

	POH AQUILA AT01-200A (N/VFR)	POH-Supplement AST-04
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SECTION 9

Pilot's Operating Handbook Supplement AST-04

VFR-DAY and VFR-NIGHT operation

This POH supplement is applicable and must be inserted into Section 9 of the Pilot's Operating Handbook when the AQUILA AT01-200A is equipped for Day- and Night-VFR.

Section 1, 2 and 3 of the basic POH must be completely replaced by the section 1, 2 and 3 of this supplement.

The information in this supplement adds to or replaces information in the basic POH.

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

27.07.2022
Date, Signature Office of Airworthiness

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0.1 RECORD OF REVISIONS

Issue	Reason for Change	Effected Pages	Date of Issue
A.01	Initial Issue (EASA 10081832)	All	27.07.2022

0.2 LIST OF CURRENT PAGES

Page	Issue	Date
1-1 to 1-12	A.01	27.07.2022
2-1 to 2-10	A.01	27.07.2022
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GENERAL

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1.1 INTRODUCTION

This Pilot's Operating Handbook contains all the information the pilot and instructor require for the safe and efficient operation by day and night 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 analogue primary instruments.

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 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.

In accordance with „Certification Review Item A-01“ (15.06.2007) as a Change to the Type Certificate of EASA.A.527, the AQUILA AT01 is certified for flights under N/VFR condition.

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
VFR by night

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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.

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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 m ²)
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 m ²)
Span:	9.84 ft	(3.00 m)

1.4.4 Fuselage and Vertical Stabilizer / Rudder

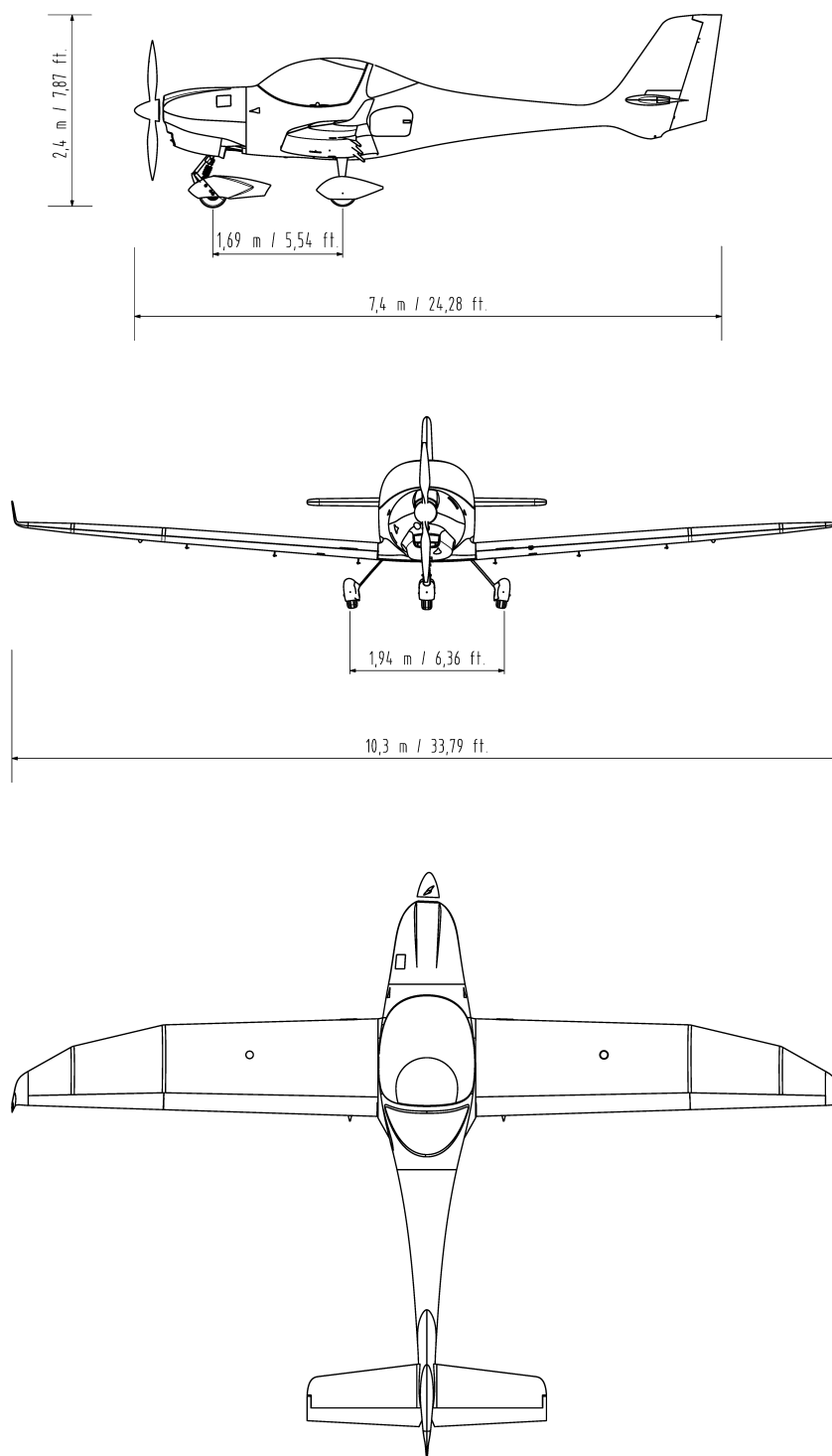
Maximum Fuselage Width	3.94 ft	(1.20 m)
Length	24.28 ft	(7.40 m)
Area (Vertical Tail):	15.61 sq. ft	(1.45 m ²)

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	

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1.5 AQUILA AT01-200 – THREE VIEW DRAWING



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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 in ³	(1211 cm ³)
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

	<u>Left Fuel Tank</u>	<u>Right Fuel Tank</u>
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.

For training operations the use of fuel grades with **RON > 95** is highly recommended to guard against detonation damages to the engine.

(Please refer to the current issue of the operating manual for the ROTAX® 914 engine series and ROTAX® Service Letter SL-914-014)

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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.

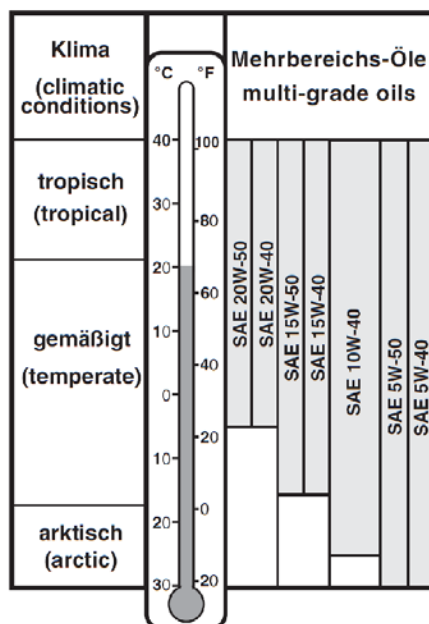


Figure 1-2

CAUTION

Do not use aviation grade oil!

When operating the engine with AVGAS do **not** 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)

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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)

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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.

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1.11.2 Weight and Balance

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

1.11.3 Meteorological Terminology

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

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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

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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
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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

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LIMITATIONS

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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.

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.

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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

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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: 101.5 psi (7.0 bar)
(only for a short time)

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

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2.5 MARKINGS ON POWER PLANT INSTRUMENTS

The following table shows the instrument markings for the engine and their meaning.

Instrument	Red Line (minimum)	Green Arc (normal operating range)	Yellow Arc (caution)	Red Line (maximum)
Tachometer [RPM]	---	0 – 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 or ALT2 [A]	---	---	---	---
optional: EGT [°F] / ([°C])	---	104 - 1742 (40 - 950)	---	1742 (950)
optional: Fuel Flow [Gal/h] / ([l / h])	---	0 - 11.9 (0 - 45)	< 11.9 (< 45)	---

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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 $\leq 60^\circ$
- d) Chandelle: Entry Speed 120 kts
- e) Lazy Eight: Entry Speed 110 kts

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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.

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2.11 KINDS OF OPERATION LIMITS / MINIMUM EQUIPMENT

Certified for: visual flights by Day and Night

Table 1	For VFR by Day and Night*	
Flight and navigational instruments	• Altimeter (0 – 20,000 ft) • Airspeed Indicator (0 – 200 kts) • Magnetic Compass • Working timepiece with a seconds hand ** • VHF Transceiver *** • VSI (± 2000 ft/min)	• Attitude Indicator • Slip Indicator • Directional Gyro • Outside Air Temperature (OAT) Indicator • VOR Receiver* • Transponder (XPDR)
Power Plant Instruments	• Fuel gauge • Oil Temperature Indicator • Oil Pressure Indicator • Cylinder Head Temperature Indicator • Manifold Pressure Gauge • Tachometer • Voltmeter • Ammeter BAT • Ammeter ALT 1 / ALT 2 (with toggle switch)	• Warning FUEL PRESSURE • Warning Light ALT 1 • Warning Light ALT 2 • Warning VOLTAGE • Warning Light TCU • Warning Light BOOST • BAT2 • TCU
Lighting	• Position lights • Anti Collision Lights • Landing Lights • Instrument lighting • Cabin lighting • Flashlight	
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.

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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

	<u>Left Fuel Tank</u>	<u>Right Fuel Tank</u>
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".

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 over FL120 an appropriate oxygen supply for all persons aboard is recommended. Furthermore national regulations may be considered if applicable.

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2.15 PLACARDS

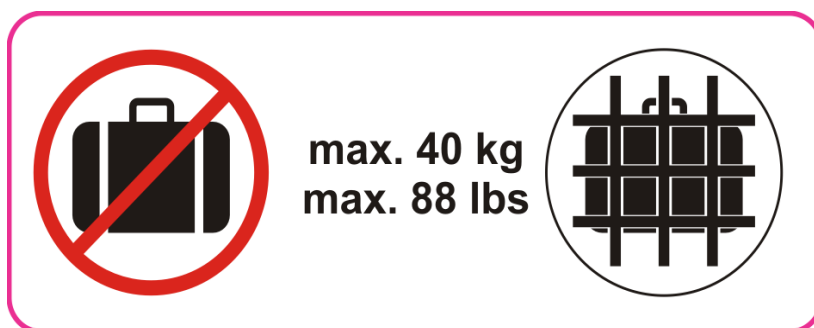
- 1) On the instrument panel, in the lower middle section of the panel:

This aeroplane is classified as VLA (Very Light Aeroplane) for Day and Night VFR in non-icing conditions. All aerobatic maneuvers including intentional spinning are prohibited. See Flight Manual for other limitations.

- 2) On the instrument panel below the Airspeed Indicator:

Maneuvering Speed
VA = 112 kts

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



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

CAUTION
Electric Main Fuel Pump
BAT2 ON for Flight
OFF for Parking

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---	---------------------------------	--

SECTION 3

EMERGENCY PROCEDURES

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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

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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 HIGH RPM 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!*

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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 |
- If fuel pressure remains below the green range:
- | | |
|--------------------------|--|
| 5. Precautionary landing | PERFORM (see 3.4.1), Engine may fail suddenly! |
|--------------------------|--|

WARNING

In case of MAIN fuel pump failure the AUX fuel pump has to be switched on within 3 seconds to prevent engine failure at increased boost pressure!

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NOTE

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

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! |

WARNING

In case of Turbocharger failure heavy oil loss due to bearing damage has to be expected.

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 fixed in open position, an engine power of 66kW (88,5 BHP) is remaining.

(see section 5 for resulting take-off distance and remaining climb rate for balked landing)

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E) SUDDEN INCREASE OF MANIFOLD PRESSURE & PROPELLER RPMI. 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.

If the situation does not improve:

WARNING

When the gas Bowden cable is broken, the spring-loaded throttle valve is opening in the carburetor 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 altitude.

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F) OSCILLATION OF MANIFOLD PRESSURE & PROPELLER RPMI. 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)

When there is no stabilisation:

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 POWERI. **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 check, 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 logbook together with information regarding type, duration and date of the exceedance! Exceedances of less than 3 seconds will not be indicated.

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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 | HIGH RPM 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 | HIGH RPM 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) |

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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 | HIGH RPM position |
| | Carburetor Heat | PULL (ON) |
| | Fuel Pump AUX switch | ON |
| | Flaps | LDG |
| | Airspeed | 60 KIAS |

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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
3. Ignition switch
4. Seat belts and harnesses
5. COM (ATC)
6. **ALT1 / BAT** switch
7. **ALT2 / BAT2** switch
8. ELT

WARNING

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

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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. Flashlight ON
7. Fire extinguisher (if installed) Use only if smoke persists
8. Land immediately Refer to Section 3.4 Forced Landings

After landing and aircraft comes to a halt:

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

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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, stall warning and landing light!*

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 HIGH RPM 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.

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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.

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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. Flight attitude STABILIZE
2. Flashlight ON
3. **ALT1 / BAT** switch CHECK if ON
4. **ALT2 / BAT2** switch CHECK if ON
5. **BAT** circuit breaker (see 3.1.1) RESET if tripped
6. **ALT1** circuit breaker (see 3.1.1) RESET if tripped
7. **ALT2** circuit breaker (see 3.1.1) RESET if tripped

If power cannot be restored, it is recommended to use the flashlight for the instruments and:

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

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WARNING

In case of a complete electrical system failure the Main fuel pump is automatically separated from the remaining on-board 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

Failure of all electrical instruments (PFD, Engine Monitoring), 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.

Possibilities for stabilizing the attitude at N/VFR:

- ⇒ Visual external references (e.g. horizon, lights on ground)
- ⇒ Standby Attitude Indicator with its own battery (e.g. GARMIN G5 AI, if installed)
- ⇒

3.10.2 Battery discharges (BAT)

Ammeter values **ALT1** and/or **ALT2** too low and thus **BAT** value YELLOW (with or without **ALT1** and/or **ALT2** warning light is illuminated)

If the ammeter for BAT is in the YELLOW arc, 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 |

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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

Ammeter value **ALT1** too low 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** warning light is still illuminated or ammeter value **ALT 1** still too low:
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)

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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 is not possible anymore.

CAUTION

Due to its design, the warning light ALT 1 does not illuminate when the alternator is switched off, there is a broken cable or the circuit breaker has tripped!

WARNING

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

3.10.4 Alternator 2 (ALT2) failure

Ammeter value **ALT2** too low 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** warning light is still illuminated or ammeter value **ALT 2** still too low:

- | | |
|---|---------------------|
| 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.

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CAUTION

Due to its design, the warning light ALT 2 does not illuminate when the alternator is switched off, there is a broken cable or the circuit breaker has tripped!

NOTE

The remaining Alternator 1 (ALT1) is delivering approx. 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 is 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) On the ground (voltmeter values YELLOW or RED)**

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

B) In flight (voltmeter values YELLOW or RED)

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) During approach and landing (voltmeter value YELLOW or RED)

1. After landing Proceed acc. 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.

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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.

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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.

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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.

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