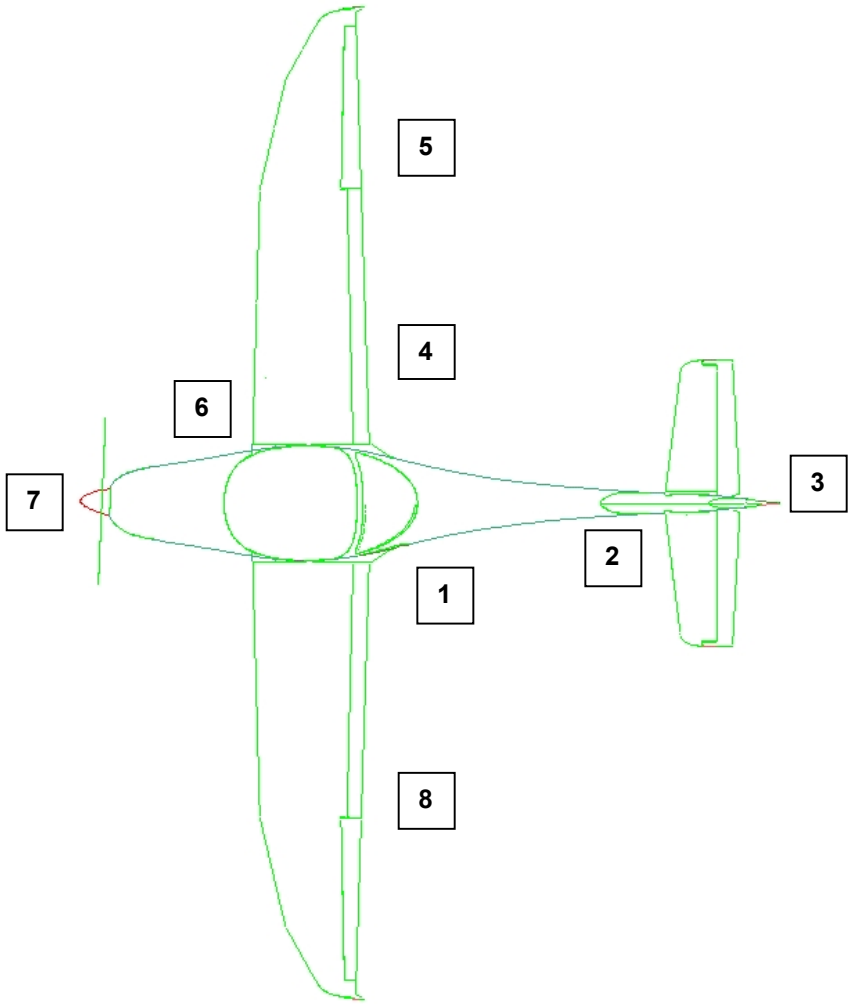
4.4 PRE-FLIGHT INSPECTION

4.4.1 Daily Pre-flight Check

A) CABIN

1.	Papers	CHECK on board
2.	Ignition key	REMOVED
3.	BAT Switch	ON
4.	Warning lights (alternator, fuel pressure)	ALIGHT
5.	Engine instruments	CHECK
6.	Fuel quantity	CHECK
7.	External lights	CHECK for proper operation
8.	BAT switch	OFF
9.	Foreign objects	CHECK and REMOVE
10.	ELT	CHECK
11.	Baggage	STOWED and SECURED
12.	Canopy	CHECK for damage and cleanliness

B) EXTERIOR CHECK, Visual Inspection



CAUTION

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

1. Left main landing gear

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

c) Tire pressure	CHECK
d) Tire slip marking	CHECK
e) Tire, wheel, brake	Visual inspection
f) Brake chocks	REMOVE

2. Tail boom

a) Tail boom 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 screw locking.
d) Vertical stabilizer	Visual inspection

4. Right main landing gear

a) Landing gear strut	Visual inspection
b) Wheel Fairing	Visual inspection
c) Tire pressure	CHECK
d) Tire slip marking	CHECK
e) Tire, wheel, brake	Visual inspection
f) Brake chocks	REMOVE

5. Right wing

a) Entire wing surface	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 and verify with the indicated fuel level in the cockpit
g) Fuel tank filler cap	CHECK if closed
h) Fuel tank drain valve	DRAIN, check for water and deposits
i) Wing tie-down	DISCONNECT

6. Nose section, cowling

WARNING

Before cranking the propeller: Switch OFF the battery and ignition circuits, activate parking brake.

WARNING

Risk of burning and scalding
Carry out pre-flight checks on the cold engine only !

a) Check oil level

Prior to the oil check, turn the propeller several times in the direction of engine rotation to pump oil from the engine back into the oil tank.

This process is completed when air returns to the oil tank and is indicated by a rustling from the open oil tank. Now check oil level which should be between the min. and max. markings of the oil but must never be below the min. marking. Volume difference between the min. and max. markings is 0.45 liter.

NOTE

The oil specification in paragraph 1.9.1 must be observed !

b) Check coolant level

Verify coolant level in the **expansion tank**, replenish as required.
The expansion tank should be at least 2/3 full.

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

NOTE

The coolant specification in paragraph 1.9.2 must be observed !

c) Air intakes (4 NACA intakes)	CHECK if clear
d) Radiator / oil cooler intake	CHECK if free from obstructions
e) Cowling	Visual Inspection CHECK Camloc fasteners
f) Propeller	Visual inspection
g) Propeller blades	CHECK for cracks and other damage
h) Spinner dome	Visual inspection
i) Electr. fuel pump drain valve	DRAIN, check for water and deposits

7. Nose landing gear

a) Nose gear strut	Visual inspection
b) Wheel fairing	Visual inspection
c) Tire pressure	CHECK
d) Tire slip marking	CHECK
e) Tire, wheel	Visual inspection
f) Shock absorber unit	Visual inspection
g) Brake chocks and tow bar	REMOVE

8. Left wing

a) Entire wing surface	Visual inspection
b) Fuel vent	CHECK if clear
c) Battery	ON
d) Stall warning system	Carefully move the small plate on the transmitter upwards until the stall warning is audible
e) Battery	OFF
f) Pitot / static head	REMOVE cover, CHECK if all holes are clear
g) Wing tip, NAV-lights and ACL	Visual inspection
h) Aileron and inspection plates	Visual inspection
i) Fuel level	CHECK with dipstick and verify with the indicated fuel level in the cockpit
j) Fuel tank drain valve	DRAIN, check for water and deposits
k) Fuel tank filler cap	CHECK if closed
l) Flap	Visual inspection
m) Wing tie-down	DISCONNECT

4.4.2 Check Before Every Flight

NOTE

The fuel level dipstick for checking the fuel tank level is stored on the inner side of the baggage compartment door.

1.	Daily pre-flight inspection	Completed
2.	Tow bar	CHECK if removed.
3.	Fuel quantity	CHECK with fuel level dipstick and verify with indicated fuel level in the cockpit.

NOTE

ONLY for aircrafts equipped with capacitive fuel probes and Westach Dual Fuel Gauge 2DA4V (see equipment list):

If AVGAS 100LL or mixtures of different grades of fuel are filled into the tanks, a lower amount of fuel than is actually in the tank will be indicated.
This situation must be kept in mind during the flight.

WARNING

Before cranking the propeller: Switch OFF the battery and ignition circuits, activate parking brake.

WARNING

Risk of burning and scalding
Carry out pre-flight checks on the cold engine only !

4. Check oil level	Prior to the oil check, turn the propeller several times in the direction of engine rotation to pump oil from the engine back into the oil tank. This process is completed when air returns to the oil tank and is indicated by a rustling from the open oil tank. Now check oil level which should be between the min. and max. markings of the oil but must never be below the min. marking. Volume difference between the min. and max. markings is 0.45 liter.

NOTE

The oil specification in paragraph 1.9.1 has to be observed !

5. Check coolant level

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

NOTE

The coolant specification in paragraph 1.9.2 has to be observed !

6.	Tie-down straps	removed.
7.	Baggage door	CHECK if closed
8.	Pitot cover	CHECK if removed.
9.	Flight controls	CHECK for proper operation
10.	Carburetor heat	CHECK for free movement, then set to the OFF-Position
11.	Cabin heat	CHECK for free movement, then set to the OFF-Position
12.	Choke	CHECK for free movement, CHECK if self-resetting (move throttle)
13.	Throttle	CHECK for free movement, then set to the IDLE-Position
14.	Propeller control lever	CHECK for free movement, then set to the HIGH-RPM position
15.	Trim system (indication and function)	CHECK, set full “nose-down” and “nose-up” positions
16.	Flaps (pos. indication and function)	CHECK, extend fully and then retract

4.5 CHECKLISTS FOR NORMAL PROCEDURES

4.5.1 Before Engine Start-up

1.	Daily pre-flight check	COMPLETED
2.	Passenger briefing	COMPLETED
3.	Seats	ADJUST as required
4.	Seat belts and harnesses	FASTENED and TIGHTENED
5.	Canopy	CLOSED and LOCKED CHECK if vibrations cause the canopy lock to release
6.	Parking brake	SET
7.	Control stick	CHECK for free movement and correct control surface deflections
8.	Fuel selector valve	SWITCH to fullest tank
9.	Carburetor heat	OFF
10.	Throttle	IDLE
11.	Propeller control lever	HIGH-RPM position
12:	AVIONICS switch	OFF
13.	ALT/BAT switch	ON
14.	Generator warning light	ILLUMINATES
15.	Fuel pressure warning light	ILLUMINATES
16.	Anti-collision light	ON
17.	Circuit breakers	CHECK if all pushed in

4.5.2 Engine Start-up

1.	Electrical fuel pump		ON
2.	Fuel pressure warning light		Does not illuminate
3.	Throttle	- cold engine	IDLE
		- hot engine	2 cm OPENED
4.	Choke	- cold engine	PULL
		- hot engine	OFF
5.	Brakes		SET
6.	Propeller area		CHECK if clear
7.	Ignition switch		START
8.	Oil pressure gauge		CHECK, oil pressure should build up into the green arc range within 10 seconds.

CAUTION

If the oil pressure does not reach at least 1.5 bar within 10 seconds after engine start-up, immediately shut down the engine !

NOTE

The oil pressure may rise into the YELLOW ARC RANGE as long as the oil temperature is below the normal operating temperature.

NOTE

If the engine does not start within 10 seconds, disengage the starter and try again after a cooling down phase of at least 2 minutes. DO NOT continuously operate the starter motor over a period of more than 10 seconds.

NOTE

For a successful engine start-up, the propeller speed must reach at least 100 RPM. This should be considered when having engine start-up problems during cold weather operations or with a partially discharged battery.

9.	Alternator warning light	OFF
10.	NAV -lights	AS REQUIRED
11.	Electrical fuel pump	OFF

4.5.3 Before Taxiing

1.	AVIONICS switch	ON
2.	Avionics and flight instruments	SET UP
3.	Engine instruments	CHECK
4.	Voltmeter	CHECK if needle is within the green range

CAUTION

Warm up the engine for approx. 2 min at 820 RPM and then at 1030 RPM until the oil temperature reaches 50°C (latter can be done during taxiing).

4.5.4 Taxiing

1.	Parking brake	RELEASE
2.	Nose wheel steering	CHECK function and for free movement
3.	Brakes	CHECK
4.	Flight instruments and avionics	CHECK
5.	Compass reading/gyro instruments	CHECK

CAUTION

Do not operate the engine at high RPM when taxiing to prevent stone chipping or other damage by foreign objects or splashed water.

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

1.	Brakes	APPLY
2.	Parking brake	SET
3.	Fuel selector valve	SWITCH to fullest tank
4.	Fuel pressure warning light	OFF (otherwise abort flight)
5.	Throttle	SET 1700 RPM.
6.	Propeller control lever	SWITCH 3 times b/w HIGH- and LOW-RPM positions (end stops) CHECK RPM drop: 200±50 RPM. Thereafter: SET HIGH-RPM pos.
7.	Throttle	SET 1700 RPM.
8.	Ignition switch	Magneto check: SWITCH through: "L-BOTH-R-BOTH" – positions. CHECK RPM-drop (max. RPM-drop: 120; max. difference L/R: 50, min. difference: the drop must be noticeable). Thereafter: SWITCH to BOTH.
9.	Carburetor heat	ON RPM-drop: 20 to 50 RPM
10.	Carburetor heat	OFF
11.	Throttle	IDLE
12.	Electrical fuel pump	ON
13.	Flaps	TAKE-OFF position
14.	Trim	TAKE-OFF position
15.	Engine instruments	CHECK if within the green range
16.	Circuit breakers	CHECK if all pushed in
17.	Control stick	CHECK for free movement
18.	Seat belts and harnesses	FASTENED and TIGHTENED
19.	Canopy	CLOSED and LOCKED CHECK if vibrations cause the canopy lock to release
20.	Parking brake	RELEASE

4.5.6 Take-off

1.	Throttle	FULL OPEN
2.	Tachometer	CHECK if within 2200-2260 RPM
3.	Elevator control	NEUTRAL at initial ground roll
4.	Rudder pedals	HOLD direction
5.	Lift nose wheel	50 KIAS
6.	Climb speed	65 KIAS

CAUTION

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

7.	Lift nose wheel	50 KIAS
8.	Climb speed	57 KIAS

4.5.7 Climb

1.	Propeller control lever	SET 2260 RPM
2.	Throttle	OPEN
3.	Engine instruments	CHECK
4.	Flaps	CRUISE position
5.	Climb	at 65 KIAS
6.	Electrical fuel pump	OFF
7.	Trim	SET as required

NOTE

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

4.5.8 Cruise

1.	Throttle	AS REQUIRED (Ref. to Section 5)
2.	Propeller control lever	SET between 1650 and 2260 RPM

NOTE

For favorable manifold pressure/propeller speed combinations: Refer to Section 5.

3.	Flaps	CRUISE position
4.	Trim	AS REQUIRED
5.	Engine instruments	CHECK

CAUTION

In flights above pressure altitudes of 6000 ft, the fuel pressure warning light must be monitored. If the fuel pressure warning light goes on, the electrical fuel pump must be switched ON to prevent fuel vapor formation in the fuel system.

4.5.9 Descent

1.	Throttle	AS REQUIRED
2.	Propeller control lever	SET between 1800 and 2200 RPM
3.	Carburetor heat	AS REQUIRED

CAUTION

For a rapid descent proceed as follows:

Propeller control lever	SET 2260 RPM
Throttle	IDLE
Carburetor heat	ON
Flaps	CRUISE position
Airspeed	130 KIAS
Oil/cylinder head temperature	CHECK

4.5.10 Landing

1.	Seat belts and harnesses	CHECK if TIGHT
2.	Electrical fuel pump	ON
3.	Carburetor heat	ON
4.	Throttle	AS REQUIRED
5	Airspeed	90 KIAS
6.	Flaps	TAKE-OFF or LANDING position

7.	Trim	AS REQUIRED
8.	Flaps	LANDING position
9.	Approach speed	60 KIAS
10.	Propeller control lever	HIGH-RPM position
11.	Landing light	ON (as required)

CAUTION

The approach speed has to be adapted to the actual environmental conditions. With strong head or crosswinds, in turbulent air or in wind shear, it may be desirable to approach at higher than normal speeds.

4.5.11 Balked Landing

1.	Throttle	OPEN
2.	Propeller control lever	HIGH-RPM position
3.	Carburetor heat	OFF
4.	Flaps	TAKE-OFF position
5	Airspeed	65 KIAS

4.5.12 After Landing

1.	Throttle	IDLE
2.	Flaps	CRUISE position
3.	Carburetor heat	OFF
4.	Electrical fuel pump	OFF
5.	Transponder	OFF
6.	Landing light	OFF

4.5.13 Engine Shut-down

1.	Throttle	IDLE
2.	Parking brake	SET
3.	Flaps	LANDING position
4.	ELT	CHECK on frequency 121.5 MHz
5.	AVIONICS switch	OFF
6.	Ignition switch	OFF
7.	Electrical equipment	OFF
8.	Instrument light	OFF
9.	BAT switch	OFF
10.	Brake chocks and tie-downs	AS REQUIRED