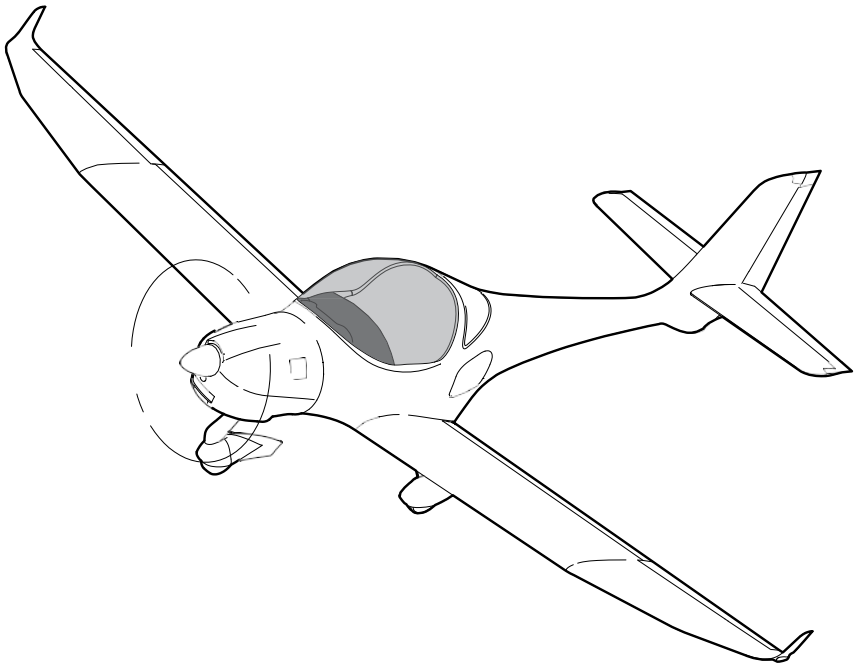
PILOT'S OPERATING HANDBOOK
AQUILA A212 GX



Type / Model: **AQUILA AT01-200**

Serial Number: **AT01-200C-**

Registration: _____

Document Number: FM-AT01-1010-106

First Issue: 02.03.2020

Certified according to: JAR-VLA

This Pilot's Operating Handbook (POH) must be carried on board the aircraft at all times. The amendment history and revision status are provided in the list of effective pages and in the list of revisions.

The aircraft must be operated in compliance with the procedures and operating limits stated herein.

INTRODUCTION

With the AQUILA AT01 you have acquired a very efficient training and utility aircraft, which is easy to operate and exhibits excellent handling qualities.

To ensure reliable operation and trouble free flight, we recommend that you read this Pilot's Operating Handbook thoroughly and adhere to the operating instructions and recommendations given herein.

CAUTION

All limitations, procedures and performance data contained in this handbook are EASA approved and mandatory. Failing to follow the procedures and limits set forth in this handbook can lead to a loss of liability by the manufacturer.

THE HANDBOOK

The handbook is presented in loose-leaf form to ease the substitution of revisions and is sized in A5-format for convenient storage in the aircraft.
Tab dividers throughout the handbook allow quick reference to each section. A Table of Contents is located at the beginning of each section to aid the location of specific data within that section.

TABLE OF CONTENTS

LIST OF EFFECTIVE PAGES

Note:
If the applicable POH supplement for Night VFR operation is implemented, the list of resulting effective chapters can be found in chapter 9.

Section	Issue	Approved	Page	Date
0	A.03		0-1 to 0-6	21.12.2021
1	A.02		1-1 to 1-12	03.03.2021
2	A.02	X	2-1 to 2-10	03.03.2021
3	A.01	X	3-1 to 3-24	02.03.2020
4	A.02	X	4-1 to 4-20	03.03.2021
5	A.01	(X)*	5-1 to 5-24	02.03.2020
6	A.01		6-1 to 6-14	02.03.2020
7	A.01		7-1 to 7-26	02.03.2020
8	A.01		8-1 to 8-6	02.03.2020
9	A.03		9-1 to 9-2	21.12.2021

* - partly approved

LIST OF REVISIONS

All revisions to the handbook, with the exception of individual weight and balance data and revisions to the Equipment List, must be recorded in the List of Revisions. Revisions must either be approved by the EASA or, in the case of changes, in accordance with Part 21.A.263(c)(2) by the Design Organization of AQUILA Aviation International GmbH.
Additions and revisions to text in an existing section will be identified by a vertical black line adjacent to the applicable revised area. A new issue code appears in the footer of the revised pages.

If revisions are distributed, the applicable sections are to be exchanged with the updated version. Generally only complete sections of the POH will be exchanged and not individual pages.

The operation of the AQUILA AT01 is only permitted with a current and up to date POH carried on board. Please refer to the following web page whenever the revision status of your POH is in question.

www.aquila-aviation.de

Issue	Description of Revision	Revised Section(s)	EASA Approval-number	Approval Date
A.01	First Issue	All	10072382	02.03.2020
A.02	Editorial changes, AS-27 "(restricted) GFC500"	0, 1, 2, 4, 9	10076303	03.03.2021
A.03	AST-02 „Increase of permissible Gross Weight to 800kg“	0, 9	10078033	21.12.2021

The technical content of this document is approved under the authority of the DOA ref. EASA.21J.025.

21. 12. 2021

Date, Signature Office of Airworthiness

Reporting of safety / airworthiness relevant occurrences:

Tel: ++49 –(0)33731-707-0
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E-Mail: occurrence@aquila-aviation.de

AVAILABILITY OF TECHNICAL PUBLICATIONS

To guarantee safe operation and correct maintenance of the AQUILA AT01-200 aircraft, all manuals and technical publications must be kept in the current effective status.

All manuals and technical publications are available from the companies listed below:

(a) *AQUILA AT01-200 related Manuals and Publications*

AQUILA Aviation International GmbH
OT Schönhagen, Flugplatz
D-14959 Trebbin

Tel: ++49 (0)33731-707-0
Fax: ++49 (0)33731-707-11
E-Mail: kontakt@aquila-aviation.de
Internet: http://www.aquila-aviation.de

(b) *Engine ROTAX 914 F related Manuals and Publications*

Contact the ROTAX® authorized distributor for ROTAX® Aircraft Engines of the applicable distribution area.
For contact details of the local authorized distributor for ROTAX Aircraft Engines, please refer to chapter 9 of the ROTAX® Operator's Manual for 914 Engines.

(c) *Propeller MTV-21 related Manuals and Publications*

mt-Propeller Entwicklung GmbH
Flugplatz Straubing-Wallmühle
D-94348 Atting

Tel: ++49 – (0)9429-9409-0
Fax: ++49 – (0)9429-8432
Internet: www.mt-propeller.com
E-Mail: sales@mt-propeller.com

SECTION 1

GENERAL

1.1 INTRODUCTION

This Pilot's Operating Handbook contains all the information the pilot and instructor require for the safe and efficient operation of the AQUILA AT01-200 aircraft.

It includes all information required in accordance with JAR-VLA and additional information considered by the manufacturer to be of value to the pilot.

This Manual consists of nine sections which cover all operational aspects of the aircraft equipped with a Garmin G500 TXi PFD and MVP-50P-AQ.

Optional equipment which has been installed on request of the customer (COM, NAV, GPS and others) is included in Section 9 "Supplements" of this Manual.

Information regarding equipment approved for installation in the AQUILA AT01-200 is provided in Section 6 of this manual and in the approved equipment overview list in the Maintenance Manual (Document Number MM-AT01-1020-110).

1.2 AIRCRAFT TYPE CERTIFICATION

The aircraft AQUILA AT01 is type-certified in accordance with the certification specifications of the *Joint Aviation Requirements for Very Light Aeroplanes (JAR-VLA,* including the revision VLA/92/1) by the Luftfahrt-Bundesamt, the National Aviation Authority of Germany.
The Type Certificate under the Type Certificate Data Sheet No. 1106 was issued on the 21st of September 2001.

Based on this Type Certificate the model AT01-200 was certified.

Category of Airworthiness: Normal

Noise Certification Basis: CS-36 (Amendment 5)

Approved for following operations: VFR by day

1.3 WARNING, CAUTIONS AND NOTES

Throughout the text, special text boxes marked WARNING, CAUTION and NOTE are used. These terms are defined as follows:

WARNING

Procedures, practices, etc. which may result in personal injury or loss of life if not strictly adhered to. The issues addressed under these text boxes directly affect the airworthiness and the safe operation of the aircraft.

CAUTION

Procedures, practices, etc. which may result in damage to or destruction of equipment if not strictly adhered to. The issues addressed under these text boxes have an indirect or minor impact on the airworthiness and the safe operation of the aircraft.

NOTE

Calls attention to additional procedures or information which are not directly associated with flight safety but are nevertheless important or deviate from standard practices.

1.4 PRINCIPLE AIRCRAFT DIMENSIONS

1.4.1 Overall Dimensions

Wing Span:	33.79 ft	(10.30 m)
Length:	24.28 ft	(7.40 m)
Height:	7.87 ft	(2.40 m)

1.4.2 Wings

Airfoil:	HQ-XX mod.	
Area:	113.02 sq. ft	(10.50 m²)
Aspect Ratio:	10.10	
Mean Aerodynamic Chord (MAC):	3.51 ft	(1.07 m)

1.4.3 Horizontal Stabilizer / Elevator

Area:	21.52 sq. ft	(2.00 m²)
Span:	9.84 ft	(3.00 m)

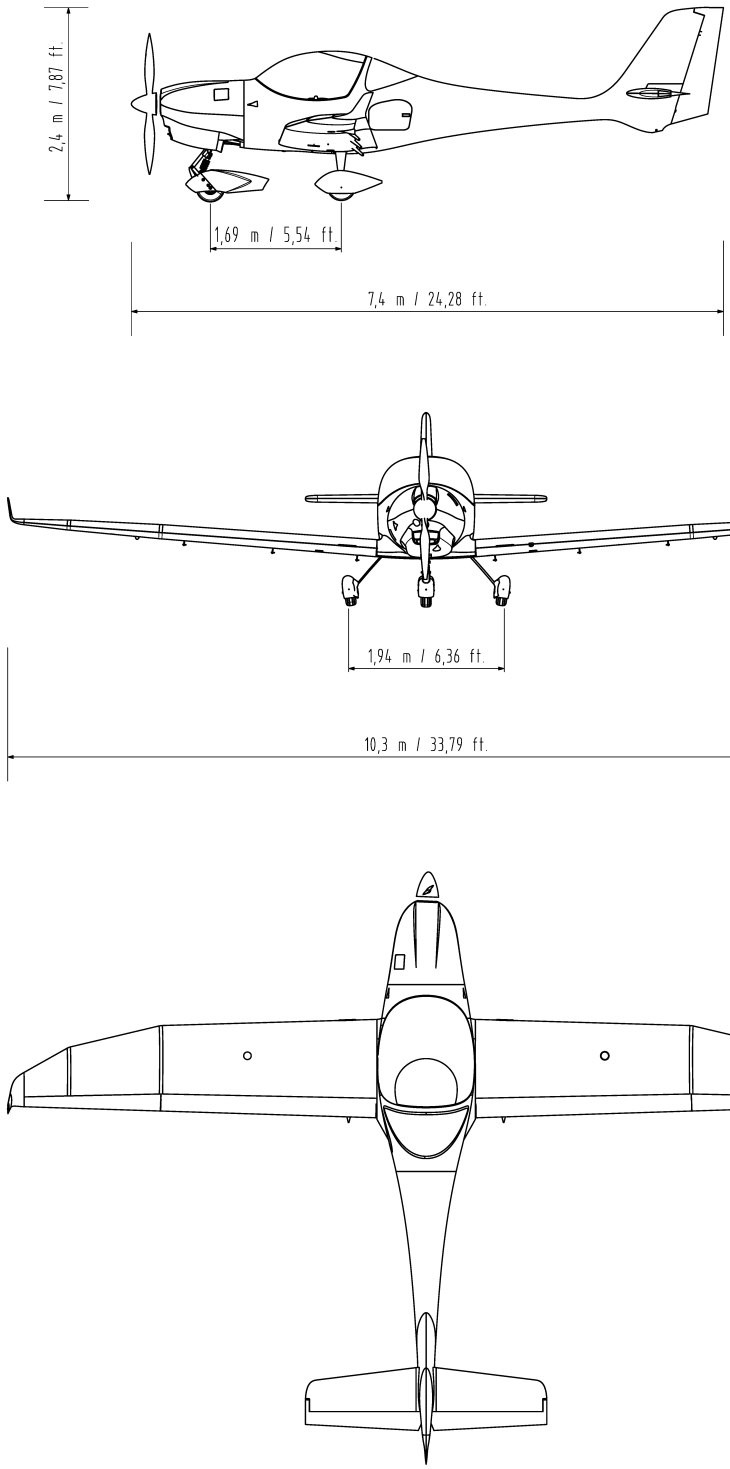
1.4.4 Fuselage and Vertical Stabilizer / Rudder

Maximum Fuselage Width	3.94 ft	(1.20 m)
Length	24.28 ft	(7.40 m)
Area (Vertical Tail):	15.61 sq. ft	(1.45 m²)

1.4.5 Landing Gear

Wheel Track:	6.37 ft	(1.94 m)
Wheel Base:	5.54 ft	(1.69 m)
Tire Size:	5.00-5	

1.5 AQUILA AT01-200 – THREE VIEW DRAWING



1.6 ENGINE

The ROTAX® 914 F3 is a 4-cylinder 4-stroke engine with air cooled cylinders and liquid cooled cylinder heads.
The Propeller is driven via an internal reduction gearbox with an integrated overload clutch and a hydraulic constant speed propeller governor.

Reduction Ratio of internal gearbox:	2.43 : 1	
Displacement:	73.9 in³	(1211 cm³)
max. Takeoff power (5 min.):	113,3 BHP	(84.5 kW)
at max. Takeoff propeller speed:	2385 RPM	
max. continuous power:	98.6 BHP	(73.5 kW)
at max. continuous propeller speed:	2260 RPM	

1.7 PROPELLER

Hydraulic two-blade, constant speed propeller

Manufacturer:	mt-Propeller	
Type:	MTV-21-A/175-05	
Diameter:	68.9 in	(175 cm)

1.8 FUEL

The following fuel grades are approved for use (min. RON 95):

EN228 Super	ASTM D4814
EN228 Super plus	
AVGAS 100LL	ASTM D910
AVGAS UL 91	ASTM D7547

	Left Fuel Tank	Right Fuel Tank
Fuel Capacity (total):	15.8 US gal (60 l)	15.8 US gal (60 l)
Usable Fuel (total):	14.48 US gal (54.8 l)	14.48 US gal (54.8 l)
Unusable Fuel:	1.37 US gal (5.2 l)	1.37 US gal (5.2 l)

Due to the higher lead content in AVGAS 100LL, wear of the valve seats, deposits in the combustion chamber and lead sediments in the lubrication system will increase when using this type of fuel. Therefore AVGAS should only be used if you encounter problems with vapor lock or if the other fuel types are not available.

Lead free AVGAS UL 91 is similar to AVGAS 100LL (MON 91 ⇒ RON > 95) when it comes to vapor lock susceptibility. However, it does not suffer from lead induced problems.
(Please refer to the current issue of the operating manual for the ROTAX® 914 engine series)

1.9 ENGINE OIL AND COOLANT

1.9.1 Engine Oil

Use only oil with an API classification of “SG” or higher. Heavy duty 4-stroke motor oils tend to meet these requirements. For more information regarding engine oil selection, please refer to the Operator’s Manual for all versions of the 914 engine series and to the current issue of the ROTAX® Service Instruction SI-914-019.

The following chart shows the recommended oil viscosity as a function of the climatic conditions. The use of multi-grade oils is recommended.

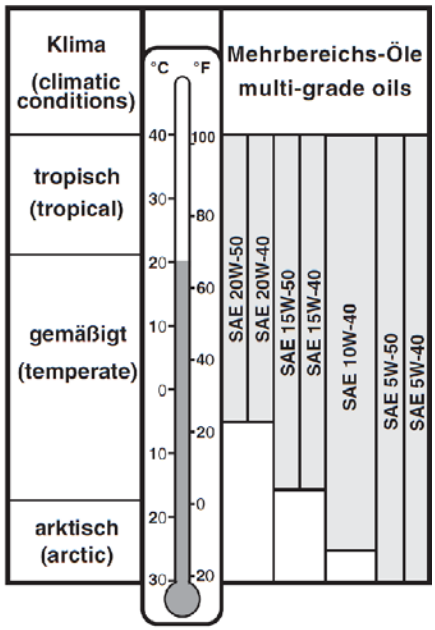


Figure 1-2

CAUTION

Do <u>not</u> use aviation grade oil!

*When operating the engine with AVGAS do **<u>not</u>** use full synthetic oil!*
If the engine is operated extensively on AVGAS 100LL (more than 30hrs within 100hrs) the interval between oil changes shall be reduced to 50 hrs!
(please refer to the current issue of the ROTAX® Service Instructions SI-914-019)

Max. Oil Capacity:	3.17 US quarts	(3.00 l)
Difference between Max/Min:	0.475 US quarts	(0.45 l)
Max. Oil Consumption:	0.063 US quarts/hr.	(0.06 l/h)

1.9.2 Engine Coolant

A conventional, ethylene glycol and water based coolant is used.

Please refer to the Operator's Manual for the 914 engine series, section 2.2, and to the current issue of the ROTAX® Service Instructions SI-914-019 when choosing an engine coolant.

Description	Ethylenglycol	Water
Mixture ratio [%] anti-freeze / water	50 + 15	50 - 15

CAUTION

Low quality or contaminated coolant may lead to deposits in the cooling system which may result in insufficient engine cooling.

Coolant Quantity:	Minimum:	2.54 US quarts	(2.4 l)
	Maximum:	2.64 US quarts	(2.5 l)
Overflow Bottle:	Minimum:	0.106 US quarts	(0.1 l)
	Maximum:	0.21 US quarts	(0.2 l)

1.10 WEIGHTS

Maximum Takeoff Weight (MTOW):		1653 lb.	(750 kg)
Maximum Landing Weight (MLW):		1653 lb.	(750 kg)
Empty Weight (MZFW):		Refer to section 6	
Max. Weight in Baggage Compartment:		88.2 lb.	(40 kg)
(All baggage must be adequately strapped and secured)			
Max. Wing Loading:		14.6 lb./ft²	(71.4 kg/m²)
Min. Wing Loading:	ca.	10.77 lb./ft²	(52.6 kg/m²)

1.11 TERMINOLOGY AND ABBREVIATIONS

1.11.1 Speeds

IAS: (Indicated Airspeed) - the speed shown on the airspeed indicator

KIAS: IAS expressed in knots

CAS: (Calibrated Airspeed) - the indicated airspeed, corrected for position and instrument error. CAS is equal to true airspeed in standard atmosphere conditions at sea level.

KCAS: CAS expressed in knots

TAS: (True Airspeed) - the airspeed relative to undisturbed air, which is the CAS corrected for altitude, temperature and compressibility.

GS: (Ground speed) - speed of the aircraft relative to the ground

V_A: Maneuvering Speed

V_S: Stall speed without engine power

V_{S0}: Stall speed without engine power in the landing configuration

V_X: Best Angle-of-Climb Speed

V_Y: Best Rate-of-Climb Speed

V_{FE}: Maximum Flap Extended Speed

V_{NE}: Never Exceed Speed - The speed limit that must not be exceeded at any time

V_{NO}: Maximum Structural Cruising Speed is the speed that should not be exceeded except in smooth air and then only with caution.

1.11.2 Weight and Balance

Reference Datum:	An imaginary vertical plane from which all horizontal distances are measured for balance purposes
Reference Line:	fixed horizontal reference line
Lever Arm:	The horizontal distance from the reference datum to the center of gravity (C.G.) of an item
Moment:	The product of the weight of an item multiplied by its lever arm
Empty Weight:	Weight of the aircraft including unusable fuel, full operating liquids and full oil.
Max. Takeoff Weight:	Maximum permissible weight approved for the conduction of the takeoff run
Useful Load:	Difference between takeoff weight and basic empty weight
Usable Fuel:	Fuel available for flight planning
Unusable fuel:	Fuel remaining in the fuel tanks that cannot be safely used in flight.
Center of Gravity (C.G.):	The point at which the aircraft would balance if it were possible to suspend it at that point
MAC:	mean aerodynamic chord
MTOW:	maximum takeoff weight
MWL:	maximum landing weight
MZFW:	empty weight

1.11.3 Meteorological Terminology

ISA:	International Standard Atmosphere
MSL:	Altitude above sea level
OAT:	Outside Air Temperature
QNH:	Barometric pressure adjusted to sea level
SAT:	Static Air Temperature - equal to OAT
VFR, Day:	Beginning of morning civil twilight until end of evening civil twilight (sun 6° below horizon)
VFR, Night:	End of evening civil twilight until beginning of morning civil twilight (sun 6° below horizon)
DVFR:	Flight during the day according to visual flight rules
NVFR:	Flight during the night according to visual flight rules

1.11.4 Engine and Performance

TOP:	(Take-off Power) - maximum power permissible for takeoff
MCP:	(Max. Continuous Power) - maximum power permitted for continuous operation

1.11.5 Various

Serial No. (S/N):	Serial Number of the Aircraft
Part No. (P/N):	Part Number
GFRP:	Glass Fiber Reinforced Plastic
CFRP:	Carbon Fiber Reinforced Plastic
ACL:	Anti Collision light
VFR:	Visual Flight Rules
PFD:	Primary Flight Display
ADC	Air-Data Computer
AHRS	Attitude and Heading Reference System
GDU	Garmin Display Unit
MFD	Multi-Function Display
AI	Attitude Indicator or Artificial Horizon
LDG:	Flaps - landing position
T/O:	Flaps - takeoff position
UP:	Flaps - cruise position
MP:	Manifold Pressure
COM:	Communication
NAV:	Navigation
CB:	Circuit Breaker
ATC:	Air Traffic Control
FF:	Fuel Flow
rpm:	revolutions per minute
AS:	AQUILA Supplement
EMS:	Engine Monitoring System
TCU:	Turbo Control Unit

1.12 CONVERSION FACTORS

1.12.1 Length

1 ft	=	0.304	m		
1 in	=	25.4	mm		

1.12.2 Speed

1 kt	=	1.852	km/h		
1 mph	=	1.609	km/h		

1.12.3 Pressure

1 hPa	=	100	N/m^2	=	1 mbar
1 in. Hg	=	33.865	hPa		
1 psi	=	68.97	mbar		

1.12.4 Mass (“Weight”)

1 lb	=	0.454	kg

1.12.5 Volume

1 US Gallon	=	3.78	Liter
1 Imperial Gallon	=	4,546	Liter

1.12.6 Temperature

(t) °C (Celsius)	=	5/9 ((t) °F-32)
(t) °F (Fahrenheit)	=	9/5 (t) °C+32

SECTION 2

LIMITATIONS

2.1 INTRODUCTION

This section includes all operating limitations, instrument markings and basic placards necessary for the safe operation of the aircraft, its engine, standard systems and standard equipment.

WARNING

The aircraft must be operated in compliance with the operating limitations.

The GARMIN G500 TXi Cockpit Reference Guide and the Operating Instructions for the Glass Panel Engine Monitor MVP-50P-AQ must be carried on board the aircraft and be accessible to the crew during flight.

2.2 AIRSPEED LIMITATIONS

The airspeeds given below are expressed in Indicated Airspeeds (IAS), the airspeed shown on the airspeed indicator:

Indicated Airspeed (IAS)	[kts]	Remarks
V_A Maneuvering speed	**112**	Do not make full or abrupt control movements above this speed. This may result in overloading the aircraft structure.
V_{FE} Maximum flap extended speed	**90**	Do not exceed this speed with flaps in T/O or LDG position.
V_{NO} Maximum structural cruising speed	**130**	Do not exceed this speed except in smooth air, and then only with caution.
V_{NE} Never exceed speed	**165**	Do not exceed this speed in any operational condition.

2.3 AIRSPEED INDICATOR MARKINGS

The airspeeds given below are expressed in Indicated Airspeeds (IAS):

Marking (IAS)	[kts]	Remarks
White arc	**39-90**	Full flap operating range
Green arc	**49-130**	Normal operating range
Yellow arc	**130-165**	Operations in this region must be conducted with caution and only in smooth air.
Red line	**165**	Maximum speed for all operations.

2.4 POWER PLANT LIMITATIONS

2.4.1 Engine

a) Manufacturer: BRP-ROTAX GmbH & Co KG, Gunskirchen, Austria

b) Model: 914 F3

NOTE

The engine is equipped with a hydraulic propeller governor and drives the propeller via a reduction gearbox. The gearbox reduction ratio is 2.43 : 1.

The tachometer indicates the propeller speed. As a result, all rpm readings in this manual are expressed as propeller speeds, unlike the data in the Engine Operator's Manual.

c) Power Plant Limitations

Maximum Takeoff Power:	113.3 BHP (84.5 kW)
Maximum Takeoff Prop Speed (5 min.):	2385 RPM
Maximum Continuous Power:	98.6 BHP (73.5 kW)
Maximum Continuous Prop Speed:	2260 RPM

d) Oil Pressure

Minimum:	11.6 psi	(0.8 bar)	below 590 RPM
Normal:	29 –72.5 psi	(2.0-5.0 bar)	above 590 RPM
Maximum during a cold start: (only for a short time)	101.5 psi	(7.0 bar)	

e) Fuel Pressure*

Minimum:	2.2 psi	(0.15 bar)
Maximum:	5.1 psi	(0.35 bar)

f) Manifold Pressure

Maximum (MCP):	35 inHg
Maximum (TOP, 5 min):	40 inHg

g) Oil Temperature

Maximum:	266 °F	(130 °C)
Minimum:	122 °F	(50 °C)

h) Cylinder Head Temperature (CHT)

Maximum:	248 °F	(120 °C)

i) Minimum temperature to start the engine

Minimum:	-13 °F	(-25 °C)

At an OAT below -13 °F (-25 °C) the engine must be preheated.

2.4.2 Propeller

a) Manufacturer: mt-Propeller Entwicklung GmbH, Atting, Germany

b) Model: MTV-21-A/175-05

c) Propeller diameter: 68.9 in (1,75 m)

d) Propeller speed limitations

Maximum take-off propeller speed (max. 5 min):	2385 RPM
Maximum continuous propeller speed:	2260 RPM

* Difference of fuel pressure minus airbox pressure

2.5 MARKINGS ON THE ENGINE MONITOR MVP-50P-AQ

The following table shows the instrument markings shown on the MVP-50P-AQ and their meaning.

MVP-50P-AQ	**Red Line** (minimum)	**Green Arc** (normal operating range)	**Yellow Arc** (caution)	**Red Line** (maximum)
Tachometer [RPM]	---	535 – 2260	2260 - 2385	2385
Oil Temperature [°F] ([°C])	122 (50)	122 - 266 (50 – 130)	---	266 (130)
Cylinder Head Temperature [°F] ([°C])	---	---	---	248 (120)
Oil Pressure [psi] ([bar])	11.6 (0.8)	29 – 72.5 (2.0 – 5.0)	11.6 – 29 (0.8 – 2.0) 72.5 – 101.5 (5.0 – 7.0)	101.5 (7.0)
Fuel Pressure [psi] ([bar])	2.2 (0.15)	2.2 – 5.1 (0.15 – 0.35)	---	5.1 (0.35)
Manifold Pressure [inHg]	---	0 – 35	35 – 40	40
Voltmeter [V]	11	12.5 – 15.5	11 – 12.5	15.5
Amperemeter BAT [A]	---	-3 - +100	< -3	---
Amperemeter ALT1 [A]	-5	+1 - +42	-5 – +1 > +42	---
Amperemeter ALT2 [A]	---	-3 - +20	< -3 > +20	---

2.6 WEIGHT LIMITS

Maximum Takeoff Weight	1653 lb	(750 kg)
Maximum Landing Weight	1653 lb	(750 kg)
Max. Weight in Baggage Compartment	88.2 lb	(40 kg)

WARNING

Exceeding the weight limits can overload the aircraft and is prohibited. In addition, aircraft performance and handling characteristics may be detrimentally affected. The stall speed will increase, so that the instrument markings are no longer accurate.

2.7 CENTER OF GRAVITY LIMITS

The reference datum is located at the wing leading edge, at the fuselage-wing junction.
With the aircraft leveled, the reference datum and the vertical fall in a plane.

The center of gravity must be within the following limits:

Forward Limit:	16.8 in.	(0.427 m)	aft of Datum
Rearward Limit:	20.6 in.	(0.523 m)	aft of Datum

WARNING

Exceeding the center of gravity limits is prohibited. Exceeding the limits reduces the controllability and stability of the aircraft.

The procedure to determine the center of gravity location for flight is provided in Section 6 of this handbook.

2.8 MANEUVER LIMITS

The aircraft is certificated in accordance to the JAR-VLA. That certification includes the following maneuvers:

a) All normal, non acrobatic maneuvers.

b) Stalls: Wings level stall

c) Steep Turns: Angle of Bank ≤ 60°

d) Chandelle: Entry Speed 120 kts

e) Lazy Eight: Entry Speed 110 kts

NOTE

All acrobatic maneuvers as well as maneuvers with a bank angle exceeding 60° are prohibited.

2.9 FLIGHT LOAD FACTORS

The following flight load factors may not be exceeded while performing any approved maneuvers.

Flight Load Factor [g]	at V_A	at V_{NE}	With Flaps Extended
Positive	4.0	4.0	2.0
Negative	-2.0	-2.0	0

WARNING

Exceeding the flight load factors limits may result in damage to the aircraft structure.

CAUTION

Maneuvers that include intentional negative flight load factors are not permitted.

Intentional Spinning is not permitted.

2.10 CREW

Maximum number of people on board: 2

Minimum crew: 1 Pilot

With only one person on board, the aircraft may only be operated from the left seat.

2.11 KINDS OF OPERATION LIMITS / MINIMUM EQUIPMENT

Certified for: visual flights by Day

Table 1	For VFR by Day*
Flight and navigational instruments	• Garmin G500 TXi • Magnetic Compass • Working timepiece with a seconds hand** • VHF Transceiver*** • GPS Receiver Garmin 400W / 500W Series or GTN (6XX/7XX)
Power Plant Instruments	• MVP-50P-AQ • Annunciator panel AP7DAQ • BAT2 • TCU
Other Equipment	• Seat belts for each occupied seat • Emergency Hammer • Battery ≥ 34 Ah • Alternator ALT 2

* The minimum equipment listed in Table 1 is valid for Germany. Other countries may require different minimum equipment. This may depend on the type of flight being carried out and the route being flown.

** In Germany a watch with a seconds hand may be used as a working timepiece. Please observe all differing national regulations.

*** In Germany a VHF Transceiver is not required for flights that do not leave the vicinity of an uncontrolled airfield (§4 Abs. 3 FSAV). Regulations of other nations must still be observed.

NOTE

For specific operations, additional equipment may be necessary. It is the aircraft operator's responsibility to observe the applicable requirements.

2.12 FUEL LIMITATIONS

	Left Fuel Tank	Right Fuel Tank
Fuel capacity (total):	15.85 US gal (60.0 l)	15.85 US gal (60.0 l)
Usable fuel (total):	14.48 US gal (54.8 l)	14.48 US gal (54.8 l)
Unusable fuel:	1.37 US gal (5.2 l)	1.37 US gal (5.2 l)

For approved fuel grades, please refer to paragraph 1.8.

CAUTION

To ensure both fuel tanks are emptied evenly, switch to the other tank at least every 60 minutes.

NOTE

The amount of unusable fuel was determined with flap on LDG and V_{FE} = 90 kts. It is the worst case fuel supply configuration within section 4 "NORMAL PROCEDURES".

NOTE

The fuel quantity, fuel used and fuel remaining functions of the G500 TXi / MVP-50 are advisory information only and must be verified by the pilot.

2.13 TEMPERATURE LIMITATIONS

Parts of the aircraft structure that are exposed to direct vertical sunlight must be painted WHITE.

The cooling system of the engine was certified up to ISA +23°C.

For climbing in OAT higher than ISA +23°C an appropriate airspeed of more than v_y has to be selected by the pilot.

2.14 OPERATING ALTITUDE

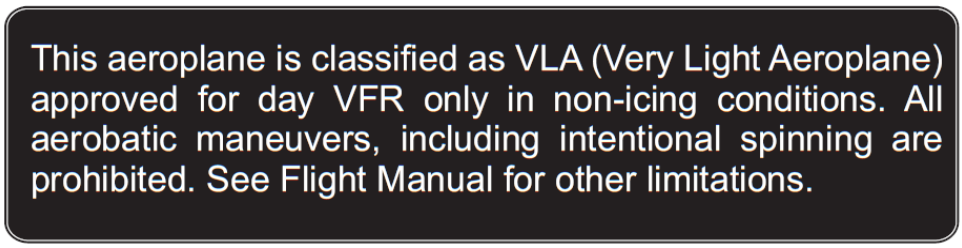
The Aquila AT01-200 has a maximum operating altitude of 16,400 ft.

For flights above FL120 an appropriate oxygen supply for all persons aboard is recommended.

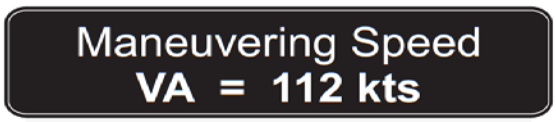
Furthermore national regulations have to be considered if applicable.

2.15 PLACARDS

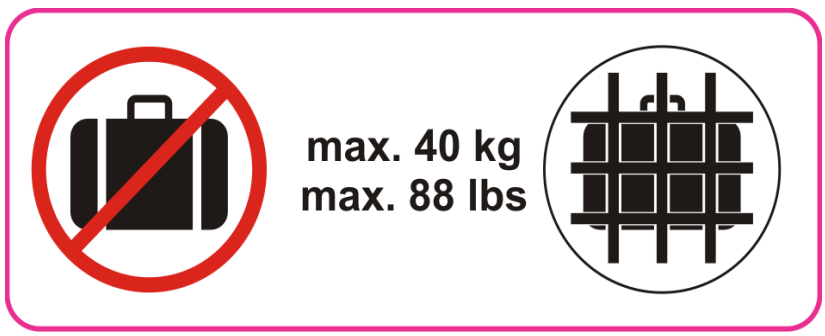
1) On the instrument panel, in the lower middle section of the panel:



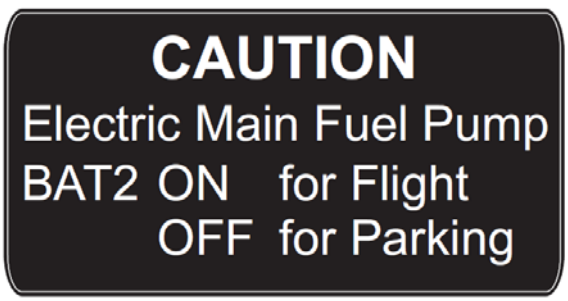
2) On the instrument panel below the Airspeed Indicator:



3) On the inner surface of the baggage compartment door:



4) On the instrument panel next to the main switches:



SECTION 3

EMERGENCY PROCEDURES

3.1 INTRODUCTION

This section provides checklists with the recommended procedures for coping with various emergency situations.
Emergencies caused by aircraft or engine malfunctions are extremely rare if all pre-flight inspections and required maintenance is properly conducted.
However, should an emergency situation occur, the procedures provided here are recommended to correct the problem and master the situation.

Not all types of emergency situations or combinations can be described in the POH. A pilot must therefore always use good airmanship and have a sound knowledge of the aircraft and its systems.

3.1.1 Resetting Circuit-breakers

The **one time only** resetting of a tripped circuit breaker or safety switch is considered a recommendation for the following emergency procedures.

Applicable for all switches: pushing the top = ON; pushing the bottom = OFF

CAUTION

A tripped circuit breaker or safety switch should only be reset if it is needed for continued safe flight and landing. In extreme cases, resetting a circuit breaker may cause an electrical fire.

*A circuit breaker or safety switch should only be reset **once** and be inspected after flight.*

3.2 AIRSPEEDS FOR EMERGENCY OPERATION

Airspeed (IAS)		**[kts]**
Maneuvering speed	V_A	112
Speed for best glide ratio		
Flaps	UP	78
Flaps	T/O	73
Precautionary landing with / without engine power		
Flaps	LDG	60
Landing without engine power		
Flaps	T/O	65
Flaps	UP	70

3.3 ENGINE FAILURES – CHECKLISTS

3.3.1 Engine Failure before Take-off

1.	Throttle	IDLE
2.	Brakes	APPLY as required

3.3.2 Engine Failure Immediately After Take-off and during Climb

1.	Airspeed (IAS)	70 KIAS

WARNING

Depending on the own speed and altitude, the wind condition and the remaining engine power a forced landing must be initiated under consideration of the local conditions.

Turning back to the runway only at adequate altitude, otherwise land straight ahead ! Pay attention to the speed !

Check the following items (if time allows):

2.	Fuel selector valve	SWITCH to fullest or other tank
3.	**Fuel Pump AUX** switch	ON
4.	Ignition switch	BOTH
5.	Throttle	wide OPEN
6.	Propeller control lever	START position
7.	Choke	PRESS (OFF)
8.	Carburetor heat	PULL (ON)

Before landing (if possible):

9.	Fuel selector valve	OFF
10.	Ignition switch	OFF
11.	**ALT1 / BAT** switch	OFF
12.	**ALT2 / BAT** switch	OFF

WARNING

*With **ALT1 / BAT** switch in OFF position: Stall warning system inoperative and flap position cannot be changed!*

3.3.3 In-flight Engine Failures

A) ENGINE ROUGHNESS

1. Carburetor heat	PULL (ON)
2. **Fuel Pump AUX** switch	ON
3. Ignition switch	SWITCH through the positions L-BOTH, then R-BOTH
4. Throttle	Maintain setting

If roughness continues:

5. Throttle	REDUCE to min. required for flight
6. Precautionary Landing	PERFORM (see 3.4.1)

B) LOSS OF OIL PRESSURE

1. Oil Temperature	CHECK

If oil pressure sinks below the green range and the oil temperature remains normal:

2. Land at the nearest airfield

If oil pressure sinks below the green range and the oil temperature rises:

2. Throttle	REDUCE to min. required for flight
3. Precautionary landing	PERFORM (see 3.4.1), Engine may fail suddenly!

C) LOSS OF FUEL PRESSURE

1. **Fuel Pump AUX** switch	ON
2. Fuel selector valve	SWITCH to fullest or other tank
3. Throttle	REDUCE to min. required for flight, if possible (Manifold pressure below air pressure)
4. **Fuel Pump AUX** switch	OFF, when fuel pressure in green range

NOTE

After switching fuel tanks, it may take up to 8 seconds for full fuel pressure to be built up.

If fuel pressure remains below the green range:

5. Precautionary landing	PERFORM (see 3.4.1), Engine may fail suddenly!

D) SUDDEN LOSS OF MANIFOLD PRESSURE & PROPELLER RPM

I. **TCU** warning light (YELLOW) **is NOT blinking** - possible Turbocharger defect (loud Bang?)

1.	Throttle	KEEP manifold pressure in green range
2.	Propeller control lever	KEEP RPM in green range
3.	Oil pressure gauge	MONITOR
4.	Precautionary landing	PERFORM (see 3.4.1), Engine may fail suddenly!

II. **TCU** warning light (YELLOW) **is blinking** - waste gate is not closing

1.	Throttle	KEEP manifold pressure in green range
2.	Propeller control lever	KEEP RPM in green range
3.	**TCU** switch	OFF (Cover up, switch down)
4.	**TCU** circuit breaker	PULL
5.	**TCU** circuit breaker	after 5 seconds PRESS
6.	**TCU** switch	after 10 seconds (TCU self-test completed) ON (switch up)

If the situation does not improve:

7.	Precautionary landing	PERFORM (see 3.4.1), Engine may fail suddenly!

WARNING

If there is a failure of the Turbocharger or a waste gate blocked in the open position, an engine power of around 66kW (88,5 BHP) is remaining.
(see section 5 for resulting take-off distance and remaining climb rate for balked landing)

E) SUDDEN INCREASE OF MANIFOLD PRESSURE & PROPELLER RPM

I. **TCU** warning light (YELLOW) **is blinking** - waste gate closed

1.	Throttle	KEEP manifold pressure in green range
2.	Propeller control lever	KEEP RPM in green range
3.	Precautionary landing	PERFORM (see 3.4.1)

WARNING

If the waste gate is closed, only a distinctly reduced engine power is available.

II. **TCU** warning light (YELLOW) **is NOT blinking** - gas bowden cable broken

1.	Throttle	REDUCE to min. required for flight
2.	Propeller control lever	KEEP RPM in green range

If manifold pressure cannot be reduced:

3.	Throttle	wide OPEN (increase engine power until engine is running as calm as possible)
4.	Propeller control lever	KEEP RPM in green range

When safe approach altitude for nearest landing field is reached:

5. Perform emergency landing with engine off according to section 3.4.2.

WARNING

If the gas bowden cable is broken, the spring-loaded throttle valve in the carburetor is opening completely (take-off power 115% MCP). With the failure only on one side, the engine will run very roughly and only by setting full throttle on the still controllable carburetor safe climbing is still possible. For landing the engine has to be turned off at a safe approach altitude.

F) OSCILLATION OF MANIFOLD PRESSURE & PROPELLER RPM

I. **TCU** warning light (YELLOW) **is NOT blinking** - Malfunction TCU

1.	Throttle	middle position (wastegate open)
2.	Propeller control lever	KEEP RPM in green range
3.	**TCU** switch	OFF (Cover up, switch down)
4.	**TCU** circuit breaker	PULL
5.	**TCU** circuit breaker	after 5 seconds PRESS
6.	**TCU** switch	after 10 seconds (TCU self-test completed) ON (switch up)

If no stabilization:

6.	**TCU** switch	OFF (switch down)
7.	Throttle	KEEP manifold pressure in green range
8.	Propeller control lever	KEEP RPM in green range
9.	Precautionary landing	PERFORM (see 3.4.1)

WARNING

Depending on the last waste gate position, without a working TCU there is only a distinctly reduced engine power available.

G) EXCEEDANCE OF THE MAXIMUM ALLOWABLE MANIFOLD PRESSURE OR OF THE MAXIMUM DURATION FOR OPERATION WITH TAKE-OFF POWER

I. **BOOST** warning light (RED) **is illuminated** - Exceedance of max manifold pressure (40inHg)

1.	Throttle	KEEP manifold pressure in green range
2.	Propeller control lever	KEEP RPM in green range
3.	**TCU** switch	ckeck, if ON (switch up)

If there is no switch failure - **Malfunction of TCU likely! (refer to 3.3.3 F)**

II. **BOOST** warning light (RED) **is blinking** - Exceedance of max. duration for TOP (5 min)

1.	Throttle	KEEP manifold pressure in green range
2.	Propeller control lever	KEEP RPM in green range
3.	Flight	CONTINUE

WARNING

Every exceedance indicated by BOOST warning light has to be recorded in the technical logbook together with information regarding type, duration and date of the exceedance! Exceedances of less than 3 seconds will not be indicated.

H) ENGINE RESTART PROCEDURE WITH STOPPED PROPELLER

1.	Non-essential electrical equipment		OFF
2.	**ALT1 / BAT** switch		ON
3.	**ALT2 / BAT2** switch		ON
4.	Propeller control lever		START position
5.	Fuel selector valve		SWITCH to fullest tank
6.	**Fuel Pump AUX** switch		ON
7.	Throttle	warm engine	OPENED 2 cm (0,8 inch)
		cold engine	IDLE
8.	Choke	warm engine	PUSHED (OFF)
		cold engine	PULL (ON)
9.	Ignition switch		BOTH, then START

When power is restored:

10.	Oil pressure	CHECK
11.	Choke	PUSHED (OFF)
12.	Electrical equipment	SWITCH ON (as required)
13.	Oil temperature	CHECK

NOTE

The engine can also be restarted by Windmilling if the airspeed is increased to approx. 120 kts. Approx. 1000 ft / 300 m of altitude is required in this method.

I) ENGINE RESTART PROCEDURE WITH WINDMILLING PROPELLER

At airspeeds above 60 kts the propeller continues to windmill with the engine off.

1.	Airspeed		78 KIAS
2.	**ALT1 / BAT** switch		ON
3.	**ALT2 / BAT2** switch		ON
4.	Fuel selector valve		SWITCH to fullest or other tank
5.	Propeller control lever		START position
6.	**Fuel Pump AUX** switch		ON
7.	Ignition switch		BOTH
8.	Throttle	hot engine	OPENED 2 cm (0,8 inch)
		cold engine	IDLE
9.	Choke	hot engine	PUSHED (OFF)
		cold engine	PULL (ON)

When power is restored:

10.	Oil pressure	CHECK
11.	Choke	PUSHED (OFF)
12.	Electrical equipment	SWITCH ON (as required)
13.	Oil temperature	CHECK

3.4 FORCED LANDINGS

Generally the flight path should always be chosen such that, in the event of an emergency, a suitable landing field can be reached.

CAUTION

If, after a forced landing, the aircraft flips over, an emergency hammer can be used to break through the canopy. For this purpose an emergency hammer is attached to back of the right hand seat.

3.4.1 Precautionary Landing

NOTE

A precautionary landing occurs when the pilot decides to discontinue flight to avoid a situation degrading into an emergency. This way the pilot has time to make decisions and choose an adequate landing site or divert to an airfield. The procedure for a precautionary landing is fundamentally the same as a normal landing, which is described in Section 4.
The choice of the landing field is here of particular importance.
Deteriorating weather is a leading cause of precautionary landings.

1.	Locate Suitable Field	CONSIDER wind direction, terrain and obstructions.
2.	Seat Belts and Harnesses	TIGHT
3.	Initiate descent	
4.	If possible: Overfly landing site at a low altitude and inspect (wind direction, terrain and obstructions)	
5.	Abeam the touchdown point:	
	Throttle	AS REQUIRED
	Propeller Control Lever	START position
	Carburetor Heat	PULL (ON)
	Fuel Pump AUX switch	ON
	Flaps	LDG
	Airspeed	60 KIAS

6. Touch down with lowest possible airspeed.
7. After touchdown:

Brakes	APPLY as required
Fuel selector valve	OFF
Ignition switch	OFF
ALT1 / BAT switch	OFF
ALT2 / BAT2 switch	OFF

3.4.2 Emergency Landing

NOTE

An emergency landing occurs in a state of distress, such as an engine failure, fuel starvation or mechanical problems with the aircraft. In this case a pilot typically has significantly less time to choose a landing site compared with a precautionary landing.

1. Airspeed:

Flaps in LDG position	60 KIAS
Flaps in T/O position	65 KIAS
Flaps in UP position	70 KIAS

2. Fuel selector valve — OFF
3. Ignition switch — OFF
4. Seat belts and harnesses — TIGHT
5. COM (ATC) — REPORT location and intention
6. **ALT1 / BAT** switch — OFF
7. **ALT2 / BAT2** switch — OFF
8. ELT — if necessary activate manually

WARNING

*With **ALT1 / BAT** switch in OFF position: Stall warning system inoperative and flap position cannot be changed!*

3.5 SMOKE AND FIRE

3.5.1 Engine Fire on the Ground

1. Fuel selector valve — OFF
2. Throttle — WIDE OPEN
3. **ALT1 / BAT** switch — OFF
4. **ALT2 / BAT2** switch — OFF
5. Ignition switch — OFF
6. Aircraft — EVACUATE immediately once engine stops

3.5.2 Engine Fire In-flight

1.	Throttle	WIDE OPEN
2.	Fuel selector valve	OFF
3.	Cabin heat	PUSHED (OFF)
4.	Canopy slide-window	OPEN
5.	Perform a precautionary landing without engine power as described in Section 3.4.2	

3.5.3 Electrical Fire with Smoke on the Ground

1.	**ALT1 / BAT** switch	OFF
2.	**ALT2 / BAT2** switch	OFF

If engine is running:

3.	Throttle	IDLE
4.	Fuel selector valve	OFF
5.	Ignition switch	OFF
6.	Canopy	OPEN
7.	Fire extinguisher (if installed)	USE as required

3.5.4 Electrical Fire with Smoke in Flight

1.	**ALT1 / BAT** switch	OFF
2.	**ALT2** switch	OFF (**BAT2** still ON)
3.	**Avionics** switch	OFF
4.	All switches (except Ignition)	OFF
5.	Cabin ventilation and canopy slide-window	OPEN
6.	Fire extinguisher (if installed)	Use only if smoke persists
7.	Land immediately	Refer to Section 3.4 Forced Landings

After landing and aircraft comes to a halt:

8.	Engine	Shut down
9.	Canopy	OPEN
10.	After engine stops	Evacuate aircraft

CAUTION

When a large amount of smoke is present or the fire extinguisher has been used, ventilate the cabin by unlocking the canopy latch. If possible, the fire extinguisher should be secured after use.

WARNING

*Turning the **ALT1 / BAT** and **ALT2** switches OFF turns off all electrical and electronic equipment, including the flaps*

3.6 INADVERTENT FLIGHT IN ICING CONDITIONS

WARNING

Intentional flight in icing conditions is prohibited. During unintentional flight in icing conditions proceed as follows:

1.	Carburetor heat	PULL (ON)
2.	Leave icing conditions immediately by flying a reciprocal heading and/or changing altitude	
3.	**P/S Heat** switch (if installed)	ON
4.	Propeller Control Lever	START position
5.	Cabin heat	PULL (ON)
6.	Move the control surfaces periodically to keep them from freezing.	

CAUTION

The stall speed increases with ice accumulation on the wing leading edge.

Airspeed indicator, altimeter and vertical speed indicator readings may be inaccurate with ice accumulation on the leading edge of the wing. Additionally, the stall warning system may be inoperative or may not work correctly.

3.7 SPIN RECOVERY PROCEDURE

1.	Rudder	Full deflection opposite direction of rotation
2.	Elevator	Neutral or slightly forward
3.	Aileron	Neutral
4.	Throttle	IDLE
5.	Flaps	UP
6.	Rudder	Neutral when rotation stops
7.	Elevator	Carefully ease out of dive

Make a smooth recovery from the dive to regain level flight attitude. Do not exceed V_{NE}.

WARNING

During spin recovery, adherence to the recovery sequence is essential!

3.8 POWER-OFF GLIDE

Achievable gliding distances vary depending on altitude and current wind conditions. This is very important when choosing a landing site or reaching a near-by airfield.

To achieve maximum gliding distance:

1.	Flaps	UP
2.	Airspeed	78 KIAS
3.	Demonstrated glide ratio	14 This means approx. 2.3 NM can be covered for every 1000 ft of altitude (no wind)

NOTE

Headwinds, tailwinds and wing contamination can significantly influence the distance achievable in glide.

3.9 LANDING WITH A FLAT TIRE

When landing with a defective tire, or this is suspected, proceed as follows:

1. Flaps — LDG position
2. Perform touch down on the side of the runway opposite the defective tire. This allows the use of the entire runway width to correct any directional changes caused by the defective tire. (for example: left tire defective, land on the right side of the runway)
3. Perform touch down with the undamaged main tire first. Lower nose wheel as quickly as possible to improve controllability on the ground.
4. Roll out with full aileron deflection in the direction of the undamaged main tire. This reduces the load on the damaged tire.
5. When landing with a defective or damaged nose wheel:
   Touch down with minimum speed.
   Keep nose wheel off the ground
   as long as possible.

3.10 ELECTRICAL SYSTEM MALFUNCTIONS

3.10.1 Complete Electrical System Failure

1. **ALT1 / BAT** switch	CHECK if ON
2. **ALT2 / BAT2** switch	CHECK if ON
3. **BAT** circuit breaker *(see 3.1.1)*	RESET if tripped
4. **ALT1** circuit breaker *(see 3.1.1)*	RESET if tripped

If power cannot be restored:

5. Throttle	below 100% indexed position (increase engine power until engine is running as calm as possible)
6. Propeller control lever	below MCP marking
7. Precautionary Landing	PERFORM (see 3.4.1), Engine may fail suddenly!

WARNING

In case of a complete electrical system failure the Main fuel pump is automatically separated from the remaining on-bord power supply by a relay. It is supplied with electricity from Alternator 2 directly. In this condition the TCU is not controlling the turbocharger anymore and, depending on the last waste gate position, there may be a distinctly reduced engine power available.

WARNING

Stall warning system inoperative and flap position cannot be changed!

WARNING

Before returning the aircraft to service, problems must be investigated and damages must be resolved.

3.10.2 Battery discharges (BAT)

Warning light **ENG** (RED) with ammeter values **ALT1** and/or **ALT2** shown in RED and thus **BAT** shown in YELLOW (with or without **ALT1** and/or **ALT2** warning light is illuminated)

If an ammeter value for BAT is shown in YELLOW on the MVP, the power supply of both alternators into the on-board electricity system is insufficient - Battery is discharging.

1. Ammeter	CHECK for defect Alternator(s) for **ALT1** acc. point 3.10.3 for **ALT2** acc. point 3.10.4

if **both alternators are defect**:

2. **Fuel Pump AUX** switch	CHECK, if ON
3. **ALT1** switch	CHECK, if OFF
4. **ALT1** circuit breaker	CHECK, if PULLED
5. **ALT2 / BAT2** switch	CHECK, if OFF
6. **ALT2** circuit breaker	CHECK, if PULLED
7. **ALT2 Disconnect** circuit breaker	CHECK, if PULLED

8. Brightness level of all additional instruments not necessary for the safe continuation of the flight has to be reduced to half or the instruments have to be turned off.

9. Ammeter and voltmeter	MONITOR
10. Precautionary Landing	PERFORM (see 3.4.1)

WARNING

The MAIN fuel pump is no longer supplied with electricity in case alternator 2 (ALT2) has failed and the fuel pump is separated from the remaining on-board power supply by turning ALT2 switch off. In this case the AUX fuel pump is the only fuel supply for the engine.

WARNING

A properly maintained and fully charged battery alone is able to supply all necessary systems with electricity for at least 30 minutes. The illuminating of the ENG (YELLOW) warning light with BAT ammeter values shown in YELLOW are indicating the beginning of the 30 minute period. After 30 minutes engine failure due to failure of the remaining AUX fuel pump has to be expected.

3.10.3 Alternator 1 (ALT1) failure

Warning light **ENG** (RED) with ammeter values **ALT1** shown in RED and / or **ALT1** warning light is illuminated

1. **ALT1** switch — SWITCH through OFF – ON, approx. 10 sec. break
2. **ALT 1** circuit breaker *(see 3.1.1)* — PUSH, if tripped

If **ALT1** or **ENG** warning light is still illuminated because of **Amp ALT 1**:

3. **ALT1** circuit breaker — PULL
4. **ALT1** switch — OFF
5. Brightness level of all additional instruments not necessary for the safe continuation of the flight has to be reduced to half or the instruments have to be turned off.
6. Ammeter and voltmeter — MONITOR
7. Precautionary Landing — PERFORM (see 3.4.1)

NOTE

The remaining Alternator 2 (ALT 2) is delivering approx. 15A into the on-board power supply and a properly maintained and fully charged battery alone is able to supply all necessary systems with electricity for at least 30 minutes.

Despite the pilot turned off the audio panel it is still possible to radio with COM1 via the headset because the audiopanel is establishing a connection even if it is turned off (failsave design). Intercom functionality ist not possible anymore.

WARNING

Before returning the aircraft to service, problems must be investigated and damages must be resolved.

3.10.4 Alternator 2 (ALT2) failure

Warning light **ENG** (RED) with ammeter values **ALT2** shown in RED and / or **ALT2** warning light is illuminated

1. **Fuel pump AUX** switch — ON
2. **ALT2 / BAT2** switch — check, if ON
3. **ALT2** circuit breaker*(see 3.1.1)* — PUSH, if tripped
4. **ALT2 Disconnect** circuit breaker*(see 3.1.1)* — PUSH, if tripped

If **ALT2** or **ENG** warning light is still illuminated because of **Amp ALT2**:

5. **ALT2** and **ALT2 Disconnect** circuit breaker — PULL
6. **ALT2 / BAT2** switch — OFF
7. Brightness level of all additional instruments not necessary for the safe continuation of the flight has to be reduced to half or the instruments have to be turned off.
8. Ammeter and voltmeter — MONITOR
9. Precautionary Landing — PERFORM (see 3.4.1)

WARNING

The MAIN fuel pump is no longer supplied with electricity in case alternator 2 (ALT2) has failed and the fuel pump is separated from the remaining on-board power supply by turning ALT2 switch off. In this case the AUX fuel pump is the only fuel supply for the engine.

NOTE

The remaining Alternator 1 (ALT1) is delivering up to 42A into the on-board power supply and a properly maintained and fully charged battery alone is able to supply all necessary systems with electricity for at least 30 minutes.

Despite the pilot turned off the audio panel it is still possible to radio with COM1 via the headset because the audiopanel is establishing a connection even if it is turned off (failsave design). Intercom functionality ist not possible anymore!

WARNING

Before returning the aircraft to service, problems must be investigated and damages must be resolved.

3.10.5 Low Voltage Indication

A) <u>On the ground (voltmeter values YELLOW or RED)</u>

1.	Engine speed	Increase RPM until value turns GREEN (RPM should be below 1350)
2.	All non-essential equipment	OFF, until value turns GREEN.
3.	If the value remains YELLOW or RED	Do not fly before problem is eliminated.

B) <u>In flight (voltmeter values YELLOW or RED)</u>

1.	All non-essential equipment	OFF, until value turns from YELLOW to GREEN or from RED to YELLOW
2.	If the value remains YELLOW or RED	CHECK ammeter for defective alternator(s) for **ALT1 + ALT2** acc.section 3.10.2 for **ALT1** acc. section 3.10.3 for **ALT2** acc. section 3.10.4

C) <u>During approach and landing (voltmeter value YELLOW or RED)</u>

1.	After landing	Proceed in accordance with section 3.10.5 A)

WARNING

If, at any point, the voltmeter value turns RED, land at the nearest airfield and solve the problem before continuing flight.

3.11 FLAP CONTROL SYSTEM MALFUNCTIONS

FLAP POSITION INDICATOR or FLAP ACTUATOR MALFUNCTION

1.	**Flap Actuator** circuit breaker *(see 3.1.1)*	RESET, if tripped
2.	**Flap Control** circuit breaker (see 3.1.1)	RESET, if tripped
3.	Flap position	visually CONFIRM on the left wing
4.	Airspeed	maintain within the WHITE ARC on the airspeed indicator
5.	Flap switch	switch through all positions.

If the flap actuator is inoperative or the flap position indicator reading is incorrect, approach and landing must be conducted at airspeed safe for the current flap setting.

WARNING

During landings with the flaps not in the landing position, stall speed and landing distance increase.

3.12 TRIM CONTROL SYSTEM FAILURES

3.12.1 Trim System Inoperative

1.	**Elevator Trim** circuit breaker *(see 3.1.1)*	RESET, if tripped
2.	Trim switch	repeatedly PRESS “Nose UP” and then “Nose Down”

NOTE

An inoperative trim system does not affect aircraft controllability. However, the control stick forces are considerably higher and may reach up to 22 lb (10kg).

3. Land at the nearest airfield.

3.12.2 Trim Actuator Runaway

1.	Control Column	HOLD in position
2.	**Elevator Trim** circuit breaker	PULL
3.	Trim switch	CHECK if pressed or jammed

If the problem is obvious, and can be solved:

4. **Elevator Trim** circuit breaker *(see 3.1.1)* RESET

NOTE

Approx. 8 seconds are required to trim from full nose-down to full nose-up or vice versa.

If the problem cannot be solved:

5. Land at the nearest airfield.

3.13 AVIONICS MALFUNCTIONS

3.13.1 Complete Avionics Failure

1.	**Avionics** switch	SWITCH OFF then ON, approx. 20 sec. interval If the switch trips to the OFF position:
2.	Land at the nearest suitable airfield.	

3.13.2 Receive Mode Failure of COM-Equipment

1.	Push-to-Talk (PPT) switch	CHECK, if pilot's and co-pilot's PTT-switches are not pressed or jammed (also check transceiver display). CHECK connectors.
2.	Head-set	Momentarily switch off SQUELCH. If no noise is audible: CHECK head-set connectors.

3.13.3 Transmit Mode Failure of COM-Equipment

1.	Transmit-Signal TX	CHECK if displayed while transmitting.
2.	Selected frequency	CHECK, if correct
3.	Microphone	CHECK, if necessary replace head-set.

If the problem cannot be eliminated, set transponder to 7600 (radio failure) as required.

3.13.4 Primary Flight Display Failure

1. **PFD** circuit breaker *(see 3.1.1)* RESET, if tripped

It is possible to safely continue flight, even if the PFD failure cannot be corrected in flight, by referencing the remaining instruments. It may, none the less, be prudent to land at the nearest airfield.

NOTE

Following information is still available when the PFD fails:

Attitude:	*Natural horizon*
Altitude:	*GPS altitude, Transponder altitude, ground visibility*
Heading/Track:	*Compass, GPS ground track*
Airspeed:	*GPS ground speed, stall warning*

3.13.5 Magnetometer Failure

1. Navigation via GPS ground track

NOTE

In the event of a magnetometer failure a red X will be displayed over the course display. If the GDU 1060 is receiving a valid GPS ground track signal, the magnetic heading display will be replaced with the GPS ground track. The GPS ground track is displayed in magenta.

3.13.6 Complete Navigation System Failure

1. Navigation Compass, GPS

NOTE

In the event of a complete navigation system failure (magnetometer and GPS ground track) a red X will be displayed over the course display and the markings on the compass rose disappear.

3.13.7 AHRS Failure

1. Attitude — Natural horizon

NOTE

In the event of an AHRS Failure, the horizon is no longer displayed on the PFD. Additionally a red "X" and in yellow "AHRS FAILURE" is displayed. A Navigation System Failure, as described in section 3.13.6, accompanies an AHRS Failure.

3.13.8 ADC Failure

1. Continue flight — Using stand-by instruments (see 3.13.4)

NOTE

Failure of the Air Data Computers (ADC) is indicated through a red X and yellow text above the airspeed indicator, the altimeter, the vertical speed indicator, the TAS and the OAT indicators. Certain functions, such as TAS and wind calculation, are no longer usable.

3.13.9 Complete MVP-50P-AQ Failure

1. **Engine Instr 1** circuit breaker *(see 3.1.1)* — RESET, if tripped

If the MVP-50P-AQ failure cannot be corrected, maintain power settings and land at the nearest suitable airfield.

NOTE

During a total failure of the Glass Engine Monitoring Instrument AND modified power settings a RPM overshoot is not possible with the following settings:

1) Throttle (MP): — *100% indexed position*

2) Propeller Control Lever (rpm):

⇒ *During climb:* — *HIGH RPM*

⇒ *All other flight phases:* — *below marking „MCP"*

3.14 STARTER MALFUNCTION

During engine start on ground, power transmission from the starter to the engine is defect (a continuing and excessive howling tone is audible).

1.	Throttle	IDLE
2.	Ignition switch	OFF
3.	Repair damage before conducting planned flight.	

3.15 IN-FLIGHT FAILURES AND MALFUNCTIONS

3.15.1 Inadvertent Release and Opening of the Canopy in flight

In the event of an inadvertent release and opening of the canopy in flight, a stationary canopy opening angle of about 20° - 30°, depending on the flight condition, is reached. Because the canopy opens forwards, the canopy cannot be torn off during flight. Even though the airflow conditions around the aircraft change considerably with an open canopy in flight, the aircraft remains fully controllable. Initial flight attitude changes can be easily corrected. Do not unbuckle the seat belt in order to close the canopy. During solo flights, carefully try to close the canopy without neglecting flight tasks and pilot responsibilities. If this is not possible, continue the flight with the open canopy and land at the nearest airfield.

1.	Keep calm, there is no imminent danger.	
2.	Flight attitude	Stabilize flight attitude. Under consideration of the actual conditions, establish stationary horizontal level flight.
	Airspeed	65 – 75 KIAS
3.	Canopy	If possible, close and lock canopy in flight. Check the canopy locking and the position of the Canopy Locking Lever periodically until landing. If it is not possible to close the canopy, continue flight with the open canopy and land at the nearest airfield.

SECTION 4

NORMAL PROCEDURES

4.1 INTRODUCTION

This section provides normal operating procedures and checklists for the aircraft as well as recommended airspeeds.

Additional information is provided in the current issues of the Operators Manual for ROTAX® engine Type 914 series and the Operation and Installation Manual of mt-Propeller® ATA 61-01-024.

Normal procedures associated with optional equipment can be found in Section 9.

4.2 AIRSPEEDS FOR NORMAL OPERATION

The following airspeeds are based on the maximum take-off weight of 1653 lbs (750 kg). They may also be used for any lower operational weight.

TAKE-OFF		
Airspeed (IAS)		**kts**
Normal climb speed to 50 Feet (Flaps **T/O**)		57
Best rate of climb speed at sea level (Flaps **UP**)	V_Y	65
Best angle of climb speed at sea level (Flaps **T/O**)	V_X	52

LANDING		
Airspeed (IAS)		**kts**
Final approach speed for landing (Flaps **LDG**)		60
Balked landing (Flaps **LDG**)		60
Maximum demonstrated crosswind component for take-off or landing		15
Maximum airspeed with Flaps **LDG**	V_{FE}	90

CRUISE		
Airspeed (IAS)		**kts**
Maneuvering speed	V_A	112
Maximum Turbulent Air Operating Speed	V_{NO}	130

4.3 DAILY INSPECTION

CAUTION

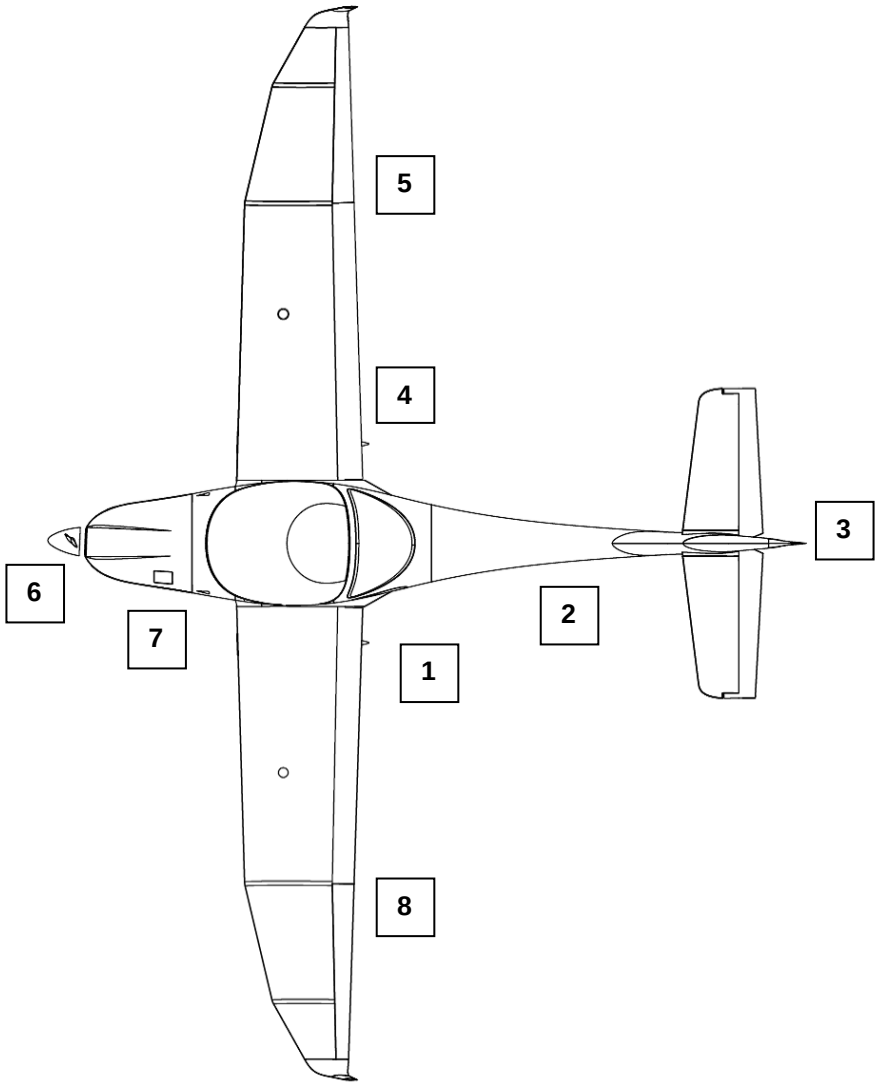
*The daily inspection is begun by checking all 3 fuel sumps for water and contamination. This must be done **before** the aircraft is moved. Otherwise the fuel in the sump may mix.*

1.	Tank drain (left / right wing)	drain and visually inspect for contamination
2.	Gascolator drain	drain and visually inspect for contamination

A) CABIN

1.	Aircraft Documentation	CHECK on board
2.	Ignition key	REMOVED
3.	**ALT1/ BAT** switch	ON
4.	Annunciator (warning lights)	Press **TEST**; check all ON
5.	**ALT1** switch	OFF
6.	Engine instruments	CHECK
7.	Fuel quantity	CHECK
8.	**Nav Lights** switch	ON, CHECK, OFF
9.	**Landing Light** switch	ON, CHECK, OFF
10.	**BAT** switch	OFF
11.	ELT	CHECK operational
12.	Foreign objects	CHECK and REMOVE, when necessary
13.	Baggage	STOWED and SECURED
14.	Canopy	CHECK condition and cleanliness

B) EXTERIOR CHECK, Visual Inspection



CAUTION

In this manual, visual inspection means the following:
Inspect for mechanical damage, dirt, cracks, delamination, excessive play, looseness, leaks, incorrect attachment, foreign objects and general condition.
Control surfaces: in addition, check for free movement.

1. Left main landing gear

a) Landing gear strut	Visual inspection
b) Wheel fairing	Visual inspection (refer to 7.11.4)
c) Tire pressure and slip marking	CHECK
d) Tire, wheel, brake	Visual inspection
e) Chocks (if in use)	REMOVE

2. Fuselage

a) Fuselage shell	Visual inspection
b) Skid plate	Visual inspection
c) Tail tie-down	DISCONNECT

3. Empennage

a) Elevator	Visual inspection
b) Horizontal stabilizer	Visual inspection
c) Rudder	Visual inspection, CHECK: fitting and bolt connection, proper control cable connection and safe-tied.
d) Vertical stabilizer	Visual inspection

4. Right main landing gear

a) Landing gear strut	Visual inspection
b) Wheel Fairing	Visual inspection (refer to 7.11.4)
c) Tire pressure and slip marking	CHECK
d) Tire, wheel, brake	Visual inspection
e) Chocks (if in use)	REMOVE

5. Right wing

a) Entire wing surface (upper and under side)	Visual inspection
b) Fuel vent	CHECK if clear
c) Flap	Visual inspection
d) Aileron and inspection window	Visual inspection
e) Wing tip, NAV lights and ACL	Visual inspection
f) Fuel level	CHECK with dipstick (see inner surface of baggage compartment door) and verify with the indicated fuel level on the fuel gauge cockpit
g) Fuel tank filler cap	CHECK if closed
h) Wing tie-down	DISCONNECT

6. Nose landing gear

a) Nose gear strut — Visual inspection
b) Wheel fairing — Visual inspection

CAUTION

Both parts of the 2 piece nose wheel fairing must always be installed on the aircraft

c) Tire pressure and slip marking — CHECK
d) Tire, wheel — Visual inspection
e) Shock absorber unit — Visual inspection
f) Chocks and tow bar — REMOVE

7. Nose section, cowling

WARNING

Before cranking the propeller:
*Ignition, **ALT1/BAT** switch and **ALT2/BAT2** switch: OFF*
Set the parking brake.

WARNING

RISK OF BURNS !
Only check the oil and coolant levels when the engine is cool.

a) Check oil level — Turn the propeller several times in the **direction of engine rotation** to pump oil from the engine back into the oil tank.

CAUTION

***NEVER** turn the propeller against the direction of engine rotation.*

Stop turning the propeller when air begins to return to the oil tank. This is indicated by the sound of air rushing from the open oil tank.
Use the oil dip stick to check that the oil level is between the -min./max.- markings. The difference between -min./max.- is approximately 0.48 US Quarts (0.45 l).

CAUTION

The oil specification in Section 1.9.1 must be adhered to!

b) Check coolant level: Verify coolant level in the **expansion tank** and replenish as required. (The expansion tank must be at least 2/3 filled or coolant has to be visible at the gauge glass.)

Verify coolant level in the **overflow bottle** and replenish as required. (The coolant level must be between the min. and max. markings.)

CAUTION

The coolant specification in Section 1.9.2 must be adhered to!

c) Air Intakes	CHECK if clear
d) Cooler intake (oil, water, intercooler)	CHECK if free from obstructions
e) Cowling	Visual Inspection; CHECK Camloc fasteners
f) Propeller and Spinner	Visual inspection
g) Propeller blades	CHECK for cracks and other damage

8. Left wing

a) Entire wing surface (upper and under side)	Visual inspection
b) Fuel vent	CHECK if clear
c) **BAT** switch	ON
d) Stall warning	press to upper detent, warning tone is audible
e) **BAT** switch	OFF
f) Pitot / Static tube	REMOVE cover, CHECK if all openings are clear
g) Wing tip, NAV lights and ACL	Visual inspection
h) Aileron and inspection window	Visual inspection
i) Fuel level	CHECK with dipstick and verify with the indicated fuel level on the fuel gauge
j) Fuel tank filler cap	CHECK if closed
k) Flap	Visual inspection
l) Wing tie-down	DISCONNECT

4.4 PRE-FLIGHT INSPECTION (Walk Around)

1.	Daily Inspection	Confirm has been carried out.
2.	Tow bar	Removed?
3.	Fuel level	CHECK with dipstick and verify with the indicated fuel level on the fuel gauge

WARNING

Before cranking the propeller:
*Ignition, **ALT1/BAT** switch and **ALT2/BAT2** switch: OFF*
Set the parking brake.

WARNING

RISK OF BURNS !
Only check the oil and coolant levels when the engine is cool !

4.	Check oil level	Turn the propeller several times in the direction of engine rotation to pump oil from the engine back into the oil tank. Stop turning the propeller when air begins to return to the oil tank. This is indicated by the sound of air rushing from the open oil tank. Use the oil dip stick to check that the oil level is between the min. and max. markings. The difference between min. and max. is approx. 0.48 US Quarts (0.45 l).

CAUTION

The oil specification in Section 1.9.1 must be adhered to !

5.	Check Coolant Level	Verify coolant level in the overflow bottle and replenish as required. (The coolant level must be between the min. and max. markings)

CAUTION

The coolant specification in Section 1.9.2 must be adhered to !

6.	Tie-down straps	remove
7.	Baggage door	CHECK if closed and locked
8.	Pitot cover	remove
9.	Control locks	remove
10.	Seating position	adjust and lock, check that nose wheel steering and brakes can be operated
11.	Carburetor heat	CHECK for free movement, then PUSH (OFF)
12.	Cabin heat	CHECK for free movement, then PUSH (OFF)
13.	Choke	CHECK for free movement and automatic reset
14.	Throttle	CHECK for free movement and if 100% indexed position is perceptible, then set IDLE
15.	Propeller Control Lever	CHECK for free movement, then set in HIGH RPM Position
16.	Weight and balance	within limits?

4.5 CHECKLISTS FOR NORMAL PROCEDURES

4.5.1 Before Engine Start-up

1.	Daily and Pre-Flight Inspection	COMPLETED
2.	Passenger Briefing	COMPLETED
3.	Seats	ADJUSTED
4.	Seat Belts and Harnesses	FASTENED
5.	Canopy	CLOSED and LOCKED Check locking mechanism
6.	Parking Brake	SET (pull lever back)
7.	Control column	CHECK for free movement and correct control surface deflections
8.	Fuel Selector Valve	LEFT or RIGHT
9.	Carburetor Heat	PRESS
10.	Throttle	IDLE
11.	Propeller Control Lever	HIGH RPM position
12:	**Avionics** Switch	OFF
13.	**P/S Heat** (if installed)	OFF
14.	Circuit Breakers	CHECK all set

NOTE

*Cage the Attitude Indicator (if installed) before switching **ALT1/BAT** on.*

15.	**ALT1 / BAT** switch	ON

NOTE

Pay attention to messages that may appear on the PFD and MFD displays while the system is loading.

The attitude indicators (AHRS module and stand-by indicator) require several minutes to stabilize. Pay attention to information on the Garmin G500 TXi display.

16.	**TCU** warning light (YELLOW)	ILLUMINATES (1 second TCU OK, then off)
17.	**BOOST** warning light (RED)	ILLUMINATES (1 second TCU OK, then off)
18.	**ALT1** warning light	ILLUMINATES
19.	**ENG** warning lights (RED and YELLOW)	ILLUMINATE
20.	**P/S-HEAT** warning light (if installed)	ILLUMINATES
21.	**ACL** switch	ON

4.5.2 Engine Start-up

1.	**Fuel Pump AUX** switch		ON
2.	Fuel Pressure		within GREEN range (AUX pump OK)
3.	**Fuel Pump AUX** switch		OFF
4.	**ALT2 / BAT2** switch		ON
5.	**ALT2** warning light		ILLUMINATES
6.	Fuel pressure		within GREEN range (MAIN pump OK)
7.	Throttle	- Cold Engine	IDLE
		- Hot Engine	0.8 in. (2 cm) OPENED
8.	Choke	- Cold Engine	PULL, and keep pulled
		- Hot Engine	RELEASE (automatic reset)
9.	Brakes		PRESS both pedals
10.	Propeller area		CHECK, if CLEAR
11.	Ignition switch		START, then BOTH
12.	Oil Pressure		CHECK, if oil pressure rises
13.	**ALT 1 / ALT 2** warning lights		OFF

CAUTION

The oil pressure has to show rising values within 10 seconds after engine start, otherwise shut down the engine immediately!

NOTE

The starter may not be operated for more then 10 seconds at a time. Allow the starter to cool off for at least 2 minutes between attempts.

CAUTION

BAT2 switch must be turned ON at all times during flight to ensure a stabilized control voltage at the ALT2 regulator-rectifier unit. If the on-board power supply fails, ALT2 will ensure the MAIN fuel pump power supply.

NOTE

As long as the propeller keeps moving (also in windmilling) ALT2 will feed the MAIN fuel pump with electricity even in the event of inadvertently switching off ALT2 AND BAT2. However, in this case the stabilizing effect of BAT2 is no longer available, which, in the event of additional extreme voltage fluctuations in the on-board power supply, could result in an automatic shut down of the ALT2 regulator-rectifier unit and cause an engine stoppage.

4.5.3 Before Taxiing

CAUTION

Engine run for approx. 2 min at 800 RPM and then at 1000 RPM for Oil Temp 122°F (50°C)

1.	**Avionics** switch	ON
2.	Avionics and flight instruments	SET

The GARMIN G500 TXi has an integrated sensor that automatically adjusts the brightness of the display. It is also possible to adjust the brightness of the G500 TXi display manually by using the MFD touch-screen to change into menu “Home” than “System” and into “Backlight”.

3.	Annunciator panel	PRESS **TEST** and check that the **ALT1** (RED), **ALT2** (RED)**, ENG** (YELLOW), **ENG** (RED), **TCU** (YELLOW), **BOOST** (RED) and **P/S HEAT** (YELLOW) warning lights illuminate
4.	Engine instruments	CHECK

NOTE

Oil can be brought up to temperature during taxiing.

5.	Voltmeter	CHECK if GREEN
6.	**ALT1** switch	OFF, ammeter ALT2 > 5A (ALT2 OK)
7.	**BAT1** switch	OFF, CHECK voltmeter if GREEN (BAT2 OK)
8.	**BAT1** switch	ON
9.	**ALT1** switch	ON, ammeter ALT2 = 0A (ALT1 OK)
10.	Ammeter (BAT, ALT1, ALT2)	CHECK if GREEN
11.	Trim switch and indication	functional CHECK
12.	Flap switch and indication	functional CHECK, afterwards UP
13.	**P/S Heat** switch (if installed)	ON , **P/S HEAT** warning light goes OFF
14.	**P/S Heat** switch (if installed)	OFF, **P/S HEAT** warning light goes ON
15.	all switches	AS REQUIRED

4.5.4 Taxiing

1.	Parking Brake	RELEASE
2.	Brakes	CHECK
3.	Nose Wheel Steering	CHECK (function, free movement)
4.	Flight instruments and Avionics	CHECK

CAUTION

Do not operate the engine at high RPM when taxiing to prevent damage to the propeller through stones or other foreign objects.

4.5.5 Before Take-off (at the Taxi Holding Position)

1.	Brakes	APPLY and HOLD
2.	Parking Brake	SET
3.	Compass and gyro Instruments	CHECK setting
4.	Fuel Selector Valve	LEFT or RIGHT, switch to the fuller tank
5.	Fuel Pressure	CHECK if in the GREEN range (otherwise, do not attempt take-off)
6.	Engine instruments	CHECK if in the GREEN range
7.	Throttle	SET 1700 RPM
8.	Ignition switch	Magneto check: SWITCH through: "L-BOTH-R-BOTH" – positions. CHECK RPM-drop max. RPM-drop: 120 RPM max. difference L/R: 50 RPM RPM drop must be noticeable then: BOTH position
9.	Carburetor heat	PULL (ON) (no RPM drop if TCU OK)
10.	Carburetor temperature indicator	slight rise in temperature
11.	Carburetor heat	PUSH (OFF)
12.	Propeller control lever	SWITCH 3 times between HIGH RPM and LOW RPM positions (end stops)
	Check points:	1) RPM drop: 200 ± 50 RPM 2) increase manifold pressure 3) constant oil pressure (± 0,5 bar then: START position

CAUTION

Pull back the propeller control lever slowly to minimize the load on the two-piece crankshaft!
For training operation switching between HIGH RPM and LOW RPM once is sufficient.

13.	Throttle	IDLE
14.	**Fuel Pump AUX** switch	ON
15.	Flap switch	T/O
16.	Trim switch	white marking
17.	Circuit breakers	CHECK all set
18.	Control column	CHECK for free movement
19.	Lap belt	FASTENED and TIGHTENED
20.	Canopy	CLOSED and LOCKED
21.	Parking brake	RELEASE

4.5.6 **Take-off** (up to 50 ft)

CAUTION

*To **increase power setting raise RPM first** and **open throttle second**.*
*To **decrease power setting close throttle first** and **lower RPM second**.*

1.	Throttle	WIDE OPEN (TOP = 115% MCP)
2.	Tachometer	CHECK if within 2300 - 2385 RPM
3.	Manifold pressure	CHECK if within 39 - 40 inHg
4.	Elevator, control column	NEUTRAL during initial ground roll
5.	Rudder pedals	Maintain direction
6.	Rotatespeed	50 KIAS
7.	Climb speed	57 KIAS

CAUTION

For the shortest take-off distance over a 50-feet obstacle at sea level:

7.	Rotate speed	50 KIAS
8.	Climb speed (V_X)	52 KIAS

4.5.7 **Climb**

1.	Throttle (max. 5 minutes)	WIDE OPEN (40 inHg) afterwards 100% MCP (35 inHg)
2.	Propeller control lever (max. 5 minutes)	2385 RPM, afterwards 2260 RPM
3.	Engine instruments	CHECK if in GREEN range

NOTE

*During take-off and climb at take off power the yellow **ENG** warning light illuminates because the maximum continuous RPM and manifold pressure is exceeded.*
This is acceptable for max. 5 minutes.

4.	Flap switch	UP
5.	Climb speed	65 KIAS
6.	**Fuel Pump AUX** switch	OFF
7.	**Landing Light** switch	OFF
8.	Trim switch	SET as required

NOTE

The best rate-of-climb speed, V_Y, is a function of the operating weight and decreases with altitude. For more information, refer to Section 5.2.6.

4.5.8 Cruise

1.	Throttle	AS REQUIRED (Ref. to Section 5, Page 5-11)
2.	Propeller control lever	SET 1650 to 2260 RPM

CAUTION

Continuous operation with throttle wide open and propeller revolution below 2140 RPM should be avoided to prevent engine damage in particular at pressure altitudes below 3000ft and at high CHT (see SL-914-014)

NOTE

For best manifold pressure/propeller speed combinations: Refer to Section 5, page 5-11

3.	Flaps switch	UP
4.	Trim switch	SET as required
5.	**P/S Heat** switch (if installed)	AS REQUIRED, OFF AT OAT >59°F (15°C)
6.	Engine instruments	CHECK if in GREEN range
7.	Carburetor temperature indicator	MONITOR

CAUTION

When carburetor temperature is around 32°F (0°C) Carburetor heat should be applied and engine power should be increased appropriately to prevent carburetor icing.

4.5.9 Descent

1.	Throttle	First decrease AS REQUIRED
2.	Propeller control lever	Second SET above 2000 RPM
3.	Carburetor heat	AS REQUIRED
4.	Carburetor temperature indicator	MONITOR

CAUTION

For a rapid descent proceed as follows:

Throttle	*First IDLE*
Propeller control lever	*Second START*
Carburetor heat	*PULL (ON)*
Flaps	*UP*
Airspeed	*130 KIAS*
Oil and cylinder head temperature	*maintain in GREEN range*

4.5.10 Landing

1.	Lap belt	CHECK SECURE
2.	**Fuel Pump AUX** switch	ON
3.	Carburetor heat	PULL (ON)
4.	Throttle	AS REQUIRED
5.	Airspeed	90 KIAS
6.	Flaps switch	T/O or LDG
7.	Trim switch	AS REQUIRED
8.	Flaps switch	LDG
9.	Approach speed	60 KIAS
10.	Propeller control lever	START
11.	**Landing Light** switch	ON (as required)

CAUTION

In strong headwinds or crosswinds, in turbulent air or in wind shear, it may be desirable to approach using less flaps and at a higher airspeed.

4.5.11 Go-Around (Balked Landing)

1.	Propeller control lever	First START
2.	Throttle	Second WIDE OPEN
3.	Carburetor Heat	PUSH (OFF)
4.	Flaps switch	T/O
5.	Airspeed	65 KIAS

CAUTION

Continued operation with throttle wide open and carburetor heat engaged should be avoided to prevent engine damage.

4.5.12 After Landing

1.	Throttle	AS REQUIRED
2.	Flaps switch	UP
3.	**P/S Heat** switch (if installed)	OFF
4.	Carburetor Heat	PUSH (OFF)
5.	**Fuel Pump AUX** switch	OFF
6.	Transponder	OFF
7.	**Landing Light** switch	OFF

4.5.13 Engine Shutdown

1.	Throttle	IDLE
2.	Parking Brake	SET
3.	Flaps switch	LDG
4.	ELT	CHECK (frequency 121.5 MHz)
5.	**Avionics** switch	OFF
6.	Engine run with below 1000 RPM	min. 2 minutes (incl. taxiing) for turbocharger cool down
7.	Ignition Switch	OFF
8.	**ALT2 / BAT2** switch	OFF
9.	Electrical equipment	OFF
10.	**ALT1 / BAT** switch	OFF

NOTE

*The GARMIN G500 TXi and the MVP-50P-AQ are turned off with the **ALT1/BAT** switch.*

11.	Chocks and tie-downs	AS REQUIRED

4.5.14 Refueling

1. Engine Shutdown as in Section 4.5.13
2. Ground the aircraft

CAUTION

*During refueling, the aircraft **must** be grounded (for example at the end of the exhaust pipe.)*

3. Open fuel tank filler cap
4. Refuel both tanks equally

NOTE

Insert the fuel pump nozzle carefully into the tanks to avoid damage.

5. Replace the fuel tank filler caps
6. Remove grounding cable

4.5.15 Flight in Heavy Rain and/or with Wing Contamination

CAUTION

When flying with wet and/or contaminated wings and control surfaces, performance and handling qualities may be reduced. This applies in particular to take-off distance, climb performance, cruising speed and stall characteristics.

The stall speed may increase up to 3 kts and the air speed indicator may give false readings.

Visibility may deteriorate considerably in rain.

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SECTION 5

PERFORMANCE

5.1 INTRODUCTION

The performance data in the following charts give an overview on the performance and capabilities of the AQUILA AT01. This information provides the basis for flight planning prior to every flight.
All data in the charts haves been acquired during flight testing conducted with an aircraft and engine in a good operating condition. The performance data was then corrected to ICAO Standard Atmospheric conditions (59°F / 15°C and 29.92 inHg / 1013.25 hPa at sea level).
The performance data presented can be achieved with a well-maintained aircraft and with average piloting techniques, when the procedures specified in this manual are followed.

The fuel flow data for cruise presented here are based on the recommended RPM/manifold pressure setting for each altitude. However, fuel flow and the resulting endurance, with and without reserve, depend on engine condition, surface quality of the aircraft (clean and dry) and meteorological conditions.
For precise flight planning and in order to estimate the amount of fuel required for a particular flight, all available information should be used and all influencing factors considered.

5.2 PERFORMANCE CHARTS

5.2.1 Airspeed Calibration

Airspeed calibration accounts for the position error of the pitot-static pressure system, but not for the instrument error.

Assumption: zero instrument error
Example: 120 KIAS (indicated airspeed) corresponds to 118 KCAS (calibrated airspeed)

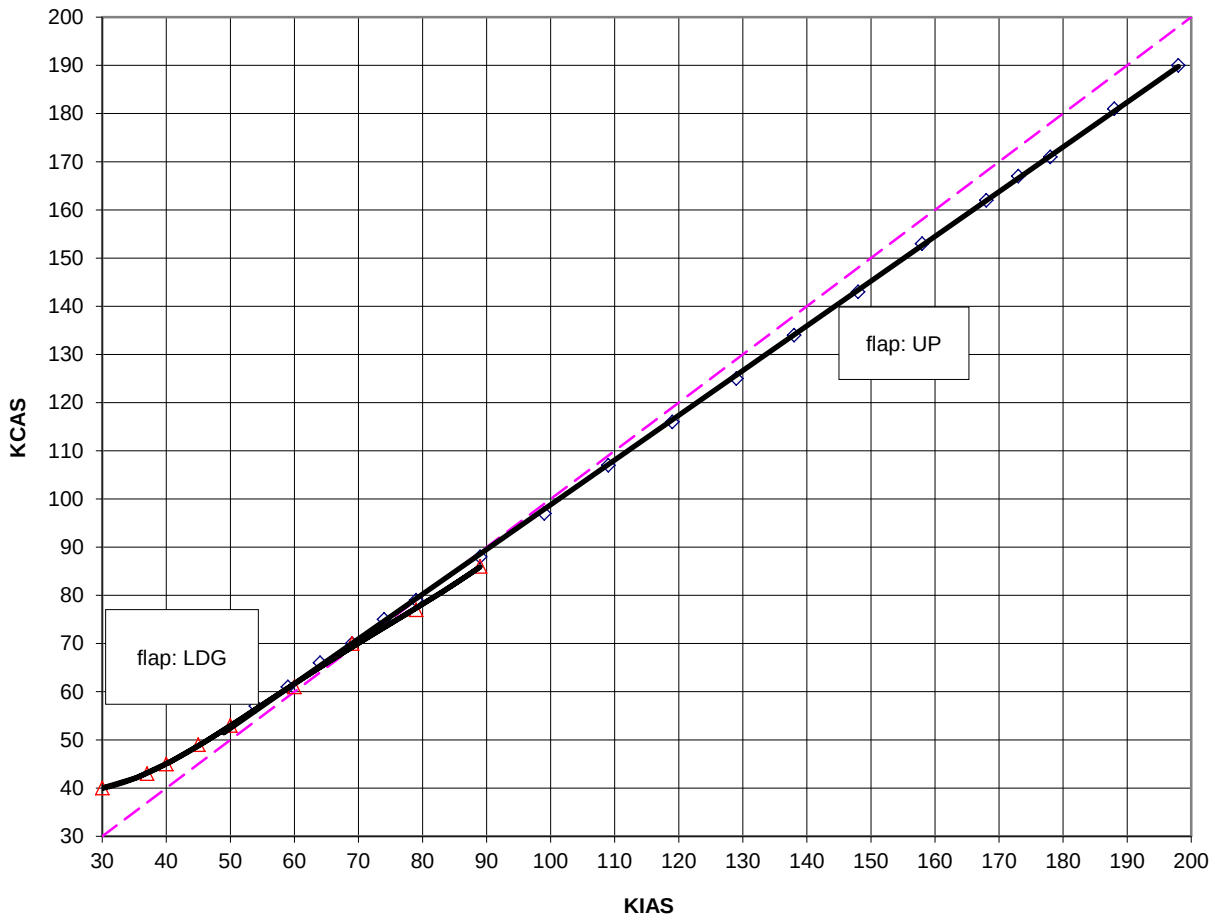


Fig.: 5.2.1 Airspeed Calibration

5.2.2 Stall Speeds

Stall speeds were determined in the following configuration:

- Forward center of gravity (CG) limit: 16.8 in (427 mm) behind the Ref. Datum
- Takeoff mass 1653 lb. (750 kg)
- Engine idle

Flap Position	**Bank Angle**				
	0°		**30°**	**45°**	**60°**
	KCAS	**KIAS**	**KIAS**	**KIAS**	**KIAS**
UP	52	49	51	55	> 64
T/O	48	45	47	51	> 60
LDG	43	39	42	47	> 57

Tab.: 5.2.2 Stall Speeds [kts]

NOTE

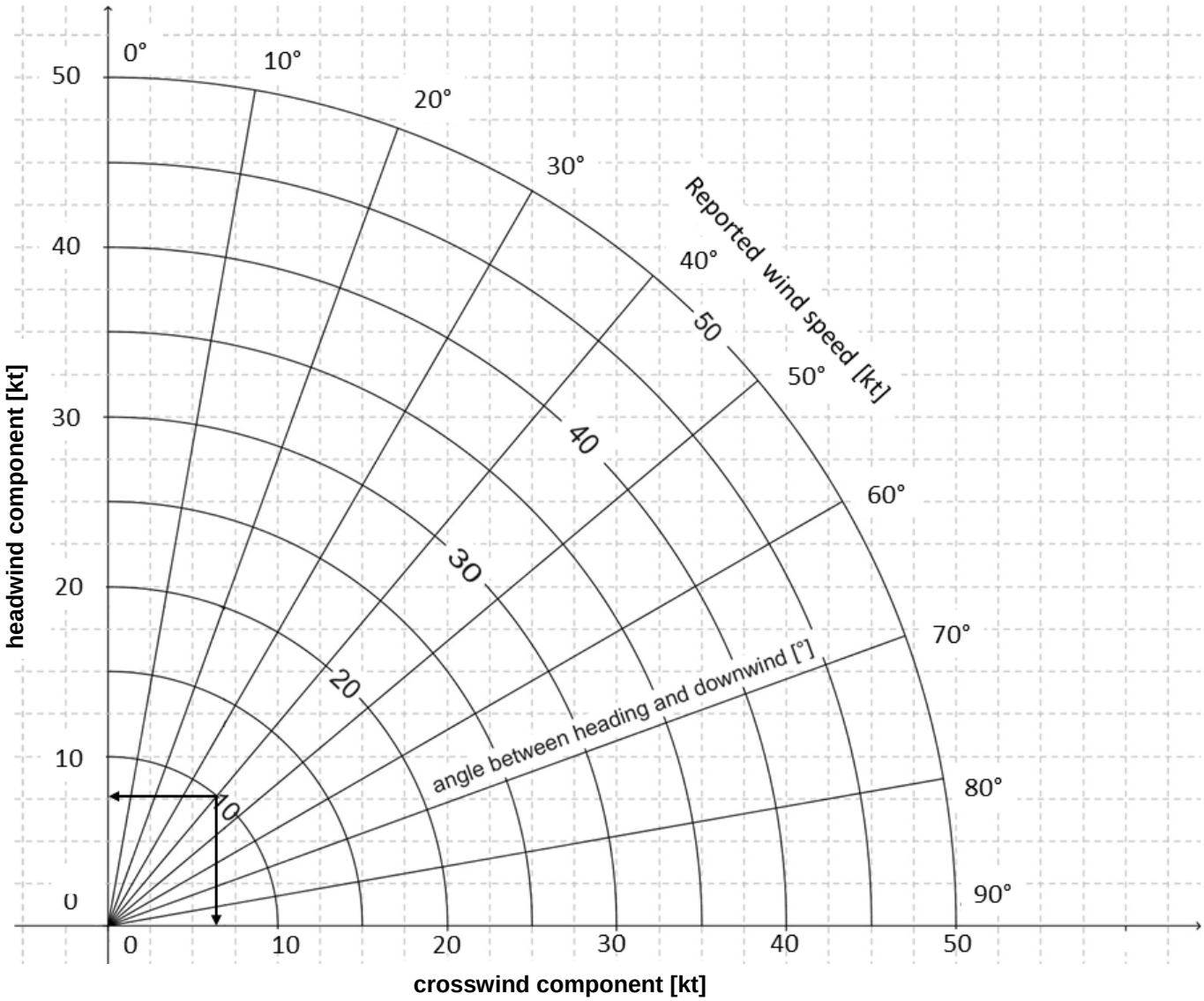
Stalling speed with bank angle should be considered as for reference purposes only. Slight differences in how the aircraft stalls can lead to discrepancies. The greater the angle of bank and flap deflection, the greater the discrepancies.

5.2.3 Demonstrated Crosswind Component, Crosswind Diagram

Maximum demonstrated crosswind component: 15 knots (27 km/h)

WARNING

Stronger crosswind components may render the aircraft uncontrollable!



5.2.4 Flight Planning

The performance tables and diagrams on the following pages contain all information required for flight planning from take-off at your point of departure to the landing at your destination.

Experience shows that the data determined during flight planning match the values achieved in flight accurately. However, it is important that flight planning is done carefully, that the aircraft is in a good operating condition and that the pilot is proficient.

During flight planning, it is important to be conservative when reading diagrams and rounding values. Differences between the actual performance data of the aircraft “at hand” and the data specified in this manual, the influence of turbulence or wing contamination can cause errors of up to 10% when calculating range and endurance.

NOTE

Insects or other contamination on the propeller or the leading edge of the wing can significantly reduce the performance and handling qualities of the aircraft.

The influence of altitude and ambient air temperature on performance is determined as follows:

1. Set the altimeter to 29.92 inHg (1013 hPa) to determine pressure altitude.
2. Using the appropriate diagrams and the ambient air temperature, the density altitude influence can be accounted for.

CAUTION

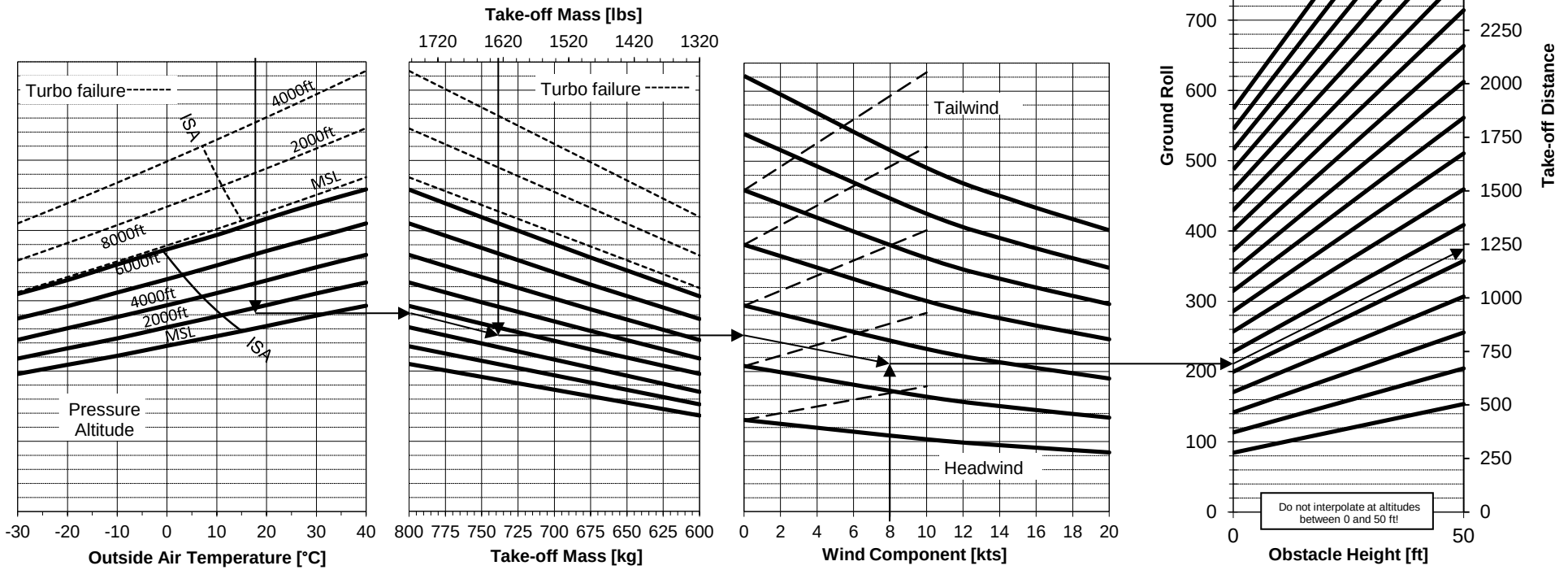
Reset the altimeter to the appropriate altimeter setting (local QNH value) to determine altitude above sea level.

5.2.5 Take-off Distance

Take-off Mass [lbs] ([kg])	Airspeed [KIAS]	
	Lift-off	50 ft
1763 (800)	50	62
1653 (750)	50	57
1323 (600)	50	55

Conditions:
Throttle: Full Throttle (max. 5 min.)
Prop Speed: 2385 rpm
Flaps: T/O

Notes:
- For operations on dry, mown grass runway, increase ground roll distance by 25%, on soft grass runway up to 40%. - Snow and slush require an appropriate increase in ground roll.
- In high humidity conditions the take-off distance may increase up to 10%.
- An improperly maintained aircraft, deviating from procedures, poor meteorological and ambient conditions (rain, crosswind, wind shear etc.) may increase take-off distances significantly.



Example: Pressure Altitude: 1800 ft
Outside Air Temperature: 64°F (18°C)

Take-off Mass: 1631 lbs (740 kg)

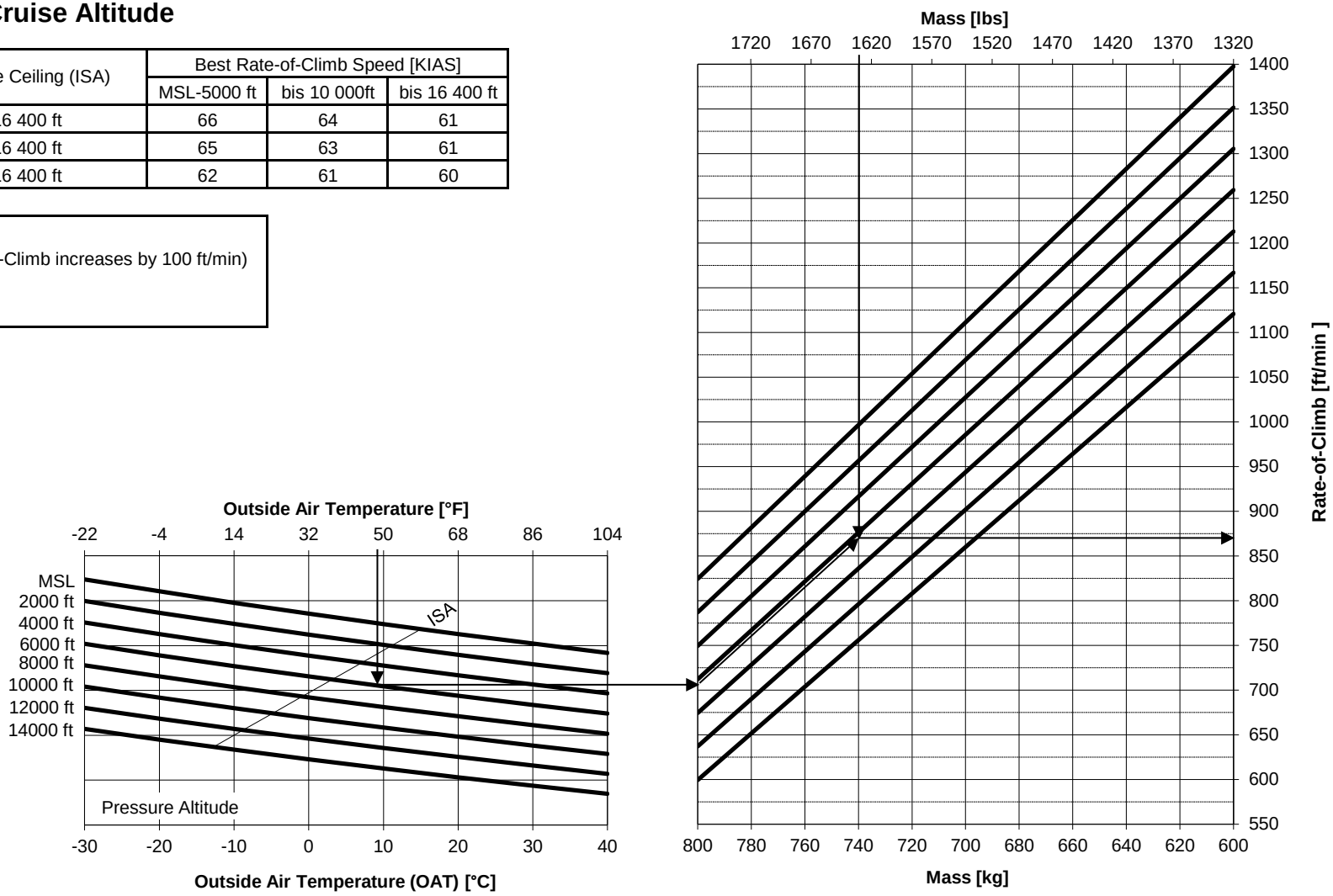
Headwind: 8 kts

Ground Roll: 689 ft (210 m)
Take-off Distance: 1230 ft (375 m)

5.2.6 Rate of Climb / Cruise Altitude

Take-off Mass [lbs] ([kg])	Service Ceiling (ISA)	Best Rate-of-Climb Speed [KIAS]		
		MSL-5000 ft	bis 10 000ft	bis 16 400 ft
1764 (800)	16 400 ft	66	64	61
1653 (750)	16 400 ft	65	63	61
1323 (600)	16 400 ft	62	61	60

Conditions:
Throttle: MCP (for TOP the Rate-of-Climb increases by 100 ft/min)
Prop Speed: 2260 rpm
Flaps: UP



Example: Pressure Altitude: 6000 ft Mass: 1630 lb (740 kg) Rate-of-Climb: 868 ft/min
Outside Air Temperature: +48 °F (+9°C)

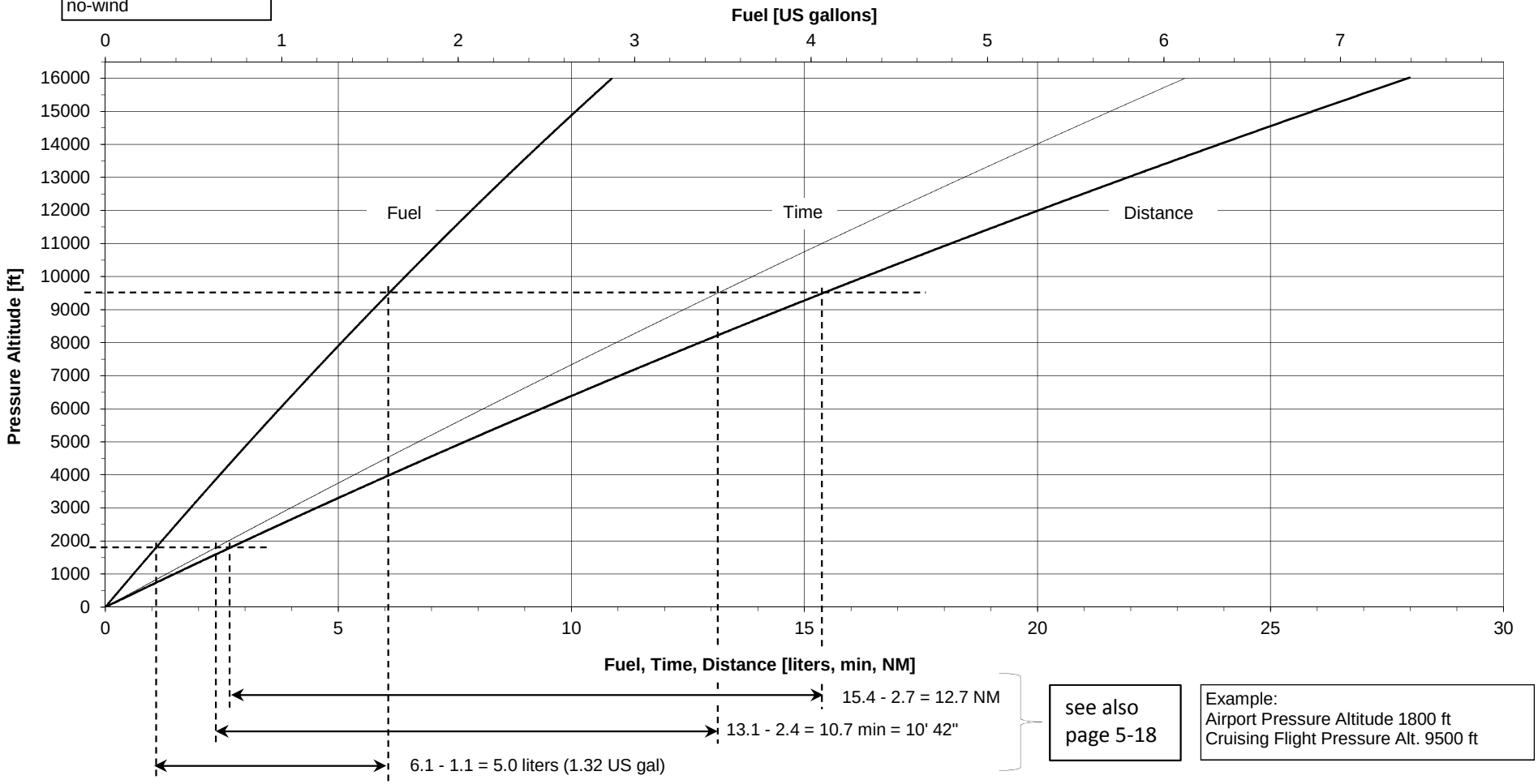
5.2.7 Climb: Fuel, Time and Distance

Conditions:
2260 rpm, MCP,
Flaps : UP
m = 800 kg (1764 lb)
no-wind

Vy= 66 KIAS, up to 5000 ft
Vy= 64 KIAS, up to 10.000 ft
Vy= 61 KIAS, up to 16.400 ft

For each 8°C above ISA, increase time, distance and fuel by 10%.

Time, distance and fuel:
750 kg (1654 lbs): decrease by 15%
700 kg (1544 lbs): decrease by 25%



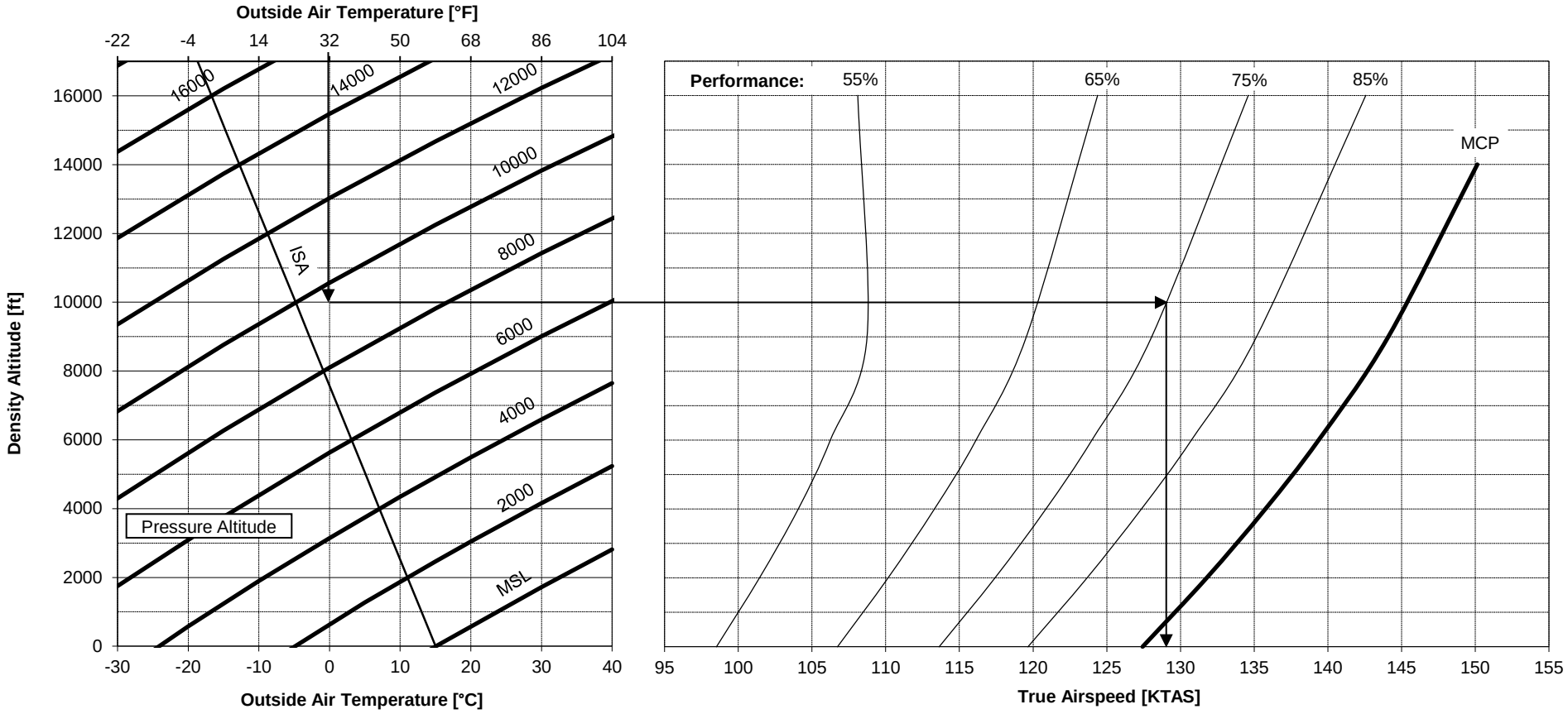
see also page 5-18

Example:
Airport Pressure Altitude 1800 ft
Cruising Flight Pressure Alt. 9500 ft

5.2.8 Cruising Speed (TAS – True airspeed)

Conditions:
Power Setting: according to page 5-11
Flaps: UP

Notice: Flying without any wheel fairings or with mud guards reduces performence up to 10%.



Excample: Pressure Altitude: 9500 ft
Outside Air Temperature: 32°F (0°C)
Density Altitude: 10000 ft
Power Setting : 75%
True Airspeed: 129 kts

5.2.9 Cruise Power Settings

Pressure Altitude	**Standard Temp.**		**Engine performance in % of the maximum continuous power**																			
			55%				**65%**				**75%**				**85%**				**MCP**			
H	T	T	RPM	MP	FF	FF	RPM	MP	FF	FF	RPM	MP	FF	FF	RPM	MP	FF	FF	RPM	MP	FF	FF
[ft]	[°C]	[°F]	[U/min]	[in Hg]	[l/h]	[gal/h]	[U/min]	[in Hg]	[l/h]	[gal/h]	[U/min]	[in Hg]	[l/h]	[gal/h]	[U/min]	[in Hg]	[l/h]	[gal/h]	[U/min]	[in Hg]	[l/h]	[gal/h]
0	15	59	1770	28	13.5	3.6	1970	29	18.5	4.8	2060	31	22.5	6.0	2165	32.2	24.5	6.5	2260	35	27.5	7.3
2000	11	52	1785	28	14.5	3.8	1980	29	19.0	5.0	2065	31	22.5	6.0	2170	32.2	24.5	6.5	2260	35	27.5	7.3
4000	7	44	1800	28	15.5	4.0	1985	29	19.5	5.1	2075	31	23.0	6.1	2180	32.2	25.0	6.6	2260	35	28.0	7.4
6000	3	37	1820	28	16.0	4.3	1990	29	20.0	5.2	2080	31	23.0	6.1	2185	32.2	25.0	6.6	2260	35	28.0	7.4
8000	-1	30	1830	28	17.0	4.5	2000	29	20.5	5.4	2090	31	23.0	6.1	2195	32.2	25.0	6.6	2260	35	28.5	7.5
10.000	-5	23	1850	28	18.0	4.7	2005	29	21.0	5.5	2100	31	23.5	6.2	2200	32.2	25.5	6.8	2260	35	28.5	7.5
12.000	-9	16	1865	28	18.5	4.9	2010	29	21.5	5.6	2105	31	23.5	6.2	2210	32.2	25.5	6.8	2260	35	28.5	7.6
14.000	-13	9	1880	28	19.5	5.2	2015	29	22.0	5.8	2115	31	24.0	6.4	2220	32.2	26.0	6.9	2260	35	29.0	7.6
16.000	-17	1	1900	28	20.5	5.4	2020	29	22.5	5.9	2120	31	24.0	6.4	2225	32.2	26.0	6.9				

MCP: maximum continuous power
RPM: revolutions per minute
MP: manifold pressure
FF: fuel flow

Sample calculation: page 5.22

Correction for non ISA temperature conditions:

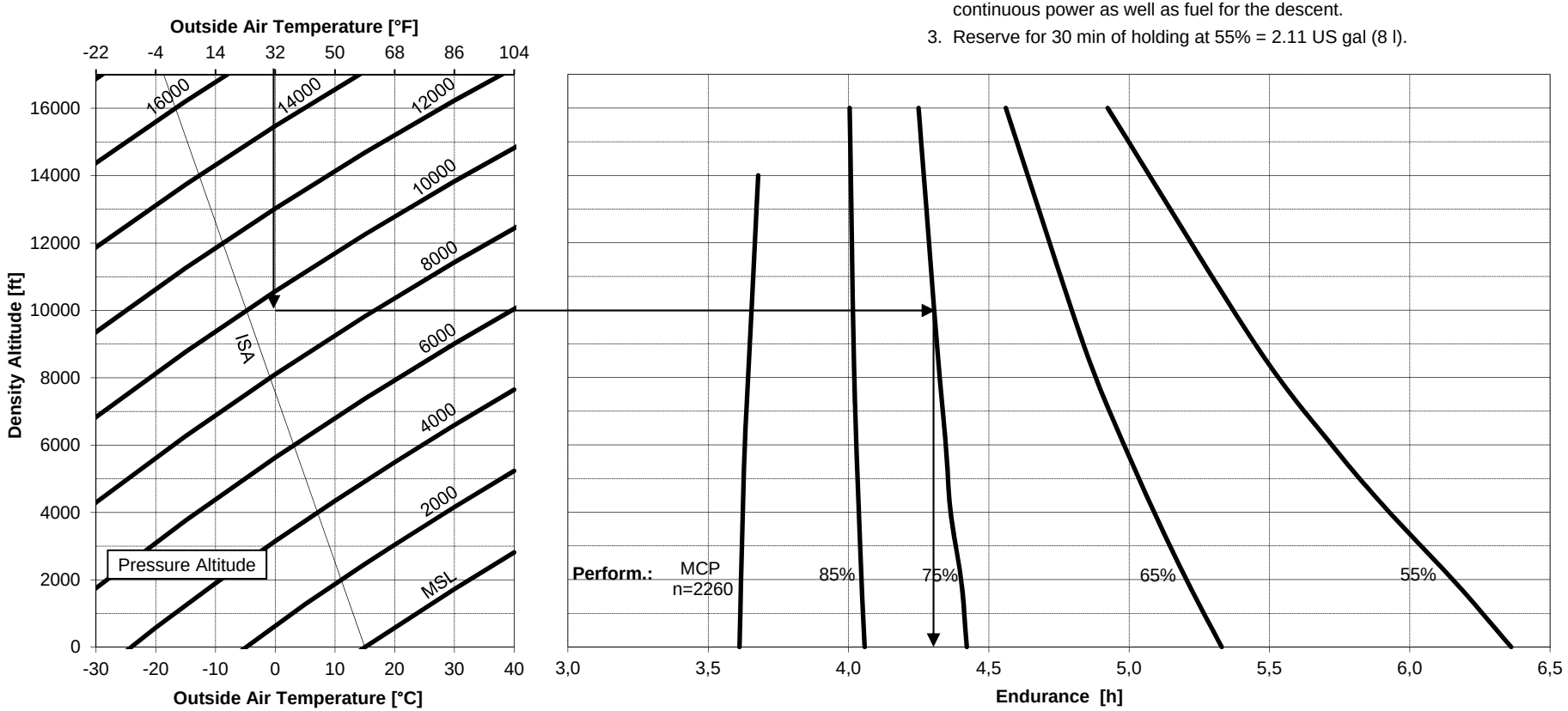
59°F (15°C) above ISA: Fuel consumption increases by approx. 5%.
Below ISA: For flight planning purposes: assume fuel flow unchanged.

5.2.10 Maximum Endurance

Conditions:
Power Setting: according to page 5-11
Flaps: UP

Notice:
A not properly maintained engine and aircraft may considerably reduce the endurance.

Fuel quantity: usable fuel 28.9 US gal (109,6 l)
The calculation of the endurance includes:
1. Fuel for engine start-up and taxiing: 0.8 US gal (3 l).
2. Fuel for take-off and climb to cruise altitude with max. continuous power as well as fuel for the descent.
3. Reserve for 30 min of holding at 55% = 2.11 US gal (8 l).



Example: Pressure Altitude: 9500 ft
Outside Air Temperature: 32°F (0°C)

Density Altitude: 10000 ft

Power Setting : 75%

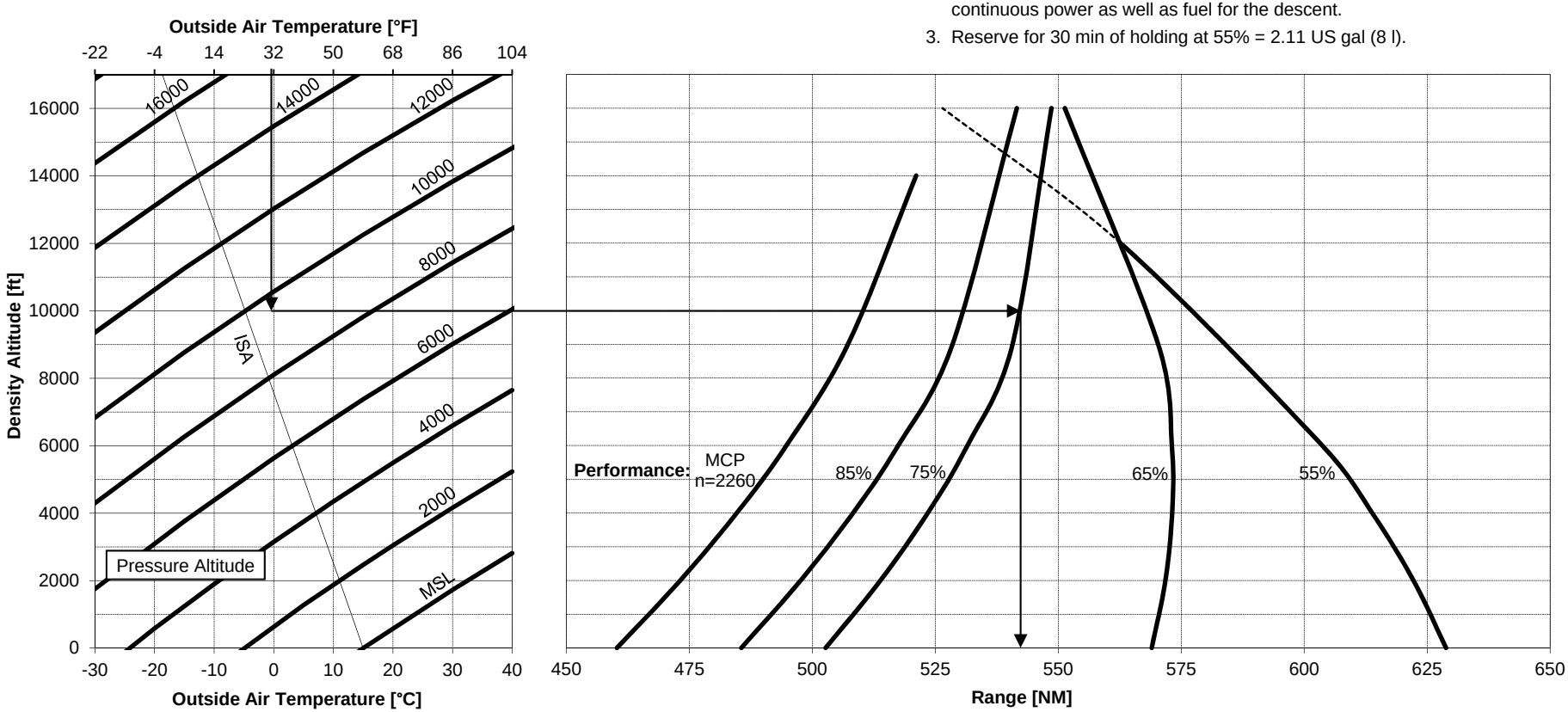
Endurance: 4,31 h = 4 h 19'

5.2.11 Maximum Range

Conditions:
Power Setting: according to page 5-11
Flaps: UP

Notice:
A not properly maintained engine and aircraft may considerably reduce the endurance.

Fuel quantity: usable fuel 28.9 US gal (109,6 l)
The calculation of the endurance includes:
1. Fuel for engine start-up and taxiing: 0.8 US gal (3 l).
2. Fuel for take-off and climb to cruise altitude with max. continuous power as well as fuel for the descent.
3. Reserve for 30 min of holding at 55% = 2.11 US gal (8 l).



Example: Pressure Altitude: 9500 ft
Outside Air Temperature: 32°F (0°C)

Density Altitude: 10000 ft

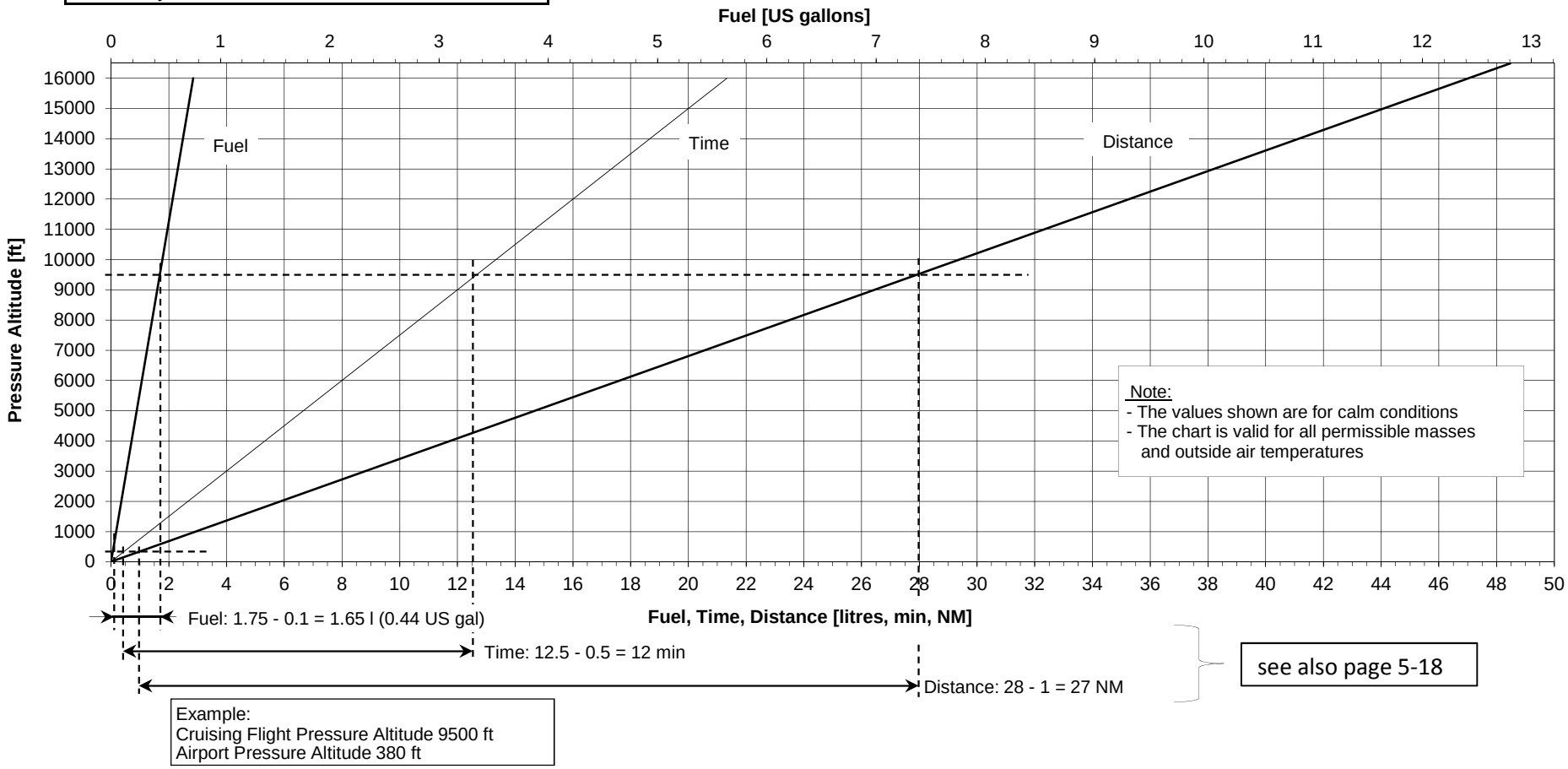
Power Setting : 75%

Range: 541 NM

5.2.12 Descent: Fuel, Time, Distance

Procedure:
In descent follow a speed of 121 KIAS.
Set performance for a descent rate of 750 ft / min.
Keep the engine temperature in the green range.
If necessary, activate carburetor heat.

Conditions:
Manifold Pressure: as required. Approx. 15 inHg
Prop speed: 2000 rpm
Flaps: UP



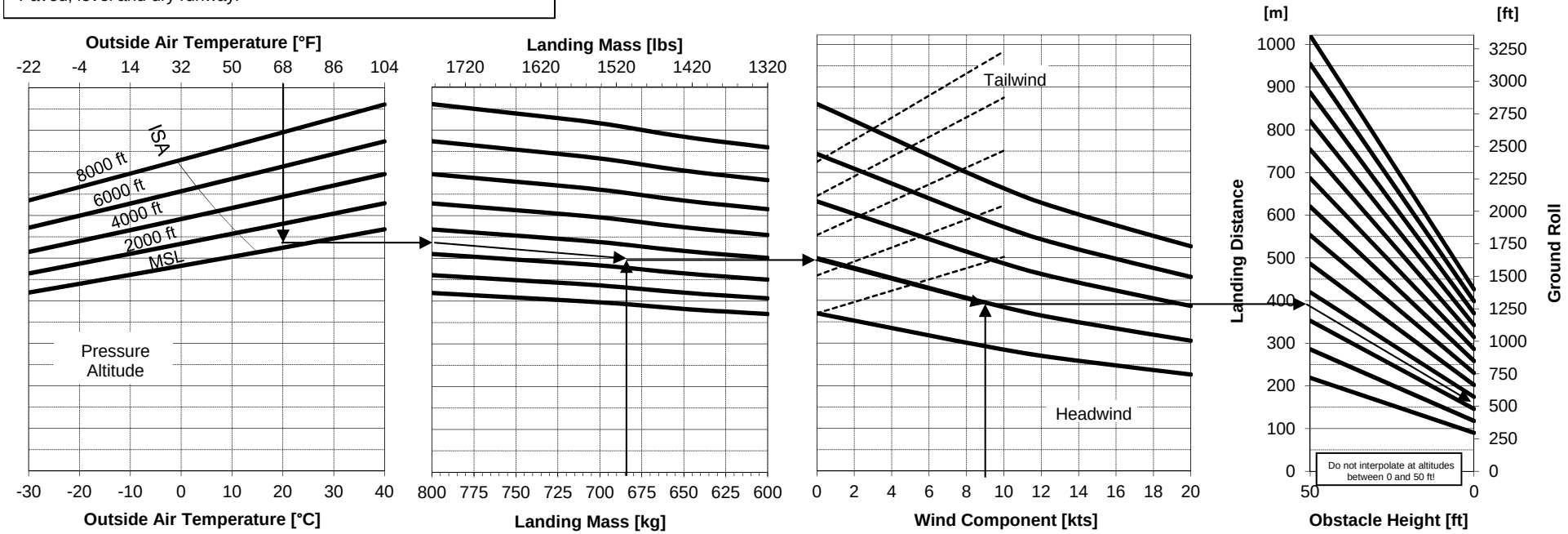
see also page 5-18

5.2.13 Landing Distance

Landing Mass [lbs] ([kg])	Airspeed [KIAS]	
	in 50 ft	Touchdown
1764 (800)	65	46
1653 (750)	65	45
1323 (600)	65	43

Notice: - When landing on a dry, mown grass runway, increase the required landing distances by 15%.
- Increase ground roll appropriately for wet grass / ground, ice, snow and slush.
- An improperly maintained aircraft, deviating from procedures, poor meteorological and ambient conditions (rain, crosswind, wind shear etc.) may increase landing distances significantly.

Conditions:
Power Setting: Idle
Propeller: Take-off (propeller controllever: HIGH-RPM position)
Flaps: LDG
Maximum brake application.
Paved, level and dry runway.



Example: Pressure Altitude: 380 ft
Outisde Air Temperature: 68°F (20°C)

Landing Mass: 1498 lbs (679 kg)

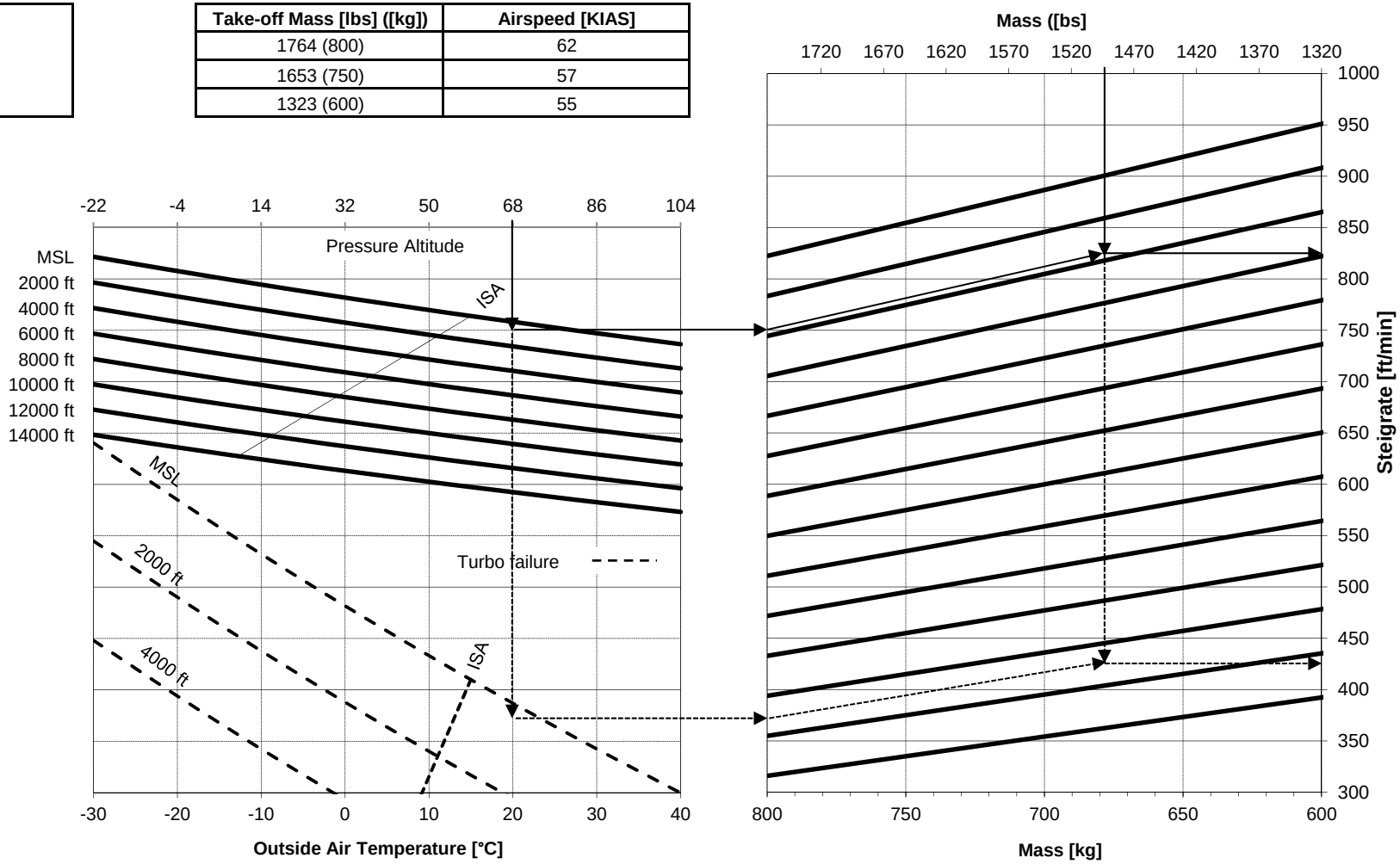
Headwind Component: 9 kts

Landing Distance: 1273 ft (388 m)
Ground Roll: 532 ft (162 m)

5.2.14 Climb Performance after Balked Landing

Conditions:
Power Setting: full throttle
Prop Speed: 2385 rpm
Flaps: LDG

Take-off Mass [lbs] ([kg])	Airspeed [KIAS]
1764 (800)	62
1653 (750)	57
1323 (600)	55



Example: Pressure Altitude: 380 ft Mass: 1498 lbs (679 kg) Rate-of-Climb: 822 ft/min

Outside Air Temperature: 68°F (+20°C) Rate-of-Climb (Turbo failure): 420 ft/min

5.2.15 Flight Planning Example

The following contains a flight-planning example to demonstrate the use of the tables, charts and data presented in this section of the POH. The flight planning is based upon the following conditions:

Aircraft

Take-off mass:..... 1632 lbs (740 kg)
Usable fuel: ..... 29 US Gal (109.6 ltr)
Wheel fairings installed

Conditions at the departure airfield

Pressure altitude:..... 1800 ft
Temperature:..... 64°F (18°C), 13°F (7°C) above ISA in 1800 ft
RWY direction:..... 24 (240°)
Wind conditions ..... 280°/10 kts
RWY length (paved, level and dry RWY)..... 2040 ft (620 m)

Cruise conditions

Overall flight distance to destination..... 480 NM (888 km)
Cruise altitude (altimeter setting 1013 hPa)... 9500 ft
Temperature at cruise altitude ..... 32°F (0°C), 9°F (5°C) above ISA in 9500 ft
Reported wind en-route ..... 10 kts tailwind component

Conditions at the destination airfield

Pressure altitude..... 380 ft
Temperature..... 68°F (20°C), 11°F (6°C) above ISA in 380 ft
RWY direction ..... 27 (270°)
Wind conditions ..... 220°/15 kts
RWY length (dry and level grass RWY)..... 2560 ft (780 m)

TAKE-OFF DISTANCE

Before using chart 5.2.5 on page 5-7 to determine the required take-off run and take-off distance, the crosswind component of the wind relative to runway direction must be obtained from chart 5.2.3 on page 5-5.

Relative to the runway heading, the wind is 40° from the right at 10 kts (see example page 5-5).

Using these values and chart 5.2.3, we obtain a headwind component of 8 kts and a crosswind component of 7 kts.

We now have all the necessary data to determine the required take-off distances from chart 5.2.5:

Take-off ground roll.....210 m
Lift-off speed.....50 KIAS
Take-off distance over a 50 ft obstacle.....375 m
Airspeed in 50 ft.....57 KIAS

The required take-off distance is less than the available runway length (TODA) of 620m.

CLIMB

Using chart 5.2.6 a best rate-of-climb of 868 ft/min is determined for an aircraft with a take-off mass of 1632 lbs (740 kg) in 6000 ft at a temperature of 48 °F (9 °C). For the calculation, the average temperature and the average altitude is used.

Time needed and distance covered as well as fuel consumption for the climb may be calculated using chart 5.2.7.

Since take-off occurs at an altitude of 1800 ft, the values for climb to this altitude must be subtracted from the time required, the distance covered and the fuel consumed to the cruise altitude (9500 ft).

Since the outside air temperature is up to 13°F (7°C) above ISA, the values determined must be increased by 10% and because of the lower take-off mass decreased by 15%. For our example, we obtain the following:

Climbing time:.....(13.1 – 2.4) · 1.1 · 0.85 = 10.0 min = 10‘00“
Climbing distance:.....(15.4 NM – 2.7 NM) · 1.1 · 0.85 = 11.9 NM
Fuel required:.....(6.1 ltr – 1.1 ltr) · 1.1 · 0.85 = 4.7 ltr
(1.61 US gal – 0.29 US gal) · 1.1 · 0.85 = 1.24 US gal

The reported tailwind component of 10 kts at the cruise altitude also has an effect on the climb. However, it has no influence on climbing time and fuel consumption.

Since wind speed tends to increase with altitude, we will assume a tail wind of 7 kts for the entire climb.

During the climb, the tail wind acts on the aircraft for 10 minutes. As a result, we obtain for the covered distance over the ground during the climb segment:

$$\mathbf{11.9\ NM} + \frac{\mathbf{7\ kts \cdot 10\ min}}{\mathbf{60\ min/h}} = \mathbf{13.1\ NM}$$

This result shows that the wind only has a small influence on climbing distance and is only of importance when large head or tail winds are present or when climbing to high altitudes. In this example, the wind influence on climbing distance could have been neglected.

CRUISE

Cruise altitude is chosen under consideration of flight distance, en-route winds and aircraft performance. In this flight-planning example, a typical cruise altitude and en-route wind condition has been chosen.

The range diagram 5.2.11 on page 5-13 shows the relationship between the engine power setting and the maximum achievable range. Lower power settings result in considerable fuel savings and thus greater achievable ranges.

Applying this chart to our example, a power setting of 75 % and a pressure altitude of 9500 ft give a maximum range of 541 NM at a true airspeed of 129 KTAS. The true airspeed at cruise was obtained from chart 5.2.8 on page 5-10 taking into account the atmospheric conditions (outside air temperature and chosen cruise pressure altitude) and the chosen power setting.

The maximum possible flight endurance is obtained from chart 5.2.10 on page 5-12. In our example, the maximum endurance is 4.31 hours (4 h 19 min) at a power setting of 75 %. This maximum flight endurance and the maximum flight range determined above include 30 minutes of reserve at a power setting of 55 %, engine start-up / taxiing, take-off, climb, cruise, descent and landing.

Taking the reported tailwind of 10 kts in 9500 ft into account, the maximum achievable range of 541 NM must be corrected as follows:

Range with no wind	541.0 NM
Range increase due to 10 kts tailwind (4.31 h x 10 kts)	+43.1 NM
	584.1 NM

This shows that, for a flight over a distance of 480 NM at a cruise power setting of 75 %, the fuel reserve is sufficient.

DESCENT

Chart 5.2.12 on page 5-14 is used to calculate time, distance and fuel consumption for the descent segment. In our flight-planning example, descent is initiated at cruise altitude (9500 ft) and ends at 380 ft. During descent, the altimeter setting must be adjusted to local QNH.

Descent duration:..... 12.5 min – 0.5 min = 12.0 min
Descent distance:..... .28 NM – 1.0 NM = 27 NM
Fuel required: ……..1.75 ltr – 0.1 ltr = 1.65 ltr
0.47 US gal – 0.03 US gal = 0.44 US gal

CALCULATION OF FUEL REQUIRED

Fuel required for engine start-up and taxiing (General Value, see remark "Fuel Quantity" on pg. 5-12 and 5-13)	0.8 US gal (3.0 ltr)
Fuel required for climb (page 5-18)	+1.25 US gal (4.7 ltr)
	2.05 US gal (7.7 ltr)

Climb distance (page 5-18)	11.9 NM
Wind correction (tailwind)	+ 1.2 NM
	13.1 NM

During the descent from 9500 ft to 380 ft, a distance of 27 NM is covered and 0.44 US gal (1.65 ltr) of fuel consumed (page 5-14). The influence of the wind has been neglected.

Overall flight distance	480.0 NM
Climb distance	- 11.9 NM
Descent distance	- 27.0 NM
Cruise section	441.1 NM

With the expected 10 kts tail wind, we obtain a (estimated) ground speed of:

$$129\ \text{kts} + 10\ \text{kts} = 139\ \text{kts}$$

for the time spent in cruise we obtain:

$$\frac{441.1\ \text{NM}}{139\ \text{kts}} = 3{,}17\ \text{h} = 3\ \text{h}\ 10\ \text{min}$$

The fuel required for the cruise segment is:

3.17 h x 6.21 US gal/h (23.5 l/h) = 19.69 US gal (74.5 ltr)

A fuel flow of 6.21 US gal/h (23.5 l/h) is calculated from the table on page 5-11 in the section for the power setting of 75 % MCP as follows:

Option 1: For a temperature of 32°F (0°C) at 9500 ft, we obtain a density altitude of 10000 ft (refer to the tables on page 5-10 and 5-12). By using density altitude instead of pressure altitude, we already accounted for the deviation from ISA conditions. An additional correction, as shown on page 5-11, is no longer necessary as fuel consumption (6.2 US gal/h) is already shown at density altitude.

Option 2: In order to obtain the fuel flow for the cruise altitude of 9500 ft, an interpolation has to be conducted for the values given for 8000 ft and 10000 ft, respectively. Furthermore, the deviation of ISA-temperature by 7.2°F (4°C) has to be accounted for by using the correction, stated on page 5-11:

$$6.18\ \text{gal / h} \times 1.01 \approx 6.2\ \text{gal / h}$$

The total amount of fuel required is calculated as follows:

Engine start-up, taxiing and climb	2.04 US gal (7.7 ltr)
Cruise	19.14 US gal (72.45 ltr)
Descent	0.44 US gal (1.65 ltr)
Total fuel required	21.62 US gal (81.8 ltr)

If we assume full tanks at take-off, the following reserve remains:

Amount of usable fuel		28.96 US gal (109.6 ltr)
Total fuel required	-	21.62 US gal (81.8 ltr)
Fuel reserve:		7.34 US gal (27.8 ltr)

The actual ground speed of the aircraft must be regularly checked and tracked during flight as it forms the basis of our calculations. If, for example, the expected tailwind of 10 kts does not materialize, the power setting may have to be reduced to 65 % MCP to achieve the same range with the same amount of fuel.

LANDING DISTANCE

To determine the required landing distance use chart 5.2.13 on page 5-15. Once again, use chart 5.2.3 on page 5-5 to determine the wind components relative to the runway.

Relative to the runway heading, the wind is 50° from the left at 15 kts. This gives a headwind component of 9 kts and a crosswind component of 12 kts.

The landing mass is:

Take-off mass	1632 lbs (740 kg)
Fuel burned	- 132 lbs (59.7 kg)
(21.62 gal ≙ 132 lbs)	1500 lbs (680.3 kg)

Landing distance required over a 50 ft obstacle	1273 ft (388 m)
Addition for grass runway (dry: +15%)	1464 ft (447 m)
Ground roll	532 ft (162 m)
Addition for grass runway (dry: +15%)	612 ft (187 m)

The available runway length of 2560 ft (780 m) is sufficient.
The reported crosswind component is also below the maximum demonstrated crosswind component (15 kts).

CLIMB PERFORMANCE AFTER BALKED LANDING

In order to determine the possible climb performance after a balked landing use chart 5.2.14 on page 5-16. A climb performance of 822 ft/min is determined for an aircraft mass of 1500 lbs (680 kg) at a pressure altitude of 380 ft and an outside air temperature of 68 °F (20°C). An air speed of 56 KIAS has to be maintained.

horizontal speed.....56 KIAS · 101 ≈ 5656 ft/min
climb rate.....822 ft/min
obstacle height.....50 ft (15 m)

The minimum distance between the rotation point and the end of the runway is calculated as follows:

$$\frac{\mathbf{50\ ft}}{\mathbf{822\ ft/min}} \cdot \mathbf{5656}\frac{\boldsymbol{ft}}{\boldsymbol{min}} = \mathbf{344\ ft\ (104\ m)}$$

The result does not include any safety factor and should be used as an estimation only. For safety reasons, the decision for a go around must be made earlier than the calculated value.

In the event of a turbocharger failure, a climb rate of 420 ft/min can be determined from diagram 5.2.14, which results in a minimum distance between the rotation point and the end of the runway of 662.8 ft (202m).

Power Setting for Cruise Flight

Sample Determination (see chart 5.2.9)

Cruise altitude:	2000 ft
ISA temperature:	51.8°F (11°C)
Temperature at cruise altitude:	69.8°F (21°C)
Power setting:	65%
RPM:	1980 rpm
Manifold pressure for ISA:	29 in Hg
Fuel consumption for ISA:	5.0 US gal/h (19 l/h)
Fuel consumption calculated for ISA + 10°C:	5.0 + (5.0 x 0.05) = 5.25 US gal/h (20 l/h)

5.3 NOISE CHARACTERISTICS / ABATEMENT

Certification basis	Actual (MTOW: 750kg / 1653 lbs)	Maximum Allowable
CS-36, Amendment 5	62.7 dB(A)	74.2 dB(A)
ICAO Annex 16, Chapter 10	62.7 dB(A)	74.2 dB(A)

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SECTION 6

WEIGHT AND BALANCE / EQUIPMENT LIST

6.1 INTRODUCTION

Before delivery, the manufacturer determines the basic empty weight and moment as well as the empty C.G. location for each aircraft. This data is documented in the Weight and Balance Record in section 6.3.1 of this section. The certified empty C.G. limits can be found in the Maintenance Manual.

It is the operator's responsibility to document any changes to the empty weight and center of gravity of the aircraft.

The aircraft is to be weighed in the following configuration

Weighing configuration:

a) Aircraft with:

Brake fluid	
Engine oil	(3.17 US qt / 3 liters)
Engine coolant	(2.64 US qt / 2.5 liters)
Unusable fuel	(2.74 US Gal / 10.4 liters)

b) Equipment in accordance with the current equipment list (section 6.5)

NOTE

The aircraft must be weighed in accordance with the relevant aviation regulations at regular intervals or after repairs, after extensive maintenance, after large portions of the aircraft have been painted, after changes to the equipment or when doubt exists as to the accuracy of the last weighing. This data must then be recorded in the Weight and Balance Record.

It is the pilot's responsibility to operate the aircraft within its weight and balance limits.

The aircraft must be flown at a weight and a center of gravity position (C.G.) that are within the approved operating ranges, as defined in this section, to guarantee safe operation, the specified performances and the flight characteristics. The shift in C.G. location due to fuel burn during flight must be taken into account.

The C.G. Limits are defined in section 6.4.3.

6.2 AIRCRAFT WEIGHING

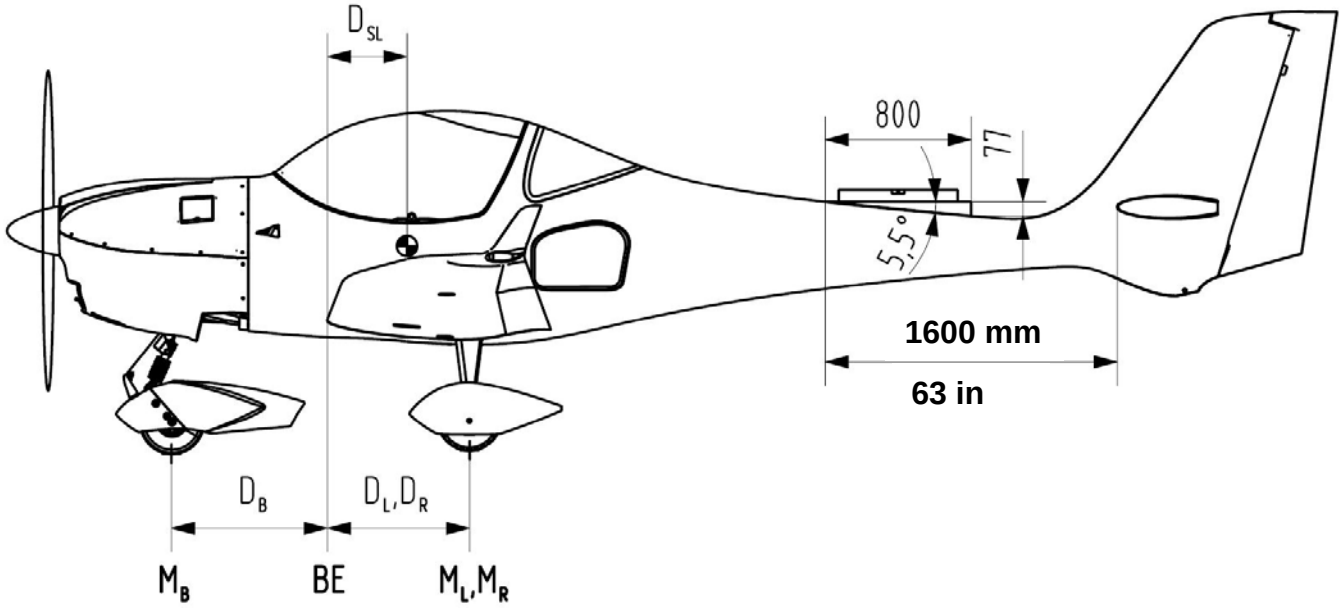
Reference Datum (BE): Leading edge of wing root rib

Horizontal reference line: Place a wedge (800 : 77) 63 in (1600 mm) ahead of the leading edge of the horizontal stabilizer. Place a level on the wedge and level the aircraft.

Lever D_B: Distance from nose wheel to Reference Datum (BE)

Lever D_L, D_R: Distance from main wheel to Reference Datum (BE)

Lever D_{SL}: Distance of C.G. to Reference Datum (BE)



Aircraft Weighing: Example in [kg, m]					
Position	Weight [kg]	*	Lever [m]	=	Moment [kg*m]
Nose Wheel	m_B = 106	*	D_B = - 0,840	=	M_B = - 89
Left Main Wheel	m_L = 200	*	D_L = + 0,780	=	M_L = + 156
Right Main Wheel	m_R = 200	*	D_R = + 0,780	=	M_R = + 156
Total	m_{Ges} = 506				M_{Ges}= 223
Center of Gravity	M_{Ges} / m_{Ges}	=	D_{SL} = 0,440		

Aircraft Weighing: Example in [lb, in]					
Position	Weight [lb]	*	Lever [in]	=	Moment [in*lb]
Nose Wheel	m_B = 234	*	D_B = - 33	=	M_B = - 7722
Left Main Wheel	m_L = 441	*	D_L = + 31	=	M_L = + 13671
Right Main Wheel	m_R = 441	*	D_R = + 31	=	M_R = + 13671
Total	m_{Ges} = 1116				M_{Ges}= 19620
Center of Gravity	M_{Ges} / m_{Ges}	=	D_{SL} = 17.58		

CAUTION

Sign Convention:

The lever arms of the main landing gear wheels, D_L and D_R, have a positive (+) value and that of the nose gear, D_N, a negative (-) one.

6.3 WEIGHT AND BALANCE DATA

The current empty weight and C.G. Location must be added to the Weight and Balance Record on page 6-6 and signed off by an authorized person. It is important that the Weight and Balance Record be complete and up to date. The first entry in the record is made during the conformity inspection at the end of the manufacturing process.

NOTE

The pilot uses the empty weight C.G. as the basis for all weight and balance calculations for flight.

It is possible to calculate a new empty weight and C.G. if the changed weights and corresponding levers are known (for example, a change in equipment). If, however, the changed weights and corresponding levers are not known (for example, after repair work) a new weighing will need to be completed.

If the empty weight and C.G. are to be calculated, it is important that current information is being used.

NOTE

The current aircraft weighing report is to be included as page 6-5 of this POH. Previous weighing reports must be clearly marked as such or removed.

Replace with current Aircraft Weighing Report

6.3.1 Weight and Balance Record

AQUILA AT01	Registration Sign:	S/N:	Page:

description of the change	IN	OUT	Mass, Lever, Moment of change acc. to wing leading edge (BE)				empty weight and centre of gravity of the airplane		authorized staff	
			in flight direction aft of BE: (+) front of BE: (-)	single-mass	lever of single mass	moment of single mass	empty weight	center of gravity (D_{SL})	signature	stamp
			„+“ or „-“	[kg] or [Lb]	[m] or [in]	[kgm] or [lb in]	[kg] or [Lb]	[m] or [in]		
Date										
at delivery										

6.4 DETERMINING WEIGHT AND BALANCE FOR FLIGHT

In order to operate the aircraft within the approved weight and C.G. limits, the take-off weight and the flight C.G. position must be determined, taking into consideration the loading for the planned flight.
Use the tables and charts provided in sections 6.4.1 through 6.4.3 to determine weight and C.G. position:

Section 6.4.1 Load moment determination (loading graph)

Section 6.4.2 Weight and moment determination

Section 6.4.3 Approved center of gravity and weight limits

Proceed as follows:

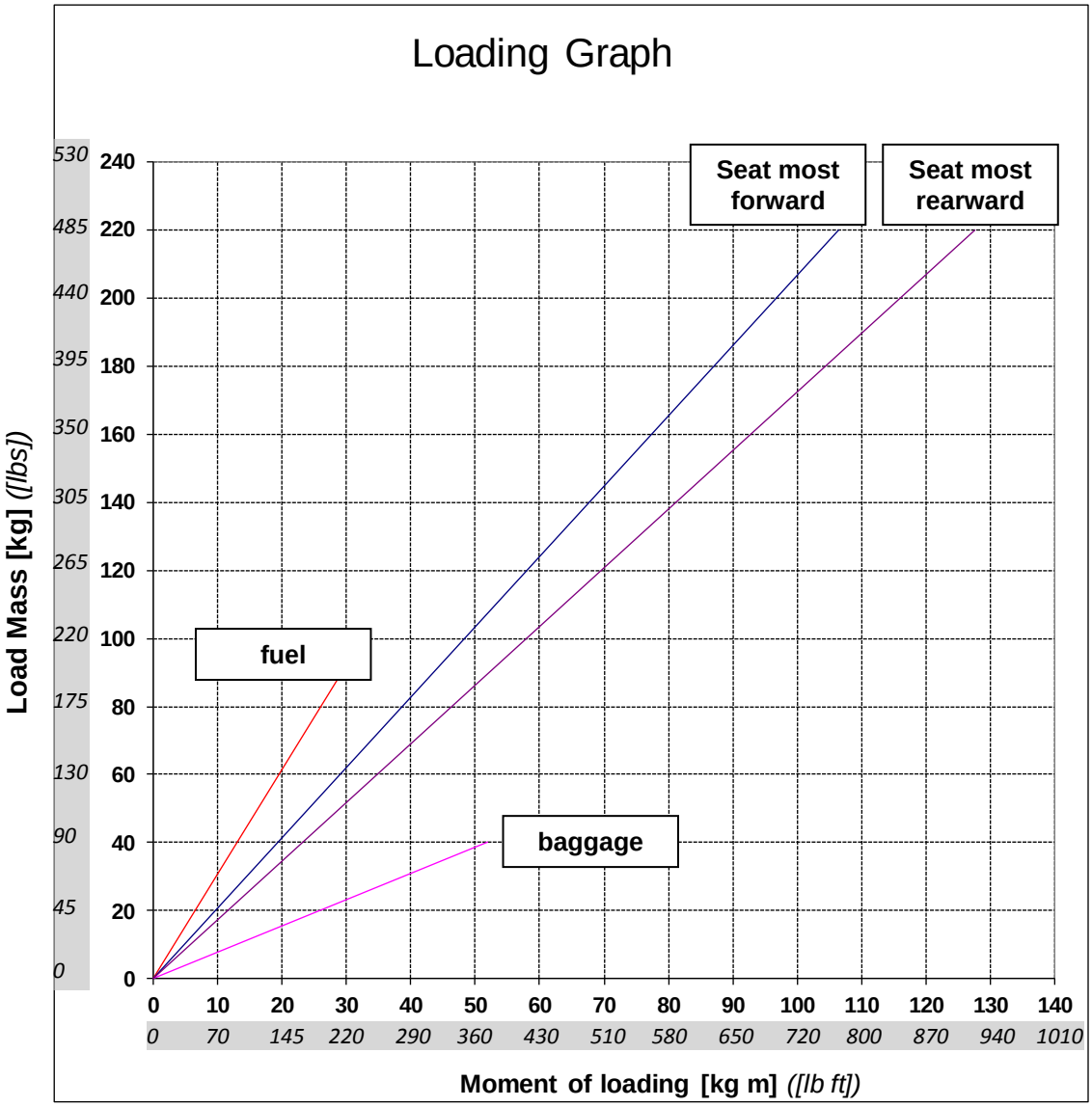
1. Take the basic empty weight m_{empty} and the empty weight moment MO_{empty} from the current Aircraft Weighing Report or the Weight and Balance Record and enter them into the appropriate fields of Table *6.4.2 Weight and Moment Determination*.

2. Using chart *6.4.1 Loading Graph* determine the moments of the load (pilot, fuel, baggage, etc.). Enter this information, as well as their weight, into the appropriate fields of Table *6.4.2 Weight and Moment Determination Table*.

   Alternatively, the moments can be calculated with the lever arms from Table *6.4.2 Weight and Moment Determination Table.*

3. Find the sum of the weights and the moments in their columns. Transfer this information into chart *6.4.3 Approved C.G. Range and Moment Limits* to check if the current C.G. is within limits.

6.4.1 Load moment determination (loading graph)



NOTE

When determining the C.G. position, the fact that the seat is adjustable must be taken into consideration. The moments for the forward and the aft seat positions are shown, the moments for all other positions must be interpolated

6.4.2 Weight and Moment Determination

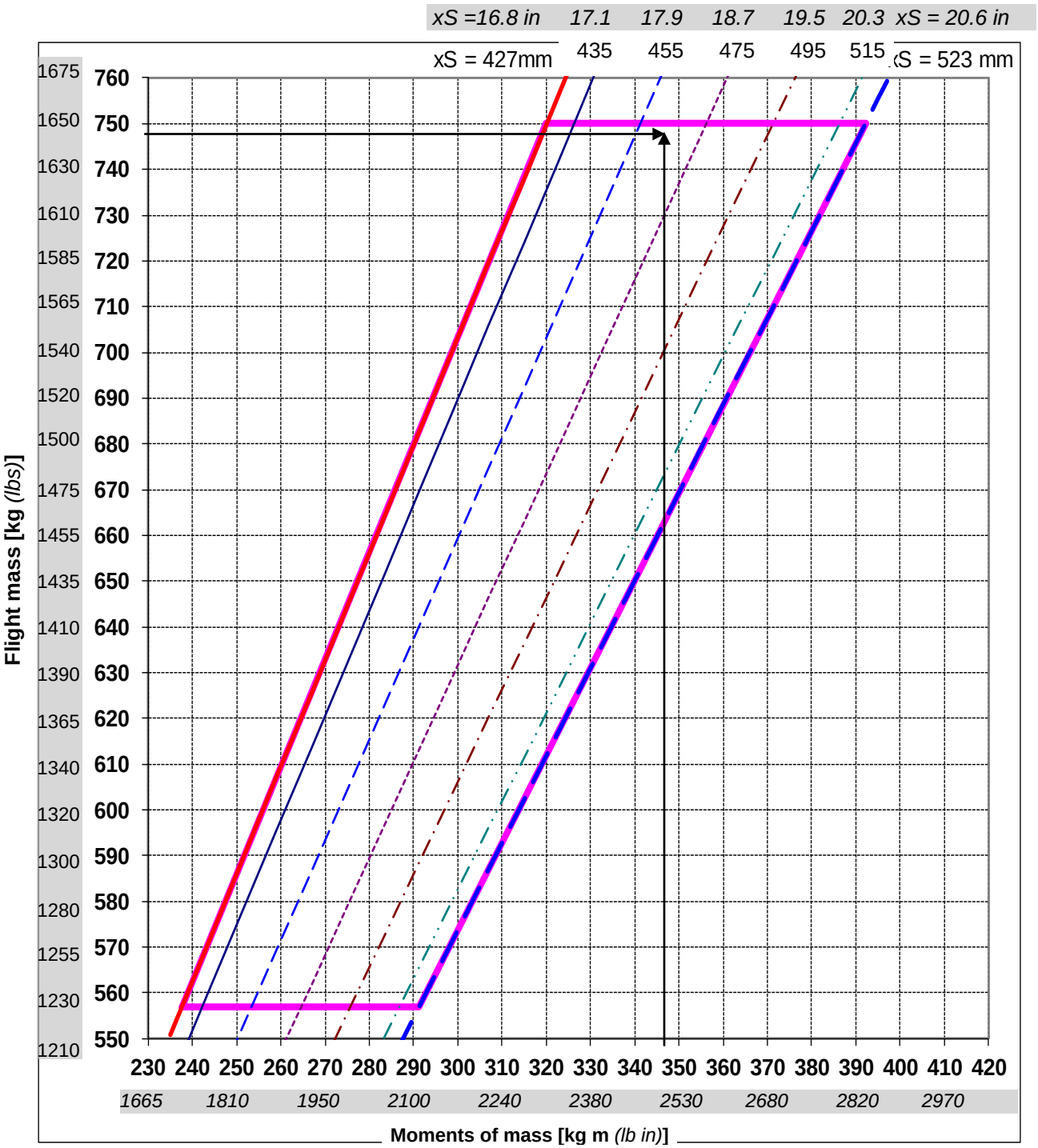
Calculating Loading Condition	**Lever from leading edge of wing root rib (BE) [in]** *[m]*	**Aquila AT01 Example**		**Registration No.:**	
		Weight [lb] *[kg]*	**Moment [in lb]** *[m kg]*	**Weight [lb]** *[kg]*	**Moment [in lb]** *[m kg]*
EMPTY WEIGHT (from Table 6.3.1)	D_{SL} = Exp.: **17.3 in** *(0.440 m)*	**1116** *506*	**19620** *223*		
PILOT	**19.1** *(0.484)* (seat forward) **22.8** *(0.580)* (seat aft)	**121** *55*	**2311** *27* (seat forward)		
PASSENGER	**19.1** *(0.484)* (seat forward) **22.8** *(0.580)* (seat aft)	**220** *100*	**4609** *53* (seat middle)		
BAGGAGE	**51.2** *(1.3)*	**33** *15*	**1690** *20*		
Weight & Moment without fuel		**1490** *676*	**28230** *323*		
usable FUEL (**6.01 lb / US gal**) *(0.72 kg / l)*	**12.8** *(0.325)*	**159 (= 26,5 gal)** *72 (= 100 ltr)*	**2035** *23*		
Total Weight & Moment		**1649** *748*	**30265** *346*		

Explanation:

- Transfer the empty weight and the empty C.G. (D_{SL}) from section 6.3.1 or from the current Aircraft Weighing Report.
- Add all the weights
- Transfer the moments from chart 6.4.1 or calculate the moments by multiplying the weight with the arms.
- Find the sum of the weights and moments
- Plot the total weight and moment in the *Center of Gravity Range and Moment Limits diagram 6.4.3*.

The flight C.G. from the example is **30265 in lb / 1649 lb = 18.4 in** (limit range: 16.8 – 20.6 in) respectively *346 kgm / 748 kg = 0,463 m* (limit range: 0,427 – 0,523 m) aft of the datum and is within the limits.

6.4.3 Approved Center of Gravity Range and Moment Limits



6.4.4 Estimating Center of Gravity Position using MVP-50P-AQ

The "Weight and Balance" function of the MVP-50P-AQ offers a comfortable and simple way of estimating the current C.G. position.

The weights of the pilot, passenger, baggage and fuel are entered into the "Weight and Balance" page of the MVP-50P-AQ which is accessed by pressing the "SCREENS"-button several times. The resulting total weight, maximum take-off weight, the difference between these two values and the center of gravity position are then shown.
If the approved limits are exceeded, some or all of the values will be shown in red.

CAUTION

The estimation of C.G. position using the MVP-50P-AQ serves solely as additional information and is in no way a substitute for the proper calculation as shown in section 6.4 of this POH.

The current empty weight of the aircraft as programmed by an authorized maintenance organization and registered in section 6.3.1 is an absolutely essential input to ensure correct calculations. The current programmed empty weight data are shown in the header of the MVP-50P-AQ.

NOTE

The MVP-50P-AQ uses the moment for the middle position of the pilot's seat (21 in. aft of BE) to calculate center of gravity positions. This must be taken into consideration in accordance with Table 6.4.2 if the seat is in the forward or rear position.

In order to avoid input mistakes, the moments of the (non-existent) seat rows 2 and 3 have also been programmed to be positioned at 21 in. aft of BE.

6.5 EQUIPMENT LIST

The equipment list includes all avionic systems, instruments and other equipment installed in the aircraft.

All changes to the equipment of this aircraft must be documented in the equipment list in this handbook. It must be kept up to date and reflect the current equipment status.

The equipment list in this handbook contains the following information:

1. Designation/Description, Manufacturer, model or P/N and S/N of the avionic system, instrument or other equipment.

2. Indication of the installation location OR lever arm in [in] from the reference datum. Positive lever arms indicate locations behind the reference datum and negative lever arms indicate locations in front of the reference datum.

NOTE

The installation of additional equipment or a change in installed equipment, must be carried out in accordance with the data provided in the Maintenance Manual. The retrofitting of equipment must be conducted in accordance with the applicable Service Bulletin. When in doubt, the type certificate holder or the production organization of AQUILA Aviation should be contacted.

After every change to the aircraft that could cause the empty weight or moment to change (for example, the installation or removal of equipment), the empty weight and C.G. (D_{SL}) need to be redetermined. The change also needs to be documented in an *Aircraft Weighing Report,* in the *Weight and Balance Record* in section 6.3.1 as well as in the Glas Panel Engine Monitor MVP-50P-AQ.

It may be possible to calculate the empty weight and C.G. if the new weights and levers are known. Otherwise a new weighing will need to be completed.

The new C.G. must lie within the limits (refer to Maintenance Manual, MM-AT-01-1020-110).

6.5.1 Current Equipment List of the Aircraft

AQUILA AT01-200		**Registration:**		**S/N: AT01-200C-**	
***)**	**Designation / Description**	**Manufacturer**	**Model / P/N**	**S/N**	**Installation Location **)**

*) Mark where applicable

**) Describe installation location or enter lever arm from reference datum in [in] (keep algebraic sign of lever arm in mind)

AQUILA AT01-200		**Registration:**		**S/N: AT01-200C-**	
***)**	**Designation / Description**	**Manufacturer**	**Model / P/N**	**S/N**	**Installation Location **)**

*) Mark where applicable

**) Describe installation location or enter lever arm from reference datum in [in] (keep algebraic sign of lever arm in mind)

SECTION 7

DESCRIPTION OF THE AIRCRAFT AND ITS SYSTEMS

7.1 INTRODUCTION

Section 7 of the Pilot's Operating Handbook contains a description of the entire aircraft and its systems, including the integration of the GARMIN G500 TXi system and the Glass Panel Engine Monitor MVP-50P-AQ as well as information related to their use.
Refer to Section 9 for the description and operating instructions of optional equipment and systems.

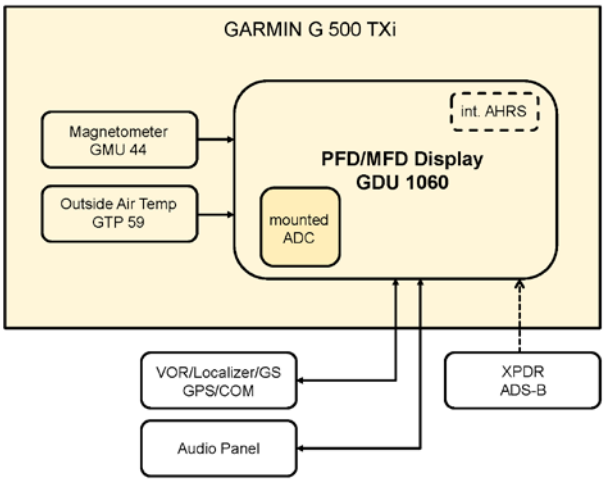
NOTE

A more in depth description and the user manuals of the G500 TXi and the MVP-50P-AQ can be found in the GARMIN G500 TXi Pilot's Guide and MVP-50P-AQ Operating Instructions.

7.1.1 Garmin G500 TXi System (Primary Flight Display)

The GARMIN G500 TXi system has 2 displays, the PFD and the MFD. Together they form the Garmin Display Unit (GDU). In addition, the GDU requires an Attitude and Heading Reference System (AHRS unit) and an Air-Data Computer (ADC unit). The GARMIN G500 TXi display has an integrated AHRS and the ADC is installed directly onto the back side of the GDU

The GARMIN G500 TXi system is organized as shown in the following illustrations.



For the G500 TXi system the GDU is attached to the aircraft power supply through its own push-pull type circuit breaker. The circuit breaker is located on the right side of the instrument panel and is labeled **PFD**. This circuit breaker also protects all other components of the G500 TXi system, because they all are connected via the display unit.

Current flows through the G500 TXi circuit breakers as soon as the **ALT1 / BAT** switch has been turned on.

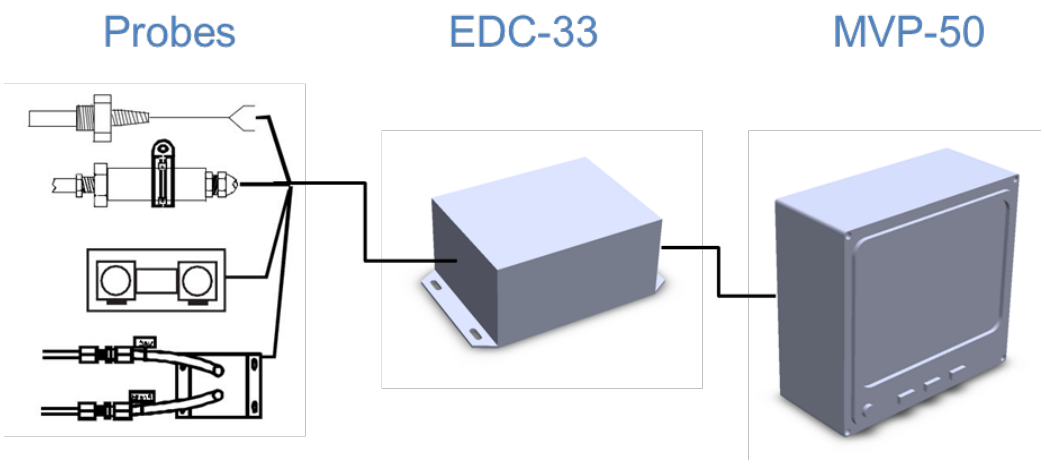
7.1.2 Glass Panel Engine Monitor MVP-50P-AQ

The MVP-50P-AQ consists of an indication / actuation interface (MVP-50), an engine data converter (ECD-33) and the attached probes.

When engine limits are exceeded, the warning light **ENG** in the annunciator panel of the MVP-50P-AQ will illuminate YELLOW (caution) or RED (operating limit).

The MVP-50P-AQ system is attached to the aircraft power supply via a push-pull circuit breaker which is located on the right side of the instrument panel and is labeled **MOTOR INSTR 1**.

The MVP-50P-AQ system is organized as shown in the following illustration:



7.2 AIRFRAME

The Aquila AT01-200 is a modern single engine two seater in a side-by-side configuration. Due to its high useful load, roomy cockpit, large baggage compartment, good cruise performance and light yet incredibly sturdy airframe, the Aquila is not only a great aircraft for longer tours but also an ideal training platform.
The aircraft is a low wing configuration with a mid mounted horizontal stabilizer.
With the exception of the landing gear, the engine mount, and a few fittings the Aquila AT01-200 is built entirely of composite material. Most components are fabricated using glass-fiber-reinforced plastic (GFRP), with carbon-fiber-reinforced plastic (CFRP) being employed where extra strength is required.

7.3 FUSELAGE

The fuselage and the vertical stabilizer are fabricated in two half shells. While the fuselage portion of the shell is fabricated from solid fiberglass laminate, the vertical stabilizer portion has a sandwich structure.
The engine side the firewall, which is made of a GFRP/CFRP sandwich, is covered with a special fire-resistant ceramic fleece and a stainless steel sheet.
The landing gear frame, together with the seat frame, supports the main landing gear struts. The frame continues upwards and forms a massive roll cage made from GFRP and CFRP.

7.4 WING

The wing is designed with a triple trapezoid planform and a swept-back leading edge. The wing is fastened to fuselage from below using 4 bolts.
The wing shells are GFRP/foam sandwich composite constructions and are reinforced locally by CFRP unidirectional bands.
The fuel tanks are integrated into the leading edge of the wing structure. The 2 fuel tanks, one on each side, have a volume of approx. 15.8 US gal (60 l) each. The inner surface of the fuel tank is sealed with a special surface lining to protect the wing structure from damage.
The position lights, ACL (Anti-Collision Light) and the fuel tank vents are integrated into the winglets.

7.5 EMPENNAGE

The vertical and horizontal stabilizers, as well as the elevator and rudder are semi-monocoque sandwich composite constructions. The shells are fabricated from a GFRP sandwich reinforced by carbon fiber bands.
The horizontal stabilizer assembly is bonded directly to the fuselage and cannot be removed.

7.6 FLIGHT CONTROLS

The flight controls of the Aquila AT01-200 are of conventional design using a control column and non-adjustable rudder pedals. The elevator and ailerons are controlled via push-pull-rods, the rudder via cables.

The flaps and the trim system are electrically actuated.

7.6.1 Ailerons

The ailerons are controlled using push-pull-rods.

A bell crank in the middle of the main wing spar sets the differentiation of the ailerons. Adjustable stops near the control column are used to limit the aileron deflection.

7.6.2 Elevator and Trim System

The elevator is controlled using push-pull-rods.

Adjustable stops near the control column are used to limit the elevator deflection.

The trim system is an electrically actuated spring trim. Even in a situation such as trim runaway, the aircraft remains controllable, though the stick forces may become somewhat higher. The trim is controlled by a spring-loaded switch. The trim indicator is located in the middle of the instrument panel.

The take-off position of the trim is marked on the indicator.

Switch forward:	nose down
Switch aft:	nose up

In addition, the trim system is protected by a resettable circuit breaker.

7.6.3 Rudder

The rudder is controlled by the rudder pedals by way of cables running in special guides. The control surface travel is limited by stops at the lower rudder attachment fitting.

Precise control and good maneuverability during taxiing on the ground is accomplished by linking the nose wheel steering mechanism directly with the rudder pedals. Differential breaking may be used to further reduce the turning radius.

The seat can easily be adjusted to allow the pilot to comfortably reach the rudder pedals.

7.6.4 Flaps and Flap Position Indication

The flaps are driven by an electric motor, via a spindle and push-pull-rods.

A three-position selector switch is incorporated in the instrument panel for flap operation. A flap position indicator is also located on the instrument panel.

In cruise position the upper green light is illuminated (UP)

In take-off position the middle green light is illuminated (T/O)

In landing position the lower green light is illuminated (LDG)

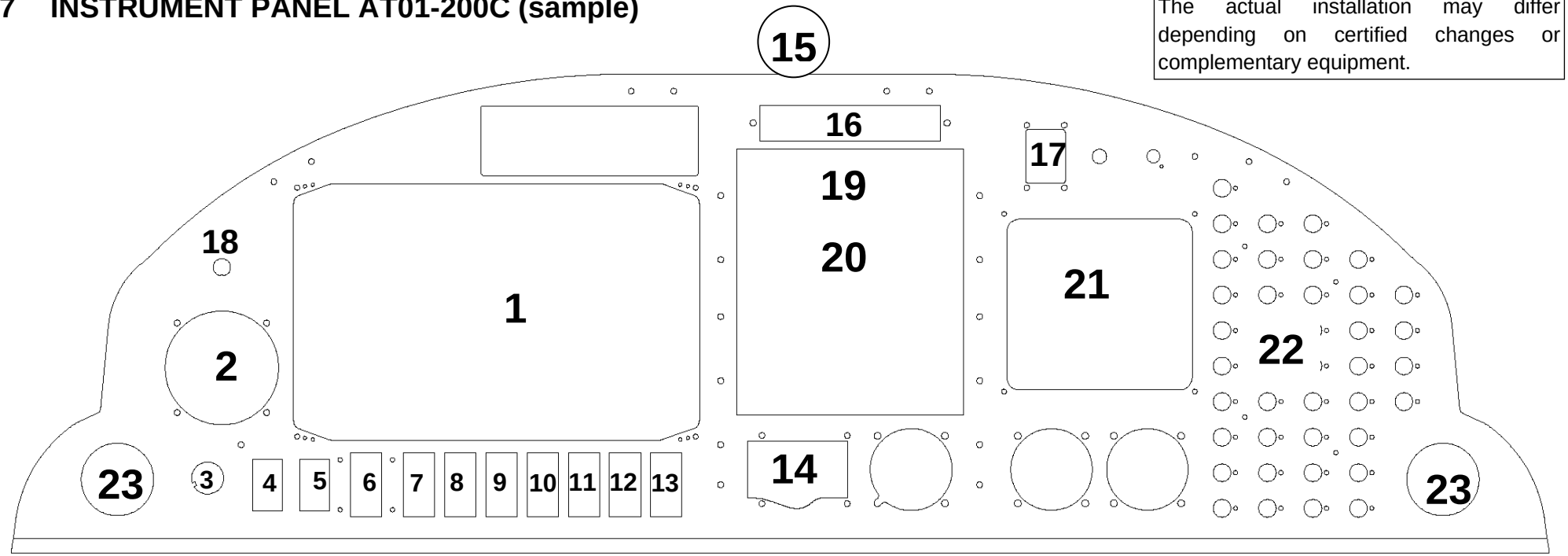
The flap selector switch position corresponds accordingly to the flap position.

Stripe markings on the flap leading edge offer an additional possibility to visually check the flap position.

A self locking spindle will maintain a flap position, even in the event on an electrical failure.

7.7 INSTRUMENT PANEL AT01-200C (sample)

NOTE:
The actual installation may differ depending on certified changes or complementary equipment.

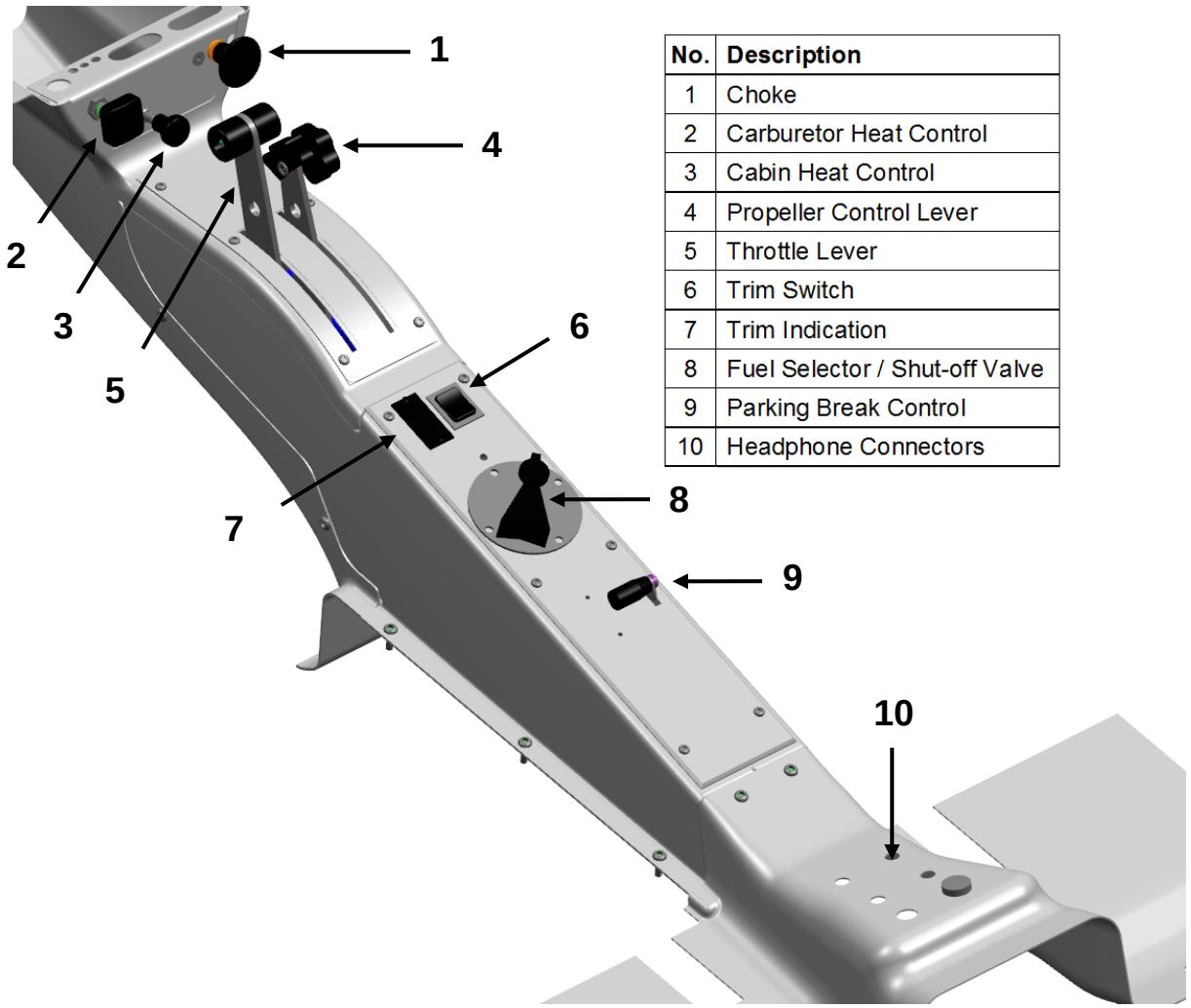


For minimum instrument requirements, refer to Section 2.12 of this manual

No.	Description	No.	Description	No.	Description	No.	Description	No.	Description	No.	Description
1	GARMIN G500 TXi	5	ALT2/BAT2	9	ACL	13	Reserved	17	ELT	21	Glass Panel Engine Monitor MVP-50P-AQ
2	Stby. artificial horizon	6	Fuel Pump AUX	10	Landing Light	14	Flap Control Switch	18	TCU switch		
3	Ignition Switch	7	Avionics	11	Instrument Lights (opt)	15	Compass	19	COM/NAV/GPS	22	Circuit Breakers
4	ALT1/BAT	8	Nav-Light	12	P/S Heat (opt.)	16	Annunciator Panel	20	Transponder	23	Ventilation Nozzle

7.7.1 Overview Control Panel

Controls and displays located on the control panel which is located below the midsection of the instrument panel, are placed so as to be easily viewed and operated from both seats.



No.	Description
1	Choke
2	Carburetor Heat Control
3	Cabin Heat Control
4	Propeller Control Lever
5	Throttle Lever
6	Trim Switch
7	Trim Indication
8	Fuel Selector / Shut-off Valve
9	Parking Break Control
10	Headphone Connectors

7.7.2 Cabin Heat

The cabin heat control knob, by which the hot-air flap is opened and closed, is located in the forward section of the control panel.
At the front section of the instrument panel cover the heated air is divided up for windshield defrosting and cabin heating.

7.7.3 Cabin Ventilation

Two adjustable ventilation nozzles are located on both sides of the instrument panel to supply fresh air to the cabin. The amount and direction of fresh airflow can be adjusted individually for each seat by pivot-mounted nozzle outlets. If required, the sliding windows in the canopy may also be opened for additional ventilation of the cabin.

7.7.4 Additional lighting (N/VFR)

With the equipment for N/VFR operations a redundant instrument lighting system is installed. The lighting system includes the following:

⇒ Panel lighting in the glare shield (controlled by a dimmer unit on the right side of the instrument panel)

⇒ Individual instrument lighting by internal instrument lights and additional lighting for instruments, controls on the control panel, and switches and circuit-breakers.

In the event of an emergency a flashlight must be available for every person on board the aircraft.

7.8 SEATS, SEATBELTS AND HARNESSES

The seats are fabricated from composite materials and are equipped with integrated head rests and removable, energy-absorbing seat cushions.
An oil/gas spring strut with locking mechanism holds the seat in the adjusted position. To adjust the seating position, the spring strut must be unlocked by pushing a handle located by your thigh.

Both seats are equipped with four-part seat belts with a central rotary buckle. The shoulder harnesses are connected to inertial reels.

To fasten the seat belts, put each belt fitting successively into the associated receptacles of the rotary buckle until a distinctive “snap” sound is heard. The seat belts can be released by turning the handle of the rotary buckle clockwise.

7.9 BAGGAGE COMPARTMENT

The AQUILA AT01-200 incorporates a large baggage compartment behind the seats which can be loaded through a lockable baggage door. The baggage compartment is also accessible through the cabin.

The maximum permissible load in the baggage compartment is **88 lbs (40 kg)**. The weight and centre of gravity limits of the aircraft (refer to Section 6 of this handbook) must be observed when loading. The baggage door must be locked during flight.

Tie-down rings for straps are provided on the floor panels of the baggage compartment to strap down baggage and other payload. Suitable tie-down straps may be purchased from the aircraft manufacturer. For small or loose articles, a baggage net is recommended, which is also available for purchase.

7.10 CANOPY

The large canopy offers an excellent all around view and allows unrestricted access to the cabin. Small sliding windows on both sides of the canopy serve as emergency view windows and can be used for additional cabin ventilation. The canopy is operated by a hand lever located on the left hand side of canopy frame. A gas spring strut adds support while opening the canopy.

7.11 LANDING GEAR

The landing gear consists of a steerable nose gear that is equipped with a shock absorber and a main landing gear. To provide precise control of the aircraft while taxiing on the ground, the nose gear strut is linked directly to the rudder pedals. The main gear struts are made of spring steel to absorb the touch-down loads during landing. Hydraulically actuated disc brakes are provided on the main landing gear.
Because of the robust landing gear and the 5.00 x 5 wheels on the nose and main wheels the AQUILA AT01-200 can be easily operated from a grass surface.
The aircraft can be operated with full size wheel pants or, for soft field operation, mud guards.

7.11.1 Nose Landing Gear and Nose Wheel Steering

The direct linkage between nose wheel and rudder pedals minimizes brake wear.

Good shock absorption and suspension characteristics are provided by a shock absorber made of stacked rubber springs located in the nose wheel fork.

The direct linkage between the nose wheel steering and rudder operation allows swift taxiing, precise taxi maneuvers and small turn radii, also in crosswind conditions without excessive braking.

Differential breaking may be used to reduce the turning radius even further.

7.11.2 Main Landing Gear and Brake System

The main landing gear consists of two cantilever struts which act as leaf-springs to absorb the touch-down loads.

The main wheels are equipped with hydraulically actuated disc brakes. The brakes are activated individually on each side by tilting the corresponding rudder pedal in the cockpit forward with the toe. Due to separate brake circuits, the left and right wheel brakes can be actuated individually.

7.11.3 Parking Brake

The parking brake lever is located in the central control panel. Actuating the parking brake locks the main wheel brakes.

To set the parking brake, the wheel brakes are applied simultaneously with the rudder pedals and, when the desired brake pressure is achieved, the control lever is pulled into the locked position.
To release the parking brake, push the parking brake lever all the way forward.

7.11.4 Wheel Fairings

It is important that no dirt or snow accumulate underneath the wheel pants. For this reason the Aquila AT01-200 can be operated with either full wheel pants (high-speed), with mud guards (soft-field), or without any wheel fairings. The aircraft can also be flown with a combination of wheel fairings, as long as the left and right main wheels have the same fairing.

NOTE

Flying without any kind of wheel fairing increases the chance of damage due to stones which, in turn, may lead to extensive, unscheduled maintenance work.

NOTE

Flying without any wheel fairings or with mud guards reduces performance up to 10%.

7.12 POWER PLANT

7.12.1 Engine

The ROTAX 914F is a 4 cylinder, 4 stroke horizontally opposed engine with liquid-cooled cylinder heads and air-cooled cylinder barrels. It has brushless magnetos, 2 carburetors, 2 electrical fuel pumps, a reduction drive, an integrated alternator (**ALT2**), an externally engine mounted alternator (**ALT1**) and an attachment for a hydraulic constant speed propeller.

Additionally the engine contains an exhaust turbocharger. It is controlled by a Turbo Control Unit (**TCU**), attached to the instrument panel, with sensors for temperature, pressure and throttle valve position. The TCU controls a servo motor which, via a bowden cable, adjusts a waste gate for manifold pressure and power control. An additional intercooler for turbocharged air ensures, that air temperature behind the turbocharger always remains within the operation limits of the engine.

Reduction ratio of internal gearbox:	2.43 : 1		
Displacement:	73.9	in³	(1211 cm³)
max. takeoff power (5 min.):	113.3	BHP	(84.5 kW)
at max. takeoff propeller speed:	2385	RPM	
max. continuous power:	98.6	BHP	(73.5 kW)
at max. continuous propeller speed:	2260	RPM	

Further information can be found in the engine operating handbook.

7.12.2 Propeller

A two-blade, hydraulically controlled variable pitch propeller (constant speed propeller) of wood-composite-hybrid construction.

Manufacturer:	mt-Propeller	
Type:	MTV-21-A/175-05	
Diameter:	68.9 in	(175 cm)

The propeller blades are wrapped in composite material and protected along the leading edge by a stainless steel sheath. Near the blade root, the propeller is protected additionally by a thick plastic film.

7.12.3 Throttle and Propeller Control

The black throttle lever and the blue propeller control lever are located on the central control panel.

The throttle controls the manifold pressure (MP):

Throttle forward, more than 100% indexed position:	Take-off power (TOP) (up to 40 inHg MP)
Throttle forward, up to 100% indexed position:	Max. continuous power (MCP) (up to 35 inHg MP)

The propeller control lever controls the pitch of the propeller blades:

Propeller control lever forward:	Low pitch (high RPM)
Propeller control lever aft:	High pitch (low RPM)

To obtain maximum engine power (max. manifold pressure), place both the throttle and the propeller control levers in their full forward positions.

During climb and cruise, the manifold pressure (throttle position) and the propeller pitch (propeller control lever position) are normally matched to each other. Refer to Section 5 of this manual and to ROTAX® 914F Operator's Manual for more information.

During the final approach for landing, the low pitch setting of the propeller is used to increase the propeller drag at low power settings and to have full climb power available in case of a missed approach (throttle aft and propeller control lever forward).

The adjustment of the propeller blade pitch is accomplished by a hydraulically operated propeller governor that increases the pitch against a spring load. The oil-hydraulic governor keeps the preselected propeller speed at a constant value regardless of manifold pressure and airspeed (constant-speed control). In the case of oil pressure loss, the blades will be automatically set into lowest pitch position. This ensures the further availability of full power.

CAUTION

In the case of governor loss, the propeller behaves like a non-adjustable propeller. Manifold pressure is set to ensure that max. permissible RPM is not exceeded.

The propeller does not have a feathered position.

7.12.4 Choke

The choke control knob is located on the control panel to the right of the carburetor heat and cabin heat controls.

The choke may only be used for a short time when starting the engine in cold conditions. The throttle must remain in Idle. The choke knob is spring-loaded and returns to the OFF position when released.

7.12.5 Carburetor Heat

The carburetor heat push-pull type control element is located on the control panel to the left of the choke and cabin heat.

When carburetor heat is pulled (ON) one part of the dyadic bowden cable closes a cover on-top of the intercooler. The other part closes a flap in the air intake system behind the air filter so that the engine is then provided with pre-heated intake air from the engine compartment.

The correct use of carburetor heat prevents the formation of carburetor ice that can cause the engine to run rough and, in the worst case, result in complete engine failure. If carburetor icing is encountered, it is usually possible to slowly melt the ice by activating the carburetor heat while maintaining the same power setting.

A carburetor temperature gauge with a caution zone marked is displayed in the Engine Monitor MVP-50P-AQ.

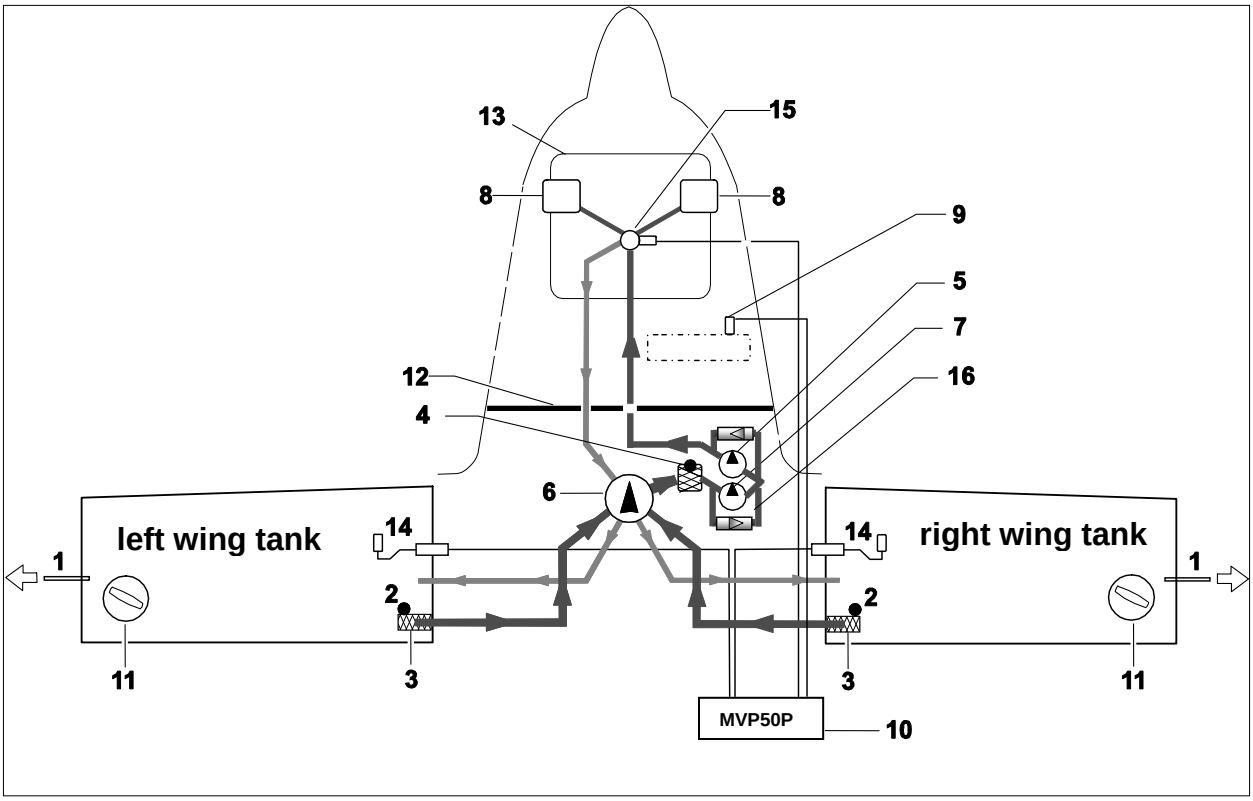
The functionality of the carburetor heat should be tested before every flight.

NOTE

Carburetor heat reduces engine power and must be used in accordance with standard rules and procedures.

7.13 FUEL SYSTEM

7.13.1 Overview



Fuel supply line

Fuel return line

1	**Fuel Vent**	**9**	**Airbox pressure probe**
2	**Drain valve**	**10**	**Glass Panel Engine Monitor**
3	**Coarse fuel filter element**	**11**	**Fuel filler cap**
4	**Gascolator (fine filter & Drain valve)**	**12**	**Firewall**
5	**Electrical fuel pump AUX (ALT1/BAT)**	**13**	**Engine**
6	**Fuel selector/shut-off valve**	**14**	**Fuel level probe**
7	**Electrical fuel pump MAIN (ALT2)**	**15**	**Fuel pressure regulator & pressure probe**
8	**Carburetor**	**16**	**By-pass with check valve**

Fuel System Schematic

7.13.2 Fuel Tank

Each wing is equipped with an integral fuel tank. The fuel line of each tank is equipped with a removable coarse fuel filter. The fuel filler caps can be locked.

A drain valve is located at the lowest point of each fuel tank. Another drain valve is in the gascolator located behind the firewall on the co-pilots side. All drain valves can be easily operated.
A drainage cup is located on the inside of the baggage compartment door.
Fuel is supplied to the engine by an electrical fuel pump MAIN. When needed, an electrical fuel pump AUX can also be switched on. Both fuel pumps are located in a separated area beneath the cockpit ground floor on the co-pilots side.

Upstream the fuel pumps there is a combined filter and drain valve (gascolator) installed. The electrical fuel pump AUX is controlled by a switch on the instrument panel labeled **Fuel Pump AUX**. It must be turned on during take-off and landing, when low fuel pressure is suspected or during critical phases of flight.

Too low fuel pressure relative to the manifold pressure is detected by a pressure probe at the fuel pressure regulator and another one at the airbox. The resulting fuel over pressure is displayed as fuel pressure on the MVP-50P-AQ.

NOTE

When flying near the ground, such as during take-off and landing or if low fuel pressure is indicated, the AUX fuel pump must be switched on in addition to the MAIN fuel pump.

The fuel tanks are vented via a vent line outlet located in the winglets.

7.13.3 Fuel Selector / Shut-Off Valve

The fuel selector is conveniently mounted on the control panel in full view of the pilots.
The red, arrow-shaped selector handle has a LEFT, RIGHT, and OFF-position. Each position is notched and has a self-centering mechanism using a spring-loaded pin. The selector handle points to the chosen position.

In both normal operating positions (LEFT/RIGHT), the fuel supply and corresponding return line of the selected fuel tank are opened. The fuel supply and return line of the other fuel tank are closed.
It is recommended to keep both tanks at approximately the same fuel level.

NOTE

Recommendation: Fuel tanks should be switched at least every 60 minutes.

When the fuel selector valve is in the OFF position, the fuel flow in the supply and return lines is interrupted and it functions as a fuel shut-off valve.

To switch the valve into the OFF-position, the knob located at the top of the handle must be PULLED while simultaneously turning the handle clockwise into the OFF-position.

7.13.4 Fuel Level Indication

A floating sensor which is easy to maintain supplies information concerning fuel levels which are then displayed on the MVP-50P-AQ. The floating gauge is located above the fuel supply; therefore fuel indication depends on the flight attitude. All filling levels above ¾ will be indicated as FULL due to the dihedral angle.

Additionally, a dipstick to visually verify the fuel level is delivered with the aircraft. With the aircraft horizontal, the dip-stick is inserted straight into the fuel tank so that the handle of the dipstick lays flat with the upper surface of the wing.

After pulling the dipstick out of the fuel tank, the fuel level can be determined by the “wetted” area of the dipstick. This can then be compared with the electrical fuel level indication on the instrument in the cockpit.

The dip-stick must always be carried with the aircraft. It is stowed on the inboard side of the baggage compartment door.

CAUTION

The fuel level indication in the cockpit must be verified with the fuel dipstick daily. For this purpose level the aircraft out as much as possible.
The dipstick has markings showing ½ and ¾ of the maximum fuel tank content.

NOTE

The fuel quantity, fuel used and fuel remaining functions of the G500 TXi / MVP-50 are advisory information only and must be verified by the pilot.

7.14 ELECTRICAL SYSTEM

The AT01-200 is equipped with a 12 V direct current (DC) electrical system that is powered by 2 engine-driven alternators and a battery. When the two **ALT1 / BAT** and **ALT2 / BAT2** split master switches are engaged, the electrical equipment can be operated and controlled by rocker switches located on the lower left section of the instrument panel. All electrical circuits are protected by circuit breakers that are accessibly arranged on the right hand section of the instrument panel.

The two engine ignition lines are independent of the aircraft power supply system.

7.14.1 Power Supply and Battery System

The 12 V lead-acid battery (capacity depending on type installed) is connected to the electrical system of the aircraft via a 50-amp circuit breaker and the **BAT** switch. With the engine operating, the battery is charged by a 40-amp alternator that is equipped with an internal regulator and protected by the 50-amp alternator (**ALT1**) circuit breaker and by a 20-amp Alternator with external regulator and protected by the 20-amp alternator (**ALT2**) circuit breaker. The alternator **ALT1** is air-cooled and driven by a V-belt drive geared down from the propeller shaft. **ALT2** is directly driven by the Propeller shaft.

If one alternator regulator fails, one of the red alternator warning lights **ALT1** or **ALT2** located in the annunciator panel will illuminate.
The charging current of the battery as well as the produced current of the alternators are monitored by the BAT, ALT1 and ALT2 amperemeters in the MVP-50P-AQ which also displays aircraft voltage level. In an emergency, the battery is able to supply all essential electrical equipment for at least half an hour, provided that the battery is correctly maintained and in a good condition.

7.14.2 Ignition System and Starter

The engine is equipped with 2 electronically controlled ignition systems that have two independent ignition circuits. The ignition system is activated by the ignition switch. An internal control unit interrupts the ignition if the propeller speed drops below 100 RPM.

With the ignition key in the R or L position, an ignition circuit is deactivated. In the BOTH position, both ignition circuits are active. When the key is turned to the START position, the starter motor is activated. When the key is released it returns to the BOTH position and the starter is disengaged.

Further information for engine operation and pre-flight checks are contained in the Operator's Manual for all versions of ROTAX® 914 engines.

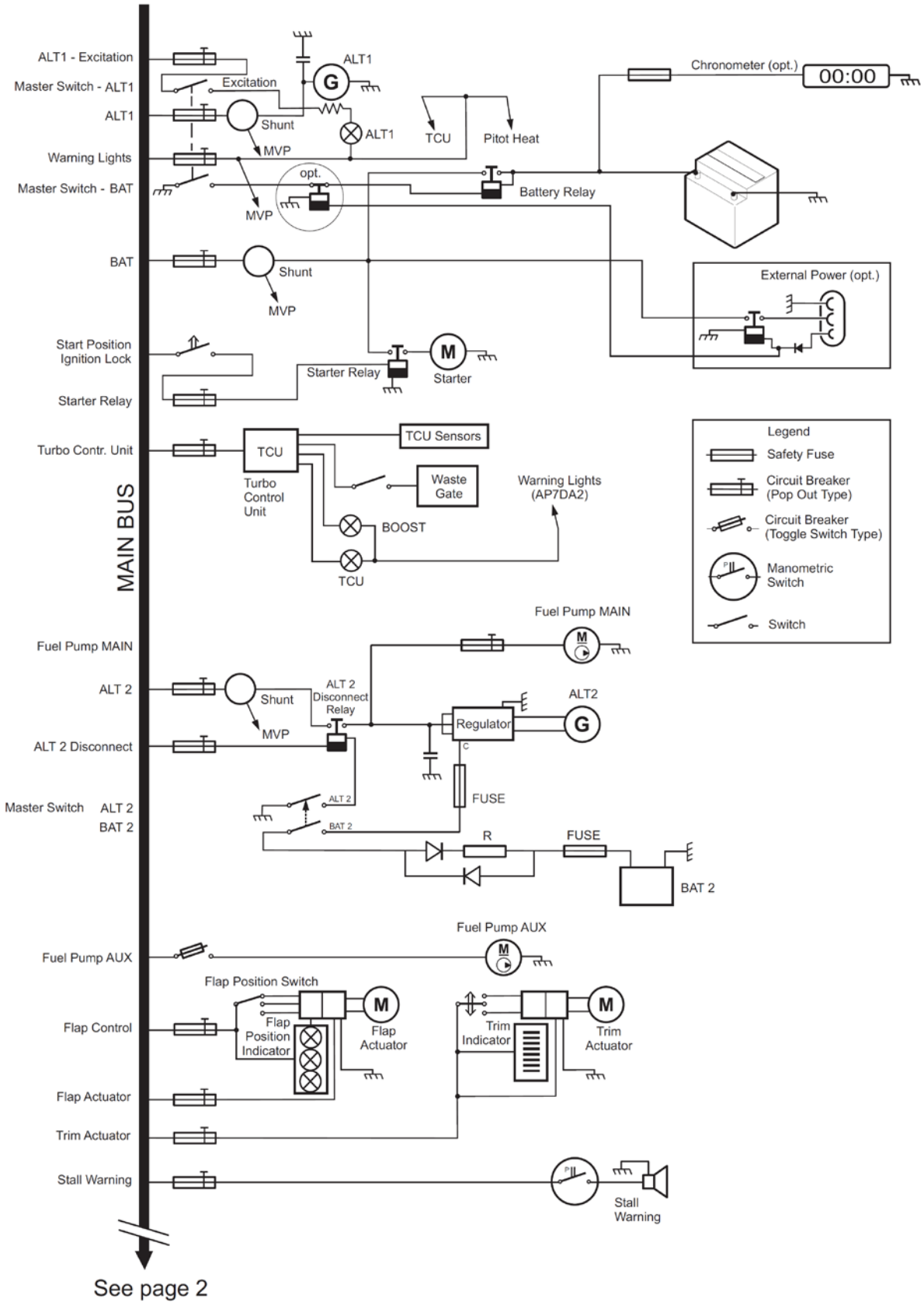


Fig.: Electrical System Schematic 1/2

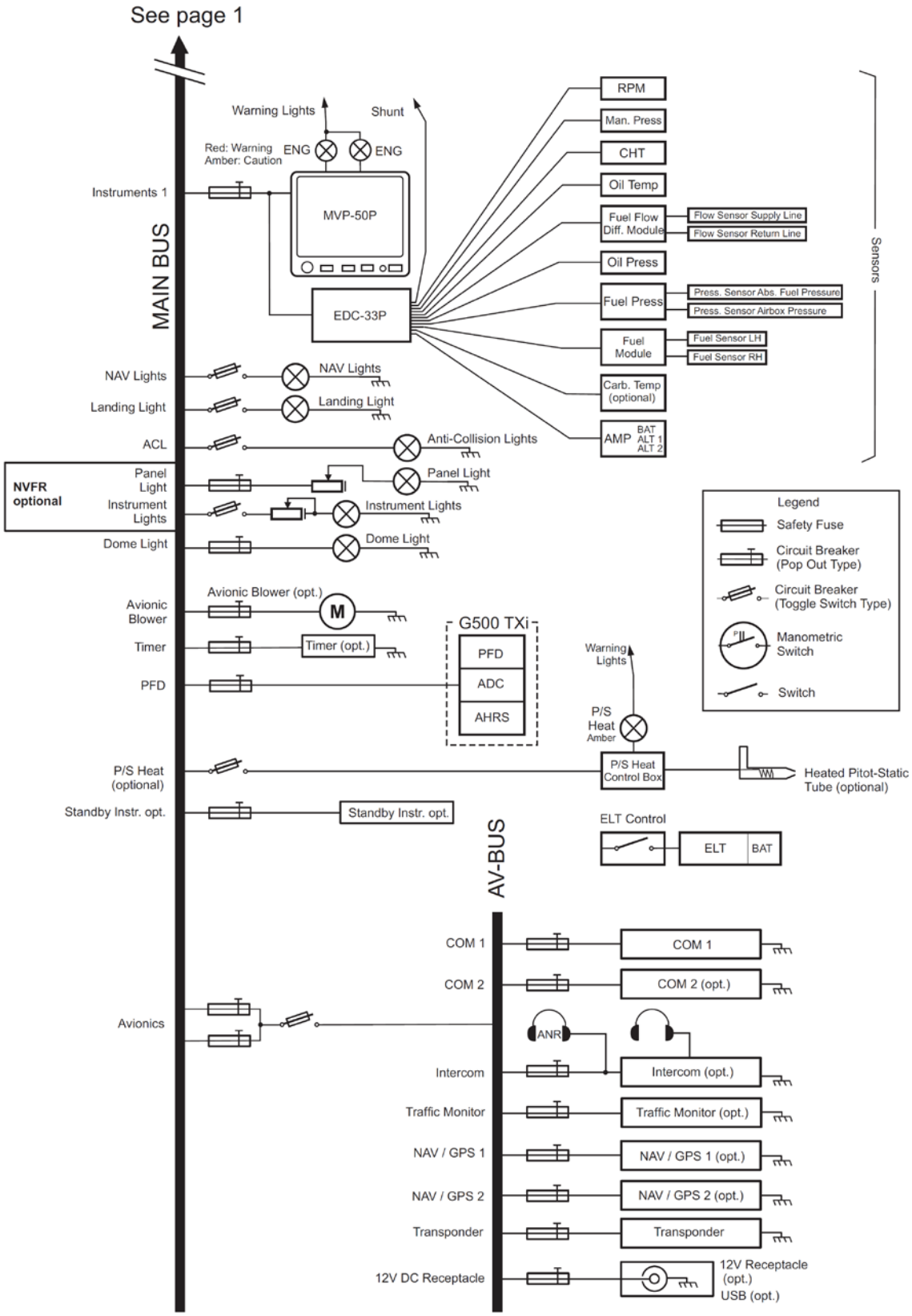


Fig.: Electrical System Schematic 2/2

7.14.3 Electrical Equipment and Circuit Breakers

All electrical equipment can be turned on or off by push-pull type circuit breakers or by rocker switches with built-in circuit breaker function.
COM/NAV-equipment along with other avionic equipment is supplied with electrical power through the **Avionics** switch. Additionally, the avionic equipment is protected by separate circuit breakers.
Equipment regularly used in flight (fuel pump AUX, ACL, etc.) are controlled by their own rocker switches with built-in circuit breaker function.

7.15 GLASS PANEL ENGINE MONITOR MVP-50P-AQ

The MVP-50P-AQ displays the following information:

1	Propeller rpm	10	Voltage
2	Carburetor manifold pressure	11	Battery charge/discharge
3	Oil temperature	12	Charging current ALT1&ALT2
4	Oil pressure	13	Time
5	Cylinder head temperature	14	Up / down timer
6	Fuel level in each tank	15	Flight time
7	Total fuel capacity	16	Engine operating hours
8	Fuel pressure	17	Estimated c.g.
9	Carburetor temperature	18	OAT (optional)

The keys of the MVP-50P-AQ have the following functions:

Select press to move the cursor, select functions and change data or values
Exit press to choose section or return to menu
Screens press to switch between various menus
Menu press to show sub-menus (if available)

Further information is contained in the Glass Panel Engine Monitor MVP-50P-AQ Operating Instructions.

7.15.1 Engine Monitoring Instruments

The following applies to propeller rpm, carburetor manifold pressure, cylinder head temperature, oil temperature, fuel flow, oil pressure, carburetor temperature and fuel tank gauge:

Data or values shown in GREEN mean that they are within normal operating limits. If they are shown in YELLOW, they are in the caution range and if they are displayed in RED, they are either below or above operating limits.

If a yellow or red range is reached, the affected data or value will blink in the appropriate color. In addition, the yellow or red **ENG** warning light in the annunciator panel will illuminate. In the case of a YELLOW warning light, the blinking can be stopped and the alarm confirmed by pressing any switch on the MVP-50P-AQ.

7.15.2 Voltmeter and Amperemeter

The voltmeter shows the system voltage generated by the power sources.

The BAT amperemeter shows the current flowing between the battery and the electrical system of the aircraft. When the battery is being charged, the ampere values are shown in GREEN. When the battery is discharging, the values are shown in YELLOW. This means that when the battery is supplying the electrical system of the aircraft, YELLOW values will be shown. During normal operation, this is a sign of an alternator malfunction. The charging current of each alternator is displayed on the separate amperemeters ALT1 and ALT2.

7.16 ANNUNCIATOR PANEL

The warning lights **ALT1, ALT2, BOOST, TCU, ENG** (YELLOW), **ENG** (RED), **P/S HEAT** (optional) and **TEST** (test switch) are incorporated in the annunciator panel.

7.16.1 Warning Light ALT1

The red alternator warning light (**ALT1**) should not illuminate during normal operation.
The warning light illuminates only if:

- alternator failure (**ALT1** produces no current) occurs

In this case the electrical power is supplied by the battery and ALT2.
The ignition system of the engine is independent of the external alternator and is therefore unaffected.

7.16.2 Warning Light ALT2

The red alternator warning light (**ALT2**) should not illuminate during normal operation.
The warning light illuminates only if:

- alternator failure (**ALT2** produces no current) occurs

In this case the electrical power is supplied by the battery and ALT1.
The ignition system of the engine is independent of the external alternator and is therefore unaffected.

7.16.3 Warning Light TCU

The yellow **TCU** warning light should not illuminate during normal operation.
The YELLOW warning light flashes only if:

- TCU, turbocharger or waste gate malfunction occurs

In case of a TCU malfunction the connection between TCU and servo motor can be interrupted by switching TCU switch OFF (switched down).

7.16.4 Warning Light BOOST

The red **BOOST** warning light should not illuminate during normal operation.
The RED warning light illuminates only if:

- Exceeding the maximum manifold pressure

The RED warning light flashes only if:

- Exceeding the maximum time for take-off power

7.16.5 Warning Light ENG (YELLOW / RED)

The warning light **ENG** (YELLOW) appears as soon as a value in the MVP-50P-AQ reaches the caution range. The warning is confirmed by pressing the EXIT key and the light goes out.

The warning light **ENG** (RED) appears if a value falls below or exceeds the operating limits and cannot be reset.

7.16.6 Warning Light P/S-HEAT

Refer to Section 7.18.1.

7.17 EXTERNAL POWER UNIT (optional)

It is recommended to use an External Power Unit (EPU) for engine start-up at outside air temperatures below –10° C. The EPU receptacle is optional and is mounted on the right fuselage side below the battery. Access is provided by a service door in the lower cowling.

Electrical power for the engine starter and the electrical buses is provided by a three poled plug (MIL standard) protected from reverse polarity by a relay circuit. A second relay disconnects the on-board battery as long as the external power source is connected to the aircraft. This second relay prevents an uncontrolled charging or discharging of the battery during the EPU operation.

WARNING

Before starting the engine with external power, make sure that NO persons or objects are in the vicinity of the propeller disk.

Procedure for starting up the engine with an external power source:

- Plug in and switch on the external power
- **ALT1/BAT** and **ALT2 / BAT2** switch ON
- Start-up engine (in accordance with section 4.5.2 “Engine Start-up”)
- Disconnect external power source.

7.18 PITOT-STATIC SYSTEM

A pitot-static tube is installed on the lower surface of the left wing which, via two separate connections, supplies total pressure and static pressure (from 6 vents distributed on the diameter). Total pressure and static pressure lines travel through the interior of the wing to the wing root where they are connected to water separators. The pressure lines have connections installed at the wing root to simplify disassembly of the wing.

Error in the static system can be neglected for altitude measurement. An airspeed calibration chart is provided in Section 5 of this manual.

NOTE

When the aircraft is parked the pitot static tube should be covered with the supplied pitot tube cover to protect it from dirt and other contamination. The cover is attached to a large “Remove Before Flight” ribbon.

7.18.1 Pitot Heat (optional)

On request, a heated pitot-static tube can be installed. The heater is turned on using the **P/S Heat** switch.

The size and location of the heated pitot static tube are identical to the unheated version. Temperature is controlled automatically.

Function:
The **P/S HEAT** warning light illuminates when:

⇒ **P/S Heat** switch OFF or
⇒ Pitot heat is defective

CAUTION

*This aircraft is **not certified** for flight into icing conditions, even if a heated pitot-static tube is installed.*

*Switch **P/S Heat** OFF when OAT exceeds + 59° F (+15° C).*

7.19 STALL WARNING SYSTEM

The stall warning system causes a loud buzzing sound at least 5 kts before the stall is reached in all flap settings.

As the aircraft approaches a stalled condition, a switch on the wing leading edge is activated due to a change in airflow as the angle-of-attack increases. The switch generates a loud buzzing sound as long as this condition is maintained.

NOTE

The stall warning system (a small metal plate on the leading edge) is delicate and must be handled with care.

7.20 AVIONICS

Depending on the installed optional avionic equipment, a NAV/COM transceiver, a transponder or a multi-functional display may be located in the centre section of the instrument panel. Detailed information on the operation of this equipment and descriptions of their systems are provided in the POH Supplements in Section 9.

The COM transmitter is activated by a push-to-talk button, integrated into each control column. The microphone and headphone jacks are located in the rear section of the centre pedestal between the seats.

Operating instructions for COM/NAV equipment are supplied in Section 9.

SECTION 8

HANDLING, SERVICE & MAINTENANCE

8.1 INTRODUCTION

Section 8 contains factory recommended procedures for correct ground handling as well as information regarding care and servicing of the aircraft. Furthermore, it includes requirements which must be adhered to during inspection as well as during maintenance and when modifications and repairs are carried out.

8.2 AIRCRAFT INSPECTION PERIODS

The required inspection items are listed and described in the Maintenance Manual (Document number MM-AT01-1020-110), the Operation Manual of the ROTAX® type 914 engine series and the Operation and Installation Manual of the propeller.

CAUTION

If the engine is operated extensively on AVGAS 100LL (more than 30 hrs within 100 hrs) the interval between oil changes shall be reduced to 50 hrs.

8.3 MODIFICATIONS AND REPAIRS

Changes to the aircraft are only permissible with the approval of the competent Aviation Authority to ensure that the airworthiness of the aircraft is not adversely affected.

All maintenance and repair work must be accomplished in accordance with the instructions contained in the current issue of the Maintenance Manual.

Prior to major repairs and in situations where the cause of damage to the aircraft is unknown, the aircraft manufacturer or TC holder should be contacted.

8.4 GROUND HANDLING

8.4.1 Towing

8.4.1.1 Moving forwards

The aircraft can be safely moved and controlled by one person on a smooth and level surface with the tow bar attached to the nose wheel.

CAUTION

The tow bar should always be removed from the aircraft when it is parked.

8.4.1.2 Moving backwards

The aircraft should be pushed backwards using the tow bar. If needed, it is possible to push on the propeller near the blade root. It is also possible to push on the leading edge of the wing near the fuselage.

8.4.1.3 Turning the aircraft on the ground

To turn tightly, push down on the fuselage in front of the vertical stabilizer to raise the nose wheel off the ground. Now the aircraft can be pivoted around the main landing gear.

CAUTION

1) Never push, pull or lift on the horizontal stabilizer or the spinner!

2) Never push or lift the control surfaces and flaps!

8.4.2 Parking

For short-term parking, align the aircraft into the wind, retract the flaps, set the parking brakes and chock the main wheels.

When parking the aircraft outside for longer periods or in unforeseeable weather conditions, the aircraft should be tied down as described in section 8.4.3.

Furthermore, cover the pitot-static tube and the stall warning, close the canopy, use a canopy cover and cap the openings in the cowling. To avoid damage to the aircraft and its control surfaces due to gusts or strong winds, secure the control column by pulling it to the control stop and securing it with the waist belt and tightening the straps.

It is, none the less, always recommended to hangar the aircraft.

CAUTION

Temperatures higher than 50°C in the cockpit may damage avionics and instruments. When parked in the sun, use a canopy cover to keep the cockpit cool.

8.4.3 Tie-Down

The aircraft has three tie-down points; two are located on the lower surface of the wings in the outboard section (fitted with M 8 threads) and the third is located on the lower fin. The tie-down points are marked by red circles.

It is recommended to always carry the eye-bolts delivered with the aircraft and suitable tie-down ropes in the aircraft. The tie-down points should be covered with tape while flying to keep them clean.

8.4.4 Jacking

Two conical jacking points are located on the lower surface of the wing, at the wing root ribs. Both of these jacking points are marked with a red ring. The tail of the aircraft can be supported on the skid plate under the vertical stabilizer. A tail stand may be placed under the skid plate and attached to the tail tie-down point with a fastener.

The nose wheel may be lifted off the ground for maintenance or inspection by weighing the tail down. The weight is best attached at the tail tie-down point.

8.5 CLEANING AND CARE

CAUTION

Any contamination on the surface of the aircraft deteriorates flight performance and handling qualities.

The stall warning (metal plate on the wing leading edge) is sensitive to excessive amounts of water. Care should be taken when washing the wings near the stall warning.

8.5.1 Painted Surfaces

To maintain the excellent flight performance and handling qualities of the AQUILA AT01-200 the aircraft must be kept clean and free of damage. Therefore it is recommended to regularly clean the aircraft, paying close attention to the leading edges of the wings and stabilizers.

8.5.1.1 Washing

The aircraft should be washed regularly, using plenty of water, a clean sponge and chamois leather. Severe contamination and dirt, especially insects, should be washed off immediately after every flight, as it is more difficult to remove them when dried.

Only use a mild detergent in cases where the dirt proves very hard to remove. Care should be taken because even a mild detergent will gradually wash away the protective wax coating.

Oil or grease can be removed using a cloth moistened with petroleum. Commercially available aircraft cleaning agents may also be used if they are grease-soluble.

8.5.1.2 Preservation

The aircraft exterior surface is protected with a durable and resistant automotive finish. To retain its protective characteristics, minor damages to the paint should be repaired as soon as practical and the exterior surface of the aircraft waxed one to three times per year using a good **silicone-free automotive hard wax**.

CAUTION

Only silicone-free cleaning and polishing agents may be used.

8.5.2 Canopy

Since acrylic glass can be easily scratched, the same principles apply as for cleaning painted surfaces. The canopy should be cleaned using plenty of water, a soft clean sponge and chamois leather.

Special, commercially available, acrylic glass cleaners can be used to tackle stubborn contamination and dirt. **Never use solvents or thinner to clean the canopy glass**.

Minor scratches may be polished using special acrylic glass polishing pastes that are commercially available. Always follow the manufacturer's instruction to ensure the desired results.

The inside of the canopy may be treated in the same way.

8.5.3 Propeller

Refer to current issue of the Operating and Installation Manual, E-124, from mt-propeller.

8.5.4 Engine

Refer to current issue of the Operator's Manual for the ROTAX® 914 series engine.

8.5.5 Interior Cleaning

Dust and dirt in the interior of the aircraft should be removed using a vacuum cleaner. Prior to cleaning, loose objects and foreign objects should be removed or properly stowed.
The floor carpets may be removed for cleaning. They can be cleaned in the same manner as house-hold carpets or they may be professionally cleaned.
Use a lint-free, moist cloth to clean plastic surfaces such as the instrument panel cover.
The instruments may be cleaned with a dry and soft cloth.

SECTION 9

SUPPLEMENTS

9.1 INTRODUCTION

In this section, all equipment that is optionally installed in your aircraft is described by the POH-Supplements. Each supplement describes a complete modification or a piece of installed equipment. Only the supplements that apply to the configuration of your aircraft must be contained in this section.

Section 9.2 “Index of Supplements” lists all existing approved supplements for the AQUILA AT01. This table may be also used as a directory for this section, adapted to your aircraft.
If modifications requiring an STC have been conducted on your aircraft at a Maintenance Organization other than AQUILA Aviation, it is the owner’s responsibility to ensure that the appropriate supplements are included in this manual and properly recorded in the index of supplements in section 9.2.

9.2 INDEX OF SUPPLEMENTS

Registration:	**S/N: AT01- 200C -**

Supplement No.	Title	Installed
AST-00	Winter Operation	variable
AST-01	Night VFR (AT01-200C)	
AST-02	Increase of permissible Gross Weight to 800kg	
AS-09*	Garmin GTN 650(Xi)	
AS-10	Garmin GMA 350(c)	
AS-11	ELT – Kannad 406	
AS-14	Trig TT22	
AS-17	Garmin GTR 225/225A/225B	
AS-18	Garmin GNC 255A/255B	
AS-19	Garmin GMA 340	
AS-21	Garmin GTX 335 / 345	
AS-22	Garmin G5 Stby AI	
AS-24	Traffic Sensor AT-1	
AS-27	Autopilot (restricted) Garmin GFC500 (AT01-200C)	

NOTE

*For the devices listed above and marked with an * software updates will be released on our website (**www.aquila-aviation.de**) via dedicated Service Information (SI).*