4. NORMAL PROCEDURES

SECTION 4

4. NORMAL PROCEDURES

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4.1 Introduction

Section 4 describes operations and recommended procedures for normal operation of the airplane. Normal procedures following from system installation and optional equipment, which require supplementation of these Instructions, are shown in section 9 - Supplements.

4.2 Recommended speeds for normal procedures

4.2.1 Take-off

Climbing speed up to 50 ft (flaps in take-off pos. - 15°)	57 KIAS (66 mph IAS)
Best rate-of-climb speed V_Y (flaps in take-off pos. - 15°)	57 KIAS (66 mph IAS)
Best rate-of-climb speed V_Y (flaps retracted - 0°)	65 KIAS (74 mph IAS)
Best angle-of-climb speed V_X (flaps in take-off pos. - 15°)	54 KIAS (63 mph IAS)
Best angle-of-climb speed V_X (flaps retracted - 0°)	56 KIAS (65 mph IAS)

4.2.2 Landing

Approaching speed for normal landing (flaps in landing position - 50°)	60 KIAS (69 mph IAS)

4.3 Assembly and disassembly

Description of assembly and disassembly is given in the HARMONY LSA Aircraft Maintenance and Inspection Procedures.

4.4 Pre-flight check

Carry out pre-flight check according to the following procedure:

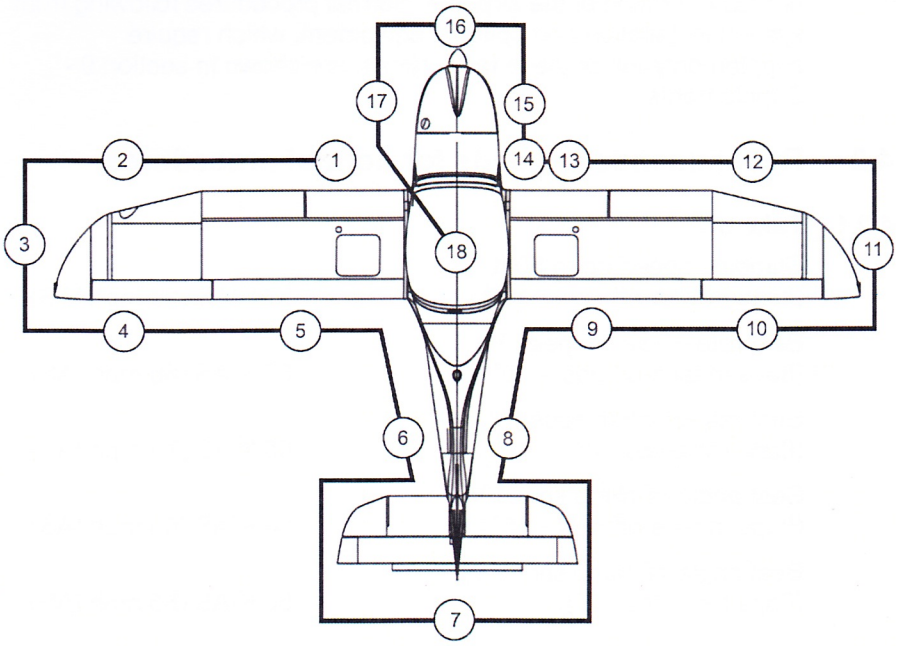

Figure 4-1 Scheme of airplane preflight check

WARNING
CHECK BEFORE PRE-FLIGHT CHECK THAT IGNITION IS SWITCHED OFF!

NOTE

The word "condition", used in procedures of pre-flight check, means visual check of surface, damage, deformation, scratches, attrition, corrosion, icing or other effects decreasing flight safety.

1. Left landing gear leg - check
   - landing gear leg attachment and condition
   - landing gear wheel condition
   - tire condition and inflation
   - condition and attachment of wheel covers
   - ground cable condition (if installed)
2. Left wing - check
   - wing surface condition
   - leading edge condition
   - landing light condition - if installed
   - condition of the Pitot tube
   - draining of fuel tank (see Chapter 8, page 8-6)
   - closing of fuel tank cap
3. Left wing tip - check
   - surface condition
   - attachment check
   - fuel tank vent - cleanness
   - condition and attachment of the position lights and the anticollision beacon - if installed
4. Left aileron - check
   - surface condition
   - condition of trim tab (if installed) and its control (electr.trim)
   - attachment
   - free movement
5. Left wing flap - check
   - surface condition
   - attachment
6. Rear part of fuselage - check
   - surface condition
   - condition of antennas (top and bottom fuselage surface) - if installed

7. Tail units - check
   - tail skid condition
   - surface condition
   - condition of rudder and elevator attachment
   - freedom of rudder and elevator movement
   - condition of trim tab, condition of elevator trim tab control
8. Rear part of fuselage - check
   - surface condition
9. Right wing flap- see 5.
10. Right aileron- see 4. except the trim tab
11. Right wing tip - see 3.
12. Right wing - see 2. except the landing light
    - Alternate pitot tube (IFR airplane)
    - AOA probe (if installed)
13. Right landing gear leg - see 1.
14. Front part of the fuselage - right hand side - check
    - Tip-up canopy attachment and condition
    - condition of the nose landing gear leg
    - nose wheel condition
    - condition of the nose wheel control rods
    - external power socket (if installed)
15. Engine

    Checks before the first flight of day - it is necessary to remove upper engine cowling:
    - condition of engine bed
    - condition of engine attachment
    - condition of exhaust system
    - condition of engine cowlings
    - visual check on fuel and electrical system condition

- check on cooling liquid volume in the expansion tank on the engine body
  (replenish as required up to max. 2/3 of the expansion tank volume)

Checks before every flight:

- cleanness of air intakes
- check on oil level (between marks - flattening on the dip stick)
- check on cooling liquid level in the overflow bottle (volume should be approx. 0.42 pints (0.2 litre))
- proper closing of the upper cowling

16. Propeller - check
    - attachment
    - condition of blades, hub and spinner
17. Front part of fuselage - left hand side - check
    - tip-up canopy attachment and condition
18. Cockpit - check

NOTE

Canopy is unlocked if a latch next to lock is visible under the glass, otherwise it is locked. Unlock it first with key.

- Master switch — switched on
- Check canopy OPEN/CLOSE indication light (or a message on the EFIS display) function
- all switches — OFF
- instrument equipment — check on condition
- check of safety belts condition and attachment
- check on presence of loose object in the cockpit
- check on adjusting and securing the rudder pedals (see section 7.3.3) - if installed adjustable rudder pedals

WARNING

RIGHT AND LEFT PEDAL OF RUDDER CONTROL MUST BE SET TO THE SAME POSITIONS AND WELL SECURED!

AOI and other required documents — check on completness and validity

4.5 Normal procedures and checklist

4.5.1 Before engine starting

1.	Pre-flight check and check on weight and centre of gravity position	done
2.	External power source (if socket is installed)	connect as necessary
3.	Safety harnesses	check, fasten
4.	Control stick	free
5.	Rudder pedals	free
6.	Wing flaps	function check
7.	Trim tab	function check
8.	PARKING BRAKE handle (if installed)	release brakes
9.	Brakes	function check
10.	AVIONICS SWITCH	check OFF
11.	Ignition	check OFF
12.	Canopy	close

4.5.2 Engine starting

1.	Master switch	ON
2.	Fuel gauge indicators	check of fuel qty.
3.	FUEL SELECTOR Pull the safety button on the fuel selector, turn the handle to the left and then release safety button. Now the handle can be freely moved between left and right position. Safety button prevents unintentionally switch the selector to OFF position.	LEFT
4.	Electric fuel pump (if installed)	ON
5.	THROTTLE lever	idle
6.	Choke	as necessary (open by pulling up and lock by turning)
7.	Space in the propeller area	free

8.	BEACON (if installed)	ON (if necessary)
9.	Brakes	apply
10.	Ignition	START (see CAUTION) after starting up BOTH

CAUTION

ACTIVATE STARTER FOR 10 SEC. AS A MAXIMUM, AND THEN LET IT COOL DOWN FOR 2 MINUTES.

AFTER STARTING UP ENGINE, DO NOT CARRY OUT SUDDEN RPM CHANGES, AFTER POWER DECREASE WAIT FOR ABOUT 3 S IN ORDER TO REACH CONSTANT RPM BEFORE REACCELERATION.

11.	THROTTLE lever	as necessary (see NOTE)
12.	Oil pressure	up to 10s min. pressure
13.	GEN, AUX GEN (if inst.) switches	ON

NOTE

After starting up engine, adjust throttle for smooth engine running at about 2500 RPM. Check oil pressure. Pressure must increase within 10 s. Increase engine RPM until oil pressure is stabilized over 2 bar (29 PSI).

14.	Engine instruments	check
15.	Choke	as necessary
16.	Engine warming up	see NOTE

NOTE

Begin warming up with engine running at 2000 RPM. for about 2 minutes, continue at 2500 RPM. Warming time depends on outside air temperature until oil temperature reaches 122 °F.

17.	FUEL SELECTOR Verify proper engine feeding from the right tank for approx. 1 minute.	RIGHT
18.	FUEL SELECTOR	LEFT

NOTE

Start engine with the fuel selector set to **LEFT**. If you would start the engine with the fuel selector set to **RIGHT** and the left tank is full, than fuel bleed from the left tank vent may occur (and pollute environment) because a fuel return hose is led only into the left tank and returning fuel will overfill the left tank.

19.	External power source (if socket is installed)	if used, give instruction to disconnect it
20.	AVIONICS SWITCH	ON
21.	Radiostation/avionics	ON
22.	Other electrical equipment	ON as necessary

4.5.3 Before taxiing

1.	Transponder (if installed)	SBY
2.	Outside lights (if installed)	as necessary

4.5.4 Taxiing

1.	THROTTLE lever	as necessary
2.	Brakes	check by depressing
3.	Rudder pedals	function check

4. Direction of taxiing control by rudder pedals (these are mechanically connected with nose wheel control), possibly by slacking up left and right wheel of the main landing gear.

4.5.5 Before take-off

1.	Brakes	brake
2.	Ignition check	carry out, see NOTE

NOTE

Carry out ignition check in the following way: Set engine speed to 4000 RPM. Switch ignition gradually to L, BOTH, R position and return to BOTH.
RPM drop with one ignition circuit switched off must not exceed 300 RPM. Maximum RPM difference at using one of the L or R circuits is 120 RPM.

3.	Engine instruments	check
4.	Control stick	free
5.	Wing flaps	Take-off pos. (15°)
6.	Elevator trim	NEUTRAL
7.	Aileron trim (if installed)	NEUTRAL
8.	Fuel gauge indicator	check on fuel quantity
8.	FUEL SELECTOR	check LEFT
10.	CARB.R PREHEATER (if installed)	check function then OFF

NOTE

If CARBURETTOR PREHEATER is switched ON, then engine RPM drop reaches approximately 50 RPM

11.	Engine instruments	check
12.	Flight instruments	check
13.	Radiostation / avionics	check, set
14.	Ignition	check BOTH
15.	Choke	close (in inserted position)

16.	Master switch	check ON
17.	Safety harnesses	tighten up
18.	Canopy	closed
19.	Transponder (if installed)	ON or ALT

4.5.6 Take-off

1.	THROTTLE lever	max. take-off power
2.	During take-off run smoothly lighten up the nose landing gear until airplane take-off occurs.	
3.	Airspeed	57 KIAS (66 mph IAS)
4.	Brakes	brake to stop main wheel rotation
5.	After reaching 150 ft, set flaps to retracted pos. (0°)	
6.	Trim	as necessary

WARNING

TAKE-OFF IS PROHIBITED:

- **IF ENGINE RUNNING IS IRREGULAR**
- **IF CHOKE IS OPEN**
- **IF VALUES OF ENGINE INSTRUMENTS ARE NOT WITHIN THE REQUIRED RANGE**

4.5.7 Climb

1.	THROTTLE lever	max. continuous power
2.	Airspeed	V_Y = 65 KIAS (75 mph IAS) for the best rate of climb or V_X = 56 KIAS (64 mph IAS) for the best angle of climb
3.	Engine instruments	check
4.	Trim	as necessary
5.	Electric fuel pump (if installed)	OFF

4.5.8 Cruise

1.	THROTTLE lever	as necessary
2.	Airspeed	max. 5500 RPM
3.	Engine instruments	check
4.	Fuel quantity	check

CAUTION

FUEL GAUGES DISPLAY TRUE FUEL QUANTITY ONLY ON GROUND AND IN A LEVEL FLIGHT. TO READ TRUE FUEL QUANTITY AFTER TRANSITION FROM CLIMB/DESCENT WAIT APPROX. 2 MINUTES TO FUEL TO LEVEL.

NOTE

It is recommended to alternately switch the tanks during cruise to equally consume fuel from both tanks and minimize airplane tendency to bank with unbalanced tanks.

Do not fly with the fuel selector set to RIGHT if the left tank is full to avoid fuel bleed from left tank vent.

When the left tank fuel gauge indicates approx. 1/8 of fuel quantity (needle in the middle between 1/4 and 0) then switch to the right tank to consume remaining fuel and then switch back the left tank to complete the flight at left tank. If the engine conks out due to fuel consumption from either tank, then immediately switch the fuel selector to other tank and engine run will be recovered within 7 seconds.

5. CARB.PREHEATER (if installed) as necessary

4.5.9 Descent

1.	THROTTLE lever	as necessary
2.	Airspeed	as necessary
3.	Trim	as necessary
4.	Engine instruments	check
5.	CARB.PREHEATER (if installed)	as necessary

CAUTION

AT LONG APPROACHING AND DESCENDING FROM HIGH ALTITUDE IT IS NOT SUITABLE TO REDUCE THROTTLE TO MINIMUM FOR THE REASON OF POSSIBLE ENGINE UNDERCOOLING AND SUBSEQUENT LOSS OF POWER. PERFORM DESCENDING AT INCREASED IDLE AND CHECK OBSERVANCE OF THE ALLOWED VALUES ON ENGINE INSTRUMENTS.

4.5.10 Before landing

1.	Fuel quantity	check

CAUTION

FUEL GAUGES DISPLAY TRUE FUEL QUANTITY ONLY ON GROUND AND IN A LEVEL FLIGHT. TO READ TRUE FUEL QUANTITY AFTER TRANSITION FROM CLIMB/DESCENT WAIT APPROX. 2 MINUTES TO FUEL TO LEVEL.

2.	FUEL SELECTOR	LEFT
3.	Engine instruments	check
4.	Brakes	check by depressing pedals
5.	Safety harnesses	tighten up
6.	Free area of landing	check
7.	CARB.PREHEATER (if installed)	ON

8.	Approaching speed	60 KIAS (69 mph IAS)
9.	Flaps	Take-off pos. (15°)
10.	Trim	as necessary
11.	Parking brake (if installed)	check for lever down

CAUTION

PARKING BRAKE MUST BE RELEASED (LEVER DOWN) TO PREVENT LANDING WITH BRAKED WHEELS.

12.	Electric fuel pump (if installed)	ON

4.5.11 FINAL

1.	Flaps	landing pos. (30° or 50°)
2.	Maintain airspeed	60 KIAS (69 mph IAS)
3.	Trim	as necessary
4.	CARB.PREHEATER (if installed)	OFF

4.5.12 Balked landing

1.	THROTTLE lever	max. take-off power
2.	Flaps	take-off pos. (15°)
3.	Airspeed	56 KIAS (65 mph IAS)
4.	Flaps in 150 ft	retracted pos. (0°)
5.	Trim	as necessary
6.	THROTTLE lever	max. continuous power
7.	Instruments	check
8.	Climb at airspeed	65 KIAS (74 mph IAS)

4.5.13 Landing

1.	THROTTLE lever	idle
2.	Touch-down on main landing gear wheels	carry out
3.	Brakes after nose landing gear wheel touch-down	as necessary

4.5.14 After landing

1.	Flaps	retracted pos. (0°)
2.	Trim	NEUTRAL
3.	Outside lights (if installed)	OFF
4.	Transponder (if installed)	OFF
5.	Electric fuel pump (if installed)	OFF

4.5.15 Engine shut-off

1.	THROTTLE lever	idle
2.	Engine instruments	check
3.	AVIONICS SWITCH	OFF
4.	Radiostation / avionics	OFF
5.	Other electrical equipment	OFF
6.	Ignition	OFF
7.	BEACON (if installed)	OFF
8.	Master switch	OFF

4.5.16 Airplane parking

1. Ignition — check OFF
2. Master switch — check OFF
3. FUEL SELECTOR — OFF
   Pull the safety button on the fuel selector, turn the handle to the OFF position and then release safety button. Now the handle is blocked in the OFF position. Safety button prevents unintentionally switch the selector from the OFF position.
4. PARKING BRAKE handle (if installed) brake as necessary
5. Canopy — close, lock as necessary

NOTE

It is recommended to use parking brake (if installed) for short-time parking only, between flights during a flight day. After ending the flight day or at low temperatures of ambient air, do not use parking brake, but use the wheel chocks instead.

If after releasing the parking brake wheels (or one of them) stay blocked, depress and release the brake pedals. This procedure should result to unblock wheels. If the wheel or wheels fail to unblock by the process (even after repeated depressing) it is necessary to allow vent valve (in the appropriate wheel) and reduce the pressure in the brake circuit.

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