuit nose section valve.

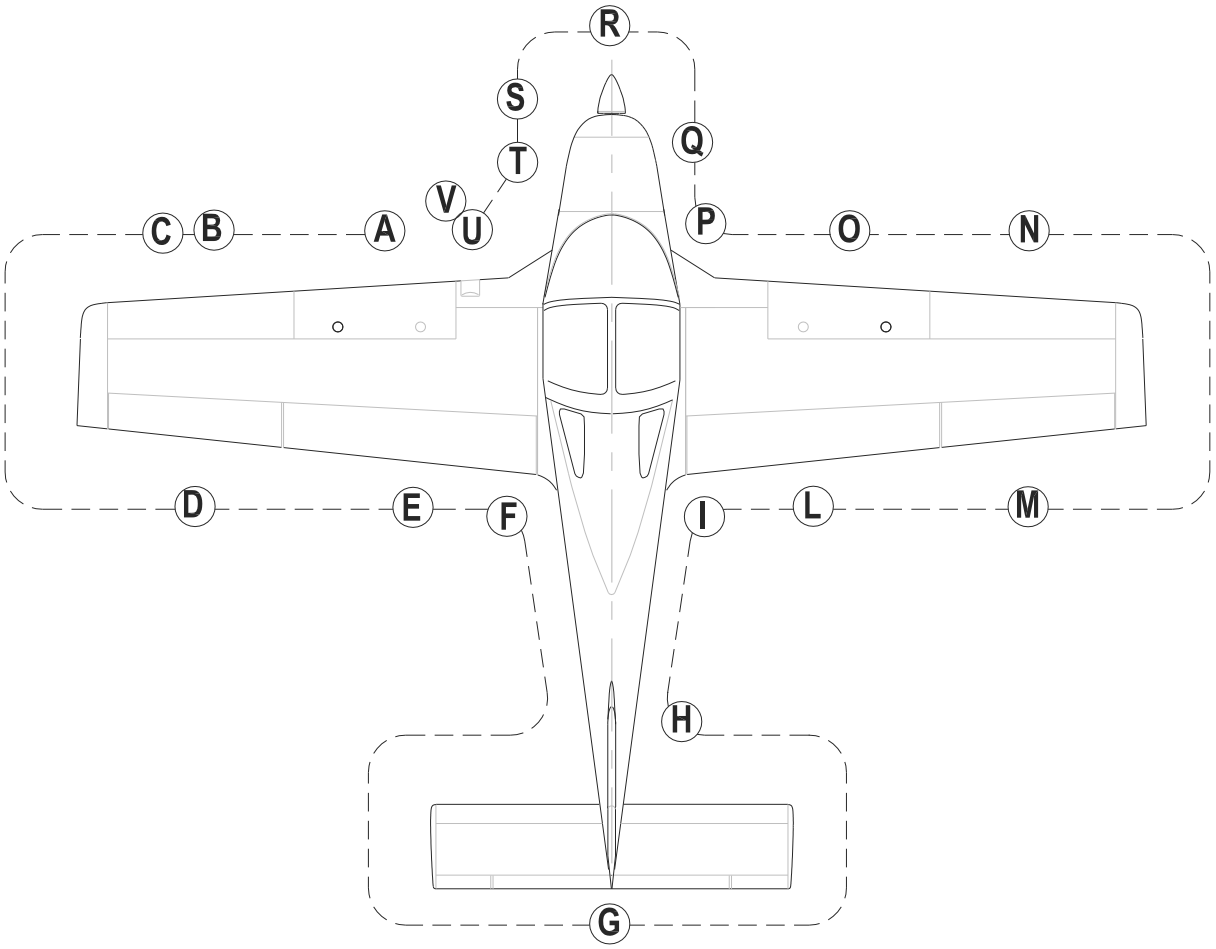

FIG. 4-1

A Left fuel filler cap: check visually for desired fuel level. Drain the left fuel tank by drainage valve using a cup to collect fuel (drainage operation must be carried out with the aircraft parked on a level surface). Check for water or other contaminants. Close filler cap.

B Remove protection plug (if provided) and check the Pitot tube and the static ports mounted on left wing are unobstructed; do not blow inside vents.

C Left side leading edge and wing skin: visual inspection

D Left aileron, trim tab and hinges: visual inspection, check free of play, friction; Left tank vent: check for obstructions.

E Left flap and hinges: visual inspection

F Left main landing gear: check inflation, tire condition, alignment, fuselage skin condition.

G Horizontal tail and tab: visual inspection, check free of play, friction.

H Vertical tail, rudder and trim tab: visual inspection, check free of play, friction.

I Right main landing gear; check inflation, tire condition, alignment, fuselage skin condition.

L Right flap and hinges: visual inspection.

M Right aileron, trim tab and hinges: visual inspection, check free of play, friction; Right side tank vent: check for obstructions.

N Right leading edge and wing skin: visual inspection.

O Right fuel filler cap: check visually for desired fuel level. Drain the right fuel tank by the drainage valve using a cup to collect fuel. Drainage operation must be carried out with the aircraft parked on a level surface. Check for water or other contaminants. Close filler cap.

P Set the fuel selector valve to ON. Drain circuit using a cup to collect fuel by opening the specific drainage valve (part of the gascolator). Check for water or other contaminants.

Q Nose wheel strut and tire: check inflation, tire and rubber shock absorber discs condition.

R Propeller and spinner condition: check for nicks, cracks, dents and other defects, propeller should rotate freely. Check fixing and lack of play between blades and hub.

S Open engine cowling:

1. Check no foreign objects are present.
2. Verify coolant level in the overflow bottle: level must be between min. and max. mark. Replenish if required.
3. *<u>Only before the first flight of the day:</u>*
   a. *Verify coolant level in the expansion tank, replenish as required up to top (level must be at least 2/3 of the expansion tank).*
   b. *Turn the propeller by hand to and fro, feeling the free rotation of 15°or 30° before the crankshaft starts to rotate. If the propeller can be turned between the dogs with practically no friction at all further investigation is necessary. Turn propeller by hand in direction of engine rotation several times and observe engine for odd noises or excessive resistance and normal compression.*
   c. *Carburettors: check the throttle cable condition and installation.*
   d. *Exhaust: inspect for damages, leakage and general condition*
4. Check radiators. There should be no indication of leakage of fluid and they have to be free of obstructions.

5. Check oil level and replenish as required. Prior to oil check, having magnetos switched off turn the propeller by hand in direction of engine rotation several times to pump oil from the engine into the oil tank, or let the engine idle for 1 minute. This process is finished when air is returning back to the oil tank and can be noticed by a murmur from the open oil tank. Prior to long flights oil should be added so that the oil level reaches the "max" mark.
6. Inspect fuel circuit for leakages.
7. Check integrity of silent-block suspensions.
8. Check connection and integrity of air intake system, visually inspect that ram air intake is unobstructed.
9. Check that all parts are secured or safetied.

T Close engine cowling, check for proper alignment of cam-locks.

U Visual inspection of the Landing and Strobe Light.

V Remove tow bar and chocks, stow on board pitot, static ports and stall warning protective covers.

NOTE *Avoid blowing inside Pitot-tube and inside airspeed indicator system's static vents as this may damage instruments.*

4. CHECKLISTS

4.1. BEFORE ENGINE STARTING (AFTER PREFLIGHT INSPECTION)

1. Seat position and safety belts adjustment
2. Flight controls: *operate until their stop checking for movement smoothness, free of play and friction.*
3. Parking brake: *engage and brake pedal press/brake lever pull*
4. Throttle friction: *adjust*
5. Circuit Breakers: *check all IN*
6. Master switch: *ON, Check generator light ON and Voltage (at least 10.5 V)*
7. Electric fuel pump: *ON, (check for audible pump noise and fuel pressure build up)*
8. Electric fuel pump: *OFF*
9. Fire detector (if installed): *TEST*
10. Avionic Master switch *(if installed)*: *ON, instruments check, then set in OFF*
11. Flap control: *cycle fully extended and then set T/O*
12. Pitch Trim: *cycle fully up and down, from both left and right controls, check for trim disconnect switch operation.*
13. Pitch trim: *set neutral*

WARNING

Pitch trim other than in neutral position would affect take off performance and take off rotation execution at the correct V_R IAS.

14. Nav. light & Strobe light: *ON*
15. Fuel quantity: *compare the fuel televels read with fuel quantity visually checked into the tanks (see Pre-flight inspection – External inspection)*

NOTE

In absence of RH seat occupant: fasten seat belts around the seat so as to prevent any interference with the aeroplane flight control operation and with rapid egress in an emergency.

16. Canopy: *Closed and locked*

CAUTION

Avionic Master switch (if installed) must be set OFF during the engine's start-up to prevent avionic equipment damage.

4.2. ENGINE STARTING

1. Master switch ON.
2. Engine throttle: *idle*
3. Choke: *as needed*
4. Fuel selector valve: *select the tank with less fuel*
5. Electric fuel pump: *ON*
6. Propeller area: *call for CLEAR and visually check*

WARNING

Check to insure no person or object is present in the area close to the propeller. Forward lower sector visibility is not possible from inside the cockpit.

7. Magnetos: *BOTH*
8. Magnetos: *START*
9. Check oil pressure rise within 10 sec. (maximum cold value 7 bar)
10. Generator switch "ON"
11. Ammeter check "green".
12. Voltmeter: check more than 14V
13. Engine instruments: Check
14. Choke: *OFF*
15. Propeller rpm: *1000-1200 rpm*
16. Electric fuel pump: *OFF*
17. Check fuel pressure (min 2.2 psi)

4.3. BEFORE TAXIING

1. Radio and Avionics: *ON*
2. Altimeter: *set*
3. Direction indicator: *set in accordance with the magnetic compass*
4. Parking brake: *OFF and taxi*

4.4. TAXIING

1. Brakes: *check*
2. Steering: *check*
3. Flight instruments: *check altimeter and variometer, artificial horizon alignement, gyro compass and turn indicator coherent with steering direction, balance ball free into the opposite direction.*

4.5. PRIOR TO TAKE-OFF

1. Parking brake: *ON, brake pedal press / brake lever pull*
2. Engine instruments: *Check within limits*
   - Oil pressure: 2-5 bar *(above 1400 rpm)*; 0.8 bar *(below 1400 rpm)*
3. Generator light: *OFF (check)*
4. Electric Fuel pump: *ON*
5. Fuel valve: *select the fullest tank*
6. Fuel pressure: *check*
7. Propeller speed: *advance throttle to 1640 rpm*
   a. Ignition magnetos test: *select LEFT, check speed drop within 130 propeller rpm;*
   b. Select BOTH: *check propeller speed 1640 rpm;*
   c. Select RIGHT: *check speed drop within 130 propeller rpm,*
   d. *Maximum difference of speed between LEFT and RIGHT 50 rpm,*
   e. Select BOTH: *check propeller speed 1640 rpm .*
8. Carburettor heat test:
   a. Pull selector fully out
   b. Propeller speed: check 100 rpm drop
   c. Push selector fully IN
   d. propeller speed: check 1640 rpm
9. Flaps: *set T/O (15°)*
10. Pitch trim: *check neutral*
11. Flight controls: *check free*
12. Seat belts: *checked fastened*
13. Canopy: *check closed and locked on three points*.

4.6. TAKE-OFF AND CLIMB

WARNING

On uncontrolled fields, before line up, check runway wind direction and speed and check for traffic on final

1. Parking brake: *OFF*
2. Carburetor heat: *OFF*
3. Check magnetic compass and gyro direction indicator alignment
4. Full throttle set: *check approximately 2100 ± 100 propeller rpm*
5. Engine instruments: *check*
6. Rotation speed V_R:

	MTOW 580kg	**MTOW 600kg**	**MTOW 620kg**
Rotation Speed (V_R)	*42 KIAS*	*42 KIAS*	*42 KIAS*

7. Flaps: *retract (above flap retraction speed 50 KIAS)*

	MTOW 580kg	**MTOW 600kg**	**MTOW 620kg**
Best of Rate Climb Speed (V_Y)	*66 KIAS*	*66 KIAS*	*66 KIAS*

8. Electric fuel pump: *OFF*
9. Fuel pressure: *check green arc*
10. Propeller speed: *reduce at or below 2250 rpm*

4.7. CRUISE

1. Set power as for required performance
2. Check engine instruments within limits
3. Carburettor heat as needed, see paragraph on carb. heat in Section 3.

NOTE

Monitor and manually compensate asymmetrical fuel consumption by switching fuel selector valve. Switch on the electric fuel pump prior to swap the fuel feeding from one tank to another.

4.8. BEFORE LANDING

1. Electric fuel pump: *ON*
2. Fuel valve: *select the fullest tank*
3. Landing Light: *ON*
4. On downwind, leg abeam touch down point:

   Flaps: set T/O (15°)

	MTOW 580kg	**MTOW 600kg**	**MTOW 620kg**
Approach Speed	*66 KIAS*	*66 KIAS*	*66 KIAS*

5. On final leg:

   Flaps: set Land (40°)

	MTOW 580kg	**MTOW 600kg**	**MTOW 620kg**
Final Approach Speed	*51 KIAS*	*51 KIAS*	*51 KIAS*

6. Carburettor heat: OFF (full IN)
7. Optimal touchdown speed: *51 KIAS*

4.9. BALKED LANDING

1. Throttle: Full
2. Speed: keep over *61 KIAS*, climb to V_Y or V_X as applicable
3. Flaps position: *TO*
4. Electric fuel pump: *ON*

5.

4.10. AFTER LANDING

1. Flaps: *UP*
2. Electric Fuel Pump*: OFF*
3. Landing light: *OFF*

4.11. ENGINE SHUT DOWN

1. Parking brake: *engage*
2. Keep engine running at 1200 rpm for about one minute in order to reduce latent heat.
3. Avionic equipment: *OFF*
4. Magnetos: *OFF, keys extracted*
5. Strobe light: *OFF*
6. Master & Generator switches: *OFF*
7. Fuel selector valve: *OFF*

4.12. POSTFLIGHT CHECK

1. Flight controls: lock by mean of seat belts
2. Wheel chocks and wing mooring lines: *Set*
3. Parking brake release
4. Canopy: *Close and lock*
5. Protection hoods: *set over pitot tube, stall warning, static ports and canopy*

INDEX

1. INTRODUCTION

This section provides all necessary data for an accurate and comprehensive planning of flight activity from takeoff to landing.

Data reported in graphs and/or in tables were determined using:

- ✓ "Flight Test Data" under conditions prescribed by EASA CS-VLA regulation
- ✓ aircraft and engine in good condition
- ✓ average piloting techniques

Each graph or table was determined according to ICAO Standard Atmosphere (ISA - s.l.); evaluations of the impact on performances were carried out by theoretical means for:

- ✓ Airspeed
- ✓ External temperature
- ✓ Altitude
- ✓ Weight
- ✓ Runway type and condition

2. USE OF PERFORMANCES CHARTS

Performances data are presented in tabular or graphical form to illustrate the effect of different variables such as altitude, temperature and weight. Given information is sufficient to plan the mission with required precision and safety.

Additional information is provided for each table or graph.

3. AIRSPEED INDICATOR SYSTEM CALIBRATION (*APPROVED DATA*)

Graph shows calibrated airspeed V_{CAS} as a function of indicated airspeed V_{IAS}.

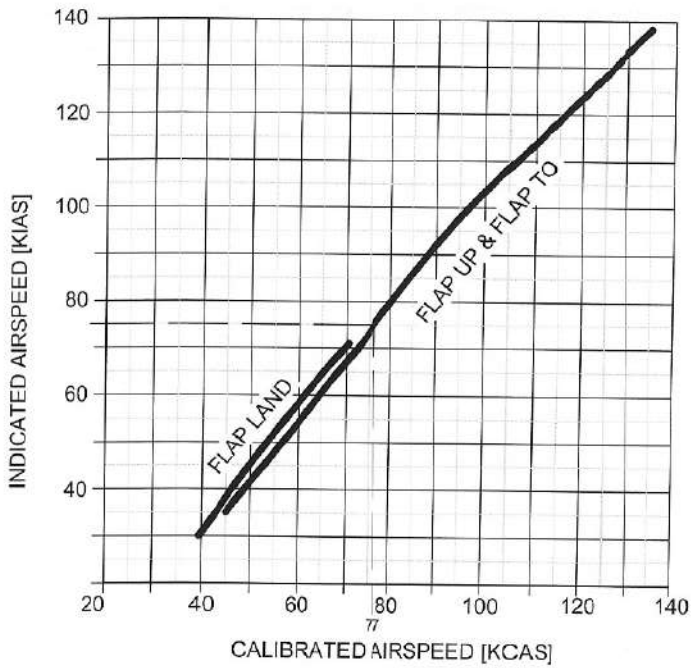

FIG. 5-1. CALIBRATED VS INDICATED AIRSPEED

Example:

Given	***Find***
KIAS *75*	KCAS *74*

NOTE *Indicated airspeed assumes 0 as an instrument error*

4. ICAO STANDARD ATMOSPHERE

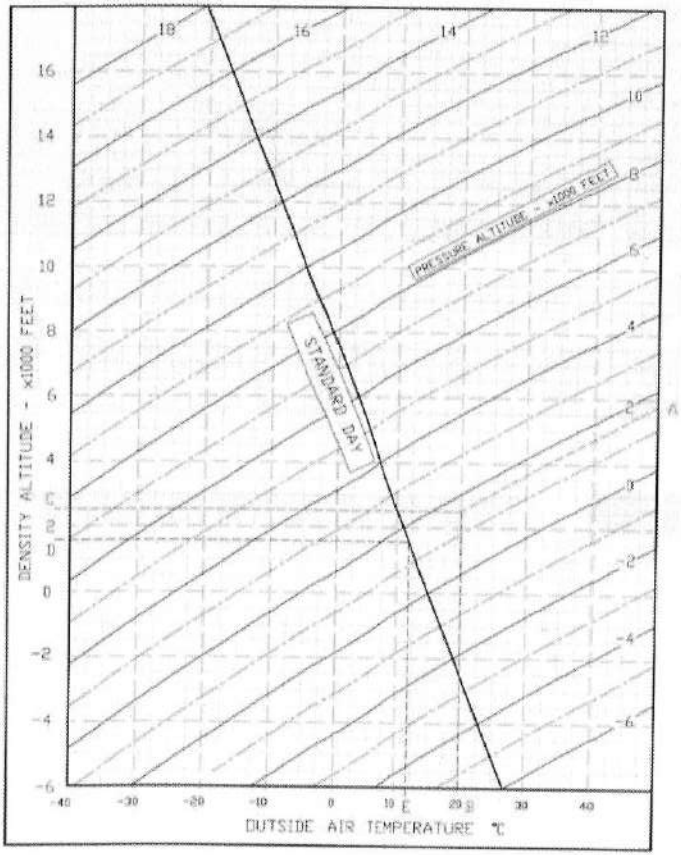

FIG. 5-2. ICAO CHART

Examples:

Scope	Given		Find
Density Altitude:	A: Pressure altitude = *1600ft* B: Temperature = *20°C*	→	C: Density Altitude = *2550ft*
ISA Temperature:	D: Pressure altitude = *1600ft*	→	E: ISA Air Temperature = *12°C*

5. STALL SPEED (*APPROVED DATA*)

Weight: *620 kg*
Throttle Levers: *IDLE*
CG: *Most Forward (26%)*
No ground effect

WEIGHT	BANK ANGLE	STALL SPEED					
		FLAPS 0°		FLAPS T/O		FLAPS FULL	
[kg]	[deg]	KIAS	KCAS	KIAS	KCAS	KIAS	KCAS
620 (FWD C.G.)	0	41	50	38	48	33	41
	15	42	51	39	49	34	42
	30	46	54	44	52	37	44
	45	54	60	51	57	44	49
	60	69	71	65	68	56	58

NOTE *Altitude loss during conventional stall recovery, as demonstrated during flight tests is approximately 150 ft with banking below 30°.*

6. CROSSWIND

Maximum demonstrated crosswind is 22 Kts

⇒ *Example:*

Given	***Find***
Wind direction (*with respect to aircraft longitudinal axis*) = 30°	Headwind = 17.5 Kts
Wind speed = 20 Kts	Crosswind = 10 Kts

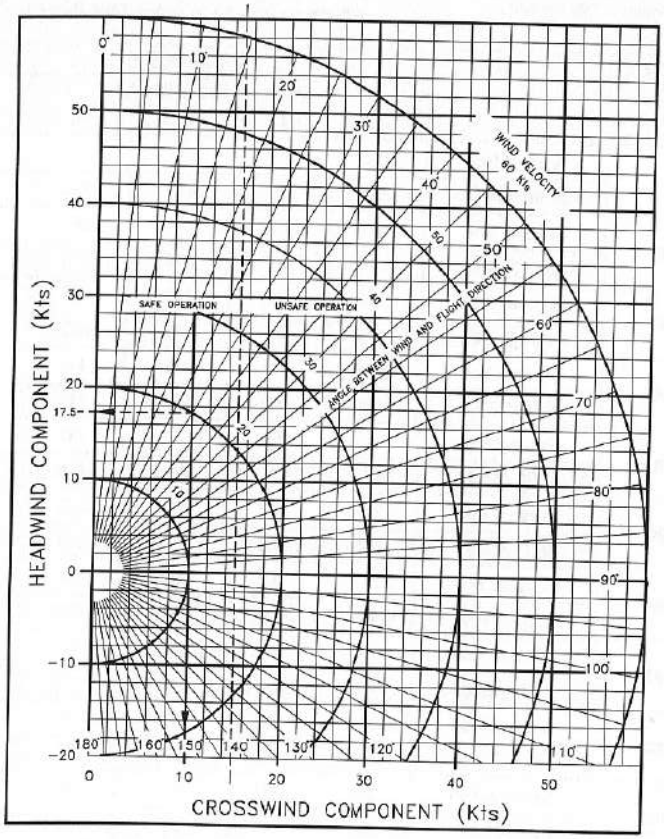

FIG. 5-3. CROSSWIND CHART

7. TAKE-OFF PERFORMANCES (*APPROVED DATA*)

Weight = *620 kg*

Flaps: *T/O*
Speed at Lift-Off = *42 KIAS*
Speed Over 50ft Obstacle = *52 KIAS*
Throttle Levers: *Full Forward*
Runway: *Grass*

Corrections

Headwind: - 2.5m for each kt (*8 ft/kt*)
Tailwind: + 10m for each kt (*33ft/kt*)
Paved Runway: - *6%* to Ground Roll
Runway slope: + 5% to Ground Roll for each +1%

Pressure Altitude [ft]		Distance [m]				
		Temperature [°C]				ISA
		-25	0	25	50	
S.L.	Ground Roll	154	203	262	331	237
	At 50 ft AGL	252	335	434	553	392
1000	Ground Roll	169	223	287	364	255
	At 50 ft AGL	277	368	478	610	423
2000	Ground Roll	186	245	316	401	275
	At 50 ft AGL	305	405	526	672	456
3000	Ground Roll	204	269	348	442	296
	At 50 ft AGL	336	446	580	742	492
4000	Ground Roll	225	296	383	487	319
	At 50 ft AGL	370	492	641	820	531
5000	Ground Roll	247	327	423	538	345
	At 50 ft AGL	408	543	708	907	574
6000	Ground Roll	272	360	466	594	372
	At 50 ft AGL	450	600	783	1005	621
7000	Ground Roll	300	397	515	657	402
	At 50 ft AGL	498	664	867	1114	672
8000	Ground Roll	331	439	570	727	435
	At 50 ft AGL	551	735	962	1236	728
9000	Ground Roll	366	486	631	806	471
	At 50 ft AGL	610	815	1068	1374	790
10000	Ground Roll	405	538	700	895	510
	At 50 ft AGL	676	905	1186	1529	857

Weight = 550 kg

Flaps: *T/O*
Speed at Lift-Off = *42 KIAS*
Speed Over 50ft Obstacle = 52 *KIAS*
Throttle Levers: *Full Forward*
Runway: *Grass*

Corrections

Headwind: - 2.5m for each kt (*8 ft/kt*)
Tailwind: + 10m for each kt (*33ft/kt*)
Paved Runway: - 6% to Ground Roll
Runway slope: + 5% to Ground Roll for each +1%

Pressure Altitude [ft]		Distance [m]				
		Temperature [°C]				ISA
		-25	0	25	50	
S.L.	Ground Roll	113	149	192	243	174
	At 50 ft AGL	185	245	318	405	287
1000	Ground Roll	124	163	211	267	187
	At 50 ft AGL	203	269	350	446	309
2000	Ground Roll	136	179	231	294	201
	At 50 ft AGL	223	297	385	492	334
3000	Ground Roll	150	197	255	323	217
	At 50 ft AGL	246	327	425	544	360
4000	Ground Roll	164	217	281	357	234
	At 50 ft AGL	271	360	469	601	389
5000	Ground Roll	181	239	309	394	252
	At 50 ft AGL	299	398	519	664	421
6000	Ground Roll	199	264	342	435	273
	At 50 ft AGL	330	440	574	736	455
7000	Ground Roll	220	291	377	481	295
	At 50 ft AGL	365	486	635	816	492
8000	Ground Roll	243	322	417	533	319
	At 50 ft AGL	403	538	704	905	533
9000	Ground Roll	268	356	462	591	345
	At 50 ft AGL	446	597	782	1006	578
10000	Ground Roll	297	394	513	655	374
	At 50 ft AGL	495	662	869	1120	627

Weight = 500 kg

Flaps: *T/O*
Speed at Lift-Off = *42 KIAS*
Speed Over 50ft Obstacle = 52 *KIAS*
Throttle Levers: *Full Forward*
Runway: *Grass*

Corrections

Headwind: - 2.5m for each kt (*8 ft/kt*)
Tailwind: + 10m for each kt (*33ft/kt*)
Paved Runway: - 6% to Ground Roll
Runway slope: + 5% to Ground Roll for each +1%

Pressure Altitude [ft]		Distance [m]				
		Temperature [°C]				ISA
		-25	0	25	50	
S.L.	Ground Roll	88	116	150	189	135
	At 50 ft AGL	144	191	248	316	224
1000	Ground Roll	97	127	164	208	146
	At 50 ft AGL	159	210	273	348	242
2000	Ground Roll	106	140	181	229	157
	At 50 ft AGL	174	231	301	384	261
3000	Ground Roll	117	154	199	252	169
	At 50 ft AGL	192	255	332	424	281
4000	Ground Roll	128	169	219	278	183
	At 50 ft AGL	212	281	366	469	304
5000	Ground Roll	141	187	242	307	197
	At 50 ft AGL	233	310	405	519	328
6000	Ground Roll	156	206	267	339	213
	At 50 ft AGL	257	343	448	574	355
7000	Ground Roll	172	227	295	375	230
	At 50 ft AGL	285	379	496	637	384
8000	Ground Roll	189	251	326	416	249
	At 50 ft AGL	315	420	550	707	416
9000	Ground Roll	209	278	361	461	269
	At 50 ft AGL	348	466	610	785	451
10000	Ground Roll	231	307	400	512	292
	At 50 ft AGL	386	517	678	874	490

8. TAKE-OFF RATE OF CLIMB

Power Setting: Maximum Continuous Power
Flaps: Take-Off (15°)
Vx = 56 KIAS

Weight	Pressure Altitude	Climb Speed V_y	Rate of Climb [ft/min]				
			Temperature [°C]				ISA
[kg]	[ft]	[KIAS]	-25	0	25	50	
620	S.L.	66	1116	879	668	478	**750**
	2000	66	936	704	496	309	**609**
	4000	66	757	529	325	141	**469**
	6000	66	578	354	154	-27	**328**
	8000	66	400	180	-17	-194	**187**
	10000	66	223	7	-187	-361	**47**
	12000	66	46	-166	-356	-527	**-94**
	14000	66	-130	-338	-525	-693	**-235**
550	S.L.	66	1339	1077	842	631	**933**
	2000	66	1140	882	651	443	**777**
	4000	66	941	687	460	256	**621**
	6000	65	742	493	271	70	**464**
	8000	65	545	300	81	-116	**308**
	10000	65	348	107	-107	-301	**152**
	12000	65	151	-85	-296	-486	**-4**
	14000	64	-44	-276	-483	-669	**-161**
500	S.L.	66	1532	1246	991	760	**1089**
	2000	66	1315	1033	782	556	**919**
	4000	65	1098	821	575	352	**749**
	6000	65	882	610	368	149	**579**
	8000	65	667	400	162	-53	**409**
	10000	64	452	190	-44	-255	**239**
	12000	64	238	-19	-249	-456	**68**
	14000	64	25	-227	-453	-656	**-102**

9. EN-ROUTE RATE OF CLIMB

Power Setting: Maximum Continuous Power
Flaps: UP
Vx = 56 KIAS

Weight	Pressure Altitude	Climb Speed V_Y	Rate of Climb [ft/min]				
			Temperature [°C]				ISA
[kg]	[ft]	[KIAS]	-25	0	25	50	
620	S.L.	66	1240	1003	792	602	874
	2000	66	1060	828	620	433	733
	4000	66	881	653	449	265	593
	6000	66	702	478	278	97	452
	8000	66	524	304	107	-70	311
	10000	66	347	131	-63	-237	171
	12000	66	170	-42	-232	-403	30
	14000	66	-6	-214	-401	-569	-111
550	S.L.	66	1463	1201	966	755	1057
	2000	66	1264	1006	775	567	901
	4000	66	1065	811	584	380	745
	6000	65	866	617	395	194	588
	8000	65	669	424	205	8	432
	10000	65	472	231	17	-177	276
	12000	65	275	39	-172	-362	120
	14000	64	80	-152	-359	-545	-37
500	S.L.	66	1656	1370	1115	884	1213
	2000	66	1439	1157	906	680	1043
	4000	65	1222	945	699	476	873
	6000	65	1006	734	492	273	703
	8000	65	791	524	286	71	533
	10000	64	576	314	80	-131	363
	12000	64	362	105	-125	-332	192
	14000	64	149	-103	-329	-532	22

10. CRUISE PERFORMANCES

Weight: *620 kg*
Pressure Altitude: *0 ft*

RPM*	ISA – 30°C			ISA			ISA + 30°C		
	PWR	KTAS	F.C.** [lt/hr]	PWR	KTAS	F.C.** [lt/hr]	PWR	KTAS	F.C.** [lt/hr]
2361	120%	110	32.2	100%	106	26.8	84%	103	22.6
2318	113%	108	30.5	94%	104	25.3	79%	100	21.2
2272	107%	106	28.8	88%	101	23.8	74%	97	19.8
2221	100%	103	26.9	82%	99	22.1	68%	94	18.3
2165	93%	100	25	76%	95	20.4	62%	90	16.8
2103	85%	97	22.9	69%	92	18.6	56%	86	15.1
2033	77%	93	20.8	62%	88	16.7	50%	81	13.4

* *Propeller RPM*
** *Fuel Consumption*

Weight: *620 kg*
Pressure Altitude: *2000 ft*

RPM*	ISA – 30°C			ISA			ISA + 30°C		
	PWR	KTAS	F.C.** [lt/hr]	PWR	KTAS	F.C.** [lt/hr]	PWR	KTAS	F.C.** [lt/hr]
2355	112%	109	30.2	93%	106	25.1	78%	101	21
2312	106%	107	28.6	88%	103	23.6	73%	99	19.7
2265	100%	105	27	82%	100	22.2	68%	96	18.4
2214	94%	102	25.2	76%	98	20.6	63%	92	17
2157	87%	99	23.4	70%	94	19	58%	88	15.5
2094	80%	96	21.4	64%	90	17.3	52%	84	13.9
2023	72%	92	19.4	57%	86	15.5	46%	77	12.3

* *Propeller RPM*
** *Fuel Consumption*

Weight: *620 kg*
Pressure Altitude: *4000 ft*

RPM*	ISA – 30°C			ISA			ISA + 30°C		
	PWR	KTAS	F.C.** [lt/hr]	PWR	KTAS	F.C.** [lt/hr]	PWR	KTAS	F.C.** [lt/hr]
2348	105%	109	28.3	87%	105	23.4	72%	100	19.5
2305	100%	107	26.8	82%	102	22	68%	97	18.3
2257	94%	104	25.2	77%	99	20.6	63%	94	17
2206	88%	101	23.6	71%	96	19.2	58%	90	15.7
2148	81%	98	21.9	65%	93	17.6	53%	86	14.3
2084	74%	95	20	59%	89	16	47%	80	12.8

* *Propeller RPM*
** *Fuel Consumption*

Weight: *620 kg*
Pressure Altitude: *6000 ft*

RPM*	ISA – 30°C			ISA			ISA + 30°C		
	PWR	KTAS	F.C.** [lt/hr]	PWR	KTAS	F.C.** [lt/hr]	PWR	KTAS	F.C.** [lt/hr]
2340	98%	108	26.5	81%	103	21.8	67%	98	18
2296	93%	106	25.1	76%	101	20.5	63%	95	16.9
2249	88%	103	23.6	71%	98	19.2	58%	92	15.7
2196	82%	100	22	66%	95	17.8	54%	87	14.4

* *Propeller RPM*
** *Fuel Consumption*

Weight: *620 kg*
Pressure Altitude: *8000 ft*

RPM*	ISA – 30°C			ISA			ISA + 30°C		
	PWR	KTAS	F.C.** [lt/hr]	PWR	KTAS	F.C.** [lt/hr]	PWR	KTAS	F.C.** [lt/hr]
2331	92%	107	24.8	75%	102	20.2	62%	96	16.7
2287	87%	105	23.4	71%	99	19	58%	93	15.6
2239	82%	102	22	66%	96	17.8	53%	89	14.4
2185	76%	99	20.5	61%	93	16.4	49%	84	13.2

* *Propeller RPM*
** *Fuel Consumption*

Weight: *620 kg*
Pressure Altitude: *10000 ft*

RPM*	ISA – 30°C			ISA			ISA + 30°C		
	PWR	KTAS	F.C.** [lt/hr]	PWR	KTAS	F.C.** [lt/hr]	PWR	KTAS	F.C.** [lt/hr]
2321	86%	106	23.1	69%	100	18.7	57%	93	15.3
2277	81%	104	21.8	65%	97	17.6	53%	89	14.3
2227	76%	101	20.5	61%	94	16.4	49%	84	13.1

* *Propeller RPM*
** *Fuel Consumption*

Weight = 550 kg

Flaps: *LAND*
Short Final Approach Speed = *51 KIAS*
Throttle Levers: *Idle*
Runway: *Grass*

Corrections

Headwind: - 5m for each kt (*16 ft/kt*)
Tailwind: + 11m for each kt (*36ft/kt*)
Paved Runway: - *2%* to Ground Roll
Runway slope: - 2.5% to Ground Roll for each +1%

Pressure Altitude [ft]		Distance [m]				
		Temperature [°C]				ISA
		-25	0	25	50	
S.L.	Ground Roll	111	122	134	145	129
	At 50 ft AGL	218	240	262	284	253
1000	Ground Roll	115	127	138	150	133
	At 50 ft AGL	226	249	272	295	261
2000	Ground Roll	120	132	144	156	137
	At 50 ft AGL	235	258	282	306	269
3000	Ground Roll	124	137	149	161	141
	At 50 ft AGL	243	268	293	317	277
4000	Ground Roll	129	142	155	168	145
	At 50 ft AGL	253	278	304	329	285
5000	Ground Roll	134	147	160	174	150
	At 50 ft AGL	262	289	315	342	294
6000	Ground Roll	139	153	167	181	154
	At 50 ft AGL	272	300	327	355	303
7000	Ground Roll	144	159	173	188	159
	At 50 ft AGL	283	311	340	368	313
8000	Ground Roll	150	165	180	195	164
	At 50 ft AGL	294	323	353	383	322
9000	Ground Roll	155	171	187	202	169
	At 50 ft AGL	305	336	367	398	333
10000	Ground Roll	162	178	194	210	175
	At 50 ft AGL	317	349	381	413	343

11. LANDING PERFORMANCES (*APPROVED DATA*)

Weight = *620 kg*

Flaps: *LAND*
Short Final Approach Speed = *51 KIAS*
Throttle Levers: *Idle*
Runway: *Grass*

Corrections

Headwind: - 5m for each kt (*16 ft/kt*)
Tailwind: + 11m for each kt (*36ft/kt*)
Paved Runway: - 2% to Ground Roll
Runway slope: - 2.5% to Ground Roll for each +1%

Pressure Altitude [ft]		Distance [m]				
		Temperature [°C]				ISA
		-25	0	25	50	
S.L.	Ground Roll	141	155	170	184	164
	At 50 ft AGL	277	305	333	361	322
1000	Ground Roll	146	161	176	191	169
	At 50 ft AGL	288	317	345	374	332
2000	Ground Roll	152	167	183	198	174
	At 50 ft AGL	298	328	358	388	342
3000	Ground Roll	158	173	189	205	179
	At 50 ft AGL	309	341	372	403	352
4000	Ground Roll	164	180	196	213	185
	At 50 ft AGL	321	353	386	418	363
5000	Ground Roll	170	187	204	221	190
	At 50 ft AGL	333	367	400	434	374
6000	Ground Roll	176	194	212	230	196
	At 50 ft AGL	346	381	416	451	385
7000	Ground Roll	183	201	220	238	202
	At 50 ft AGL	359	396	432	468	397
8000	Ground Roll	190	209	228	248	209
	At 50 ft AGL	373	411	449	486	410
9000	Ground Roll	198	217	237	257	215
	At 50 ft AGL	388	427	466	505	423
10000	Ground Roll	205	226	247	267	222
	At 50 ft AGL	403	444	484	525	436

Weight = *500 kg*

Flaps: *LAND*
Short Final Approach Speed = *51 KIAS*
Throttle Levers: *Idle*
Runway: *Grass*

Corrections

Headwind: - 5m for each kt (*16 ft/kt*)
Tailwind: + 11m for each kt (*36ft/kt*)
Paved Runway: - *2%* to Ground Roll
Runway slope: - 2.5% to Ground Roll for each +1%

Pressure Altitude [ft]		Distance [m]				
		Temperature [°C]				
		-25	0	25	50	ISA
S.L.	Ground Roll	92	101	110	120	**107**
	At 50 ft AGL	180	199	217	235	**209**
1000	Ground Roll	95	105	114	124	**110**
	At 50 ft AGL	187	206	225	244	**216**
2000	Ground Roll	99	109	119	129	**113**
	At 50 ft AGL	194	214	233	253	**222**
3000	Ground Roll	102	113	123	133	**117**
	At 50 ft AGL	201	221	242	262	**229**
4000	Ground Roll	106	117	128	138	**120**
	At 50 ft AGL	209	230	251	272	**236**
5000	Ground Roll	110	122	133	144	**124**
	At 50 ft AGL	217	239	260	282	**243**
6000	Ground Roll	115	126	138	149	**128**
	At 50 ft AGL	225	248	270	293	**251**
7000	Ground Roll	119	131	143	155	**132**
	At 50 ft AGL	234	257	281	304	**258**
8000	Ground Roll	124	136	149	161	**136**
	At 50 ft AGL	243	267	292	316	**266**
9000	Ground Roll	128	141	154	167	**140**
	At 50 ft AGL	252	278	303	329	**275**
10000	Ground Roll	134	147	160	174	**144**
	At 50 ft AGL	262	289	315	341	**284**

12. BALKED LANDING CLIMB

Power Setting: Maximum Take-Off Power
Flaps: Land (40°)
V_{OBS}: 51 KIAS

Weight	Pressure Altitude	Rate of Climb [ft/min]				
		Temperature [°C]				ISA
[kg]	[ft]	-25	0	25	50	
620	S.L.	617	489	374	271	419
	1000	568	441	328	225	380
	2000	519	393	281	180	342
	3000	471	346	234	134	304
	4000	422	299	188	88	266
	5000	374	251	142	43	228
	6000	326	204	95	-3	190
	7000	277	157	49	-48	152
550	S.L.	777	635	508	394	557
	1000	723	582	457	344	515
	2000	669	530	405	293	473
	3000	615	477	354	242	431
	4000	562	425	302	192	389
	5000	508	372	251	142	347
	6000	454	320	200	91	304
	7000	401	268	149	41	262
500	S.L.	915	759	620	494	674
	1000	856	701	563	438	627
	2000	796	643	506	383	581
	3000	737	585	449	327	534
	4000	678	527	393	272	488
	5000	619	470	336	216	442
	6000	560	412	280	161	395
	7000	502	355	224	106	349

NOTE *During balked landing manoeuvre, flaps should be retracted immediately after applying full power.*

13. NOISE DATA

Noise level, determined in accordance with ICAO/Annex 16 4th Ed., July 2005, Vol. I°, Chapter 10, is **65.74** dB(A).

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SECTION 6 – WEIGHT and BALANCE

INDEX

1. INTRODUCTION

This section describes the procedure for establishing the basic empty weight and the moment of the aircraft. Loading procedure information is also provided.

NOTE *Aircraft must be operated in accordance with the limits concerning the maximum take-off weight and CG excursion as reported in Flight Manual Section 2.*

Pilot is responsible for checking the weight and CG excursion are compliant with the related limits. CG excursion and weight limits are reported in Section 2 – Limitations.

2. WEIGHING PROCEDURES

2.1. PREPARATION

- Carry out weighing procedure inside closed hangar
- Remove from cabin any objects left unintentionally
- Insure on board presence of the Flight Manual
- Align nose wheel
- Drain fuel via the specific drain valve.
- Oil, hydraulic fluid and coolant to operating levels
- Move sliding seats to most forward position
- Raise flaps to fully retracted position (0°)
- Place control surfaces in neutral position
- Place scales (min. capacity 200 kg) under each wheel

2.2. LEVELLING

- Level the aircraft.

  Reference for levelling: remove a seat and then place a level between the two seat's fwd and aft supporting trusses.
- Center bubble on level by deflating nose tire

2.3. WEIGHING

- Record weight shown on each scale
- Repeat weighing procedure three times
- Calculate empty weight

2.4. DETERMINATION OF C.G. LOCATION

- Drop a plumb bob tangent to the leading edge (at 15mm inboard respect the rib#7 riveting line) and trace reference mark on the floor.
- Repeat operation for other wing.
- Stretch a taught line between the two marks
- Measure the distance between the reference line and main wheel axis
- Using recorded data it is possible to determine the aircraft's C.G. location and moment (see following table)

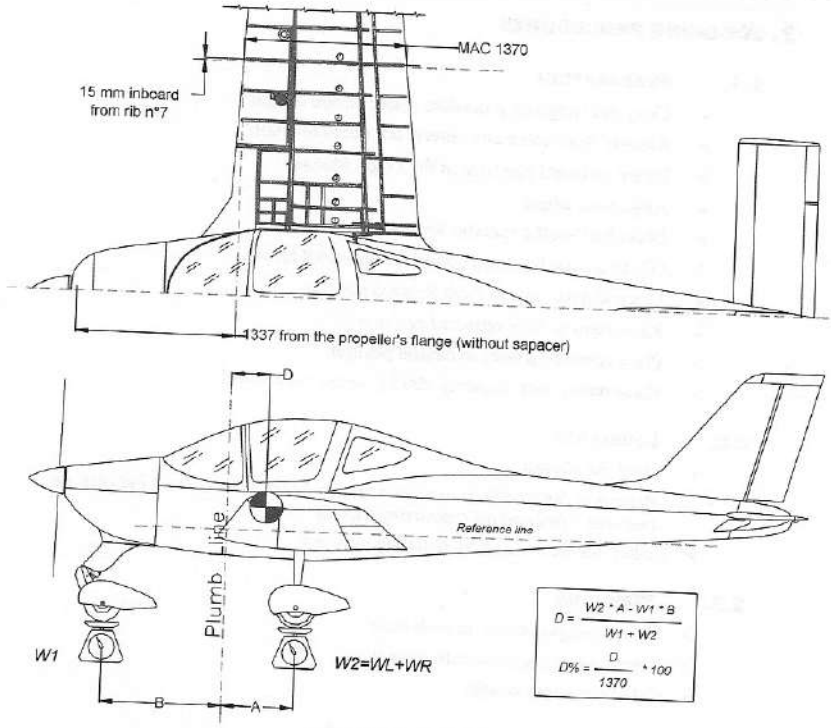
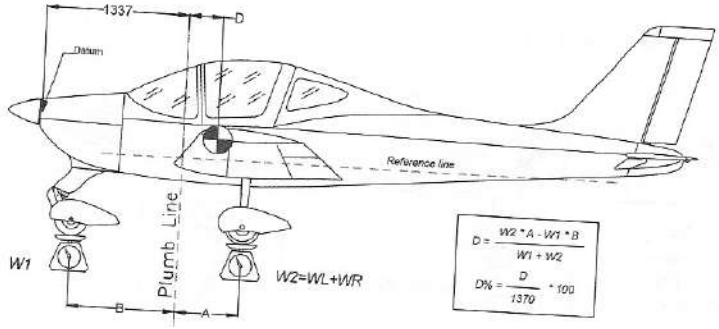

MAC 1370
15 mm inboard
from rib n°7
1337 from the propeller's flange (without sapacer)
D
Reference line
Plumb line
W1
W2=WL+WR
B
A
$D = \frac{W2 * A - W1 * B}{W1 + W2}$
$D\% = \frac{D}{1370} * 100$

Fig.6.1

3. WEIGHING REPORT (I)

Model P2002-JF *S/N:* 154 *Weighing no.* ___ *Date:* 19/04/2011

Datum: Propeller support flange without spacer.



	Kg
Nose wheel weight	W_1 = 44
LH wheel weight	W_L = 175
RH wheel weight	W_R = 176
$W_2 = W_L + W_R$ =	351 Kg

	meters
Plumb bob distance(1) LH wheel	A_L = 0.556
Plumb bob distance(1) RH wheel	A_R = 0.556
Average distance $(A_L + A_R)/2$	A = 0.556
Bob distance from nose wheel(1)	B = 1.027

Empty weight $We = W_1 + W_2$ = 395 Kg

$$D = \frac{W_2 \cdot A - W_1 \cdot B}{We} =_m 0.380 \qquad D\% = \frac{D}{1.370} \cdot 100 = 27.7\%$$

Empty weight moment: M = [(D+1.337) We] = Kg m 678.22

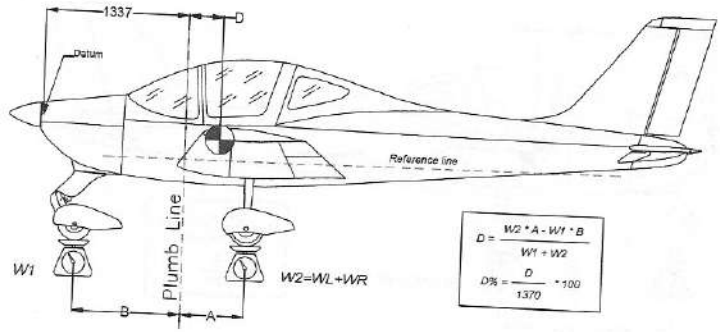
Maximum takeoff weight	W_T = 620 Kg
Empty weight	We = 395 Kg
Maximum payload W_T - We	Wu = 225 Kg

(1) To determine the Mean Aerodynamic Chord (MAC) and the plumb line see FIG.6-1.

4. WEIGHING REPORT (II)

Model P2002-JF *S/N:* 154 *Weighing no.* 02 *Date:* 10 APR 2021

Datum: Propeller support flange without spacer.



	Kg
Nose wheel weight	W_1 = 44
LH wheel weight	W_L = 176
RH wheel weight	W_R = 176
$W_2 = W_L + W_R$ =	352 Kg

	meters
Plumb bob distance(1) LH wheel	A_L = 0.556
Plumb bob distance(1) RH wheel	A_R = 0.556
Average distance $(A_L + A_R)/2$	A = 0.556
Bob distance from nose wheel(1)	B = 1.027

Empty weight $We = W_1 + W_2$ = 396 Kg

$D = \frac{W_2 \cdot A - W_1 \cdot B}{We} =_m$ 0.380 | $D\% = \frac{D}{1.370} \cdot 100 =$ 27.7 %

Empty weight moment: $M = [(D+1.337) \cdot We] = Kg \cdot m$ 679.93

Maximum takeoff weight	W_T = 620 Kg
Empty weight	We = 396 Kg
Maximum payload W_T - We	Wu = 224 Kg

(1) To determine the Mean Aerodynamic Chord (MAC) and the plumb line see FIG.6-1

5. WEIGHT AND BALANCE DETERMINATION FOR FLIGHT

In this subsection, the procedure to be used for the determination of aircraft weight and balance in flight is described. The weight and moment obtained must fall within the approved Weight-Moment Envelope (Figure 6-4). The procedure explained requires the use of:

- Aircraft Weighing Report (I/II)
- Weight and C.G. - Form (Table 6-1)
- Loading Diagram (Figure 6-3)
- Weight-Moment Envelope (Figure 6-4)

An example calculation is provided to help understand the method.

5.1. USE OF "WEIGHT & BALANCE" CHART

To determine weight and balance for flight, proceed as follows:

1. Read the most recent values of the Empty A/C weight and corresponding moment from the Aircraft Weighing Report and write them in the Weight and C.G.- Form (Table 6-1).
2. Write the weight and moment of the pilot/co-pilot in the Weight and C.G. - Form (Table 6-1). Calculate the moment as:

   Moment = weight X arm where the arm is read in Table 6-1.

   Alternatively, the moment can be read from the Loading Diagram (Figure 6-3).

   NOTE *It is strongly recommended to perform a cross-check with Loading Tables (Table 6-3) to assure an accurate loading value.*

3. Repeat the procedure described in 2 for the fuel and baggage loads.
4. The total weight/moment is obtained summing all weights/moments; report take-off condition (weight and moment) in the Weight and Balance C.G. - Form (Table 6-1).
5. To obtain the landing weight and moment, subtract from the take-off condition values the weight and moment of the total fuel required. These values are reported in the Weight and Balance C.G. - Form (Table 6-1). Write the landing values Weight and Balance C.G. - Form (Table 6-1).

Locate on the Weight-Moment Envelope (Figure 6-4) the points (weights and moment) corresponding to the take-off and landing conditions. If the points fall within the envelope, the loading condition meets the weight and balance requirements.

Table 6-1 -Weight and C.G.- Form

	W [kg]	Arm [m]	Moment (M) = W * Arm [kg*m]
Empty weight			
LOADING			
Pilot		1.8	
Co-pilot		1.8	
Baggage		2.26	
Usable fuel Fuel (liters)*ρ_{fuel} (0.72) [kg]		1.53	
TAKE-OFF CONDITION			
Take-off condition $W_{TO} = \sum W$		$M_{TO} = \sum M$	
LANDING CONDITION			
Fuel required Fuel (liters)*ρ_{fuel} (0.72) [kg]		1.53	
Landing condition $W_L = W_{TO} - W_{fuel\_req}$		$M_L = M_{TO} - M_{fuel\_req}$	

Table 6-2 -Weight and C.G.- Example

	W [kg]	Arm [m]	Moment (M) = W * Arm [kg*m]
Empty weight	350	1.66	581
LOADING			
Pilot	80	1.8	144
Co-pilot	65	1.8	117
Baggage	10	2.26	22.6
Usable fuel Fuel (liters)*ρ_{fuel} (0.72) [kg]	(50 liters) 57.6	1.53	88.1
TAKE-OFF CONDITION			
Take-off condition $W_{TO} = \sum W$	552.6	$M_{TO} = \sum M$	952.7
LANDING CONDITION			
Fuel required Fuel (liters)*ρ_{fuel} (0.72) [kg]	28.8	1.53	44.1
Landing condition $W_L = W_{TO} - W_{fuel\_req}$	533.8	$M_L = M_{TO} - M_{fuel\_req}$	908.6

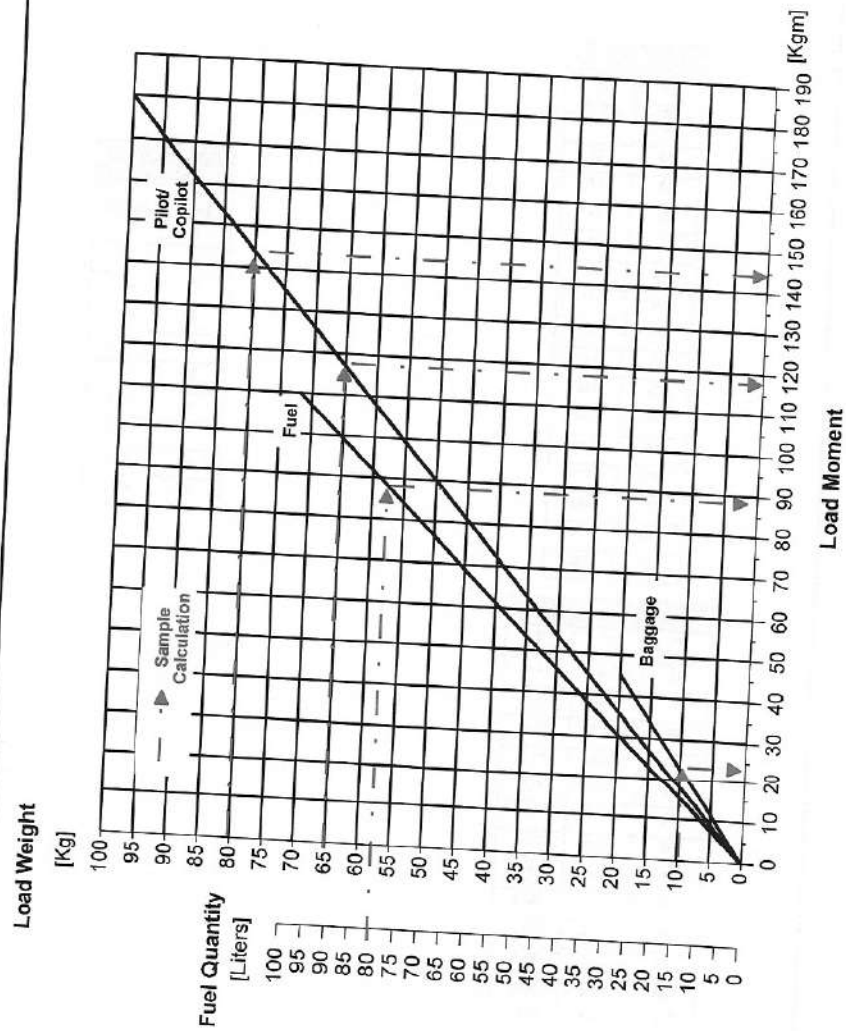


Fig.6.3 LOADING DIAGRAM

Table 6-3 –Loading tables

Pilot/Co-pilot loading	
W [kg]	M [kg*m]
5	9
10	18
15	27
20	36
30	54
40	72
50	90
60	108
65	117
70	126
75	135
80	144
85	153
90	162
95	171
100	180

Baggage loading	
W [kg]	M [kg*m]
2	4.5
4	9.0
6	13.6
8	18.1
10	22.6
12	27.1
14	31.6
16	36.2
18	40.7
20	45.2

Fuel loading		
W [litres]	W [kg]	M [kg*m]
10	7.2	11.0
20	14.4	22.0
30	21.6	33.0
40	28.8	44.1
50	36.0	55.1
60	43.2	66.1
65	46.8	71.6
70	50.4	77.1
75	54.0	82.6
80	57.6	88.1
85	61.2	93.6
90	64.8	99.1
95	68.4	104.7
100	72.0	110.2

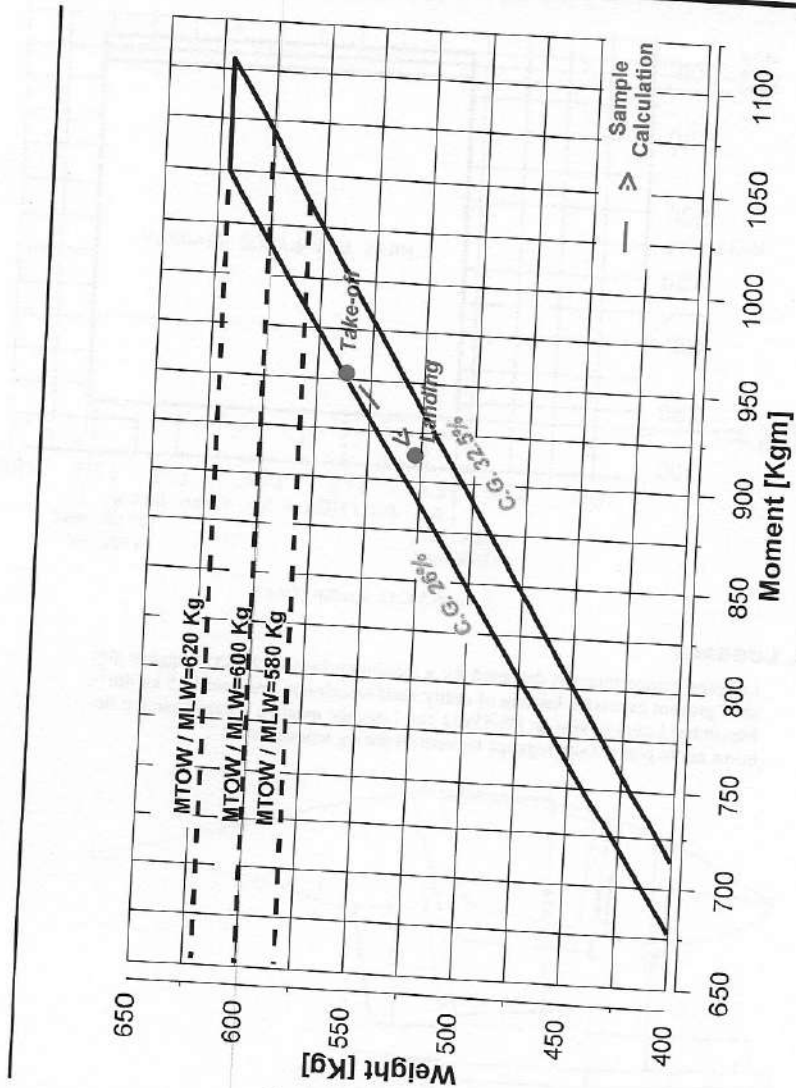


Fig.6.4 WEIGHT-MOMENT ENVELOPE

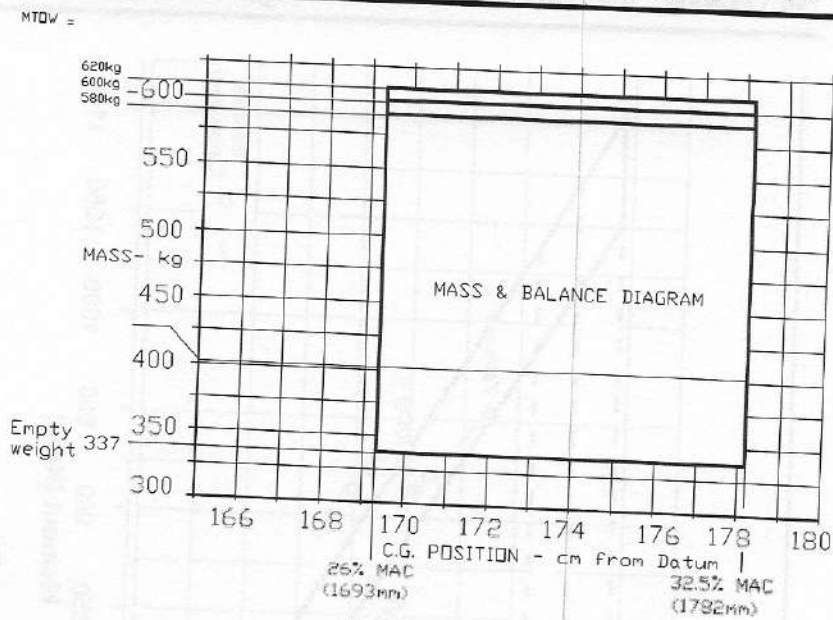


Fig 6.5 C.G. RANGE CHART

6. LUGGAGE

Luggage compartment is designed for a maximum load of 20 kg. Luggage size shall prevent excessive loading of utility shelf (maximum pressure 12.5 kg/dm^2). Maximum Luggage size is: 80x45x32 cm. Luggage must be secured using a tie-down net to prevent any luggage movement during maneuvers.

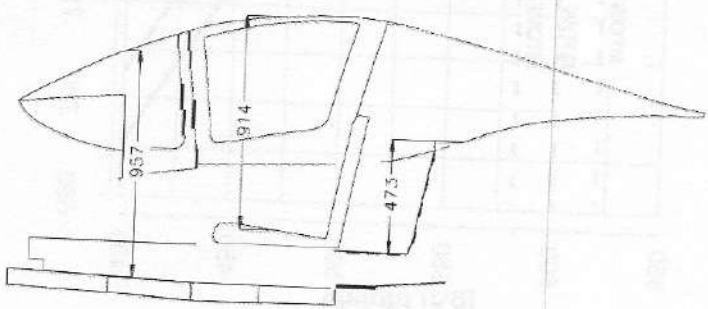


Fig 6.6 CABIN DIMENSIONS

7. EQUIPMENT LIST

The following is a comprehensive list of all TECNAM supplied equipment for the P2002-JF. The list consists of the following groups:

A Engine and accessories
B Landing gear
C Electrical system
D Instruments
E Avionics

the following information describes each listing:

- Part-number to uniquely identify the item type.
- Item description
- Serial number
- Weight in kilograms
- Distance in meters from datum

NOTE *Items marked with an asterisk (*) are part of basic installation. Equipment marked with X in the* Inst. *column are those actually installed on board relative to aircraft S/N.*

EQUIPMENT LIST	S/N: 154	DATE: SEP 21		
RIF.	DESCRIPTION &P/N	INST	WEIGHT [kg]	DATUM [m]
	ENGINE & ACCESSORIES			
A1	Engine Rotax 912S2 - p/n 309.120.133	*	61.0	0.32
A2	Prop. HOFFMANN – p/n HO-17GHM-A174 177C	*	6.0	-0.13
A3	Exhaust and manifolds –p/n SSB-978-480-CC		4.50	0.55
A4	Muffler – p/n 22-11-450-003		4.50	0.55
A5	Heat exchanger - p/n 92-11-830 or 21-11-402-000	*	2.00	0.55
A6	Oil Reservoir (full) - p/n 956.137 or 656865	*	4.00	0.64
A7	Oil cooler - p/n 886 033	*	0.40	0.07
A8	Liquid coolant radiator - p/n 995.697 or 997.083	*	0.90	0.33
A9	Air filter K&N- p/n 33-2544	*	0.40	0.60
A10	Fuel pump p/n 21-11-342-000	*	0.10	0.71
A11	Thermostatic water valve 26-9-9100-000		0.35	0.15
A12	Thermostatic oil valve 26-9-9000-000		0.20	0.20
	LANDING GEAR AND ACCESSORIES			
B1	Main gear spring-leafs - p/n 92-8-300-1	*	5.700	1.94
B2	Main gear wheel rims. - Cleveland 40-78B	*	2.050	1.94
B3	Main gear tires.-Air Trac 5.00-5 P/n AA1D4	*	2.580	1.94
B4	Disk brakes - Cleveland 164-17	*	0.800	1.94
B5	Nose gear wheel rim – Marc Ingegno 010101120	*	1.300	0.310
B6	Nose gear tire - Air Trac 5.00-5 P/n AA1D4	*	1.200	0.460
B7	Nose gear fairing p/n 27-8-240-1	*	1.500	0.460
B8	Main gear fairing p/n 27-8-410-1/-2	*	1.500	1.930
B9	Nose gear shock p/n 92-8-200-000	*	1.450	0.465
	ELECTRICAL SYSTEM			
C1.1	Battery FIAMM 6H4P 12V 18Ah		6.00	2.59
C1.2	Battery GILL-Teledyne G-25 12V 18Ah		9.53	2.59
C1.3	Battery Spark 500		4.9	2.59
C2.1	Regulator, rectifier - p/n 945.345 or 965.349	*	0.20	0.82
C3	Battery relay – Aircraft Spruce 111-226-5	*	0.30	2.59
C4	Flaps actuator – SIR Mod. AO-01/M, p/n 6814242		2.20	2.30
C5	Trim actuator control Ray Allen C. T2-10A	*	0.40	5.73
C6	Overvoltage sensor OS75-14 or B-00289-2	*	0.30	0.80
C7	Strobe light – Aircraft Spr. p/n 2005		0.15	5.89
C8	Navigation lights - AS W1285-PR		0.15	1.75
C9	Stall detector - AS 164R		0.10	1.36
C10	Stall detector – Tecnam PN 21-9-420-000	*	0.10	1.36
C11	NAV/POS/Strobe lights – Aveo AVE-WPST(R/G)-54G		0.25	1.75
C12	Landing LED light Whelen PLED 1L or P36P1L		0.50	0.20
	Landing light – AS GE 4509		0.50	0.20
	Landing light – AS GE 4509		0.50	1.36

EQUIPMENT LIST	S/N: 154	DATE: MAY 2020		
RIF.	DESCRIPTION &P/N	INST	WEIGHT [kg]	DATUM [m]
	INSTRUMENTS			
D1	Altimeter Mikrotechna - LUN 1128.12B6		0.39	1.35
	Altimeter United Instruments P/n 5934PM-3A84		0.39	1.35
	Altimeter Mikrotechna P/n 1128.10B4		0.39	1.35
D2	Airspeed Indicator – Mikrotechna 1106.B0B2		0.30	1.35
	Airspeed Indicator Mikrotechna LUN 1116.F2B2 M007		0.30	1.35
	Airspeed Indicator – UMA T16-311-161		0.30	1.35
D3	Vertical speed indicator – Mikrotechna UL 30-42.2		0.35	1.35
	Vertical speed indicator –Falcon Gauge VS12FM-3		0.35	1.35
	Vertical speed indicator –Falcon Gauge BC-2A		0.35	1.35
	Vertical speed indicator –York Aviation VS10		0.35	1.35
D4	Attitude Indicator - RCA ALLEN INSTR. RCA 22-7		1.10	1.35
	Attitude indicator RCA 26EK-12		1.10	1.35
	Attitude Indicator Falcon Gauge GH02-V3 or GH 0022		0.98	1.35
	Attitude Indicator Mid Continent 4200-10		0.80	1.35
D5	Turn Coordinator – Mid Continent T1394T100-7(Z/B)		0.54	1.35
	Turn Coordinator – Falcon Gauge TC02E-3-2		0.56	1.35
	Turn Coordinator – Falcon Gauge TC02E-3-1		0.56	1.35
	Turn and slip coordinator Mid Continent 5550-8340N3L		0.68	1.35
D6	Directional Gyro – RCA ALLEN INSTR. RCA 11A-8		1.10	1.35
	Directional Gyro Falcon Gauge DG 02V-3		1.10	1.35
	Directional Gyro RCA 15AK-2		1.10	1.35
D7	RPM indicator (Sorlini) SOR 52		0.10	1.35
	Prop. RPM Ind. Aircraft Mitchell. D1-112-5041		1.10	1.35
D8	CT indicator SOR 59		0.10	1.35
D9	Oil pressure indicator (Sorlini) SOR 50V	*	0.10	1.35
D10	Voltmeter Indicator (Sorlini) SOR 51	*	0.10	1.35
D11	Oil temperature indicator (Sorlini) SOR 54	*	0.10	1.35
D12	Fuel Pressure Ind. UMA 4-360-007U		0.13	1.35
	Fuel Pressure Ind. UMA N042125010P02W		0.13	1.35
D13	Amperometer Ind. VDO 190-037-001G		0.10	1.35
	Amperometer Ind. Speed Com Instruments 0203		0.10	1.35
D14	Fuel Quantity Ind. Road GmbH XID4000800		0.56	1.35
	Fuel Quantity Ind. Road GmbH ID31.2B35.21		0.56	1.35
D15	Clock – DAVTRON mod. M 800	*	0.15	1.35
D16	Compass - Airpath C2400 L4P	*	0.29	1.35
D17	Vacuum Instr.Ind.- UMA Inc. 3-200-12		0.10	1.35
D18	Trim Position Indicator – RAY ALLEN C. RP3 or RP4		0.05	1.35
	Trim Position Indicator – UMA N0911SOU2DR00W		0.05	1.35
D19	CHT indicator SOR 53		0.10	1.35
D20	MGL avionics GF-2 force meter P/N 11-05693		0.16	1.35

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EQUIPMENT LIST	S/N: 154	DATE: SEP 21		
RIF.	DESCRIPTION &P/N	INST	WEIGHT [kg]	DATUM [m]
	AVIONICS AND OTHER			
E1	Nav/CommTrans.-Garmin SL30		1.50	1.35
E2	Nav Indicator - Bendix King KI208		0.46	1.35
E3	R/T VHF COMM ICOM IC-A200		1.20	1.35
E4	GPS/NAV Receiver an R/T COMM Garmin GNS430		2.31	1.35
E5	Transponder-Garmin GTX327 or 330		1.00	1.35
E6	Transponder-Garmin GTX328		1.00	1.35
E7	Audio panel –Garmin GMA 340 or 345		0.50	1.35
E8	VOR/LOC Indicator–Garmin GI106A, GI106B, MD200-306		0.64	1.35
E9	Transponder Antenna Comant Industries CI 105		0.17	1.09
E10	Mic - Telex TRA 100 or Telex 66-T		0.17	1.90
E11	GPS Antenna.Garmin GA35		0.27	1.08
E12	Comm Antenna Comant Industries CI 291 or CI 121	*	0.34	3.30
E13	Comm Antenna Sigma Antenna		0.20	3.20
E14	VOR/ILS Antenna. Comant Industries CI 158C	*	0.26	5.80
E15	Marker Antenna Comant Industries CI 102	*	0.27	2.70
E16	First Aid Kit P/N 92-12-333-000	*	0.28	2.30
E17	Altitude Encoder- Ack A-30 or A30.5	*	0.25	1.00
E18	Emergency Hammer-Dmail 108126	*	0.35	2.30
E19	ADF Bendix King KR87		1.38	1.35
E20	ADF Antenna Bendix King KA44B		1.89	2.05
E21	ADF Indicator Bendix King KI227		0.32	1.34
E22	COMM Garmin SL40		1.50	1.35
E23	Fire Extinguisher Enterprises Ltd BA51015-3		2.20	2.32
E24	Fire Extinguisher H3R Model RTA 600		0.60	2.32
E25	COM/NAV/GPS Garmin GTN 650		3.20	1.35
	COM/NAV/GPS Garmin GTN 650Xi		2.50	1.35
E26	COM/NAV Garmin GNC 255A		1.37	1.35
E27	COM Garmin GTR 225A		1.07	1.35
E28	COM/NAV/GPS Garmin GTN 750		4.65	1.35
E29	Transponder Garmin GTX 33		1.60	2.74
E30	Audio panel Garmin GMA 35		1.00	1.35
E31	DME unit King KN 63		1.27	2.74
E32	DME indicator King KDI 572		0.40	1.35
E33	DME antenna KA 61		0.20	1.00
	DME antenna C1105-16		0.20	1.00
E34	Display Garmin GDU 620		3.20	1.35
E35	Air data computer Garmin GDC 74A		1.04	1.08
E36	AHRS Garmin GRS 77		1.57	2.74
E37	Magnetometer Garmin GMU 44		0.23	5.30
E38	ELT Kannad 406 AF Compact or Integra		1.10	2.70
E39	ELT Antenna ANT 200 or AV-200		0.11	2.70
E40	ELT ACK E-04		0.73	2.70
E41	ELT ANTENNA Whip E-04.8		0.06	2.70
E42	ELT Artex ME 406		1.10	2.74
E43	ELT Antenna Kit Model ME 406		0.21	2.70
E44	Fire Extinguisher Amerex A344T		1.50	2.32
E45	Transponder-Garmin GTX335		1.32	1.35
E46	Heated Pitot GARMIN GAP26		0.30	1.73
E47	Intercom Flight Com 403		0.14	1.35

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SEZIONE 7 – AIRFRAME AND SYSTEMS DESCRIPTION

INDEX

1. Introduction

This section provides description and operation of the aircraft and its systems.

2. Airframe

2.1. WING

The wing consists of a central light alloy torque box; an aluminium leading edge with integrated fuel tank is attached to the front spar while flap and ailerons are hinged to rear spar. Flaps and ailerons consist of a centre spar to which front and rear ribs are joined; wrap-around aluminium skin panels cover the structure.

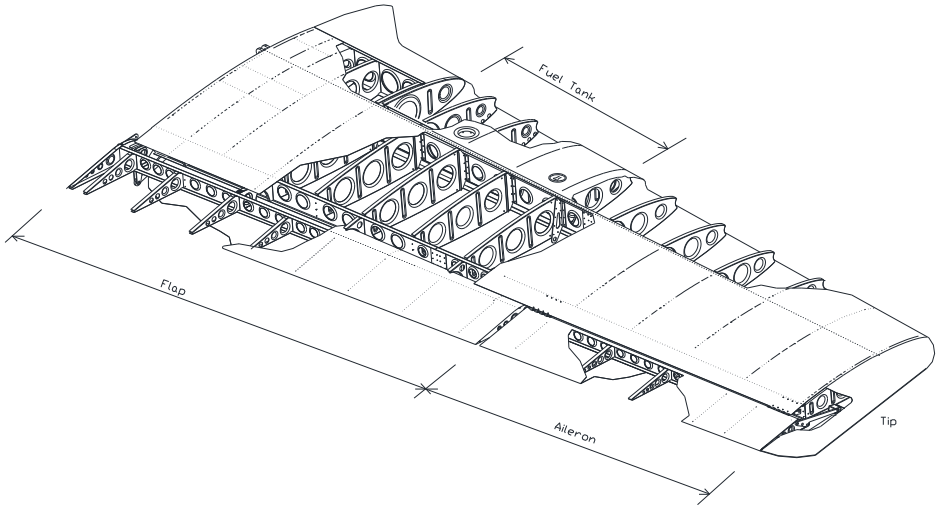

Fig. 7-1. RIGHT WING EXPLODED VIEW

2.2. FUSELAGE

The front part of the fuselage is made of a mixed structure: a truss structure with special steel members for cabin survival cell, and a light-alloy semi-monocoque structure for the cabin's bottom section. The aft part of the fuselage is constructed of an aluminium alloy semi-monocoque structure. The engine is isolated from the cabin by a firewall; the steel engine mount is attached to the cabin's truss structure in four points.

2.3. EMPENNAGES

The vertical tail is entirely metal made: the vertical fin is made up of a twin spar with stressed skin while the rudder consists of an aluminium torque box made of light alloy ribs and skin. The horizontal tail is an all-moving type (stabilator); its structure consists of an aluminium tubular spar connected to ribs and leading edge covered by an aluminium skin.

3. FLIGHT CONTROLS

Aircraft flight controls are operated through conventional stick and rudder pedals. Longitudinal control acts through a system of push-rods and is equipped with a trim tab. Aileron control is of mixed type with push-rods and cables; the cable control circuit is confined within the cabin and is connected to a pair of push-rods positioned in the wings that control ailerons differentially. Aileron trimming is carried out on ground through a small tab positioned on left aileron.

Flaps are extended via an electric servo actuator controlled by a switch on the instrument panel. Flaps act in continuous mode; the indicator displays the two positions relative to takeoff (15°) and landing (40°). A breaker positioned on the right side of the instrument panel protects the electric circuit.

Longitudinal trim is performed by a small tab positioned on the stabilator and controlled via an electric servo by pushing Up/Down the push-button on the control stick, a shunt switch placed on the instrument panel enables control of either left or right stick.

4. INSTRUMENT PANEL

The conventional type instrument panel allows placement of a broad range of equipment. Instruments marked with an asterisk (*) are optional.

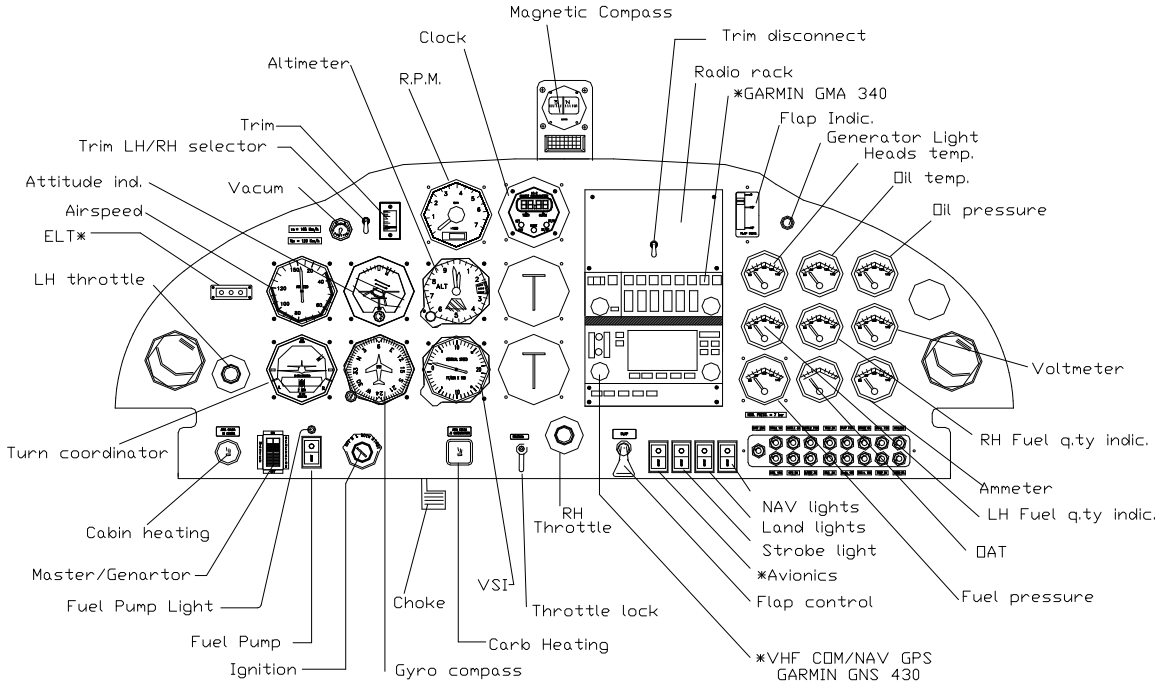

Fig. 7-2. INSTRUMENT PANEL

4.1. CARBURETTOR HEAT

Carburettor heat control knob is located on the left of the pedestal; when the knob is pulled fully outward from the instrument panel, carbs receive maximum hot air. During normal operation, the knob is OFF.

4.2. CABIN HEAT

The cabin heat control knob is positioned on the lower left side of the instrument panel; when knob is pulled fully outward, cabin receives maximum hot air. Vents are located by the rudder pedals and above instrument panel. If necessary, outside fresh air can be circulated inside cabin by opening the vents on the dashboard.

4.3. THROTTLE FRICTION LOCK

It is possible to adjust the engine's throttle friction lock by appropriately tightening the friction lock knob located on the instrument panel near the center throttle control.

5. SEATS AND SAFETY HARNESS

Aircraft features four point fitting safety belts with waist and shoulder harnesses adjustable via sliding metal buckle.

Seats are built with light alloy tube structure and synthetic material cushioning. A lever located on the right lower side of each seat allows for seat adjustment according to pilot size.

6. CANOPY

The cabin's canopy slides on wheel bearings along tracks located on fuselage sides; canopy is made out of composite material. Latching system uses a central lever located overhead and two additional levers positioned on canopy's sides. The canopy could be opened both from in and outside. In correspondence with each lock is present a placard indicating the emergency release procedure.

7. LUGGAGE COMPARTMENT

The Luggage compartment is located behind the pilots' seats. Luggage shall be uniformly distributed on utility shelf and its weight shall not exceed 20kg.

Tie-down luggage using adjustable tie-down net.

WARNING

Before loading luggage, check aircraft's weight and CG location (see Sect. 6)

8. POWERPLANT

8.1. ENGINE

Manufacturer: *Bombardier-Rotax GmbH*

Model: *ROTAX 912 S2*

Type: *4 stroke, horizontally-opposed 4 cylinder, mixed air and water cooled, twin electronic ignition, forced lubrication.*

Maximum rating: *98.6hp (73.5kW) @ 5800 rpm/min (2388 rpm/min. prop). Gear reduction ratio - 2.4286:1*

Max oil consumption: *Max: 0.1 litres/hour*

8.2. PROPELLER

Manufacturer: *Hoffmann Propeller*

Model: *HO17GHM A 174 177C*

N° of blades: *2*

Diameter: *1740 mm (no reduction permitted)*

Type: *wood, fixed pitch*

9. FUEL SYSTEM

The system is equipped with two aluminium fuel tanks integrated within the wing leading edge and accessible for inspection through dedicated covers. Capacity of individual tank is 50lt and the total fuel capacity is 100lt. Fuel indicator is calibrated as follows.

Indicator	Fuel Quantity (liters)
0	0.5
1/4	15 (+3 / -3)
1/2	25 (+3 / -3)
3/4	35 (+3 / -3)
4/4	50 (+0 / -3)

NOTE *In a conservative way, the sensor installation is arranged in order to show "0" when up to 5 (±1) liters are contained in each tank. The quantity to be taken into account for flight operations is nevertheless the unusable fuel (0.5 liters for each tank).*

A multi-position fuel selector valve is located into the cabin. It is possible to select the following fuel feeding: LEFT (means a left tank feeding), RIGHT (means a right tank feeding) and a third OFF position which could not be accidentally operated. A strainer cup with a drainage valve (Gascolator) is located beneath the cabin, just behind the firewall. Fuel level indicators for each tank are located on instrument panel. Fuel feed is through an engine-driven mechanical pump and also through an electric pump that supplies adequate engine feed in case of main pump failure. Figure 7-3 illustrates the schematic layout of the fuel system.

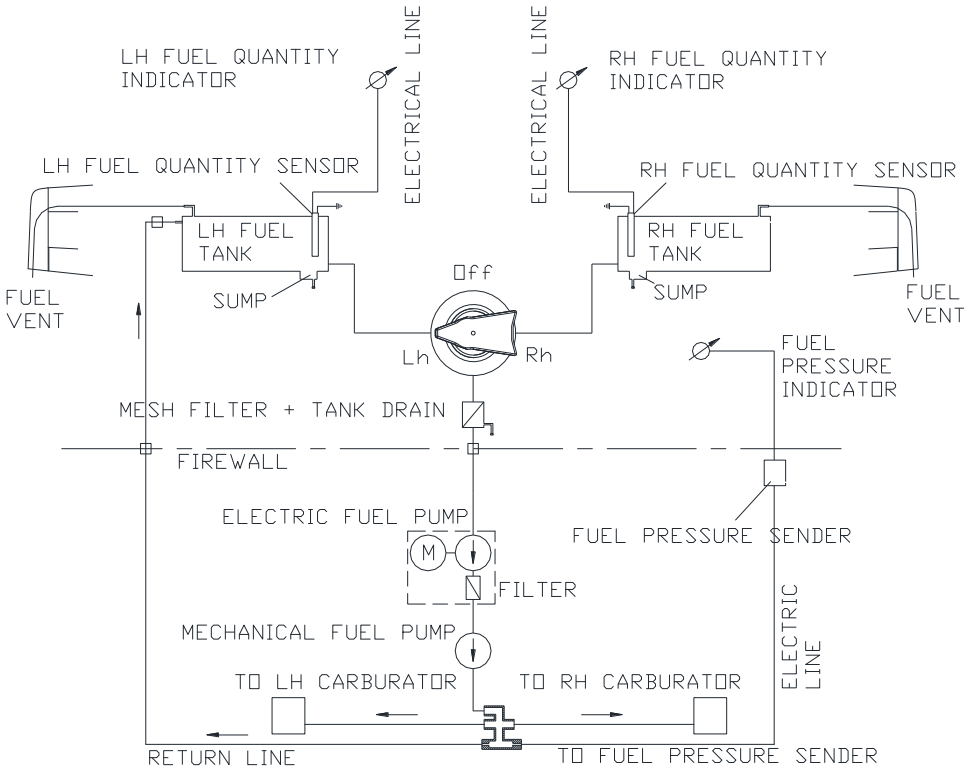

Fig.7-3. FUEL SYSTEM SCHEMATIC

10. ELECTRICAL SYSTEM

The aircraft's electrical system consists of a 12 Volt DC circuit controlled by the Master Switch located on the instrument panel. Electrical power is provided by an alternator and by a buffer battery. Generator light is located on the right side of the instrument panel.

An optional fire detector light with its push to test is installed near the generator light.

WARNING

If the Ignition is in the position L, R, or BOTH, an accidental movement of the propeller may start the engine with possible danger for bystanders.

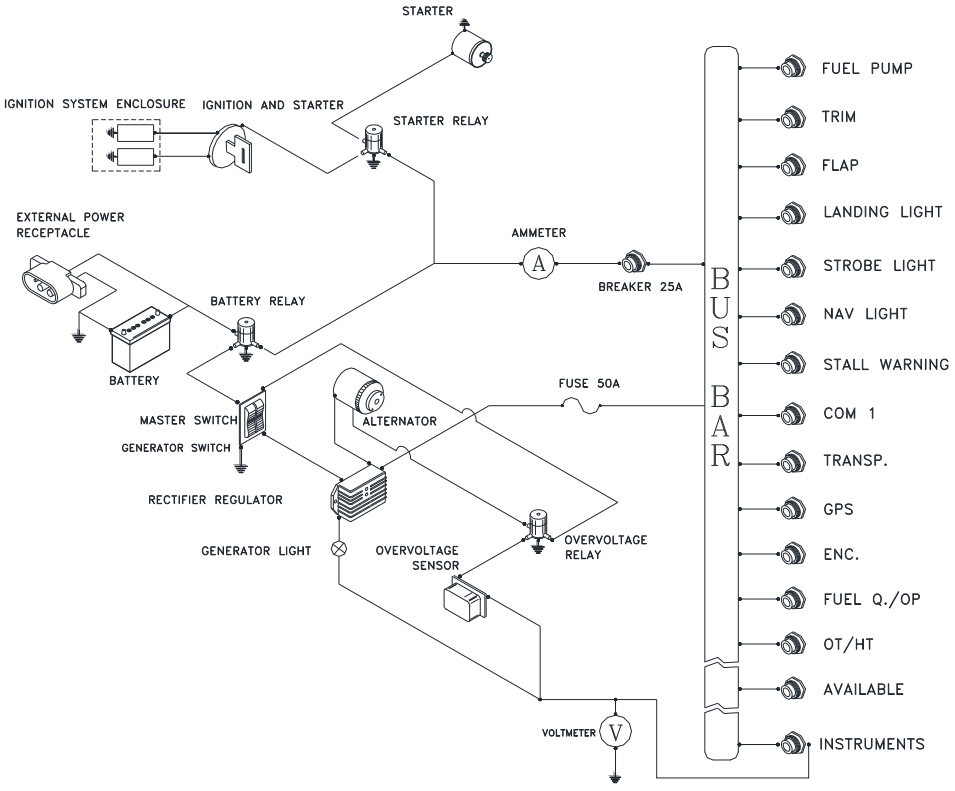

FIG.7-4. ELECTRICAL SYSTEM SCHEMATIC

10.1. GENERATOR LIGHT

Generator light (red coloured) illuminates either:

- for a generator failure.
- for a failure of the regulator/rectifier, with consequent overvoltage sensor shut off.

10.2. VOLTMETER AND AMMETER

The voltmeter indicates voltage on bus bar. A positive ammeter indication warns that the generator is charging the battery, a negative value indicates the battery's discharge rate.

10.3. OIL AND CYLINDER HEADS TEMP. - OIL PRESSURE

These instruments are connected in series with their respective sensors. The same breaker protects all temperature instruments while a second breaker protects oil pressure indicator and other instruments.

10.4. O.A.T. INDICATOR

A digital Outside Air Temperature indicator (°C) is located on the upper left side of the instrument panel.

10.5. STALL WARNING SYSTEM

The aircraft is equipped with a stall warning system consisting of a sensor located on the right wing leading edge connected to a warning horn located near the instrument panel.

10.6. AVIONICS

The central part of the instrument panel holds room for avionics equipment.

The manufacturer of each individual system furnishes features for each system.

10.7. EXTERNAL POWER SUPPLY

On the right side of the tail cone, an external power is present. Using this device it is possible to feed the electric system directly on the bus bar, by an external power source. It should be used at the engine start-up in cold weather condition. For engine start below -17°C OAT it is advisable to use the external power source.

Follow this procedure to start the engine using the external power source.

1. Magnetos, Master switch, Generator switch: OFF
2. Open the receptacle door and insert the external power source’s plug into the socket
3. Engine start-up procedure (see Sect. 4 in this manual)
4. Disconnect the external power source’s plug and close firmly the receptacle door.

11. PITOT AND STATIC PRESSURE SYSTEMS

The airspeed indicator system for the aircraft is shown below.

Below the left wing's leading edge are positioned in a single group (1) both the Pitot tube (3, total pressure intake) and a series of static ports (6). Two flexible hoses (5) feed the airspeed indicator (4) on the instrument panel.

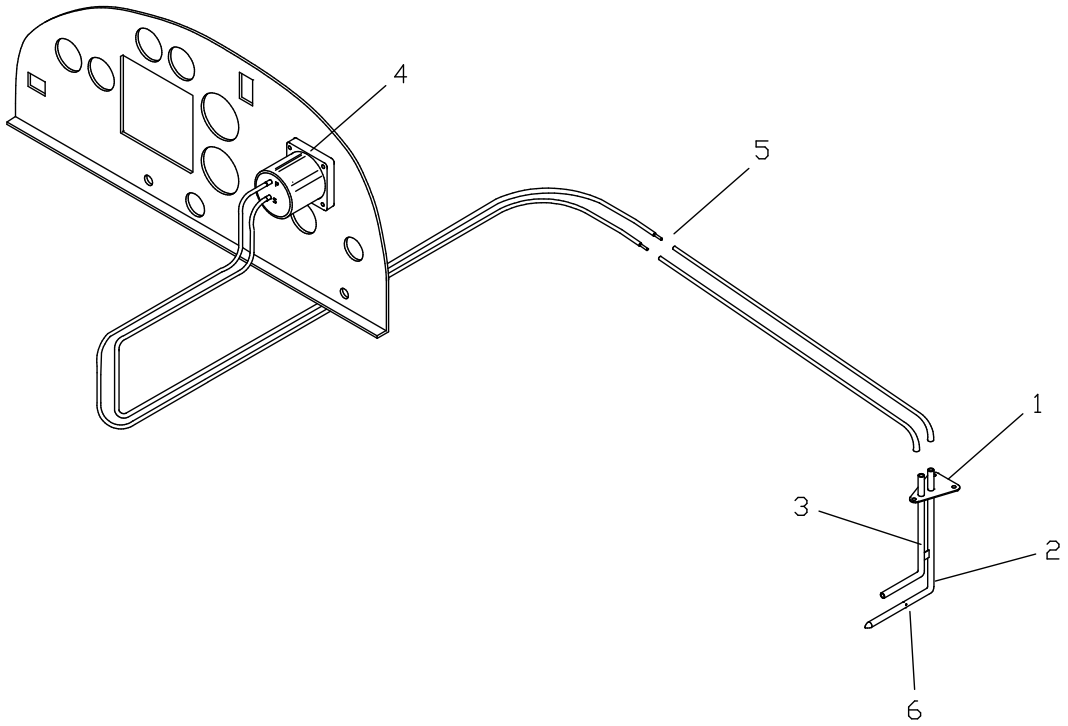

FIG.7-5. AIRSPEED INDICATOR SYSTEM

12. BRAKES

The aircraft's braking system is a single system acting on both wheels of main landing gear through disk brakes, the same circuit acts as parking brake via an intercept valve (2).

To activate brakes it is sufficient to verify that brake shut-off valve (2) positioned on tunnel between pilots is OFF, then activate brake lever (1) as necessary.

To activate parking brake pull brake lever (1) and set brake shut-off valve (2) to ON.

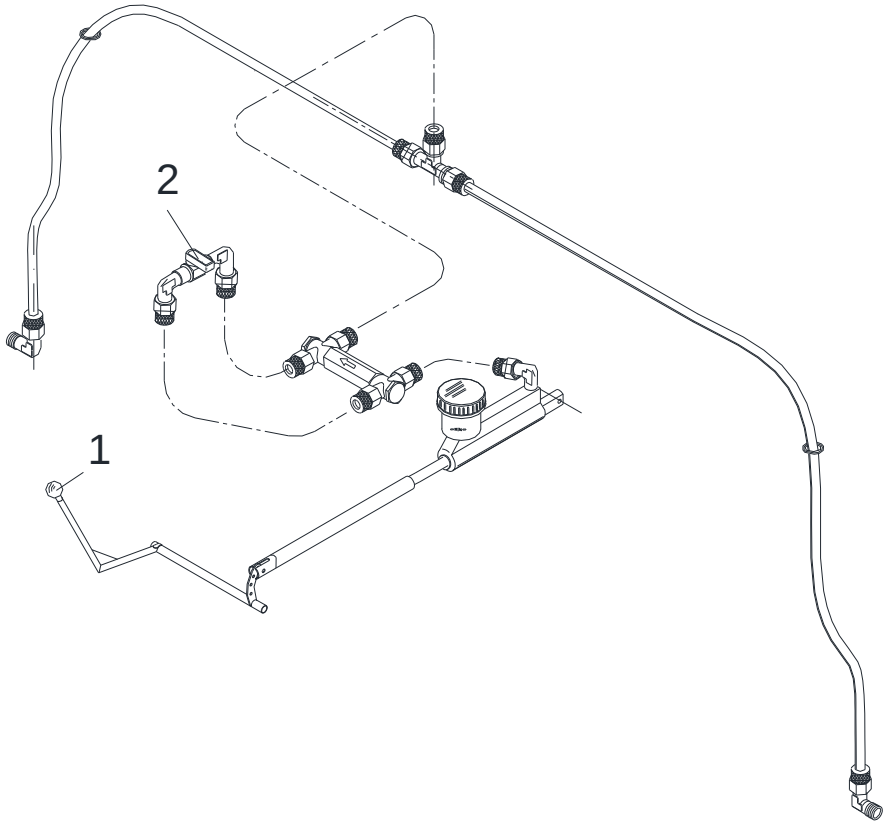

FIG. 7-6. BRAKE SYSTEM

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SECTION 8 – GROUND HANDLING & SERVICE

INDEX

1. INTRODUCTION

This section contains factory-recommended procedures for proper ground handling and routine care and servicing. It also identifies certain inspection and maintenance requirements, which must be followed if the aircraft is to retain its new-plane performance and dependability. It is recommended to follow a planned schedule of lubrication and preventive maintenance based on climatic and flying conditions encountered locally.

2. AIRCRAFT INSPECTION INTERVALS

Inspection intervals occur at 100 hours or at 1 year (whichever occurs first) and in accordance with special inspection schedules which are added to regularly scheduled inspections. Correct maintenance procedures are described in the aircraft's Maintenance Manual or in the engine's Maintenance Manual.

3. AIRCRAFT CHANGES OR REPAIRS

Aircraft changes or repairs must be performed in accordance with Aircraft Maintenance Manual and only by TECNAM authorized personnel.

4. GROUND HANDLING

4.1. TOWING

The aircraft is most easily and safely maneuvered by pulling it by its propeller near the axle. Aircraft may be steered by turning rudder or, for steep turns, by pushing lightly on tailcone to lift nose wheel.

4.2. PARKING AND TIE-DOWN

When parking airplane outdoors, head it into the wind and set the parking brake. If chocks or wedges are available it is preferable to use the latter.

In severe weather and high wind conditions it is wise to tie the airplane down. Tie-down ropes shall be fastened to the lug present on the wing's lower surface. Nose gear fork can be used for front tie-down location.

Flight controls shall be secured to avoid possible weathervaning damage to moving surfaces.

4.3. JACKING

Given the light empty weight of the aircraft, lifting one of the main wheels can easily be accomplished even without the use of hydraulic jacks. For an acceptable procedure please refer to the Maintenance Manual.

4.4. LEVELING

Aircraft leveling may become necessary to check wing incidence, dihedral or the exact location of CG. Longitudinal leveling verification is obtained placing a level between the front and aft seat's supporting trusses (slide off the seats to get the access to the two trusses).

4.5. ROAD TRANSPORT

It is recommended to secure tightly all aircraft components onto the cart to avoid damage during transport. Minimum cart size is 7x2.5 meters. It is suggested to place wings under the aircraft's bottom, secured by specific clamps. Secondary components like the stabilator shall be protected from accidental hits using plastic or other material. For correct rigging and de-rigging procedure, refer to the Maintenance Manual.

5. CLEANING AND CARE

To clean painted surfaces, use a mild detergent such as shampoo normally used for car finish; use a soft cloth for drying

The plastic windshield and windows should never be dusted when dry; use lukewarm soapy water and dry using chamois only. It is possible to use special glass detergents but, in any case, never use products such as gasoline, alcohol, acetone or other solvents.

To clean cabin interior, seats, upholstery and carpet, it is generally recommended to use foam-type detergents.

6. ENGINE COWLING CHECK

6.1. UPPER COWLING

I. Parking brake: *ON*

II. Fuel selector valve: *OFF*

III. Magnetos: *OFF*

IV. Generator & Master switches: *OFF*

V. Unlatch all four butterfly Cam-locks mounted on the cowling by rotating them 90° counter clockwise while slightly pushing inwards.

VI. Remove engine cowling paying attention to propeller shaft passing through nose.

VII. To assemble: rest cowling horizontal insuring proper fitting of nose base reference pins.

VIII. Secure latches by applying light pressure, check for proper assembly and fasten Cam-locks.

WARNING

Butterfly Cam-locks are locked when tabs are horizontal and open when tabs are vertical. Verify tab is below latch upon closing.

6.2. LOWER COWLING

I. After disassembling upper cowling, move the propeller to a horizontal position.

II. Using a standard screwdriver, press and rotate 90° the two Cam-locks positioned on lower cowling by the firewall.

III. Disconnect the ram-air duct from the NACA intake. Pull out the first hinge pin positioned on the side of the firewall, then, while holding cowling, pull out second hinge pin; remove cowling with downward motion.

IV. For installation follow reverse procedure.

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SECTION 9 – SUPPLEMENTS

INDEX

1. INTRODUCTION

This Section concerns the supplemental manuals of additional (or optional) instrumentation equipping the ***P2002-JF***.

2. SUPPLEMENTS LISTS

Aircraft S/N: 154 Registration marks: 5B-CLS Date: 2021

Sup. No.	Title	Rev. no.	Date	APPLICABLE:	
				YES	NO
A1	Garmin GNS-430W Gps/VHF Comm/Nav	0		☒	☐
A2	GARMIN GNS 530 GPS/VHF COMM/NAV	0		☐	☒
A3	New analogical instruments panel	1		☒	☐
A4	Differential brake system	0		☒	☐
A5	Central throttle control system	1		☐	☒
A6	AFM supplement for CIS countries operators	1		☐	☒
A7	Garmin G500 Avionics Display System	1		☐	☒
A8	VFR Night equipment	3		☐	☒
A9	VFR Night equipment - Analogical version	3		☒	☐
A10	AFMS for Malaysia Registered Aircraft	0		☐	☒
A11	INCREASED MTOW (600 kg)	3		☐	☒
A12	INCREASED MTOW (620 kg)	3		☒	☐
A13	Variable Pitch Propeller	5		☐	☒
A14	Rudder and throttle controls additional controls	0		☐	☒
A15	GARMIN GTN 750 GPS/VHF COMM/NAV	0		☐	☒
A16	AFMS for Ukraine Registered Aircraft	0		☐	☒

Aircraft S/N: 154 Registration marks: SB-CLD Date: SEP 21

Sup. No.	Title	Rev. no.	Date	APPLICABLE:	
				YES	NO
A17	AFMS for Argentine Registered Aircraft	0		☐	☒
A18	Alternative Placards	0		☒	☐
A19	AFM Supplement for GTX335 Transponder	1		☐	☒
A20	AFM Supplement for GTX335 Transponder (analogue configuration)	0		☐	☒
A21	AFM Supplement for MGL Avionics GF-2 Force Meter	0		☐	☒
A22	AFM Supplement for GTN 650/650Xi	1		☐	☒
A23	AFM Supplement for GTX 330	0		☒	☐

SUPPLEMENT NO. A01

GARMIN GNS 430 GPS/VHF COMM/NAV

Record of Revisions

Rev	Revised page	Description of Revision	Tecnam Approval			EASA Approval or Under DOA Privileges
			DO	OoA	HDO	
0	-					

List of Effective Pages

Page	Revision	Page	Revision
A01-1	Rev 0	A01-4	Rev 0
A01-2	Rev 0	A01-5	Rev 0
A01-3	Rev 0	A01-6	Rev 0

INDEX

INTRODUCTION

This section contains supplementary information for safe and efficient operation of the aircraft if equipped with a Garmin GNS 430 system.

GENERAL

1. The GPS GNS 430 Global Positioning System is an integrated system that contains a GPS navigation system in addition to a VHF COMM radio transceiver and a VOR/ILS receiver.
2. The system includes an antenna for GPS, a receiver for GPS, a VOR/LOC antenna, a VOR/ILS receiver, a VHF Comm antenna and a VHF Comm tranceiver.
3. The main function of the VHF Comm is to allow communication with the control tower.
4. The VOR/ILS function is to receive and demodulate VOR and LOC signals.
5. The GPS section is dedicated to signal acquisition from the GPS satellite system and to furnish real-time information with respect to position, speed and time.
6. With appropriate signals the GPS GNS 430 can:
   - plan VFR/IFR routes, track waypoints and plan non-precision instrument approaches (GPS, LORAN-C, VOR, VOR-DME, TACAN, NDB, NDB-DME, RNAV) in accordance with AC 20-138;
7. Reference coordinates used for navigation are WGS-84.

LIMITATIONS

1. The "Pilot's guide and Reference" p/n 190-00140-00 rev. F dated July 2000 or later versions, must be available for proper use of the instrument.
2. Only VFR use is permitted.
3. The GPS section must use the following (or more recently approved) software versions:

Subsystem	*Software Version*
MAIN	2.00
GPS	2.00
COMM	1.22
VOR/LOC	1.25

The software version of the main subsystem is displayed by the GNS 430 immediately after start-up for 5 seconds. Remaining subsystems software versions may be verified in sub-page 2 of the AUX Group display for "SOFTWARE/DATA BASE VER".

4. The following default settings must be keyed-in in the SETUP 1 menu of the GNS430 receiver before any other operation:

- **DIS, SPD** *nm kt* (select navigation unit to "nautical miles" and "knots");
- **ALT,VS** *ft fpm* (select altitude to "feet " and "feet per minute");
- **MAP DATUM** *WGS 84* (select map datum WGS84);
- **POSN** *deg-min* (select grid for nav unit to decinal-minutes);

EMERGENCY PROCEDURES

1. If the information provided by the Garmin GNS430 is not available or manifestly wrong, it is necessary to use other navigation instruments.
2. If the message "WARN" appears in the lower left portion of the display, the receiver cannot be considered useful as a navigation aid. The pilot must use the VLOC receiver or an alternative navigation system.
3. If the message "INTEG" appears in the lower left portion of the display, the RAIM function is unavailable. The pilot must use the VLOC receiver or an alternative navigation system;
4. In emergency flight conditions, pressing the COM flip-flop knob for 2 seconds will automatically tune-in the 121.500MHz emergency frequency.

NORMAL OPERATION

1. DETAIL FOR NORMAL OPERATION

   Normal operation is described in the "Pilot's guide and Reference" P/N 190-00140-00 rev. F dated July 2000 or later versions.

2. GARMIN GNS 430 DISPLAY

   Data for GNS 430 system appears on GARMIN GNS430 display.

   Data source is either the GPS or the VLOC as indicated above the CDI switch of the GARMIN 430 display.

PERFORMANCE

No variations.

WEIGHT AND BALANCE

See Section 6 of the present manual.

SYSTEMS

See "GNS 430 Pilot's Guide" p/n 190-00140-00 rev. F dated July 2000 or later versions, for a complete description of the system.

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SUPPLEMENT NO. A03

NEW ANALOGICAL INSTRUMENT PANEL

Record of Revisions

Rev	Revised page	Description of Revision	Tecnam Approval			EASA Approval or Under DOA Privileges
			DO	OoA	HDO	
0	-					
1	A03-4	Alternative layout for instrument panel.	G. Valentino	D.Ronca	M.Oliva	Approved under the authority of DOA ref. EASA.21J.335 (MOD2002/228.201016)

List of Effective Pages

Page	Revision	Page	Revision
A03-1	Rev 1	A03-3	Rev 0
A03-2	Rev 0	A03-4	Rev 1

INDEX

INTRODUCTION

This section contains supplementary information for safe and efficient operation of the aircraft if equipped with the new analogical instruments panel.

GENERAL

No variations.

LIMITATIONS

No variations.

EMERGENCY PROCEDURES

No variations.

NORMAL OPERATION

No variations.

PERFORMANCE

No variations.

WEIGHT AND BALANCE

No variations.

SYSTEMS

The new analogical instruments panel is designed with a modular concept to improve the instruments visibility.

The new instruments panel is divided into three main parts. The left part with the flight instruments, central part with the avionic instruments and the right part with the engine instruments.

The following picture shown the new analogical instruments panel (standard and alternative layout).

The avionic system allows also the installation of ADF and DME as optional equipment.

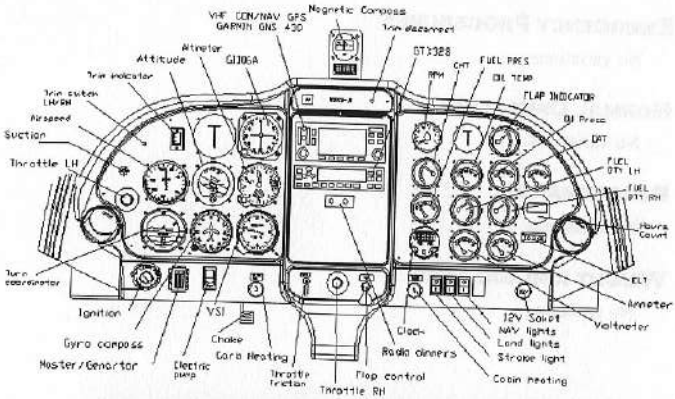


Figure A03-1 NEW ANALOGICAL INSTRUMENTS PANEL (ONLY FOR REFERENCE)

SUPPLEMENT NO. A04

DIFFERENTIAL BRAKE SYSTEM

Record of Revisions

Rev	Revised page	Description of Revision	Tecnam Approval			EASA Approval or Under DOA Privileges
			DO	OoA	HDO	
0	-					

List of Effective Pages

Page	Revision	Page	Revision
A04-1	Rev 0	A04-3	Rev 0
A04-2	Rev 0	A04-4	Rev 0

INDEX

INTRODUCTION

This section contains supplementary information for safe and efficient operation of the aircraft if equipped with the differential brake system.

GENERAL

No variations.

LIMITATIONS

No variations.

EMERGENCY PROCEDURES

No variations.

NORMAL OPERATION

No variations.

PERFORMANCE

No variations.

WEIGHT AND BALANCE

No variations.

SYSTEMS

Figure A04-2 shows the brake system schematic diagram.

The left and right wheel brakes are independent systems. The system has a reservoir (4) on the co-pilot's brake pedals (1). The reservoir is directly connected to the brake master cylinders (3). Two flexible hoses connect the master cylinders on the co-pilot's brake pedals to the master cylinders on the pilot's brake pedals.The parking brake valve (6) is mounted on the floor of the fuselage, below the seats and it's activated by lever (2). Each main wheel has a brake disc (7).

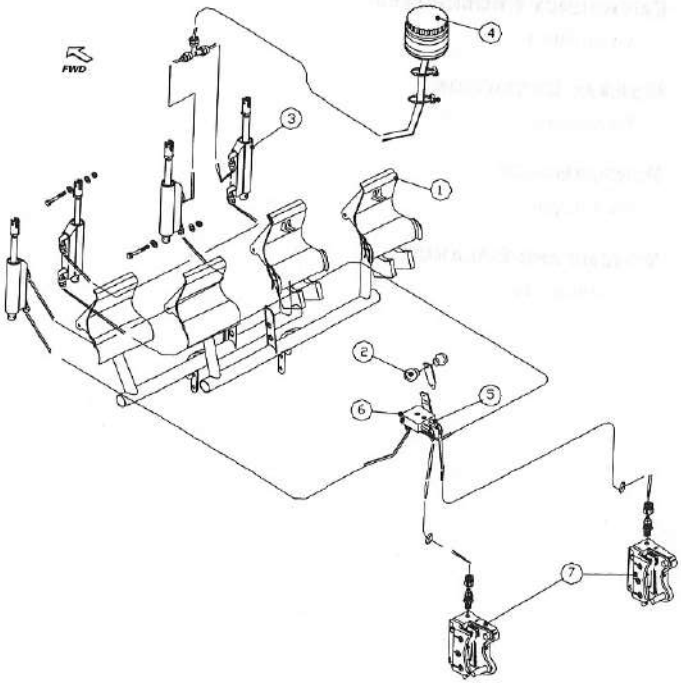


Figure A04-2 Differential brake system

SUPPLEMENT NO. A09

VFR NIGHT EQUIPMENT – ANALOGICAL VERSION

Record of Revisions

Rev	Revised page	Description of Revision	Tecnam Approval			EASA Approval or Under DOA Privileges
			DO	OoA	HDO	
0	-					
1	A09-12,13	Alternative layout for instrument panel.	G.Valentino	D.Ronca	M.Oliva	Approved under the authority of DOA ref. EASA.21J.335 (MOD2002/228.201016)
2	A09-3,4	Optimization minimum equipment list.	G.Valentino L. De Salvi (OJT)	D.Ronca	M.Oliva	Approved under the authority of DOA ref. EASA.21J.335 (MOD2002/229.210112)
3	A09 - 9	Clarification equipment list	L. De Salvi	D.Ronca	M.Oliva	Approved under the authority of DOA ref. EASA.21J.335 (MOD2002/231.210921)

List of Effective Pages

Page	Revision	Page	Revision
A09-1	Rev 3	A09-8	Rev 0
A09-2	Rev 0	A09-9	Rev 3
A09-3	Rev 2	A09-10	Rev 0
A09-4	Rev 2	A09-11	Rev 0
A09-5	Rev 0	A09-12	Rev 1
A09-6	Rev 0	A09-13	Rev 1
A09-7	Rev 0	A09-14	Rev 0

INDEX

INTRODUCTION

This AFM Supplement contains supplemental information to operate the airplane, in VFR Night conditions, in a safe and efficient manner.

In this case the airplane must embody the Design Change MOD 2002/084 "VFR Night for analogical version".

GENERAL

In order to allow flight in VFR Night conditions, the airplane is fitted with additional equipment, namely:

- ✓ an airspeed indicating system connected to a heated Pitot tube
- ✓ an alternate static port
- ✓ two instruments lights fitted with dimmer device
- ✓ a dimmable annunciator panel
- ✓ a dome light
- ✓ a torch

LIMITATIONS

KINDS OF OPERATION

Following table contains the list of minimum equipment, in addition to those reported on Section 2 of the basic AFM, required on board to allow flight operations in VFR Night: flight in VFR Night is permitted only if the prescribed additional equipment is installed and operational.

- ✓ **Pitot heating system**
- ✓ **Instruments lights**
- ✓ **Landing light**
- ✓ **Strobe lights**
- ✓ **ELT**
- ✓ **Transponder**
- ✓ **Torch**
- ✓ **Dome light**

Flight into expected and/or known icing conditions is prohibited.

NOTE *Additional equipment may be asked to fulfill national or specific requirements. It's a responsibility of the continued airworthiness manager to be compliant with these requirements.*

AIRSPEED INDICATOR MARKINGS

The following limitation placard is placed in clear pilot's view on the instruments panel:

THIS AEROPLANE IS CLASSIFIED AS A VERY LIGHT AEROPLANE APPROVED FOR DAY AND NIGHT VFR IN NON-ICING CONDITIONS. ALL AEROBATIC MANOEUVRES INCLUDING INTENTIONAL SPINNING ARE PROHIBITED. SEE FLIGHT MANUAL FOR OTHER LIMITATIONS

EMERGENCY PROCEDURES

GENERATOR WARNING LIGHT

Generator warning light ALT may illuminate for a faulty alternator or when voltage is above 16V; in this case the over-voltage sensor automatically shuts down the alternator.

Apply following procedure::

1. **Generator switch and master switch:** *OFF*
2. **Generator switch and master switch:** *ON*

If generator warning light ALT stays displayed

1.	**Generator switch:**	*OFF*
2.	**Non essential electric equipments:**	*OFF*
3.	**Radio calls:**	*Reduce at the strictly necessary*
4.	**Five minutes before landing:**	*Pitot heat OFF*
5.	**Limit the *landing light* use:**	*Turn the light ON just 5 minutes before landing.*

NOTE *The battery is able to supply the electrical system for at least 35 minutes to complete flight in emergency conditions, with normal flight electric-loads including operation of flap and trim.*

INSTRUMENTS LIGHTS FAILURE

In event of failures affecting the instruments lights, if required, apply following instructions:

Dome light: *ON*

STATIC PORT FAILURE

In case of static port failure, the alternate static port in the cabin (pedestal, right side) must be activated.

In this case apply following procedure:

1. **Cabin ventilation** *OFF (hot and cold air)*
2. **Alternate static port** *OPEN*
3. **Continue the mission**

UNINTENTIONAL FLIGHT INTO ICING CONDITIONS

1. **Carburettor heating:** *ON*
2. **Pitot heat:** *ON*
3. *Get away from icing conditions by changing altitude or direction of flight in order to reach an area with warmer external temperature*
4. *Controls surfaces: continue to move to maintain their movability*
5. *Increase RPM to avoid ice formation on propeller blades.*
6. **Cabin heat:** *ON*

WARNING

In event of ice build-up in correspondence of wing leading edges, stall speed increases.

NORMAL OPERATION

PRE-FLIGHT INSPECTIONS

Before each flight, in addition to the inspections prescribed on Section 4 of the basic AFM, it is necessary to carry out following functional checks:

CABIN INSPECTION

MASTER SWITCH	*ON*
Torch	*TEST*
Day/Night Switch	*Set as required by lighting condition*
Instrument lights	*TEST*
Dome light	*TEST*
Pitot heating system	*Make sure plug is removed, set to ON, CHECK advisory light ON. After about 5 seconds, turn OFF Pitot heating system. Check Pitot if warm.*
Alternate static port	*CHECK closed*
Strobe lights switch	*ON, check wing strobe lights ON*
Strobe lights switch	*OFF*
Landing light	*TEST*
Navigation Light	*TEST*
MASTER SWITCH	*OFF*

PERFORMANCE

VFR Night equipment installation does not affect the aircraft performance.

WEIGHT AND BALANCE

For weight and balance, make reference to Section 6 of this Manual.

The following equipment has to be considered as standard for VFR night configuration:

EQUIPMENT LIST		A/C S/N	DATE:	
REF.	DESCRIPTION & P/N	INST	WEIGHT *kg*	DATUM *m*
	Instruments lights (two items) - each	*	0.1	1.55
	Alternate static port	*	0.03	1.55
	Pitot heated	*	0.3	1.73
	Dome light	*	0.1	2.70
	Landing light (1)	*	0.5	0.2

(1) : Make reference to equipment list of your A/C (Sect.6 of basic AFM) for additional information on applicable P/N

SYSTEMS

VFR NIGHT EQUIPMENT

In order to allow flight in VFR Night conditions, the airplane is fitted with additional equipment, herein described.

INSTRUMENTS LIGHTS

A couple of instrument lights (LED type) is connected to the main bus through a circuit breaker and installed in correspondence of fixed part of the canopy, one for each side. Fitted with flexible struts, they can be adapted to illuminate the instruments panel, as per pilot needs.

A dimmer device, located next to the annunciator panel, allows for regulating instruments lights brightness.

DOME LIGHT

In event of electrical failures, the dome light, installed on the cabin ceiling and directly connected to the battery through a circuit breaker, provides the pilot with an additional mean to illuminate the cabin and the instruments panel.

TORCH

An emergency torch is provided in the cabin.

ANNUNCIATOR PANEL

Instruments panel features an annunciator panel consisting of three lights, namely:

- **ALT** warning light: it indicates that the alternator is **OFF** or not working properly
- **PITOT HEAT** advisory light: it indicates that Pitot heating system is **ON**
- **FUEL PUMP** advisory light: it indicates that the electrical fuel pump is **ON**

The 'VFR day/night' switch allows for regulating annunciator panel brightness, depending upon light conditions; it is located next to the annunciator panel itself and it permits two brightness set-ups (day and night).

LANDING LIGHT

Landing light is located under the engine nacelle, instead of the left wing leading edge, in order to prevent pilot blinding during night operations.

PITOT HEATING SYSTEM

The airplane airspeed indicating system is connected to a heated Pitot tube; heating system is activated by means of a switch which activates the advisory light (PITOT HEAT) on the annunciator panel.

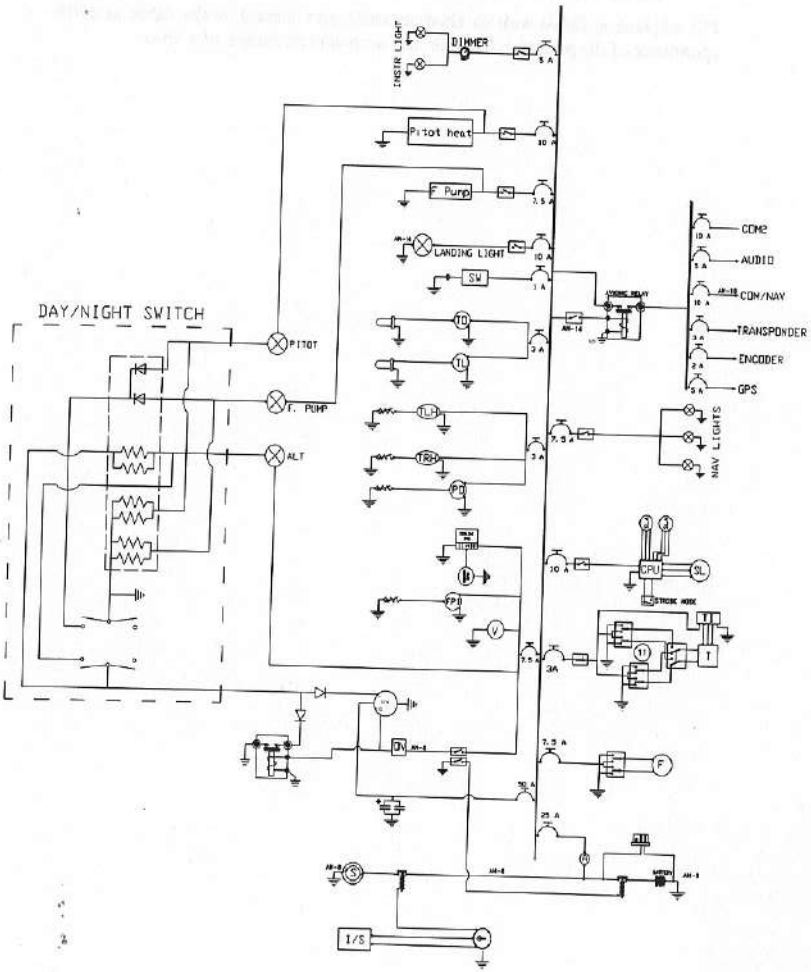
The advisory light informs the pilot that the system is activated but it does not indicate whether it works properly.

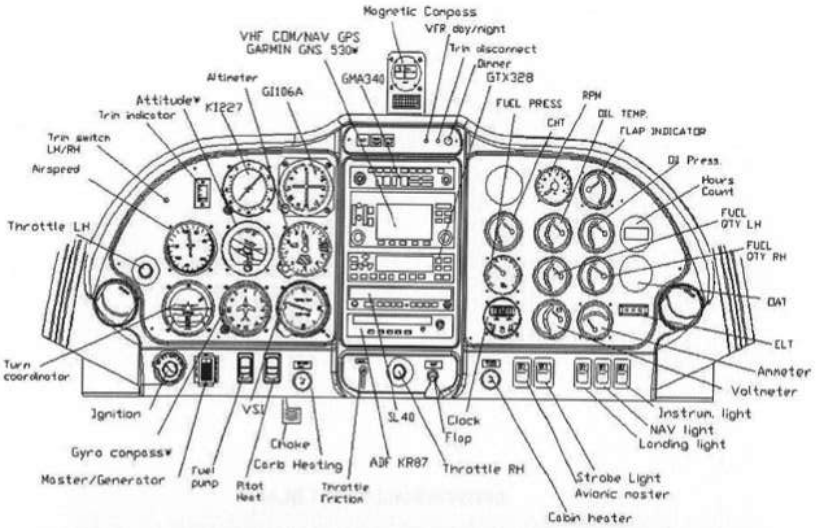
ALTERNATE STATIC PORT

The airplane is fitted with an alternate static port located in the cabin in correspondence of the pedestal, RH side. It is activated by means of a lever.

ELECTRICAL SYSTEM AND INSTRUMENTS PANEL

The drawings below show the electrical system schematic and the instruments panel (typical and alternative layout).





N°	DESCRIPTION	N°	DESCRIPTION	N°	DESCRIPTION		
1	Trim indicator	9	Vertical Speed	17	Head Temperature	25	Chronometer
2	ADF	10	GTN 750	18	Oil Temperature	26	Ammeter
3	VOR GI 106A	11	GMA 35 (Remote)	19	Oil Pressure	27	Voltmeter
4	Airspeed	12	GTX 33 (Remote)	20	OAT	28	ELT
5	Attitude ind.	13	KR 87 ADF	21	Fuel Pressure	29	DME
6	Altimeter	14	GTR 225	22	Fuel ind. SX	30	Parachute
7	Turn coordinator	15	MAP ind.	23	Fuel ind. DX		
8	Directional gyro	16	RPM ind.	24	Hours count		

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SUPPLEMENT NO. A12

INCREASED MTOW (620KG)

Record of Revisions

Rev	Revised page	Description of Revision	Tecnam Approval			EASA Approval or Under DOA Privileges
			DO	OoA	HDO	
1	W2-14	Amend Warning	G.Paduano	M.Landi	M.Oliva	DOA privileges
1	W5-6	Update Stall Speed Table	G.Paduano	M.Landi	M.Oliva	DOA privileges
1	W5-11,12	Update Climb performance table	G.Paduano	M.Landi	M.Oliva	DOA privileges
2	A12-5	Update Cover	A. Glorioso	D. Ronca	M. Oliva	Approved under the authority of DOA, ref. EASA.21J.335 (MOD2002/223.191111)
3	W5-13, 14	Updated reference weight for cruise performance.	G. Valentino	D. Ronca	M. Oliva	Approved under the authority of DOA, ref. EASA.21J.335 (MOD2002/224.200512)

List of Effective Pages

	Page	Revision
Cover Pages	A12-1	*Rev 3*
	A12-2 thru 12	*Rev 2*
Section 2	W2-3	*Rev 0*
	W2-4	*Rev 0*
	W2-13	*Rev 0*
	W2-14	*Rev 1*
	W2-19	*Rev 0*
	W2-20	*Rev 0*
Section 5	W5-1 thru 5 W5-7 thru 10 W5-15 thru 20	*Rev 0*
	W5-6 W5-11 thru 12	*Rev 1*
	W5-13, 14	*Rev 3*

INTRODUCTION

This Supplement provides supplemental information to perform Increased Maximum Takeoff Weight (620 kg) operations when the Tecnam Service Bulletin SB 0105-CS or Design Change MOD 2002/087 has been embodied on the airplane.

The information contained herein supplements or supersedes the basic Aircraft Flight Manual: detailed instructions are provided to allow the owner for replacing the basic AFM pages containing information amended as per the Increased MTOW Design Change in subject.

It is the owner's responsibility to replace the mentioned pages in accordance with the instructions herein addressed section by section.

Supplement A12: pages replacement instructions

SECTION 1 – GENERAL

See basic AFM - Section 1.

Supplement A12: pages replacement instructions

SECTION 2 – LIMITATIONS

Apply following pages replacement procedure:

Supplement A11 – Limitations page		Basic AFM – Limitations page
W2-3	REPLACES	2-3
W2-4	REPLACES	2-4
W2-13	REPLACES	2-13
W2-14	REPLACES	2-14
W2-19	REPLACES	2-19
W2-20	REPLACES	2-20

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Supplement A12: pages replacement instructions

SECTION 3 – EMERGENCY PROCEDURES

See basic AFM - Section 3.

Supplement A12: pages replacement instructions

SECTION 4 – NORMAL OPERATION

See basic AFM - Section 4.

Supplement A12: pages replacement instructions

SECTION 5 - PERFORMANCE

Supplement A11 – Performances pages replace basic AFM Section 5 as a whole.

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Supplement A12: pages replacement instructions

SECTION 6 – WEIGHT AND BALANCE

See basic AFM - Section 6.

Supplement A12: pages replacement instructions

SECTION 7 – AIRFRAME AND SYSTEM DESCRIPTION

See basic AFM - Section 7.

SUPPLEMENT NO. A18

ALTERNATIVE PLACARDS

Record of Revisions

Rev	Revised page	Description of Revision	Tecnam Approval			EASA Approval or Under DOA Privileges
			DO	OoA	HDO	
0	-		D. Ronca	M.Oliva	M. Oliva	DOA

List of Effective Pages

Page	Revision	Page	Revision
A18-1	Rev 0		
A18-2	Rev 0		
A18-3	Rev 0		
A18-4	Rev 0		

INDEX

INTRODUCTION

This supplement contains supplementary information for a safe and efficient operation of the aircraft.

This supplement must be applied to both P2002 JF digital and analogue configuration.

For limitations, procedures, and performance information not contained in this supplement, refer to the EASA Approved Aircraft Flight Manual.

ALTERNATIVE PLACARDS

The information contained herein complements or supersedes the basic information in the EASA Approved Aircraft Flight Manual.

Following are reported alternative placards applicable for VFR Night aircraft and for all aircraft:

✓ **For VFR Night aircraft**

This a/c can be operated only in normal category
VFR DAY & NIGHT
(with required equipment)in non-icing condition
All aerobatics manouvers including spinning
are prohibited. For operational limitations refer to the
FLIGHT MANUAL

✓ **For ALL aircraft**

SUPPLEMENT NO. A23

AFM SUPPLEMENT FOR GTX 330

Record of Revisions

Rev	Revised pages	Description of Revision	Tecnam Approval			EASA Approval or Under DOA Privileges
			DO	OoA	HDO	
0	-	First issue	A. Sabino	D. Ronca	M. Oliva	Approved under DOA Privileges (ref. EASA.21J.335) Approval no. MOD2002/214.190228

List of Effective Pages

Page	Revision
A23-1 thru 4	Rev 0

INTRODUCTION

The information contained herein supplement or supersede the basic Aircraft Flight Manual.

NOTE *For detailed operational instructions related to this equipment, see GTX 330/330D Pilot's Guide (PN 190-00207-00), last issue.*

GENERAL

Refer to the basic AFM.

LIMITATIONS

Refer to the basic AFM.

EMERGENCY PROCEDURES

Refer to the basic AFM.

NORMAL PROCEDURES

Refer to the basic AFM.

PERFORMANCE

Refer to the basic AFM.

WEIGHT AND BALANCE

Refer to the basic AFM.

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AIRFRAME AND SYSTEMS DESCRIPTION

Garmin GTX 330 is a IFR-certified, 250 W, Mode S transponder with optional 1090 MHz ES broadcast technology. The transmitter is a solid state type. The device has a built-in timer, automatic ALT/GND mode, verbal alerts, OAT display and pressure altitude readout.

The unit is installed in the central panel of the cockpit.

Figure 1 – GARMIN GTX330 Transponder

GROUND HANDLING & SERVICE

Refer to the basic AFM.