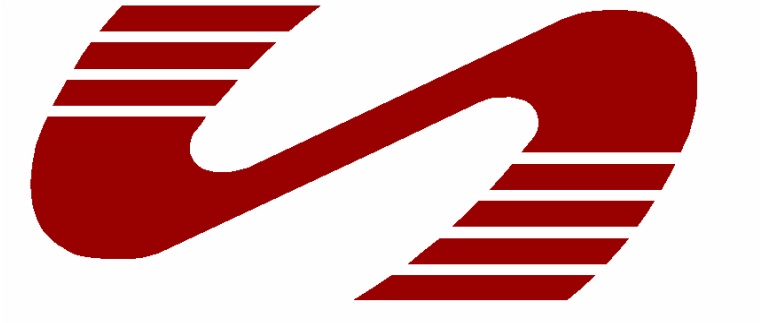
Breezer 600L



Breezer

Serial Number xxx

Pilot Operating Handbook and Flight Training Manual

Issue 2

July 20, 2009

Breezer Pilot Operating Handbook and Flight Training Manual

This Manual belongs to

Aircraft reg: **D-XXX**

Type: Breezer 600L :

Serial No.: XXXX

Light Sport Aircraft (LSA) / European Light Aircraft (ELA)

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This handbook should be kept with the aircraft.

1 Table of contents

2 General Information

Read this Handbook carefully before your first flight!

2.1 Introduction

A record of all amendments is to be found in the front of this manual.

The Breezer aircraft is a Light Sport Aircraft (LSA) in Europe called European Light Aircraft (ELA), conforming to the definition within LSA category.

To operate the aircraft the pilot must hold a license or certificate appropriate to this category of aircraft. The aircraft is not to be flown unless it is registered, carries registration markings in accordance with the requirements of the country in which the aircraft is to be flown, and has a Permit to Fly or certificate of Airworthiness valid in the country of operation. The aircraft is to be flown under VFR conditions. Flight into conditions other than VFR without the correct aircraft equipment and pilot ratings is extremely dangerous and can result in serious injury or death.

Pilots holding licences for other categories even higher ones are required to be checked out by an appropriately qualified instructor prior to flying this aircraft as it possesses characteristics that are unique to light sport type aircraft.
These characteristics include low inertia, susceptibility to turbulence and wind gradient and special engine considerations.

The safety of all occupants, the aircraft and persons on the ground are the sole responsibility of the the Pilot in command. Do not operate this aircraft in a manner that would endanger the occupants, the aircraft or persons on the ground.

The engine of this aircraft is not certified, and could fail at any time. For this reason NEVER fly over congested areas or other areas on to which a safe landing cannot be made in the event of an engine failure. On cross-country flights, ALWAYS keep an emergency landing field in sight.

Changes to the control system, structure, wings and engine are prohibited. These changes would invalidate any certificate of Airworthiness or permit to fly and as such would result in an insurance becoming null and void.

All operating difficulties and equipment failures should be reported to your dealer or the manufacturer.

2.2 Certification basis

The Breezer has been designed, manufactured, inspected and certified according to the American Light Sport aircraft category, the German “Bauvorschriften für Ultraleichtflugzeuge (BFU 95)” and, since 2003, the LTF-UL (German airworthiness requirements for micro-light aircraft). In Germany, the Luftsport-Gerätebüro of the DAeC (German Aero Club) is responsible for the certification of micro-light aircraft.

The noise emission certificate has been issued in accordance with the “Lärmschutzverordnung für Ultraleichtflugzeuge (LS-UL)” (Noise protection regulation for micro-light aircraft).

2.3 Notes / Warnings

Notes and sections which are of particular importance to operation and flight safety are highlighted as follows:

Note
Draws attention to information which is not directly related to the safe operation of the Breezer aircraft but which is important and to which attention should be paid.

Caution
Draws attention to methods, procedures or limits which must be followed to avoid short-term or long-term degradation of flight safety.

Warning
Draws attention to methods, procedures or limits which must be followed precisely to avoid immediate or massive degradation of flight safety.

Note
Always prepare a cross-country flight with due diligence. Use all available sources of information, e.g. NOTAMS, aviation authority bulletins, safety requirements. Even on short flights you should always call up the current weather reports and forecasts.

Caution
- For fire safety reasons, smoking is prohibited on board.
- Avoid flights in heavy turbulence or thermal winds. Should you be unable to avoid such areas, reduce speed to VA to avoid damage to the aircraft structure.
- Keep well away from storm fronts. Make a precautionary landing if necessary.

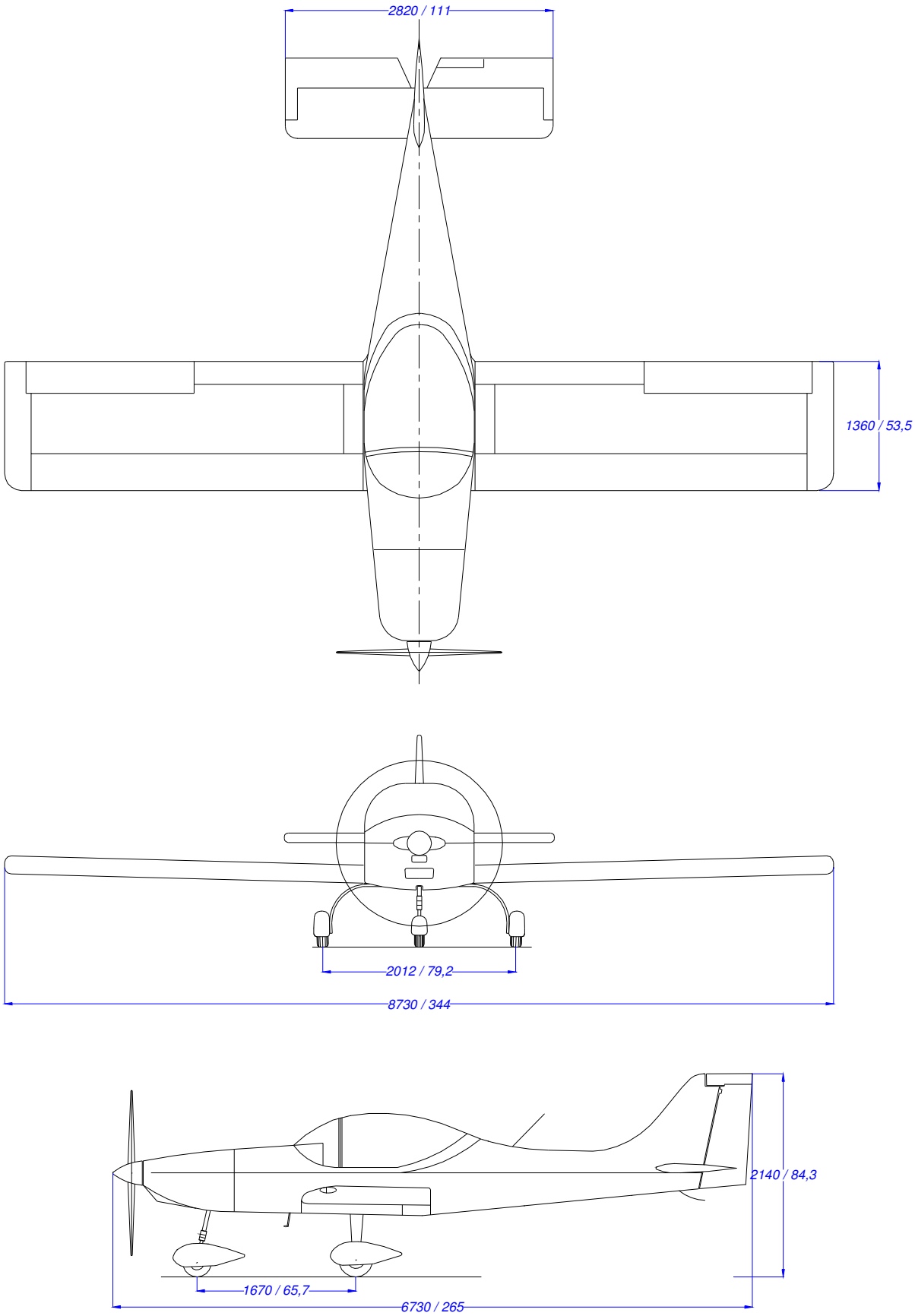
2.4 Description / Technical data

The Breezer is a two-seat micro-light aircraft with a conventional aluminum stressed skin structure. It has been designed, built and certificated according to the Light Sport aircraft category, the European Light Aircraft category, the German "Bauvorschriften für Ultraleichtflugzeuge (BFU 95)" and the LTF-UL, valid since 2003 (German airworthiness requirements for micro-light aircraft). It is a monoplane with a cruciform empennage arrangement, two side-by-side seats, tricycle landing gear and flaps. The Breezer is powered by a geared Rotax 912S four-cycle engine and a 3-bladed Neuform propeller.

Technical data

Wing span	344 in	(8.73 m)
Wing chord	53.5 in	(1.36 m)
Wing area	127.8 sq ft	(11.87 m²)
Wing aspect ratio	6.4	
Wing loading	51 kg/m²	
Wing profile	NACA 4414 mod.	
Aileron area	12.16 sq ft	(1.13 m²)
Flaps	12.27 sq ft	(1.14 m²)
Length	265 in	(6.73 m)
Height	84.3 in	(2.14 m)
Cabin width	45.7 in	(1.16 m)
Wheel track	79.2 in	(2.12 m)
Wheel base	65.7 in	(1.67 m)
Nose wheel tire	4.00 - 4	
Tire pressure - nose-wheel	26 psi	(1.8 bar)
Main wheel tire	4.00 - 6	
Tire pressure - main wheel	32 psi	(2.2 bar)
MTOM	1320 lbs	(599 kg)
Fuel tank capacity	18.5 US Gal	(70 liters)

Views, Dimensions [mm / inches] - Breezer 600L



3 Airplane and System Descriptions

3.1 Engine

Engine manufacturer:	Bombardier-Rotax GmbH Motorenfabrik
Engine model:	912S (100 hp)
Description:	4-stroke, 4 cylinder horizontally opposed, spark ignition engine, one central camshaft – push-rods – OHV
	Liquid cooled cylinder heads
	Ram air-cooled cylinders
	Dry sump forced lubrication
	Dual breaker less capacitor discharge ignition
	2 constant depression carburetors
	Mechanical fuel pump
	Prop drive via reduction gear with integrated shock absorber and overload clutch
	Electric starter (12V 0,6 kW)
	Integrated AC generator with external rectifier-regulator (12V 20A DC)
Gear:	2.43 : 1
Maximum take-off rpm:	5800 rpm (max. 5 minutes)
Maximum continuous rpm:	5500 rpm
Idle speed:	ca. 1400 rpm
Take-off performance:	73,5 kW at 5800 rpm
Max. continuous Performance:	69 kW at 5500 rpm
Acceleration:	Limit of engine operation at zero gravity and in negative “g” conditions:
	max: 5 seconds at max. -0,5 g
Oil pressure:	max. 7 bar; **Attention**: For a short period admissible at cold start.
	min. 0,8 bar (12 psi) (below 3500 rpm)
	normal: 2,0 - 5,0 bar (29 - 73 psi) (above 3500 rpm)
Oil temperature:	max. 140°C (284°F)
	min. 50 °C (120°F)
	normal operating temperature: ca. 90-110°C (190-230°F)
Cylinder head temperature:	max. 150°C (300°F)
	reading at the observation point of the hotter cylinder head, either no. 2 or no. 3.
Engine start, operating temperature:	max. 50°C (120°F)
	min. -25°C (-13°F)
Fuel pressure:	2.2 – 5.8 psi (0.15 - 0.4 bar)
	NOTE: Exceeding the max. admissible fuel pressure will override the float valve of the carburetor.
	The delivery pressure of an additional backing pump (e.g. electric standby pump) must not exceed 0,3 bar (4.4 psi) in order not to override the float valve.

More engine data are available in the Rotax operation manual supplied with the aircraft.

Lubrication

For detailed information on engine oil, refer to the engine manual supplied with the airplane.

Oil capacity (without oil cooler and connecting lines)

Maximum	3 l	(0,8 US gal)
Minimum	2 l	(0,5 US gal)
Amount of oil between min. and max.	0,45 l	(0,12 US gal)
Maximum consumption	0,06 l/h	(0,13 liq pt/h)

Oil viscosity

see Chapter 10 of the Rotax Operator`s Manual
Use of multi-grade oil is recommended.

Oil pressure

Minimum	11.6 psi (0.8 bar) below 3500 rpm
Maximum	101.5 psi (7.0 bar) (briefly permissible during cold weather start)
Normal operating range	29 – 72.5 psi (2.0 - 5.0 bar)

For further information refer to the engine manual. The relevant instruments are accordingly marked with the appropriate limitations.

3.2 Propeller

Neuform, carbon fibre, three blade CR-75-47-101.6 (Rotax 912 S)

The standard propeller installed in this Breezer aircraft is ground-adjustable and is set by the aircraft manufacturer to ensure an optimum combination of climb and cruise performance. The noise emission measurements were carried out with the propeller thus set.

3.3 Fuel and fuel capacity

Fuel tank capacity:	18.5 US GAL / 70 liters
Usable fuel:	17.7 US GAL / 67 liters
Fuel grade:	min. RON 95, AVGAS 100LL For complete fuel specifications see the original Rotax Operator`s Manual.

Note

- When filling up using canisters or if the origin of the fuel is not known, use a funnel with a water trap.

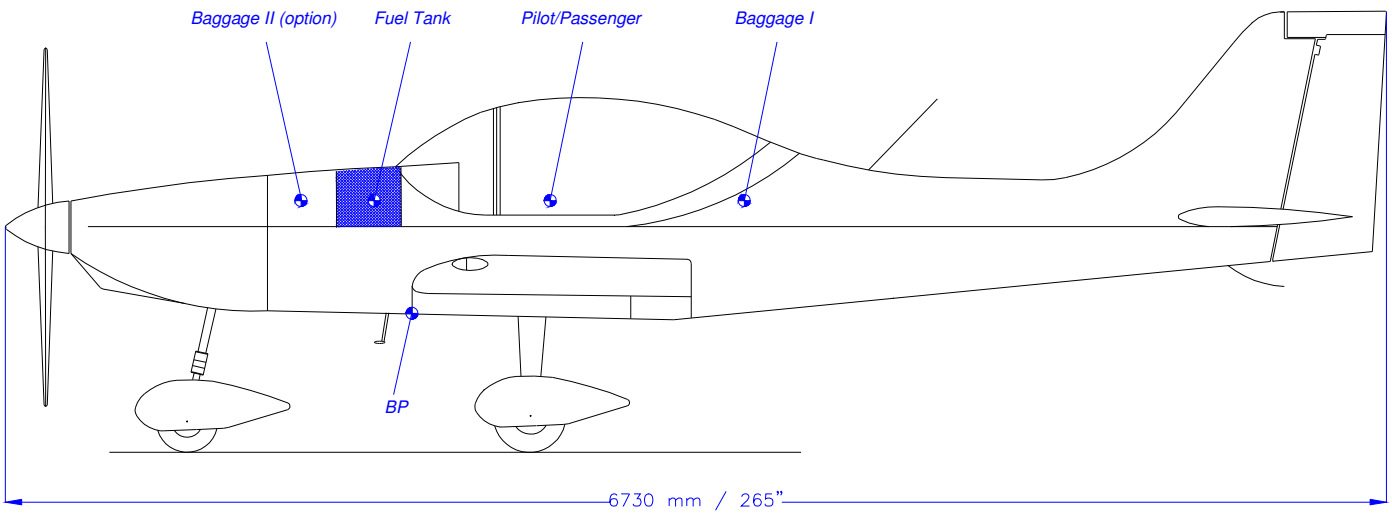
3.4 Oil

Oil:	**Motorcycle oil of a registered brand with gear additives.** If using aircraft engine oil; then only blended one. **Attention:** At the selection of suitable lubricants refer to the additional information in the Rotax Service Information SI-912-016 latest edition
Oil specification:	Use only oil with API classification "**SG**" or higher! Due to the high stresses in the reduction gears, oil with gear additives such as high performance motorcycle oils are required. Because of the incorporated friction clutch, oils with friction modifier additives are unsuitable as this could result in a slipping clutch during normal operation. Heavy-duty 4-stroke motorcycle oils meet all the requirements. These oils are normally no mineral oils but semi- or full synthetic oils. Oils primarily for Diesel engines are due to **insufficient high temperature properties and additives, which favor clutch slipping, generally unsuitable.** **Attention**: If the engine is mainly run on AVGAS **more frequent** oil changes will be required. See Service Information SI-912-016 latest edition

3.5 Operating weights and loading (occupants, baggage, fuel, ballast)

Minimum load per seat:	120 lb	54 kg
Maximum weight per seat:	250 lb	100 kg
Empty weight (standard):	728 lb	330 kg

Maximum take-off mass (MTOM)	1320 lbs/ 599 kg
Maximum landing mass	1320 lbs/ 599 kg
Empty mass	cf. weighing sheet, Chap. VI
Maximum loading mass - baggage	44 lbs / 20 kg



The reference plain (BE) for all centre of gravity calculations is the canopy frame or the canopy guide rail. The reference datum (BP) is the wing leading edge.

Refer to Chapter 5.2 for more detailed information on the horizontal alignment of the aircraft and the permissible centre of gravity range.

Centre of gravity range:

Forward: 10.7 inches / 272 mm aft of reference point (BP) = 20% MAC

Rearward: 17.7 inches / 449 mm aft of reference point (BP) = 33% MAC

Typical loading configurations for the Breezer

1: Pilot and Passenger, max. Baggage, max. Fuel **(middle/rearward position CG)**

	Litre [l]	mi		xi		mi * xi	
		lb	kg	ft	mm	lb * ft	kg * mm
Empty weight		738,5	335	0,83	254	615,5	85090
Pilot		220,5	100	2,21	673	486,8	67300
Passenger		206,4	93,6	2,21	673	455,6	62992,8
Fuel	70	111,1	50,4	-0,61	-185	-67,4	-9324
Baggage		44,1	**20**	5,32	1620	234,4	32400
Sum		1320,6	599				238459
CG location					398,1		
CG location, % of MAC					29,3	%	

2: Pilot and Passenger, max. Baggage, min. Fuel **(most rearward CG)**

	Litre [l]	mi		xi		mi * xi	
		lb	kg	ft	mm	lb * ft	kg * mm
Empty weight		738,5	335	0,83	254	615,5	85090
Pilot		220,5	100	2,21	673	486,8	67300
Passenger		206,4	93,6	2,21	673	455,6	62992,8
Fuel	3	4,8	2,16	-0,61	-185	-2,9	-399,6
Baggage		44,1	**20**	5,32	1620	234,4	32400
Sum		1214,2	550,8				247383
CG location					449		
CG location, % of MAC					33,0	%	

3: Pilot, max. Fuel **(most forward CG)**

	Litre [l]	mi		xi		mi * xi	
		lb	kg	ft	mm	lb * ft	kg * mm
Empty weight		738,5	335	0,83	254	615,5	85090
Pilot		158,7	72	2,21	673	350,5	48456
Passenger		0,0	**0**	2,21	673	0,0	0
Fuel	70	111,1	50,4	-0,61	-185	-67,4	-9324
Baggage		0,0	**0**	5,32	1620	0,0	0
Sum		1008,4	457,4				124222
CG location					271,6		
CG location, % of MAC					20,0	%	

Note

The pilot is responsible for ensuring that the maximum take-off mass is not exceeded.
If additional equipment is installed, the empty mass will increase accordingly. If equipment is removed, the empty mass will decrease accordingly.

Warning

- If the MTOM is exceeded, the Breezer aircraft will be over-loaded. This in turn will lead to deterioration in flight characteristics and performance.
- Exceeding the centre of gravity limits will detrimentally affect the controllability and stability of the aircraft.

Maneuver limits

The Breezer is designed for normal flight operations. These include any maneuvers incidental to normal flying and stalls (except whip stalls). Higher loads are not permitted.

Warning

- All aerobatic maneuvers including spins and whip stalls are prohibited.
- Turns with bank angles exceeding 60° are not permitted.

3.6 Structure and systems description

Fuselage

The construction of the load-bearing structure of the fuselage is a conventional aluminum stressed-skin design. L-shaped profiles are used as stringers as re-enforcement. The spars and ribs of the vertical tail form part of the fuselage structure; the skin of the completely symmetrical vertical tail is formed by the glass-fibre panel, which is a part of the fairing of the upper side of the fuselage. The upper side of the fuselage fairing serves solely to shape the structure. The fuselage ends at the engine compartment side at a stainless steel sheet (firewall). The engine is attached to the firewall via engine mounts made of welded steel tubing. A two-piece, carbon-fibre cowling covers the engine compartment.

Cockpit

The cockpit has two side-by-side seats. To facilitate boarding, part of the two-piece Plexiglas canopy can be pushed back.

Wings

The rectangular wing is of a conventional design and comprises:

- main spar
- auxiliary spar
- ribs
- skin

The fittings for the flaps and the ailerons are mounted on the auxiliary spar. For strength and weight reasons, the skin varies in thickness. Glass-fibre wing tips are attached to the wing ends.

Empennage

As in the case of the wings, the completely symmetrical horizontal tail comprises a main spar, an auxiliary spar, ribs, skin and glass-fibre surface tips.

Control surfaces, flaps

All control surfaces and flaps are of the same design and comprise a main spar, ribs and skin.

Flight controls

The elevator and ailerons are operated by push rods whereas the rudder is operated conventionally via control cables. The nose wheel is also operated via push rods, which are attached to the rudder pedals. Elevator forces can be balanced by means of a trim tab on the elevator. The flaps are extended mechanically.

Trim

The elevator trim tab is operated by a servo located in the elevator. The relevant switch is in the middle console below the instrument panel. Next to the switch is a position indicator showing the position of the trim tab. By pressing the rocker-type switch, a trim change can be achieved:

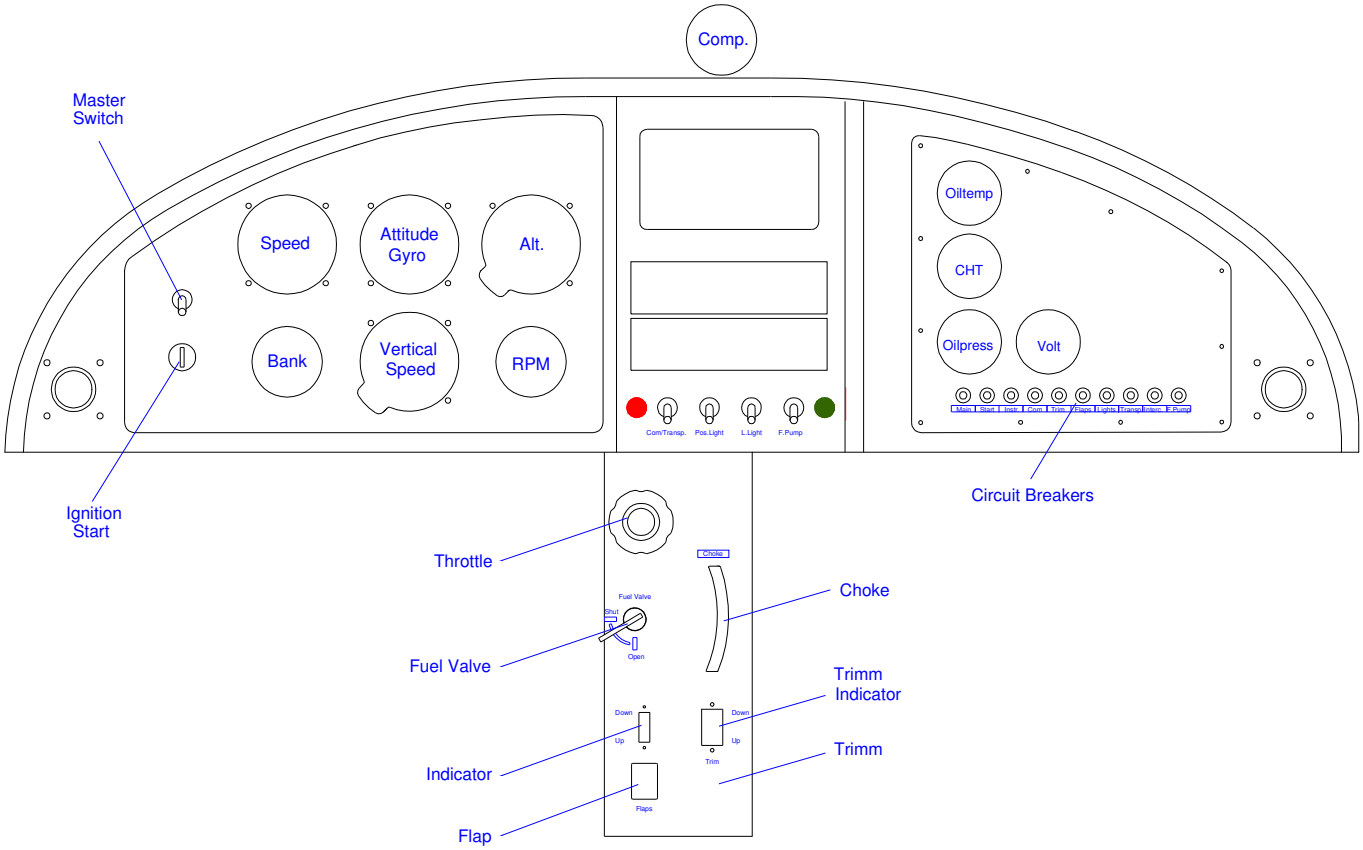
upper part of the switch	nose-heavy
lower part of the switch	tail-heavy

Optional the trim switch can be part of the stick grip

Flaps

The flaps can be extended from 0° to 45°. Standard is an electrical flap extension mechanism.
It is operated by a rocker-type switch, which is located in the middle console and has a position indicator.

Instrument panel



The instrument panel depicted above shows the locations for the standard instruments. On request additional instruments may be installed. In this case, the position of the standard instruments may deviate from the above.

Landing gear

The main landing gear of the Breezer comprises two glass-fiber struts which are attached to the underside of the fuselage. The wheel axles are screwed to the lower part of the strut. The main gear wheels have hydraulic brakes, which are actuated simultaneously via a brake lever in the middle console. The main wheel tires are 4.00 x 6 (tire pressure: 32 psi / 2.2 bar).

Shock absorption of the nose wheel landing gear which is made of high-strength steel tubes is provided by three rubber buffers and a steel spring. The nose wheel tire is 4.00 x 6 (tire pressure: 26 psi / 1.8 bar). The nose wheel landing gear is steered via push rods, which are attached to the rudder pedals. Wheel fairings are optional. They reduce drag and keep the aircraft remarkably clean.

Seats and safety harnesses

The seat buckets are made of aluminum and are riveted to the fuselage. Hand-holes have been integrated into the airframe near the seats to facilitate maintenance work and dismantling the wing. The seat cushioning can be removed. Each seat has a four-point safety harness which is attached to the fuselage structure at re-enforced attachment points. The harness has a central lap buckle.

Note

The safety harness should be adjusted to ensure that the lap belt is actually in the lap area and the shoulder harness only permits slight forward movement. Only in this way can you be sure that the harness will operate properly in turbulent weather or in an emergency.

Baggage compartment

There is a baggage compartment behind the seats. Baggage should be evenly distributed in the compartment and tied down appropriately to prevent it from moving.

Caution

Do not load more than 44 lbs (20 kg) into the baggage compartment. Before loading, check that the mass and balance values are within the limitations. The loading plan provides the necessary information.

Canopy

The two-piece canopy is designed as a sliding canopy. The non-movable front part of the canopy is fixed to the front glass-fibre fuselage fairing and is re-enforced by a tubular frame. The rear, sliding part of the canopy is adhered to a tubular frame and runs in three rails. The cockpit canopy lock is opened by a quarter turn to the left, once the locking mechanism has hooked in, it can be locked by a quarter turn to the right.

Cowling

The cowling must be removed for engine inspection. The locks can be easily removed by pressing gently and simultaneously making a quarter turn to the left.
The upper half of the cowling should be removed before the first flight of the day in order to carry out the preflight check described in Chapter 8.1. To check the oil level, the oil tank cap and the oil dipstick must be removed. The oil should reach the uppermost mark on the dipstick.
Coolant level can be checked at the coolant reservoir / compensator at the firewall. The container should be half-full.

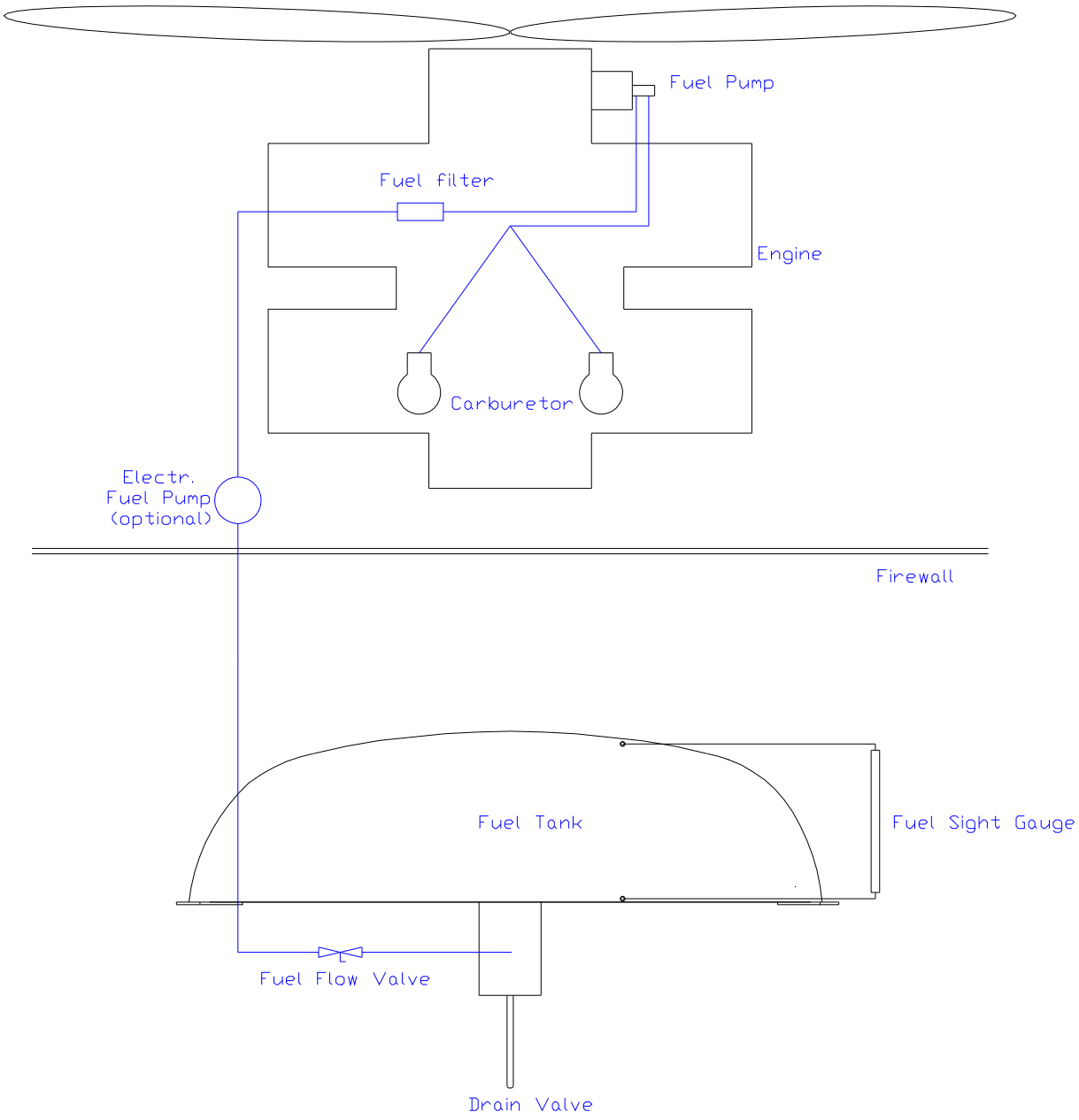
Note

- Always use a screwdriver of the right size to release the screws and guide it with your other hand. This prevents the screwdriver from slipping and scratching the paintwork.
- Bear in mind that the engines used in Breezer aircraft are usually not aviation engines and thus do not offer the same high safety standards found in other classes of aircraft. Prepare your flight so that you can always reach an emergency landing area should you experience engine failure

Fuel system

The aluminum tank is located between the firewall and the instrument panel. It holds 18.5 US Gall (70 liters) of which 17.7 US Gall (67 liters) are usable, respectively. The filler neck is screwed into the fuselage covering. The drain valve is on the left underside of the fuselage just behind the firewall. The spring-loaded valve is opened by pressing the drain cup into it.

Schematic diagram – Fuel system



Electrical system

A simplified circuit plan for the standard configuration is to be found in the appendix (Chap. 12.2). Deviations from this standard configuration may occur if additional equipment is installed.

Pitot-static system

A pick-up for pitot and static pressure is to be found on the underside of the left wing. Two thin tubes attach the instruments in the cockpit to this device.

Avionics

Radio and navigation instruments are not mandatory parts of the minimum equipment required to operate Breezer aircraft. It is, however, in the interest of safety to install a radio, an intercom and a GPS. Every additional piece of equipment will, however, increase the empty mass of the aircraft.

4 Operating Limitations

Introduction
This chapter includes operating limitations for the safe operation of the aircraft, its engine and standard equipment. The limitations have been calculated and verified by tests.

4.1 Stalling Speed at maximum take off weight (V_{S1} and V_{SO})

V_{S1} = 83 km/h (52 mph / 45 kts)

V_{SO} = 70 km/h (44 mph / 38 kts)

4.2 Flap extended speed range (V_{SO} to V_{FE})

V_{SO} = 70 km/h (44 mph / 38 kts)

V_{FE} = 140 km/h (87 mph / 76 kts)

4.3 Maximum maneuvering speed (V_A)

V_A = 179 km/h (111 mph / 97 kts)

4.4 Never exceed speed (V_{NE})

V_{NE} = 252 km/h (157 mph / 136 kts)

4.5 Crosswind and wind limitations

Maximum operating wind speeds:

- Steady head winds in take-off direction 37 km/h (23 mph / 20 kts)
- Demonstrated crosswind component 22 km/h (14 mph / 12 kts)

Note

- Cross wind take-offs and landings demand a lot of training and skill, the higher the crosswind component, the greater your skill must be.
- Flight operations should be terminated in very gusty winds or in wind speeds above 46 km/h ≈ 11 m/s (25 mph / 22 kts).

4.6 Service ceiling

Maximum service ceiling is about 15.000 ft (4570 m)

4.7 Load factors

At V_A: +4.0g / -2.0g

At V_{NE}: +4.0g / -1.5 g

Warning

If the load limits are exceeded, the aircraft structure may fail.
In the interest of your own safety, take heed of the limitations!

4.8 Prohibited maneuvers

The Breezer is prohibited from performing aerobatic maneuvers.

Turns with a banking angle of more than 60° are not allowed.

Warning

- The never-exceed speed (VNE) must never be exceeded.
- Full control movements may be made up to a speed of VA. Above this speed, only use of 1/3 of the max. deflections of the control surfaces is allowed.
- V_{FE} must not be exceeded with the flaps extended.
- Flight in known icing conditions is prohibited.

5 Weight and Balance information

Introduction

Flight performance and flight characteristics described in this handbook assume that the mass and centre of gravity limits of the aircraft are not exceeded. The pilot is responsible for ensuring that this Breezer aircraft is operated within the mass and balance limitations.
This chapter defines the balance limitations.

Warning

- It is prohibited to exceed the maximum take-off mass. This may lead to an over-loading of the Breezer aircraft and to deterioration in flight performance and characteristics.
- If the centre of gravity limitations is exceeded, the controllability and stability of the Breezer aircraft will be adversely affected.

5.1 Installed equipment list

Breezer Serial No.: Registration:

Engine: Prop.: Date:

	Manufacturer	***Type***	***Description***
1	Falcon Gauge	ASI 300K-3	Analog Airspeed Indicator
2	Falcon Gauge	VSI 10MES-3	Analog Vertical Speed Indicators
3	Falcon Gauge	ALT 20MBT-3N	Analog Sensitive Altimeters
4	TRUTRAK	ADI 3	ADI
5	UMA	SI-2Q	2-1/4" Inclinometer
6	Airpath Instrument Co.	C2400-L4P	COMPASS
7	Garmin	SL40	COM Radio
8	Garrecht Avionik	VT-02	Transponder Mode S
9	AMERI-King Co	AK-450 / 451	ELT
	Options:		
10	PS Engineering	PM 3000A	Intercom
11	Honeywell	85094	Hobbs Hour Meter

5.2 Center of Gravity (CG) range and determination

The operating centre of gravity range is:

Forward centre of gravity: 10.7” (272 mm) aft of BP (= 20% MAC)

Rearward centre of gravity 17.7” (449 mm) aft of BP (= 33% MAC)

Note that while determining the center of gravity, the aircraft must be leveled

Weighing

Scales are placed under each wheel of the aircraft. The aircraft must be properly aligned. The reference plain (BE) for centre of gravity measurements is the canopy frame or the canopy-guiding rail; the reference datum (BP) is the wing leading edge.

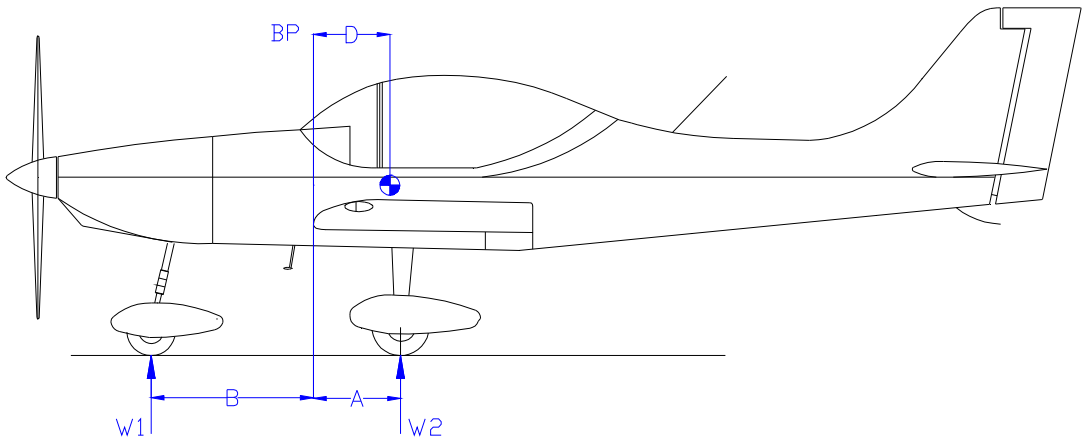
Weighing conditions:

- Equipment as per current equipment list
- including all lubricants
- including fuel reserve 0.8 US Gall (3 liters)

The distances A and B can be determined by dropping a plumb bob from the reference datum (wing leading edge). Subsequently, the weights W1 and W2 (WL + WR) can be measured.
The location of the empty weight CG can be determined with the help of the following formula:

$$D = \frac{W_2 * A - W_1 * B}{W_1 + W_2}$$

Weighing diagram – Breezer



The most important arms, measured from the BP (wing leading edge), are:

- Pilots 26.5” (673 mm)
- Baggage 63.8” (1620 mm)
- Fuel -7.2” (-185 mm)

Caution

The fuel moment is always negative, because the fuel tank lies in front of the reference datum.

Note

- The most forward centre of gravity position is reached with a full tank and a pilot with a mass of 72 kg
- The most rearward centre of gravity position is reached with 0,8 US Gall (3 liters) of fuel, two pilots and baggage.
- The pilot is responsible for ensuring that the MTOM is not exceeded.

- If additional equipment is installed or if equipment is removed, the empty mass will increase or decrease accordingly.

A weight and balance report is supplied with each plane. An example of it is shown below

Weight & Balance Report

Model:_____ Registration:_____

Reference datum for arms:_____ horizontal reference line:_____

Reference plain for arms:_____

max. empty mass:_____lbs MTOM::_____lbs

Empty mass centre of gravity range:_____ins to _____ins aft of BP

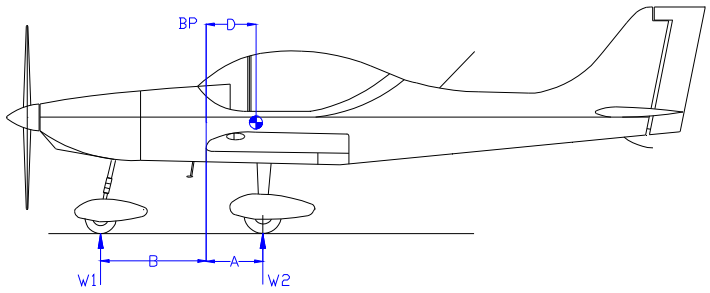
max. fuel mas:_____ lbs max. baggage:_____lbs

max. cockpit load, single seat:_____ lbs max. cockpit load, two seat:_____lbs

One pair of scales under each main wheel ! Mass W2 = WL + WR

Mass W1:_____lbs Mass W2:_____lbs Empty mass centre of gravity WS = W1+W2:_____ lbs

$$D = \frac{W2*A - W1*B}{W1 + W2}$$



Arm A:_____ ins Arm B:_____ ins Empty mass centre of gravity D:_____ ins

Information on aircraft configuration during weighing (mark appropriately)

	YES	NO
Permanent ballast installed ?		
Minimum equipment installed ?		
Unusable fuel in tank ?		
Maximum amount of oil ?		
Other lubricants (e.g. hydraulic fluid, coolant)		

Name of inspector (printed):_____

_____ _____

(Place, date) (Signature)

6 Performance

Introduction

The following performance data have been computed from actual flight tests with the aircraft and engine in good condition and corrected to ISA standard conditions (15°C, 1013.25 hPa at MSL) and a MTOW of 1320 lb.
Operations at higher temperatures and altitudes will reduce take-off and climb performance.

The take-off and landing distances have been determined for an asphalt runway.
The performance data may be reached with average piloting techniques and an aircraft in good condition.

6.1 Take off and landing distances

Ground roll	185 m	(606 ft)
Total distance over 15 m obstacle	282 m	(925 ft)
Rotating speed with 0° of flaps	74 km/h	(46 mph / 40 kts)

6.2 Rate of climb

Best rate of climb	3,9 m/s	(767 ft/min)
at Vy	111 km/h	(69 mph / 60 kts)
at	4900 RPM	+- 100 RPM

6.3 Cruise speeds

Maximum cruising speed at 75 %:	185 km/h	(115 mph / 100 kts)

6.4 RPM

Take-off performance:	4800 RPM	
Max. continuous performance:	5500 RPM	
Min RPM before take-off:	4700 RPM	
Idle speed:	1400 RPM	
Maximum RPM (Redline):	5800 RPM	(max. 5 min)
Cruising flight RPM:	4200-5300 RPM	
75 Percent cruise RPM:	5100 RPM	

6.5 Fuel consumption

Fuel consumption at take-off power:	22 l/h	(5, 81 Gph)
Fuel consumption at cruising power:	13-22 l/h	(3, 44 – 5, 81 Gph)
Fuel consumption at 5500 RPM:	26 l/h	(6, 88 Gph)

For more engine data, refer to the Rotax Operator`s Manual supplied with the airplane.

Range

Range is very dependent upon cruise speed. High cruising speeds will result in a very high fuel consumption and thus a relatively short range. At a cruising speed of roughly 185 km/h (115 mph / 100 kts), fuel consumption will be approximately 5 US GAL / 19 liters per hour which will result in a range of about 650 km (400 miles). At a cruising speed of about 150 km/h (92 mph / 80 kts), fuel consumption will fall to about 3.2 US Gal / 12 liters per hour and the range will thus increase to approximately 800 km (500 miles).

7 Emergency Procedures

Introduction
The engines installed in Breezer aircraft are usually not certified aviation engines. For this reason, power plant failures are commonplace. Keep this in mind and plan your flight so, that you can safely perform a forced landing at any time.

Note

One can train how to react in an emergency. The following emergency procedures should be committed to memory and emergency-landing procedures should be trained frequently in flight.

Engine failure

- On the ground

Abort take-off roll - assuming enough runway is available ahead
1. Throttle idle
2. Apply brakes

- Immediately after commencing take off.

Abort take-off
1. Push elevator control forward
2. Increase airspeed
3. Land straight ahead, only undertakes small course directions to avoid obstacles.

Altitude and airspeed rarely suffice to perform the necessary 180° turn to return to the airfield.

Caution

Do not attempt such a turn below 100 m (330 ft) AGL

– In flight

Look for an emergency landing area, pay attention to airspeed and, when possible, land into the wind or up a slope. In wooded areas or in areas with tall plants, regard the top of the plants as the ground surface.

Fire

- Engine fire on the ground
  1 Fuel valve shut
  2 Throttle full open
  3 Ignition key turn to off position
  4 Master switch off
  5 Evacuate the aircraft

- Engine fire during take-off or in flight
  1 Fuel valve shut
  2 Throttle full open
  3 Ignition key turn to off position
  4 Master switch off
  5 Perform an emergency landing craft

- Fire in the cockpit
  1 Fuel valve shut
  2 Ignition key turn to off position
  3 Master switch off
  4 Cabin heating off
  5 Unlock canopy and open slightly
  6 Perform an emergency landing
  7 Evacuate the aircraft

Glide

1. Flaps retracted
2. Airspeed (IAS) 68 mph / 59 kts
3. Glide ratio approx. 10

I.e. from an altitude of 300 m / 1000 ft AGL, the gliding distance will be approximately 3 km / 2 miles (no wind).

Note

The gliding distance increases with a tail wind and decreases with a head wind. Practice landing without engine power under various conditions in order to reach perfection.

Forced landings

Forced landings are not only emergency landings undertaken due to critical technical defects, they also include precautionary landings undertaken when the aircraft or its passengers are in danger due to operational irregularities (e.g. rough engine operation) or deteriorating weather conditions. Breezer pilots should react to technical defects or deteriorating weather conditions as follows:

- Perform a forced landing.
- Look for an emergency landing area
- Pay attention to airspeed and, when possible, land into the wind or up a slope.

Loss of controls

Should one of the controls be lost, flight may be continued using the remaining controls and engine power to compensate for the loss. The following table shows how the various controls may be compensated:

Loss of control	Measures
Elevator	Control altitude and speed using elevator trim
Aileron	Control the aircraft via the rolling moment due to yaw by using the rudder
Rudder	Hold direction using aileron

The following pre-requisites must prevail when attempting a forced landing with defect controls:

- The controls are not blocked in a non-neutral position
- Smooth air
- Large suitable landing area

Loss of alternator

If the voltmeter falls below 12 volt, the battery will not be re-charged. In the worst case, the alternator warning light will not illuminate when this defect occurs. The following steps should be taken when the alternator fails:

1. Switch off all electrical equipment not essential for safe flight operations
2. Land at the next airfield.

8 Normal procedures and Flight training Procedures

Introduction

This chapter provides check lists and amplified procedures for normal operation of this Breezer aircraft. Normal procedures associated with optional systems can be found in the appropriate section.

8.1 Preflight check

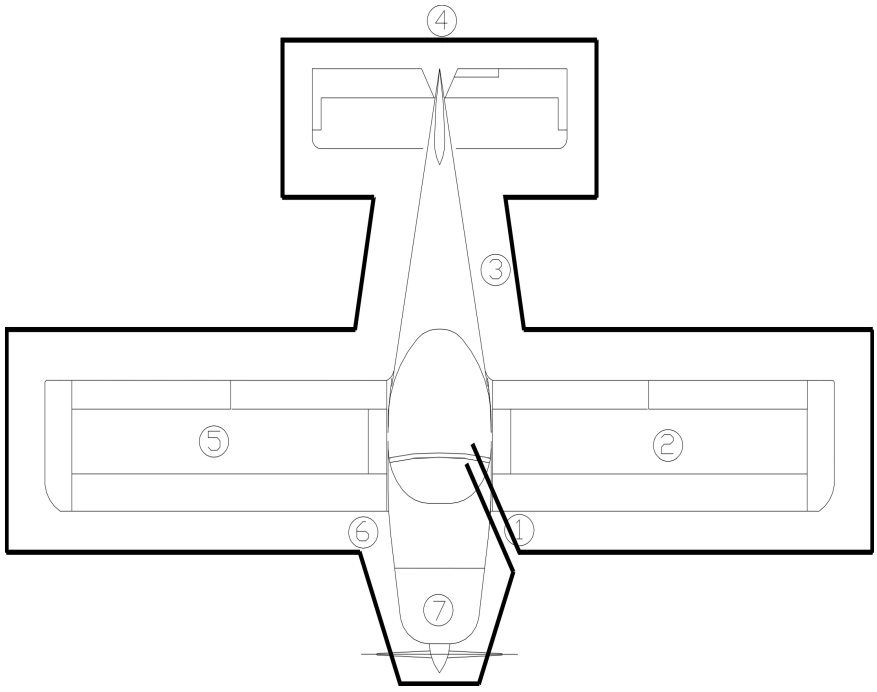
A preflight inspection should be undertaken before each flight. It is for your own safety and all points should be carried out. In this way, small defects may be discovered and removed on time.

Cabin control

a.	Aircraft papers	check
b.	Check list	available
c.	Ignition key	removed
d.	Master switch	off
e.	Ignition key	off
f.	Amount of fuel	sufficient for the planned flight
g.	Throttle	idle
h.	Foreign substance check	complete
i.	Baggage	stored and secure

Walk-around inspection

Visually inspect the general condition of the aircraft, i.e. check the following stations for damage (deformation, cracks), play and freedom of movement of the control surfaces, tight fit, correct attachment and general condition. Also check ground and firewall for signs of leakage (brake fluid, oil, coolant)!



Left main landing gear

(1)	Landing gear strut	visual inspection
(2)	Landing gear attachment	visual inspection
(3)	Wheel fairing (if installed)	visual inspection
(4)	Tire pressure	check
(5)	Tire, wheel, brakes	visual inspection

Left wing

(1)	Wing skin	visual inspection
(2)	Wing tip, mass balance	visual inspection
(3)	Strobe light (if installed)	visual inspection
(4)	Aileron	visual inspection
(5)	Flaps	visual inspection

Fuselage

(1)	Skin	visual inspection
(2)	External items	visual inspection

Empennage

(1)	Stabilizers and control surfaces	visual inspection
(2)	Trim surfaces	visual inspection

Right wing

(1)	Wing skin	visual inspection
(2)	Flaps	visual inspection
(3)	Aileron	visual inspection
(4)	Wing tip, mass balance	visual inspection
(5)	Strobe light (if installed)	visual inspection
(6)	Pitot tube	bore-hole free, clean

Right main landing gear

(1)	Landing gear strut	visual inspection
(2)	Landing gear attachment	visual inspection
(3)	Wheel fairing (if installed)	visual inspection
(4)	Tire pressure	check
(5)	Tire, wheel, brakes	visual inspection

Front fuselage

(1)	Upper cowling	remove
(2)	Oil level	check
(3)	Coolant level	check
(4)	Fuel system	visual inspection
(5)	Cowling	visual inspection
(6)	Air inlets	no blockage
(7)	Propeller	visual inspection, secure
(8)	Propeller reduction gear	turn propeller, check for unusual noises
(9)	Hub	visual inspection
(10)	Nose landing gear	visual inspection
(11)	Tire and wheel	visual inspection
(12)	Wheel fairing (if installed)	visual inspection
(13)	Tire pressure	check

Note

The following points should be checked once a day, before beginning flight operations, in addition to the steps listed under 7.

Front fuselage

(14)	Tank	drain sample to check for water
(15)	Engine mount	visual inspection
(16)	Exhaust system	visual inspection
(17)	Lubrication and fuel lines	visual inspection
(18)	Electric system and bowden control cables	visual inspection
(19)	Upper cowling	secure

8.2 Starting the engine

- Pre-flight inspection — complete
- Safety harness — adjust and lock
- Canopy — lock
- Flight controls — free
- Fuel valve — open
- Choke — pull, if engine cold
- Brakes — apply
- Throttle — free, closed
- Propeller area — clear
- Master switch — on
- Ignition – both circuits — on
- Alternator warning light — illuminates
- Ignition key turn to start position — on
- Oil pressure — check

Warm up the engine at 2200-2500 rpm until oil temperature reaches 50°C. Engine warm-up may be completed during taxiing. Check each magneto at 3800 rpm, rpm drop should not exceed 150 rpm on either magneto. Maximum engine run-up rpm with the standard propeller is 4800 ± 100 rpm. Engine power is adequate if this rpm is reached during a full power check on the ground.

Note

To start the engine in cold weather conditions, pull out the choke completely but do not open the throttle. In warm weather, do not apply any choke but open the throttle slightly.
Crank the engine for a maximum of 10 sec. Allow the starter to cool for two minutes if the engine does not start. As soon as the engine starts, set the throttle level in such way that the engine runs smoothly at minimum rpm

8.3 Taxiing

- Electrical equipment — ON
- Choke — closed
- Flight instruments and avionics — set
- Brakes — check
- Directional control — check
- Flight instruments and avionics — check (if possible)

This Breezer aircraft can be steered precisely using the steerable nose wheel. It is normally not necessary to apply the brakes during taxiing.

8.4 Normal Takeoff

- Engine monitoring instruments — within normal operating range
- Trim — neutral
- Throttle — full open (smoothly), 4800 ± 100 rpm
- Elevator — neutral

- Hold direction using rudder
- Unstick nose wheel 74 km/h (46 mph / 40 kts)
- Increase airspeed and climb at 111 km/h (69 mph / 60 kts)

Warning

Takeoff is prohibited if:

- the engine monitoring instruments are above or below operating limits;
- the engine does not run at full power;
- the engine does not run smoothly;
- the cross-wind component exceeds permissible levels

Climb

- Engine monitoring instruments within normal operating range
- Throttle full open, at 150 m (500 ft) altitude above ground or more reduce power by approx. 100-200 rpm
- Climb airspeed 111 km/h (69 mph / 60 kts)

Note

Monitor oil temperature carefully in warm weather. If the maximum value of 140°C is reached during climb, increase climbing airspeed or reduce rpm.

8.5 Best angle of climb speed (V_x)

Best angle of climb speed is 108 km/h (67 mph / 58 kts) with flaps at 0°

8.6 Best rate of climb speed (V_y)

Best rate of climb speed is 111 km/h (69 mph / 60 kts) with flaps at 0°

8.7 Cruise

Optimum airspeed for cruising lies between 100 mph / 87 kts and 119 mph / 103 kts at 4500 to 5000 rpm. During cruising flight, monitor your fuel consumption and your engine monitor instruments.

8.8 Approach

Always try to land into the wind or the runway with the least crosswind if possible!

- Initial approach airspeed max. 74 mph / 64 kts
- Throttle as required
- Flaps set as required
- Final approach airspeed 64 mph / 56 kts

Note

In strong head winds, turbulence or rain, increase approach speed slightly. The position of the flaps during landing depends on the length of the runway and the prevailing wind conditions. Do not fully extend the flaps when landing in strong head winds.

8.9 Normal landing

At the distance of 3 ft over the ground, close the throttle and land the aircraft gently with the main landing gear first. Lower slowly the nose wheel.

When landing with crosswind, perform a crabbing approach or slip carefully.

Note

Flights over obstacles during approach to landing should be avoided (if possible).

Engine stop

- Throttle idle
- Avionics OFF
- Ignition key turn to off position OFF
- Master switch OFF

Check list

A loose-leaf checklist is to be found in Appendix X.1. It may, however, not be complete. Only the procedures described in Chapter 8 are binding.

8.10 Short field takeoff and landing procedures

Take off

- Set the airplane fully on brakes.
- Set flaps on 25° position.
- Apply full power (maximum RPM).
- Release the brakes.
- Pull the landing control stick at stall speed 50 mph (43 kts)

Landing

Always try to land into the wind or the runway with the least crosswind if possible!

- Flaps Set on 45° position
- Initial approach airspeed 64 mph / 56 kts
- Throttle as required
- Final approach airspeed 58 mph / 50 kts

Warning

The airspeed is near the stall speed - in strong head winds, turbulence or rain, increase approach speed slightly. Do not fully extend the flaps when landing in strong head winds.

8.11 Balked landing procedures

- Apply the throttle smoothly to fully open (forward)
- Engine speed: 4800 – 5000 RPM
- Pull the control stick backward smoothly as airspeed builds up to 63 mph (55 kts).
- Climb to a minimum altitude 350 ft.
- Set the flaps smoothly to 10° position (if they were set).
- Climb to a minimum height of 600 ft. in straight ahead flight at 69 mph (60 kts) before attempting to turn the aircraft.

8.12 Information on stalls, spins and any other useful pilot information

Stalls

Slight buffeting will be experienced as the aircraft approaches its stall speed. At speeds below 56 mph (49 kts), the control forces will get lighter.

A stall during level flight with flaps retracted is preceded by slight buffeting. Usually the aircraft will pitch down, in gusty weather it may have a tendency to drop one wing. The wing can be easily brought back into the horizontal position using the rudder. Stall characteristics with flaps extended

are exactly the same as those with flaps retracted and may be described as docile. Loss in altitude during stalling with maximum takeoff mass is approximately 330 ft (100 m).

Stalling during a turn is preceded by heavy buffeting before the aircraft rights itself and resumes level flight. The aircraft shows no tendency to drop the wing on the inside of the turn. Loss in altitude during a stall in a turn with maximum take-off mass is approximately 360 ft (110 m).

Spins

Intentional spins are prohibited with a Breezer aircraft. Due to the excellent slow flight characteristics of the Breezer, inadvertent spins are extremely unlikely to occur during climb, cruise, descent or even in a turn as long as aircraft speed does not fall below stalling speed. Should, however, an inadvertent spin occur, the following recovery procedure should be used:

1. Throttle idle
2. Aileron neutral
3. Elevator neutral
4. Rudder full rudder opposite to direction of rotation

After rotation has ended, make a smooth recovery of the aircraft.

Warning

Too abrupt recovery could lead to overloading the aircraft structure. Too gentle a recovery could lead to VNE being exceeded and thus result in structural damage.

9 Aircraft Ground Handling and Servicing

9.1 Servicing fuel, oil, and coolant

To fill up the fuel tank one person is needed.

1. Make sure the plane is set with chalks on wheels .
2. Open the fuel cap.
3. Pour in the fuel per specification.
4. Check the needed amount of the fuel by the fuel gauge after pouring.
5. Close the cap.
6. Make sure that no spilled fuel is on the plane. Remove, if necessary.

To service oil one person is required.

1. Remove the oil control cover plate.
2. Make sure the ignition key and main switch are OFF.
3. Rotate the propeller ONLY in the operating direction until a gurgling sound is heard from the reservoir tank.
4. Open the oil tank cap and check the level of the oil by the dipstick.
5. Add oil if necessary.
6. Close the cap.

To service the coolant one person is needed.

1. Remove the top cowling.
2. Open the cap of the coolant tank and add coolant to fill up the tank.

3. Make sure the ignition and both main circuit breakers are OFF.
4. Turn the propeller 8 to 10 times counter-clockwise standing in front of the aircraft.
5. Make sure that no air is inside the cooling system.
6. Close the coolant tank cap.
7. If necessary, add coolant to the expansion tank.

9.2 Towing and tie-down instructions

To tow the aircraft one person is required.

1. Make sure the aircraft ignition is off .
2. Make sure the space near the aircraft is clear of obstacles and people.
3. Push the tail beam of the aircraft down to lift the nose gear off the ground.
4. Push the aircraft in needed direction.

To tie the aircraft down one person is needed.

1. Make sure the plane the wheels chalked .
2. Attach the tie down straps over the wings. Caution do not strap over the flaps or ailerons.
3. Attach the lines to the mooring arrangements on the ground. Make sure the lines are tightened.

10 Required Placards and Markings

10.1 Airspeed indicator range markings and their meaning are shown in the following table

Marking	IAS		Explanation
	mph	kts	
White arc	50 – 84	43 – 73	Full flap operating range
Green arc	56 – 121	49 – 105	Normal operating range
Yellow line	112	97	No full or abrupt control movements may be made above the yellow line
Yellow arc	121 – 161	105 – 140	Operations must be conducted with caution and only in smooth air
Red line	161	140	Maximum speed for all operations (V_{NE})

10.2 Operating limitations on instrument panel

Warning placard - flight maneuvers:
For the 100hp:

V_{NE}	161 mph (140 kts)
V_{FE}	82 mph (71 kts)
VA (112 mph)	112 mph (97 kts)
RPM max. (5 mins)	5800 rpm
RPM max. continuous	5500 rpm
Oil pressure	29 – 72 psi (2 - 5 bar)
Oil Temp.	Min. 50°C
Oil Temp.	Max. 130°C
CHT	Max. 135°C

STARTER

Loading

Position : within Pilot's view

Max. weight	1320 lb (599 kg)
Min. cockpit load	159 lb (72 kg)
Max. weight per seat	250 lb (100 kg)

10.3 Passenger Warning – VFR

Position : within Passenger's view

This aircraft was manufactured in accordance with Light Sport Aircraft airworthiness standards and does not conform to standard aircraft airworthiness requirements.
To be flown VFR only.

Occupant Warning – Non VFR

Position : within Occupant's view

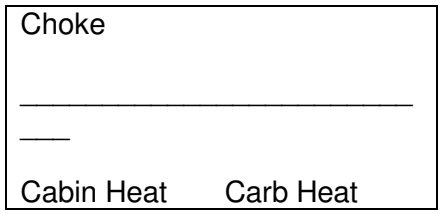
10.4 Prohibited Maneuvers

Position : within Pilot's view

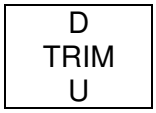
10.5 Miscellaneous placards and markings

Starter - next to the starter button

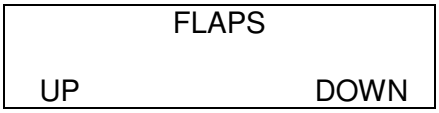
Choke, cabin heat & carb heat - next to the choke:



Trim - next to the trim switches.



Flaps - next to the flaps control lever:



"Light Sport" - Position : On the exterior of the doors and is minimum of 2" in height

Baggage loads:
On the shelf behind the passenger seat - left

Max Baggage Load – 44 lbs (20 kg)

Fuel grade and amount:
Near the fuel tank filler cap on the front fuselage cover

For the 100 hp Rotax:

Unleaded Premium Auto GAS Minimum Fuel Grade RON 95 AVGAS 100LL Avoid prolonged use of Avgas

Position - near the fuel filler:

Usable fuel capacity 17 US Gallons (65 liters)

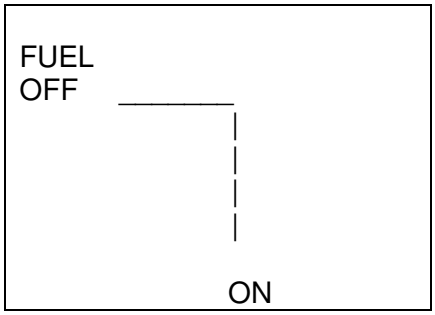
Unleaded Fuel Warning

Position : within Pilot's view

USE OF UNLEADED MOGAS
(See Airworthiness Notice 98B & C)
* Only legal in aircraft specifically approved for the purpose.
* Fuel to be fresh, clean, alcohol and water free.
* Check for leaks and deterioration of pipes, fittings, and valves.
* Verify takeoff power prior to committing to takeoff.
* Tank fuel temperature not above 20°C.
* Fly below 6000 ft.

CARB ICING AND VAPOUR LOCK MORE LIKELY

Main fuel shut off valve- next to the fuel valve:



Oil Filler

Position - near the oil filler:

Use synthetic or semi-synthetic oil. Specification API SG, SF or higher. See Rotax manual for oil recommendations

11 Supplementary information

11.1 Familiarization flight procedures

For familiarization flight procedures, refer to the chapter 8

11.2 Maintenance

Introduction

This chapter contains procedures recommended by the manufacturer for the proper ground handling and routine care and servicing of this Light Sport Aircraft.
The observance of the following service intervals is in the interest of your own safety and will maintain the value of your aircraft.

Maintenance intervals

Engine / Propeller

The manual provided by the engine manufacturer contains all necessary information on engine maintenance.
The manufacturer of the Rotax 912 has set a time between overhauls (TBO) of 1500 hours or 15 years for this engine, after which the engine should be completely overhauled.

Daily inspection:	as described in Chapter 8 of this handbook and in the engine manual.
25 hrs inspection:	in accordance with the engine manual
100 hrs /annual inspection:	in accordance with the engine manual, to be repeated every 100 hours
200 hrs inspection:	replacement of: spark plugs ,fuel filter, coolant
Oil change	in accordance with the engine manual. The oil tank drain valve is located on the underside of the oil tank. The oil filter is on the left side of the gear box.

Note
Cut open the used oil filter and check the filter paper for metal filings

Propeller: with the propeller mounted on the aircraft, inspection is restricted to a visual check for damage, e.g. cracks, dents, foreign object damage, etc. All bolts must be torqued according to the manufacturer's requirements on installation.

Airframe: all inspections are based on an extended version of the pre-flight inspection, i.e. the normal pre-flight inspection including those points, which are checked once a day before the first flight of the day (Chap. 8).

25 hours inspection

1. Extended pre-flight inspection
2. Engine maintenance as per engine manual
3. Check setting and secure attachment of propeller
4. Check fuel tank for contamination
5. Check exhaust attachment screws and springs

50 hours inspection

1. Detailed pre-flight inspection, plus:
2. Thorough cleaning of the aircraft, inside and out
3. Engine maintenance as per engine manual
4. Check secure attachment of propeller
5. Check engine hoses and lines for leakage and proper fitting
6. Check air filter, blow out if necessary (from the inside out!)
7. Check exhaust attachment screws and springs for cracks
8. Check nose-wheel landing gear and wheel for damage and cracks, grease bearings
9. Check main landing gear for secure attachment and damage
10. Check control rods. Open the hand-holes in the fuselage (3) and in the wings (2) and check functionality of shift levers.
11. Check rudder control cables for abrasion and secure attachment.
12. Grease the hinges of the: elevator, rudder and ailerons
13. Check the attachment of the horizontal tail and the vertical tail spar
14. Grease the flap bearings
15. Check the installation of the recovery system, the laying of the attachment straps, the attachment of the release grip (if installed).
16. Check battery
17. Check brakes for leakage, amount of brake fluid and function

100 – hours inspection

1. 50 hours inspection, plus:
2. Very careful check of:
3. Welded joints of the engine mount, bolts and rubber bearings of the engine suspension and the engine mount
4. Engine maintenance as per engine manual
5. Check nose wheel landing gear and rubber damper for damage and cracks; change tire if necessary
6. Check main landing gear for damage, delaminating and secure attachment of the bolts; change tires if necessary
7. Check the brake discs and the wheel bearings (play, lubrication)
8. Careful check of the electrical system and the battery
9. Careful inspection of the skin and the rivets for damage, secure attachment and cracks
10. Careful inspection of all instruments and avionics
11. Careful inspection of the cockpit interior:
    - for foreign substances
    - the flight controls for bearing play
    - wing attachment
12. Carry out lubrication in accordance with the lubrication plan.

Lubrication plan

Note
Acid-free grease and oil only should be used. In order to prevent unnecessary dirtying of the aircraft, do not use too much grease or oil.

Grease

1. Nose-wheel axle
2. Upper nose-wheel landing gear bearing
3. Flap mechanism and bearing
4. Canopy guide rails

Oil

1. Elevator, aileron and rudder hinges
2. Trim tab hinges
3. Movable parts of the flight controls including the shift levers
4. Canopy lock
5. Brake lever, rudder pedals
6. Bowden control cables

Changes / Repairs

Changes, excepting the installation of additional instruments and/or avionics, may only be carried out with the permission of the manufacturer and the certification authority. The owner/operator may carry out repair work but this work is limited to the replacement of defect parts with original parts. Repair work on the skin of the aircraft may be carried out by authorized persons following authorized repair procedures.

Ground handling

The aircraft may only be moved by hand by pulling it at the propeller hub. It should not be pushed at the wing tips or at the control surfaces. To move the aircraft backwards and during leveling, push down the fuselage at fuselage-vertical tail connection and/or at the horizontal tail root (at the main spar) and position as required.

Clearing and care

A dirty aircraft does not perform as well as a clean one and dirt can cover damage. The aircraft should, therefore, be cleaned at the end of each day of flight. Insects and light dirt are best removed using clear water, for more persistent dirt a mild detergent may be added to the water.
Depending upon type of operation and weather conditions the painted surfaces should be polished and waxed at least once a year.
One should avoid parking the aircraft for longer periods in the bright sunlight or in rain; if necessary, use a tarpaulin to protect the aircraft from the weather.

Special operating conditions

- If the aircraft is operated with wheel fairings from muddy runways, make sure that no mud collects in the rear part of the fairing.
- During winter operations, this mud or snow could freeze in the air and the wheels could block.
- During winter operations, carefully remove all snow from the wings and make sure that the control surfaces move freely.
- If during winter operations the engine does not reach its minimum operating temperature of 90°C - 100°C, partially cover the oil cooler.

12 Appendix

12.1 Check list

Before starting the engine

1.	Pre-flight inspection	complete
2.	Seat belts	adjust and lock
3.	Canopy	locked, lever to the left
4.	Controls	check freedom of movement
5.	Fuel valve	open
6.	Throttle	check freedom of movement, open slightly

Starting the engine

1.	Propeller area	clear
2.	Choke	pull
3.	Master switch	ON
4.	Ignition	both ON
5.	Starter	press
6.	Oil pressure	check

Taxiing

1.	Electrical equipment	ON
2.	Flight instruments and avionics	set
3.	Brakes	check
4.	Directional control	check
5.	Flight instruments and avionics	check (if possible)

Take off

1.	Trim	neutral
2.	Throttle	full open
3.	Elevator	neutral
4.	maintain Direction	Use the rudders
5.	Take-off airspeed	46 mph / 40 kts
6.	Increase airspeed and climb out with	69 mph / 60 kts

Cruise

1.	Climb to cruising altitude	
2.	Rpm / airspeed	as required

Descent

1.	Reduce airspeed to	74 mph / 64 kts
2.	Throttle	as required

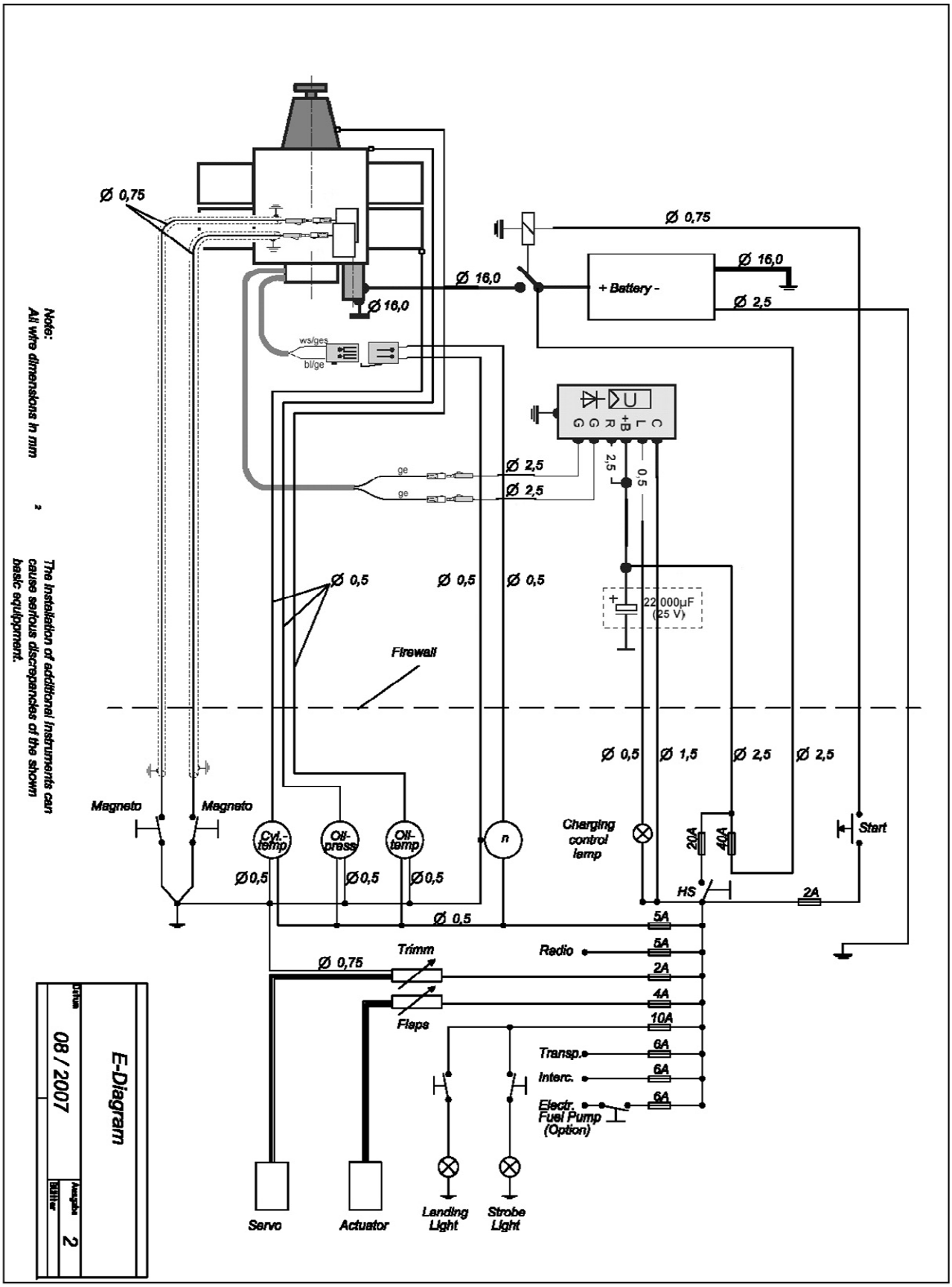
Approach

1.	Final approach airspeed	64 mph / 56 kts
2.	Flaps	set as required
3.	Touchdown	main landing gear first
4.	Brake	as required

Shutting down and securing the aircraft

1.	Throttle	idle
2.	Avionics	OFF
3.	Ignition	OFF
4.	Master switch	OFF

12.2 Circuit plan



13 Issue Amendments

The Issue Amendments pages are updated by Breezer Aircraft each time revision is issued.

Issue No.	Change / Description	Date	Signature
1	Initial draft issue 1	09/24/2007