

Aircraft Flight Manual

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TECNAM P2002-JF

MANUFACTURER: *CONSTRUZIONI AERONAUTICHE* **TECNAM***S.r.l.*

AIRCRAFT MODEL: **P2002-JF**

EASA TYPE CERTIFICATE NO: **A .006**(DATED 2004, MAY 27TH)

SERIAL NUMBER:

BUILD YEAR:

REGISTRATION MARKINGS:

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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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:

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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 thru 10	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 thru 14	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 thru 14	Update equipment list	D. Ronca	C. Caruso	M. Oliva	DOA privileges
	9-3,4	Amend Supplement list	D. Ronca	C. Caruso	M. Oliva	

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	<i>June 20th 2012</i>
3rd Edition, Rev. 1	<i>December 20th 2012</i>
3rd Edition, Rev. 2	<i>June 10th 2013</i>
3rd Edition, Rev. 3	<i>February 28th 2014</i>
3rd Edition, Rev. 4		<i>July 26th 2015</i>
3rd Edition, Rev. 5		<i>July 27th 2015</i>

Section	Pages	Revision
Section 0	Pages 1,4 and 6	Rev 4
	Pages 2,3,5,7,8	Rev 0
Section 1	Pages 1 thru 14	Rev 0
Section 2	Page 5,11	Rev 4
	Pages 1 thru 4, 6 thru 10, 12 thru 22	Rev 0
Section 3	Page 8,9,10	Rev 2
	Pages 1 thru 7, 11 thru 18	Rev 0
Section 4	Pages 9,11	Rev 0
	Pages 1 thru 8	Rev 0
Section 5	Pages 1 thru 20	Rev 0
Section 6	Pages 1 thru 11	Rev 0
	Pages 12 thru 14	Rev 2
Section 7	Pages 1 thru 14	Rev 0
Section 8	Pages 1 thru 8	Rev 0
Supplements		
Section 9	Page 3,4	Rev 5
	Pages 1,2	Rev 0
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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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

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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.

2 THREE-VIEW AND DIMENSIONS

2.1 THREE VIEW

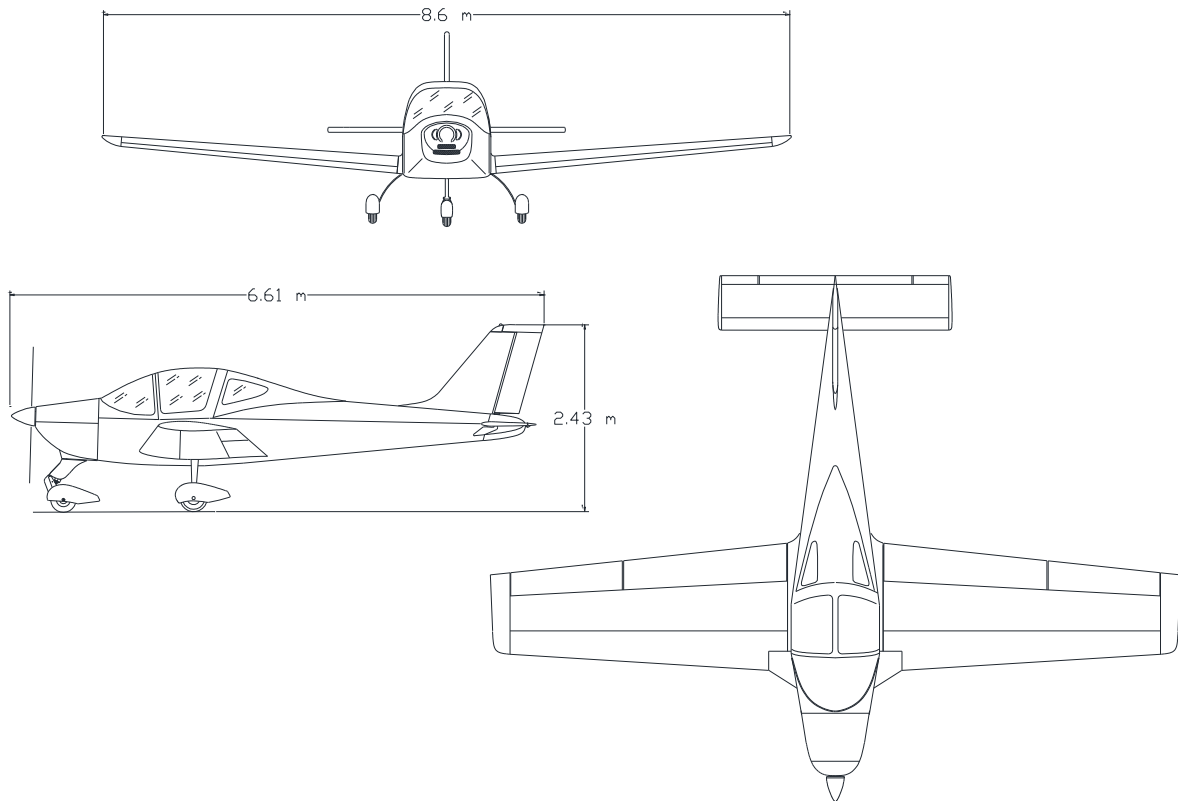


Fig. 1.1 – General views

- 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
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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) <i>(see also Section 2)</i>
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 tank	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

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

NOTE

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

4.2 METEOROLOGICAL TERMINOLOGY

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

4.3 ENGINE POWER TERMINOLOGY

RPM	<u>Revolutions Per Minute</u> : is the number of revolutions per minute of the propeller, multiplied by 2.4286 yields engine RPM.
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4.4 AIRCRAFT PERFORMANCE AND FLIGHT PLANNING TERMINOLOGY

<i>Crosswind Velocity</i>	is the velocity of the crosswind component for the which adequate control of the airplane during takeoff and landing is assured.
<i>Usable fuel</i>	is the fuel available for flight planning.
<i>Unusable fuel</i>	is the quantity of fuel that cannot be safely used in flight.
<i>G</i>	is the acceleration of gravity.
<i>TOR</i>	is the takeoff distance measured from actual start to wheel liftoff point.
<i>TOD</i>	is total takeoff distance measured from start to 15m obstacle clearing.
<i>GR</i>	is the distance measured during landing from actual touchdown to stop point.
<i>LD</i>	is the distance measured during landing, from 15m obstacle clearing to actual stop.
<i>S/R</i>	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

<i>Datum</i>	“Reference datum” is an imaginary vertical plane from which all horizontal distances are measured for balance purposes.
<i>Arm</i>	is the horizontal distance of an item measured from the reference datum.
<i>Moment</i>	is the product of the weight of an item multiplied by its arm.
<i>C.G.</i>	<u>Center of Gravity</u> 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.
<i>Standard Empty Weight</i>	is the weight of the aircraft with engine fluids and oil at operating levels.
<i>Basic Empty Weight</i>	is the standard empty weight to which it is added the optional equipment weight.
<i>Useful Load</i>	is the difference between maximum takeoff weight and the basic empty weight.
<i>Maximum Takeoff Weight</i>	is the maximum weight approved to perform the takeoff.
<i>Maximum Landing Weight</i>	is the maximum weight approved for the landing touchdown (for <i>P2002-JF</i> it is equivalent to the Maximum Takeoff Weight).
<i>Tare</i>	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

<i>MULTIPLYING</i>		<i>BY →</i>	<i>YIELDS</i>	
TEMPERATURE				
Fahrenheit	[°F]	$\frac{5}{9} \cdot (F - 32)$	Celsius	[°C]
Celsius	[°C]	$\left(\frac{9}{5} \cdot C\right) + 32$	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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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 LIMITATIONS

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

SPEED			KIAS	KCAS	REMARKS
V _{NE}	Never exceed speed		138	135	Do not exceed this speed in any operation.
V _{NO}	Maximum Structural Cruising Speed		110	106	Do not exceed this speed except in smooth air, and only with caution.
V _A	Design Manoeuvring speed		96	94	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	67	69	Do not exceed this speed for indicated flaps setting.
		T.O.	97	95	

3. AIRSPEED INDICATOR MARKINGS

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

MARKING	KIAS	EXPLANATION
White arc	30 – 67	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	40 – 110	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	110 – 138	Manoeuvres must be conducted with caution and only in smooth air.
Red line	138	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 and 893114

5. LUBRICANT

Use viscosity grade oil as specified in the following table:

Klima (climatic conditions)	°C °F	Mehrbereichs-Öle multi-grade oils
tropisch (tropical)	40 100	SAE 20W-50 SAE 20W-40
gemäßigt (temperate)	20 68 10 50 0 32 -10 -14 -20 -28	SAE 15W-50 SAE 15W-40 SAE 10W-40 SAE 5W-50 SAE 5W-40
arktisch (arctic)	-20 -4 -30 -20	



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

At altitudes above 12500 ft (3810 m) up to and including 14000 ft (4260 m), flight must be limited to 30 minutes, unless the required minimum flight crew is provided with and uses supplemental oxygen for that part of the flight at those altitudes that is of more than 30 minutes duration.

9. AMBIENT TEMPERATURE

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



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 - 135	----	135
CT	°C		0 - 120		120
Oil pressure	bar	0.8	2 - 5	0.8 - 2 5 - 7 ⁽¹⁾	7
Fuel press.	psi	2.2	2.2-5.8 or 7.26 ⁽³⁾	----	5.8 or 7.26 ⁽³⁾
Fuel Q.ty	litres	0 ⁽²⁾	----	----	----

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

2 - "0" indication shows the unusable fuel quantity (0,5 litres).

3 – when fuel pump part no. 893110 and 893114.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)

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	4,0 inHg	4,5 – 5,5 inHg	----	----

12. WEIGHTS

Condition	Weight
Maximum take-off weight	580 kg
Maximum landing weight	580 kg
Maximum zero wing fuel weight	580 kg
Maximum baggage weight (2.26 m aft from datum):	20 kg

13. CENTER OF GRAVITY RANGE

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



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

14. APPROVED MANEUVERS

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	96
Chandelle	110
Steep turn (max 60°)	96
Stall	Slow deceleration (1 kts/s)



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



Limit load factor could be exceeded by moving abruptly flight controls at their end run at a speed above V_A (Manoeuvring Speed: 96 KIAS).

15. MANEUVERS 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:	<i>50 liters each</i>
TOTAL FUEL CAPACITY:	<i>100 liters.</i>
USABLE FUEL Q.TY:	<i>99 liters</i>
UNUSABLE FUEL Q.TY:	<i>0.5 liters each (1.0 litres total)</i>

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)



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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Section 2 – Limitations

DEMONSTRATED CROSS WIND SAFE OPERATIONS

21. LIMITATION PLACARDS

The following limitation placards must be placed in plain view on the aircraft.

Near the airspeed indicator a placard states the following:

MANEUVERING SPEED $V_A = 96$ KIAS

On the left hand side of the dashboard a placard states 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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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:

<u>BEFORE ROTATION: ABORT TAKE OFF</u>	
1.	Throttle <i>IDLE</i>
2.	Rudder <i>Keep heading control</i>
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 | <i>IDLE</i> |
| 2. Magnetos | <i>OFF</i> |
| 3. Fuel Selector | <i>OFF</i> |
| 4. Electrical fuel pump | <i>OFF</i> |
| 5. Generator switch | <i>OFF</i> |

4. ENGINE FAILURE

4.1. ENGINE FAILURE DURING TAKE-OFF RUN

- | | |
|---------------------|-----------------------------|
| 1. Throttle: | <i>IDLE (fully out)</i> |
| 2. Rudder | <i>Keep heading control</i> |
| 3. Brakes: | <i>apply as needed</i> |

When safely stopped:

- | | |
|---------------------------------|-------------|
| 4. Magnetos: | <i>OFF.</i> |
| 5. Fuel selector valve: | <i>OFF</i> |
| 6. Electric fuel pump: | <i>OFF</i> |
| 7. Generator & Master switches: | <i>OFF.</i> |

4.2. ENGINE FAILURE IMMEDIATELY AFTER TAKE-OFF

- | | |
|---|-----------------------------|
| 1. Speed: | <i>keep minimum 51 kias</i> |
| 2. Find a suitable place to land safely. | |



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: | <i>as needed.</i> |
|------------------|-------------------|



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: | <i>IDLE (fully out)</i> |
| 5. Magnetos: | <i>OFF.</i> |
| 6. Fuel selector valve: | <i>OFF</i> |
| 7. Electric fuel pump: | <i>OFF</i> |
| 8. Generator & Master switches: | <i>OFF</i> |



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



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



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 | <i>ON if required</i> |
| 2. Electrical fuel pump | <i>ON</i> |
| 3. Fuel quantity indicator | <i>CHECK</i> |
| 4. Fuel Selector | <i>change the fuel feeding tank</i> |
| 5. Magnetos | <i>BOTH</i> |
| 6. Magnetos | <i>START</i> |
| 7. Throttle lever | <i>SET as required</i> |



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



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 | <i>OFF</i> |
| 2. Electrical fuel pump | <i>OFF</i> |
| 3. Magnetos | <i>OFF</i> |
| 4. Throttle lever | <i>FULL POWER</i> |
| 5. Cabin Heat | <i>OFF</i> |
| 6. Generator & Master Switches | <i>OFF</i> |
| 7. Parking Brake | <i>ENGAGED</i> |
| 8. Aircraft Evacuation | <i>carry out immediately</i> |

6.2. ENGINE FIRE DURING TAKEOFF**BEFORE ROTATION: ABORT TAKE OFF**

- | | |
|-------------------|-----------------------------|
| 1. Throttle Lever | <i>IDLE</i> |
| 2. Rudder | <i>Keep heading control</i> |
| 3. Brakes | <i>As required</i> |

With aircraft under control

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

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.*



*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



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*



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

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SECTION 4 – NORMAL PROCEDURES

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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).

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

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



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.



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



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.

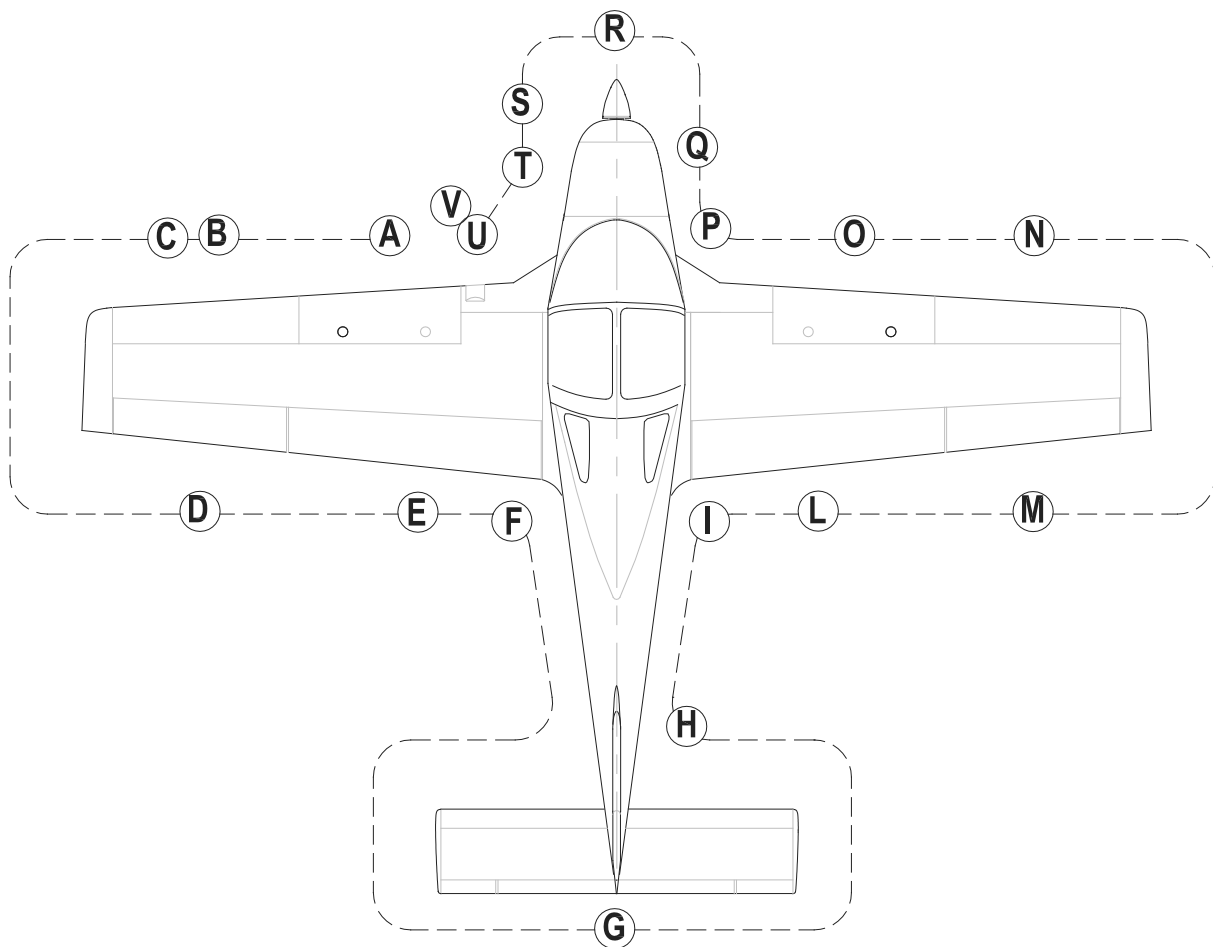


FIG. 4-1

- 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 OFF. 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. Only before the first flight of the day:
 - 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. *Carburetors: 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.

CHECKLISTS

3.3. 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. Avionic Master switch (if installed): *ON, instruments check, then set in OFF position*
10. Flap control: *cycle fully extended and then set T/O*
11. Pitch Trim: *cycle fully up and down, from both left and right controls, check for trim disconnect switch operation.*
12. Pitch trim: *set neutral*



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

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



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.

15. 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.

3.4. 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*



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.

WARNING

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)

3.5. 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*

3.6. TAXIING

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

3.7. 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.*

3.8. TAKE-OFF AND CLIMB



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
<i>Rotation Speed (V_R)</i>	<i>42 KIAS</i>	<i>42 KIAS</i>	<i>42 KIAS</i>

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

	MTOW 580kg	MTOW 600kg	MTOW 620kg
<i>Best of Rate Climb Speed (V_Y)</i>	<i>66 KIAS</i>	<i>66 KIAS</i>	<i>66 KIAS</i>

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

3.9. CRUISE

1. Set power at or below maximum continuous: *2250 propeller rpm*
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.

3.10. 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
<i>Approach Speed</i>	<i>66 KIAS</i>	<i>66 KIAS</i>	<i>66 KIAS</i>

5. On final leg:

Flaps: set Land (40°)

	MTOW 580kg	MTOW 600kg	MTOW 620kg
<i>Final Approach Speed</i>	<i>51 KIAS</i>	<i>51 KIAS</i>	<i>51 KIAS</i>

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

3.11. 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*

3.12. AFTER LANDING

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

3.13. 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*

3.14. 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*

SECTION 5 - PERFORMANCES

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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} .

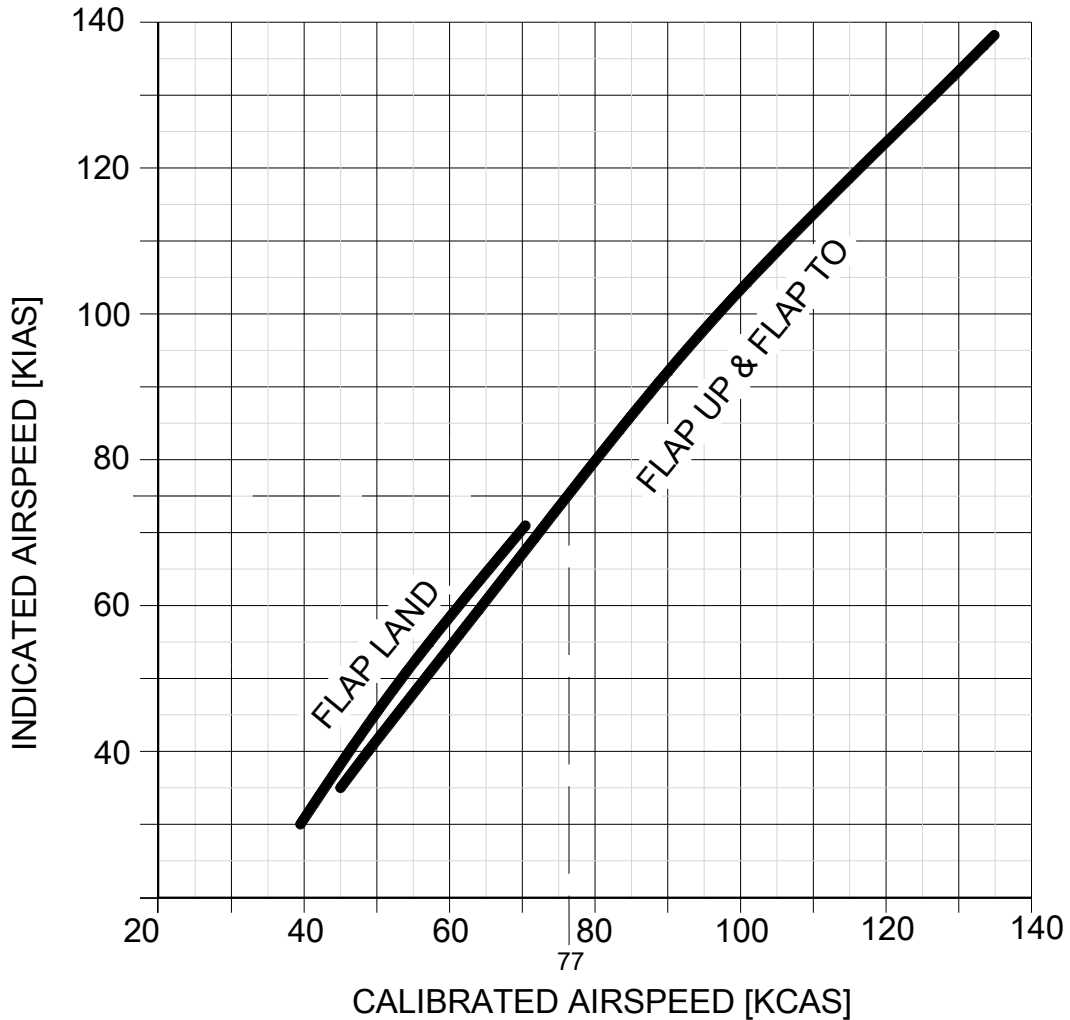


FIG. 5-1. CALIBRATED VS INDICATED AIRSPEED

Example:

<u>Given</u>	<u>Find</u>
KIAS 75	KCAS 74

NOTE

Indicated airspeed assumes 0 as an instrument error

4. ICAO STANDARD ATMOSPHERE

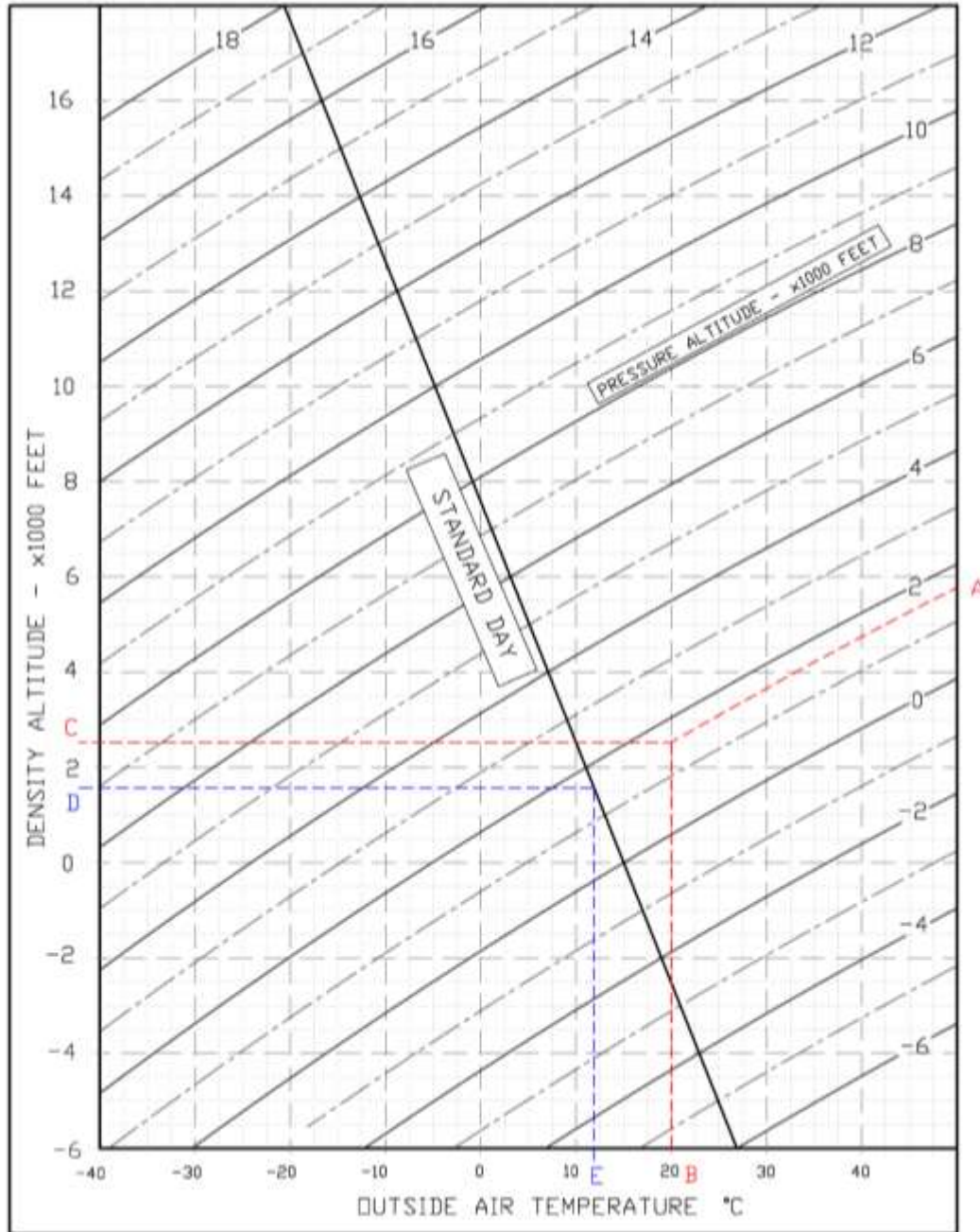


FIG. 5-2. ICAO CHART

Examples:

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

5. STALL SPEED (*Approved Data*)

Weight: 580 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
580 (FWD C.G.)	0	40	49	35	46	30	39
	15	41	50	36	47	31	40
	30	45	53	40	49	34	42
	45	53	58	47	54	41	47
	60	67	70	61	65	53	56

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

Wind direction (with respect to aircraft longitudinal axis) = 30°

Wind speed = 20 Kts

Find

Headwind = 17.5 Kts

Crosswind = 10 Kts

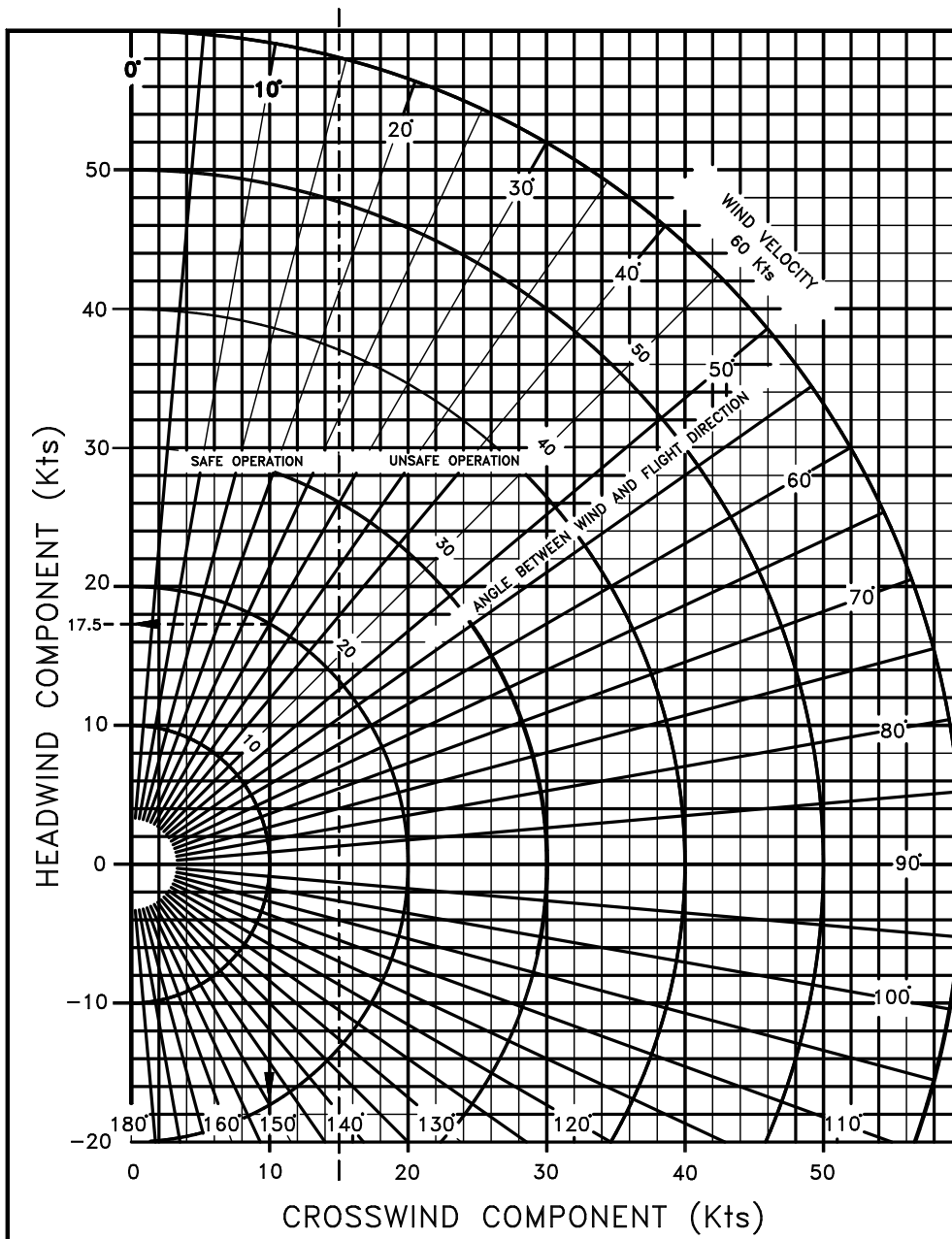


FIG. 5-3. CROSSWIND CHART

7. TAKE-OFF PERFORMANCES (*Approved Data*)

Pressure Altitude [ft]		Distance [m]				
		Temperature [°C]				ISA
		-25	0	25	50	
S.L.	Ground Roll	130	171	220	279	199
	At 50 ft AGL	212	281	365	465	330
1000	Ground Roll	142	187	242	306	214
	At 50 ft AGL	233	309	402	513	355
2000	Ground Roll	156	206	266	337	231
	At 50 ft AGL	257	340	443	565	383
3000	Ground Roll	172	226	292	371	249
	At 50 ft AGL	282	375	488	624	414
4000	Ground Roll	189	249	322	409	269
	At 50 ft AGL	311	414	539	690	447
5000	Ground Roll	208	275	355	452	290
	At 50 ft AGL	343	457	595	763	483
6000	Ground Roll	229	303	392	499	313
	At 50 ft AGL	379	505	659	845	522
7000	Ground Roll	252	334	433	552	338
	At 50 ft AGL	419	558	729	937	565
8000	Ground Roll	279	369	479	612	366
	At 50 ft AGL	463	618	809	1040	612
9000	Ground Roll	308	408	531	678	396
	At 50 ft AGL	513	685	898	1155	664
10000	Ground Roll	341	452	588	753	429
	At 50 ft AGL	568	761	998	1286	720

Pressure Altitude [ft]		Distance [m]					ISA
		Temperature [°C]					
		-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 = 550 kg
Corrections
Flaps: T/O
Speed at Lift-Off = 42 KIAS
Speed Over 50ft Obstacle = 52 KIAS
Throttle Levers: Full Forward
Runway: Grass
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]					ISA
		Temperature [°C]					
		-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	

Weight = 500 kg

Corrections

Flaps: T/O

Speed at Lift-Off = 42 KIAS

Speed Over 50ft Obstacle = 52 KIAS

Throttle Levers: Full Forward

Runway: Grass

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%

8. TAKE-OFF RATE OF CLIMB

Power Setting: Maximum Continuous Power Flaps: Take-Off (15°) V _x =56 KIAS							
Weight [kg]	Pressure Altitude [ft]	Climb Speed V _y [KIAS]	Rate of Climb [ft/min]				
			Temperature [°C]				ISA
			-25	0	25	50	
580	S.L.	66	1238	987	764	562	850
	2000	66	1047	801	581	383	701
	4000	66	858	615	399	204	552
	6000	66	668	430	218	27	403
	8000	65	480	246	37	-151	254
	10000	65	292	62	-143	-327	105
	12000	65	104	-121	-322	-503	-44
	14000	65	-82	-303	-501	-679	-193
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 V _x =56 KIAS							
Weight [kg]	Pressure Altitude [ft]	Climb Speed V _y [KIAS]	Rate of Climb [ft/min]				
			Temperature [°C]				ISA
			-25	0	25	50	
580	S.L.	66	1362	1111	888	686	974
	1000	66	1171	925	705	507	825
	2000	66	982	739	523	328	676
	3000	66	792	554	342	151	527
	4000	65	604	370	161	-27	378
	5000	65	416	186	-19	-203	229
	6000	65	228	3	-198	-379	80
	7000	65	42	-179	-377	-555	-69
550	S.L.	66	1463	1201	966	755	1057
	1000	66	1264	1006	775	567	901
	2000	66	1065	811	584	380	745
	3000	65	866	617	395	194	588
	4000	65	669	424	205	8	432
	5000	65	472	231	17	-177	276
	6000	65	275	39	-172	-362	120
	7000	64	80	-152	-359	-545	-37
500	S.L.	66	1656	1370	1115	884	1213
	1000	66	1439	1157	906	680	1043
	2000	65	1222	945	699	476	873
	3000	65	1006	734	492	273	703
	4000	65	791	524	286	71	533
	5000	64	576	314	80	-131	363
	6000	64	362	105	-125	-332	192
	7000	64	149	-103	-329	-532	22

10. CRUISE PERFORMANCES

Weight: 580 kg Pressure Altitude: 0 ft									
RPM *	ISA – 30°C (-15°C)			ISA (15°C)			ISA + 30°C (45°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: 580 kg Pressure Altitude: 2000 ft									
RPM *	ISA – 30°C (-15°C)			ISA (15°C)			ISA + 30°C (45°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: 580 kg Pressure Altitude: 4000 ft									
RPM *	ISA – 30°C (-15°C)			ISA (15°C)			ISA + 30°C (45°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: 580 kg									
Pressure Altitude: 6000 ft									
RPM*	ISA – 30°C (-15°C)			ISA (15°C)			ISA + 30°C (45°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: 580 kg									
Pressure Altitude: 8000 ft									
RPM*	ISA – 30°C (-15°C)			ISA (15°C)			ISA + 30°C (45°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: 580 kg									
Pressure Altitude: 10000 ft									
RPM*	ISA – 30°C (-15°C)			ISA (15°C)			ISA + 30°C (45°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

11. LANDING PERFORMANCES (*Approved Data*)

Pressure Altitude [ft]		Distance [m]					ISA
		Temperature [°C]					
		-25	0	25	50		
S.L.	Ground Roll	124	136	149	161	144	
	At 50 ft AGL	243	267	292	316	282	
1000	Ground Roll	128	141	154	167	148	
	At 50 ft AGL	252	277	302	328	290	
2000	Ground Roll	133	146	160	173	152	
	At 50 ft AGL	261	287	314	340	299	
3000	Ground Roll	138	152	166	180	157	
	At 50 ft AGL	271	298	325	353	308	
4000	Ground Roll	143	158	172	186	162	
	At 50 ft AGL	281	309	338	366	317	
5000	Ground Roll	149	164	178	193	167	
	At 50 ft AGL	292	321	350	380	327	
6000	Ground Roll	154	170	185	201	172	
	At 50 ft AGL	303	333	364	394	337	
7000	Ground Roll	160	176	192	209	177	
	At 50 ft AGL	314	346	378	410	348	
8000	Ground Roll	166	183	200	217	183	
	At 50 ft AGL	327	360	393	425	359	
9000	Ground Roll	173	190	208	225	188	
	At 50 ft AGL	339	374	408	442	370	
10000	Ground Roll	180	198	216	234	194	
	At 50 ft AGL	353	388	424	460	382	

Pressure Altitude [ft]		Distance [m]					ISA
		Temperature [°C]					
		-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	

Weight = 550 kg

Corrections

Flaps: LAND

Short Final Approach Speed = 51 KIAS

Throttle Levers: Idle

Runway: Grass

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]					ISA
		Temperature [°C]					
		-25	0	25	50		
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	

Weight = 500 kg
Corrections
Flaps: LAND
Short Final Approach Speed = 51 KIAS
Throttle Levers: Idle
Runway: Grass
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%

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	
580	S.L.	703	569	449	340	495
	1000	652	519	400	292	455
	2000	601	469	351	244	415
	3000	550	419	302	196	375
	4000	499	369	253	148	335
	5000	448	319	204	101	295
	6000	397	270	156	53	255
	7000	347	220	107	5	215
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 **62.36 dB(A)**.

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SECTION 6 – WEIGHT and BALANCE**INDEX**

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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)

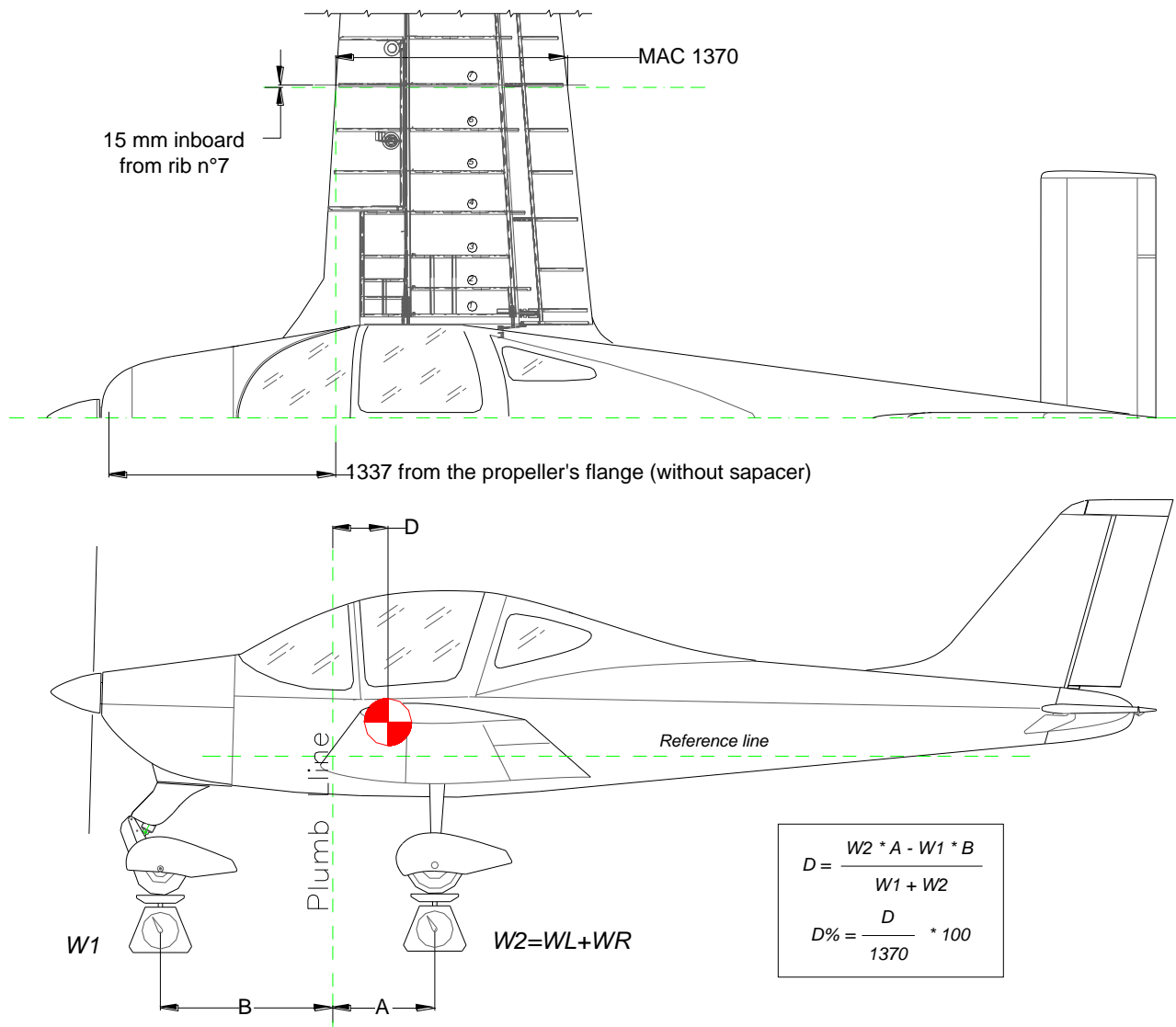
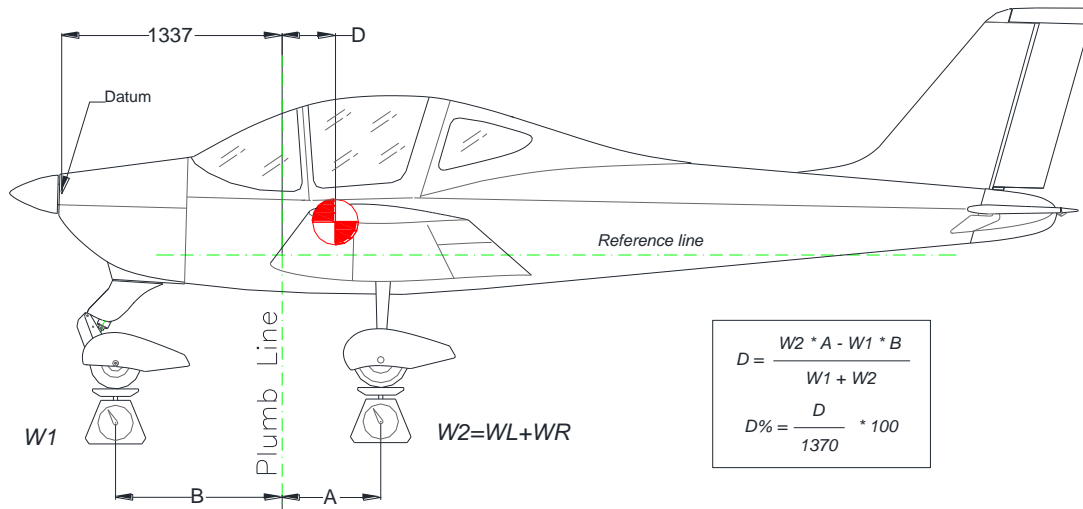


Fig.6.1

3. WEIGHING REPORT (I)

Model **P2002-JF**/N: _____ Weighing no. ____ Date: _____

Datum: Propeller support flange without spacer.



	<i>Kg</i>		<i>meters</i>
Nose wheel weight	$W_1 =$	Plumb bob distance ⁽¹⁾ LH wheel	$A_L =$
LH wheel weight	$W_L =$	Plumb bob distance ⁽¹⁾ RH wheel	$A_R =$
RH wheel weight	$W_R =$	Average distance $(A_L + A_R)/2$	$A =$
$W_2 = W_L + W_R =$		Bob distance from nose wheel ⁽¹⁾	$B =$

Empty weight $W_e = W_1 + W_2 =$

$D = \frac{W_2 \cdot A - W_1 \cdot B}{W_e} = m$	$D\% = \frac{D}{1.370} \cdot 100 =$
---	-------------------------------------

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

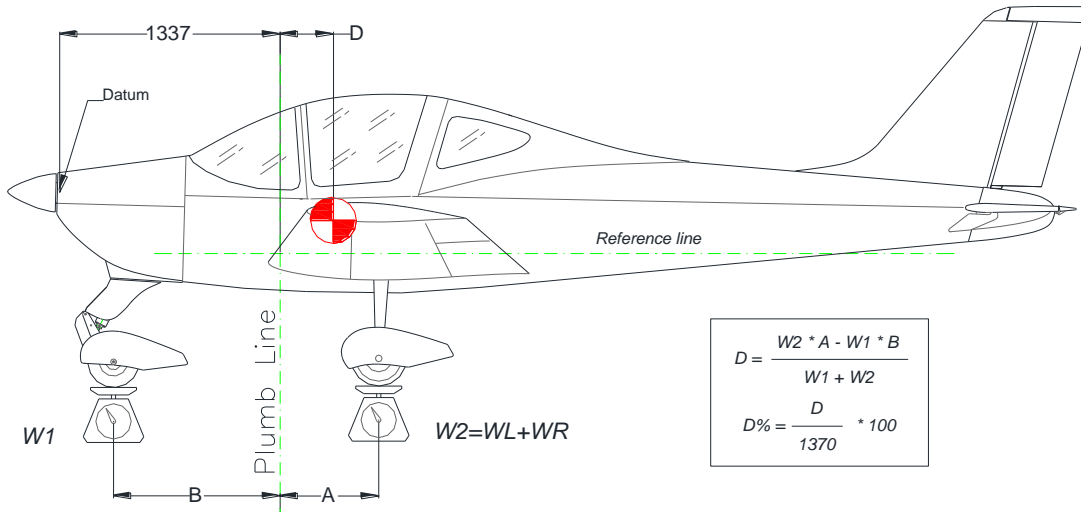
Maximum takeoff weight	$W_T =$	Kg
Empty weight	$W_e =$	Kg
Maximum payload $W_T - W_e$	$W_u =$	Kg

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

4. WEIGHING REPORT (II)

Model **P2002-JF**/N: _____ Weighing no. ____ Date: _____

Datum: Propeller support flange without spacer.



	<i>Kg</i>		<i>meters</i>
Nose wheel weight	$W_1 =$	Plumb bob distance ⁽¹⁾ LH wheel	$A_L =$
LH wheel weight	$W_L =$	Plumb bob distance ⁽¹⁾ RH wheel	$A_R =$
RH wheel weight	$W_R =$	Average distance $(A_L + A_R)/2$	$A =$
$W_2 = W_L + W_R =$		Bob distance from nose wheel ⁽¹⁾	$B =$

Empty weight $W_e = W_1 + W_2 =$

$D = \frac{W_2 \cdot A - W_1 \cdot B}{W_e} = m$	$D\% = \frac{D}{1.370} \cdot 100 =$
---	-------------------------------------

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

Maximum takeoff weight	$W_T =$	<i>Kg</i>
Empty weight	$W_e =$	<i>Kg</i>
Maximum payload $W_T - W_e$	$W_u =$	<i>Kg</i>

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

5. WEIGHT AND BALANCE

To determine the aircraft's CG location and to verify that the CG lies within the predetermined CG travel range, it would be helpful to use the chart in the following page. Chart reports CG location as a function of the empty weight moment with respect to the datum as yielded by weighing report.

5.1. USE OF "WEIGHT & BALANCE" CHART

In order to use the graph it is necessary to know the value of the moment arm (empty weight conditions) with respect to the datum. Once this value is found on the abscissa, a parallel to the oblique lines is drawn until it intersects the ordinate relative to the weight of pilot and passenger. From this point, a new line is drawn horizontally up to the graph limit-value of 200 kg and, from here, a parallel to the oblique lines is drawn until it intersects with the abscissa relative to fuel weight carried on board. A horizontal line is then drawn through this point up to the graph limit-value of 100 liters and a new parallel to the oblique lines is drawn until abscissa is intercepted relative to baggage loaded on board behind the seats. Another horizontal line is drawn and it is thus possible to verify that the intersection of this segment with the vertical abscissa relative to the aircraft's takeoff total weight falls within the shaded area which represents the admissible CG range as a function of total weight.

Other charts show the CG travel as a function of aircraft weight, distances in meters of pilots and baggage from datum (propeller support flange) is also provided.

NOTE

"Weight & Balance and C.G. Travel" charts are valid for 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).

EXAMPLE(see page 6-8)

Empty weight moment = 581 kg·m

Pilot and passenger = 160 kg

Fuel = 50 L

Baggage = 15 kg

Takeoff weight = 548 kg

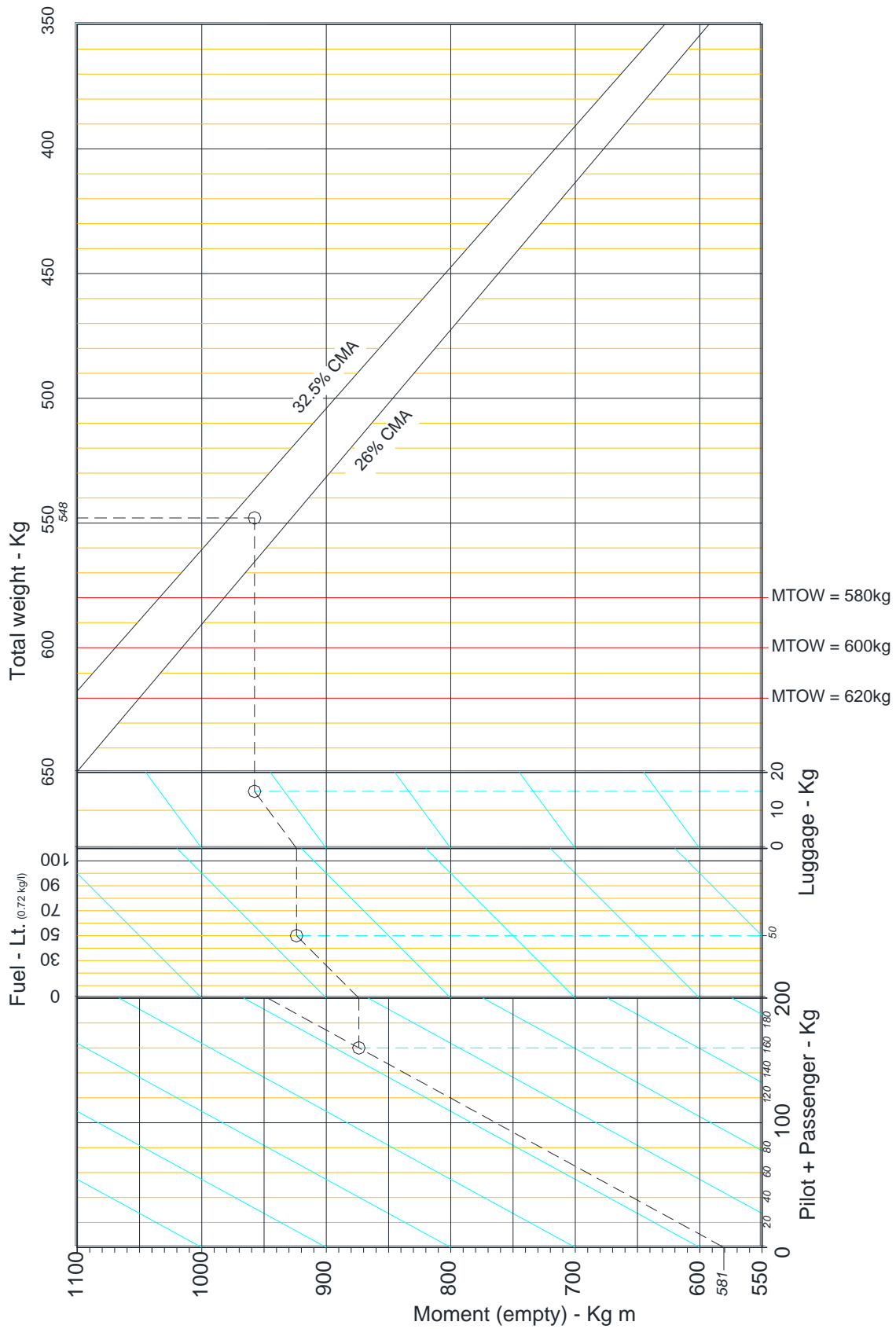


Fig. 6-2 Weight & Balance Chart

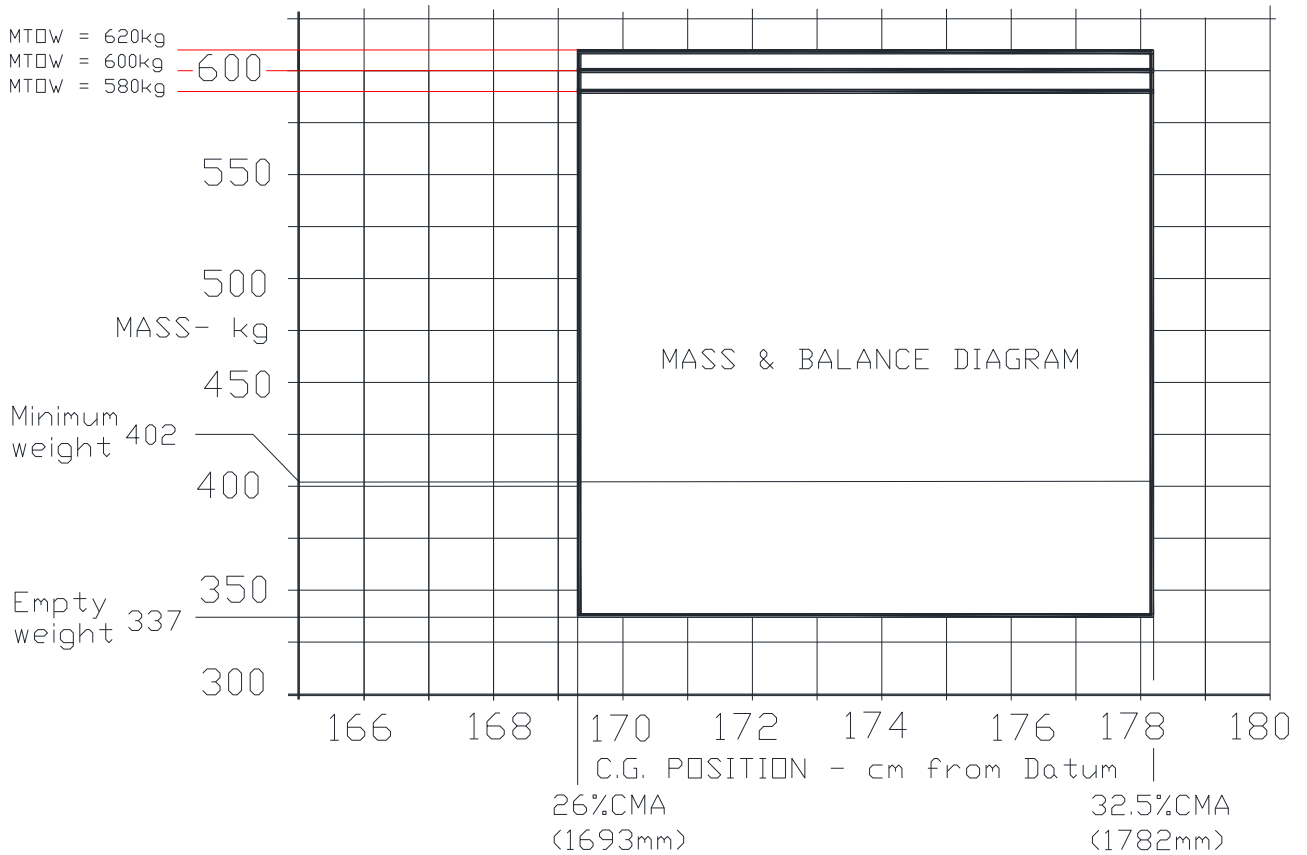


Fig 6.3 C.G. RANGE CHART

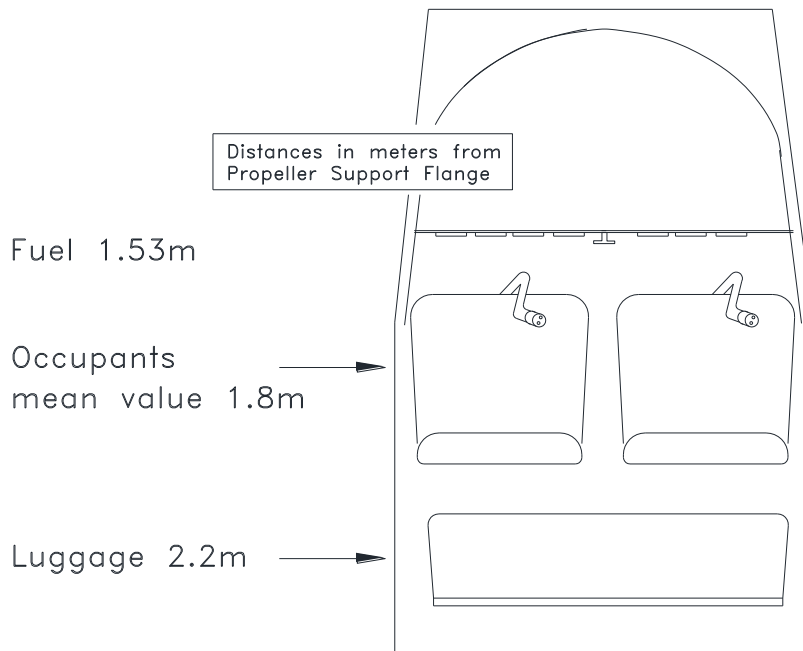


Fig 6.4 LOAD POSITION WITH RESPECT TO DATUM

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/dm²). Maximum Luggage size is: 80x45x32 cm. Luggage must be secured using a tie-down net to prevent any luggage movement during maneuvers.

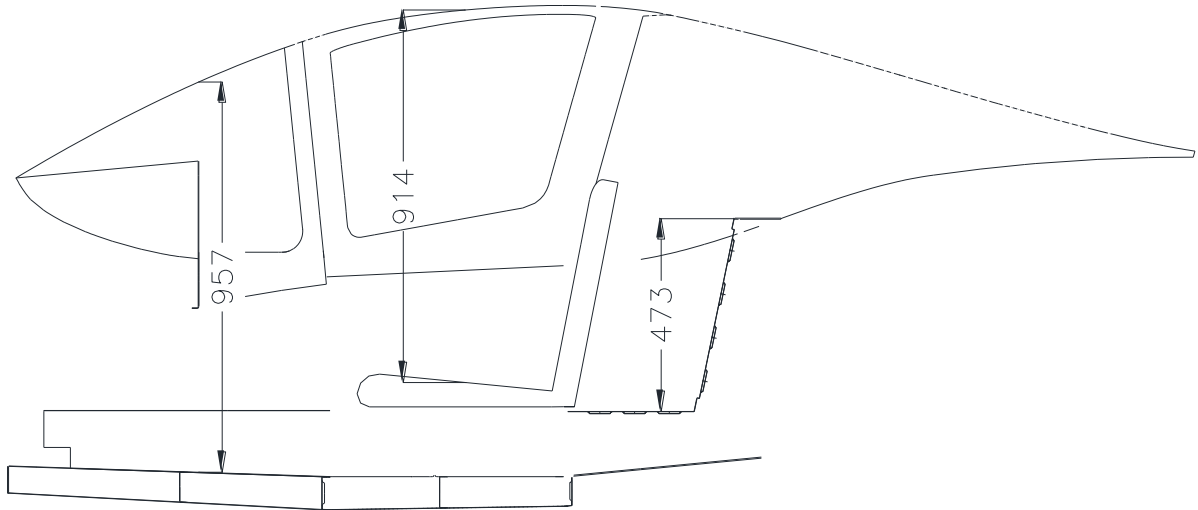


Fig 6.5 CABIN DIMENSIONS

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	DATE:	
RIF.	DESCRIPTION & P/N	INST	WEIGHT [kg]	DATUM [m]
ENGINE & ACCESSORIES				
A1	Engine Rotax 912S3 - p/n 309.120.133	*	61.0	0.32
A2	Prop. HOFFMANN - p/n HO-V352 F1/C170FQ+8	*	10.0	-0.13
A3	Exhaust and manifolds - p/n SSB-978-480-CC	*	4.50	0.55
A4	Heat exchanger - p/n 92-11-830	*	2.00	0.55
A5	Oil Reservoir (full) - p/n 956.137	*	4.00	0.64
A6	Oil radiator - p/n 886 025	*	0.40	0.07
A7	Liquid coolant radiator. - p/n 995.697	*	0.90	0.33
A8	Air filter K&N- p/n 33-2544	*	0.40	0.60
A9	Fuel pump p/n 21-11-342-000	*	0.10	0.71
A10	Thermostatic water valve 26-9-9000-000		0.35	0.15
A11	Thermostatic oil valve 26-9-9100-000		0.20	0.20
A12	Governor Jihostroj P-110-030/A	*	1.00	0.25
A13	Manifold Pressure Indicator UMA 7-100-20	*	0.13	1.35
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 - P/n 0101120	*	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	Battery FIAMM 6H4P 12V 18Ah		6.00	2.59
C2	Battery GILL-Teledyne G-25 12V 18Ah		9.53	2.59
C2	Regulator, rectifier - p/n 945.345	*	0.20	0.82
C3	Battery relay - p/n 111-226-5	*	0.30	2.59
C4	Flaps actuator control - SIR Mod. AO-01/M	*	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 warning - AS 164R	*	0.10	1.36
C10	NAV/POS/Strobe LED light - AveoAVE-WPSTR-54G / R		0.25	1.75
C11	Cowling Landing LED light Whelen PLED 1L		0.35	1.36
C12	Battery Spark 500		4,9	2.59

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

EQUIPMENT LIST		S/N	DATE:	
RIF.	DESCRIPTION & P/N	INST	WEIGHT [kg]	DATUM [m]
<i>AVIONICS AND OTHER</i>				
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 GTX 330		1.00	1.35
E6	Transponder-Garmin GTX328		1.00	1.35
E7	Audio panel -Garmin GMA 340		0.50	1.35
E8	Vor/LocIndicator-Garmin GII06A or MD 200-306		0.64	1.35
E9	Transponder Antenna Comant Industries CI 105		0.17	1.09
E10	Mic - Telex TRA 100		0.17	1.90
E11	GPS Antenna. Garmin GA35		0.27	1.08
E12	Comm Antenna Comant Industries CI 291		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 92-12-333-1	*	0.28	2.30
E17	Altitude Encoder- Ack A-30	*	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
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
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		1.10	2.70
E39	ELT Antenna ANT 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

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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.

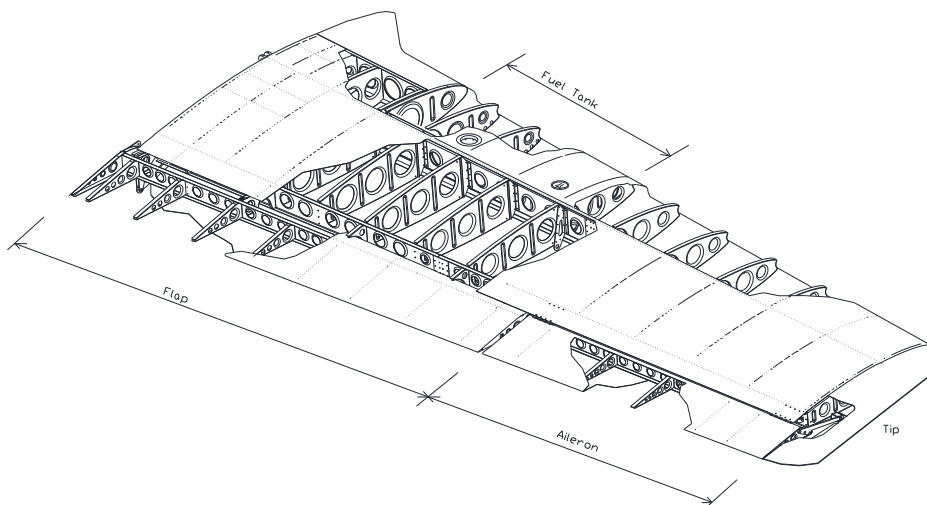


Fig. 7-1. RIGHT WING EXPLODED VIEW

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.

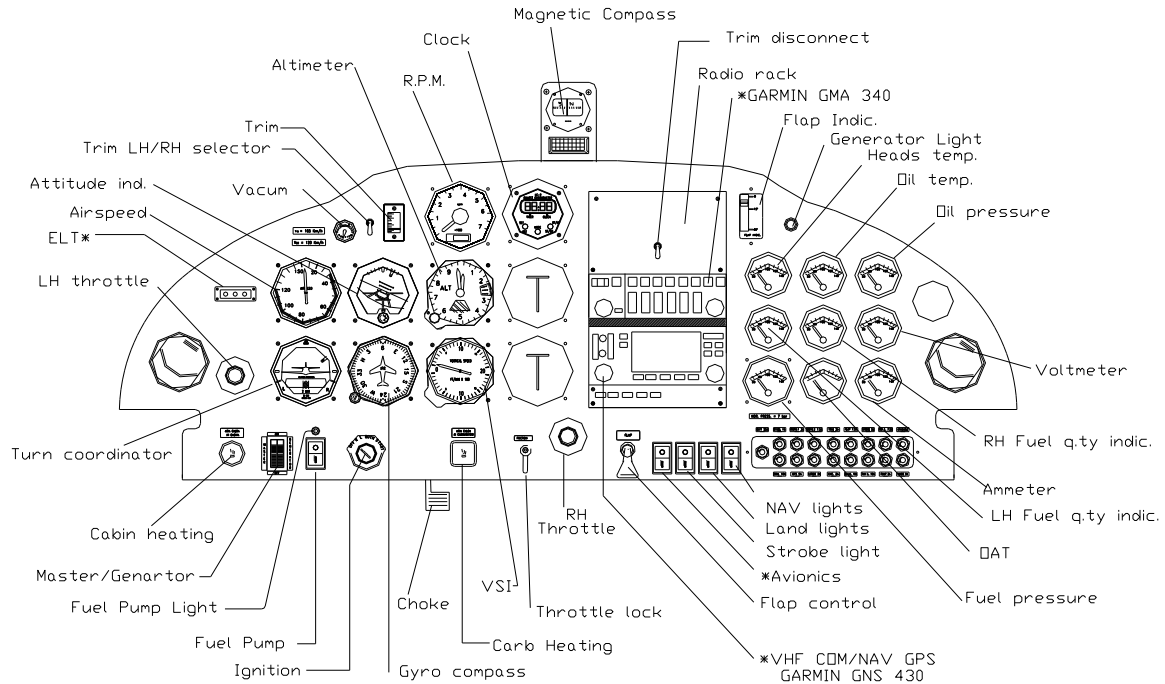


Fig. 7-2. INSTRUMENT PANEL

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.



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

8. POWERPLANT

8.1. ENGINE

Manufacturer:	<i>Bombardier-Rotax GmbH</i>
Model:	<i>ROTAX 912 S2</i>
Type:	<i>4 stroke, horizontally-opposed 4 cylinder, mixed air and water cooled, twin electronic ignition, forced lubrication.</i>
Maximum rating:	<i>98.6hp (73.5kW) @ 5800 rpm/min (2388 rpm/min. prop). Gear reduction ratio - 2.4286:1</i>
Max oil consumption:	<i>Max: 0.1 litres/hour</i>

8.2. PROPELLER

Manufacturer:	<i>Hoffmann Propeller</i>
Model:	<i>HO17GHM A 174 177C</i>
N° of blades:	<i>2</i>
Diameter:	<i>1740 mm (no reduction permitted)</i>
Type:	<i>wood, fixed pitch</i>

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. 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.

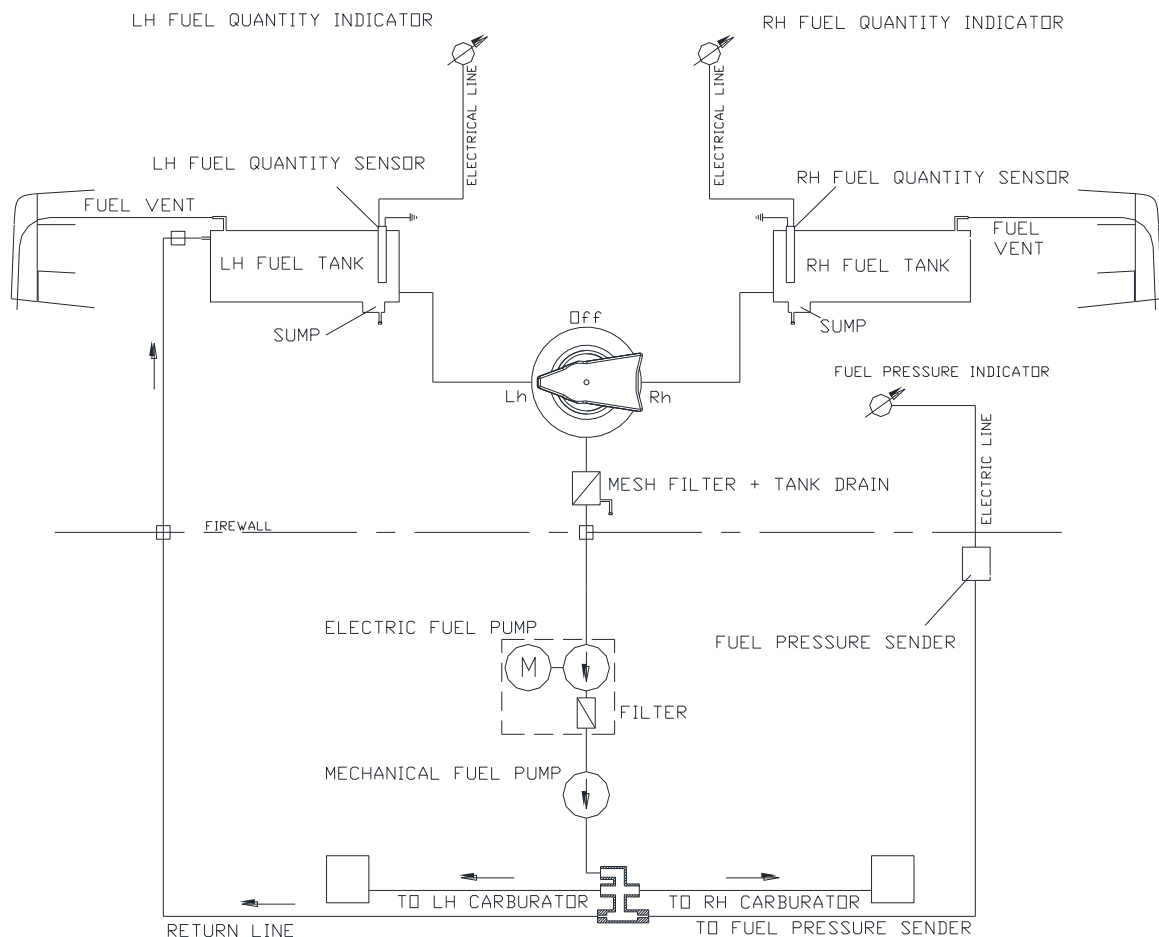


Fig.7-3. FUEL SYSTEM SCHEMATIC

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.



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.

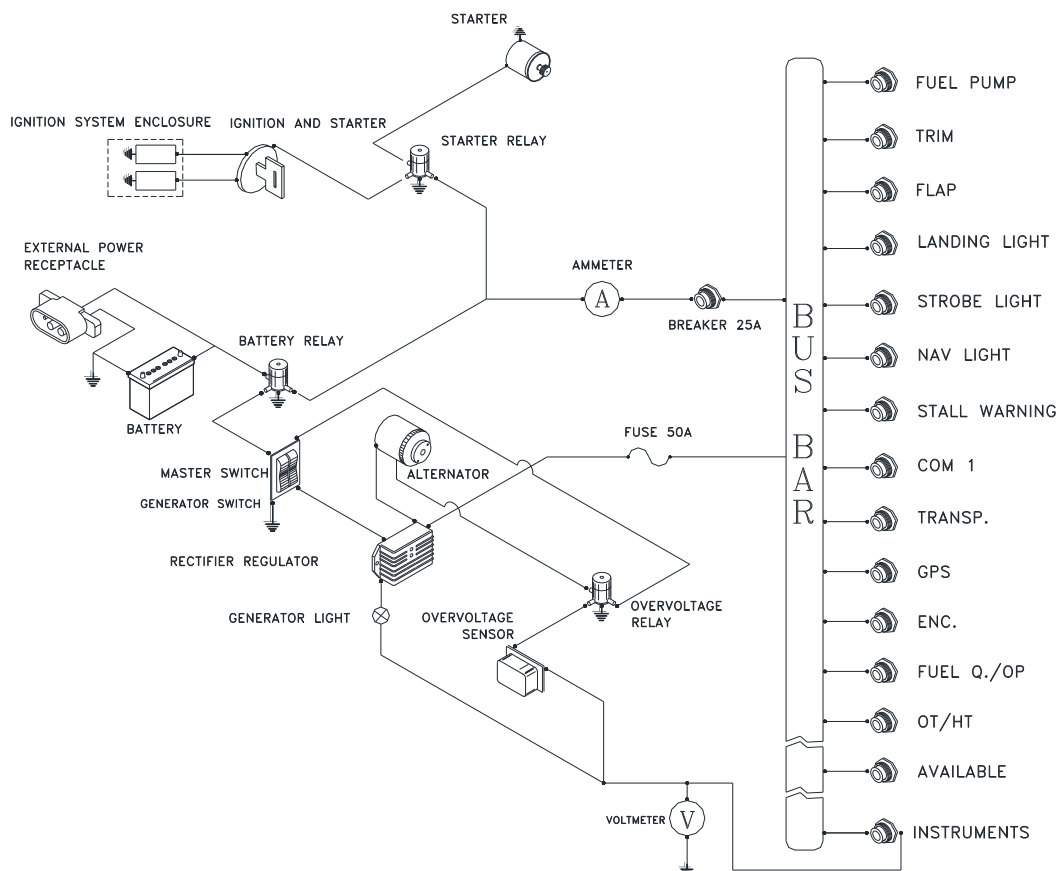


FIG.7-4. ELECTRICAL SYSTEM SCHEMATIC

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.

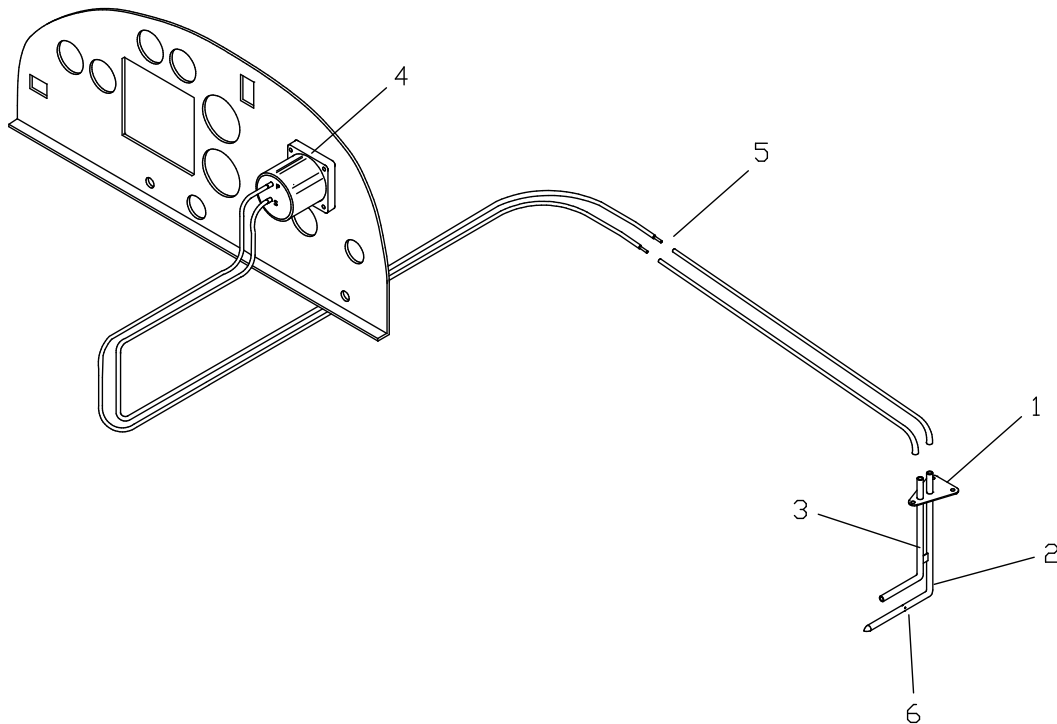


FIG.7-5. AIRSPEED INDICATOR SYSTEM

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.

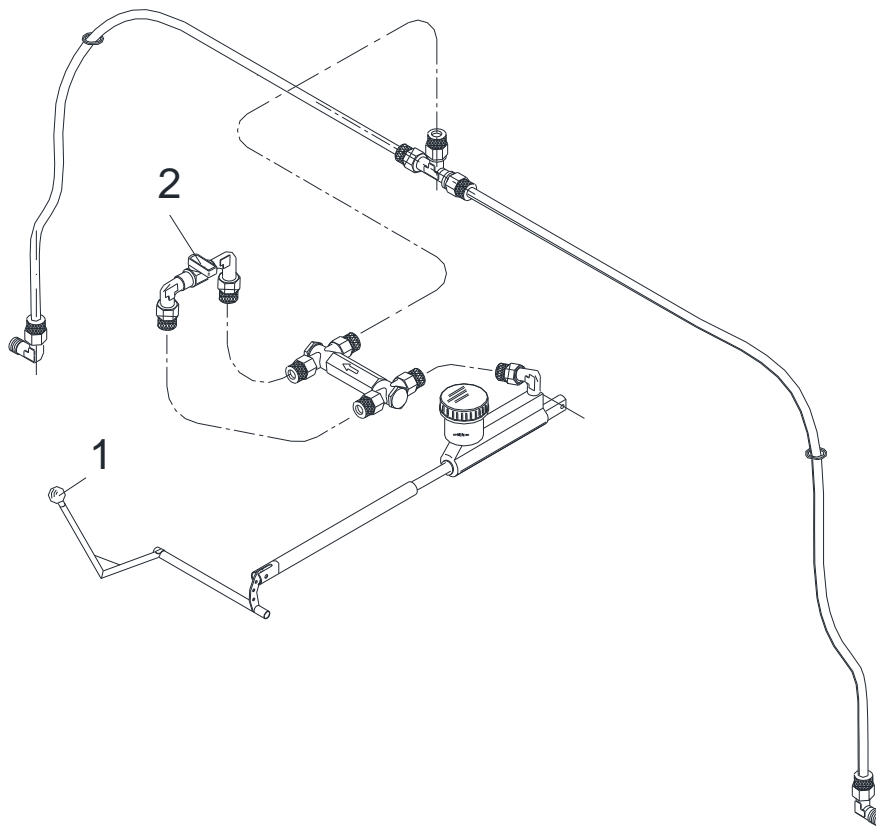


FIG. 7-6. BRAKE SYSTEM

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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

5.1. 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.



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

WARNING

5.2. 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

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1. INTRODUCTION

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

2. SUPPLEMENTS LISTS

Aircraft S/N:		Registration marks:		Date:	
Sup. No.	Title	Rev. no.	Date	APPLICABLE:	
				YES	NO
A1	Garmin GNS-430W Gps/VHF Comm/Nav			<input type="checkbox"/>	<input type="checkbox"/>
A2	GARMIN GNS 530 GPS/VHF COMM/NAV			<input type="checkbox"/>	<input type="checkbox"/>
A3	New analogical instruments panel			<input type="checkbox"/>	<input type="checkbox"/>
A4	Differential brake system			<input type="checkbox"/>	<input type="checkbox"/>
A5	Central throttle control system			<input type="checkbox"/>	<input type="checkbox"/>
A6	AFM supplement for CIS countries operators			<input type="checkbox"/>	<input type="checkbox"/>
A7	Garmin G500 Avionics Display System			<input type="checkbox"/>	<input type="checkbox"/>
A8	VFR Night equipment			<input type="checkbox"/>	<input type="checkbox"/>
A9	VFR Night equipment - Analogical version			<input type="checkbox"/>	<input type="checkbox"/>
A10	AFMS for Malaysia Reg- istered Aircraft			<input type="checkbox"/>	<input type="checkbox"/>
A11	INCREASED MTOW (600 kg)			<input type="checkbox"/>	<input type="checkbox"/>
A12	INCREASED MTOW (620 kg)	1	20/12/2012	<input type="checkbox"/>	<input type="checkbox"/>
A13	Variable Pitch Propeller			<input type="checkbox"/>	<input type="checkbox"/>
A14	Rudder and throttle con- trols additional controls			<input type="checkbox"/>	<input type="checkbox"/>
A15	GARMIN GTN 750 GPS/VHF COMM/NAV			<input type="checkbox"/>	<input type="checkbox"/>
A16	AFMS for Ukraine Reg- istered Aircraft			<input type="checkbox"/>	<input type="checkbox"/>

Aircraft S/N:		Registration marks:		Date:	
Sup. No.	Title	Rev. no.	Date	APPLICABLE:	
				YES	NO
A17	AFMS for Argentine Registered Aircraft			<input type="checkbox"/>	<input type="checkbox"/>

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

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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 transceiver.
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:

<i>Subsystem</i>	<i>Software Version</i>
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 decimal-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. A02
GARMIN GNS 530 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

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A02-1	Rev 0	A02-4	Rev 0
A02-2	Rev 0	A02-5	Rev 0
A02-3	Rev 0	A02-6	Rev 0

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INTRODUCTION

This section contains supplementary information for safe and efficient operation of the aircraft if equipped with a Garmin GNS 530 system.

GENERAL

1. The GPS GNS 530 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 transceiver.
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 530 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 190-00181-00 rev. A dated April 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:

<i>Subsystem</i>	<i>Software Version</i>
<i>MAIN</i>	<i>2.00</i>
<i>GPS</i>	<i>2.00</i>
<i>COMM</i>	<i>1.22</i>
<i>VOR/LOC</i>	<i>1.25</i>

The software version of the main subsystem is displayed by the GNS 530 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 GNS530 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 decimal-minutes);

EMERGENCY PROCEDURES

1. If the information provided by the Garmin GNS530 is not available or manifestly wrong, it is necessary to use other navigation instruments.
2. If the message “RAIM POSITION WARNING ” appears in 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 “RAIM IS NOT AVAILABLE ” appears in the 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 Garmin GNS 530 “Pilot’s guide ” P/N 190-00181-00 rev. A dated April 2000 or later versions.
2. **GARMIN GNS 430 DISPLAY**
Data for GNS 530 system appears on GARMIN GNS530 display.
Data source is either the GPS or the VLOC as indicated above the CDI switch of the GARMIN 530 display.

PERFORMANCE

No variations.

WEIGHT AND BALANCE

See Section 6 of the present manual.

SYSTEMS

See “GNS 530 Pilot’s Guide” p/n 190-00181-00 rev. A dated April 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	-					

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

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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.

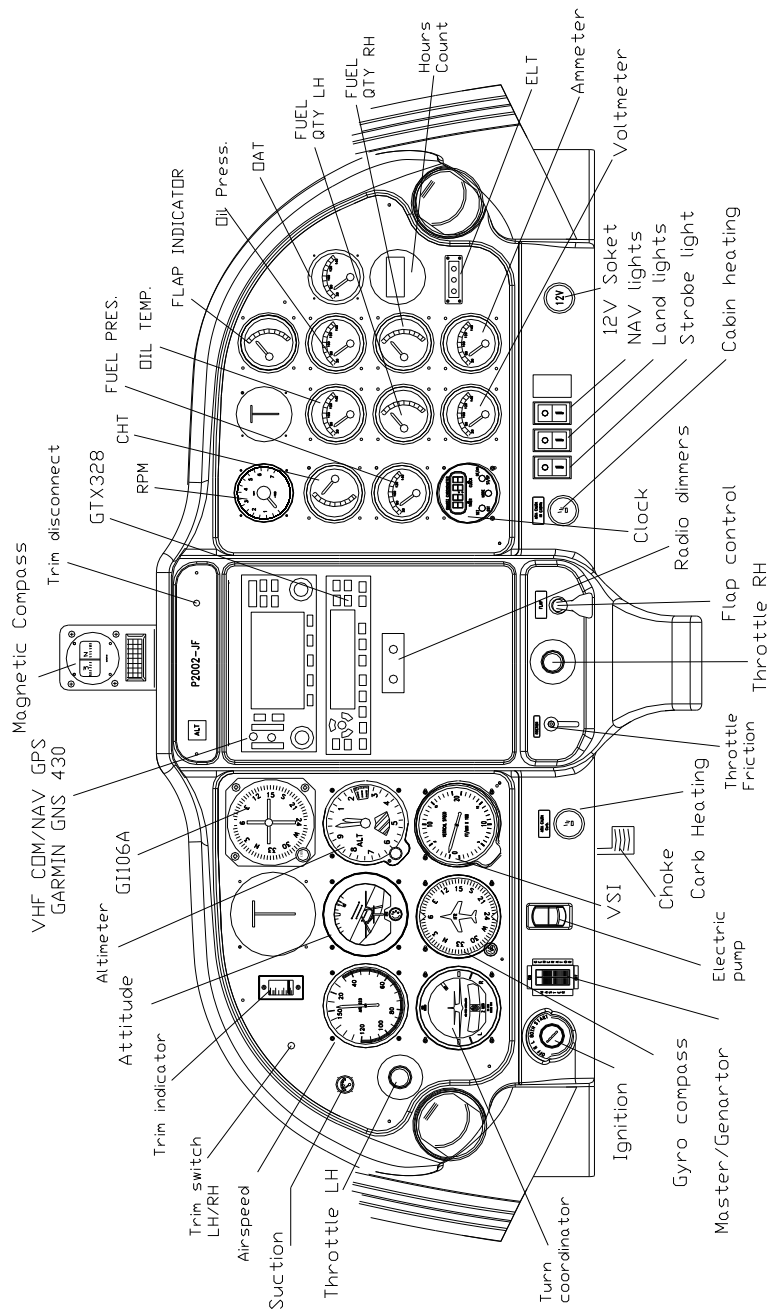


Figure A03-1 NEW ANALOGICAL INSTRUMENTS PANEL

SUPPLEMENT NO. A04
DIFFERENTIAL BRAKE SYSTEM
Record of Revisions

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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).

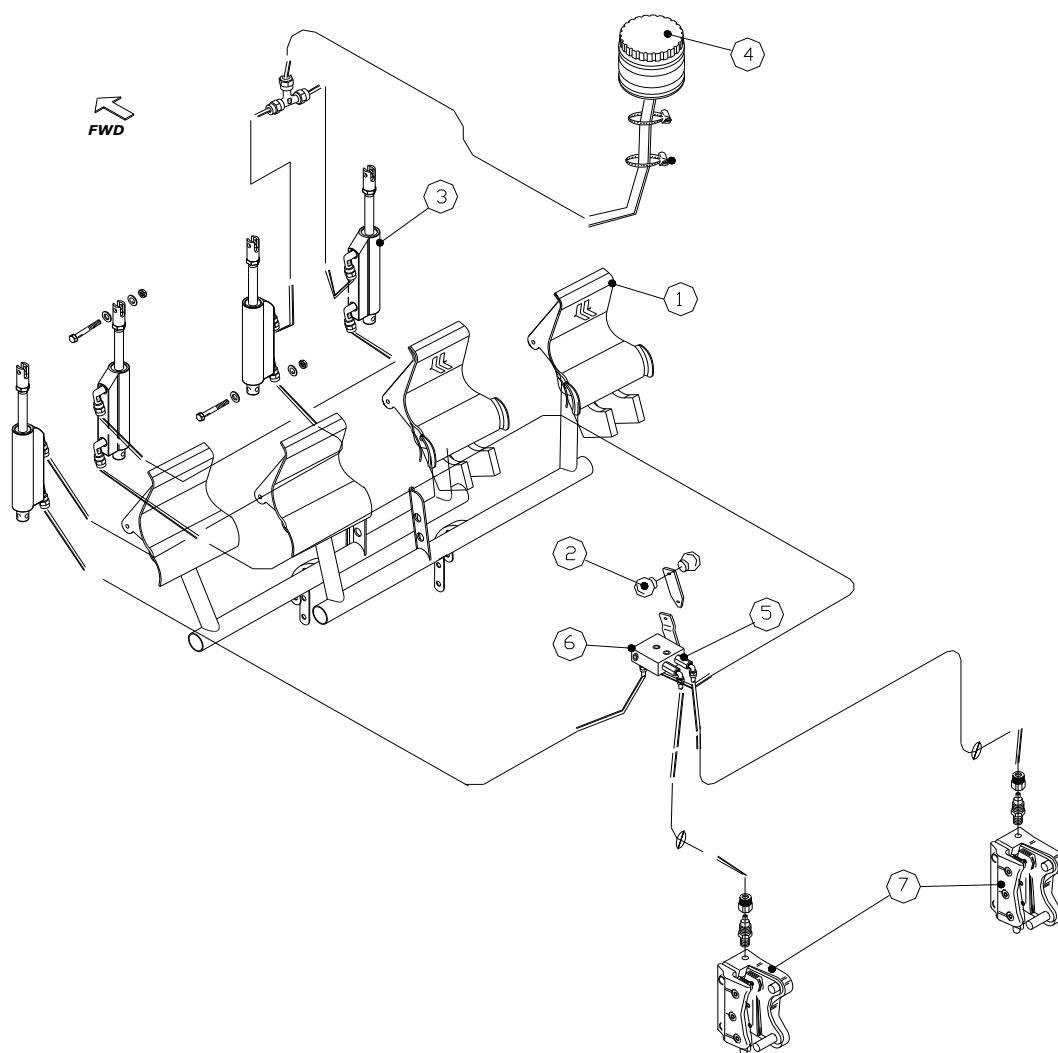


Figure A04-2 Differential brake system

SUPPLEMENT NO. A05
CENTRAL THROTTLE CONTROL SYSTEM
Record of Revisions

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INTRODUCTION

This section contains supplementary information for safe and efficient operation of the aircraft if equipped with the central throttle control system.

GENERAL

No variations.

LIMITATIONS

No variations.

EMERGENCY PROCEDURES

No variations.

NORMAL OPERATION

No variations.

PERFORMANCE

No variations.

WEIGHT AND BALANCE

No variations.

SYSTEMS

The figure A05-3 shows the central throttle control system.

The engine throttle lever is located on the left site and the choke lever is located on the right site.

The levers friction is located on the lateral right site of the central throttle control system.

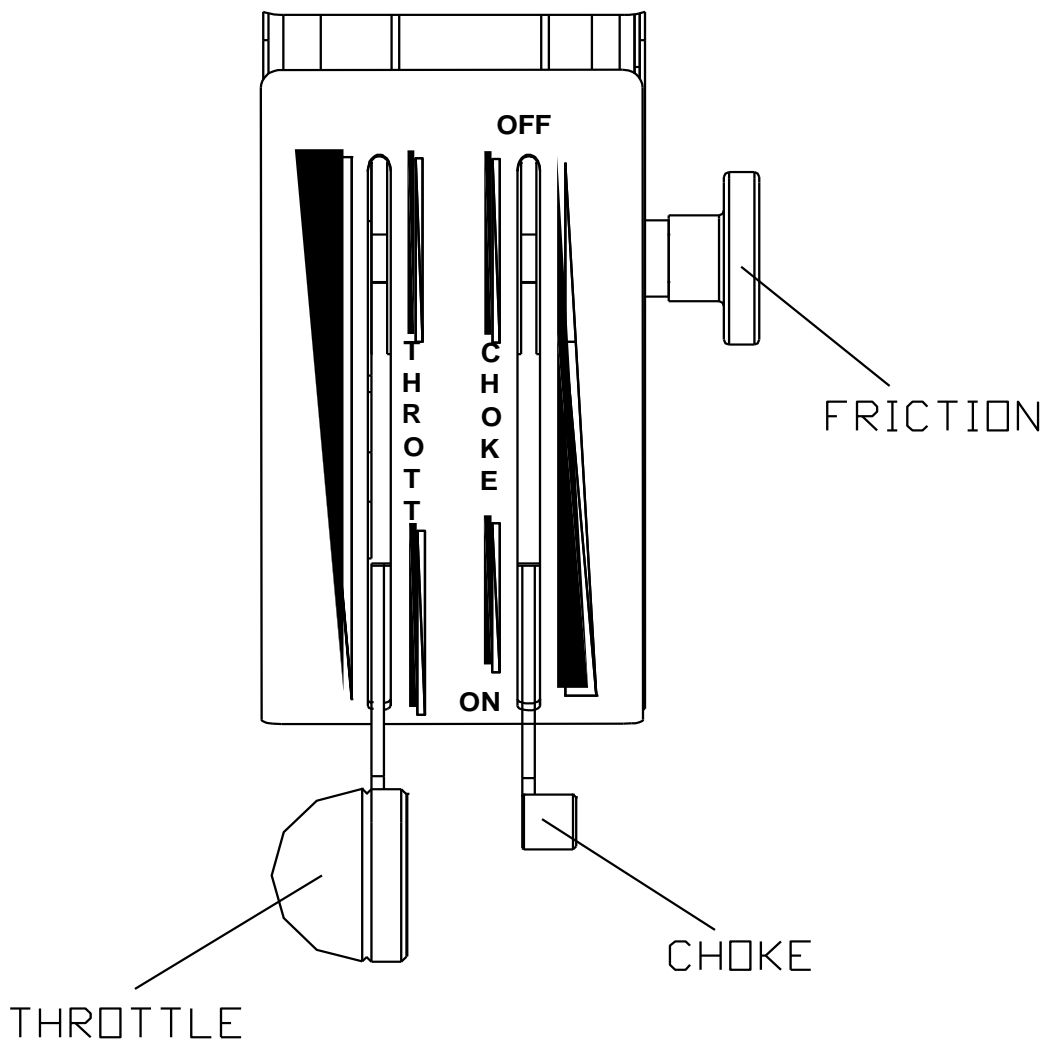


Figure A05-3 Central throttle control system

SUPPLEMENT NO. A06
AFM SUPPLEMENT FOR CIS COUNTRIES OPERATORS
Record of Revisions

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INTRODUCTION

This supplement applies for CIS countries operators.

GENERAL

This supplement must be placed in EASA Approved P2002JF Aircraft Flight Manual Section 9, if the airplane is certified to the CIS configuration. The information contained herein complements the basic information in the EASA Approved Aircraft Flight Manual. For limitations, procedures, and performance information not contained in this supplement, refer to the EASA Approved Aircraft Flight Manual.

GENERAL AIRSPEED TERMINOLOGY AND SYMBOLS

V_{LOF} Lift off speed: is the speed at which the aircraft generally lifts off from the ground.

LIMITATIONS

AMBIENT GROUND TEMPERATURE

Ambient temperature from -25°C to 40°C.

AIRFIELD ELEVATION

Maximum airfield elevation (Pressure Altitude) less than 2100m (7000ft).

FLIGHT ALTITUDE

Flight Altitude limitation of 3000m (9800ft) and of 3600m (11800ft) during 30 min.

OPERATION FROM UNPAVED RUNWAYS

Operation from unpaved runways is limited by soil strength of *6 kg per sq. Centimetre* ($\sigma \geq 6 \text{kg/cm}^2$)

OVER-WATER FLIGHTS

Extended over-water flights are allowed within the limitations prescribed by CIS operational regulations (distance from the coast shall not exceed gliding distance with engine failed).

SINGLE-PILOT OPERATIONS

In case of single-pilot operations, the right crew seat may not be occupied by a passenger without removal of control stick.

KIND OF OPERATIONS

For basic information refer to Section 2 in the basic Aircraft Flight Manual.
For VFR Night operation refer to supplement n°A08.



WARNING

VFR Night flights without visibility of earth surface reference points are forbidden.

EMERGENCY PROCEDURES

ENGINE FAILURES

ENGINE FAILURE DURING FLIGHT

Irregular Engine RPM

1. Throttle: *check position and adjustable friction*
2. Check engine gauges.
3. Check both fuel quantity indicators.
4. Carburettors heating: *ON*
5. Electric fuel pump: *ON*

If the engine continues to run irregularly:

6. Fuel selector valve: *change the fuel feeding to the tank not in use (e.g. if you are drawing fuel from the LEFT tank, change to RIGHT or v.v.)*

If the engine continues to run irregularly:

7. Ignition key: *check both*
8. Land as soon as possible

NOTE

Glide ratio is 12.8 (landing gear up) therefore with 1000ft elevation it is possible to cover ~4km (~2 nautical miles) in zero wind conditions.

NOTE

The lost of altitude by turning of 180° with bank angle of 30° is about 200ft on the V_Y .

SMOKE AND FIRE

ENGINE FIRE WHILE PARKED

1. Fuel selector valve: *OFF*
2. Electric fuel pump: *OFF*
3. Magnetos: *OFF*
4. Generator & Master switches: *OFF*
5. Parking brake: *ON*
6. Do not restart the engine.
7. Escape rapidly from the aircraft.

ENGINE FIRE IN-FLIGHT

1. Procedure for a forced landing: *apply*
2. Cabin heating: *OFF*
3. Fuel selector valve: *OFF*

4. Electric fuel pump: *OFF*
5. Throttle: *full in until the engine stops running*
6. Cabin vents: *OPEN*
7. Magnetos: *OFF*
8. Speed: *69 KIAS (maximum efficiency speed)*
9. Do not restart the engine.

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: *move and hold forward until spin is halted*
As the spin is halted
4. Rudder: *neutralize*
5. Aeroplane attitude: *make a smooth recovery by pulling the stick back gently averting speeds in excess of V_{NE} and maximum load factor ($n=+3.8$)*

OTHER EMERGENCIES

ELECTRIC POWER SYSTEM MALFUNCTION

Causes for malfunctions are hard to establish but, in any case, problems of this nature must be dealt with immediately. The following may occur:

Generator Light Illuminates

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.

In both cases proceed as follows:

1. Generator switch and master switch: *OFF*
 2. Generator switch and master switch: *ON*
- If the problem persists*
3. Generator switch: *OFF*
 4. Non vital electric equipments: *OFF*
 5. Radio calls: *reduce at the strictly necessary*

NOTE

The battery is capable of supply the electrical system enough time to complete flight in emergency conditions, with normal flight electric-loads including operation of flap and trim.

If the light turns off:

6. No further action is requested.

TRIM SYSTEM FAILURE**Locked Control**

In case the trim control should not respond, act as follows:

1. Breakers: *check*
2. Trim switch Lh/Rh: *check for correct position*
3. Trim disconnect: *ON (check)*
4. Speed: *adjust to control aircraft without excessive stick force*
5. Land aircraft as soon as possible.

Runway

If trim position indicator reads displacement without pilot's action on trim control, follow procedure below:

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

NORMAL OPERATION

PRE-FLIGHT INSPECTIONS

Before each flight, it is necessary to carry out a complete inspection of the aircraft starting with an external inspection followed by an internal inspection as below detailed.

EXTERNAL INSPECTION

To carry out the external inspection it will be necessary to follow the checklist below with the station order outlined in fig. A06-1.



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.

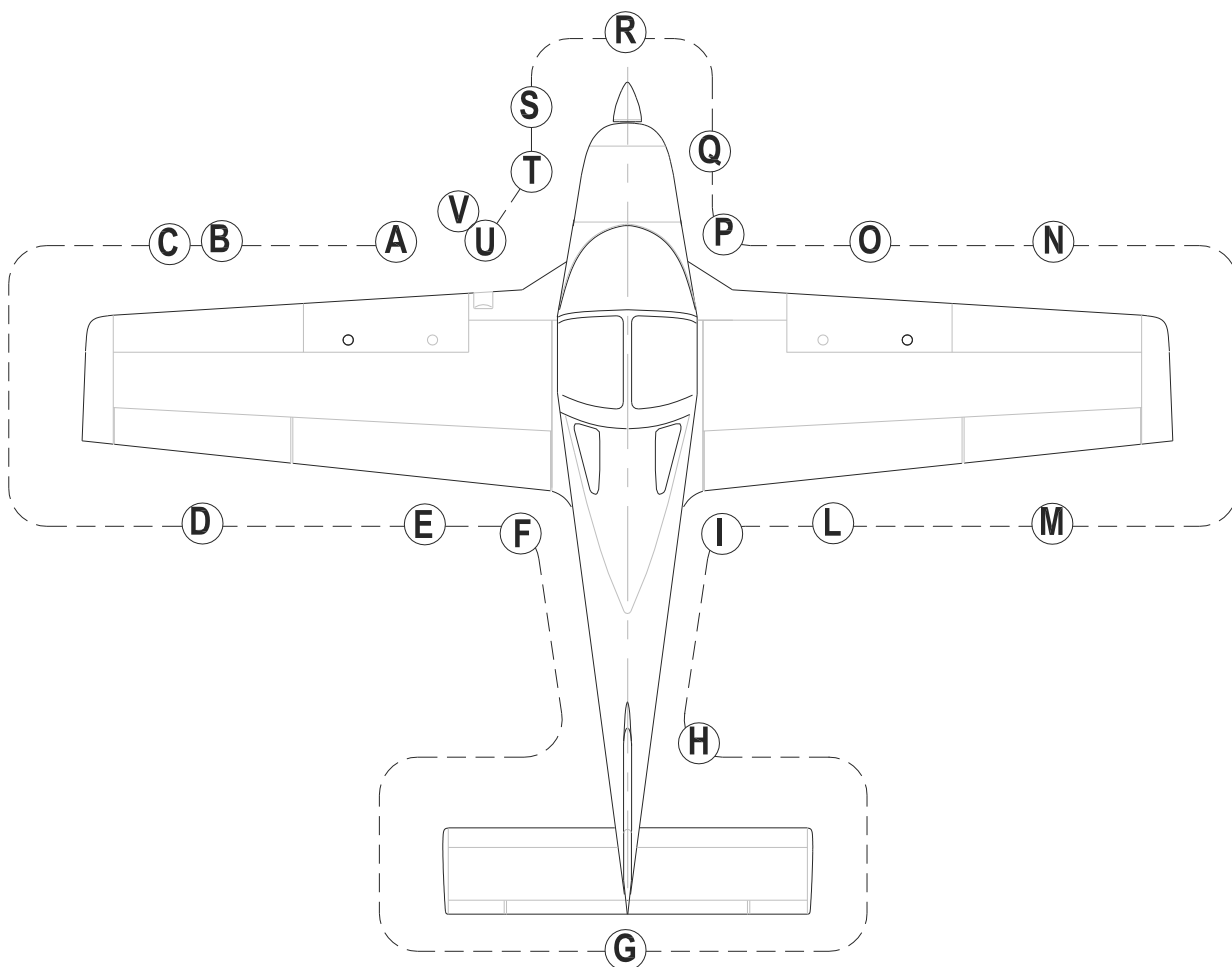


FIG. A06-1

- A Left fuel filler cap: check visually for desired fuel level then secure filler cup. Drain the left fuel tank by drainage valve using a cup to collect fuel. Check for water or other contaminants.

**WARNING**

Fuel level indicated by the fuel quantity indicators (on the instrument panel) is only indicative. For flight safety, pilot should verify actual fuel quantity embarked before take-off.

- B Remove protection cap and check the Pitot tube and the static ports mounted on left wing are unobstructed, do not blow inside vents, place protection cap inside the aircraft.
- C Left side leading edge and wing skin: visual inspection
- D Left aileron: visual inspection; Left tank vent: check for obstructions.
- E Left flap and hinges: visual inspection
- F Left main landing gear; check inflation 23 psi (1.6 bar), tire condition, alignment, fuselage skin condition.
- G Horizontal tail and tab: visual inspection.
- H Vertical tail and rudder: visual inspection.
- I Right main landing gear; check inflation 23 psi (1.6 bar), tire condition, alignment, fuselage skin condition.
- L Right flap and hinges: visual inspection.
- M Right aileron: visual inspection; 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 then secure filler cup. Drain the right fuel tank by drainage valve using a cup to collect fuel. Check for water or other contaminants.
- P Set the fuel selector valve to OFF. Drain circuit using a cup to collect fuel by opening the specific drainage valve (part of the gascolator). Check for water or other contaminants (drainage operation must be carried out with the aircraft parked on a level surface).
- Q Nose wheel strut and tire: check inflation 15 psi (1.0 bar), tire condition and condition of rubber shock absorber discs.
- R Propeller and spinner condition: check for nicks and security.
- S Open engine cowling and perform the following checklist:
- I. Check no foreign objects are present.
 - II. Check the cooling circuit for losses, check coolant level into the expansion tank, insure radiator honeycomb is unobstructed.

- III. Check lubrication circuit for losses, check oil reservoir level, and insure radiator honeycomb is unobstructed.
- IV. Inspect fuel circuit for losses.
- V. Check integrity of silent-block suspensions.
- VI. Check connection and integrity of air intake system, visually inspect that ram air intake is unobstructed.
- VII. Check that all parts are secured or safetied.
- T Close engine cowling.
- U Visual inspection of the Landing Light.
- V Remove tow bar and chocks.

NOTE

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

CHECKLIST

BEFORE STARTING ENGINE (AFTER PREFLIGHT INSPECTION)

- I. Flight controls: *operate until their stop checking for movement smoothness*
- II. Parking brake: *engage*
- III. Throttle: *adjust friction*
- IV. Master switch: *ON*, Generator switch: *ON*, generator light *ON*, check the *ammeter*.
- V. Electric fuel pump: *ON*, (*check for audible pump noise and fuel pressure*)
- VI. Electric fuel pump: *OFF*
- VII. Avionic Master switch (*if installed*): *ON*, instruments check, then set in *OFF* position
- VIII. Flap control: *operate flap throughout their extreme positions*
- IX. Trim control: *operate from both left and right controls the trim between its extreme positions checking the trim position indicator*
- X. Nav. light & Strobe light: *ON*
- XI. Landing light: *ON*, check
- XII. Landing light: *OFF*
- XIII. Fuel quantity: *compare the fuel levels read by the fuel quantity indicators with the quantity present into the tanks (see Pre-flight inspection – External inspection)*
- XIV. Flight planning, fuel consumption, refuelling.
- XV. Seat position and safety belts adjustment

NOTE

In the absence of the passenger: fasten seat belts around the free seat so as to prevent interference with the operation of the aeroplane and with rapid egress in an emergency.

- XVI. Canopy: *Closed and locked*

**CAUTION**

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

PRIOR TO TAKE-OFF

- I. Parking brake: *ON*
- II. Check engine instruments:
 - ✓ Oil temperature: 50-110 °
 - ✓ Cylinder heads temperature: max 135 °
 - ✓ Oil pressure: 2-5 bar (*above 1400 rpm*); 0.8 bar (*below 1400 rpm*)
 - ✓ Fuel pressure: 2.2 – 5.8 psi (*0.15-0.40 bar*)
- III. Generator light: *OFF (check)*
- IV. Propeller's rpm: *1560 and test magnetos (speed drop with only one ignition circuit must not exceed 130 prop's rpm; maximum difference of speed by use of either circuits LEFT or RIGHT is 50 rpm).*
- V. Check fuel quantity indicators.
- VI. Flaps: *T/O (15°)*
- VII. Stick free and trim set at *zero*
- VIII. Seat belts fastened and canopy closed and locked

CRUISE

Flights in the CIS airspace are allowed only along the routes with continuous ATC monitoring using RBS mode in the VHF covering zones.

- I. Reach cruising altitude
- II. Set power and engine rpm's for cruise.
- III. Check engine instruments
 - ✓ Oil temperature: 90°-110 ° C.
 - ✓ Temperature cylinder heads: 90° ÷ 135 °C
 - ✓ Oil pressure: 2 - 5 bar.
 - ✓ Fuel pressure: 2.2 – 5.8 psi (*0.15 – 0.40 bar*)
- IV. Carburettor heat as needed, see paragraph on carb. heat in Section 3.

NOTE

Compensate unpredicted asymmetrical fuel consumption between left and right fuel tanks operating the fuel selector valve. Switch on the electric fuel pump prior to swap the fuel feeding from one tank to another

BEFORE LANDING

- I. Electric fuel pump: *ON*
- II. On downwind leg: *speed: 68 KIAS (for both MTOW); Flaps: T/O (15°)*
- III. On downwind base: *speed: 65 KIAS (for both MTOW); Flaps: T/O (15°)*
- IV. On final leg: *speed: 63 KIAS (for both MTOW); Flaps: Land (40°)*
- V. Establish descent
- VI. Optimal touchdown speed: *51 KIAS (for both MTOW)*

COLD WEATHER OPERATIONS

If the aircraft is operated in cold weather conditions (from -25°C till -5°C) it is necessary to perform following procedures:

- ✓ Heat the cabin to +25°C to avoid windshield frost in flight
- ✓ Heat the engines with external source to + 20° C

PERFORMANCE

STALL SPEED (APPROVED DATA)

CONDITIONS:

- ✓ Weight **580** kg
- ✓ Throttle: idle
- ✓ No ground effect

Lateral Bank	0°		30°		45°		60°	
	KIAS	KCAS	KIAS	KCAS	KIAS	KCAS	KIAS	KCAS
FLAP UP	40	49	45	53	53	58	67	70
FLAP TO	35	46	40	49	47	54	61	65
FLAP FULL	30	39	34	42	41	47	53	56

CONDITIONS:

- ✓ Weight **600** kg
- ✓ Throttle: idle
- ✓ No ground effect

Lateral Bank	0°		30°		45°		60°	
	KIAS	KCAS	KIAS	KCAS	KIAS	KCAS	KIAS	KCAS
FLAP UP	41	50	46	53	54	59	68	70
FLAP TO	36	46	41	50	48	55	62	65
FLAP FULL	31	40	35	43	41	47	53	56

NOTE

Altitude loss during conventional stall recovery as demonstrated during test flights is approximately 100ft with banking under 30°.

TAKE-OFF PERFORMANCES (APPROVED DATA)

TAKE-OFF DISTANCES

CONDITIONS:

- Flaps: TO
- Engine throttle: full throttle (see Sect.4)
- R/C ≥ 200 ft/min
- Runway: paved
- Slope: 0°; Wind: zero

⇒ Example:

Given

O.A.T. = 15°C

Pressure altitude = 2900 ft

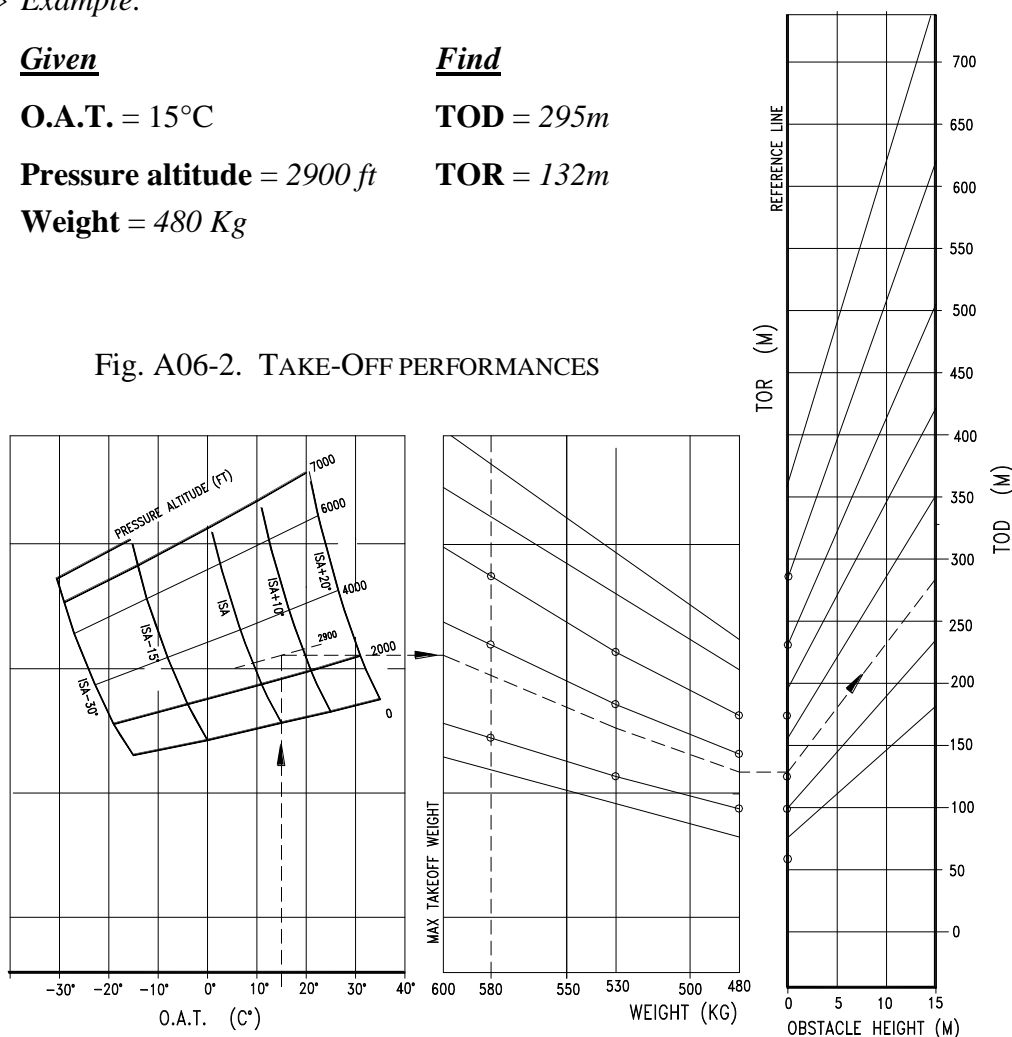
Weight = 480 Kg

Find

TOD = 295m

TOR = 132m

Fig. A06-2. TAKE-OFF PERFORMANCES



NOTE

1. Decrease distances by 10% for each 10Kts of ahead wind. Increase distances by 20% for each 10 Kts of tailwind.
2. Measurement distance for short grass (less than 2 inches) must be increased of 10%. Measurement distance for high grass (more than 2 inches) must be increased of 15%.
3. A rising runway with a gradient of 1% causes an acceleration decreasing of the same intensity and, consequently, the takeoff run increases by 5%.

CLIMB RATE IN TAKE-OFF CONFIGURATION (APPROVED DATA)

CONDITIONS:

	580 kg MTOW	600 kg MTOW
Flaps	<i>15°</i>	<i>15°</i>
Engine	<i>Full throttle</i>	<i>Full throttle</i>
V_{obs}	<i>45 KIAS</i>	<i>46 KIAS</i>

Climb rate at maximum takeoff weight (580/600kg) in demonstrated ISA s.l. conditions is 850 ft/min for 580 kg MTOW and 800 ft/min for 600 kg MTOW.

CRUISE

CONDITIONS:

- ✓ ISA
- ✓ Wind: zero
- ✓ MTOW = For both MOTW

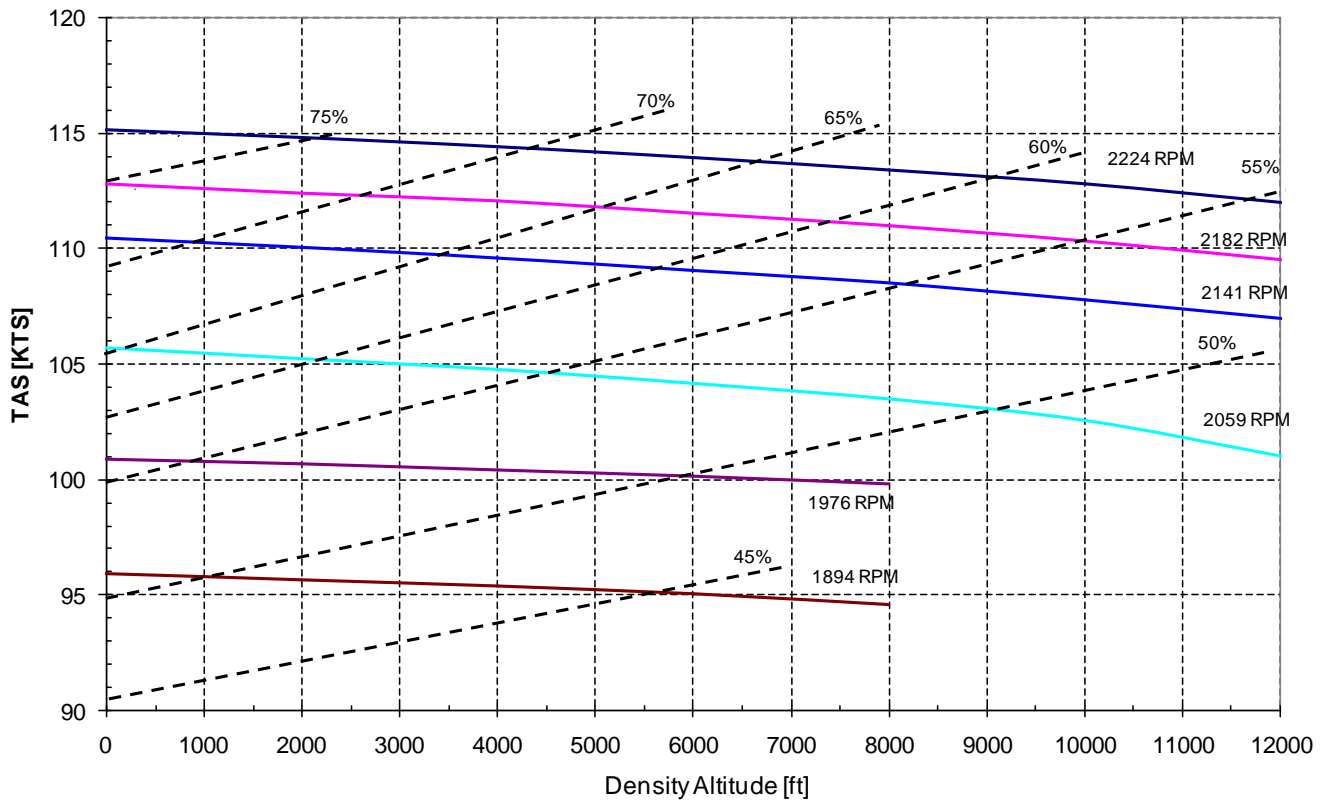


Fig. A06-3 CRUISE

LANDING DISTANCE (APPROVED DATA)

LANDING DISTANCE AND GROUND RUN

CONDITIONS:

Weight: 580 kg; Flap: 10° Runway: dry, compact, grass

Engine: idle Slope: 0°; Wind: zero

Distance over the obstacle of 15 m
OAT: ISA -20°C

Hp (ft)	Total Distance (m)	Ground Run (m)
0	235	88
2000	241	94
4000	248	99
6000	256	105

OAT: ISA -10°C

Hp (ft)	Total Distance (m)	Ground Run (m)
0	239	92
2000	246	97
4000	253	103
6000	261	109

OAT: ISA +0°C

Hp (ft)	Total Distance (m)	Ground Run (m)
0	243	95
2000	250	101
4000	258	107
6000	266	113

OAT: ISA +10°C

Hp (ft)	Total Distance (m)	Ground Run (m)
0	247	98
2000	255	104
4000	263	111
6000	271	118

OAT: ISA +20°C

Hp (ft)	Total Distance (m)	Ground Run (m)
0	251	101
2000	259	108
4000	268	114
6000	277	122

OAT: ISA +40°C

Hp (ft)	Total Distance (m)	Ground Run (m)
0	258	108
2000	269	116
4000	270	120
6000	289	130

NOTE

1. *Decrease distances by 10% for each 10 Kts of headwind. Increase distances by 20 % for each 10 Kts of tailwind;*
2. *For dry and paved runway operation increase ground run by 10%;*
3. *If it becomes necessary to land without flap extension (flap malfunction), increase approach speed by 10 Kts, increase by 40% distance pertaining to flap setting at 40° and increase V_{obs} to 56 KIAS for 580 kg MTOW and to 57 KIAS for 600 kg MTOW;*
4. *V_{obs} (speed over obstacle) is 48 KIAS for 580 kg MTOW and 49 KIAS for 600 kg MTOW;*
5. *If the maximum takeoff weight is 600 kg, the Total Distance increases about 10%;*

WEIGHT AND BALANCE

No variations.

SYSTEMS

No variations.

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SUPPLEMENT NO. A07
GARMIN G500 AVIONICS DISPLAY SYSTEM
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INTRODUCTION

This AFM Supplement contains supplemental information to operate, in a safe and efficient manner, the aircraft when equipped with Garmin G500 Avionics Display System (Design Change MOD 2002/041).

**CAUTION**

Garmin G500 Pilot's Guide (P/N 190-01102-02)

– last issue - must be carried on-board the airplane at all times.

NOTE

Garmin G500 Cockpit Reference Guide

(P/N 190-01102-03) – last issue – provides a synthetic explanation of system operation.

GENERAL

The G500 is an integrated display system that presents primary flight instrumentation, navigation, and a moving map to the pilot through large format displays.

In normal operating mode, the Primary Flight Display (PFD) presents graphical flight instrumentation (attitude, heading, airspeed, altitude, vertical speed), replacing the traditional flight instrument cluster. The Multi-Function Display (MFD) normally displays a full-color moving map with navigation information.

An analogue stand-by airspeed indicator and a stand-by altimeter provide the pilot with the primary flight information also in event of G500 failure.

LIMITATIONS

AIRSPPEED LIMITATIONS

Airsppeed limitations and their operational significance are shown below:

SPEED		KIAS	KCAS	REMARKS
V_{NE}	<i>Never exceed speed</i>	141	138	Never exceed this speed in any operation.
V_{NO}	<i>Maximum Structural Cruising Speed</i>	112	108	Never exceed this speed unless in smooth air, and then only with caution.
V_A	<i>Manoeuvring speed</i>	98	96	Do not make full or abrupt control movements above this speed as this may cause stress in excess of limit load factor
V_{FE}	<i>Maximum flap extended speed</i>	LDG	68	Do not exceed these speeds with the given flap setting.
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AIRSPPEED INDICATOR MARKINGS

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

Garmin G500 Airspeed Indicator displays airspeed on a rolling number gauge using a moving tape: a color-coded (white, green, yellow, and red/white “barber pole”) speed range strip is located on the moving tape.

NOTE

Refer to Garmin G500 Pilot’s Guide (P/N 190-01102-02) – last issue – for airspeed indicator description.

MARKING	KIAS	SIGNIFICANCE
White band	31 - 68	Positive Flap Operating Range (lower limit is V_{SO} , at maximum weight [600 kg] and upper limit is the maximum speed permissible with landing flaps extension).
Green band	41 – 112	Normal Operating Range (lower limit is $VS1$ at maximum weight [600 kg] and most forward c.g. with flaps retracted and upper limit is maximum structural speed V_{NO}).
Yellow band	112 - 141	Manoeuvres must be conducted with caution and only in smooth air.
Red line	141	Maximum speed for all operations.

EMERGENCY PROCEDURES

Before operating the aircraft, the pilot should become thoroughly familiar with the Garmin G500 Pilot's Guide (P/N 190-01102-02) – last issue.



CAUTION

Garmin G500 Pilot's Guide (P/N 190-01102-02) – last issue - must be carried onboard the airplane at all times.

Further, a continued and appropriate training should be provided.



WARNING

For safety reasons, G500 operational procedures must be learned on the ground.



WARNING

The Garmin G500 has a very high degree of functional integrity.

However, the pilot must recognize that providing monitoring and/or self-test capability for all conceivable system failures is not practical. Although unlikely, it may be possible for erroneous operation to occur without a fault indication shown by the G500. It is thus the responsibility of the pilot to detect such an occurrence by means of cross-checking with all redundant or correlated information available in the cockpit.

In case of emergency the pilot should acts as follows:

- 1. Keep self-control and aircraft control*
- 2. Analyse the situation identifying, if required, the area for a likely emergency landing*
- 3. Apply the pertinent procedure*
- 4. Inform the Air Traffic Control if time and conditions allow for it*

IN-FLIGHT ENGINE RESTART

Make reference to the instructions reported on Section 3 of this Manual.

Additionally, take into account what below addressed:

NOTE

After starter engagement during in-flight engine restart, GNS 430 (or the alternative equipment GNS 530) indication may be temporarily lost. Recovery can last up to 1 minute.

G500 SYSTEM FAILURES**LOSS OF INFORMATION DISPLAYED**

When a LRU or a LRU function fails, a large red 'X' is typically displayed on the display field associated with the failed data.

NOTE

In most of cases, the red "X" annunciation is accompanied by an Alert Message. Refer to G500 Pilot's Guide (P/N 190-01102-02), last issue, Chapter 6, Annunciations and Alerts list.

LOSS OF AIRSPEED INFORMATION

If the display system is not receiving airspeed input from the Air Data Computer, a red X is displayed on the field.

INSTRUCTION: refer to standby analogical airspeed indicator

LOSS OF ALTITUDE INFORMATION

If the display system is not receiving altitude input from the Air Data Computer, a red X is displayed on the field.

INSTRUCTION: refer to standby analogical altitude indicator

NORMAL OPERATION

Document Garmin G500 Pilot's Guide (P/N 190-01102-02) – last issue - reports detailed instructions to operate the system in subject. Make always reference to the information addressed within the above mentioned document.

**CAUTION**

Garmin G500 Pilot's Guide (P/N 190-01102-02) – last issue - must be carried onboard the airplane at all times.

**WARNING**

For safety reasons, G500 operational procedures must be learned on the ground.

**WARNING**

To reduce the risk of unsafe operation, carefully review and understand all aspects of the G500 Pilot's Guide. Thoroughly practice basic operation prior to actual use. During flight operations, carefully compare indications from the G500 to all available navigation sources, including the information from other NAVAIDs, visual sightings, charts, etc.

For safety purposes, always resolve any discrepancies before continuing navigation.

PERFORMANCE

Garmin G500 Avionics Display System installation does not affect the aircraft performance.

WEIGHT AND BALANCE

For weight and balance, make reference to Section 6 of this Manual; additionally, the equipment list is so integrated:

EQUIPMENT LIST		A/C S/N	DATE:	
REF.	DESCRIPTION & P/N	INST	WEIGHT <i>kg</i>	DATUM <i>m</i>
	Garmin GDU 620 Display	*	2.9	1.35
	Garmin GRS 77 AHRS	*	1.27	2.77
	Garmin GDC 74A ADC	*	0.72	0.81
	Garmin GMU 44 magnetometer	*	0.16	4.91
	Garmin GTP 59 temperature probe	*	0.2	2.08
	Stand-by airspeed indicator Mid Continent P/N 25020-0179	*	0.27	1.35
	Stand-by altimeter Mid Continent P/N 15035-1102	*	0.36	1.35
	Bank angle indicator (optional) Falcon Gauge P/N SI-2Q		0.2	1.35

SYSTEMS

Garmin G500 system is an avionics system which interfaces with the NAV devices and integrates the functions of a VOR/ILS/GPS indicator.

An overview of the configuration of the system installed on Tecnam P2002 is shown in the figure below:

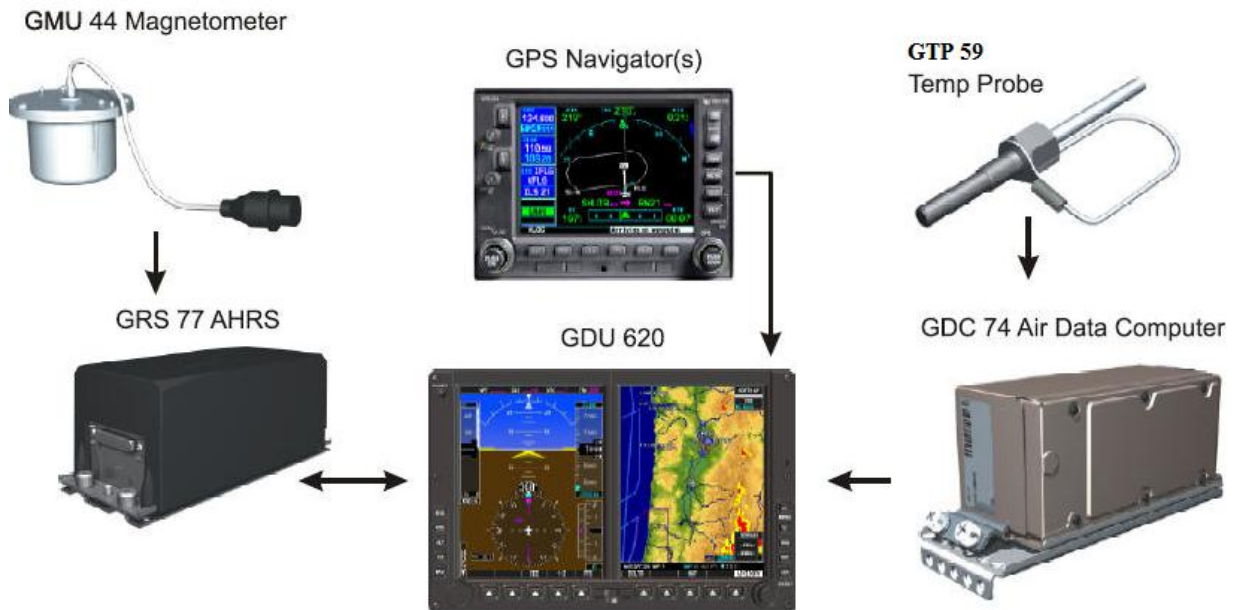


Fig. A07-1

Below a brief description of each unit of the suite is provided.

The GDU 620 has dual VGA 6.5 inch LCD displays. The left side of the GDU is a PFD and the right side is the MFD. The MFD shows a moving map, flight plan and more. The PFD shows primary flight information, in place of traditional pitot-static and gyroscopic systems and also provides an HSI for navigation.

The GRS 77 is an Attitude and Heading Reference System (AHRS) unit that provides aircraft attitude information to the G500 display. The unit contains advanced tilt sensors, accelerometers, and rate sensors. In addition, the GRS 77 interfaces with both the GDC 74A Air Data Computer and the GMU 44 magnetometer. The GRS 77 also utilizes GPS data forwarded from the GDU620.

The GMU 44 magnetometer senses the earth’s magnetic field. Data is sent to the GRS 77 AHRS for processing to determine aircraft magnetic heading. This unit receives power directly from the GRS 77.

The GDC 74A Air Data Computer (ADC) compiles information from the pitot/static system and an Outside Air Temperature (OAT) sensor. The GDC 74A provides pressure altitude, airspeed, vertical speed, and OAT information to the G500 system. The GDC 74A communicates with the GDU 620 and GRS 77.

GTP59 It is the temperature probe which provides Outside Air Temperature (OAT) data to the GDC74A.

The GPS unit is the same installed on analogue P2002 configuration: the Garmin GNS 430 or GNS 530.

An analogue airspeed indicator and an altimeter have been added to provide the pilot with main flight information also in case of G500 failure.

The above mentioned instruments are pneumatic and they don't need electrical supply.

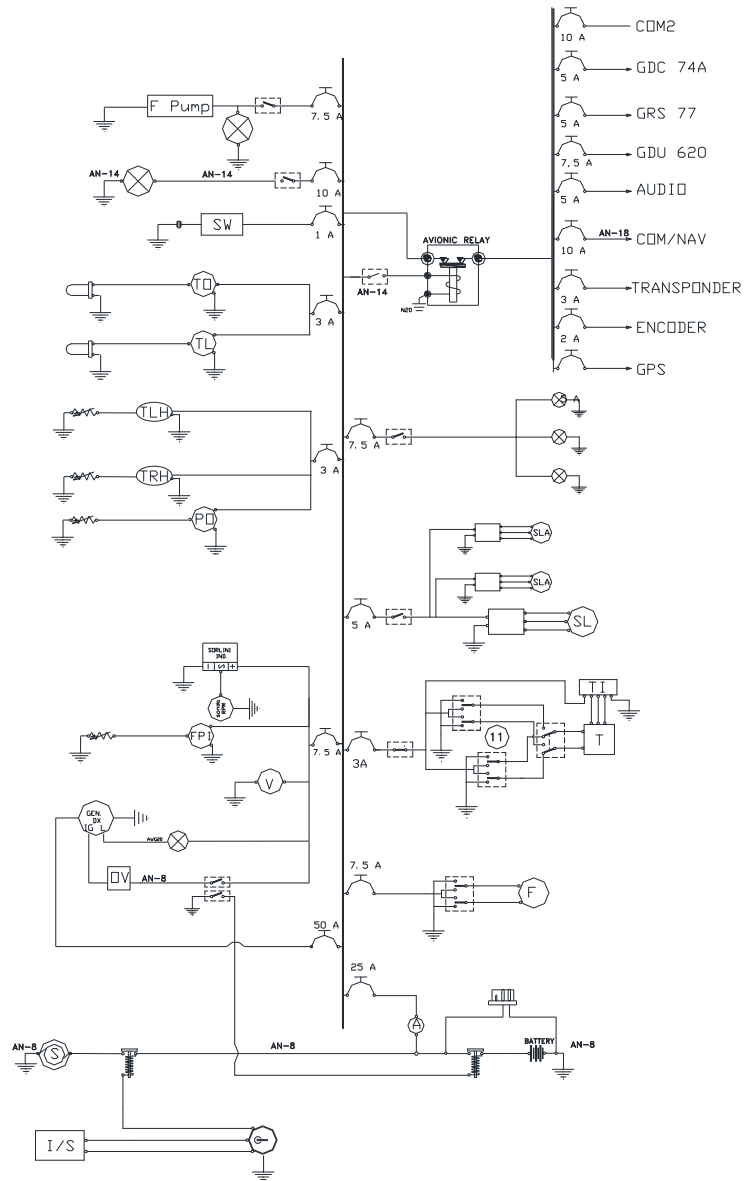


CAUTION

The G500 PFD and MFD displays use a lens coated with a special anti-reflective coating that is very sensitive to skin oils, waxes, and abrasive cleaners. CLEANERS CONTAINING AMMONIA WILL HARM THE ANTI-REFLECTIVE COATING. It is very important to clean the lens using a clean, lint-free cloth and an eye-glass lens cleaner that is specified as safe for anti-reflective coatings.

ELECTRICAL SYSTEM

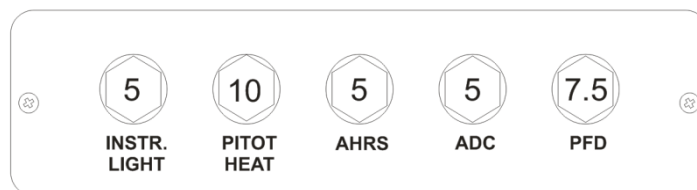
The drawing below shows the electrical system schematic:



The Garmin G500 units are connected to the avionic bus through dedicated circuit breakers.

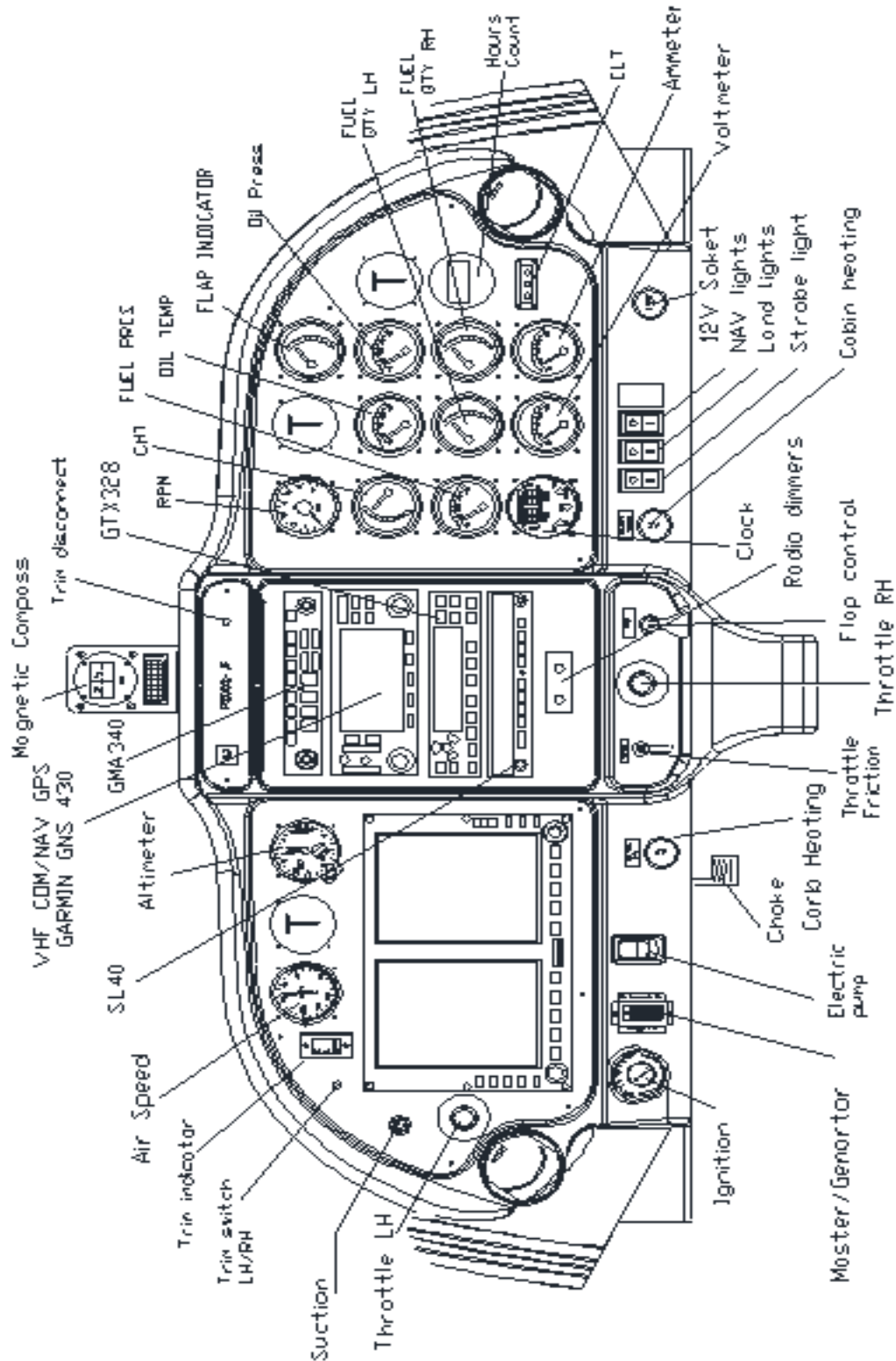
When the G500 is installed, also the design change 2002/026 “Optional External Generator” is applied to provide the necessary amount of current to the new electrical loads.

A dedicated breaker panel is therefore installed:



INSTRUMENTS PANEL

The instrument panel (typical layout) is shown on the following figure.



Section 9 – Supplements

Supplement no. A07 – GARMIN G500 Avionics Display System

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SUPPLEMENT NO. A08
VFR NIGHT EQUIPMENT
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

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A08-1	Rev 0	A08-8	Rev 0
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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 both Design Change MOD 2002/050 “VFR Night” and Design Change MOD 2002/041 “Garmin G500 Avionics Display System”.

Additionally, following equipment must be installed:

- ✓ Garmin GNS 430 (or 530) GPS/VHF COMM/NAV or Garmin SL30 VHF COMM/NAV
- ✓ Garmin SL40 VHF COMM/NAV
- ✓ Garmin GTX328 Mode S Transponder

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.

- **2nd VHF COMM equipment**
- **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 equipments may be asked to fulfill national or specific requirements. It's a responsibility of the continued airworthiness manager to be compliant with these requirements.

AIRPEED 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: | <i>OFF</i> |
| 2. | Non essential electric equipments: | <i>OFF</i> |
| 3. | Strobe lights mode switch: | <i>Set to EMER</i> |
| 4. | Radio calls: | <i>Reduce at the strictly necessary</i> |
| 5. | Five minutes before landing: | <i>Pitot heat OFF</i> |
| 6. | Limit the <i>landing light</i> use: | |

NOTE

The battery is able to supply the electrical system for at least 30 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*



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	<i>ON</i>
Torch	<i>TEST</i>
Instrument lights	<i>TEST</i>
Dome light	<i>TEST</i>
Pitot heating system	<i>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.</i>
Alternate static port	<i>CHECK closed</i>
Strobe lights mode switch	<i>NORM</i>
Strobe lights switch	<i>ON, check wing and vertical fin strobe lights ON</i>
Strobe lights mode switch	<i>EMER, check wing strobe lights OFF, check vertical fin strobe ON</i>
Strobe lights mode switch	<i>NORM</i>
Strobe lights switch	<i>OFF</i>
Landing light	<i>TEST</i>
MASTER SWITCH	<i>OFF</i>

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; additionally, the equipment list is so integrated:

EQUIPMENT LIST		A/C S/N	DATE:	
REF.	DESCRIPTION & P/N	INST	WEIGHT <i>kg</i>	DATUM <i>m</i>
	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 - AS GE 4509	*	0.5	0.2

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).

STROBE LIGHTS MODE SWITCH

Strobe lights (located on the wings and on the vertical fin) are activated by means of a switch located on the instruments panel, RH lower side.

The strobe lights mode switch, instead, allows for selecting two operational modes:

- **NORM**: all strobe lights are **ON**
- **EMER**: only the strobe light on the vertical fin is **ON**

The switch allows for reducing electrical loads in event of electrical system failures.

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.

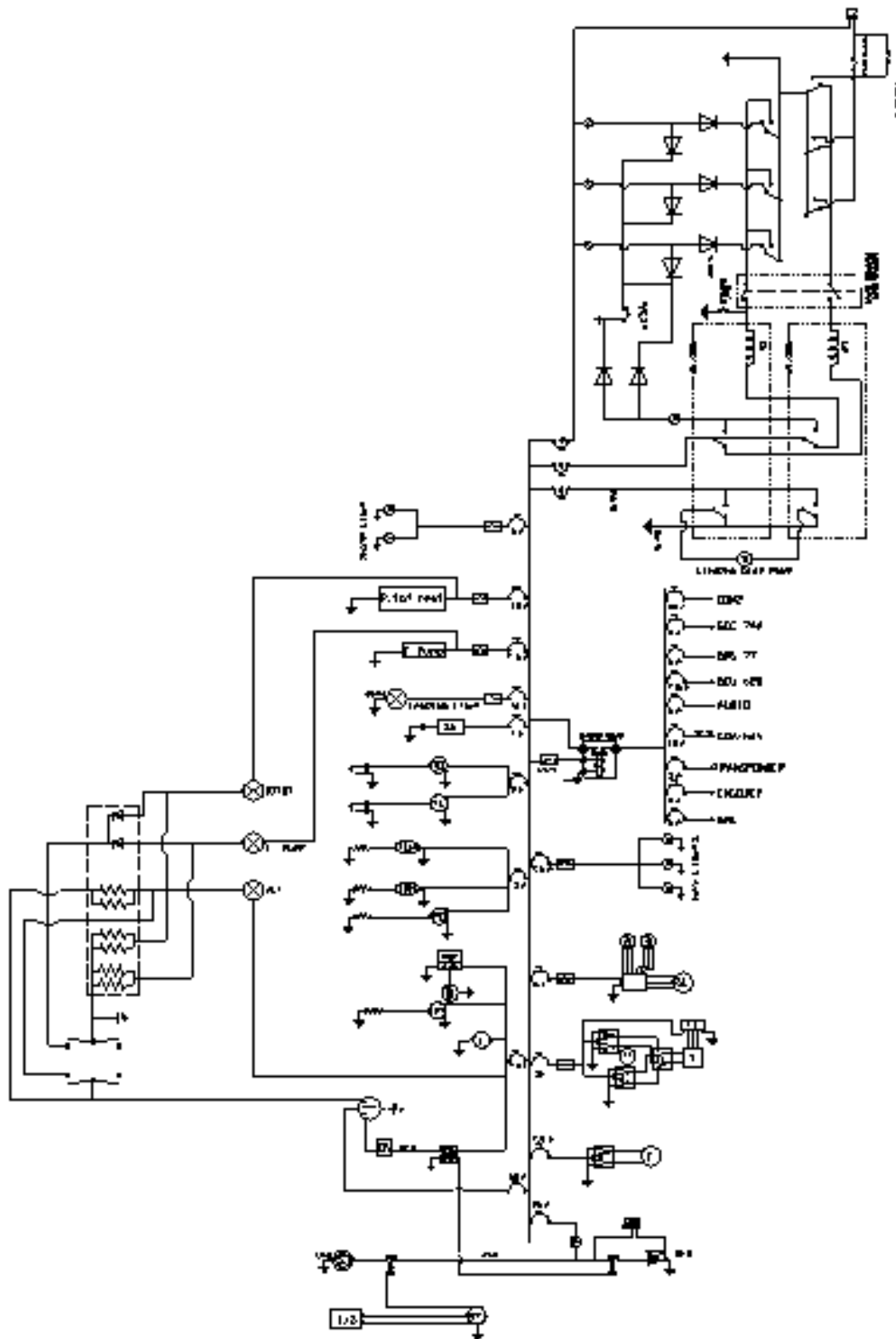
The advisory light informs the pilot that the system is activated but it does not indicate whether it works properly.

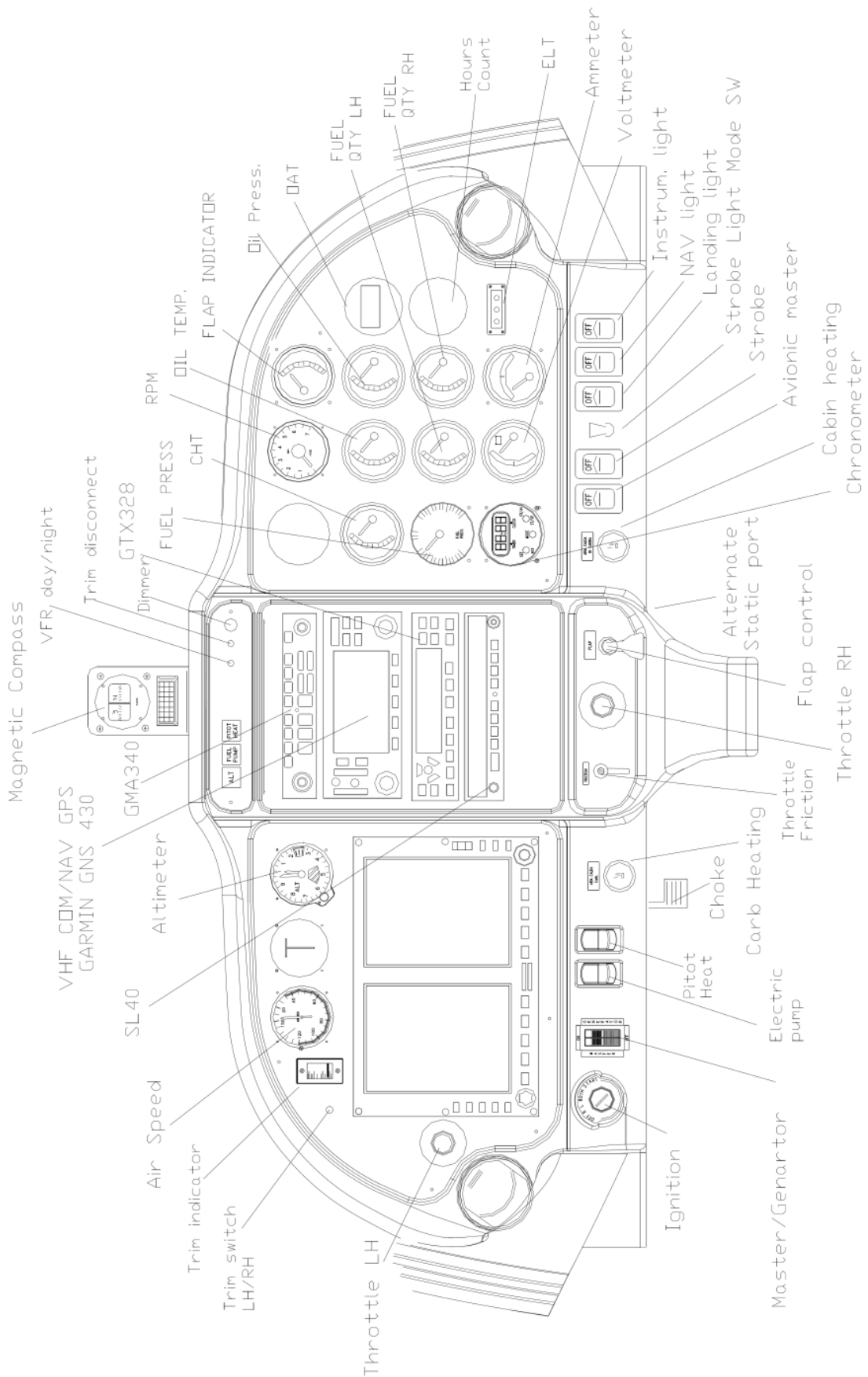
ALTERNATE STATIC PORT

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 layout).





Section 9 – Supplements

Supplement no. A08 –VFR Night Equipment

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SUPPLEMENT NO. A09
VFR NIGHT EQUIPMENT – ANALOGICAL VERSION
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A09-4	Rev 0	A09-11	Rev 0
A09-5	Rev 0	A09-12	Rev 0
A09-6	Rev 0	A09-13	Rev 0
A09-7	Rev 0	A09-14	Rev 0

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Electrical System and Instruments Panel 12

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”.

Additionally, following equipment must be installed:

- ✓ Garmin GNS 430 (or 530) GPS/VHF COMM/NAV or Garmin SL30 VHF COMM/NAV
- ✓ Garmin SL40 VHF COMM/NAV
- ✓ Garmin GTX328 (or GTX 320 or GTX 327 or GTX 330) Mode S Transponder
- ✓ ELT AK 450 (or ARTEX ME406)
- ✓ ADF King KR87

NOTE

“ADF” and a second radio are necessary if the aircraft is Italian registered. In other cases please refer to local operating regulation.

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.

- ✓ **2nd VHF COMM equipment**
- ✓ **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 equipments may be asked to fulfill national or specific requirements. It's a responsibility of the continued airworthiness manager to be compliant with these requirements.

AIRSPPEED 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: | <i>OFF</i> |
| 2. | Non essential electric equipments: | <i>OFF</i> |
| 3. | Radio calls: | <i>Reduce at the strictly necessary</i> |
| 4. | Five minutes before landing: | <i>Pitot heat OFF</i> |
| 5. | Limit the landing light use: | <i>Turn the light ON just 5 minutes before landing.</i> |

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*



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	<i>ON</i>
Torch	<i>TEST</i>
Day/Night Switch	<i>Set as required by lighting condition</i>
Instrument lights	<i>TEST</i>
Dome light	<i>TEST</i>
Pitot heating system	<i>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.</i>
Alternate static port	<i>CHECK closed</i>
Strobe lights switch	<i>ON, check wing strobe lights ON</i>
Strobe lights switch	<i>OFF</i>
Landing light	<i>TEST</i>
Navigation Light	<i>TEST</i>
MASTER SWITCH	<i>OFF</i>

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; additionally, the equipment list is so integrated:

EQUIPMENT LIST		A/C S/N	DATE:	
REF.	DESCRIPTION & P/N	INST	WEIGHT <i>kg</i>	DATUM <i>m</i>
	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 - AS GE 4509	*	0.5	0.2

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.

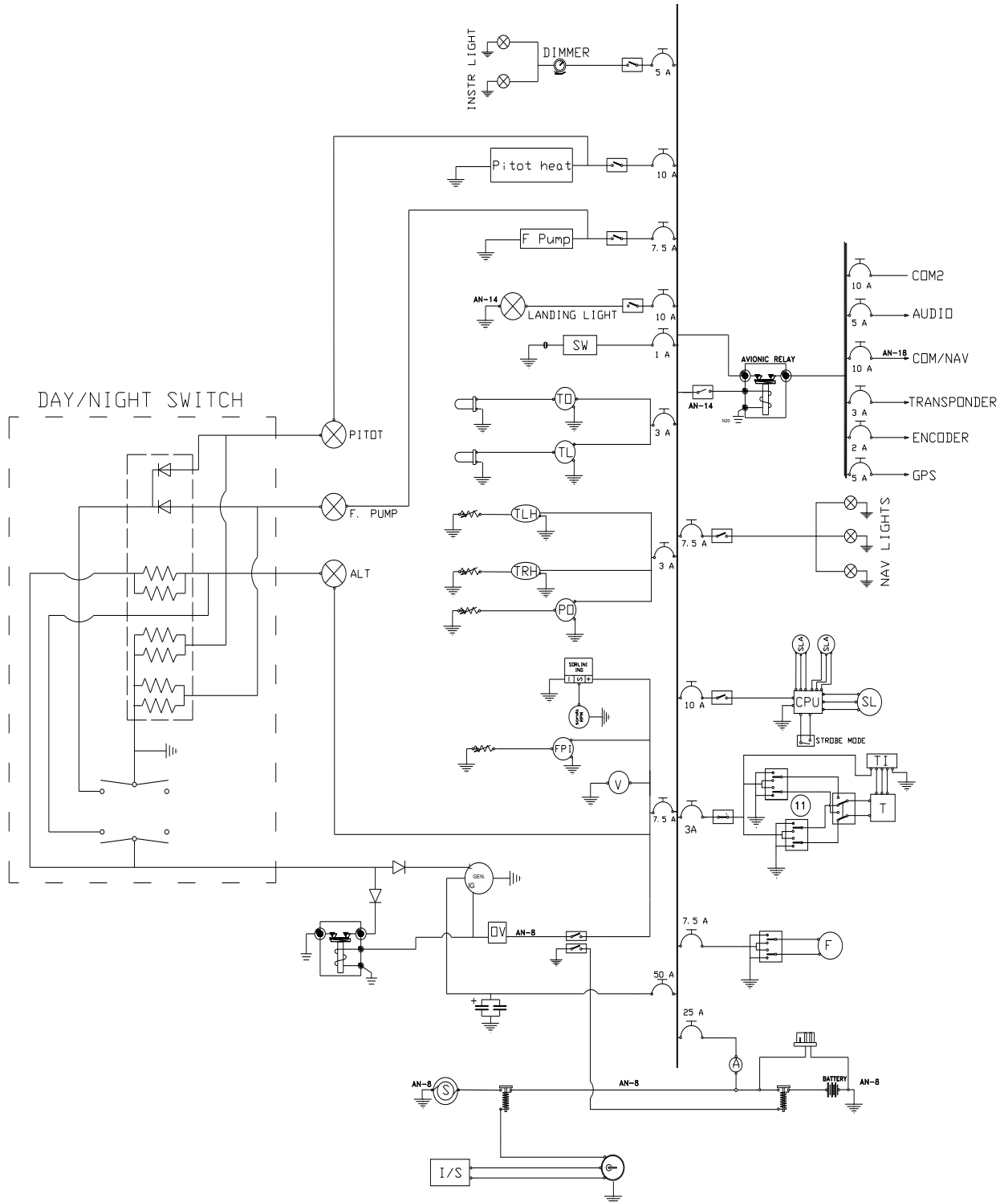
The advisory light informs the pilot that the system is activated but it does not indicate whether it works properly.

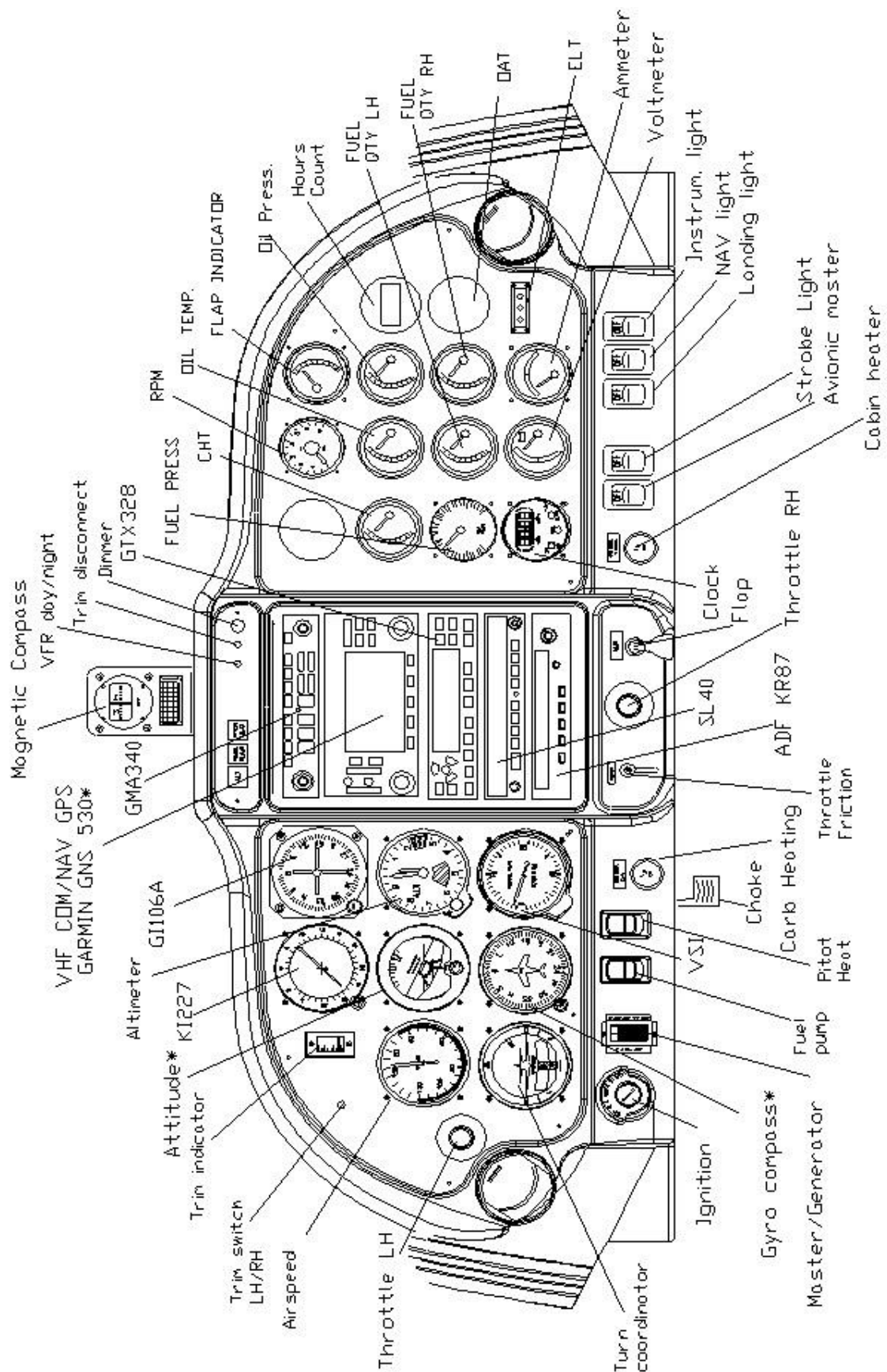
ALTERNATE STATIC PORT

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 layout).





Section 9 - Supplements

Supplement no. A09 - VFR Night Equipment - Analogical Version

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SUPPLEMENT NO. A10

AFMS FOR MALAYSIA REGISTERED AIRCRAFT

Record of Revisions

Rev	Revised page	Description of Revision	Tecnam Approval			EASA Approval or Under DOA Privileges
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List of Effective Pages

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A10-3	Rev 0	A10-6	Rev 0

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Throttle Friction Placard 5

INTRODUCTION

This AFMS, applicable to Malaysia registered airplanes, provides information about instruments panel configuration, parking brake and throttle friction placards

GENERAL

No variations.

LIMITATIONS

No variations.

EMERGENCY PROCEDURES

No variations.

NORMAL OPERATION

No variations.

PERFORMANCE

No variations.

WEIGHT AND BALANCE

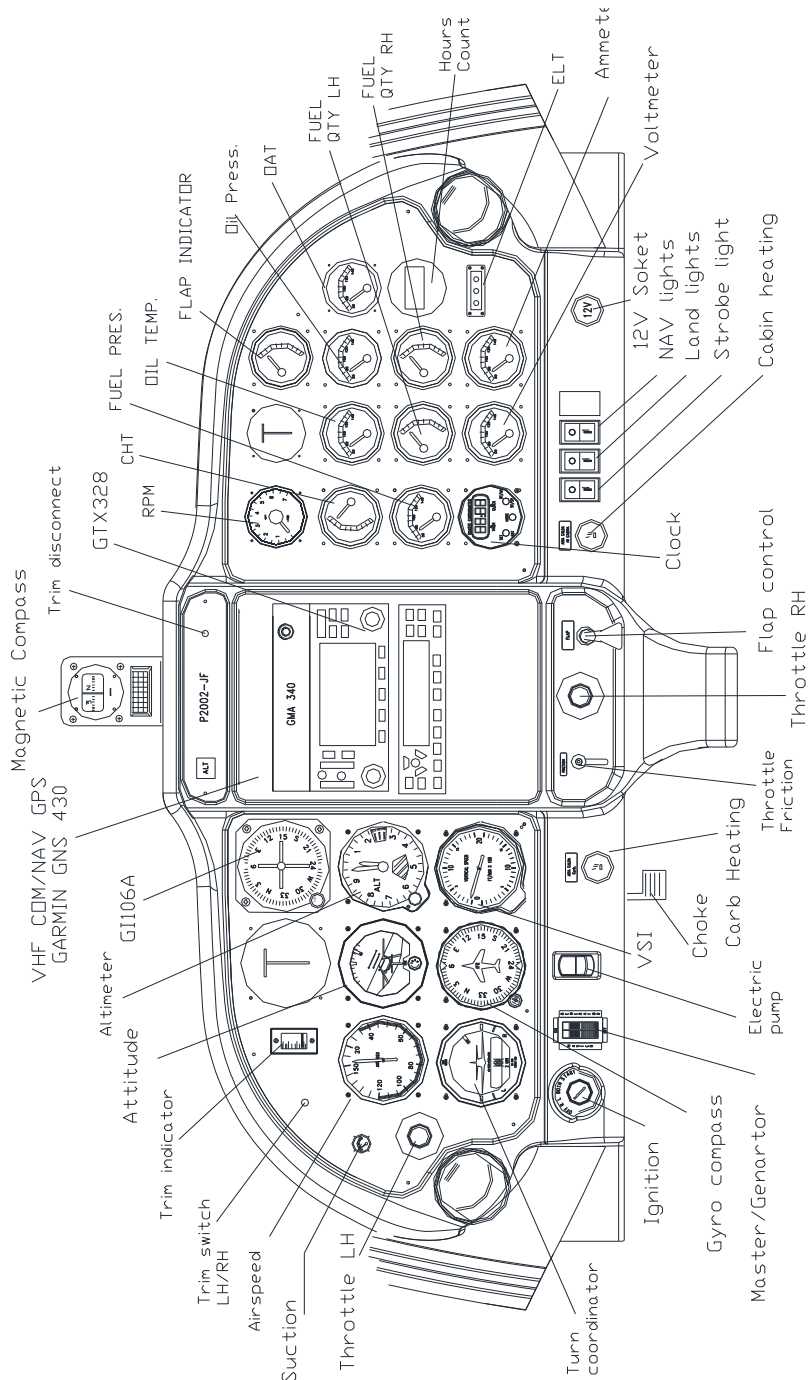
No variations.

SYSTEMS

INSTRUMENT PANEL

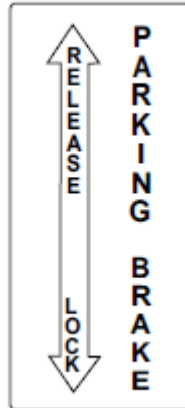
The instruments panel is divided into three main parts. The left part with the flight instruments, central part with the avionic instruments and the right part with the engine instruments.

The following picture show the analogical instruments panel configuration:



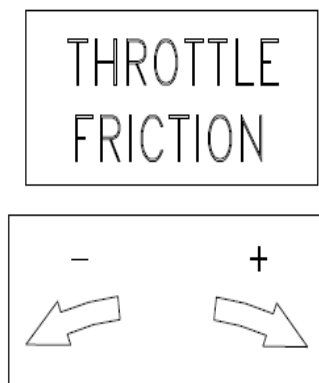
PARKING BRAKE PLACARD

The parking brake placard is located on central tunnel between the two seats:



THROTTLE FRICTION PLACARD

The throttle friction placard is located on central-lower instrument panel:



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SUPPLEMENT NO. A11

INCREASED MTOW (600KG)

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
Cover Pages	A11-1 thru 11	Rev 0
Section 2	W2-3	Rev 0
	W2-4	Rev 0
	W2-13	Rev 0
	W2-14	Rev 0
	W2-19	Rev 0
	W2-20	Rev 0
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INTRODUCTION

This Supplement provides supplemental information to perform Increased Maximum Takeoff Weight (600 kg) operations when the Tecnam Service Bulletin SB 010-CS or Design Change MOD 2002/029 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 A11: pages replacement instructions

SECTION 1 – GENERAL

See basic AFM - Section 1.

Supplement A11: 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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2. SPEED LIMITATION

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

SPEED			KIAS	KCAS	REMARKS
V _{NE}	Never exceed speed		141	138	Do not exceed this speed in any operation.
V _{NO}	Maximum Structural Cruising Speed		112	108	Do not exceed this speed except in smooth air, and only with caution.
V _A	Design Manoeuvring speed		98	96	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	68	70	Do not exceed this speed for indicated flaps setting.
		T.O.	99	97	

3. AIRSPEED INDICATOR MARKINGS

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

MARKING	KIAS	EXPLANATION
White arc	31 – 68	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 – 112	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	112 – 141	Manoeuvres must be conducted with caution and only in smooth air.
Red line	141	Maximum speed for all operations.

12. WEIGHTS

Condition	Weight
Maximum take-off weight	600 kg
Maximum landing weight	600 kg
Maximum zero wing fuel weight	600 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



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	98
Chandelle	112
Steep turn (max 60°)	98
Stall	Slow deceleration (1 kts/s)



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



Limit load factor could be exceeded by moving abruptly flight controls at their end run at a speed above V_A (Manoeuvring Speed: 98 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

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 $V_A = 98$ 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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Supplement A11: pages replacement instructions

SECTION 3 – EMERGENCY PROCEDURES

See basic AFM - Section 3.

Supplement A11: pages replacement instructions

SECTION 4 – NORMAL OPERATION

See basic AFM - Section 4.

Supplement A11: pages replacement instructions

SECTION 5 - PERFORMANCE

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

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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} .

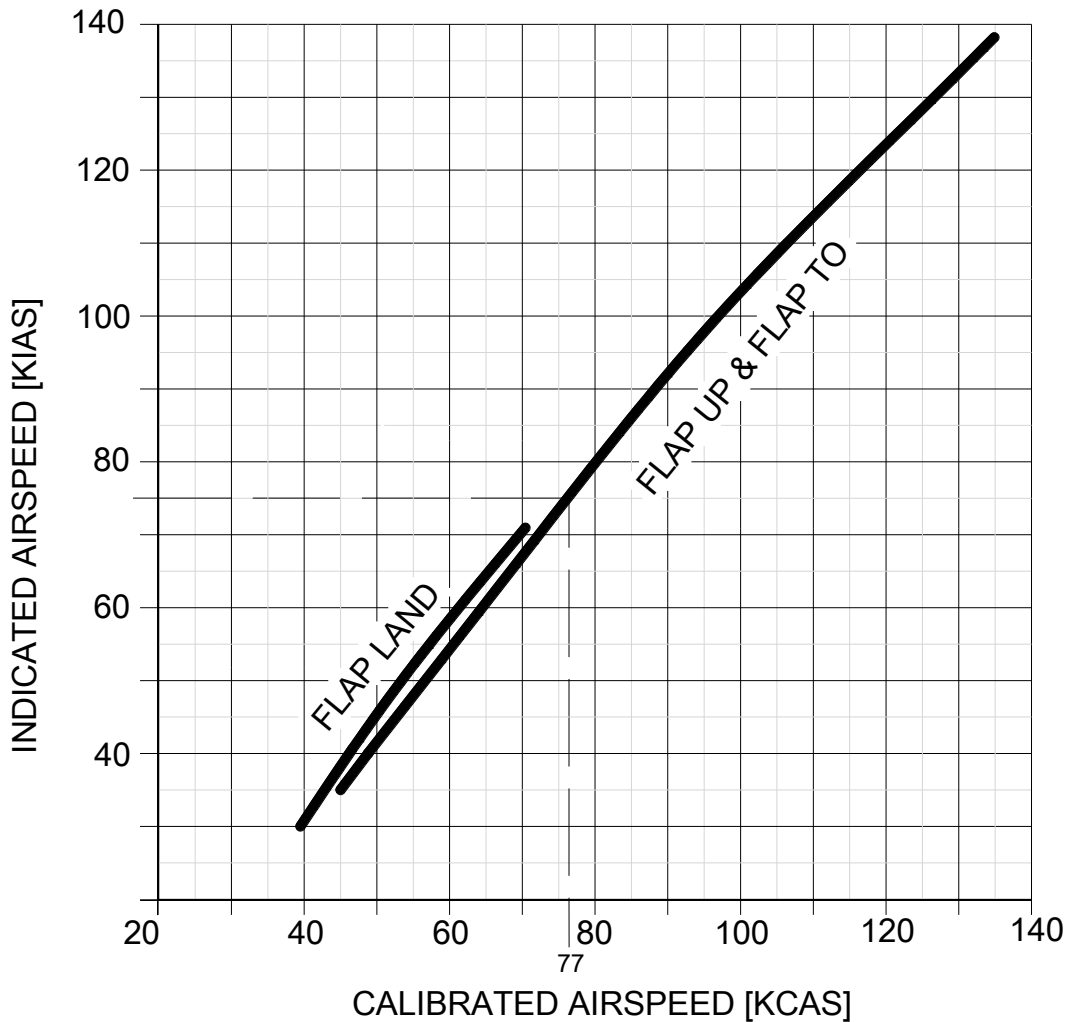


FIG. 5-1. CALIBRATED VS INDICATED AIRSPEED

Example:

Given
KIAS 75

Find
KCAS 74

NOTE

Indicated airspeed assumes 0 as an instrument error

4. ICAO STANDARD ATMOSPHERE

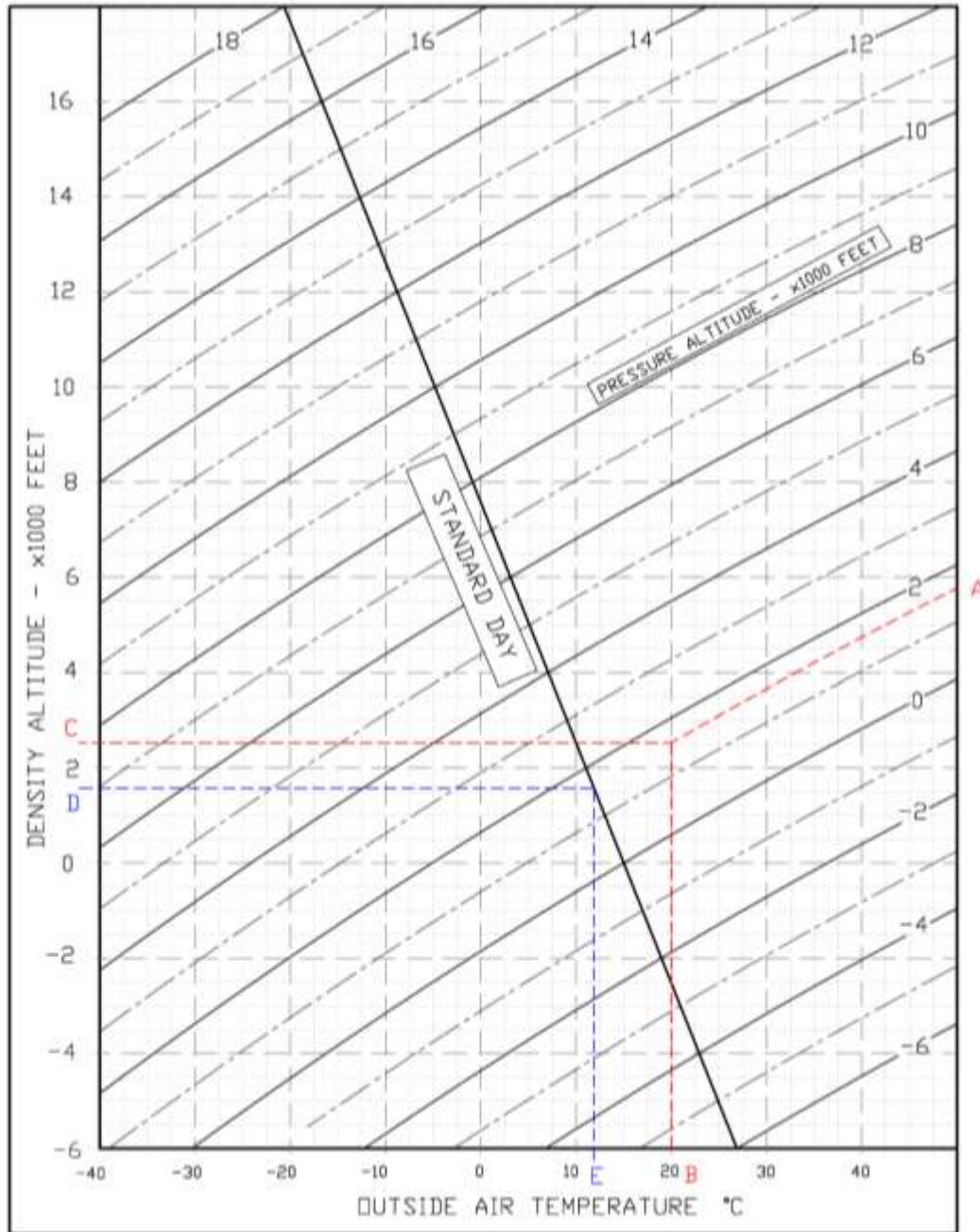


FIG. 5-2. ICAO CHART

Examples:

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

5. STALL SPEED (*APPROVED DATA*)

Weight: 600 kg Throttle Levers: IDLE CG: Most Forward (26%) No ground effect							
WEIGHT [kg]	BANK ANGLE [deg]	STALL SPEED					
		FLAPS 0°		FLAPS T/O		FLAPS FULL	
		KIAS	KCAS	KIAS	KCAS	KIAS	KCAS
600 (FWD C.G.)	0	41	50	36	46	31	40
	15	42	51	37	47	32	40
	30	46	53	41	50	35	43
	45	54	59	48	55	41	47
	60	68	70	62	65	53	56

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

Wind direction (with respect to aircraft longitudinal axis) = 30°

Wind speed = 20 Kts

Find

Headwind = 17.5 Kts

Crosswind = 10 Kts

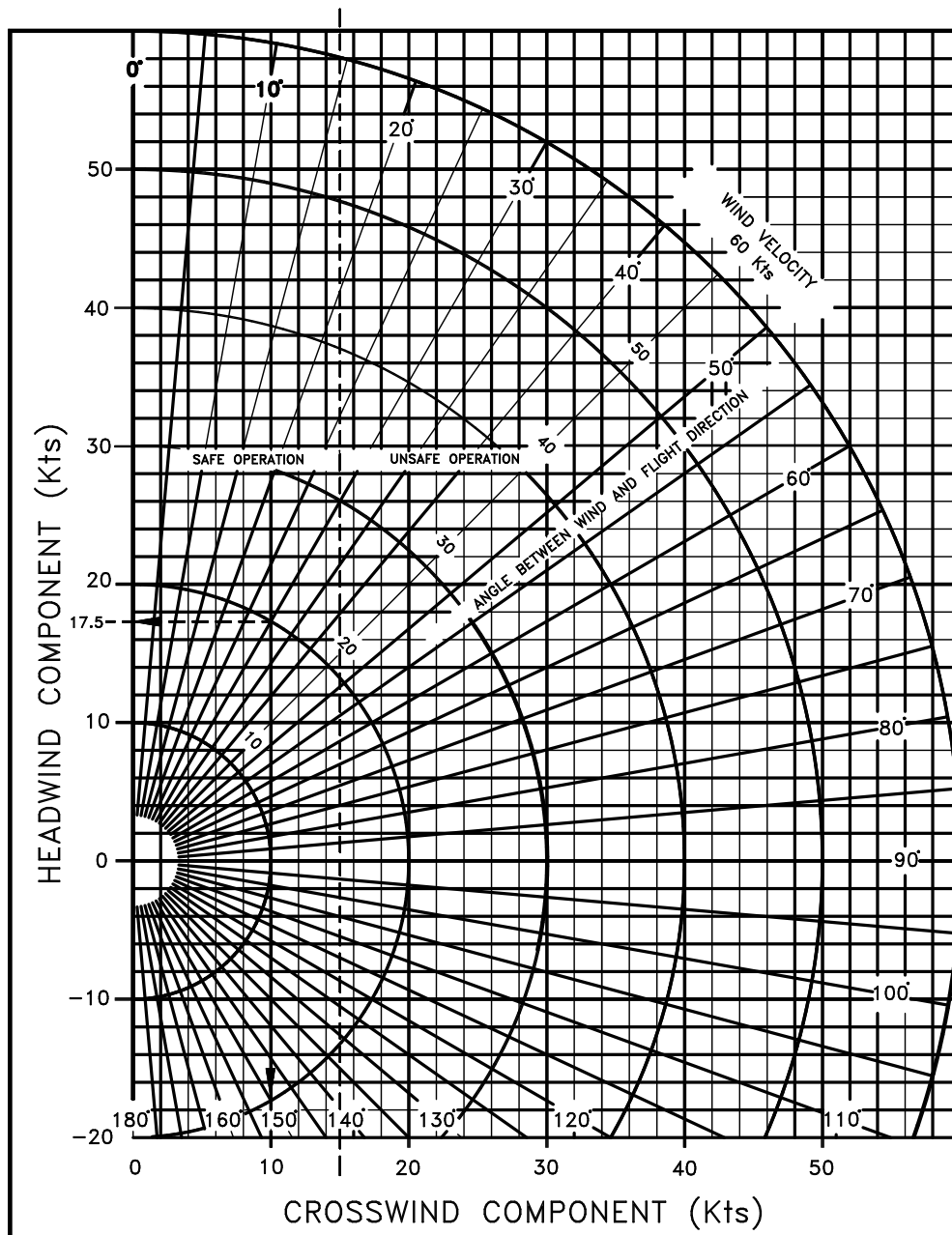


FIG. 5-3. CROSSWIND CHART

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

Pressure Altitude [ft]		Distance [m]				
		Temperature [°C]				ISA
		-25	0	25	50	
S.L.	Ground Roll	142	186	240	304	218
	At 50 ft AGL	232	307	399	508	360
1000	Ground Roll	155	205	264	335	234
	At 50 ft AGL	255	338	439	560	388
2000	Ground Roll	171	225	290	368	252
	At 50 ft AGL	280	372	483	617	419
3000	Ground Roll	188	247	319	406	272
	At 50 ft AGL	308	410	533	681	452
4000	Ground Roll	206	272	352	447	293
	At 50 ft AGL	340	452	588	753	488
5000	Ground Roll	227	300	388	494	316
	At 50 ft AGL	375	499	650	833	527
6000	Ground Roll	250	331	428	545	342
	At 50 ft AGL	414	551	719	923	570
7000	Ground Roll	276	365	473	603	369
	At 50 ft AGL	457	610	797	1023	617
8000	Ground Roll	304	403	523	668	400
	At 50 ft AGL	506	675	883	1135	669
9000	Ground Roll	336	446	580	740	432
	At 50 ft AGL	560	748	980	1262	725
10000	Ground Roll	372	494	643	822	468
	At 50 ft AGL	620	831	1089	1404	787

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Section 5 – Performances (MTOW = 600kg) TAKE-OFF PERFORMANCES (APPROVED DATA)

Pressure Altitude [ft]		Distance [m]					ISA
		Temperature [°C]					
		-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	

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°) V _x = 56 KIAS							
Weight [kg]	Pressure Altitude [ft]	Climb Speed V _y [KIAS]	Rate of Climb [ft/min]				ISA
			Temperature [°C]				
			-25	0	25	50	
600	S.L.	66	1175	932	715	519	799
	2000	66	990	751	538	345	654
	4000	66	806	571	361	172	509
	6000	66	622	391	185	-1	365
	8000	66	439	212	10	-173	220
	10000	66	257	34	-165	-344	75
	12000	65	75	-144	-339	-515	-70
	14000	65	-107	-321	-513	-686	-214
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							
V _x = 56 KIAS							
Weight	Pressure Altitude	Climb Speed V _y	Rate of Climb [ft/min]				ISA
			Temperature [°C]				
[kg]	[ft]	[KIAS]	-25	0	25	50	
600	S.L.	66	1299	1056	839	643	923
	1000	66	1114	875	662	469	778
	2000	66	930	695	485	296	633
	3000	66	746	515	309	123	489
	4000	66	563	336	134	-49	344
	5000	66	381	158	-41	-220	199
	6000	65	199	-20	-215	-391	54
	7000	65	17	-197	-389	-562	-90
550	S.L.	66	1463	1201	966	755	1057
	1000	66	1264	1006	775	567	901
	2000	66	1065	811	584	380	745
	3000	65	866	617	395	194	588
	4000	65	669	424	205	8	432
	5000	65	472	231	17	-177	276
	6000	65	275	39	-172	-362	120
	7000	64	80	-152	-359	-545	-37
500	S.L.	66	1656	1370	1115	884	1213
	1000	66	1439	1157	906	680	1043
	2000	65	1222	945	699	476	873
	3000	65	1006	734	492	273	703
	4000	65	791	524	286	71	533
	5000	64	576	314	80	-131	363
	6000	64	362	105	-125	-332	192
	7000	64	149	-103	-329	-532	22

10. CRUISE PERFORMANCES

Weight: 580 kg Pressure Altitude: 0 ft									
RPM *	ISA – 30°C (-15°C)			ISA (15°C)			ISA + 30°C (45°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: 580 kg Pressure Altitude: 2000 ft									
RPM *	ISA – 30°C (-15°C)			ISA (15°C)			ISA + 30°C (45°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: 580 kg Pressure Altitude: 4000 ft									
RPM *	ISA – 30°C (-15°C)			ISA (15°C)			ISA + 30°C (45°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: 580 kg									
Pressure Altitude: 6000 ft									
RPM*	ISA - 30°C (-15°C)			ISA (15°C)			ISA + 30°C (45°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: 580 kg									
Pressure Altitude: 8000 ft									
RPM*	ISA - 30°C (-15°C)			ISA (15°C)			ISA + 30°C (45°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: 580 kg									
Pressure Altitude: 10000 ft									
RPM*	ISA - 30°C (-15°C)			ISA (15°C)			ISA + 30°C (45°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

11. LANDING PERFORMANCES (*APPROVED DATA*)

Pressure Altitude [ft]		Distance [m]				
		Temperature [°C]				ISA
		-25	0	25	50	
S.L.	Ground Roll	132	146	159	172	154
	At 50 ft AGL	260	286	312	338	302
1000	Ground Roll	137	151	165	179	158
	At 50 ft AGL	269	296	324	351	311
2000	Ground Roll	142	157	171	185	163
	At 50 ft AGL	279	307	336	364	320
3000	Ground Roll	148	162	177	192	168
	At 50 ft AGL	290	319	348	377	330
4000	Ground Roll	153	169	184	199	173
	At 50 ft AGL	301	331	361	392	340
5000	Ground Roll	159	175	191	207	178
	At 50 ft AGL	312	344	375	406	350
6000	Ground Roll	165	182	198	215	184
	At 50 ft AGL	324	357	389	422	361
7000	Ground Roll	171	189	206	223	189
	At 50 ft AGL	337	370	404	438	372
8000	Ground Roll	178	196	214	232	195
	At 50 ft AGL	350	385	420	455	384
9000	Ground Roll	185	204	222	241	202
	At 50 ft AGL	363	400	437	473	396
10000	Ground Roll	192	212	231	250	208
	At 50 ft AGL	378	416	454	492	408

Weight = 550 kg		Corrections				
Flaps: LAND		Headwind: - 5m for each kt (16 ft/kt)				
Short Final Approach Speed = 51 KIAS		Tailwind: + 11m for each kt (36ft/kt)				
Throttle Levers: Idle		Paved Runway: - 2% to Ground Roll				
Runway: Grass		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

Weight = 500 kg		Corrections				
Flaps: LAND		Headwind: - 5m for each kt (16 ft/kt)				
Short Final Approach Speed = 51 KIAS		Tailwind: + 11m for each kt (36ft/kt)				
Throttle Levers: Idle		Paved Runway: - 2% to Ground Roll				
Runway: Grass		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	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	
600	S.L.	657	527	411	306	456
	1000	608	479	364	260	417
	2000	558	430	316	213	379
	3000	509	382	269	167	340
	4000	460	334	222	121	301
	5000	411	286	175	75	263
	6000	362	238	128	29	224
	7000	313	190	81	-17	185
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 **62.58 dB(A)**.

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Supplement A11: pages replacement instructions

SECTION 6 – WEIGHT AND BALANCE

See basic AFM - Section 6.

Supplement A11: pages replacement instructions

SECTION 7 – AIRFRAME AND SYSTEM DESCRIPTION

See basic AFM - Section 7.

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

List of Effective Pages

	Page	Revision
Cover Pages	A12-1 thru 12	Rev 0
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	Rev 0
	W5-6	Rev 1
	W5-7 thru 10	Rev 0
	W5-11 thru 12	Rev 1
	W5-13 thru 20	Rev 0

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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	REPLACES	Basic AFM – Limitations page
W2-3	REPLACES	2-3
W2-4	REPLACES	2-4
W2-13	REPLACES	2-13
W2-14	REPLACES	2-14
W2-20	REPLACES	2-20
W2-21	REPLACES	2-21

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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	<i>FULL</i>	69	71	Do not exceed this speed for indicated flaps setting.
		<i>T.O.</i>	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.

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



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

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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.

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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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} .

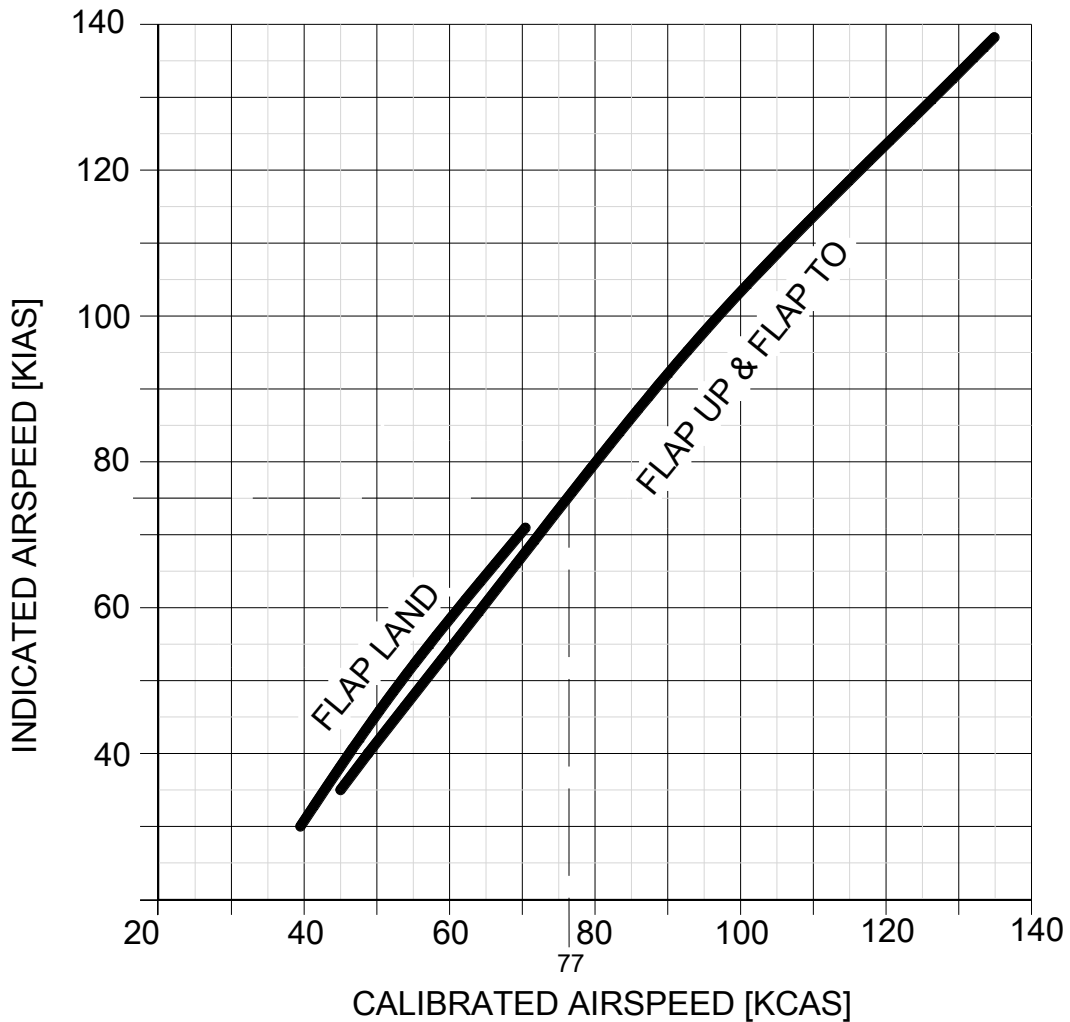


FIG. 5-1. CALIBRATED VS INDICATED AIRSPEED

Example:

<u>Given</u>	<u>Find</u>
KIAS 75	KCAS 74

NOTE

Indicated airspeed assumes 0 as an instrument error

4. ICAO STANDARD ATMOSPHERE

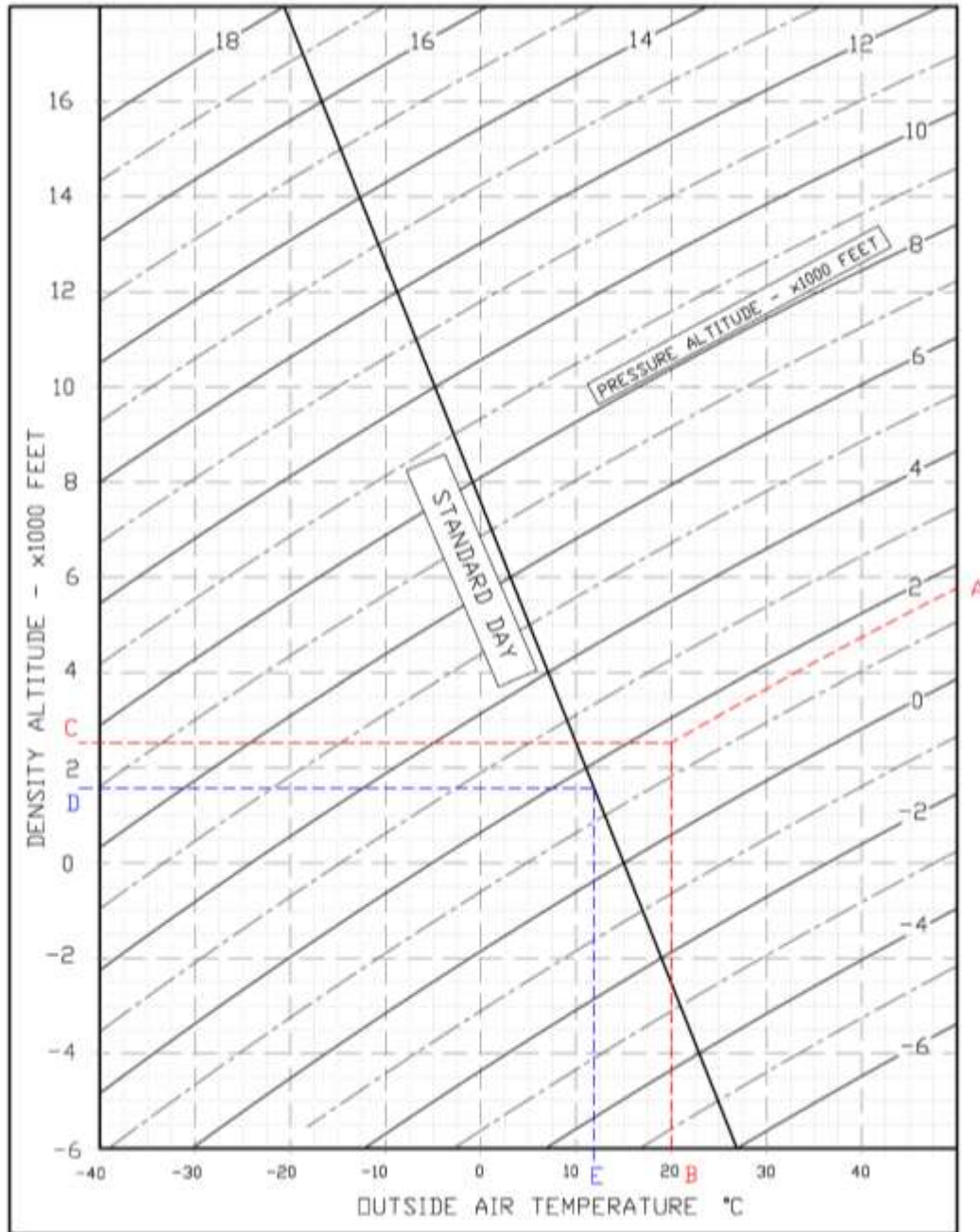


FIG. 5-2. ICAO CHART

Examples:

<u>Scope</u>	<u>Given</u>	<u>Find</u>
<u>Density Altitude:</u>	A: Pressure altitude = 1600ft B: Temperature = 20°C	→ C: Density Altitude = 2550ft
<u>ISA Temperature:</u>	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 [kg]	BANK ANGLE [deg]	STALL SPEED					
		FLAPS 0°		FLAPS T/O		FLAPS FULL	
		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

Wind direction (with respect to aircraft longitudinal axis) = 30°
Wind speed = 20 Kts

Find

Headwind = 17.5 Kts
Crosswind = 10 Kts

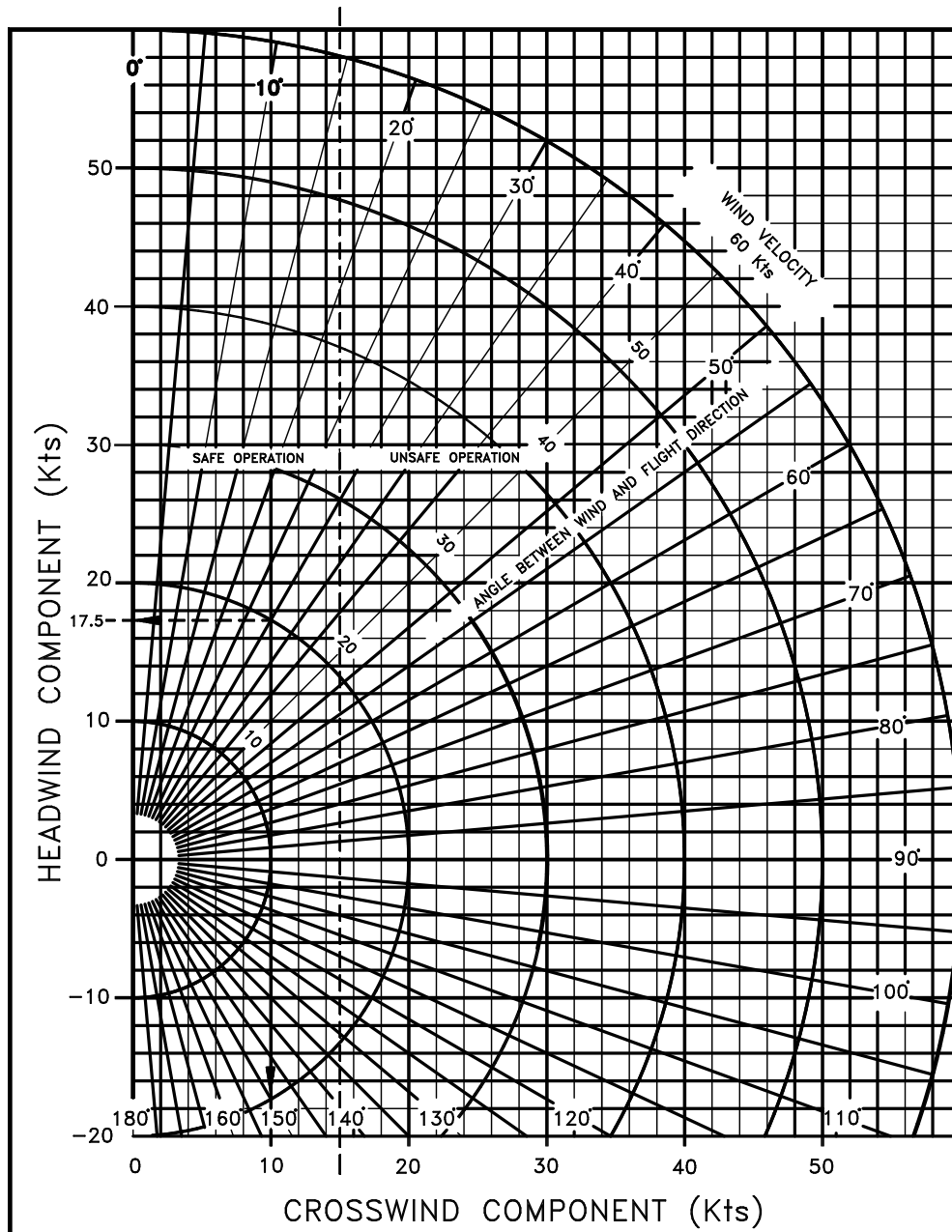


FIG. 5-3. CROSSWIND CHART

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

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

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Section 5 – Performances (MTOW = 620kg) TAKE-OFF PERFORMANCES (*APPROVED DATA*)

Pressure Altitude [ft]		Distance [m]					ISA
		Temperature [°C]					
		-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	

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°) V _x = 56 KIAS							
Weight [kg]	Pressure Altitude [ft]	Climb Speed V _y [KIAS]	Rate of Climb [ft/min]				ISA
			Temperature [°C]				
			-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							
V _x = 56 KIAS							
Weight [kg]	Pressure Altitude [ft]	Climb Speed V _y [KIAS]	Rate of Climb [ft/min]				ISA
			Temperature [°C]				
			-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: 580 kg Pressure Altitude: 0 ft									
RPM *	ISA – 30°C (-15°C)			ISA (15°C)			ISA + 30°C (45°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: 580 kg Pressure Altitude: 2000 ft									
RPM *	ISA – 30°C (-15°C)			ISA (15°C)			ISA + 30°C (45°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: 580 kg Pressure Altitude: 4000 ft									
RPM *	ISA – 30°C (-15°C)			ISA (15°C)			ISA + 30°C (45°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: 580 kg									
Pressure Altitude: 6000 ft									
RPM *	ISA – 30°C (-15°C)			ISA (15°C)			ISA + 30°C (45°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: 580 kg									
Pressure Altitude: 8000 ft									
RPM *	ISA – 30°C (-15°C)			ISA (15°C)			ISA + 30°C (45°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: 580 kg									
Pressure Altitude: 10000 ft									
RPM *	ISA – 30°C (-15°C)			ISA (15°C)			ISA + 30°C (45°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

11. LANDING PERFORMANCES (*APPROVED DATA*)

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

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

Weight = 550 kg

Corrections

Flaps: *LAND*

Short Final Approach Speed = 51 KIAS

Throttle Levers: *Idle*

Runway: *Grass*

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%

Weight = 500 kg		Corrections				
Flaps: LAND		Headwind: - 5m for each kt (16 ft/kt)				
Short Final Approach Speed = 51 KIAS		Tailwind: + 11m for each kt (36ft/kt)				
Throttle Levers: Idle		Paved Runway: - 2% to Ground Roll				
Runway: Grass		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	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 [kg]	Pressure Altitude [ft]	Rate of Climb [ft/min]				ISA
		Temperature [°C]				
		-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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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. A13

VARIABLE PITCH PROPELLER

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
Cover Pages	A13-1 thru 16	Rev 0
Section 1	VP1 thru 2	Rev 0
	VP1-5 thru 8	Rev 0
Section 2	VP2-5 thru 8	Rev 0
Section 3	VP3-1 thru 2	Rev 0
	VP9 thru 12	Rev 0
Section 4	VP4-7 thru 12	Rev 0
Section 5	VP5-1 thru 20	Rev 0
Section 6	VP6-11	Rev 0
	VP6-12 thru 14	Rev 1
Section 7	VP7-3,4,7,8	Rev 0

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INTRODUCTION

This Supplement provides supplemental information when the Tecnam Service Bulletin SB 119-CS or Design Change MOD 2002/127 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 Variable Pitch Propeller Design Change in subject.

The application of this supplement invalidate the supplement A05 “Central Throttle control system”.

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

Supplement A13: pages replacement instructions

SECTION 1 – GENERAL

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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.

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 S3
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	Joint Airworthiness Requirements JAR-P Propellers, Change 7 inclusive
Type Certificate	LBA TCDS 32.130/88 dated 20/08/2003
Model	HOV352F1/C170FQ+8
Number of blades:	2
Diameter	1780 mm (no reduction allowed)
Type	Variable pitch – wood

3.4 GOVERNOR

Manufacturer	Jihostroj
Model	P-110-030/A
Type	Hydraulic

3.5 FUEL

Approved fuel:	MOGAS ASTM D4814 MOGAS EN 228 Super/Super Plus (Min RON 95) AVGAS 100LL (ASTM D910) <i>(see also Section 2)</i>
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 tank	50 litres
Tanks overall capacity	100 litres
Overall usable fuel	99 litres
Overall unusable fuel	1 litre

3.6 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

3.7 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.

3.8 WEIGHTS

See Section 2.

3.9 STANDARD WEIGHTS

Empty Weight: see weighing record on Section 6

3.10 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

NOTE

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

Supplement A13: pages replacement instructions

SECTION 2 – LIMITATIONS

Apply following pages replacement procedure:

Supplement A13 – Limitations page	REPLACES	Basic AFM – Limitations page
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VP2-8	REPLACES	2-8

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4. POWERPLANT LIMITATIONS

Following table reports the operating limitations for aircraft engine installed:

ENGINE MANUFACTURER: Bombardier Rotax GmbH.

ENGINE MODEL: 912 S3

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
Min/Max Oil	50° C / 130° C
Oil normal operating range (approx.)	90° C / 110° C

Oil Pressure:

Minimum	0.8 Bar / 12 psi	(below 1400 rpm prop)
Normal	2 – 5 Bar / 29-73 psi	(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.

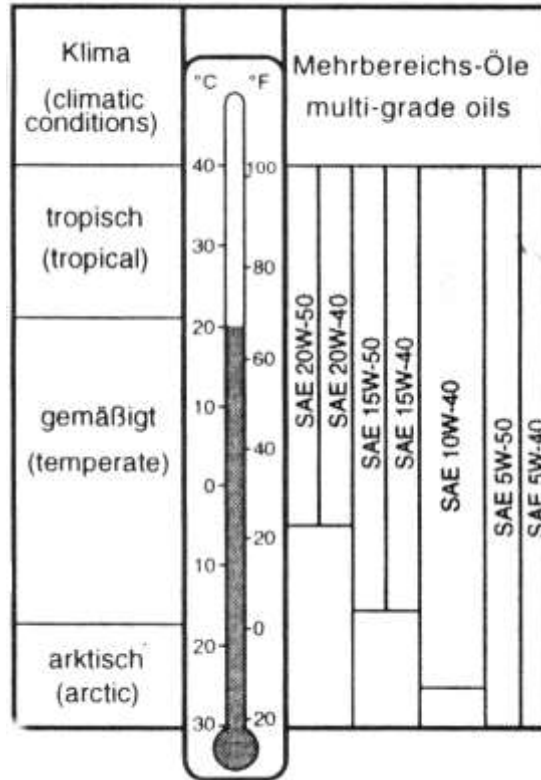
Fuel pressure:

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 and 893114*

5. LUBRICANT

Use viscosity grade oil as specified in the following table:



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:	HOV352F1/C170FQ+8
TYPE:	Wood twin blade variable pitch
DIAMETER:	1780 mm (no reduction permitted)

Supplement A13: pages replacement instructions

SECTION 3 – EMERGENCY PROCEDURES

Apply following pages replacement procedure:

Supplement A13 – Limitations		Basic AFM – Limitations
page		page
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4. ENGINE FAILURE

4.1. ENGINE FAILURE DURING TAKE-OFF RUN

- | | |
|---------------------|-----------------------------|
| 1. Throttle: | <i>IDLE (fully out)</i> |
| 2. Rudder | <i>Keep heading control</i> |
| 3. Brakes: | <i>apply as needed</i> |

When safely stopped:

- | | |
|---------------------------------|-------------|
| 4. Magnetos: | <i>OFF.</i> |
| 5. Fuel selector valve: | <i>OFF</i> |
| 6. Electric fuel pump: | <i>OFF</i> |
| 7. Generator & Master switches: | <i>OFF.</i> |

4.2. ENGINE FAILURE IMMEDIATELY AFTER TAKE-OFF

- | | |
|---|-----------------------------|
| 1. Speed: | <i>keep minimum 51 kias</i> |
| 2. Find a suitable place to land safely. | |



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: | <i>as needed.</i> |
|------------------|-------------------|



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: | <i>IDLE (fully out)</i> |
| 5. Magnetos: | <i>OFF.</i> |
| 6. Fuel selector valve: | <i>OFF</i> |
| 7. Electric fuel pump: | <i>OFF</i> |
| 8. Generator & Master switches: | <i>OFF</i> |



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.**

4.3.2 Oil Pressure limits exceedance

If oil pressure exceeds upper limit (7 bar):

1. Throttle Lever *REDUCE engine power as practical*
2. Propeller Lever *Keep higher than 2000 RPM*
3. OIL PRESS *CHECK within limits*
4. **Land as soon as practical**

If oil pressure is under 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*
2. Propeller Lever *Keep higher than 2000 RPM*

If oil temperature does not decrease

3. 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.

4. **Land as soon as practical**

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

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

4.3.4 CHT limit exceedance

If CHT is above 135°C:

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

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

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

4.3.5 Propeller overspeeding

The aircraft is fitted with propeller/governor set by Hoffman-Propeller such a way that the maximum propeller rpm exceedance is prevented.

In case of propeller overspeeding in flight, apply following procedure:

1. Throttle Lever *REDUCE power to minimum practical*
2. Propeller Lever *REDUCE as practical*
3. Airspeed *REDUCE as practical*
4. RPM indicator *CHECK*

If it is not possible to decrease propeller rpm and avoid overspeed:

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



Maximum propeller rpm exceedance may cause the engine components damage. Propeller and engine shall be inspected in accordance with related Operators Manuals.

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 | <i>ON if required</i> |
| 2. Electrical fuel pump | <i>ON</i> |
| 3. Fuel quantity indicator | <i>CHECK</i> |
| 4. Fuel Selector | <i>change the fuel feeding tank</i> |
| 5. Throttle lever | <i>IDLE</i> |
| 6. Propeller lever | <i>Full forward</i> |
| 7. Magnetos | <i>BOTH</i> |
| 8. Magnetos | <i>START</i> |
| 9. Propeller lever | <i>SET as required</i> |
| 10. Throttle lever | <i>SET as required</i> |



CAUTION

After engine restart, if practical, moderate propeller rpm and throttle increase to allow OIL and CHT 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 | <i>OFF</i> |
| 2. Electrical fuel pump | <i>OFF</i> |
| 3. Magnetos | <i>OFF</i> |
| 4. Throttle lever | <i>FULL POWER</i> |
| 5. Propeller lever | <i>FULL FORWARD</i> |
| 6. Cabin Heat | <i>OFF</i> |
| 7. Generator & Master Switches | <i>OFF</i> |
| 8. Parking Brake | <i>ENGAGED</i> |
| 9. Aircraft Evacuation | <i>carry out immediately</i> |

6.2. ENGINE FIRE DURING TAKEOFF

BEFORE ROTATION: ABORT TAKE OFF

- | | |
|-------------------|-----------------------------|
| 1. Throttle Lever | IDLE |
| 2. Rudder | <i>Keep heading control</i> |
| 3. Brakes | <i>As required</i> |

With aircraft under control

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

Supplement A13: pages replacement instructions

SECTION 4 – NORMAL OPERATION

Apply following pages replacement procedure:

Supplement A13 – Limitations page		Basic AFM – Limitations page
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VP4-11	REPLACES	4-11
VP4-12	REPLACES	4-12

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CHECKLISTS**1.1. 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 and propeller lever 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. Avionic Master switch (if installed): *ON, instruments check, then set in OFF position*
10. Flap control: *cycle fully extended and then set T/O*
11. Pitch Trim: *cycle fully up and down, from both left and right controls, check for trim disconnect switch operation.*
12. 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.

13. Nav. light & Strobe light: *ON*
14. 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.

15. 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.

1.2. ENGINE STARTING

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



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.

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

1.3. 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*

1.4. TAXIING

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

1.5. 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 max 130 rpm propeller speed drop;*
 - b. Select BOTH: *check propeller speed 1640 rpm;*
 - c. Select RIGHT: *check max 130 rpm propeller speed drop and max difference between LEFT and RIGHT 50 rpm,*
 - d. 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. Propeller lever: *Maximum to minimum travel for three times: check MAP increasing, RPM decreasing and oil pressure surge. Verify 1640 RPM are restored with prop lever at full forward position*
10. Flaps: *set T/O (15°)*
11. Pitch trim: *check neutral*
12. Flight controls: *check free*
13. Seat belts: *checked fastened*
14. Canopy: *check closed and locked on three points.*

1.6. TAKE-OFF AND CLIMB



WARNING

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



CAUTION

To avoid overboost engine power reduction shall be performed starting with throttle reduction and then propeller speed reduction; instead engine power increase shall be performed starting with propeller speed rise and then power lever set forward.

1. Parking brake: *OFF*
2. Carburetor heat: *OFF*
3. Check magnetic compass and gyro direction indicator alignment
4. Propeller: *FULL FORWARD*
5. Throttle lever set full power: *check approximately 2100 ± 100 propeller rpm*
6. Engine instruments: *check*
7. Rotation speed V_R :

	MTOW 580kg	MTOW 600kg	MTOW 620kg
<i>Rotation Speed (V_R)</i>	<i>42 KIAS</i>	<i>42 KIAS</i>	<i>42 KIAS</i>

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

	MTOW 580kg	MTOW 600kg	MTOW 620kg
<i>Best of Rate Climb Speed (V_Y)</i>	<i>68 KIAS</i>	<i>68 KIAS</i>	<i>68 KIAS</i>

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

1.7. CRUISE



CAUTION

To avoid overboost engine power reduction shall be performed starting with throttle reduction and then propeller speed reduction; instead engine power increase shall be performed starting with propeller speed rise and then power lever set forward.

1. Propeller speed: set at or below 2250 rpm
2. Check engine instruments within limits
3. Carburettor heat as needed, see paragraph on carb. heat in Section 3.

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.

NOTE

1.8. BEFORE LANDING

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

Flaps: set T/O (15°)

	MTOW 580kg	MTOW 600kg	MTOW 620kg
<i>Approach Speed</i>	66 KIAS	66 KIAS	66 KIAS

6. On final leg:

Flaps: set Land (40°)

	MTOW 580kg	MTOW 600kg	MTOW 620kg
<i>Final Approach Speed</i>	51 KIAS	51 KIAS	51 KIAS

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

1.9. BALKED LANDING



CAUTION

To avoid overboost engine power reduction shall be performed starting with throttle reduction and then propeller speed reduction; instead engine power increase shall be performed starting with propeller speed rise and then power lever set forward.

1. Propeller: *FULL FORWARD*
2. Throttle: *FULL POWER*
3. Speed: keep over *61 KIAS*, Flaps position: *TO*
4. Climb to V_Y or V_X as applicable
5. Flaps position: *UP*
6. Electric fuel pump: *ON*

1.10. AFTER LANDING

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

1.11. 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*

1.12. 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*

Supplement A13: pages replacement instructions

SECTION 5 - PERFORMANCE

Supplement A13 – Performances pages replace basic AFM Section 5 as a whole.

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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} .

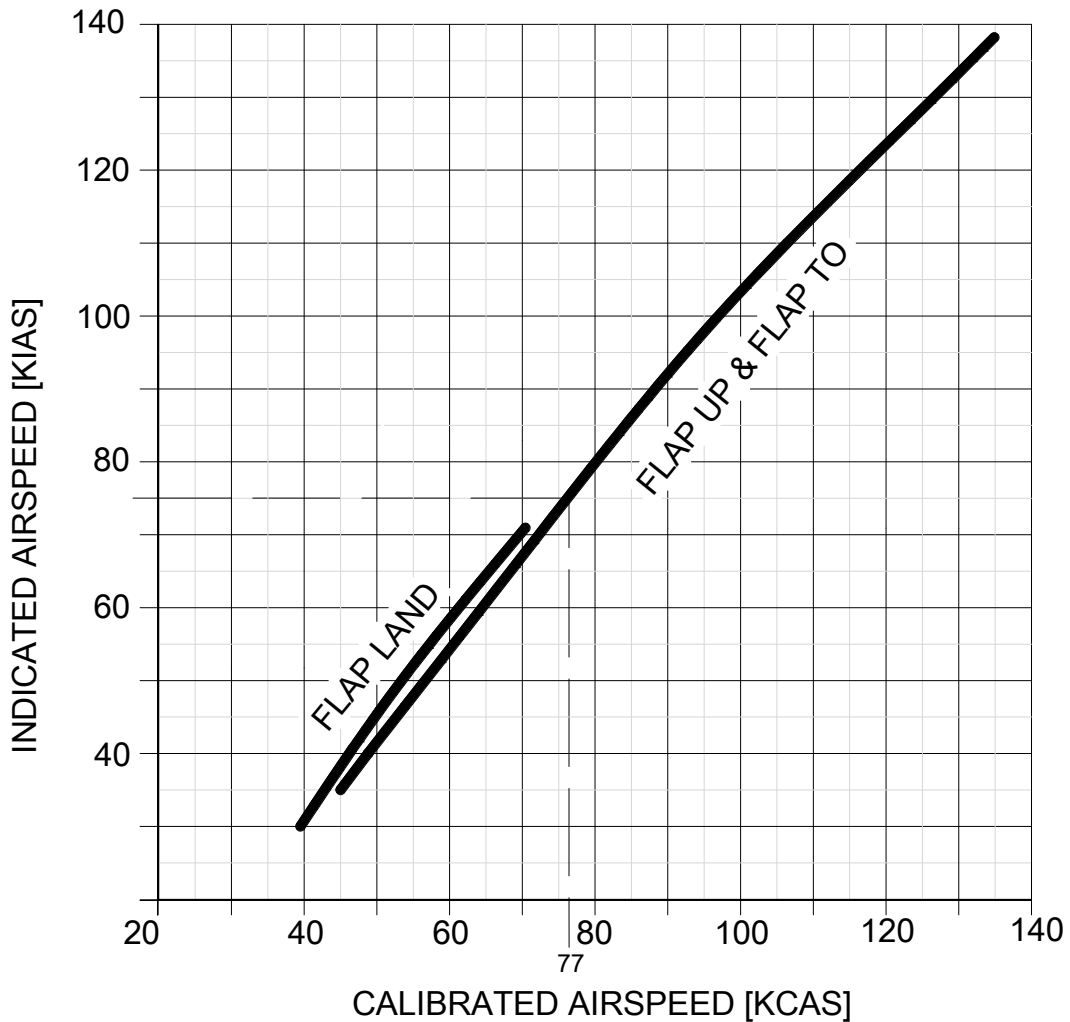


FIG. 5-1. CALIBRATED VS INDICATED AIRSPEED

Example:

<u>Given</u>	<u>Find</u>
KIAS 75	KCAS 74

NOTE

Indicated airspeed assumes 0 as an instrument error

4. ICAO STANDARD ATMOSPHERE

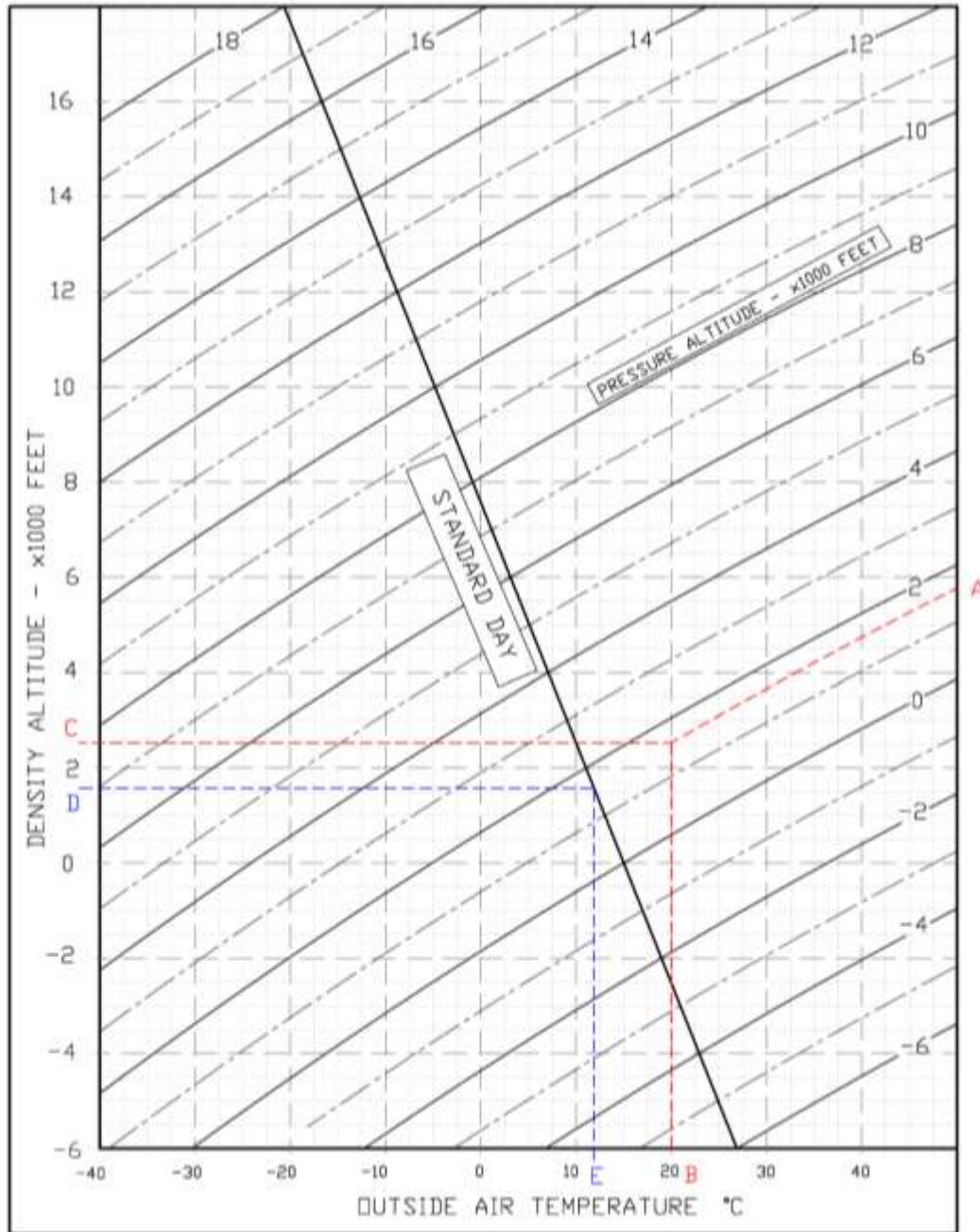


FIG. 5-2. ICAO CHART

Examples:

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

5. STALL SPEED (*APPROVED DATA*)

Throttle Levers: <i>IDLE</i> CG: <i>Most Forward (26%)</i> No ground effect							
MTOW	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
600 (FWD C.G.)	0	41	50	36	46	31	40
	15	42	51	37	47	32	40
	30	46	53	41	50	35	43
	45	54	59	48	55	41	47
	60	68	70	62	65	53	56
580 (FWD C.G.)	0	40	49	35	46	30	39
	15	41	50	36	47	31	40
	30	45	53	40	49	34	42
	45	53	58	47	54	41	47
	60	67	70	61	65	53	56

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

Wind direction (with respect to aircraft longitudinal axis) = 30°
 Wind speed = 20 Kts

Find

Headwind = 17.5 Kts
 Crosswind = 10 Kts

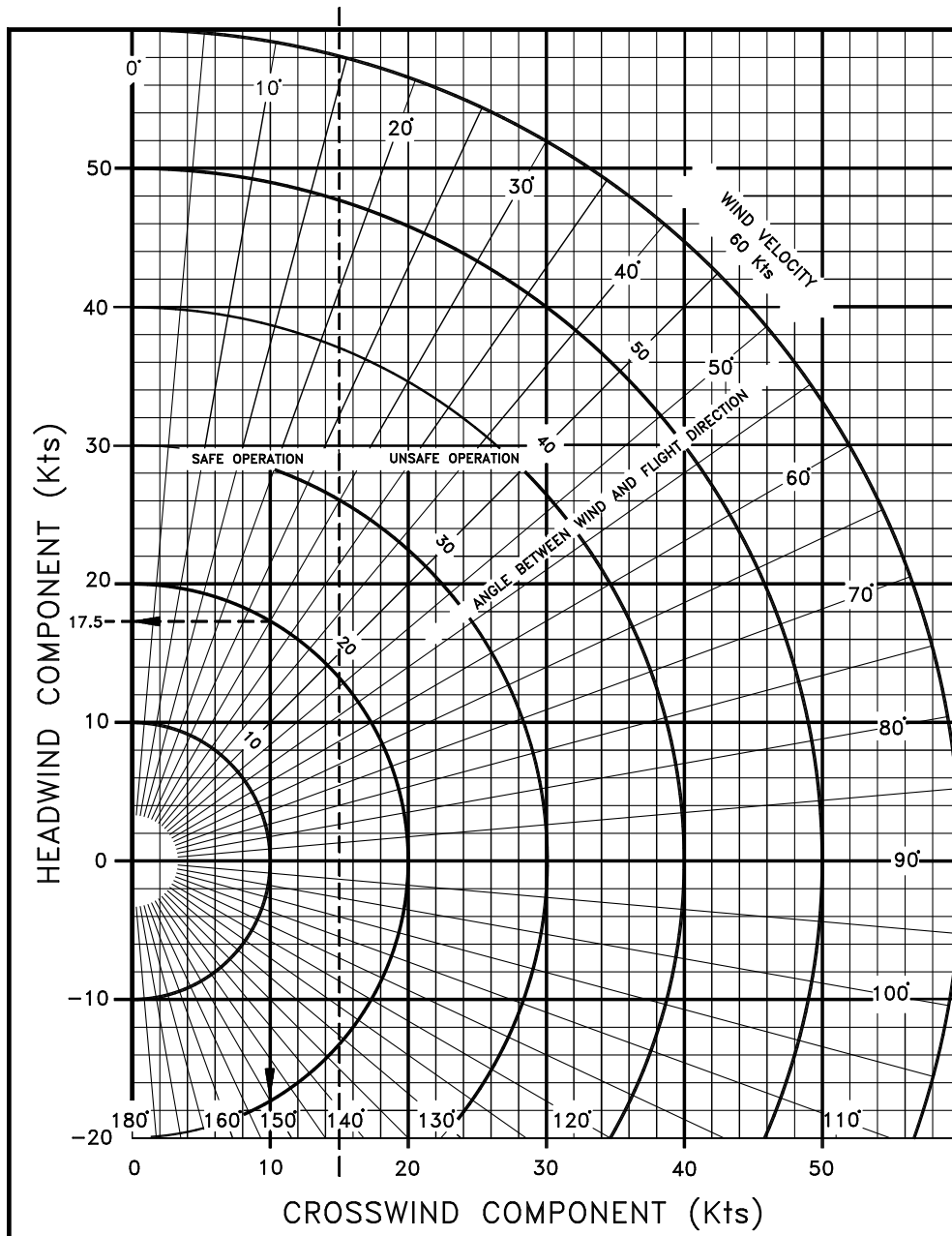


FIG. 5-3. CROSSWIND CHART

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

Weight = 620 kg		Corrections				
Flaps: Take-Off (15°)		Headwind: - 5m for each kt (16 ft/kt)				
Speed at Lift-Off = 42 KIAS		Tailwind: + 15m for each kt (50ft/kt)				
Speed Over 50ft Obstacle = 52 KIAS		Paved Runway: - 6% to Ground Roll				
Throttle Levers: Full Forward		Runway slope: + 5% to Ground Roll for each +1%				
Runway: Grass						
Pressure Altitude [ft]		Distance [m]				
		Temperature [°C]				ISA
		-25	0	25	50	
S.L.	Ground Roll	143	176	213	253	192
	At 50 ft AGL	246	303	367	436	330
1000	Ground Roll	159	195	236	280	216
	At 50 ft AGL	274	337	407	485	373
2000	Ground Roll	174	214	258	307	234
	At 50 ft AGL	301	370	447	532	404
3000	Ground Roll	191	234	283	336	252
	At 50 ft AGL	330	406	491	584	438
4000	Ground Roll	209	256	309	367	272
	At 50 ft AGL	361	444	537	639	473
5000	Ground Roll	228	280	338	402	294
	At 50 ft AGL	396	487	588	700	511
6000	Ground Roll	250	307	370	440	317
	At 50 ft AGL	434	534	645	768	553
7000	Ground Roll	274	337	406	483	344
	At 50 ft AGL	477	587	709	844	600
8000	Ground Roll	301	370	446	530	372
	At 50 ft AGL	525	646	781	929	651
9000	Ground Roll	330	406	490	582	403
	At 50 ft AGL	577	710	858	1021	705
10000	Ground Roll	363	446	538	639	436
	At 50 ft AGL	635	781	944	1124	765

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Section 5 – Performances (Variable Pitch Propeller)

TAKE-OFF PERFORMANCES (*APPROVED DATA*)

Weight = 550 kg		Corrections				
Flaps: Take-Off (15°)		Headwind: - 5m for each kt (16 ft/kt)				
Speed at Lift-Off = 42 KIAS		Tailwind: + 15m for each kt (50ft/kt)				
Speed Over 50ft Obstacle = 52 KIAS		Paved Runway: - 6% to Ground Roll				
Throttle Levers: Full Forward		Runway slope: + 5% to Ground Roll for each +1%				
Runway: Grass						
Pressure Altitude [ft]		Distance [m]				
		Temperature [°C]				ISA
		-25	0	25	50	
S.L.	Ground Roll	105	129	156	185	141
	At 50 ft AGL	181	222	268	320	242
1000	Ground Roll	116	143	172	205	158
	At 50 ft AGL	201	247	298	355	273
2000	Ground Roll	128	157	189	225	171
	At 50 ft AGL	220	271	327	390	296
3000	Ground Roll	140	172	207	246	185
	At 50 ft AGL	242	297	359	428	321
4000	Ground Roll	153	188	226	269	199
	At 50 ft AGL	264	326	393	468	346
5000	Ground Roll	167	205	248	294	215
	At 50 ft AGL	290	357	431	513	374
6000	Ground Roll	183	225	271	322	232
	At 50 ft AGL	318	391	473	563	405
7000	Ground Roll	201	247	297	353	252
	At 50 ft AGL	349	430	520	618	439
8000	Ground Roll	220	271	327	388	273
	At 50 ft AGL	384	473	572	681	477
9000	Ground Roll	242	297	358	426	295
	At 50 ft AGL	423	520	628	748	517
10000	Ground Roll	266	326	394	468	319
	At 50 ft AGL	465	572	692	823	560

Pressure Altitude [ft]		Distance [m]					ISA
		Temperature [°C]					
		-25	0	25	50		
S.L.	Ground Roll	82	101	122	144	110	
	At 50 ft AGL	141	173	210	249	189	
1000	Ground Roll	91	112	135	160	124	
	At 50 ft AGL	157	193	233	277	213	
2000	Ground Roll	100	122	148	175	134	
	At 50 ft AGL	172	211	256	304	231	
3000	Ground Roll	109	134	162	192	144	
	At 50 ft AGL	189	232	280	334	250	
4000	Ground Roll	119	146	177	210	156	
	At 50 ft AGL	206	254	307	365	270	
5000	Ground Roll	130	160	193	230	168	
	At 50 ft AGL	226	278	336	400	292	
6000	Ground Roll	143	175	212	251	181	
	At 50 ft AGL	248	305	369	439	316	
7000	Ground Roll	157	192	232	276	196	
	At 50 ft AGL	273	336	406	483	343	
8000	Ground Roll	172	211	255	303	213	
	At 50 ft AGL	300	369	446	531	372	
9000	Ground Roll	189	232	280	333	230	
	At 50 ft AGL	330	406	491	584	403	
10000	Ground Roll	207	255	307	365	249	
	At 50 ft AGL	363	447	540	643	437	

8. TAKE-OFF RATE OF CLIMB

Power Setting: Maximum Continuous Power Flaps: Take-Off (15°) V _x = 60 KIAS							
Weight [kg]	Pressure Altitude [ft]	Climb Speed V _y [KIAS]	Rate of Climb [ft/min]				ISA
			Temperature [°C]				
			-25	0	25	50	
620	S.L.	64	1059	892	742	607	800
	2000	62	932	767	620	487	700
	4000	61	805	643	498	367	600
	6000	59	678	519	376	248	500
	8000	58	552	395	255	129	400
	10000	56	426	272	135	11	300
	12000	55	300	149	15	-107	200
	14000	53	175	27	-105	-224	100
550	S.L.	64	1263	1078	913	765	977
	2000	62	1123	941	779	632	867
	4000	61	983	804	645	501	757
	6000	60	843	668	511	370	647
	8000	58	704	531	378	239	537
	10000	57	565	396	245	108	427
	12000	55	427	261	112	-21	317
	14000	54	289	126	-20	-151	207
500	S.L.	63	1438	1238	1059	898	1128
	2000	62	1286	1089	913	755	1009
	4000	61	1134	941	768	612	890
	6000	60	983	793	623	470	770
	8000	58	832	645	478	328	651
	10000	57	682	498	334	187	532
	12000	56	532	352	191	46	413
	14000	54	383	206	48	-94	293

9. EN-ROUTE RATE OF CLIMB

Power Setting: Maximum Continuous Power Flaps: UP V _x = 63 KIAS							
Weight [kg]	Pressure Altitude [ft]	Climb Speed V _y [KIAS]	Rate of Climb [ft/min]				
			Temperature [°C]				ISA
			-25	0	25	50	
620	S.L.	68	1214	1043	891	754	950
	2000	67	1084	916	767	632	848
	4000	66	955	790	643	510	747
	6000	65	826	664	519	389	645
	8000	64	698	539	397	268	544
	10000	63	570	413	274	148	442
	12000	62	442	289	152	28	341
	14000	61	315	165	30	-91	239
550	S.L.	68	1424	1240	1076	928	1140
	2000	67	1284	1104	942	797	1030
	4000	66	1145	968	809	666	921
	6000	65	1006	832	676	536	812
	8000	64	868	697	544	406	702
	10000	63	730	562	412	276	593
	12000	62	593	427	280	147	483
	14000	61	456	294	149	18	374
500	S.L.	68	1606	1410	1235	1077	1303
	2000	67	1457	1264	1092	937	1186
	4000	66	1308	1119	950	797	1069
	6000	65	1160	974	808	658	952
	8000	64	1012	830	666	519	835
	10000	63	865	686	525	381	719
	12000	62	719	542	385	243	602
	14000	61	573	399	245	106	48

10. CRUISE PERFORMANCES

Weight: 580 kg Pressure Altitude: 0 ft										
RPM *	MAP [inHg]	ISA - 30°C (-15°C)			ISA (15°C)			ISA + 30°C (45°C)		
		PWR	KTAS	F.C. ** [lt/hr]	PWR	KTAS	F.C. ** [lt/hr]	PWR	KTAS	F.C. ** [lt/hr]
2388	29.5	113%	128	29.5	106%	129	27.9	101%	131	26.6
2260	29.5	106%	127	28.6	100%	128	27.1	96%	129	25.8
2260	28	91%	119	24.5	86%	119	23.2	82%	119	22
2260	26	71%	106	19.2	67%	106	18.2	64%	105	17.3
2260	24	61%	98	16.6	58%	96	15.7	55%	94	14.9
2260	22	47%	81	12.8	45%	74	12.1	43%	70	11.5

* Propeller RPM
** Fuel Consumption

Weight: 580 kg Pressure Altitude: 3000 ft										
RPM *	MAP [inHg]	ISA - 30°C (-15°C)			ISA (15°C)			ISA + 30°C (45°C)		
		PWR	KTAS	F.C. ** [lt/hr]	PWR	KTAS	F.C. ** [lt/hr]	PWR	KTAS	F.C. ** [lt/hr]
2388	26.4	98%	125	25.7	93%	125	24.3	88%	124	23.1
2260	26.4	92%	122	25	87%	123	23.6	83%	123	22.4
2260	26	88%	120	23.9	84%	121	22.6	79%	121	21.5
2260	24	74%	110	20	70%	110	18.9	66%	109	18
2260	22	59%	97	16	56%	95	15.1	53%	91	14.3
2260	20	50%	85	13.4	47%	77	12.7	45%	73	12.1

* Propeller RPM
** Fuel Consumption

Weight: 580 kg Pressure Altitude: 6000 ft										
RPM *	MAP [inHg]	ISA - 30°C (-15°C)			ISA (15°C)			ISA + 30°C (45°C)		
		PWR	KTAS	F.C. ** [lt/hr]	PWR	KTAS	F.C. ** [lt/hr]	PWR	KTAS	F.C. ** [lt/hr]
2388	23.6	88%	121	23.3	84%	122	22	80%	120	20.9
2260	23.6	83%	120	22.6	79%	120	21.4	75%	119	20.3
2260	22	71%	110	19.1	67%	109	18.1	64%	107	17.2
2260	20	59%	98	15.8	55%	95	14.9	53%	88	14.2
2260	18	48%	81	12.9	45%	81	12.2	43%	80	11.6

* Propeller RPM
** Fuel Consumption

NOTE

The weight does not affect significantly the cruise performances; a reference weight of 580 kg has been taken into account.

Weight: 580 kg										
Pressure Altitude: 9000 ft										
RPM*	MAP [inHg]	ISA - 30°C (-15°C)			ISA (15°C)			ISA + 30°C (45°C)		
		PWR	KTAS	F.C.** [lt/hr]	PWR	KTAS	F.C.** [lt/hr]	PWR	KTAS	F.C.** [lt/hr]
2388	21.1	80%	117	20.9	76%	117	19.7	71%	115	18.7
2260	21.1	75%	116	20.3	71%	115	19.2	67%	113	18.2
2260	20	68%	109	18.3	64%	107	17.2	60%	104	16.3
2260	18	55%	94	14.9	52%	86	14	49%	82	13.3

* Propeller RPM
** Fuel Consumption

Weight: 580 kg										
Pressure Altitude: 12000 ft										
RPM*	MAP [inHg]	ISA - 30°C (-15°C)			ISA (15°C)			ISA + 30°C (45°C)		
		PWR	KTAS	F.C.** [lt/hr]	PWR	KTAS	F.C.** [lt/hr]	PWR	KTAS	F.C.** [lt/hr]
2388	18.8	71%	113	18.8	67%	111	17.7	64%	105	16.7
2260	18.8	68%	111	18.2	64%	109	17.2	60%	103	16.3
2260	18	62%	105	16.8	59%	101	15.9	56%	87	15

* Propeller RPM
** Fuel Consumption

11. LANDING PERFORMANCES (*APPROVED DATA*)

Pressure Altitude [ft]		Distance [m]				
		Temperature [°C]				ISA
		-25	0	25	50	
S.L.	Ground Roll	117	129	141	153	136
	At 50 ft AGL	316	328	340	352	335
1000	Ground Roll	121	134	146	158	140
	At 50 ft AGL	320	333	345	357	339
2000	Ground Roll	126	139	151	164	144
	At 50 ft AGL	325	338	350	363	343
3000	Ground Roll	131	144	157	170	149
	At 50 ft AGL	330	343	356	369	348
4000	Ground Roll	136	149	163	177	153
	At 50 ft AGL	335	348	362	376	352
5000	Ground Roll	141	155	169	183	158
	At 50 ft AGL	340	354	368	382	357
6000	Ground Roll	146	161	176	190	163
	At 50 ft AGL	345	360	375	389	362
7000	Ground Roll	152	167	182	198	168
	At 50 ft AGL	351	366	381	397	367
8000	Ground Roll	158	174	189	205	173
	At 50 ft AGL	357	373	388	404	372
9000	Ground Roll	164	180	197	213	179
	At 50 ft AGL	363	379	396	412	378
10000	Ground Roll	170	188	205	222	184
	At 50 ft AGL	369	387	404	421	383

Weight = 550 kg		Corrections				
Flaps: Land (40°)		Headwind: - 5m for each kt (16 ft/kt)				
Short Final Approach Speed = 51 KIAS		Tailwind: + 15m for each kt (50ft/kt)				
Throttle Levers: Idle		Paved Runway: - 2% to Ground Roll				
Runway: Grass		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	92	101	111	120	107
	At 50 ft AGL	291	300	310	319	306
1000	Ground Roll	96	105	115	124	110
	At 50 ft AGL	295	304	314	323	309
2000	Ground Roll	99	109	119	129	114
	At 50 ft AGL	298	308	318	328	313
3000	Ground Roll	103	113	124	134	117
	At 50 ft AGL	302	312	323	333	316
4000	Ground Roll	107	117	128	139	121
	At 50 ft AGL	306	316	327	338	320
5000	Ground Roll	111	122	133	144	124
	At 50 ft AGL	310	321	332	343	323
6000	Ground Roll	115	127	138	150	128
	At 50 ft AGL	314	326	337	349	327
7000	Ground Roll	119	131	144	156	132
	At 50 ft AGL	318	330	343	355	331
8000	Ground Roll	124	137	149	162	136
	At 50 ft AGL	323	336	348	361	335
9000	Ground Roll	129	142	155	168	140
	At 50 ft AGL	328	341	354	367	339
10000	Ground Roll	134	148	161	175	145
	At 50 ft AGL	333	347	360	374	344

Weight = 500 kg		Corrections				
Flaps: Land (40°)		Headwind: - 5m for each kt (16 ft/kt)				
Short Final Approach Speed = 51 KIAS		Tailwind: + 15m for each kt (50ft/kt)				
Throttle Levers: Idle		Paved Runway: - 2% to Ground Roll				
Runway: Grass		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	76	84	92	99	88
	At 50 ft AGL	275	283	291	298	287
1000	Ground Roll	79	87	95	103	92
	At 50 ft AGL	278	286	294	302	291
2000	Ground Roll	82	90	98	107	95
	At 50 ft AGL	281	289	297	306	294
3000	Ground Roll	85	94	102	111	99
	At 50 ft AGL	284	293	301	310	298
4000	Ground Roll	88	97	106	115	102
	At 50 ft AGL	287	296	305	314	301
5000	Ground Roll	92	101	110	119	106
	At 50 ft AGL	291	300	309	318	305
6000	Ground Roll	95	105	114	124	110
	At 50 ft AGL	294	304	313	323	309
7000	Ground Roll	99	109	119	129	114
	At 50 ft AGL	298	308	318	328	313
8000	Ground Roll	103	113	123	134	119
	At 50 ft AGL	302	312	322	333	318
9000	Ground Roll	107	117	128	139	123
	At 50 ft AGL	306	316	327	338	322
10000	Ground Roll	111	122	133	144	128
	At 50 ft AGL	310	321	332	343	327

12. BALKED LANDING CLIMB

Power Setting: Maximum Take-Off Power						
Flaps: Land (40°)						
V _{OBS} : 51 KIAS						
Weight [kg]	Pressure Altitude [ft]	Rate of Climb [ft/min]				ISA
		Temperature [°C]				
		-25	0	25	50	
620	S.L.	940	768	613	473	673
	1000	876	702	550	411	621
	2000	809	639	487	349	570
	3000	743	575	424	288	519
	4000	678	511	361	226	466
	5000	612	447	298	165	415
	6000	547	383	235	103	363
	7000	482	319	173	42	312
550	S.L.	1116	924	753	601	819
	1000	1044	854	684	530	763
	2000	972	782	615	462	706
	3000	899	710	545	396	648
	4000	827	640	476	327	592
	5000	753	570	407	258	535
	6000	681	500	337	191	477
	7000	608	428	267	122	421
500	S.L.	1268	1060	874	706	945
	1000	1190	982	798	631	885
	2000	1110	905	722	558	822
	3000	1031	829	645	482	760
	4000	952	751	571	409	698
	5000	873	675	495	335	635
	6000	795	597	420	261	573
	7000	716	520	343	188	512

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 6th Ed., July 2011, Vol. I°, Chapter 10, is **68.63** dB(A).

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Supplement A13: pages replacement instructions

SECTION 6 – WEIGHT AND BALANCE

Apply following pages replacement procedure:

Supplement A13 – Limitations page		Basic AFM – Limitations page
VP6-11	REPLACES	6-11
VP6-12	REPLACES	6-12
VP6-13	REPLACES	6-13
VP6-14	REPLACES	6-14

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1. 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	DATE:	
RIF.	DESCRIPTION &P/N	INST	WEIGHT [kg]	DATUM [m]
ENGINE & ACCESSORIES				
A1	Engine Rotax 912S3 - p/n 309.120.133	*	61.0	0.32
A2	Prop. HOFFMANN – p/n HO-V352 F1/C170FQ+8	*	10.0	-0.13
A3	Exhaust and manifolds –p/n SSB-978-480-CC	*	4.50	0.55
A4	Heat exchanger - p/n 92-11-830	*	2.00	0.55
A5	Oil Reservoir (full) - p/n 956.137	*	4.00	0.64
A6	Oil radiator - p/n 886 025	*	0.40	0.07
A7	Liquid coolant radiator. - p/n 995.697	*	0.90	0.33
A8	Air filter K&N- p/n 33-2544	*	0.40	0.60
A9	Fuel pump p/n 21-11-342-000	*	0.10	0.71
A10	Thermostatic water valve 26-9-9000-000		0.35	0.15
A11	Thermostatic oil valve 26-9-9100-000		0.20	0.20
A12	Governor Jihostroj P-110-030/A	*	1.00	0.25
A13	Manifold Pressure Indicator UMA 7-100-20	*	0.13	1.35
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 - P/n 0101120	*	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	Battery FIAMM 6H4P 12V 18Ah		6.00	2.59
C2	Battery GILL-Teledyne G-25 12V 18Ah		9.53	2.59
C2	Regulator, rectifier - p/n 945.345	*	0.20	0.82
C3	Battery relay - p/n 111-226-5	*	0.30	2.59
C4	Flaps actuator control – SIR Mod. AO-01/M	*	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 warning - AS 164R	*	0.10	1.36
C10	NAV/POS/Strobe LED light - AveoAVE-WPSTR-54G / R		0.25	1.75
C11	Cowling Landing LED light Whelen PLED 1L		0.35	1.36
C12	Battery Spark 500		4,9	2.59

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

EQUIPMENT LIST		S/N	DATE:	
RIF.	DESCRIPTION &P/N	INST	WEIGHT [kg]	DATUM [m]
<i>AVIONICS AND OTHER</i>				
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 GTX 330		1.00	1.35
E6	Transponder-Garmin GTX328		1.00	1.35
E7	Audio panel -Garmin GMA 340		0.50	1.35
E8	Vor/LocIndicator-Garmin GII06A or MD 200-306		0.64	1.35
E9	Transponder Antenna Comant Industries CI 105		0.17	1.09
E10	Mic - Telex TRA 100		0.17	1.90
E11	GPS Antenna.Garmin GA35		0.27	1.08
E12	Comm Antenna Comant Industries CI 291		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 92-12-333-1	*	0.28	2.30
E17	Altitude Encoder- Ack A-30	*	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
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
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		1.10	2.70
E39	ELT Antenna ANT 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

Supplement A13: pages replacement instructions

SECTION 7 – AIRFRAME AND SYSTEM DESCRIPTION

Apply following pages replacement procedure:

Supplement A13 – Limitations page		Basic AFM – Limitations page
VP7-3	REPLACES	7-3
VP7-4	REPLACES	7-4
VP7-7	REPLACES	7-7
VP7-8	REPLACES	7-8

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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.

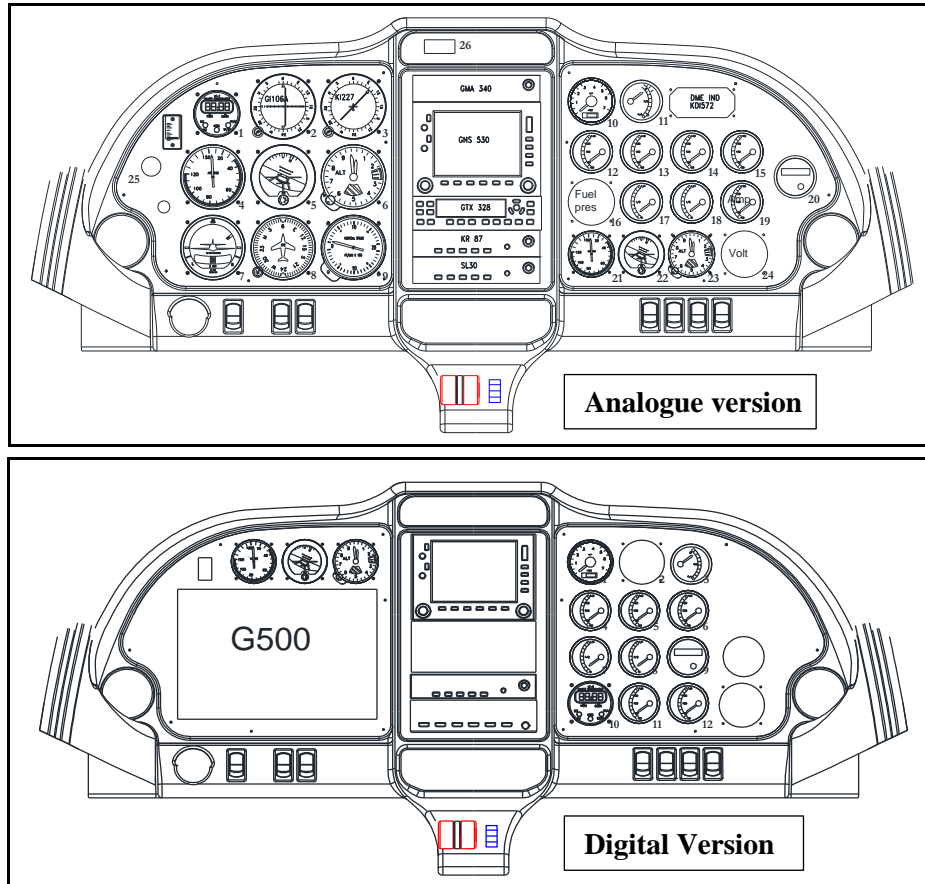


Fig. 7-2. INSTRUMENT PANELS

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. 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.



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

6. POWERPLANT

6.1. ENGINE

Manufacturer:	<i>Bombardier-Rotax GmbH</i>
Model:	<i>ROTAX 912 S3</i>
Type:	<i>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.</i>
Maximum rating:	<i>98.6hp (73.5kW) @ 5800 rpm/min (2388 rpm/min. prop). Gear reduction ratio - 2.4286:1</i>
Max oil consumption:	<i>Max: 0.1 litres/hour</i>

6.2. PROPELLER

Manufacturer:	<i>Hoffmann Propeller</i>
Model:	<i>HOV352F1/C170FQ+8</i>
N° of blades:	<i>2</i>
Diameter:	<i>1780 mm (no reduction permitted)</i>
Type:	<i>Variable pitch – wood</i>

GOVERNOR

Manufacturer	<i>Jihostroj</i>
Model	<i>P-110-030/A</i>
Type	<i>Hydraulic</i>

SUPPLEMENT NO. A14

RUDDER AND THROTTLE ADDITIONAL CONTROLS

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

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INTRODUCTION

This AFM Supplement contains supplemental information to operate the airplane, using additional flight controls, in a safe and efficient manner when Design Change MOD2002/141 “Flight and Throttle Additional Controls” has been embodied on the airplane.

The Design Change MOD2002/141 can be applied only on aircraft embodying the Design Changes MOD2002/146 “Stick mounted brake hand control”

The information contained herein supplements or supersedes the basic Aircraft Flight Manual: detailed instructions are provided to allow the owner to replace the normal and emergency procedures of basic AFM as per Flight and Throttle Additional Controls Design Change in subject.

For Limitations, Procedures and Performance information not contained in this Supplement, refer to the basic Aircraft Flight Manual.

The application of this supplement invalidates the following supplements:

- A04 “Differential Brake System”
- A05 “Central Throttle Control System”
- A013 “Variable Pitch Propeller”

The related equipment, in fact, cannot be incorporated when the design change of this Supplement A14 is embodied in the P2002JF.

GENERAL

The Design Change MOD2002/141 provides the installation of additional hand controls, which allows disabled pilots to fly the airplane, without relying on the rudder pedals for directional control. The system consists of a central stick acting both as rudder and throttle control. An electric flap switch is also installed on the top of the stick. Moreover, a lever installed on the left standard stick allows brake operation by-passing the standard (central) brake control (MOD2002/146).

For flight instruction purposes, a third RH mounted throttle is provided in order to allow flight instructors to have standard flight controls.

The entire kit of hand control can be removed when the aircraft is operated by not specifically trained pilots. In this case this AFM supplement becomes inapplicable.

The Change consists also of a permanent, factory-made installation of external handles over canopy rail and a right wing leading edge reinforcement to ease access/egress to the cabin.

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LIMITATIONS

Standard basic AFM limitations are unchanged.

EMERGENCY PROCEDURES

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 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 recognised;

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

<u>BEFORE ROTATION: ABORT TAKE OFF</u>					
1.	<table style="width: 100%; border: none;"> <tr> <td style="width: 50%;">Throttle Hand Control</td> <td style="width: 50%;"><i>IDLE (rotate fully counter-clockwise)</i></td> </tr> <tr> <td><i>or: Throttle standard control</i></td> <td><i>IDLE (fully out)</i></td> </tr> </table>	Throttle Hand Control	<i>IDLE (rotate fully counter-clockwise)</i>	<i>or: Throttle standard control</i>	<i>IDLE (fully out)</i>
Throttle Hand Control	<i>IDLE (rotate fully counter-clockwise)</i>				
<i>or: Throttle standard control</i>	<i>IDLE (fully out)</i>				
2.	Rudder <i>Keep heading control</i>				
3.	--				
4.	--				

- b. Other procedures which should be well theoretically known 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

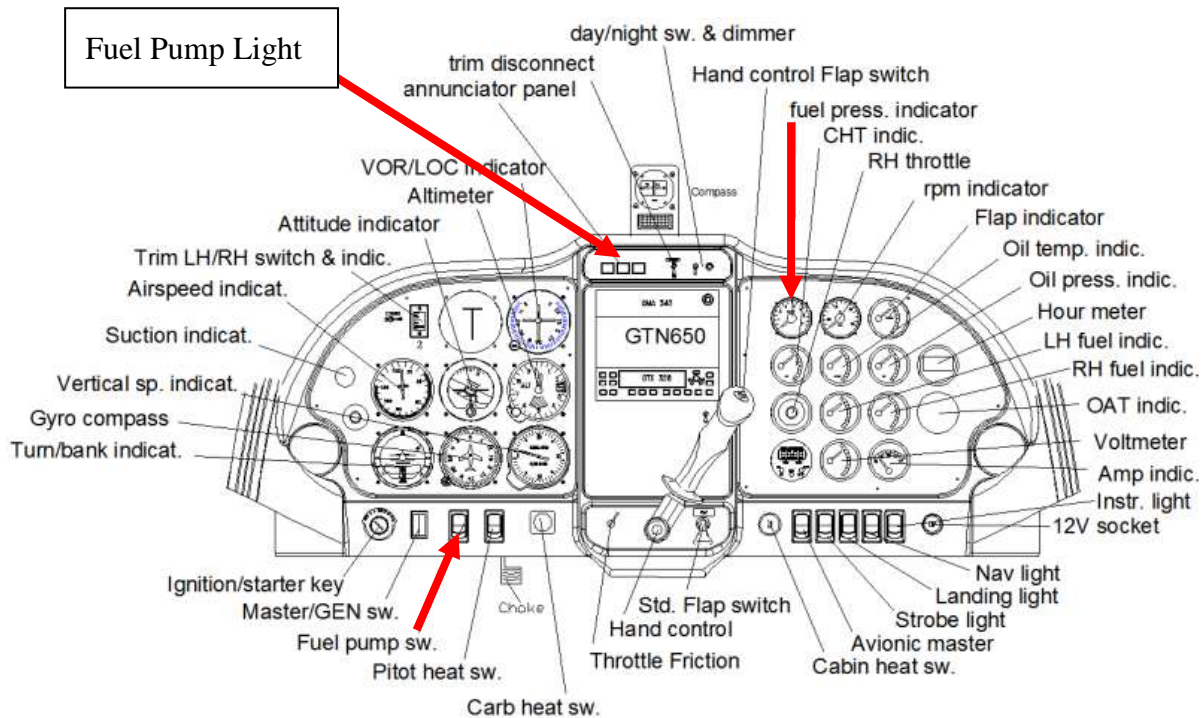


Fig.A14-1. Cockpit view

If the electrical fuel pump light (central annunciator panel light) is *OFF* the reason can be:

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

Apply the following procedure:

- | | |
|---------------------------------|--------------------|
| 1. Electrical fuel pump switch: | <i>OFF</i> |
| 2. Electrical fuel pump switch: | <i>ON</i> |
| 3. Fuel pressure: | <i>CHECK raise</i> |

If fuel pressure doesn't build up:

Land as soon as possible monitoring fuel pressure

2.3 TRIM SYSTEM FAILURE

Locked Control

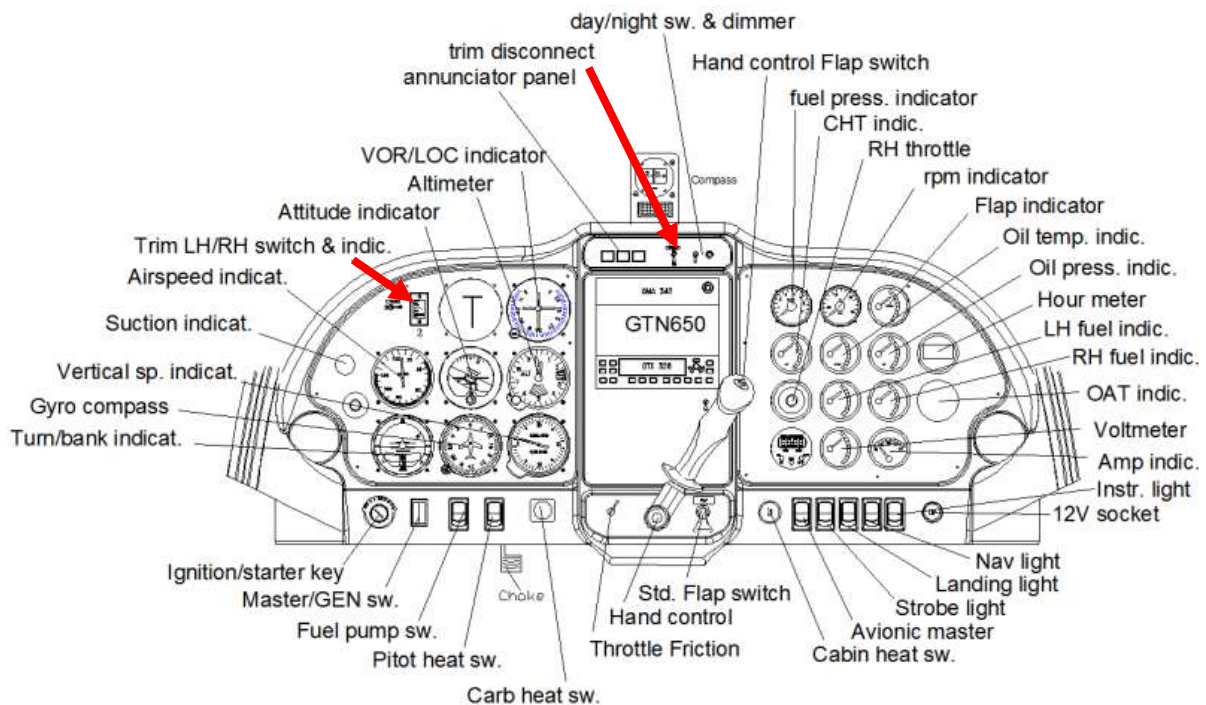
Should trim control be inoperative, act as follows:

1. Breakers: *CHECK*
2. Trim switch LH/RH: *CHECK for correct position*
3. Speed: *adjust to control aircraft without excessive stick force*
4. **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. Fuel shut off valve | OFF |
| 2. Engine | SECURE |
| 3. Parking brake: | ON |
| 4. Radio | Call for assistance |
| 5. Master switch | OFF |
| 6. Seat belts: | unstrap completely |
| 7. Headphones: | REMOVE |
| 8. Canopy: | OPEN |
| 9. If canopy is locked or doesn't slide: | break using the hammer |
| 10. Escape away from flames/ hot engine compartment/ spilling fuel tanks. | |

NOTE

Pilots can grab the additional external handles to help themselves exiting the cockpit

NOTE

Simulated emergency evacuations, even if there is not a maximum escape time given from the rules (CS-VLA) is strongly recommended during the training of disabled people. Simulated emergency evacuations should be part of on-ground training.

3. ENGINE SECURING

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

- | | |
|---|---|
| 1. Throttle Hand Control
<i>or: Throttle standard control</i> | IDLE (rotate fully counter-clockwise)
IDLE (fully out) |
| 2. Ignition key | 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 Hand Control:
<i>or: Throttle standard control</i> | <i>IDLE (rotate fully counter-clockwise)
IDLE (fully out)</i> |
| 2. Rudder | <i>Keep heading control</i> |
| 3. Brakes: | <i>apply as needed</i> |

When safely stopped:

- | | |
|---------------------------------|------------|
| 4. Ignition key: | <i>OFF</i> |
| 5. Fuel selector valve: | <i>OFF</i> |
| 6. Electric fuel pump: | <i>OFF</i> |
| 7. Generator & Master switches: | <i>OFF</i> |

4.2. ENGINE FAILURE IMMEDIATELY AFTER TAKE-OFF

- | | |
|---|-----------------------------|
| 1. Speed: | <i>keep minimum 51 kias</i> |
| 2. Find a suitable place to land safely. | |



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: | <i>as needed</i> |
|------------------|------------------|



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 Hand Control:
<i>or: Throttle standard control</i> | <i>IDLE (rotate fully counter-clockwise)
IDLE (fully out)</i> |
| 5. Ignition key: | <i>OFF</i> |
| 6. Fuel selector valve: | <i>OFF</i> |
| 7. Electric fuel pump: | <i>OFF</i> |
| 8. Generator & Master switches: | <i>OFF</i> |



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 Hand Control (*or standard throttle*) *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 Hand Control (*or standard throttle*) *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 Hand Control (*or standard throttle*) *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 is detected:

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

4.3.4 CHT limit exceedance

If CHT is above 135°C:

1. Throttle Hand Control (*or standard throttle*) *REDUCE Minimum practical*
2. **Land as soon as practical**

If CHT 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



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 | <i>ON if required</i> |
| 2. Electrical fuel pump | <i>ON</i> |
| 3. Fuel quantity indicator | <i>CHECK</i> |
| 4. Fuel Selector | <i>change the fuel feeding tank</i> |
| 5. Ignition key position | <i>BOTH</i> |
| 6. Ignition key position | <i>START</i> |
| 7. Throttle Hand Control | <i>(or standard throttle) SET as required</i> |



After engine restart, if practical, moderate propeller rpm and throttle increase to allow OIL and CHT 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. | Ignition key | OFF |
| 4. | Throttle Hand Control | FULL POWER (ROTATE CLOCKWISE) |
| | <i>or: Throttle standard control</i> | FULL POWER (fully in) |
| 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 Hand Control | IDLE (ROTATE COUNTER-CLOCKWISE) |
| | <i>or: Throttle standard control</i> | IDLE (fully out) |
| 2. | Rudder | Keep heading control |
| 3. | Brakes | As required |

With aircraft under control

- | | | |
|----|-----------------------------|------------------------------|
| 1. | Fuel Selector | OFF |
| 2. | Electrical fuel pump | OFF |
| 3. | Ignition key | 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 Hand Control: | FULL POWER until the engine stops |
| | <i>or: Throttle standard control</i> | FULL POWER (fully in) until the engine stops |
| 5. | Ignition key: | 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 Hand Control: | IDLE (rotate fully counter-clockwise) |
| | <i>or: Throttle standard control</i> | IDLE (fully out) |
| 3. | Ignition key: | 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. Ignition key: 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. Ignition key: OFF
10. Generator and Master switches: OFF

7.3. LANDING WITH A FLAT NOSE TYRE

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 TYRE

If it's suspected a main tyre 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 tyre 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 tyre 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 Hand Control:** *IDLE (rotate fully counter-clockwise)
or: Throttle standard control IDLE (fully out)*
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 avoiding speeds in excess of V_{NE} and maximum load factor ($n=+3.8$)*
6. **Throttle Hand Control:** *Readjust to restore engine power.*



*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



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*



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

INTENTIONALLY LEFT BLANK

NORMAL PROCEDURES

1. INTRODUCTION

Section 4 contains checklists and the procedures for the conduct of normal operation. Due to the uncommon flight control philosophy, this section includes also some Flight Training Supplement especially for transition from "traditional" flight controls to "additional hand control". The following minimum recommended training/familiarization shall be executed to the extent required to achieve and master the new system granting at least normal PPL flight tolerances and up to the point that pilot's self confidence is sufficiently reinforced.



P2002JF aircraft incorporating Additional Flight Controls MOD2002/141 shall be operated by authorised crew only, as per competent Civil Aviation Authority specific approval.



Execute flight training with a safety pilot /flight instructor in RH seat, capable to override and correct any flight manoeuvre by use of traditional controls before attempting solo flights with Additional Hand Control and relevant Cockpit MOD2002/141.

On Ground familiarization

1. LH seated pilot:

Locate and train to use, as quickly as possible, all essential controls with safety belts properly tightened:

- brakes (central lever and hand control on LH stick);
- parking brake selector;
- fuel tank valve and shut off;
- engine throttle (both standard and hand control types);
- throttle friction set



CAUTION

Pilots shall adjust throttle friction in order to grant smooth and precise throttle control through both throttle systems (Hand Control - rotation; Normal Throttles - push/pull) and at the same time it shall be ensured that no inadvertent throttle increase may happen after sudden a/c decelerations (e.g. during braking, landing, taxiing turns) due to Rotax engine spring loaded throttle cable devices.

- flap (both standard switch and hand control-mounted switch);
- flap selector switch (to normal and hand control positions);
- pitch trim (standard controls);
- pitch trim selector switch;
- pitch trim disconnect;
- canopy locking system;
- emergency egress handles;
- canopy hammer (just behind your seat, in the central, upper position);
- ELT (switch located on the RH panel);
- Fire Extinguisher (baggage compartment).

2. RH seated pilot (safety pilot or Flight Instructor/Examiner):

Locate and train to use, as quickly as possible, all essential controls with safety belts properly tightened:

- brake lever (central - between LH and RH seats);
- parking brake selector
- fuel tank valve and shut-off;
- engine throttle (RH cockpit panel);
- throttle friction;
- flap (both standard switch and hand control-mounted switch);
- flap selector switch (to normal and hand control positions);
- pitch trim (standard controls);
- pitch trim selector switch;
- pitch trim cut-out;
- canopy locking system;
- emergency egress handles;
- canopy hammer (just behind your seat, in the central, upper position);
- ELT (switch located just in front of you, on RH cockpit panel);
- Fire Extinguisher (baggage compartment).

Complete view of cockpit panel, equipped with MOD2002/141,

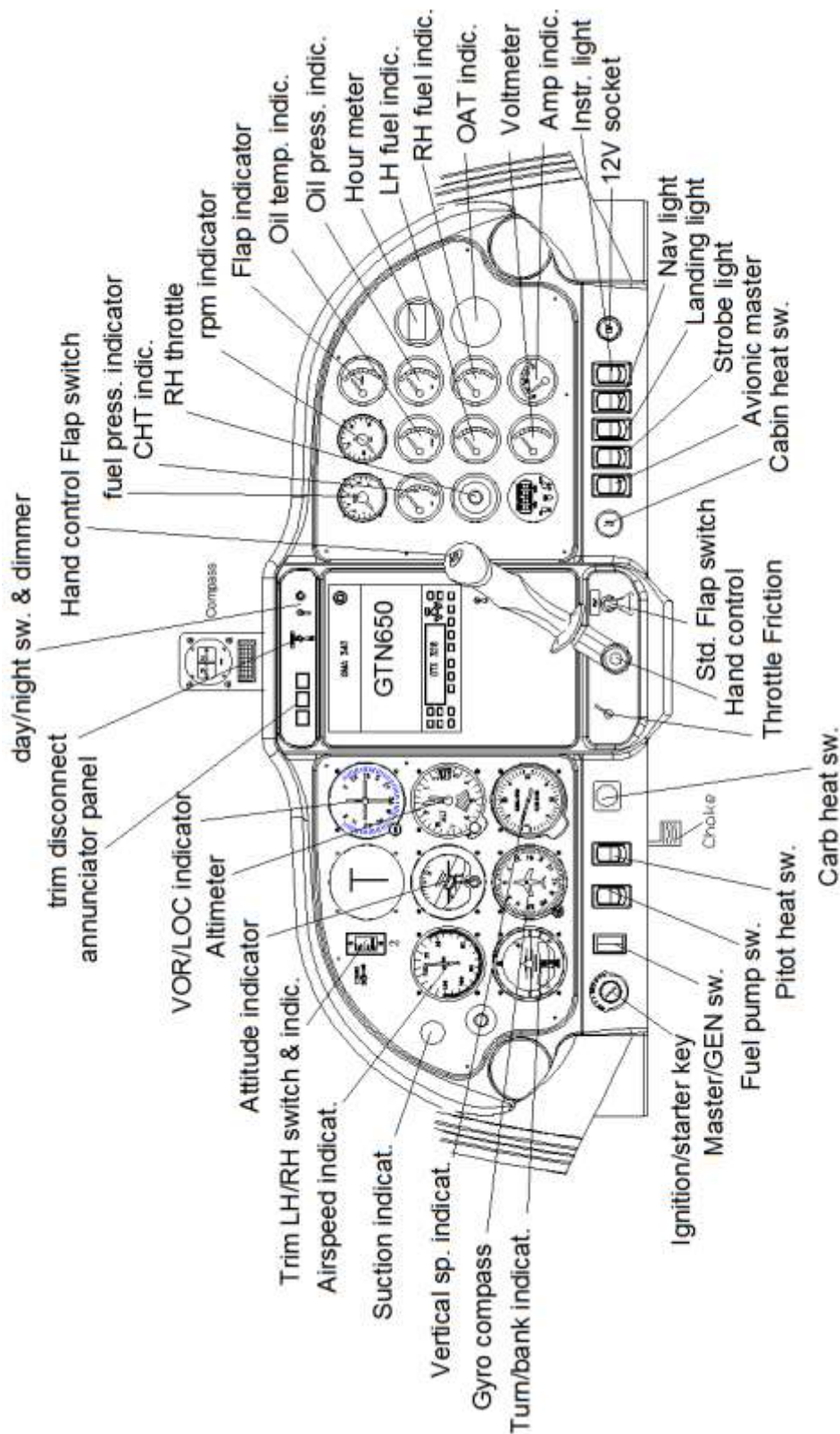


Fig.A14-2. Cockpit view

3. Both pilots (LH and RH seats)

Practice normal and additional flight control use and sense of operation, verify effects, displacements and efforts required to operate them on ground. Define best throttle friction setting in order to allow smooth operation of engine power controls and avoid engine creeping during fast decelerations (sudden braking, landing roll).

Practice emergency exit procedures.

4. Both pilots (LH and RH seats)

Execute normal engine starting procedures; revise and perform engine shut down/securing procedure, access to fuel shut off control.

5. Execute taxiing at different speeds, practice parking entry/exit and centreline precision keeping. Simulate as possible sudden obstacle avoidance (e.g. personnel, vehicles, etc.) so that pilots using hand controls can reinforce instinctive control and reaction to avoid unwanted a/c motions and mishandling.

NOTE

Especially for pilots with previous flight experience on a/c equipped with "side steering wheels" or "side stick" flight controls, errors are possible as Additional Hand Control "engine throttle" (rotation) happens to be instinctively operated, instead of "push/pull" action, when sudden direction changes are demanded (instinctual reaction).

It is useful to visualize this "rule of thumb":

"Push => nose goes left / Pull => nose goes right"

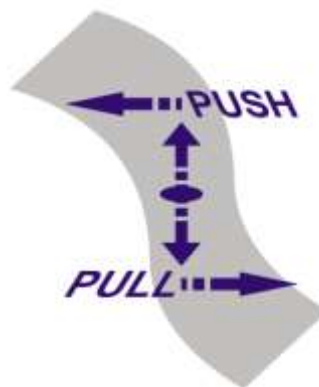


Fig.A14-3. Inverted "S" push-pull direction control

In the disabled pilots' community, it is common to learn how to use the Additional Hand Control "push-pull" type, thinking of riding a bicycle. When in the LH seat of this airplane, act as driving a bicycle with the right hand only:

"Push-to-go-Left" and "Pull-to-go-Right".

6. Execute high speed taxiing on the runway, Flap T/O, maintaining centreline alignment whilst commanding pitch up (without taking off). This exercise will help reinforcing instinctual directional control and reaction and will be useful for X-wind take-off, take-off reject and landing roll out.



Avoid brakes wear and over-temperature after repetitive high speed taxiing.

During acceleration and stop exercise it is useful to visualise the following Additional Hand Control use scheme:

- Acceleration: increase power while pulling the Additional Hand Control



- Deceleration: decrease power while pushing the Additional Hand Control



7. Practice Take-off and landing patterns.

It is recommended to perform specific training for take off, approach and landing patterns at all flap settings. First approaches shall be interrupted at safety altitude and go around practice shall be done as well.

Later on, touch and goes can be planned and executed by mean of hand controls solely.

Training is also suggested for en-route phase of flight, coordinated turns, climbs, power settings and flap configuration changes, climbing turns.

Typical tolerances to be obtained during training might be:

- Airspeed: ± 5 kias
- Sideslip: $\pm 1/2$ ball on slip indicator;
- Engine: ± 100 rpm;
- Spot Landing: ± 5 mt from centreline, ± 25 mt longitudinal error;
- Taxi: ± 1 mt from taxiway centreline

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).

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

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.

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 Ignition key: *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.*

AIRCRAFT WALK-AROUND

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



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.



Fuel level indicated by the cockpit-gauges 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.

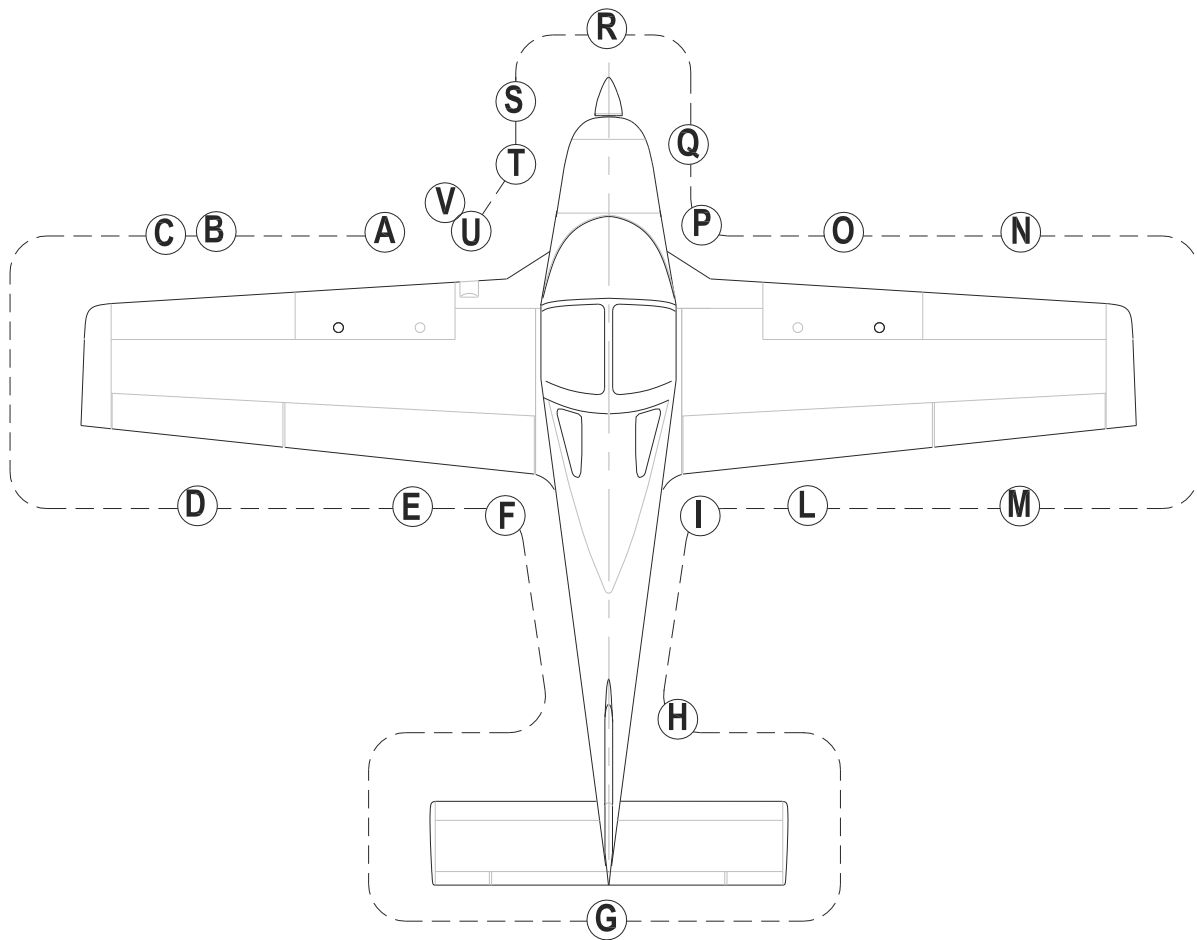


Fig.A14-4. Walk-around

- 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, tyre 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, tyre 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 OFF. 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 tyre: check inflation, tyre 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. Only before the first flight of the day:
 - 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 ignition key 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 mountings.
 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, NAV 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.

CHECKLISTS**3.3. 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*

**CAUTION**

Pilots shall adjust throttle friction in order to grant smooth and precise throttle control through both throttle systems (Hand Control - rotation; Normal Throttles - push/pull) and at the same time it shall be ensured that no inadvertent throttle increase may happen after sudden a/c decelerations (e.g. during braking, landing, taxiing turns) due to Rotax engine spring loaded throttle cable devices.

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. Avionic Master switch (if installed): *ON, instruments check, then set in OFF position*
10. Flap control:
 - 10.1 Switch selector: *set to NORMAL*
 - 10.2 Control switch (standard): *cycle fully extended and set UP*
 - 10.3 Switch selector: *HAND CONTROL*
 - 10.4 Control switch (hand control): *cycle fully extended then set T/O*
11. Pitch Trim: *cycle fully up and down, from both left and right controls, check for trim disconnect switch operation.*
12. 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_{RIAS} .

13. Nav. light & Strobe light: *ON*

14. Fuel quantity: *compare the fuel gauges agree 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 to prevent any interference with the aeroplane flight control operation and with rapid egress in an emergency.

15. 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.

3.4. ENGINE STARTING

1. Master switch *ON*.
2. Throttle Hand Control: *idle (rotate fully counter-clockwise)*
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. Ignition key: *BOTH*
8. Ignition key: *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)

3.5. 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*

3.6. TAXIING

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

3.7. PRIOR TO TAKE-OFF

1. Parking brake: *ON, 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: *rotate hand throttle control clock-wise to 1640 rpm*
 - a. Ignition 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: *set neutral*
11. Flight controls: *check free*
12. Seat belts: *checked fastened*
13. Canopy: *check closed and locked on three points.*

3.8. TAKE-OFF AND CLIMB



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*

NOTE

Indicated airspeed higher than V_Y (67 Kias) can be used for prolonged climb legs in order to minimize required force on hand control and to increase comfort.

When climbing at airspeed higher than V_Y (67 Kias), consider reduced climb performances. The following table shows climb performances at indicated airspeed V_{CLIMB} 85 Kias.

W	Hp	IAS	Outside Air Temperature				
			-25	0	25	50	ISA
620	0	85	1065	832	624	436	704
620	2000	85	888	658	454	269	565
620	4000	85	711	486	284	103	427
620	6000	85	535	313	116	-62	288
620	8000	85	359	142	-52	-227	149
620	10000	85	184	-29	-220	-392	10
620	12000	85	10	-200	-387	-556	-128
620	14000	85	-164	-369	-553	-719	-267
600	0	85	1113	873	659	466	742
600	2000	85	931	695	485	295	600
600	4000	85	749	518	311	125	457
600	6000	85	568	341	138	-46	314
600	8000	85	388	164	-35	-215	172
600	10000	85	208	-11	-207	-384	29
600	12000	85	29	-187	-379	-552	-113
600	14000	85	-150	-361	-550	-720	-256
580	0	85	1164	917	697	499	782
580	2000	85	977	734	518	322	636
580	4000	85	790	551	339	147	489
580	6000	85	603	369	160	-28	342
580	8000	85	418	188	-18	-203	195
580	10000	85	233	7	-195	-377	49
580	12000	85	48	-173	-371	-550	-98
580	14000	85	-135	-353	-547	-723	-245

Climb Performances at V_{CLMB} 85kIAS

3.9. CRUISE

1. Set power at or below maximum continuous: 2250 propeller rpm
2. Check engine instruments within limits
3. Carburettor heat as needed, see paragraph on carb. heat in Section 3.

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

NOTE

3.10. BEFORE LANDING

1. Electric fuel pump: ON
2. Fuel valve: select the fullest tank
3. Landing Light: ON
4. Throttle friction: adjust



CAUTION

Pilots shall adjust throttle friction in order to grant smooth and precise throttle control through both throttle systems (Hand Control - rotation; Normal Throttles - push/pull) and at the same time it shall be ensured that no inadvertent throttle increase may happen after sudden a/c decelerations (e.g. during braking, landing, taxiing turns) due to Rotax engine spring loaded throttle cable devices.

5. On downwind, leg abeam touch down point:

Flaps: set T/O (15°)

	MTOW 580kg	MTOW 600kg	MTOW 620kg
<i>Approach Speed</i>	66 KIAS	66 KIAS	66 KIAS

6. On final leg:

Flaps: set Land (40°)

	MTOW 580kg	MTOW 600kg	MTOW 620kg
<i>Final Approach Speed</i>	51 KIAS	51 KIAS	51 KIAS

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

3.11. BALKED LANDING

1. Throttle Hand Control: Full Power (Rotate fully clockwise)
2. Speed: keep over *61KIAS*, climb to V_Y or V_X as applicable
3. Flaps position: *T/O*
4. Electric fuel pump: *ON*

3.12. AFTER LANDING

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

3.13. 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. Ignition key: *OFF, keys extracted*
5. Strobe light: *OFF*
6. Master & Generator switches: *OFF*
7. Fuel selector valve: *OFF*

3.14. 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*

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PERFORMANCES

The performances of the basic AFM apply except for the followings.

1. GENERAL INFORMATION

As additional Hand Control is used:

<u>Where indicated</u>		<u>Replace with</u>
<i>Throttle lever</i>	→	<i>Throttle Hand control</i>
<i>Full forward</i>	→	<i>Full power (rotate fully clockwise)</i>
<i>IDLE</i>	→	<i>Rotate fully counter-clockwise</i>

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1.2 EMPTY WEIGHT AND BALANCE DETERMINATION

The actual empty weight and balance of the aircraft configured as per MOD2002/141, can be determined using the following table.

EQUIPMENT LIST		DATE:		
RIF.	DESCRIPTION	WEIGHT [kg]	DATUM [m]	MOMENT [kg*m]
	BASIC AIRCRAFT (REFER TO WEIGHING REPORTS §§3 AND 4 OF THE BASIC AFM)	We=_____	-	M=_____
	ADDITIONAL CONTROLS (REFER TO EQUIPMENT LIST §1.1 OF THIS SUPPLEMENT)	A=_____	-	B=_____
	TOTAL (A/C EMPTY):	W _T =_____	-	M _T =_____
	CENTER OF GRAVITY: C.G. _{EMPTY} = M _T / W _T =		_____	<i>m</i>
	C.G. _{EMPTY} [%] = (C.G. _{EMPTY} / 1.370) * 100 =		_____	

Use the §5 of the basic AFM to determine the aircraft's take-off CG location and to verify that take-off CG lies within the predetermined CG travel range.

AIRFRAME AND SYSTEMS DESCRIPTION

Type Design Change MOD2002/141 allows installation of additional controls for rudder and nose wheel, throttle and flap system; additional controls are operated by mean of a stick located in the central instrument panel.

In addition, the MOD2002/141 introduces further changes that have been applied in order to strengthen / facilitate entry to the occupant.

These changes have affected the following groups:

- right wing leading edge
- fuselage
- flight controls: rudder, flap and throttle
- canopy

Finally, to apply the MOD2002/146, the aircraft must be configured according to the MOD2002/146 “Stick mounted brake hand control” that provides the installation of a brake control lever on the standard left stick.

WING

The right wing leading edge has been reinforced to enable its use as support. Reinforcements are located along the wing leading edge span and at the fuselage attachment point.

FUSELAGE

The support for the directional and throttle additional control has been installed on the lower part of the forward fuselage structure.

FLIGHT CONTROLS

In order to install the additional control stick, the throttle control central unit present in the airplane basic configuration has been displaced on the RH side.

The stick installed on central instrument panel allows the control of the directional control system, engine throttle and flap system.

An additional skid indicator has been installed on the central panel.

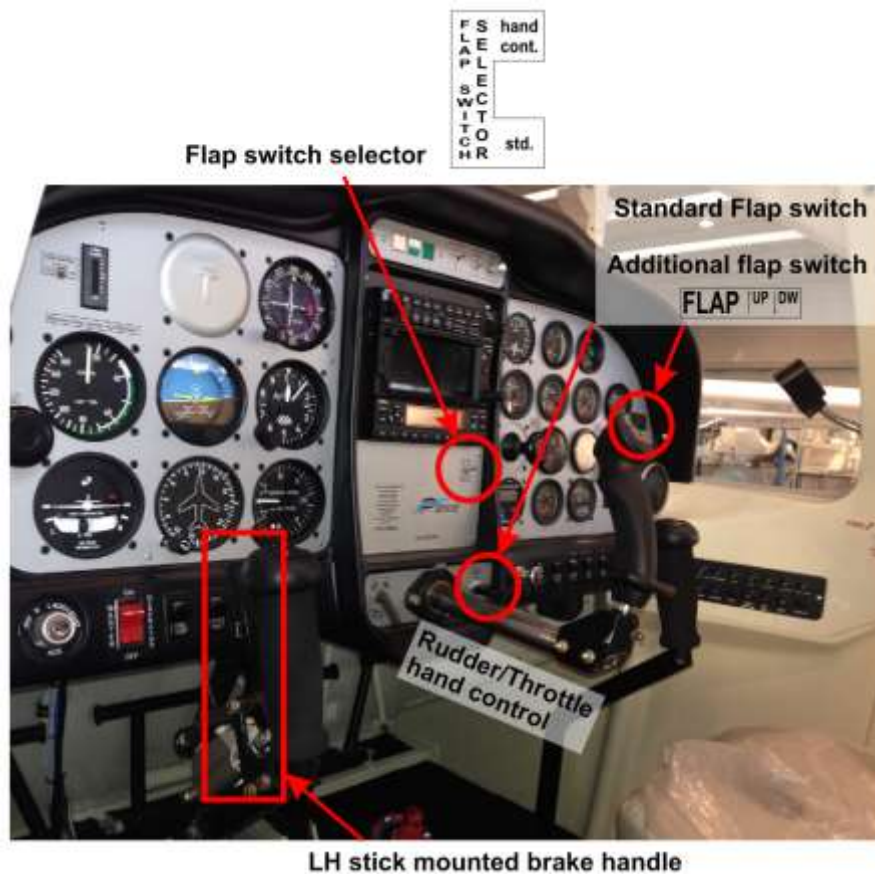


Fig. A14-5. Hand control and Brake lever

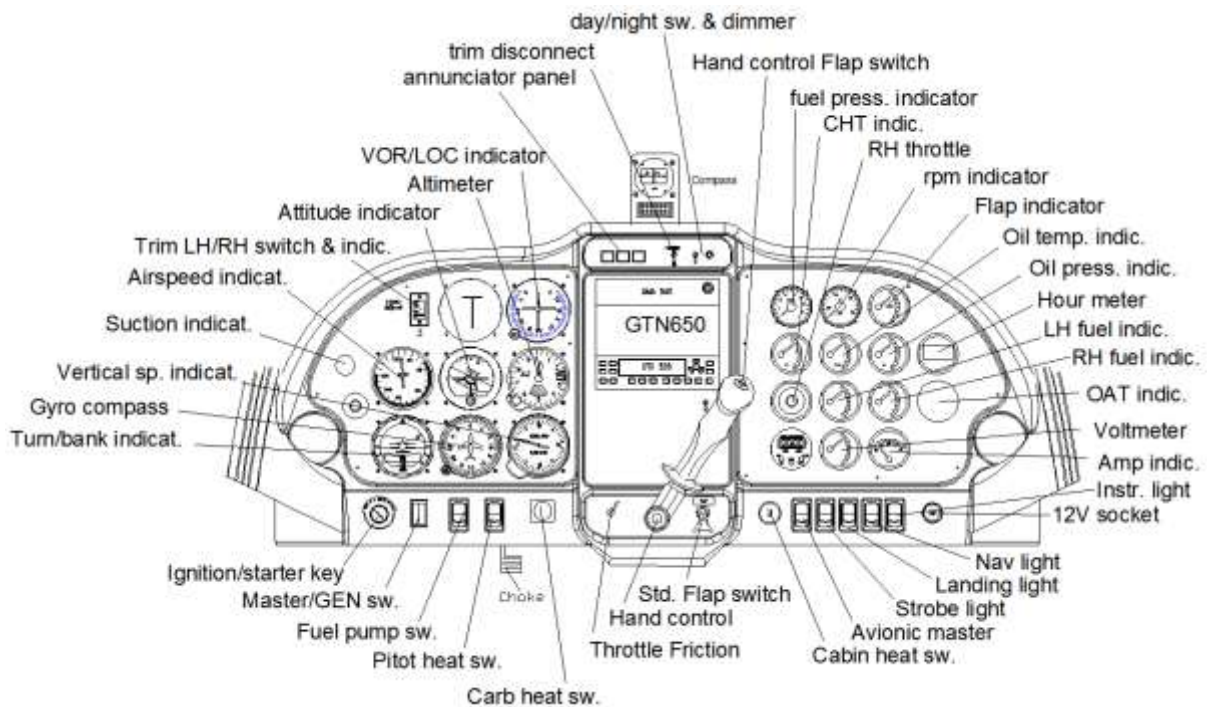


Fig.A14-6. Instrument panel

Section 7 – Airframe and systems description

Rudder and Flight Additional Controls

Pilot can fly using additional controls as follows:

- ✓ *left hand* on the *stick* for longitudinal, lateral control and for brake system;
- ✓ *right hand* on the *central additional control* for directional, throttle and flap control.

Directional Control

The central stick acts on a lever installed on the support located on the forward fuselage structure and connected to the basic directional control system. The central stick is then mechanically connected to rudder pedals.

Movement along stick axis acts on rudder and steering (see Fig.A14-2):

- ✓ *PUSH* for rudder and nose wheel deployment to left (*A/C nose left*)
- ✓ *PULL* for rudder and nose wheel deployment to right (*A/C nose right*)



Fig.A14-7. Hand controls schematic

Flap

The flap switch located on the central stick acts on the flap system. Flap acts in continuous mode and the flap setting is displayed on the indicator located in the instrument panel.

Pilot moves switch down for flap down until the desired flap setting has been reached.

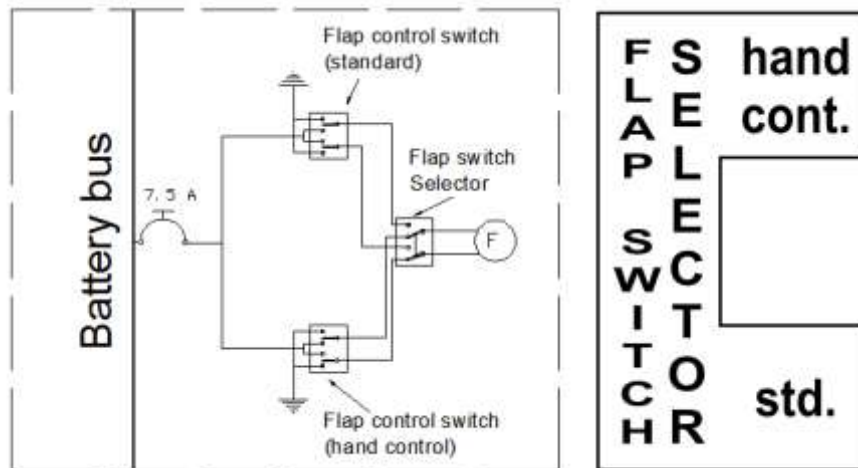


Fig.A14-8. Flap system electric scheme & switch selector placard

Throttle

The additional central stick can rotate around its axis and allows the control of the engine power. The stick is mechanically connected to the airplane engine control system, then actuation of the central stick moves the throttle lever on the instrument panel (left side).

Movements around stick axis act on engine as follows:

- ✓ turn *clockwise* to *increase* power
- ✓ turn *counter-clockwise* to *decrease* power

Proper set stops (approximately $\pm 45^\circ$) warn pilot of the *IDLE* and *FULL* positions.



CAUTION

Pilots shall adjust throttle friction in order to grant smooth and precise throttle control through both throttle systems (Hand Control - rotation; Normal Throttles - push/pull) and at the same time it shall be ensured that no inadvertent throttle increase may happen after sudden a/c decelerations (e.g. during braking, landing, taxiing turns) due to Rotax engine spring loaded throttle cable devices.

BRAKES SYSTEM (MOD.2002/146 “Stick mounted brake hand control”)

In order to allow control of the brakes system, an additional pump has been installed on standard left stick; this pump is connected to the airplane brake system and is operated by a lever (see Fig.A14-4).

Pilot pulls lever to operate brakes.

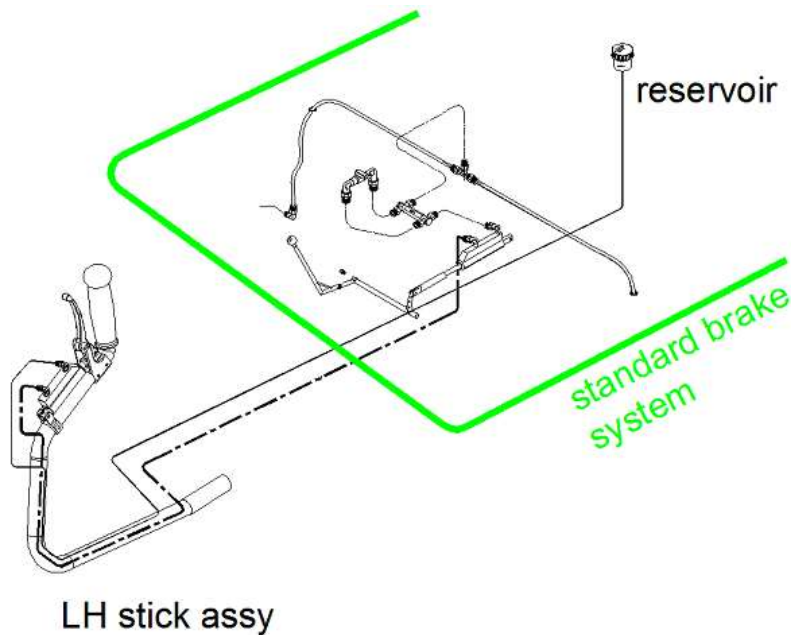


Fig.A14-9. Brakes system

CANOPY

In order to ease access to cabin, additional external handles have been installed on the canopy (see Fig.A14-4).

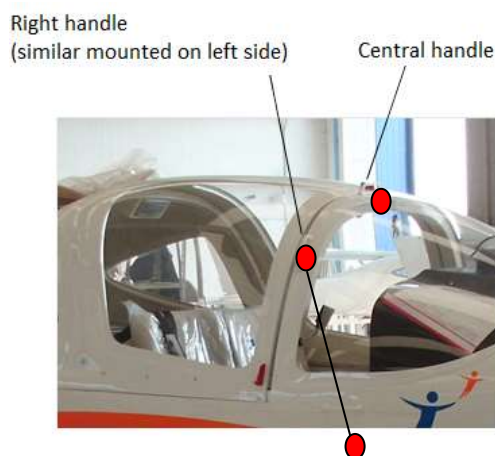


Fig.A14-10. External Handles on Canopy Structure

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GROUND HANDLING & SERVICE

The ground handling and service of the basic AFM apply.

In addition considering the following :

CLEANING

Normal care is required for rudder and throttle additional controls. This includes keeping all joints clean and free of dirt, and drying them thoroughly to prevent the onset of corrosion.

The use of ACF-50 compound, in addition with the greases for joint and bearing lubrication is allowed to prevent the corrosion accretion.



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SUPPLEMENT NO. A15

GARMIN GTN 750 GPS/VHF COMM/NAV

Record of Revisions

Rev	Revised page	Description of Revision	Tecnam Approval			EASA Approval or Under DOA Privileges
			DO	OoA	HDO	
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List of Effective Pages

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A15-1	Rev 0	A15-4	Rev 0
A15-2	Rev 0	A15-5	Rev 0
A15-3	Rev 0	A15-6	Rev 0

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INTRODUCTION

This section contains supplementary information for safe and efficient operation of the aircraft if equipped with a Garmin GTN 750 COMM/NAV/GPS unit.

GENERAL

1. The GTN 750 is an integrated unit with touchscreen interface that contains a GPS navigation system in addition to a VHF COMM radio transceiver and a VOR/ILS receiver.
2. The system installation includes a GPS/WAAS antenna, a VOR/ILS antenna and a VHF Comm antenna.
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/LOC/GS 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 GTN 750 can:
 - plan routes using VFR/IFR reporting points, track waypoints and plan non-precision approaches;
7. Reference coordinates used for navigation are WGS-84.

The GTN 750 front panel is shown in the below picture:



Figure 1- GTN 750 Control and Display Layout

LIMITATIONS

No variations.

EMERGENCY PROCEDURES

1. If the information provided by the Garmin GTN 750 is not available or manifestly wrong, the pilot must continue flight reverting to visual references.
2. If the message “LOI” appears in the lower left portion of the display, the RAIM function is unavailable. The pilot must use the VLOC receiver or revert to visual references;
3. In the event of a loss of COM radio tuning, pressing the volume 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” P/N 190-01007-03 Rev. A, dated February 2011, or later versions.

The information reported in the pilot’s guide are also summarized in the cockpit reference guide p/n 190-01007-04 Rev. A dated February 2011, or later versions.
2. **Garmin GTN 750 acts at the same time as a receiver and an indicator of both GPS and VOR/ILS information. Depending on the specific aircraft configuration an external indicator is installed such as:**
 - a. **Garmin GI-106A analog CDI indicator**
 - b. **Garmin GDU 620 digital display (if MOD 2002/041 is installed)**
3. **The following default settings must be keyed-in in the System → Units page of the GTN 750 receiver before any other operation:**

➤ DIS, SPD	<i>nm kt</i>	(select navigation unit to “nautical miles” and “knots”);
➤ ALT, VS	<i>ft fpm</i>	(select altitude to “feet ” and “feet per minute”);
➤ MAP DATUM	<i>WGS 84</i>	(select map datum WGS84);
➤ POSN	<i>deg-min</i>	(select grid for nav unit to decimal-minutes);

PERFORMANCE

No variations.

WEIGHT AND BALANCE

See Section 6 of the present manual.

SYSTEMS

See “GTN 750 Pilot’s Guide” p/n 190-01007-03 Rev. A dated February 2011 or later versions, for a complete description of the system.

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SUPPLEMENT NO. A16
UKRAINIAN AIRCRAFT FLIGHT MANUAL SUPPLEMENT

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A06-3	Rev 0		
A06-4	Rev 0		

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INTRODUCTION

This supplement must be placed in EASA Approved P2002 JF Aircraft Flight Manual Section 9, if the airplane is delivered in Ukraine.

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.

GENERAL

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


FUEL

APPROVED FUEL

- MOGAS ASTM D4814
- MOGAS EN 228 Super/Super plus (min. RON 95)
- AVGAS 100 LL (ASTM D910)
- MOGAS DSTU 4839-2007

LIMITATIONS

OTHER PLACARDS

Description	Placard	Place
Fuel type and quantity	 <p style="text-align: center;"> MOGAS ASTM D4814-EN 228 SUPER/SUPER PLUS (min. RON 95) DSTU 4839-2007 AVGAS 100LL (ASTM D910) 50 LITERS (13.2 U.S. GALS.) TOTAL USABLE CAPACITY </p>	In correspondence of each fuel tank filler cap.

KIND OF OPERATIONS

This paragraph reports the KOEL table, concerning the equipment list required on board to allow the VFR Day flight operations in Ukraine country

- 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
- ELT (Emergency locator transmitter)



WARNING

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

SUPPLEMENT NO. A17
ARGENTINE AIRCRAFT FLIGHT MANUAL SUPPLEMENT

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A17-2	Rev 0		
A17-3	Rev 0		
A17-4	Rev 0		

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INTRODUCTION

This supplement contains supplementary information for a safe and efficient operation of the aircraft delivered in the Argentina

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.

LIMITATION

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

WARNING: Limitations, operation under Normal and Emergency Procedures, Performances & Weighing Instructions associated to:

- **600 Kg MTOW:** are only applicable for Aircrafts after install Service Bulletin SB 010-CS or Design Change MOD 2002/029.
- **620 Kg MTOW:** are only applicable for Aircrafts after install Service Bulletin SB 0105-CS or Design Change MOD 2002/087.

FUEL

APPROVED FUEL

- MOGAS ASTM D4814
- AVGAS 100 LL (ASTM D910)

LIMITATION PLACARDS

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

NO FUMAR

Near baggage compartment a placard will state the following:

ASEGURAR LA RED
PESO MÁXIMO 20 Kg
MÁXIMA PRESIÓN 12,5 Kg/dm²

On the wing root there is the following placard

NO PISAR