

Section 0

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/FAA 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.

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9	A.03		9-1 to 9-2	08.04.2014

^{* -} partially approved

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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 editorial changes, in accordance with Part 21A.263(c)(4) by the Design Organization of AQUILA Aviation 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 by AQUILA / EASA Date / Signature
A.01	First Issue	All	10045115	29.05.2013
A.02	Editorial changes, Supplements 8,33 kHz FAA certification	All		15.10.2013
A.03	AS-00 "Winter Operation"	0, 9		08.04.2014
A.04	Editorial changes	0, 4		19.10.2015

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Revision A.04 of AFM ref. FM-AT01-1010-103 is approved under the authority of DOA ref. EASA.21J.025.

Date, Signature Office of Airworthiness

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PURCHASE OF TECHNICAL PUBLICATIONS

To guarantee safe operation and correct maintenance of the AQUILA AT01-100 aircraft, all manuals and technical publications must be kept in the current effective status.

All manuals and technical publications relating to the aircraft AQUILA AT01-100 are available from the companies listed below:

(a) AQUILA AT01-100C related Manuals and Publications

AQUILA Aviation 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 912 S related Manuals and Publications

Contact the ROTAX $_{\circledR}$ authorized distributor for ROTAX $_{\circledR}$ Aircraft Engines of the applicable distribution area.

For contact details of the local authorized distributor for ROTAX Aircraft Engines, please refer to chapter 13 of the ROTAX® Operator's Manual for 912 S 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*

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SECTION 4

NORMAL PROCEDURES

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Section 4 NORMAL PROCEDURES

4.1 INTRODUCTION

This section provides normal operating procedures and checklists for the aircraft as well as recommended airspeeds under D/VFR and N/VFR.

Additional information is provided in the current issues of the Operators Manual for ROTAX® engine Type 912 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.

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Section 4 NORMAL PROCEDURES

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		

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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.

Tank drain (left / right wing) drain and visually inspect for contamination
 Electrical fuel pump drain drain and visually inspect for contamination

A) CABIN

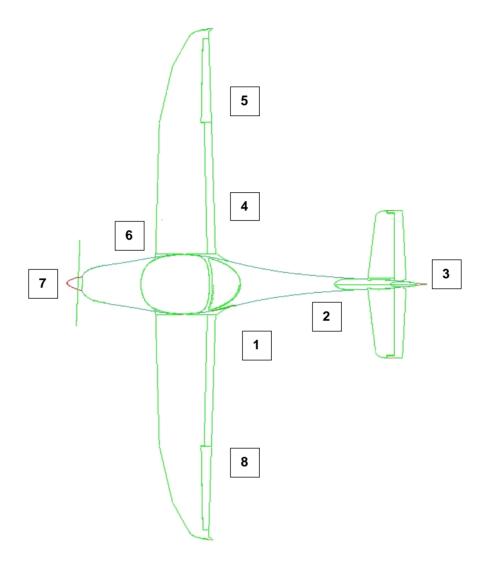
, ,,	57.5.I.T	
1.	Aircraft Documentation	CHECK on board
2.	Ignition key	REMOVED
3.	ALT1/ BAT switch	ON
4.	Annunciator (warning lights)	Press TEST; check all ON
5.	ALT1 switch	OFF
6.	Engine instruments	CHECK
7.	Fuel quantity	CHECK
8.	Nav Lights switch	ON, CHECK, OFF
10.	Landing Light switch	ON, CHECK,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

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B) EXTERIOR CHECK, Visual Inspection



CAUTION

In this manual, <u>visual inspection</u> 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.

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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 shellb) Skid platec) Tail tie-downVisual inspectionDISCONNECT

3. Empennage

a) Elevatorb) Horizontal stabilizerc) RudderVisual inspectionVisual 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

Right wing

a) Entire wing surface (upper and under side) Visual inspection

b) Fuel vent CHECK if clear c) Flap Visual inspection

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

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6. Nose section, cowling

WARNING

Before cranking the propeller: Ignition and **ALT1/BAT** 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 <u>direction of</u>

<u>engine rotation</u> 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 I).

CAUTION

The oil specification in Section 1.9.1 must be adhered to!

b) Check coolant level: Verify coolant level in the expansion 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 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

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7. Nose landing gear

a) Nose gear strutb) Wheel fairingVisual 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

8. <u>Left wing</u>

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
h) Aileron and inspection window
i) Cooler cover (if installed)
Visual inspection
Visual inspection

j) Fuel level CHECK with dipstick and verify

with the indicated fuel level on the

fuel gauge

k) Fuel tank filler cap CHECK if closed

I) Flap Visual inspection

m) Wing tie-down DISCONNECT

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4.4 PRE-FLIGHT INSPECTION (Walk Around)

1. Daily Inspection Confirm has been carried out.

2. Tow bar Remove

3. Fuel level CHECK with dipstick and verify with the

indicated fuel level on the fuel gauge

WARNING

Before cranking the propeller: Ignition and **ALT1/BAT** 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 <u>direction</u> 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 I).

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!

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6. Tie-down straps remove

7. Baggage door CHECK if closed and locked

8. Pitot cover remove9. 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,

then set IDLE

15. Propeller Control Lever CHECK for free movement,

then set in START Position

16. Weight and balance within limits?

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4.5 CHECKLISTS FOR NORMAL PROCEDURES

4.5.1 Before Engine Start-up

Daily and Pre-Flight Inspection
 Passenger Briefing
 Seats
 Seat Belts and Harnesses
 COMPLETED ADJUSTED
 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 PRESS10. Throttle IDLE

11. Propeller Control Lever START 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 given on the Garmin G500 display.

16. ALT 1 warning light
17. ALT 2 warning light
18. FUEL warning light
19. P/S-HEAT warning light (if installed)
ILLUMINATES
ILLUMINATES

20. **ACL** switch ON

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4.5.2 Engine Start-up

1. Fuel Pump switch ON

2. Fuel Pressure within GREEN range

3. Throttle - Cold Engine IDLE

- Hot Engine 0.8 in. (2 cm) OPENED

4. Choke - Cold Engine PULL, and keep pulled

- Hot Engine RELEASE (automatic reset)

5. Brakes PRESS both pedals

6. Propeller area CLEAR

7. Ignition switch START, then BOTH

8. Oil Pressure in GREEN range within 10

seconds

CAUTION

If the oil pressure does not reach at least 21 psi (1.5 bar) within 10 seconds after engine start, 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.

9.	ALT 1 warning light	OFF
10.	ALT 2 warning light	OFF
11.	Fuel Pump switch	OFF

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4.5.3 Before Taxiing

CAUTION

Warm up the engine for approx. 2 min at 800 RPM and then at 1000 RPM until the Oil Temperature reaches a temperature of at least 122°F (50°C)

Avionics switch
 Avionics and flight instruments
 SET

The GARMIN G500 has an integrated sensor that automatically adjusts the brightness of the display.

It is also possible to adjust the brightness of the display manually. Using the large knob of the MFD change to the AUX page. Use the small knob to adjust the brightness. When finished press the ENT button to save the changes.

3. Annunciator panel PRESS **TEST** and check that the

ALT1, ALT2, ENG (YELLOW) and

ENG (RED) warning lights

illuminate

4. Engine instruments CHECK

NOTE

Oil can be brought up to temperature during taxiing.

5.	Voltmeter	CHECK if GREEN
6.	Amperemeter	CHECK if GREEN
7.	Trim switch and indication	functional CHECK
8.	Flap switch and indication	functional CHECK, afterwards UP
9.	P/S Heat switch (if installed)	ON, P/S HEAT warning light goes off
10.	P/S Heat switch (if installed)	OFF, P/S HEAT warning light goes on

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ALTERNATORTEST at 1000 RPM:

CAUTION

There are two independently protected alternators installed, which are constantly in use during D- and N/VFR. Especially for night operation the proper function of <u>both</u> alternators is important.

9. Nav Lights switch
10. Landing Light switch
11. Instrument Lights switch
ON

⇒ ammeter indication with GREEN (positiv) values (charge)

12. **ALT 1** switch OFF

⇒ ammeter indication with YELLOW (negative) values (discharge)

13. ALT 2 circuit breaker PULL

 \Rightarrow increase of discharge (ALT 2 o.k.)

 \Rightarrow no change (ALT 2 damaged)

14. ALT 2 circuit breaker15. ALT 1 switchPUSHON

⇒ ammeter indication bounce up to high positive GREEN values (strong charge) and

decline thereafter (ALT 1 o.k)

 \Rightarrow no change (ALT 1 damaged)

16. all switches AS REQUIRED

4.5.4 Taxiing

Parking Brake
 Brakes
 RELEASE
 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.

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

Brakes APPLY
 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)

(RPM drop: 20 to 50 RPM)

10. Carburetor temperature indicator (if installed) CHECK

11. Carburetor heat PUSH (OFF)

12. Propeller control lever SWITCH 3 times between START

and CRUISE 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

13. Throttle IDLE14. Fuel Pump switch ON

15. Flap switch T/O

16. Trim switch white marking17. Circuit breakers CHECK all set

18. Control column19. Lap beltCHECK for free movementFASTENED and TIGHTENED

20. Canopy CLOSED and LOCKED

21. Parking brake RELEASE

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4.5.6 Take-off (up to 50 ft)

1. Throttle WIDE OPEN

Tachometer
 Elevator, control column
 Elevator, control column
 CHECK if within 2300 - 2385 RPM
 NEUTRAL during initial ground roll

4. Rudder pedals Maintain direction

5. Rotatespeed6. Climb speed50 KIAS57 KIAS

CAUTION

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

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 WIDE OPEN

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 illuminates because the maximum continuous rpm is exceeded. This is acceptable for max. 5 minutes.

4. Flap switch UP
5. Climb speed 65 KIAS
6. Fuel Pump switch OFF
7. Landing Light switch OFF

8. Trim switch SET as required

NOTE

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

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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-912-016)

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 (if installed) MONITOR

CAUTION

During flights above a pressure altitude of 6000 ft, the fuel pressure warning light must be monitored closely. If the fuel pressure falls below the GREEN range the **Fuel Pump** must be switched ON to prevent fuel vapor formation in the fuel system.

4.5.9 Descent

Throttle
 Propeller control lever
 First decrease AS REQUIRED
 Second SET above 2000 RPM

3. Carburetor heat AS REQUIRED

4. Carburetor temperature indicator (if installed) 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

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Section 4 NORMAL PROCEDURES

4.5.10 Landing

1. Seat belts and harnesses CHECK SECURE

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

CAUTION

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

AC DECLUDED

4.5.12 After Landing

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١.	rnrottie	AS REQUIRED
2.	Flaps switch	UP
3.	P/S Heat switch (if installed)	OFF

4. Carburetor Heat PUSH (OFF)

5. Fuel Pump switch
6. Transponder
7. Landing light switch
OFF

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Section 4 NORMAL PROCEDURES

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
6. Ignition Switch
7. Electrical equipment
8. Instrument Lights switch
9. ALT1 / BAT switch

NOTE

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

10. 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 <u>must</u> 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

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Section 4 NORMAL PROCEDURES

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 9

Pilot's Operating Handbook Supplement AS-06 VFR-DAY and VFR-NIGHT operation Garmin G500, MVP-50P-AQ

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

Section 1, 2, 3, 4 and 7 of the basic POH must be <u>completely</u> replaced by the section 1, 2, 3, 4 und 7 of this supplement.

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

Revision A.03 of AFM Supplement AS-06 ref. FM-AT01-1010-245 is approved under the authority of DOA ref. EASA.21J.025.

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	All	28.05.2013
A.02	Editorial Changes	All	15.10.2013
A.03	Amendment to Normal Procedures	4-1 to 4-20	19.10.2015

0.2 LIST OF CURRENT PAGES

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3-1 to 3-22	A.02	15.10.2013	
4-1 to 4-20	A.03	19.10.2015	
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