Aircraft Operating Instructions

BRISTELL LSA

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BRISTELL LSA

BRMAERO Wings with heart

Aircraft Operating Instructions

BRISTELL LSA

Registration: **N163BL**

Serial Number: **363/2018**

This airplane must be operated in compliance with information and limitations contained in herein. This AOI must be available on board of the airplane.

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SECTION 0

0 Technical Information

0.1 Record of revisions

0.2 List of effective pages

0.3 Table of contents

0.1 Record of revisions

Any revision of the present manual (except actual weighing data, cockpit description and list of instruments and avionics) must be recorded in the following table.

Revision No.	Affected Section	Affected Pages	Date of Issue	Approved by	Date of approval	Date inserted	Sign.
-	ALL	ALL, Initial	03/2018	Petr Javorský	03/2018	03/2018	P.Javorský

0.2 List of effective pages

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0.3 Table of contents

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SECTION 1

1 General Information

1.1 Introduction

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1.2 Warnings, cautions and notes

1.3 Descriptive data

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1.3.2 Power plant
1.3.3 Aircraft dimensions
1.3.4 Aircraft layout

1.4 Definitions and abbreviations

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1.1 Introduction

This Aircraft Operating Instructions have been prepared to provide the pilots, instructors, owners and operators with information for safe and efficient operation of BRISTELL aircraft. It also contains supplemental data supplied by the Aircraft Flight Training Supplement.

It is the pilot's responsibility to be familiar with this handbook, the special characteristics of this aircraft, and all other information and legal requirements relevant for the operation in his country. The pilot is responsible to determine the aircraft is safe for flight, and to operate the aircraft with respect to the procedures and limitations provided in this manual.

It is the owner's/operator's responsibility to have the aeroplane registered and insured, according to country-specific regulations. The aircraft owner/operator is also responsible for maintaining the aircraft in airworthy condition.

1.1.1 Certification

BRISTELL LSA is a light sport category airplane made in
BRM AERO s.r.o., Uherske Hradiste, Czech Republic,
based on the following airworthiness requirements:

- ASTM Consensus Standards:
  F2245
  F2279
  F2295
  and other to LSA category applicable ASTM Consensus Standards.
- Czech LAA UL-2 Standards
- EASA CS-VLA Standards

1.2 Warnings, cautions and notes

The following definitions apply to warnings, cautions and notes in the Pilot Operating Handbook.

WARNING

Means that the non-observation of the corresponding procedure leads to an immediate or important degradation of the flight safety i.e. to injury or death of persons.

CAUTION

Means that the non-observation of the corresponding procedure leads to a minor or possible long term degradation of the flight safety.

NOTE

Draws attention to any special item not directly related to safety, but which is important or unusual.

1.3 Descriptive data

1.3.1 Aircraft description

BRISTELL LSA is an airplane intended especially for recreational and cross-country flying, basic flight training, with limitation to non-aerobatics operation.

BRISTELL LSA is a single-engine, all metal, low-wing monoplane of semi-monocoque construction with two side-by-side seats. The airplane is equipped with a fixed tricycle undercarriage with steerable nose wheel.

1.3.2 Power plant

The standard power plant is composed of ROTAX 912 ULS, 4-cylinder, 4-stroke engine and FITI three blade ground adjustable propeller.

Bristell LSA, S/N 363/2018 is fitted with:

- Rotax 912 iS Sport engine
- DUC Inconel FLASH propeller, composite, 3-bladed, on-ground adjustable.

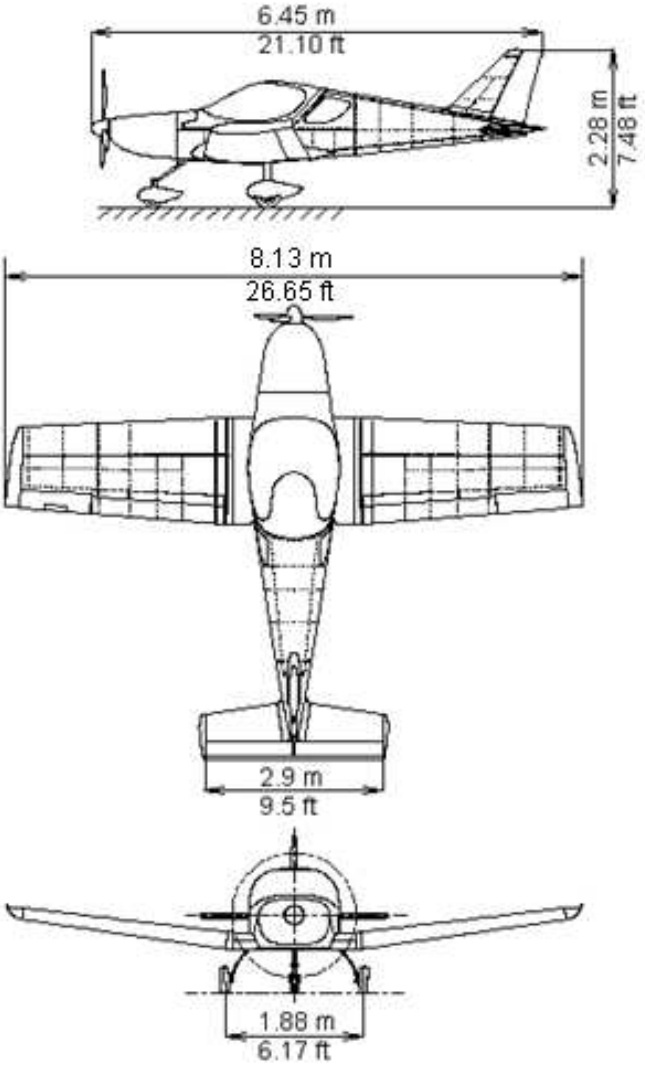
1.3.3 Aircraft dimensions

Wing span	8.13	m	26.65	ft
Length	6.45	m	21.10	ft
Height	2.28	m	7.48	ft
Wing area	10.5	m^2	113.02	sq ft
Wing loading				
Design MTOW 600 kg	57.14	kg/m^2	11.68	lb/sq ft
Cockpit width	1.3	m	51.17	in

Deflections:

Rudder deflections	30° to each side
Elevator deflections	+ 30°/-15°
Aileron deflections	+ 24°/-17°
Flap deflections	0°, 10°, 20°and 30°
Aileron trim deflections	+ 15°/- 20°
Elevator trim deflections	+ 10°/- 25°

1.3.4 Aircraft layout



1.4 Definitions and abbreviations

°F	temperature in degree of Fahrenheit
ASI	Airspeed Indicator
ATC	Air Traffic Control
BEACON	anti-collision beacon
CAS	Calibrated Airspeed
CG	Center of Gravity
COMM	communication transmitter
ECU	Engine Control Unit
EFIS	Electronic Flight Instrument System
ELT	Emergency Locator Transmitter
E-LSA	Experimental Light Sport Aircraft
EMS	Engine Monitoring System
ft	foot / feet
ft/min	feet per minute
GPS	Global Positioning System
hp	power unit
IAS	Indicated Airspeed
IC	Intercom
IFR	Instrument Flight Rules
in	inch
ISA	International Standard Atmosphere
knot	NM per hour
lb	pound
LAA	Light Aircraft Association of the Czech Republi
MAC	Mean Aerodynamic Chord
max.	maximum
min.	minimum or minute

mph	statute miles per hour
NM	Nautical Mile
OAT	Outside Air Temperature
OFF	system is switched off or control element is in off-position
ON	system is switched on or control element is in on-position
POH	Pilot Operating Handbook
psi	pound per square inch - pressure unit
rpm	revolutions per minute
sec.	second
US gal	volume unit
V_A	maneuvering airspeed
V_{FE}	maximum flap extended speed
VFR	Visual Flight Rules
VMC	Visual Meteorological Conditions
V_{NE}	never exceed speed
V_{NO}	maximum designed cruising speed
V_{S1}	stall speed with wing flaps in retracted position
V_{SO}	stall speed with wing flaps in extended position
V_X	best angle of climb speed
VY	best rate of climb speed

1.5 Summary of performance specifications

Performance	US units	Metric units
Gross weight (Maximum take-off weight)	1320 lb	600 kg
Top speed at sea level MCP: 5500 rpm	120 KCAS	222 km/h CAS
Cruise speed at sea level 75%: 5000 rpm	108 KCAS	201 km/h CAS
Cruise speed at sea level 65%: 4800 rpm	103 KCAS	190 km/h CAS
Full fuel range at 4000 ft pressure altitude, at 75 % MCP (5000 rpm), No fuel reserve	650 NM	1210 km
Rate of climb at sea level ..... **Vx**	860 fpm at 60 KIAS	860 fpm at 112 km/h IAS
Rate of climb at sea level ..... **Vy**	910 fpm at 67 KIAS	910 fpm at 125 km/h IAS
Stall speed V_{S1} (flaps retracted)	45 KCAS	83 km/h CAS
Stall speed V_{S0} (flaps fully extended)	38 KCAS	71 km/h CAS
Total fuel capacity	31.7 US gal	120 liters
Total usable fuel	31.4 US gal	119 liters
Approved types of fuel **ATTENTION:** Obey the latest edition of Service Instruction SI-912-016, for the selection of the correct fuel.	Min. RON 95 (min. AKI4 91) Mogas: EN 228 super Mogas: EN 228 super plus AVGAS 100LL (ASTM D910)	
Engine Maximum takeoff power	73.5 kW (100 HP) at 5800 rpm	
Engine Maximum continuous power	72 kW (97.9 HP) at 5500 rpm	
Engine Cruising power 75 % of MCP	54 kW (73.4 HP) at 5000 rpm	
Engine Cruising power 65 % of MCP	46.7 kW (63.5 HP) at 4800 rpm	
Engine Cruising power 50 % of MCP	35.9 kW (48.8 HP) at 4300 rpm	

SECTION 2

2 Operating Limitation

2.1 Introduction

Section 2 includes operating limitations, instrument markings and basic placards necessary for the safe operation of the aircraft, its engine, standard systems and standard equipment.

2.2 Airspeed

Airspeed limitations and their operational significance are shown below:

Speed		*KIAS*	IAS (km/h)	Remarks
V_{NE}	Never exceed speed	***157***	**290**	Do not exceed this speed in any operation.
V_{NO}	Max. structural cruising speed	***129***	**240**	Do not exceed this speed except in smooth air, and then only with caution.
V_A	Maneuvering speed	***96***	**180**	Do not make full or abrupt control movement above this speed, because under certain conditions full control movement may overstress the aircraft.
V_{FE}	Maximum Flap Extended Speed	***75***	**139**	Do not exceed this speed with flaps extended.

2.3 Airspeed indicator markings

Airspeed indicator markings and their color-code significance are shown below:

Marking	IAS value or range		Significance
	knots	km/h	
White arc	***37-75***	**70-139**	Flap Operating Range.
Green arc	***44-129***	**82-240**	Normal Operating Range.
Yellow arc	***129-157***	**240-290**	Maneuvers must be conducted with caution and only in smooth air.
Red line	***157***	**290**	Maximum speed for all operations.

2.4 Power plant

2.4.1 Engine operating speeds and limits

Engine Model:		**ROTAX 912 iS Sport**
Engine Manufacturer:		**Bombardier-Rotax GMBH**
Power	***Max Take-off:***	**73.5 kW (100 HP) at 5800 rpm, max.5 min.**
	Max. Continuous:	**72 kW (97 HP) at 5500 rpm**
	Cruising 75%:	**54.0 kW (73.4 HP) at 5000 rpm**
Engine speed	***Max. Take-off:***	**5800 rpm (max. 5 min)**
	Max. Continuous:	**5500 rpm**
	Cruising 75%:	**5000 rpm**
	Idling:	**min 1400 rpm**
Coolant temperature	***Minimum:***	**-**
	Maximum:	**120 °C *(248 °F)***
	Optimum:	**80 – 110 °C *(176 - 230 °F)***
Oil temperature	***Minimum:***	**50 °C *(120 °F)***
	Maximum:	**130 °C *(266 °F)***
	Normal operating:	**90 – 110 °C *(190 – 230 °F)***
Oil pressure:	***Minimum:***	**0.8 bar *(12 psi) - below 3500 rpm***
	Maximum:	**7 bar (*102 psi*) - For a short period at cold start**
	Normal:	**2 - 5 bar *(29-73 psi) - above 3500 rpm***
Exhaust gas temp.	***Maximum:***	***950 °C (1742 °F)***
Fuel pressure	***Maximum:***	**3.2 bar *(46.5 psi)***
	Minimum:	**2.8 bar *(40.5 psi)***
Ambient temperature	***Maximum in flight:***	**60 °C (140 °F) (manifold temperature)**
	Maximum at start:	**50 °C (120 °F) (ambient temperature)**
	Minimum at start:	**-20 °C (-13 °F) (oil temperature)**

2.4.2 Fuel

General note

NOTICE Obey the latest edition of Service Instruction SI-912 i-001 for the selection of the correct fuel.

NOTICE Use only fuel suitable for the respective climatic zone.

NOTE: Risk of vapour formation if using winter fuel for summer operation.

Antiknock properties

Fuels with following specification can be used:

Fuel specification	
	Usage/Description
Anti-knock properties	**912 i Series**
	Min. RON 95

NOTE: For fuels according to ASTM D4814 and/or fuels with RON instead of AKI (Anti Knock Index) specifications, following AKI value has to be observed: min. AKI 91

MOGAS

	Usage/Description
MOGAS	**912 i Series**
European standard	EN 228 Super
	EN 228 Super plus

AVGAS

AVGAS 100LL places greater stress on the valve seats due to its high lead content and forms increased deposits in the combustion chamber and lead sediments in the oil system.

	Usage/Description
AVGAS	**912 i Series**
Aviation Standard	AVGAS 100 LL (ASTM D910)

Fuel volume:

Wing fuel tank volume	2x60	l	2x16	US gal
Unusable fuel quantity	2x0.5	l	2x0.13	US gal

2.4.3 Oil

Oil type

Motorcycle oil of a registered brand with gear additives.

NOTICE

At the selection of suitable lubricants refer to the additional information in the Service Information SI-912 i-001, latest edition.

Oil consumption

Max. 0.06 l/h (0.13 liq pt/h).

Oil specification

- Use only oil with API classification **"SG"** or higher!
- Due to the high stresses in the reduction gears, oils with gear additives such as high performance motor cycle oils are required.
- Because of the incorporated overload clutch, oils with friction modifier additives are unsuitable as this could result in clutch slippage during normal operation.
- Heavy duty 4-stroke motor cycle oils meet all the requirements. These oils are normally not mineral oils but semi- or full synthetic oils.
- Conventional aircraft oils (a.d.= ashless dispersant) are not suitable. Oils with ashless dispersant do not have suitable cleaning agents for modern designs such as the ROTAX 912 i Series.
- Oils primarity for Diesel engines have **insufficient high temperature properties and additives which favour clutch slipping, and are generally unsuitable.**

NOTE

Type of oil used by aircraft manufacturer is shown in Section 10 Supplement No.2.

Oil volume:

Minimum	3.2 l	0.856	US gal
Maximum	3.6 l	0.951	US gal

2.4.4 Coolant

General note

NOTICE Obey the latest edition of Service Instruction SI-912 i-001 for the selection of the correct coolant.

Conventional coolant

Conventional coolant mixed with water has the advantage of a higher specific thermal capacity than water-less coolant.

Application

When correctly applied, there is sufficient protection against vapor bubble formation, freezing or thickening of the coolant within the operating limits.

Use the coolant specified in the manufacturers documentation.

Mixture

NOTICE Obey the coolant manufacturers instructions about the coolant mixture.

	mixture ratio %	
designation	**concentrate**	**water**
Conventional e.g. BASF Glysantine Protect Plus G48 anticorrosion	50	50

NOTE

Type of coolant used by aircraft manufacturer is shown in Section 10 Supplement No.2.

Coolant liquid volume:

It is about.....2.5 l 0.66 US gal

2.5 Power plant instrument markings

Analogue engine instruments markings and their color-code significance are shown below.

Rotax 912 iS Sport	Minimum Limit (red line)	Normal Operating Range (green arc)	Caution Range (yellow arc)	Maximum Range (red line)
Engine speed [RPM]	1400	1400-5500	5500-5800	5800
Oil Temperature	*50 °C (120 °F)*	*50 – 110 °C (120 – 230 °F)*	*110 – 130 °C (230 – 266 °F)*	*130 °C (266 °F)*
Exhaust Gas Temp. (EGT)	-	*800 – 850 °C (1472 – 1562 °F)*	*850 – 950 °C (1562 - 1742 °F)*	*950 °C (1742 °F)*
Coolant Temperature (CT)	50 °C *(122°F)*	50-110°C *(122-230°F)*	110-120 °C *(230 - 248 °F)*	120 °C *(248 °F)*
Oil Pressure	*0.8 bar (12 psi)*	*0.8 - 5 bar (12 - 73 psi)*	*5 - 7 bar (73 - 102 psi)*	*7 bar (102 psi) cold engine starting*

2.6 Miscellaneous Instrument Marking

There is not any miscellaneous instrument marking.

2.7 Weight

Empty weight (standard equipment).....	325 kg	715 lb	
Max.take-off weight	600 kg	1320 lb	
Max.landing weight.....	600 kg	1320 lb	
Max. weight of fuel (120 l)	87 kg	192 lb	
Max. baggage weight:			
Baggage compartment behind seats.. …	15 kg	33 lb	
Wing lockers (optional).....	20 kg	44 lb	each
Front locker (optional)	10 kg	22 lb	

NOTE
Actual empty weight is shown in SECTION 6

2.8 Center of gravity

Operating C.G. range.....	25 to 35	%	of MAC
MAC 53.819	in	1367	mm

Datum: Wing leading edge between ribs No. 4 and 5, 81.52 in (2071 mm) from plane of symmetry.

2.9 Approved maneuvers

Airplane Category: LSA (Special Light Sport Aircraft)

The BRISTELL LSA is approved for normal and below listed maneuvers:

- Steep turns not exceeding 60° bank
- Lazy eights
- Chandelles
- Stalls (except whip stalls)

WARNING
Aerobatics and intentional spins are prohibited!

2.10 Maneuvering load factors

Maximum positive limit load factor .....+4 g

Maximum negative limit load factor .....- 2 g

2.11 Crew

Number of seats 2

Minimum crew .....1 pilot in the left seat

Minimum crew weight.....121 lb

Maximum crew weight.....see SECTION 6

WARNING

Do not exceed maximum take-off weight!

2.12 Kinds of operation

There are permitted Day VFR flights, Night VFR flights are permitted with installation of optional Night Lighting Package and operation by an appropriate rated pilot.

WARNING

IFR flights and intentional flights under icing conditions are PROHIBITED!

Minimum instruments and equipment list for VFR flights:

- Airspeed indicator
- Altimeter
- Compass (not required by ASTM F 2245)
- Fuel quantity indicator
- Tachometer (RPM)
- Oil temperature indicator
- Oil pressure indicator
- Cylinder head temperature indicator (Coolant temp indicator)

2.13 Other limitations

WARNING

No smoking on board of the aircraft!

SECTION 3

3 EMERGENCY PROCEDURES

3.1 Introduction

Section 3 provides checklists and amplified procedures for coping with various emergencies that may occur. Emergencies caused by aircraft or engine malfunction are extremely rare if proper pre-flight inspections and maintenance are practiced.

However, should an emergency arise, the basic guidelines described in this section should be considered and applied as necessary to correct the problem.

3.2 Engine Failure

3.2.1 Engine failure during take-off run

1. Throttle - reduce to idle
2. Ignition (LANE A,B) - switch off
3. Apply brakes

3.2.2 Engine failure during take-off

1. Speed - gliding at 120 km/h (65 KIAS)
2. Altitude - below 150 ft: land in take-off direction
   - over 150 ft: choose a landing area
3. Wind - find direction and velocity
4. Landing area - choose free area without obstacles
5. Flaps - extend as needed
6. Fuel Selector - shut off
7. Ignition (LANE A,B) - switch off
8. Safety harness - tighten
9. Master switch - switch off before landing
10. Land

3.2.3 Engine failure in flight

1. Push control stick forward
2. Speed - gliding at 120 km/h (65 KIAS)
3. Altitude - below 150 ft: land in take-off direction
   - over 150 ft: choose a landing area
4. Wind - find direction and velocity
5. Landing area - choose free area without obstacles
6. Flaps - extend as needed
7. Fuel Selector - shut off
8. Ignition (LANE A,B) - switch off
9. Safety harness - tighten
10. Master switch - switch off before landing
11. Land

3.3 In-flight Engine Starting

Engine Stop

1. If the propeller continues to rotate during flight by windmilling, but the speed is not sufficient to start the engine, the electric starter can be used without problems. You must not wait until the propeller stands still.
2. Electric pumps - ON
3. Fuel Selector - switch to second fuel tank
4. Throttle lever - to idling position
5. EMS main switch - AUTO
6. LANE select switch A - ON
7. LANE select switch B - ON
8. Start power switch - switch ON
9. Starter button - press until the engine starts to run
10. Start power switch - switch off after 15 sec.

WARNING

Do not try to re-start the engine in the case, that the reason for the engine stop was empty fuel tank!

3.4 Smoke and Fire

3.4.1 Fire on ground at engine starting

1. Starter - keep in starting position
2. Fuel Selector - close
3. Throttle - full power
4. Ignition (LANE A,B) - switch off
5. Leave the airplane
6. Extinguish fire by a fire extinguisher (if available) or call for a fire-brigade if you cannot do it.
7. Locate the cause of fire and resolve the error before next flight by qualified staff (authorized by the Aviation Authorities).
8. An entry in the logbook must be made.
9. A maintenance inspection should be carried out.

3.4.2 Fire on ground with engine running

1. Heating - close
2. Fuel selector - close
3. Throttle - full power
4. Ignition (LANE A,B) - switch off
5. Leave the airplane
6. Extinguish fire by a fire extinguisher (if available) or call for a fire-brigade if you cannot do it.
7. Locate the cause of fire and resolve the error before next flight by qualified staff (authorized by the Aviation Authorities).
8. An entry in the logbook must be made.
9. A maintenance inspection should be carried out.

3.4.3 Fire during take-off

1. Speed - 120 km/h (65 KIAS)
2. Heating - close
3. Fuel Selector - close
4. Throttle - full power
5. Ignition (LANE A,B) - switch off
6. Land and stop the airplane

7. Leave the airplane
8. Extinguish fire by a fire extinguisher (if available) or call for a fire-brigade if you cannot do it.
9. Locate the cause of fire and resolve the error before next flight by qualified staff (authorized by the Aviation Authorities).
10. An entry in the logbook must be made.
11. A maintenance inspection should be carried out.

3.4.4 Fire in flight

1. Heating - close
2. Fuel Selector - close
3. Throttle - full power
4. Master switch - switch off
5. Ignition (LANE A,B) - switch off
6. Choose of area - heading to the nearest airport or choose emergency landing area
7. Emergency landing - perform according to 3.6
8. Leave the airplane
9. Extinguish fire by a fire extinguisher (if available) or call for a fire-brigade if you cannot do it.
10. Locate the cause of fire and resolve the error before next flight by qualified staff (authorized by the Aviation Authorities).
11. An entry in the logbook must be made.
12. A maintenance inspection should be carried out

NOTE
Engine will stop immediately after master switch switched off.

WARNING
Do not attempt to re-start the engine!

3.4.5 Fire in the cockpit

1. Master switch - switch off
2. Heating - close
3. Use a fire extinguisher (if available).
4. If not land a leave the airplane as soon as possible

3.5 Glide

An example of the use of gliding is in the case of engine failure

1. Speed - recommended gliding speed 120 km/h (65 KIAS)

3.5.1 Emergency descent

Emergency descent means to get on the ground as quickly as possible. It is used in case of a big problem encountered in flight like engine fire, smoke in the cockpit, or any other serious problem.

1. Throttle lever - fully pulled to set idle
2. Flaps - retracted
3. Control stick - push forward to bring airplane into descent
4. Speed - V_{NO} 129 KIAS (240 km/h)
   Do not exceed this speed except in smooth air, and then only with caution.
   - VNE 157 KIAS (290 km/h)
   Do not exceed this speed in any operation.

Steep spiral dive with max. 60° bank may be used however be carefull to not exceed limit load factor during spiral. You can monitor area below you during a spiral.

3.6 Landing Emergencies

3.6.1 Emergency landing

Emergency landings are generally carried out in the case of engine failure and the engine cannot be re-started.

1. Speed - adjust for optimum gliding 120 km/h (65 KIAS)
2. Trim - adjust
3. Safety harness - tighten
4. Flaps - extend as needed
5. COMM - report your location if possible
6. Fuel Selector - close
7. Ignition (LANE A,B) - switch off
8. Master switch - switch off
9. Perform approach without steep turns and land on chosen landing area.

3.6.2 Precautionary landing

A precautionary landing is generally carried out in the cases where the pilot may be disorientated, the aircraft has no fuel reserve or possibly in bad weather conditions.

1. Choose landing area, determine wind direction
2. Report your intention to land and land area location.
3. Perform low-altitude passage into wind over the right-hand side of the chosen area with flaps extended as needed and thoroughly inspect the landing area.
4. Perform circle pattern.
5. Perform approach at increased idling with flaps fully extended.
6. Reduce power to idle when flying over the runway threshold and touch-down at the very beginning of the chosen area.
7. After stopping the airplane switch off all switches, shut off the fuel selector, lock the airplane and seek for assistance.

NOTE

Watch the chosen area steadily during precautionary landing.

3.6.3 Landing with a flat tire

1. During landing keep the damaged wheel above ground as long as possible using the ailerons control
2. Maintain the direction on the landing roll out, applying rudder control.

3.6.4 Landing with a defective landing gear.

1. If the main landing gear is damaged, perform touch-down at the lowest practicable speed and if possible, maintain direction during landing run.
2. If the nose wheel is damaged perform touch-down at the lowest practicable speed and hold the nose wheel above the ground by means of the elevator control as long as possible.

3.7 Recovery from Unintentional Spin

WARNING
Intentional spins are prohibited!

There is no an uncontrollable tendency of the airplane to enter into a spin provided the normal piloting techniques are used.

Unintentional spin recovery technique:

1. Throttle - idle
2. Lateral control - ailerons neutralized
3. Rudder pedals - full opposite rudder
4. Rudder pedals - neutralize rudder immediately when rotation stops
5. Longitudinal control - neutralize or push forward and recover dive.

3.8 Other Emergencies

3.8.1 Vibration

If any forced aircraft vibrations appear, it is necessary:

1. To set engine speed to such power rating where the vibrations are lowest.
2. To land on the nearest airfield or to perform a precautionary landing according to 3.6

3.8.2 Autopilot malfunction

In the case, that autopilot starts to not work properly, press immediately red button “AP OFF” on the instrument panel.

WARNING
Take-Off, climb, Approach and landing with AP “ON” or with malfunction AP are PROHIBITED.

3.8.3 Inadvertent icing encounter

WARNING

Intentional flights under icing conditions are PROHIBITED!

If icing is inadvertently encountered then:

5. Pitot heat (if installed) - ON
6. Exit icing conditions - change altitude or turn back.
7. Cockpit heating - pull knob to ON
8. Up/Down knob - pushed forward (UP) to defrost windshield

3.8.4 Loss of primary instruments

If primary instruments are lost and the aircraft is fitted with the backup instruments then use these to safely complete the flight.

If no backup instruments are installed then visually check the aircraft altitude and attitude and land as soon as practicable.

3.8.5 Loss of flight controls

Loss of control may have several reasons like a failure of the control system, jamming, disconnection, strong turbulence, unrecoverable spin, pilot disorientation, etc.

If loss of a control appears e.g. due to jamming or disconnection, then some control might be still possible:

Lost control	Action
Ailerons	Some degree of roll control is available by using the secondary effect of rudder. Effectivness of rudder may be increased by rapid bursts of power. Aircraft with a jammed aileron can be landed in a slip, preferably against a crosswind.
Elevator	Try to use elevator trim to control airplane longitudinally. Keep in mind that trim control works considerably slower than elevator control. Engine power may be used to pitch up. Before landing, when the airplane will enter ground effect, will be needed to apply a slight nose-up pitch as the airplane enters ground effect. Small shot of power in addition to the trim up may be needed. Wing flap control may be used to pitch down.
Rudder	Some degree of yaw control is available by using the secondary effect of ailerons.
Wing flaps	The flaps are mechanically interconnected and have the electrical control. If the electrical control would fail or if the flaps would jamm in any position, then adjust elevator trim to trim flaps pitching moment. If (in spite of flaps mechanical interconnection) one flap would extend and the aircraft rolls then immediately use the opposite ailerons and rudder to eliminate pitching and rolling moment.

WARNING

If the control cannot be regained and the aircraft is fitted with a ballistic rescue system, then activate the system.

3.9 Rotax 912 iS Engine abnormal operation

WARNING

Non-compliance can result in serious injuries or death!
At unusual engine behaviour conduct checks as per Maintenance Manual Line Chapter 05-50-00 before next flight

NOTE

Further checks – see Engine Maintenance Manual

3.9.1 Fault indicated by the warning lamps

Warning lamps

NOTE

Reduce engine power setting to the minimum necessary and carry out precautionary landing.

LANE A	LANE B	Action on ground	Action during flight
OFF	Flashing	One way flight to maintenance hangar permissible	Flight is possible to your destination at your own discretion
Flashing	OFF	One way flight to maintenance hangar permissible	Flight is possible to your destination at your own discretion
OFF	ON	Flight not permissible	Land the aircraft
Flashing	Flashing	Flight not permissible	Land the aircraft
Flashing	ON	Flight not permissible	Land the aircraft
ON	OFF	Flight not permissible	Land the aircraft
ON	Flashing	Flight not permissible	Land the aircraft
ON	ON	Flight not permissible	Land the aircraft

ON = permanently on

Landing: Take the next landing oportunity (airfield, airport) at your own discretion.

NOTE

If a warning lamp flashes, it indicates an error with lower severity (Fault) that has been detected by the internal testing procedures of the ECU. In this case, the ECU continues to operate normally. There will be no transfer of control of the ignition and injection to the error-free LANE.
If a warning lamp remains on permanently, it indicates that a fatal error with higher severity (failure) has been detected by the internal testing procedures of the ECU. In this case, the ECU will continue to

operate in an alternative control mode, which will transfer the control of ignition and injection to the error-free LANE.
Regular operation as well as alternative control modes of the ECU are able to represent the full engine power. Differences arise only in the efficiency of the engine.

3.9.2 Engine not responding to power inputs

Engine vibrations

- Possible breakage of throttle valve actuation/linkage.
- Limited flight operation with available power possible.
- A maintenance inspection should be carried out.

3.9.3 Occurrence of uncharacteristic and severe engine vibrations

- If the vibrations occur in conjuction with a loss of power then the engine may only be firing on 3 cylinders.
- Limited flight operation.
- A maintenance inspection should be carried out.

3.9.4 Re-Start during flight

Engine stop

- If the propeller continues to rotate during flight by windmilling, but the speed is not sufficient to start the engine, the electric starter can be used without problems. You must not wait until the propeller stands still.

3.9.5 Failure of the EMS power supply

Failure of the EMS

- If the EMS power supplies (alternator A) fails then the ECU automatically switches one-time over to the second EMS power supply (alternator B).

NOTE
No charging of battery!

- While alternator B runs, no power drop is recognizable.
- Failure of both EMS power supplies (alternator A/B) result in engine stoppage.

Remedy: Switch „ON“ the **backup battery switch.** In this case the power supply is provided by the aircraft battery.

- Land the aircraft at the next available oportunity.

- A maintenance inspection should be carried out.

3.9.6 Exceeding max.admissible engine speed

Exceeding engine speed

- Reduce the engine speed. Any exceeding of the max.admissible engine speedhas to be entered by the pilot into logbook, stating duration and extent of over engine speed.

3.9.7 Exceeding of max.coolant temperature

Exceeding coolant temperature

CAUTION

Reduce engine power setting to the minimum necessary and carry out precautionary landing.

- Any exceeding of the max.admissible coolant temperature has to be entered by the pilot into logbook, stating duration and extent of over-temperature condition.
- A maintenance inspection should be carried out.
- Check the ECU error log file.

3.9.8 Exceeding of max.admissible oil temperature

Exceeding oil temperature

CAUTION

Reduce engine power setting to the minimum necessary and carry out precautionary landing.

- Any exceeding of the max.admissible oil temperature has to be entered by the pilot into logbook, stating duration and extent of over-temperature condition.
- A maintenance inspection should be carried out.
- Check the ECU error log file.

3.9.9 Oil pressure below minimum - during flight

Oil pressure too low

CAUTION

Reduce engine power setting to the minimum necessary and carry out precautionary landing.

- Check oil system.
- A maintenance inspection should be carried out.
- Check the ECU error log file.

3.9.10 Oil pressure below minimum - on ground

Oil pressure too low

CAUTION

Immediately stop the engine and check for reason. Check oil system.

- Check oil quantity in oil tank.
- Check oil quality. See also Chapter 2.4 of the Engine Manual.
- A maintenance inspection should be carried out.

3.9.11 Oil pressure above permitted range at low ambient temperatures

Oil pressure too high

- Reduce engine speed and check the oil pressure again once it has reached a higher oil temperature.
- A maintenance inspection should be carried out.
- Check the ECU error log file.

3.9.12 Engine on fire or fire in the engine compartment

Engine on fire

WARNING

Carry out emergency procedures as prescribed in 3.6.1Emergency landing.

- After landing locate the cause of fire and resolve the error before next flight by qualified staff (authorized by the Aviation Authorities).
- An entry in the logbook must be made.
- A maintenance inspection should be carried out.

3.9.13 Fuel pressure outside range

Exceeding fuel pressure

CAUTION

Reduce engine power setting to the minimum necessary and carry out precautionary landing.

- If the pressure is too high, switch the AUX-pump OFF. If this has no effect then limited flight operation with reduced power is possible.
- If the pressure is too low, switch the AUX-pump ON. If this has no effect then limited flight operation with reduced power is possible.
- A maintenance inspection should be carried out.

3.9.14 Maximum permissible exhaust temperatures exceeded

Exceeded exhaust temperatures

CAUTION

Reduce engine power setting to the minimum necessary and carry out precautionary landing.

- Check the exhaust temperature
- Oil and coolant limits must not be exceeded.
- A maintenance inspection should be carried out.

3.9.15 EMS voltage supply below the minimum required level

Voltage supply below level

- Limited flight operation is possible if the voltage (alternator A or B) is OK here.
- Proceed according to 3.9.5 Failure of the EMS power supply if this has no effect.
- A maintenance inspection should be carried out.

3.9.16 The sprag clutch decouples not from starter

Sprag clutch is permanently in engagement position

CAUTION

Switch the engine “OFF”. Risk of fire and danger of the electric starter overheating.

- Move the throttle lever to the idle position.
- Set the **Master switch** to **“OFF”**.
- A maintenance inspection should be carried out.

3.10 Rotax 912 iS Engine Trouble Shooting

Introduction

All checks in accordance with the Engine Maintenance Manual (current issue/revision).

WARNING

Non compliance can result in serious injuries or death!
Only qualified staff (authorized by the Aviation Authorities) trained on this particular engine, is allowed to carry maintenance and repair work.

NOTE

If the following hints regarding remedy do not solve the problem, ocntact an authorized workshop. The engine must not be operated until the problem is rectified.

3.10.1 Engine does not start

Possible cause	Remedy
Turn **OFF** the LANE select witch A/B.	Turn **ON** the LANE select witch A/B.
Turn **OFF** the **Master switch**.	Turn **ON** the **Master switch** to.
Closed fuel selector/valve.	Open valve or clean filter, alternatively renew filter. Check fuel system for leakage.
No fuel in tank.	Refuel.
Fuel pumps	Set both to “ON”.
Starting speed too low, faulty or discharged battery.	Fit fully charged battery.
Starting speed too low, starting problems on cold engine.	Use top quality, low friction oil; allow for sufficient cooling period to counter for performance drop on hot starter; preheat engine.
Wrong fuel (Jet fuel or Diesel)	Change of fuel

3.10.2 Knocking under load

Possible cause	Remedy
Octane rating of fuel too low.	Use fuel with higher octane rating.
Intake air temperature too high.	Reduce the power. Check air filter according to Engine Maintenance Manual Line Chapter 12-20-00.

3.10.3 Low oil pressure

Possible cause	Remedy
Not enough oil in oil tank.	Refill oil

3.10.4 Oil level is increasing

Possible cause	Remedy
Oil too cold during engine operation.	Cover oil cooler surface, maintain the oil temperature prescribed.
Contamination with diesel fuel.	Check fuel.

3.10.5 Engine hard to start at low temperature

Possible cause	Remedy
Staring speed too low.	Preheat engine.
Low charge battery.	Fit fully charged battery.
High oil pressure.	At cold start a pressure reading of up to around 7 bar (102 psi) does not indicate a malfunction.
Oil pressure too low after cold start	Too much resistance in the oil suction system at low temperatures due to cold oil. Stop engine and preheat oil. After a cold start the oil tank must be observed and the pressure should be above 1.5 bar (22 psi). Otherwise, the speed must be lowered again, because not enough cold oil can be sucked. If oil pressure is reading lower than 1 bar (15 psi) oils with lower viscosity are to be used. See SI-912 i-001, current issue.

NOTE

Oil pressure must be measured at idle at an oil temperature of minimum 50 °C (120 °F).

Be sure the oil pressure does not go below minimum at idle.

SECTION 4

4 NORMAL PROCEDURES

4.2 Assembly and Disassembly

4.3 Pre-flight Inspection

4.4 Normal procedures

4.4.1 Before engine starting
4.4.2 Engine starting
4.4.3 Engine warm up, Engine check
4.4.3.1 Engine warm up
4.4.3.2 Ignition check
4.4.3.3 Check of fuel pumps
4.4.4 Taxiing
4.4.5 Before take-off
4.4.6 Take-off
4.4.7 Short field take-off
4.4.8 Soft field take-off
4.4.9 Climb
4.4.10 Cruise
4.4.11 Descent
4.4.12 Before landing
4.4.13 Balked Landing (Go around)
4.4.14 Landing
4.4.15 Short field landing
4.4.16 Soft field landing
4.4.17 After landing
4.4.18 Engine shutdown
4.4.19 Aircraft parking and tie-down
4.4.20 Flight in rain

4.1 Introduction

Section 4 provides checklists and recommended procedures for normal operation of the aircraft.

4.2 Assembly and Disassembly

Refer to the BRISTELL LSA Maintenance and Inspection Procedures manual.

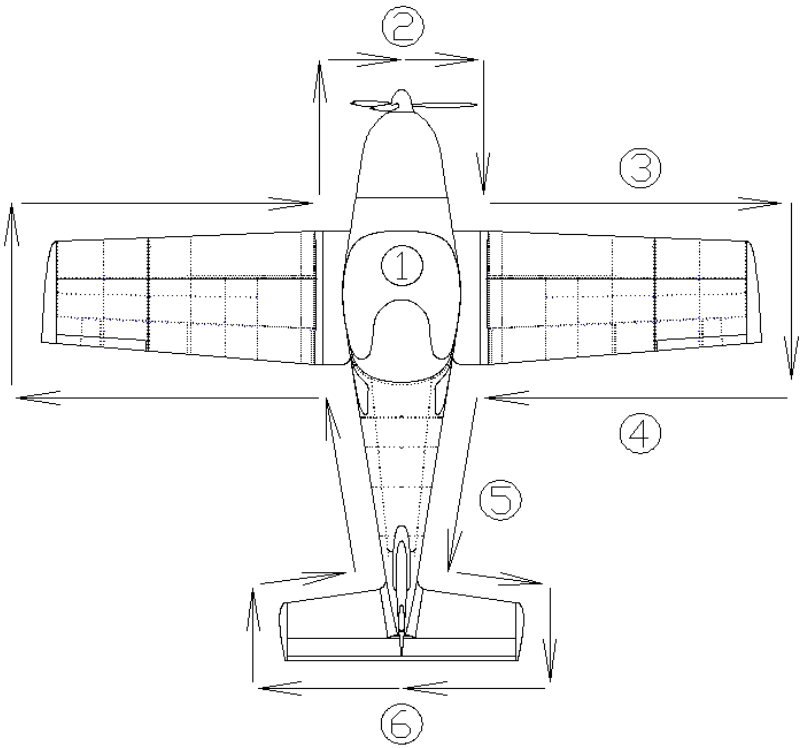
4.3 Pre-flight Inspection

Carry out the pre-flight inspection every day prior to the first flight or after airplane assembly. Incomplete or careless inspection can cause an accident. Carry out the inspection following the instructions in the Inspection Check List.

NOTE

The word "condition" in the instructions means a visual inspection of surface for damage deformations, scratching, chafing, corrosion or other damages, which may lead to flight safety degradation.

The manufacturer recommends carrying out the pre-flight inspection as follows:



Inspection Check List

①	– Ignition (LANE A,B)	- OFF
	– Master switch	- ON
	– Fuel gauge ind.	- check fuel quantity
	– Master switch	- OFF
	– Avionics	- check condition
	– Control system	- visual inspection, function, clearance, free movement up to stops
		- check wing flaps operation
	– Canopy	- condition of attachment, cleanness
	– Check cockpit for loose objects	
②	– Engine cowling condition	
	– Propeller and spinner condition	
	– Engine mount and exhaust manifold condition	
	– Oil and coolant quantity check	
	– Visual inspection of the fuel and electrical system	
	– Fuel system draining	
	– Other actions according to the engine manual	
③	– Wing surface condition	
	– Leading edge condition	
	– Pitot tube condition	
④	– Wing tip	- surface condition, attachment
	– Aileron	- surface condition, attachment, clearance, free movement
	– Flap	- surface condition, attachment, clearance
⑤	– Landing gear	- wheel attachment, brakes, condition and pressure of tires
	– Wing lower surface and fuselage bottom surface condition	
⑥	– Vertical tail unit	- condition of surface, attachment, free movement, rudder stops
	– Horizontal tail unit	- condition of surface, attachment, free movement, elevator stops
	– The check on left side of the fuselage and wing is the same as on right side	

Rotax 912 iS Daily Checks:

Step	Procedure
1	Verify coolant level in the expansion tank, replenish as required up to the top. The max.coolant level must flush with the bottom of filler neck.
2	Verify coolant level in the overflow bottle, replenish as required. The coolant level must be between max. and min. mark.
3	Turn propeller slowly by hand in direction of engine rotation several times and observe engine for odd noises or excessive resistance and normal compression.
4	Verify free movement of throttle valve and the complete range.
5	Inspect exhaust system for damages, leakage and general condition.
6	Visually inspect sensors/wiring harness for mechanical and thermal damages.
7	Check for any oil, coolant, and fuel leaks. If leaks are evident, rectify and repair them before next flight.
8	Check oil level and add oil if necessary.The oil level should be in the upper half (between the “50%” and the “max” mark and should never fals below the “min mark. Prior to long flights oil should be added so that the oil level reaches the “max” mark.

WARNING

Visually check fuel level in each tank before each take-off to be sure that you have sufficient fuel quantity for the planned flight.

CAUTION

In case of long-term parking it is recommended to turn the engine several times (**Master switch and LANE A,B OFF**!) by turning the propeller. Always handle the blade area by the palm i.e. do not grasp only the blade edge. It will facilitate engine starting.

4.4 Normal procedures

4.4.1 Before engine starting

1. Control system - free & correct movement
2. Canopy - clean
3. Brakes - fully applied
4. Safety harness - tighten
5. Rudder pedals - set to required position

WARNING

Adjusting of rudder pedals position during flight is PROHIBITED.

4.4.2 Engine starting

Follow engine Operators manual for **Engine start** procedure:

1. Fuel Selector - ON - LEFT or RIGHT FUEL TANK
2. Accomplish aircraft specific startup
   - activate Flight display
3. Master switch - ON
4. Fuel pump - ON, only use one fuel pump. Using both fuel pumps can lead to a bad start behaviour.
5. Lane select switch A - ON
   Lane select switch B - ON
6. Start Power switch - Activate it during steps 7,8,9, and 10
7. Warning lamps - check if illuminate and extinguish after around 3 sec. If not, consult Engine Manual Chapter 4.
8. Fuel pressure - check whether it reached 3 bar
9. Throttle - put throttle 1-2 cm of its opening
10. Start button - press until engine runs and release after engine has reached 1500 rpm or more (stable run)
11. Starter power switch - OFF after 15 sec, just the engine reached min. 1600 rpm. Activate starter for max. 10 sec, then wait 2 minutes for cooling.
12. Throttle - reduce throttle valve position as required

13. Engine instruments compliance
    - check warning lamps and ensure with engine operating limits. Monitor oil pressure which should rise within 10 sec. RPM increase is only permitted at steady oil pressure above 3 bar.
14. Throttle
    - Increase engine speed above 2500 rpm and hold it for 5 sec.
15. Engine instruments compliance
    - check warning lamps and ensure with engine operating limits.

CAUTION

The starter should be activated for a maximum of 10 sec., followed by 2 min. pause for engine cooling.
As soon as engine runs, adjust throttle to achieve smooth running at approx. 2000 rpm. Check the oil pressure, which should increase within 10 sec. Increase the engine speed after the oil pressure has reached 3 bar (43 psi) and is steady.
To avoid shock loading, start the engine with the throttle lever set for idling or 10% open at maximum, then wait 3 sec to reach constant engine speed before new acceleration.
Only one ignition (LANE Aor B) should be switched on (off) during ignition circuit check.

4.4.3 Engine warm up, Engine check

4.4.3.1 Engine warm up

Prior to engine check block the main wheels using chocks. Initially warm up the engine to 2000 rpm for approx. 2 minutes, then continue to 2500 rpm till oil temperature reaches 50 °C (122 °F). The warm up period depends on ambient air temperature.

Switch “ON” propeller control and check propeller adjustment in all adjustment range.

4.4.3.2 Ignition check

Check both ignition circuits at 4000 rpm.

If the engine speed drops or any error messages are present from the EMS then find out what the cause is and take corresponding action to rectify the problem.

1. Engine speed - 4000 rpm
2. Lane A selector switch - OFF. Observe the rev counter. The speed drop may not exceed 180 rpm.
3. Lane A selector switch - ON
4. Lane B selector switch - OFF. Observe the rev counter. The speed drop may not exceed 180 rpm.
5. Lane B selector switch - ON
6. Reduce to idle speed

NOTE

Only one ignition (LANE A or B)should be switched on (off) during ignition circuit check.

4.4.3.3 Check of fuel pumps

1. Engine speed - set to 2000 rpm
2. Aux fuel pump - deactivate for 5 sec
3. Fuel pressure - check
4. Aux fuel pump - activate
5. Main fuel pump - deactivate for 5 sec
6. Fuel pressure - check. If not within limits, find cause. Do not continue in operation until cause is find and problem rectified.
7. Set max. power for verification of max. speed with given propeller and engine parameters (temperatures and pressures).
8. Check acceleration from idling to max. power. If necessary, cool the engine at 3000 rpm before shutdown.

CAUTION

The engine check should be performed with the aircraft heading upwind and not on a loose terrain (the propeller may suck grit which can damage the leading edges of blades).

4.4.4 Taxiing

Apply power and brakes as needed. Apply brakes to control movement on ground. Taxi carefully when wind velocity exceeds 20 knots (10 m/s). Hold

the control stick in neutral position, or in a position that properly deflects a crosswind.

4.4.5 Before take-off

1. Altimeter - set
2. Trim - set neutral position
3. Control system - check free movement
4. Cockpit canopy - closed
5. Safety harness - tighten
6. Fuel Selector - ON (LEFT or RIGHT tank)

NOTE

AIRCRAFT IS EQUIPPED WITH RETURN LINES IN BOTH FUEL TANKS.

7. Ignition (LANE A,B) - ON
8. El. pumps - ON
9. Propeller control - ON
10. Wing flaps - extend as needed
11. Autopilot - OFF

4.4.6 Take-off

1. Brakes - apply to stop wheel rotation
2. Take-off power - throttle fully forward
3. Engine speed - check rpm
4. Instruments - check if within limits
5. Nose wheel unstick - 55 km/h (30 KIAS)
6. Airplane lift-off - 75 km/h (40 KIAS)
7. Wing flaps - retract when speed of 120 km/h (65 KIAS) is reached, at altitude of 150 ft
8. Make transition to climb

WARNING

The Take-off is prohibited if:
- The engine is running unsteadily
- The engine instruments values are beyond operational limits
- The crosswind velocity exceeds permitted limits (see 5.2.8)
- Autopilot is “ON”

4.4.7 Short field take-off

1. Use all available runway
2. Heading - set
3. Flaps - 30°
4. Trim - as required
5. Hold brakes
6. Throttle - fully forward (5800 rpm, max. 5min.)
7. Engine instruments - check within limits
8. Release brakes after rpm increase
9. Accelerate and pull control stick aft to lift off the nose wheel as soon as possible.
10. As aircraft becomes airborne, level off in ground effect to accelerate to:

No obstacle:	Vy (best rate of climb)	67 KIAS (125 km/h)
Obstacle:	Vx (best angle of climb)	60 KIAS (112 km/h)

11. Flaps - set to 10°
12. Climb at:

No obstacle:	Vy (best rate of climb)	67 KIAS (125 km/h)
Obstacle:	Vx (best angle of climb)	60 KIAS (112 km/h)

13. Trim - adjust
14. Flaps - retract at Vy 67 KIAS (125 km/h) or at 150 ft

4.4.8 Soft field take-off

1. Inspect field condition checking for grass height, bumps, holes, debris, wetness.
2. Taxiing - control stick fully aft
3. Heading - set
4. Flaps - 30°
5. Trim - as required
6. Throttle - fully forward (5800 rpm, max. 5min.)
7. Control stick - full aft pressure during T/O run to lift off nose wheel as soon as possible.
8. As aircraft becomes airborne, level off in ground effect to accelerate to:

No obstacle:	Vy (best rate of climb)	67 KIAS (125 km/h)
Obstacle:	Vx (best angle of climb)	60 KIAS (112 km/h)

9. Flaps - set to 10°
10. Climb

No obstacle:	Vy (best rate of climb)	67 KIAS (125 km/h)
Obstacle:	Vx (best angle of climb)	60 KIAS (112 km/h)

11. Trim - adjust
12. Flaps - retract at Vy 67 KIAS (125 km/h) or at 150 ft

4.4.9 Climb

1. Best ROC speed - 120 km/h (65 KIAS)
2. Throttle - Max. take-off power
   - (max. 5800 rpm for 5 minutes)
   - Max. cont.power 5500 rpm
3. Trim - trim the airplane
4. Instruments - oil temperature and pressure, coolant temperature within limits

CAUTION

If coolant or oil temperature approach their limits, reduce the climb angle to increase airspeed and thus fulfill the limits.

4.4.10 Cruise

Avoid operation below normal operation oil temperature 90-110 °C (194-230 °F), as possible formation of condensation water in the lubrication system badly influences the oil quality.

To evaporate possibly accumulated condensation water, at least once a day 100 °C (212 °F) oil temperature must be reached.

1. Aux fuel pump - OFF

Refer to Section 5, for recommended cruising regimes.

4.4.11 Descent

1. Optimum glide speed - 110-120 km/h (60–65 KIAS)

CAUTION

It is not advisable to reduce the engine throttle control lever to minimum on final approach and when descending from very high altitude. In such cases the engine becomes under-cooled and a loss of power may occur. Descent at increased idle (approx. 3000 rpm), speed between 120-1300 km/h (65-70 KIAS) and check that the engine instruments indicate values within permitted limits.

4.4.12 Before landing

1. Approach speed - 110 km/h (60 KIAS)
2. Throttle - as needed
3. Electric fuel pump(s) - ON
4. Wing flaps - extend as needed
5. Trim - as needed
6. Autopilot - OFF

4.4.13 Balked Landing (Go around)

1. Throttle - full power (max.5800 rpm)
2. Wing flaps - extend as needed
3. Trim - adjust as needed
4. Wing flaps - retract at height of 150 ft after reaching 120 km/h (65 KIAS)
5. Trim - adjust
6. Repeat circuit pattern and landing

4.4.14 Landing

1. Touch-down on main wheels
2. Apply brakes as needed after the nose wheel touch-down

4.4.15 Short field landing

1. Fuel selector - select proper tank
2. Safety harness - check that tightened
3. Approach speed - 55 KIAS (100 km/h)
4. Glide path – just enough to clear obstacle at approach end of runway
5. Throttle - as required
6. Electric fuel pump - ON
7. Flaps - 30°
8. Trim - as required
9. Landing light(s) - ON
10. Flare - minimum float
11. After touchdown - stick forward
    - Retract flaps
    - Maximum braking

4.4.16 Soft field landing

1. Fuel selector - select proper tank
2. Safety harness - check that tightened
3. Approach speed - 59 KIAS (110 km/h)
4. Throttle - as required
5. Electric fuel pump - ON
6. Flaps - 20 °
7. Trim - as required
8. Landing light(s) - on
9. Flare - add power before touchdown to keep elevator effective to help keep weight off nose wheel
10. After touchdown - throttle to idle
    gradually increase back elevator to keep weight of nosewheel
    No braking during roll out

4.4.17 After landing

1. Engine speed - set as required for taxiing
2. Wing flaps - retract

4.4.18 Engine shutdown

Normally the cooling down of the engine during descending and taxiing will be sufficient to allow ECU to be shut off as soon as the aircraft is stopped.

At increasing operating temperatures make an engine cooling run of at least minimum 2 minutes.

1. Engine instruments - within limits
2. Engine speed - idle
3. Avionics - switch off
4. Ignition LANE B - switch off
5. Ignition LANE A - switch off
6. Fuel pumps - switch off
7. Propeller control - switch off
8. Circuit breakers - switch off
9. Master switch - switch off

CAUTION

Rapid engine cooling should be avoided during operation. This happens above all during aircraft descent, taxiing, low engine rpm or at engine shutdown immediately after landing.

Under normal conditions the engine temperatures stabilize during descent, taxiing and at values suitable to stop engine by switching the ignition (LANE A,B) off. If necessary, cool the engine at 2500 - 2750 rpm to stabilize the temperatures prior to engine shut down.

4.4.19 Aircraft parking and tie-down

1. Ignition check - OFF
2. Master switch check - OFF
3. Fuel selector - OFF
4. Parking brake - use it as necessary (if installed)
5. Canopy - close, lock as necessary
6. Secure the airplane

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.

NOTE

Use anchor eyes on the wings and fuselage rear section to fix the airplane. Move control stick forward and fix it together with the rudder pedals. Make sure that the cockpit canopy is properly closed and locked. The anchoring before leaving the airplane is important if the airplane is not equipped with a parking brake.

4.4.20 Flight in rain

When flying in the rain, no additional steps are required. Aircraft qualities and performance are not substantially changed. However Visual Meteorological Condition (VMC) must be maintained.

SECTION 5

5 PERFORMANCE

5.1 Introduction

5.2 Performance

5.2.1 Airspeed indicator system calibration
5.2.2 Stall speeds
5.2.3 Take-off performance
5.2.4 Landing distances
5.2.5 Climb performance
5.2.6 Cruise
5.2.7 Endurance and Range
5.2.8 Demonstrated crosswind performance
5.2.9 Optimum glide speed
5.2.10 Ceiling

5.1 Introduction

Section 5 provides data for airspeed calibration, stall speeds, take-off performance and additional information.

The presented data has been computed from actual flight tests with the aircraft and engine in good conditions and using average piloting techniques.

If not stated otherwise, the performance stated in this section is valid for maximum take-off weight and under ISA conditions.

The performance shown in this section is valid for aircraft fitted with given power plant - ROTAX 912 iS SPORT engine and DUC Inconel Flash propeller.

5.2 Performance

5.2.1 Airspeed indicator system calibration

	KIAS	KCAS
	35	36
VS0	37	38
	40	41
VS1	44	45
	50	51
	55	55
	60	60
	65	65
	70	70
VFE,	75	75
	80	80
	85	85
	90	90
VA	96	96
	100	100
	105	105
	110	109
	115	114
	120	119
	125	124
VN0	130	129
	135	134
	140	139
	145	144
	150	149
VNE	157	156

	IAS (km/h)	CAS (km/h)
	65	66
VS0	70	71
	80	81
VS1	82	83
	90	91
	100	101
	110	111
	120	120
	130	130
VFE	139	139
	150	150
	160	160
	170	170
VA	180	179
	190	189
	200	199
	210	209
	220	219
	230	229
VN0	240	238
	250	248
	260	258
	270	268
	280	278
VNE	290	287

5.2.2 Stall speeds

Conditions: Max.takeoff-off weight 1320 lb Engine idle run	Wing flaps pos.	*KIAS*	*KCAS*	IAS [km/h]	CAS [km/h]	Altitude loss at recovery [ft]
Wing level stall	0°	44	45	82	83	100
	20°	42	43	78	79	120
	30°	37	38	70	71	160
Co-ordinated turn 30° bank	0°	47	48	88	89	120
	20°	45	46	84	85	160
	30°	40	41	75	76	200

5.2.3 Take-off performance

ISA Conditions			CONCRETE		GRASS	
Airport altitude H [ft]	Temperature tH [°C]	Temperature tH [°F]	Takeoff Run [ft]	Distance over 50 ft obstacle [ft]	Takeoff Run [ft]	Distance over 50 ft obstacle [ft]
0 ft ISA	15,0	59	660	1500	920	1760
2000 ft ISA	11,0	52	740	1690	1040	1980
4000 ft ISA	7,1	45	840	1900	1170	2230
6000 ft ISA	3,1	38	940	2150	1320	2520
8000 ft ISA	-0,8	30	1070	2430	1490	2850
10000 ft ISA	-4,8	23	1210	2750	1690	3230

ISA + 10 °C			CONCRETE		GRASS	
Airport altitude H [ft]	Temperature tH [°C]	Temperature tH [°F]	Takeoff Run [ft]	Distance over 50 ft obstacle [ft]	Takeoff Run [ft]	Distance over 50 ft obstacle [ft]
0 ft ISA	25,0	77	710	1610	980	1880
2000 ft ISA	21,0	70	800	1810	1110	2120
4000 ft ISA	17,1	63	900	2040	1250	2390
6000 ft ISA	13,1	56	1010	2310	1410	2710
8000 ft ISA	9,2	48	1150	2610	1600	3060
10000 ft ISA	5,2	41	1300	2960	1820	3470

ISA + 20 °C			CONCRETE		GRASS	
Airport altitude H [ft]	Temperature tH [°C]	Temperature tH [°F]	Takeoff Run [ft]	Distance over 50 ft obstacle [ft]	Takeoff Run [ft]	Distance over 50 ft obstacle [ft]
0 ft ISA	35,0	95	750	1720	1050	2010
2000 ft ISA	31,0	88	850	1930	1190	2270
4000 ft ISA	27,1	81	960	2180	1340	2560
6000 ft ISA	23,1	74	1090	2470	1510	2900
8000 ft ISA	19,2	66	1230	2800	1720	3280
10000 ft ISA	15,2	59	1400	3180	1950	3730

ISA -10 °C			CONCRETE		GRASS	
Airport altitude H [ft]	Temperature tH [°C]	Temperature tH [°F]	Takeoff Run [ft]	Distance over 50 ft obstacle [ft]	Takeoff Run [ft]	Distance over 50 ft obstacle [ft]
0 ft ISA	5,0	41	610	1400	860	1640
2000 ft ISA	1,0	34	690	1570	960	1840
4000 ft ISA	-2,9	27	780	1770	1080	2080
6000 ft ISA	-6,9	20	880	1990	1220	2340
8000 ft ISA	-10,8	12	990	2250	1380	2640
10000 ft ISA	-14,8	5	1120	2550	1560	2990

ISA -20 °C			CONCRETE		GRASS	
Airport altitude H [ft]	Temperature tH [°C]	Temperature tH [°F]	Takeoff Run [ft]	Distance over 50 ft obstacle [ft]	Takeoff Run [ft]	Distance over 50 ft obstacle [ft]
0 ft ISA	-5,0	23	570	1300	800	1520
2000 ft ISA	-9,0	16	640	1460	890	1710
4000 ft ISA	-12,9	9	720	1640	1010	1920
6000 ft ISA	-16,9	2	810	1850	1130	2170
8000 ft ISA	-20,8	-6	920	2080	1280	2450
10000 ft ISA	-24,8	-13	1040	2360	1450	2760

5.2.4 Landing distances

ISA Conditions			CONCRETE		GRASS	
Airport altitude H [ft]	Temperature tH [°C]	Temperature tH [°F]	Landing Run [ft]	Distance over 50 ft obstacle [ft]	Landing Run [ft]	Distance over 50 ft obstacle [ft]
0 ft ISA	15,0	59	300	950	360	1020
2000 ft ISA	11,0	52	320	1010	380	1080
4000 ft ISA	7,1	45	340	1070	410	1150
6000 ft ISA	3,1	38	360	1140	430	1220
8000 ft ISA	-0,8	30	380	1210	460	1300
10000 ft ISA	-4,8	23	410	1290	490	1380

ISA + 10 °C			CONCRETE		GRASS	
Airport altitude H [ft]	Temperature tH [°C]	Temperature tH [°F]	Landing Run [ft]	Distance over 50 ft obstacle [ft]	Landing Run [ft]	Distance over 50 ft obstacle [ft]
0 ft ISA	25,0	77	310	980	370	1060
2000 ft ISA	21,0	70	330	1040	400	1120
4000 ft ISA	17,1	63	350	1110	420	1190
6000 ft ISA	13,1	56	370	1180	450	1260
8000 ft ISA	9,2	48	400	1250	470	1350
10000 ft ISA	5,2	41	420	1330	510	1430

ISA + 20 °C			CONCRETE		GRASS	
Airport altitude H [ft]	Temperature tH [°C]	Temperature tH [°F]	Landing Run [ft]	Distance over 50 ft obstacle [ft]	Landing Run [ft]	Distance over 50 ft obstacle [ft]
0 ft ISA	35,0	95	320	1020	390	1090
2000 ft ISA	31,0	88	340	1080	410	1160
4000 ft ISA	27,1	81	360	1150	430	1230
6000 ft ISA	23,1	74	380	1220	460	1310
8000 ft ISA	19,2	66	410	1300	490	1390
10000 ft ISA	15,2	59	440	1380	520	1480

ISA -10 °C			CONCRETE		GRASS	
Airport altitude H [ft]	Temperature tH [°C]	Temperature tH [°F]	Landing Run [ft]	Distance over 50 ft obstacle [ft]	Landing Run [ft]	Distance over 50 ft obstacle [ft]
0 ft ISA	5,0	41	290	920	350	980
2000 ft ISA	1,0	34	310	970	370	1040
4000 ft ISA	-2,9	27	330	1030	390	1110
6000 ft ISA	-6,9	20	350	1100	420	1180
8000 ft ISA	-10,8	12	370	1160	440	1250
10000 ft ISA	-14,8	5	390	1240	470	1330

ISA -20 °C			CONCRETE		GRASS	
Airport altitude H [ft]	Temperature tH [°C]	Temperature tH [°F]	Landing Run [ft]	Distance over 50 ft obstacle [ft]	Landing Run [ft]	Distance over 50 ft obstacle [ft]
0 ft ISA	-5,0	23	280	880	340	950
2000 ft ISA	-9,0	16	300	940	350	1010
4000 ft ISA	-12,9	9	310	990	380	1070
6000 ft ISA	-16,9	2	330	1050	400	1130
8000 ft ISA	-20,8	-6	350	1120	420	1200
10000 ft ISA	-24,8	-13	380	1190	450	1280

5.2.5 Climb performance

CONDITIONS: MCP MTOW	BEST RATE OF CLIMB					BEST ANGLE OF CLIMB				
	IAS	IAS	KIAS	RATE OF CLIMB	RATE OF CLIMB	IAS	IAS	KIAS	RATE OF CLIMB	RATE OF CLIMB
ALTITUDE	[mph]	[km/h]	[knots]	[m/s]	[fpm]	[mph]	[km/h]	[knots]	[m/s]	[fpm]
0 ft ISA	78	125	67	4,6	910	70	112	60	4,4	860
2000 ft ISA	76	123	66	4,0	790	68	110	59	3,7	730
4000 ft ISA	75	121	65	3,4	660	67	108	58	3,1	610
6000 ft ISA	74	119	64	2,8	540	66	106	57	2,5	490
8000 ft ISA	73	117	63	2,1	410	65	104	56	1,9	370
10000 ft ISA	71	115	62	1,5	290	63	102	55	1,3	260

5.2.6 Cruise

		55%	65%	75%	MCP
		4300 rpm	4800 rpm	5000 rpm	5500 rpm
0 ft	KIAS	90 knots	104 knots	109 knots	121 knots
	KCAS	89 knots	103 knots	108 knots	120 knots
	KTAS	89 knots	103 knots	108 knots	120 knots
2000 ft	KIAS	88 knots	101 knots	106 knots	119 knots
	KCAS	87 knots	100 knots	105 knots	117 knots
	KTAS	90 knots	103 knots	108 knots	121 knots
4000 ft	KIAS	86 knots	98 knots	102 knots	114 knots
	KCAS	85 knots	97 knots	101 knots	113 knots
	KTAS	90 knots	103 knots	108 knots	120 knots
6000 ft	KIAS	84 knots	95 knots	99 knots	110 knots
	KCAS	83 knots	94 knots	98 knots	108 knots
	KTAS	91 knots	102 knots	107 knots	119 knots
8000 ft	KIAS	82 knots	91 knots	95 knots	105 knots
	KCAS	81 knots	91 knots	94 knots	104 knots
	KTAS	92 knots	102 knots	107 knots	117 knots
10000 ft	KIAS	80 knots	88 knots	92 knots	100 knots
	KCAS	79 knots	88 knots	91 knots	99 knots
	KTAS	92 knots	102 knots	106 knots	116 knots

5.2.7 Endurance and Range

The table below shows fuel consumption, endurance and range

Fuel qty. =	120 l	31,7 US gal
Unusable fuel =	1 l	0,3 US gal

NO FUEL RESERVE CONSIDERED !

			55%	65%	75%	MCP
		4000 rpm	4300 rpm	4800 rpm	5000 rpm	5500 rpm
0 ft	KIAS	82 knots	90 knots	104 knots	109 knots	121 knots
	KCAS	81 knots	89 knots	103 knots	108 knots	120 knots
	KTAS	81 knots	89 knots	103 knots	108 knots	120 knots
	Fuel consumption	10,5 l/h	13,0 l/h	17,6 l/h	19,6 l/h	25,2 l/h
		2,8 USgal/h	*3,4 USgal/h*	*4,7 USgal/h*	*5,2 USgal/h*	*6,6 USgal/h*
	Endurance	11:18	9:09	6:45	6:03	4:43
	Range	1700 km	1510 km	1290 km	1220 km	1050 km
		920 NM	*820 NM*	*700 NM*	*660 NM*	*570 NM*
2000 ft	KIAS	80 knots	88 knots	101 knots	106 knots	119 knots
	KCAS	80 knots	87 knots	100 knots	105 knots	117 knots
	KTAS	82 knots	90 knots	103 knots	108 knots	121 knots
	Fuel consumption	10,8 l/h	13,2 l/h	17,7 l/h	19,6 l/h	25,0 l/h
		2,9 USgal/h	*3,5 USgal/h*	*4,7 USgal/h*	*5,2 USgal/h*	*6,6 USgal/h*
	Endurance	11:00	9:00	6:44	6:03	4:46
	Range	1670 km	1500 km	1280 km	1210 km	1070 km
		900 NM	*810 NM*	*690 NM*	*650 NM*	*580 NM*
4000 ft	KIAS	79 knots	86 knots	98 knots	102 knots	114 knots
	KCAS	78 knots	85 knots	97 knots	101 knots	113 knots
	KTAS	83 knots	90 knots	103 knots	108 knots	120 knots
	Fuel consumption	11,1 l/h	13,4 l/h	17,7 l/h	19,6 l/h	24,8 l/h
		2,9 USgal/h	*3,5 USgal/h*	*4,7 USgal/h*	*5,2 USgal/h*	*6,5 USgal/h*
	Endurance	10:43	8:52	6:42	6:03	4:48
	Range	1650 km	1480 km	1270 km	1210 km	1070 km
		890 NM	*800 NM*	*690 NM*	*650 NM*	*580 NM*
6000 ft	KIAS	77 knots	84 knots	95 knots	99 knots	110 knots
	KCAS	77 knots	83 knots	94 knots	98 knots	108 knots
	KTAS	84 knots	91 knots	102 knots	107 knots	119 knots
	Fuel consumption	11,4 l/h	13,6 l/h	17,8 l/h	19,6 l/h	24,6 l/h
		3,0 USgal/h	*3,6 USgal/h*	*4,7 USgal/h*	*5,2 USgal/h*	*6,5 USgal/h*
	Endurance	10:26	8:43	6:40	6:03	4:50
	Range	1630 km	1470 km	1270 km	1200 km	1060 km
		880 NM	*790 NM*	*680 NM*	*650 NM*	*570 NM*
8000 ft	KIAS	76 knots	82 knots	91 knots	95 knots	105 knots
	KCAS	77 knots	83 knots	92 knots	96 knots	106 knots
	KTAS	85 knots	92 knots	102 knots	107 knots	117 knots
	Fuel consumption	11,7 l/h	13,9 l/h	17,9 l/h	19,6 l/h	24,4 l/h
		3,1 USgal/h	*3,7 USgal/h*	*4,7 USgal/h*	*5,2 USgal/h*	*6,4 USgal/h*
	Endurance	10:11	8:35	6:39	6:03	4:53
	Range	1610 km	1460 km	1260 km	1200 km	1060 km
		870 NM	*790 NM*	*680 NM*	*650 NM*	*570 NM*
10000 ft	KIAS	75 knots	80 knots	88 knots	92 knots	100 knots
	KCAS	74 knots	79 knots	88 knots	91 knots	99 knots
	KTAS	86 knots	92 knots	102 knots	106 knots	116 knots
	Fuel consumption	12,0 l/h	14,1 l/h	17,9 l/h	19,6 l/h	24,2 l/h
		3,2 USgal/h	*3,7 USgal/h*	*4,7 USgal/h*	*5,2 USgal/h*	*6,4 USgal/h*
	Endurance	9:56	8:27	6:37	6:03	4:55
	Range	1590 km	1440 km	1250 km	1190 km	1050 km
		860 NM	*780 NM*	*680 NM*	*640 NM*	*570 NM*

5.2.8 Demonstrated crosswind performance

Max. permitted head wind velocity for take-off and landing	15	m/s	30	knots
Max. permitted cross wind velocity for take-off and landing	8	m/s	16	knots

5.2.9 Optimum glide speed

Optimum glide speed	110-120	km/h	60-65	KIAS

5.2.10 Ceiling

Service ceiling	4000	m	13.100	ft

SECTION 6

6 WEIGHT AND BALANCE

6.1 Introduction

6.2 Weight and Balance Record

6.2.1 Weight and Balance Report

6.2.1.1 Empty Aircraft Weight and CG
6.2.1.2 Loaded Aircraft Weight and CG
6.2.1.3 Weight and CG Blank Form

6.3 Permitted payload range

6.4 Operational Weight and Balance Computation

6.4.1 Airplane Loading Schedule Chart
6.4.2 Table of static moments
6.4.3 Airplane loading graph
6.4.4 CG Moment envelope
6.4.5 CG limits

6.5 Equipment list

6.1 Introduction

This section contains the payload range within which the BRISTELL LSA may be safely operated.

Procedures for weighing the aircraft and the calculation method for establishing the permitted payload range are contained in last revision of FAA Aviation Advisory Circular AC.43.13 – 1B

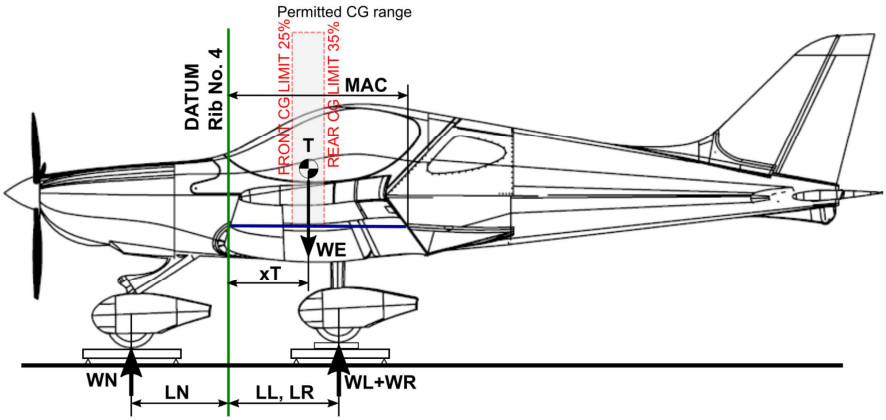
6.2 Weight and Balance Record

The table is intended to record continuous history of changes of equipment affecting weight and balance.

Type	BRISTELL LSA			Serial. No.:	363/2018						
Date	Item No.		Description of part or modification	Weight change						Basic weight of empty airplane	
				Added (+)			Removed (-)				
	+	-		Weight (lb)	Arm (in)	Moment (lb.in)	Weight (lb)	Arm (in)	Moment (lb.in)	Weight (lb)	Moment (lb.in)
3.9. 2018			Manufactured airplane							**808**	**12424**

6.2.1 Weight and Balance Report

6.2.1.1 Empty Aircraft Weight and CG



MAC (in): 53,8

	ITEM	WEIGHT (lb)	ARM (in)	MOMENT = WEIGHT x ARM (lb.in)
EMPTY AIRCRAFT WEIGHT AND CG	RIGHT MAIN WHEEL	WR= 316	LR= 27,6	MR= 8718,6
	LEFT MAIN WHEEL	WL= 320	LL= 27,6	ML= 8809,7
	NOSE WHEEL	WN= 172	LN= -29,7	MN= -5104,6
	EMPTY AIRCRAFT	**EMPTY WEIGHT (lbs) WE= 808,0**	**CG (in) = 15,38 CG (%MAC) = 28,6**	**EMPTY ACFT TOTAL MOMENT (lbs.in) MT= 12423,70**

$$CG\ (in) = \frac{Total\ Moment}{Total\ Weight}$$

$$CG\ (\%MAC) = CG\ (in) \times \frac{100}{MAC}$$

Serial No.: 363/2018
Date: 3.9.2018
By: BRM Aero

6.2.1.2 Loaded Aircraft Weight and CG

	ITEM	WEIGHT (lb)	ARM (in)	MOMENT = WEIGHT x ARM (lb.in)
	EMPTY AIRCRAFT	808,0	15,38	12423,7
LOADED AIRCRAFT WEIGHT AND CG	PILOT		23,6	
	PASSENGER		23,6	
	BAGGAGE - BEHIND SEATS		55,1	
	BAGGAGE - FRONT optional)		-9,8	
	BAGGAGE - WING LOCKERS		24,8	
	FUEL TANKS		7,9	
	LOADED AIRCRAFT	TAKEOFF WEIGHT (lbs) TOW=	CENTER OF GRAVITY CG (in)= CG (%MAC) =	LOADED ACFT TOTAL MOMENT (lb.in) MT=

Max.Takeoff Weight:	1320,0	lb	
CG Range:	25	35	
Forward limit:	13,5	in	
Rearward limit:	18,8	in	

$$CG\ (in) = \frac{\text{Total Moment}}{\text{Total Weight}}$$

$$CG\ (\%MAC) = CG\ (in) \times \frac{100}{MAC}$$

Serial No.: 363/2018
Date:
By:

6.2.1.3 Weight and CG Blank Form

	ITEM	WEIGHT (lb)	ARM (in)	MOMENT = WEIGHT x ARM (lb.in)
EMPTY AIRCRAFT WEIGHT AND CG	RIGHT MAIN WHEEL	WR=	LR= 27,6	MR=
	LEFT MAIN WHEEL	WL=	LL= 27,6	ML=
	NOSE WHEEL	WN=	LN= -29,7	MN=
	EMPTY AIRCRAFT	EMPTY WEIGHT (lbs) WE=	CG (in) = CG (%MAC) =	EMPTY ACFT TOTAL MOMENT (lbs.in) MT=

	ITEM	WEIGHT (lb)	ARM (in)	MOMENT = WEIGHT x ARM (lb.in)
	EMPTY AIRCRAFT			
LOADED AIRCRAFT WEIGHT AND CG	PILOT		23,6	
	PASSENGER		23,6	
	BAGGAGE - BEHIND SEATS		55,1	
	BAGGAGE - FRONT optional)		-9,8	
	BAGGAGE - WING LOCKERS		24,8	
	FUEL TANKS		7,9	
	LOADED AIRCRAFT	TAKEOFF WEIGHT (lbs) TOW=	CENTER OF GRAVITY CG (in)= CG (%MAC) =	LOADED ACFT TOTAL MOMENT (lb.in) MT=

Max.Takeoff Weight:	1320	lb
CG Range:	25	35
Forward limit:	13,5	in
Rearward limit:	18,8	in

$$CG\ (in) = \frac{\text{Total Moment}}{\text{Total Weight}}$$

$$CG\ (\%MAC) = CG\ (in) \times \frac{100}{MAC}$$

Serial No.: 363/2018
Date:
By:

Max.useful load:

WU (lb) =	MTOW	-	WE
WU (lb) =	1320	-	
WU (lb) =			

WARNING
DO NOT EXCEED MAXIMUM TAKEOFF WEIGHT!

6.3 Permitted payload range

PERMITTED PAYLOAD RANGE OF BRISTELL (lb)								
S/N:	363/2018				Empty weight (lb):	808	MTOW (lb):	1320,0
FUEL								
	VOLUME	(US gal)	5,0	10,0	15,0	20,0	25,0	31,7
	WEIGHT	(lb)	30,3	60,5	90,8	121,0	151,3	191,8
			PERMITTED CREW WEIGHT (lb)					
BAGGAGE (lb)	NO BAGGAGE	0	**482** *33,8 %MAC*	**452** *33,2 %MAC*	**421** *32,5 %MAC*	**391** *31,8 %MAC*	**361** *31,2 %MAC*	**320** *30,3 %MAC*
	1/2 REAR	17	**465** *34,6 %MAC*	**435** *33,9 %MAC*	**405** *33,2 %MAC*	**374** *32,6 %MAC*	**344** *31,9 %MAC*	**304** *31,0 %MAC*
	MAX REAR	33	**403** *35,0 %MAC*	**418** *34,6 %MAC*	**388** *34,0 %MAC*	**358** *33,3 %MAC*	**328** *32,6 %MAC*	**287** *31,7 %MAC*
	1/2 WING LOCKERS	44	**438** *33,9 %MAC*	**407** *33,2 %MAC*	**377** *32,6 %MAC*	**347** *31,9 %MAC*	**317** *31,2 %MAC*	**276** *30,3 %MAC*
	1/2 REAR + 1/2 WING	61	**421** *34,6 %MAC*	**391** *34,0 %MAC*	**361** *33,3 %MAC*	**330** *32,6 %MAC*	**300** *32,0 %MAC*	**260** *31,1 %MAC*
	MAX REAR + 1/2 WING	77	**348** *35,0 %MAC*	**374** *34,7 %MAC*	**344** *34,0 %MAC*	**314** *33,4 %MAC*	**284** *32,7 %MAC*	**243** *31,8 %MAC*
	MAX WING LOCKERS	88	**394** *34,0 %MAC*	**363** *33,3 %MAC*	**333** *32,6 %MAC*	**303** *32,0 %MAC*	**273** *31,3 %MAC*	**232** *30,4 %MAC*
	1/2 REAR + MAX WING	105	**377** *34,7 %MAC*	**347** *34,1 %MAC*	**317** *33,4 %MAC*	**286** *32,7 %MAC*	**256** *32,0 %MAC*	**215** *31,1 %MAC*
	MAX REAR + WING	121	**293** *35,0 %MAC*	**330** *34,8 %MAC*	**300** *34,1 %MAC*	**270** *33,4 %MAC*	**240** *32,8 %MAC*	**199** *31,9 %MAC*

Permitted crew weight with regard to CG limits.
"X" (if present) means computed crew weight less than minimum crew weight

6.4 Operational Weight and Balance Computation

An important part of preflight planning is to determine that the aircraft is loaded so its weight and CG location are within the allowable limits.
This is possible by using hereafter explained Loading graph method, using weights, arms, and moment indexes.

Procedure:

1. Record into the 6.4.1 Airplane Loading Schedule Chart current empty weight and static moment of the airplane, which you read from 6.2 Weight and Balance Record.
2. Record the weight of crew, fuel, and baggage into 6.4.1 Airplane Loading Schedule Chart.
3. See the 6.4.2 Table of static moments or 6.4.3 Airplane loading graph to read static moments for given weights of crew, fuel, and baggage.
4. Record found moments into the 6.4.1 Airplane Loading Schedule Chart.
5. Determine Take-off weight of the airplane – add together the airplane empty weight, crew, fuel, and baggage and record the result into the 6.4.1 Airplane Loading Schedule Chart.
6. Check, whether the calculated Take-off weight does not exceed Airplane Maximum Take-off Weight 1320 lb, 600 kg.
   If yes, then it is necessary to reduce weight of some of the useful load items (fuel, baggage).

WARNING
EXCEEDING MTOW MAY LEAD TO DETERIORATION OF SAFETY OF FLIGHT!

7. Determine Total Static Moment of loaded airplane – add together the static moment of empty airplane, crew, fuel, and baggage and record the result into the 6.4.1 Airplane Loading Schedule Chart.
8. Plot Takeoff Weight and Total Static Moment into the 6.4.4 CG Moment envelope.
9. Check, whether the intersection of Take-off weight horizontal line and Total Static Moment vertical line is inside the envelope.
   If **YES**, then the flight may be safely performed as regards weight

and balance.

If **NOT**, then it is necessary to change weight of some of the useful load items (crew, fuel, baggage) so that after a repeated computation the intersection of Take-off Weight and Total Static Moment will be inside the CG Moment envelope.

WARNING

SAFETY OF FLIGHT PERFORMED WITH THE AIRPLANE LOADED OUTSIDE PERMITTED LIMITS OF WEIGHT AND STATIC MOMENTS MAY BE DETERIORATED!

6.4.1 Airplane Loading Schedule Chart

Aircraft Type/Model:	BRISTELL LSA	Airplane S/N:	363/2018	Registration:	N163BL

LOADING SCHEDULE CHART			SAMPLE AIRCRAFT			YOUR AIRCRAFT		363/2018
#	ITEM	WEIGHT LIMIT [lb]	WEIGHT [lb]	ARM [in]	MOMENT/100 [lb.in]	WEIGHT [lb]	ARM [in]	MOMENT/100 [lb.in]
1.	Einpty aeroplane		771,6	15,1	116,3	808,0	15,38	124,237
2.	Crew		198,4	23,6	46,9		23,6	
3.	Fuel	190,5	111,1	7,9	8,7		7,9	
4.	Bagagge behind seats	33,1	33,1	55,1	18,2		55,1	
5.	Baggage wing lockers	88,2	88,2	24,8	21,9		24,8	
6.	Baggage front locker	22,0	22,0	-9,8	-2,2		-9,8	
		MTOW [lb]	TAKEOFF WEIGHT [lb] = sum of weights 1 to 6		TOTAL MOMENT/100 [lb.in] = sum of moments 1 to 6	TAKEOFF WEIGHT [lb] = sum of weights 1 to 6		TOTAL MOMENT/100 [lb.in] = sum of moments 1 to 6
		1320	1224,4		209,8			

FRONT CG LIMIT 13,5
AFT CG LIMIT 18,8

CG POSITION [in] = TOTAL MOMENT/100 x 100 / TAKEOFF WEIGHT
= 20982,4 / 1224,4
= **17,136**

FRONT CG LIMIT 25,0 %MAC
AFT CG LIMIT 35,0 %MAC

CG POSITION [%MAC] = CG POS. [in] x 100 / MAC
= 1713,6 / 53,8
= **31,8**

CG POSITION [in] = TOTAL MOMENT/100 x 100 / TAKEOFF WEIGHT
=
=

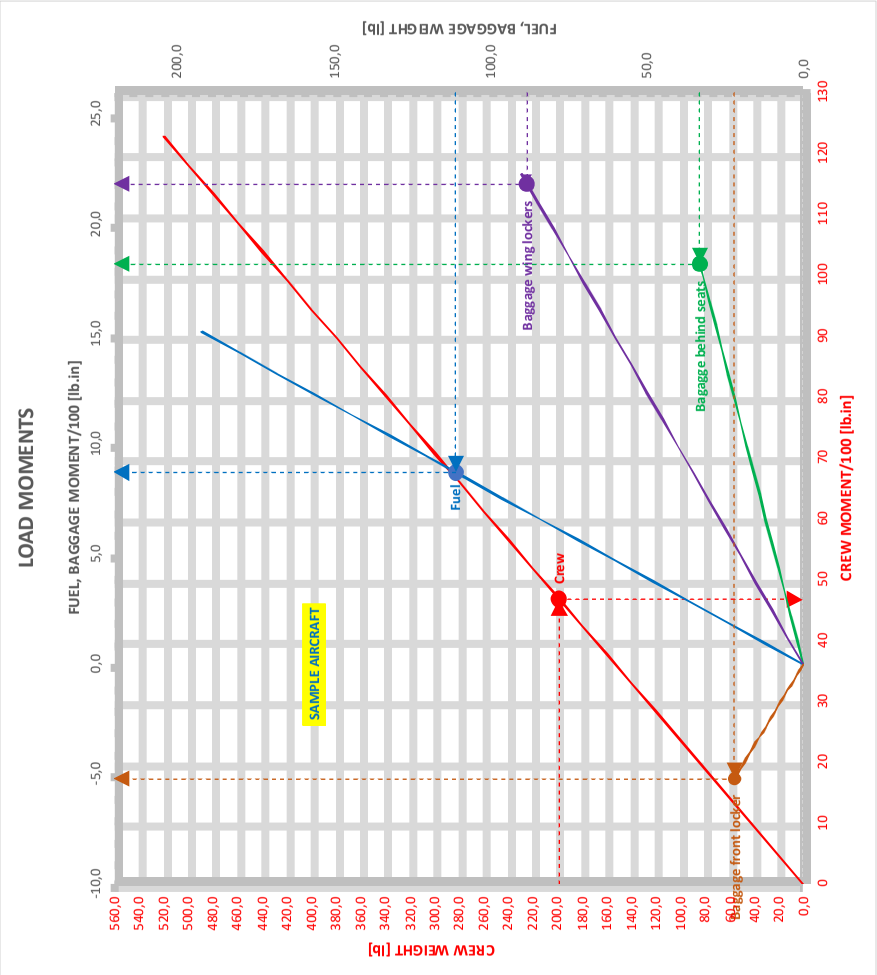
CG POSITION [%MAC] = CG POS. [in] x 100 / MAC
=
=

MAC [in]= 53,8

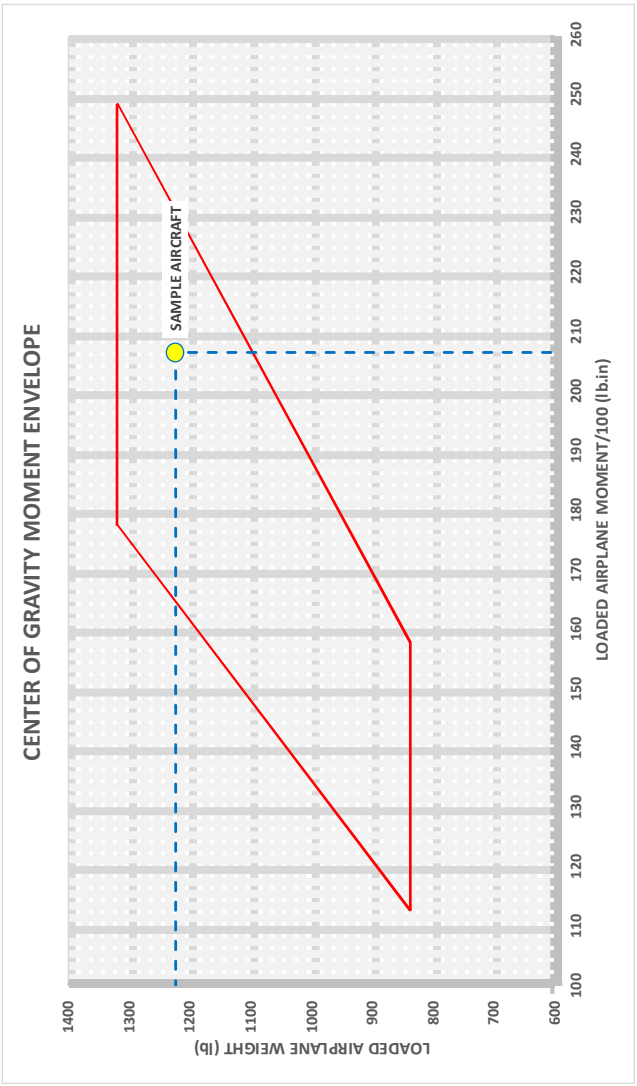
6.4.2 Table of static moments

CREW		FUEL			BAGGAGE BEHIND SEATS		BAGGAGE WING LOCKERS		BAGGAGE FRONT LOCKER	
Weight [lb]	Moment/100 [lb.in]	Quantity [US gal]	Weight [lb]	Moment/100 [lb.in]	Weight [lb]	Moment/100 [lb.in]	Weight [lb]	Moment/100 [lb.in]	Weight [lb]	Moment/100 [lb.in]
0,0	0,0	0,0	0,0	0,0	0	0,0	0	0,0	0	0,0
121,0	28,6	2,0	12,0	0,9	2	1,1	5	1,2	1	-0,1
140,0	33,1	4,0	24,0	1,9	4	2,2	10	2,5	2	-0,2
160,0	37,8	6,0	36,1	2,8	6	3,3	15	3,7	3	-0,3
180,0	42,5	8,0	48,1	3,8	8	4,4	20	5,0	4	-0,4
200,0	47,2	10,0	60,1	4,7	10	5,5	25	6,2	5	-0,5
220,0	52,0	12,0	72,1	5,7	12	6,6	30	7,4	6	-0,6
240,0	56,7	14,0	84,1	6,6	14	7,7	35	8,7	7	-0,7
260,0	61,4	16,0	96,1	7,6	16	8,8	40	9,9	8	-0,8
280,0	66,1	18,0	108,2	8,5	18	9,9	45	11,2	9	-0,9
300,0	70,9	20,0	120,2	9,5	20	11,0	50	12,4	10	-1,0
320,0	75,6	22,0	132,2	10,4	22	12,1	55	13,6	11	-1,1
340,0	80,3	24,0	144,2	11,4	24	13,2	60	14,9	12	-1,2
360,0	85,0	26,0	156,2	12,3	26	14,3	65	16,1	13	-1,3
380,0	89,8	28,0	168,2	13,2	28	15,4	70	17,4	14	-1,4
400,0	94,5	30,0	180,3	14,2	30	16,5	75	18,6	15	-1,5
420,0	99,2	32,0	192,3	15,1	32	17,6	80	19,8	16	-1,6
440,0	103,9				33	18,2	85	21,1	17	-1,7
460,0	108,7						90	22,3	18	-1,8
480,0	113,4								19	-1,9
500,0	118,1								20	-2,0
520,0	122,8								21	-2,1
									22	-2,2

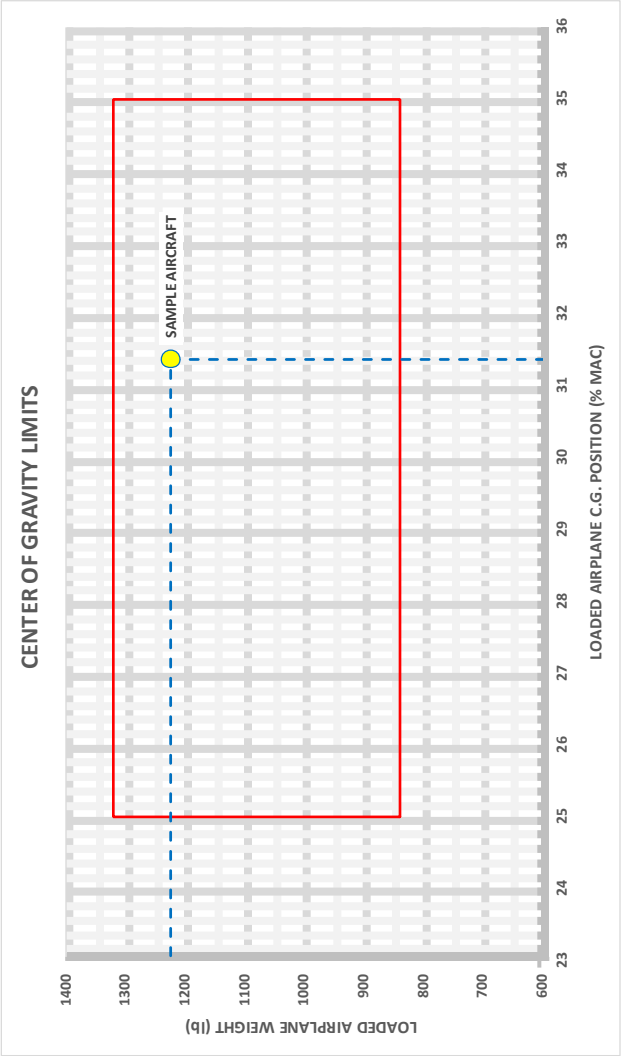
6.4.3 Airplane loading graph



6.4.4 CG Moment envelope



6.4.5 CG limits



6.5 Equipment list

List of equipment installed in Bristell LSA, S/N 363/2018:

1. 2 map pockets
2. 3-pos.adjustable rudder pedals on both sides
3. additional 12V/5V socket on instrument panel
4. Aileron electric trim - control on both control sticks
5. Arm rest box
6. AVEO Powerburst Daylight wing strobes/nav lights
7. Beringer 5,00-5 wheels
8. Beringer dual brakes with pressure limiter
9. Cabin heat
10. Canopy glass - blue
11. Carpet on baggage compartment floor
12. Central console armrest cover padded leather
13. Cockpit floor carpets
14. DUC Inconel Flash propeller
15. Elevator electric trim
16. ELT Kannad AF Integra + RC 200 control unit
17. Fixed landing gear
18. Fuel selector on console between seats
19. Garmin G5 EFIS
20. Garmin GAP 26 angle of attack heated probe
21. Garmin GDU 460, 10,6" dual
22. Garmin GMC 507 Autopilot Control Module without Yaw damper
23. Garmin GPS 20A ADS-B Receiver
24. Garmin GSU 25 ADHRS (1x)
25. Garmin GTR 20 remote-mount comm radio
26. Garmin GTX 45R mode S transponder with ADS-B out
27. Horn (klaxon) 4-cars
28. Lambert Flaps V4_0 LED light +LINAK electric flaps actuator
29. Landing lights in both wings, WIG-WAG
30. Large size oil cooler
31. Large square eye-ball vents 3275

32. Leather glareshield, middle size
33. Leather grips of the control sticks
34. LED strip on glareshield + dimmer
35. LEMO Connector with power supply
36. Lockable canopy
37. Lockable fuel tank caps
38. Long HTU (2.9 m) with long trim and horn balance
39. Middle size instrument panel for G3X
40. Nose gear doubled flexible rod (Teleflex)
41. ON/OFF spherical button for car horn
42. Paint scheme: #6
43. Parking brake Beringer
44. RAMI AV-10 comm antenna
45. RAMI AV-74 transponder DME antenna
46. Rotax 912 iS Sport engine
47. Seat back with cut-out, padded leather
48. Seat padded leather
49. Side panels padded leather
50. Steerable nose wheel
51. TCW IBBS-12V-3AH backup battery for Garmin G3X
52. Tinted canopy - blue
53. Tosten CS-6 grips
54. USB port(s) on the instrument panel
55. VARTA Powersports battery
56. VOR VAL 2000 Ultra-thin navigation receiver
57. Wheel fairings (pants) for wheels 5,00"-5"
58. Whelen MB 1 tail mounted LED strobe
59. Wing lockers
60. Wing span 8,13 m
61. Winter QM 2 Art. 1120 bank indicator

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SECTION 7

7 AIRPLANE AND SYSTEMS DESCRIPTION

7.1 Introduction

This section provides description and operation of the aircraft and its systems.

7.2 Airframe

All-metal construction, single curvature metal skins riveted to stiffeners. Construction is of 6061-T6 aluminum sheet metal riveted to aluminum angles with Avex rivets. This high strength aluminum alloy construction provides long life and low maintenance costs thanks to its durability and corrosion resistance characteristics.

The wing has a high lift airfoil equipped by fowler flaps controlled by the electric servo operated by the pilot.

7.3 Control system

The plane is equipped with a dual stick control and classic rudder pedals, with pedal hydraulic brakes for easy ground control.

The elevator and aileron trim control, as well as wing flaps are electrically operated from the rocker switches located on the instrument panel or on the control stick.

7.4 Landing gear

Tricycle landing gear with the steerable nose wheel. Main landing gear uses two fiberglass spring elements.

7.5 Seats and safety harness

Side-by-side seating. Seat cushions are removable to make easier cleaning and drying. Four point safety belts provided to each seat. Optional, is additional seat upholstery to raise the small pilot or move him forward.

NOTE

Prior to each flight, ensure that the seat belts are firmly secured to the airframe, and that the belts are not damaged. Adjust the buckle so that it is centered on the body.

7.6 Baggage compartment

The rear baggage compartment is located behind the seats. It may accommodate up to 15 kg (33 lb). This space is divide on two sections – baggage compartment A and B. Is not recommended give too heavy things into baggage compartment B.

The baggage may also be loaded into the baggage compartment inside each wing up to 20 kg (44 lb), in each wing locker.

Make sure that baggage does not exceed maximum allowable weight, and that the aircraft CG is within limits with loaded baggage.

All baggage must be properly secured.

7.7 Canopy

Access to the cabin is from both sides. Make sure that the canopy is latched and mechanism is securely locked into position on both sides before operating the aircraft.

7.8 Power plant

Engine:

Rotax 912 iS SPORT is 4-stroke, 4 cylinder, horizontally opposed, spark ignition engine with one central camshaft-push-rod-OHV. Liquid cooled cylinder heads, ram air cooled cylinders.

Dry sump forced lubrication. Dual contactless capacitor discharge ignition. The engine is fitted with an electric starter, AC generator and electrical fuel pumps. Prop drive via reduction gear with integrated shock absorber.

Propeller:

DUC Inconel FLASH, composite, 3-bladed, on-ground adjustable propeller.

NOTE

For technical data refer to documentation supplied by the propeller manufacturer.

7.8.1 Throttle

Engine power is controlled by means of the THROTTLE lever. THROTTLE lever is positioned in the middle channel between the seats. Lever is mechanically connected (by cables) to the flaps on the carburetors. Spring is added to the throttle push rod to ensure that the engine will go to full power if the linkages fail.

7.8.2 Heating

Heating consists of a heat exchanger on the exhaust manifold and control mechanism located on the right hand side of instrument panel.

CAUTION

Incidents involving exhaust gases entering the heating or ventilation system may result in fatal accidents due to carbon monoxide poisoning of the aircraft occupants. A carbon monoxide detector is recommended.

7.9 Fuel system

Wing tanks volume: 2x60 l (2x16 US gallons)

Each tank is equipped with a vent outlet and screen filter.

Drain valve located in the lowest point of the each tank and on the bottom edge of the firewall, on the gascolator.

Main fuel selector valve is on the central console in the cockpit.

The electric fuel pump is located on firewall.

CAUTION

Do not overfill the tanks to avoid fuel overflow through venting tubes.

7.10 Electrical system

7.10.1 Battery

The battery is mounted on the forward side of the firewall.

7.10.2 Master switch

Master switch connects the electrical system to the 12 Volt battery and charger/coils, controlled by the regulator. See Engine Manual for electrical system details.

NOTE

Ignition system is independent on the power source and will operate even with Master switch and/or breaker off.

7.10.3 Lane Switches

There are instaled two independent LANE select switches A and B on the instrument panel to connect the engine control unit ECU for the relevant LANE to the EMS power supply. The switches are used for LANE and ignition check after engine starting. LANE A and LANE B have different sensor inputs. During LANE and Ignition Check, some sensors values are not displayed, depending on activation of the LANES. Refer to Engine Operator's Manual for more details.

NOTE

All switches and or engine controls are "up" or "push forward" for operation, except cabin heat which is "Pull" for "on". Optional equipment, switches and/or fuses are subject to change or installed as requested. See Aircraft Equipment List and Photo and Description of equipment and controls in the cockpit.

7.10.4 Start Power Switch

By pressing the Start Power Switch, the EMS system of the engine is powered externally by the onboard battery for a short time during start-up.

7.10.5 Battery Backup Switch

If necessary (e.g. in case of supply failure by the internal generator) the EMS system can by powered by the onboard battery by activating the Battery Backup Switch.

7.10.6 Start Button

The Red Start Button on the instrument panel activates the starter motor.

7.11 Pitot and static pressure system

Pitot tube (optionally heated) is located below the wing. Pressure distribution to the instruments is through flexible plastic hoses.

Static ports are located on both sides of the fuselage at the tail.

Keep the Pitot tube and static ports clean to ensure proper function of the system..

7.12 Miscellaneous equipment

BRISTELL LSA, S/N 363/2018 is fitted with

1. 2 map pockets, Arm rest box
2. 3-pos.adjustable rudder pedals on both sides
3. Additional 12V/5V socket on instrument panel
4. Aileron + elevator electric trim - control on both control sticks
5. AVEO Powerburst Daylight wing strobes/nav lights
6. Beringer 5,00-5 wheels + wheel fairings
7. Beringer dual brakes with pressure limiter, parking brake
8. Cabin heat
9. Canopy glass - blue
10. Cockpit and baggage compartment floor carpets compartment floor
11. Central console armrest cover padded leather
12. Fixed landing gear, steerable nose wheel
13. Fuel selector on console between seats
14. Horn (klaxon) 4-cars
15. Lambert Flaps V4_0 LED light +LINAK electric flaps actuator
16. Landing lights in both wings, WIG-WAG
17. Large size oil cooler
18. Large square eye-ball vents 3275
19. Leather glareshield, middle size
20. Leather grips of the control sticks
21. LED strip on glareshield + dimmer
22. LEMO Connector with power supply
23. Lockable canopy, Lockable fuel tank caps
24. Nose gear doubled flexible rod (Teleflex)
25. ON/OFF spherical button for car horn
26. Seats, and interior padded leather
27. Tosten CS-6 grips
28. USB port(s) on the instrument panel
29. VARTA Powersports battery
30. Whelen MB 1 tail mounted LED strobe
31. Wing lockers

7.13 Instruments and Avionics

BRISTELL LSA, S/N 363/2018 is fitted with:

Flight instruments:

1. Garmin G5 EFIS
2. Winter QM 2 Art. 1120 bank indicator
3. Garmin G3X glass cockpit including:
4. Garmin GDU 460, 10,6" dual displays
5. Garmin GEA 24 engine module
6. Garmin GSU 25 ADHRS (1x)
7. Garmin GMU 22 magnetometer
8. Garmin GAP 26 angle of attack heated probe
9. Garmin GMC 507 Autopilot Control Module without Yaw damper + GSA-28 servos
10. TCW IBBS-12V-3AH backup battery for Garmin G3X

Engine instruments:

1. Garmin GEA 24 engine module

COM/NAV instruments:

1. Garmin GTR 20 remote-mount comm radio + RAMI AV-10 comm antenna
2. Garmin GTX 45R mode S transponder with ADS-B out + RAMI AV-74 transponder DME antenna
3. VOR VAL 2000 Ultra-thin navigation receiver
4. Garmin GPS 20A ADS-B Receiver
5. ELT Kannad AF Integra + RC 200 control unit

NOTE

For operating instructions refer to the documentation supplied with the instruments.

7.14 Cockpit

7.14.1 Cockpit layout

BRISTELL LSA, S/N 363/2018 has the following cockpit layout:

7.14.2 Instrument panel

BRISTELL LSA, S/N 363/2018 has the following instrument panel:

SECTION 8

8 Airplane handling, servicing and maintenance

8.1 Introduction

This section contains factory-recommended procedures for proper ground handling and servicing of the airplane. It also identifies certain inspection and maintenance requirements, which must be followed if the airplane is to retain that new-plane performance and dependability.

8.2 Aircraft inspection periods

Periods of overall checks and contingent maintenance depends on the condition of the operation and on overall condition of the airplane.

Inspections and revisions should be carried out in the following periods, at least:

a) after the first 25 flight hours
b) after every 50 flight hours
c) after every 100 flight hours or at least annual inspection

Refer to the Engine Operator's Manual for engine maintenance.

Maintain the prop according to its manual.

All repairs and maintenance should be made in accordance with AC 43.13-1B.

8.3 Aircraft alterations or repairs

It is recommended to contact the airplane manufacturer prior to any alternations to the aircraft to ensure that the airworthiness of the aircraft is not violated. Always use only the original spare parts produced by the airplane (engine, prop) manufacturer.

If the aircraft weight is affected by that alternation, a new weighing is necessary, then record the new empty weight into the Weight and Balance record / Permitted payload range in SECTION 6 and up-date the placard showing weights in the cockpit.

8.4 Ground handling

8.4.1 Towing

To handle the airplane on the ground, use the Tow Bar, or the fuselage rear pushed down in the place of a bulkhead.

CAUTION

Avoid excessive pressure at the airplane airframe-especially at control surfaces. Keep all safety precautions, especially in the propeller area.

8.4.2 Parking

It is advisable to park the airplane inside a hangar or alternatively inside any other suitable space (garage) with stable temperature, good ventilation, low humidity and dust-free environment.

It is necessary to moor the airplane when it is parked outside a hangar. Also when parking for a long time, cover the cockpit canopy, possibly the whole airplane by means of a suitable tarpaulin.

8.4.3 Mooring

The airplane should be moored when parked outside a hangar after the flight day. The mooring is necessary to protect the airplane against possible damage caused by wind and gusts.

For this reason the aircraft is equipped with mooring eyes located on the lower surfaces of the wings.

Mooring procedure:

1. Check: Fuel Selector shut off, Circuit breakers and Master switch switched off, Switch box switched off.
2. Fix the hand control using e.g. safety harness
3. Close air vent
4. Close and lock canopy
5. Moor the aircraft to the ground by means of a mooring rope passed through the mooring eyes located on the lower surfaces of the wings and below rear fuselage

NOTE

In the case of long term parking, especially during winter, it is recommended to cover the cockpit canopy or possibly the whole aircraft by means of a suitable tarpaulin attached to the airframe.

8.4.4 Jacking

Since the empty weight of this aircraft is relatively low, two people can lift the aircraft easily.

First of all prepare two suitable supports to support the aircraft.

It is possible to lift the aircraft by handling the following parts:

- By pushing the fuselage rear section down in the place of a bulkhead the fuselage front section may be raised and then supported under the firewall.

- By holding the fuselage rear section under a bulkhead the fuselage rear may be raised and then supported under that bulkhead.
- To lift up a wing, push from underneath that wing only at the main spar area. Do not lift up a wing by handling the wing tip.

8.4.5 Road transport

The aircraft may be transported after loading on a suitable car trailer. It is necessary to dismantle the wings before road transport. The aircraft and dismantled wings should be attached securely to protect these parts against possible damage.

8.5 Cleaning and care

Use efficient cleaning detergents to clean the aircraft surface. Oil spots on the aircraft surface (except the canopy!) may be cleaned with gasoline.

The canopy may only be cleaned by washing it with a sufficient quantity of lukewarm water and an adequate quantity of detergents. Use either a soft, clean cloth sponge or deerskin. Then use suitable polishers to clean the canopy.

CAUTION

Never clean the canopy under “dry“conditions and never use gas or chemical solvents!

Upholstery and covers may be removed from the cockpit, brushed and eventually washed in lukewarm water with an adequate quantity of detergents. Dry the upholstery thoroughly before insertion into the cockpit.

CAUTION

In the case of long term parking, cover the canopy to protect the cockpit interior from direct sunshine.

SECTION 9

9 REQUIRED PLACARDS AND MARKINGS

9.1 Limitation placards

9.2 Miscellaneous placards and markings

9.1 Limitation placards

The airplane must be placarded with:

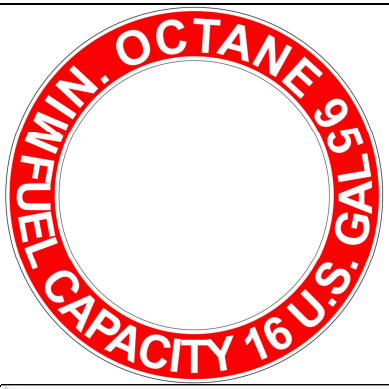
- All fuses
- Ignition switches (LANE A,B)
- Starter
- Trim: Nose heavy and Tail heavy
- Flaps: 0°, 10°, 20°, 30°
- Maximum rear baggage weight 15 kg, 33 lb
- Maximum weight in each wing locker 20 kg, 44 lb, if installed
- Maximum weight in front locker 10 kg, 22 lb, if installed
- Instruments
- Canopy: Open - Close
- Fuel capacity: 60 litres, 15.87 US gallons / min. 95 Octane - at filler neck
- Fireproof Identification plate attached to the fuselage port side, in front of the horizontal tail unit

Aircraft Operating Instructions

PASSENGER WARNING! THIS AIRCRAFT WAS MANUFACTURED IN ACCORDANCE WITH LIGHT SPORT AIRCRAFT AIRWORTHINESS STANDARDS AND DOES NOT CONFORM TO STANDARD CATEGORY AIRWORTHINESS REQUIREMENTS.	Passenger warning for LSA category aeroplanes. Located on the instrument panel.
PASSENGER NOTICE THIS AIRCRAFT CONFORMS TO ASTM CONSENSUS STANDARDS OF AIRWORTHINESS DEVELOPED AND MAINTAINED BY THE AVIATION COMMUNITY UNDER ASTM TECHNICAL COMMITTEE F 37.	Passenger notice for LSA category aeroplanes. Located on the instrument panel.
ALL AEROBATIC MANEUVERS, INCLUDING SPINS ARE PROHIBITED	Operation limitation. Located on the instrument panel.
WARNING IFR FLIGHTS AND INTENTIONAL FLIGHTS UNDER ICING CONDITIONS ARE PROHIBITED!	Operation limitation. Located on the instrument panel.
BAGGAGE COMPARTMENT - A	Main baggage compartment behind the seats.
BAGGAGE COMPARTMENT - B	Additional baggage compartment behind the Baggage compartment A. NOT TO BE USED FOR HEAVY ITEMS!
MAX. 33 LB	Maximum weight of baggage in the Baggage compartment – A, behind the seats.
MAX. 44 LB	Maximum weight of baggage in each wing locker, if installed.
MAX. 22 LB	Maximum weight of baggage in fuselage front locker, if installed.
UNUSABLE FUEL QUANTITY 0.13 US GAL	Unusable quantity of fuel in each tank
V_{FE} 75 kt V_A 96 kt V_{NE} 157 kt	Airspeed limitations. Located on the instrument panel or fuselage side.
ENGINE RPM: Max. take-off (max. 5 min.) 5800 rpm Max. continuous 5500 rpm Idle 1400 rpm	Engine speed limitations. Located on the instrument panel or fuselage side.

WARNING DO NOT EXCEED MAXIMUM TAKE-OFF WEIGHT 1320 LBS	Maximum Takeoff Weight Limitation. 1320 lb limit for Light sport aeroplanes. Located on the instrument panel or fuselage side.

9.2 Miscellaneous placards and markings

	Wing flap root area
	Areas to avoid pushing on them. Wing trailing edge, control surfaces trailing edges, etc.
	Located on wing upper skin around the fuel tank filler neck.
	Throttle and Choke placard located on the Throttle-choke quadrant.
	Located on the fuselage right/left side under the instrument panel. Placard point to the lever to adjust pedals position.
	Located between the seat backs, at the headphone sockets.
	Located on the fuselage left side at the button to release canopy locks.
	Located inside the cockpit on the left and right side of the tip-up canopy frame.

	Located on the top of the canopy inside.
	Located on the lever between seats.
	**If BRS rescue system is installed:** Placard located on the both sides of fuseline between canopy and rear window
	Placard located in place rocket egress
	Located on both sides of the fuselage tail where are located static ports.

CAUTION
The owner (operator) of this airplane is responsible for the readability of placards during the aircraft service life.

SECTION 10

10 SUPPLEMENTS

10.1 Introduction

10.2 List of inserted supplements

10.3 Inserted Supplements

10.1 Introduction

This section contains the appropriate supplements necessary to safely and efficiently operate the aircraft when equipped with various optional systems and equipment not provided with the standard airplane.

10.2 List of inserted supplements

Date	Suppl. No.	Title of inserted supplement
07/2011	01/2011	Aircraft Flight Training Supplement
08/2018	02	Description of the aircraft S/N 363/2018

10.3 Inserted Supplements

Aircraft Operating Instructions

SUPPLEMENT No. 01/2011

Aircraft Flight Training Supplement

The BRISTELL LSA flying characteristics and behavior are similar to single engine aircraft.
Following training procedure is applicable if the pilot is holder of UL, PPL or LSA Pilot License. The training flight hours are recommended minimum and depends on the Flight Instructor if student pilot is ready to continue on in next training step. Training can be performed by Flight Instructor or by the experienced pilot who has minimum 20 hours on the BRISTELL LSA.

Type Rating Training Procedure:

Ground Training - *before practical Flight Training the pilot has to get familiar with following procedures and documentation*

- *Aircraft Operating Instructions (AOI)*
- *Aircraft Maintenance and Inspection Procedures*
- *Aircraft preflight inspection procedure*
- *Control Checklists*
- *Radio, avionics, aircraft and engine controls procedures*
- *Differences in control and aircraft handling*
- *Emergency procedures*

Flight training program - *recommended*

Flight Training Procedure		Dual		Solo	
		Flights	hr/min	Flights	hr/min
1.	Check flight	1	30’		
2.	Pattern training flights up to 1000 ft AGL	4	20’	3	15’
3.	Pattern training flights up to 500 ft AGL	4	20’	3	15’
4.	Stall speed, 45°turns, side slips	1	30’	1	20’
5.	Emergency landing training	4	20’	3	10’
Total		14	2 hr	10	1 hr

Flight Training Procedure - *description*

1. ***Check flight –*** *Student Pilot will fly the airplane in local flight, instructor is giving advice as necessary.*

2. ***Pattern training flights up to 1000 feet AGL -*** *high pattern procedures, instructor is giving advice as necessary.*

3. ***Pattern training flights up to 500 feet AGL -*** *high pattern procedures, instructor is giving advice as necessary.*

4. ***Stall speed, 45°turns, sideslips –*** *stall speed flaps retracted and extended (landing configuration), sideslips at landing configuration.*

5. ***Emergency landing training –*** *emergency procedures and landing to 1/3 of runway.*

NOTE

During solo flights instructor is observing the student pilot on pattern and can advise by radio as necessary.

Endorsement:

Instructor will endorse the Type Rating to the Pilots Logbook, if required.

BRISTELL LSA

BRMAERO Wings with heart

Aircraft Operating Instructions

SUPPLEMENT No. 02

AIRCRAFT DESCRIPTION

Registration: **N163BL**

Serial Number: **363/2018**

This Supplement must be contained in the Aircraft Operating Instructions during operation of the airplane.

Information contained in this Supplement add or replace information from the basic Aircraft Operating Instructions in the further mentioned parts only. Limitations, procedures and information not mentioned in this Supplement are contained in the basic Aircraft Operating Instructions.

0 TECHNICAL INFORMATION

This Supplement adds information necessary for airplane operation with equipment installed in the airplane **BRISTELL LSA, S/N 363/2018**.

0.1 Record of revisions

No changes.

1 GENERAL INFORMATION

No changes.

2 OPERATING LIMITATION

2.4.3 Oil

Type of oil used by aircraft manufacturer :
Aeroshell OIL SPORT PLUS 4

2.4.4 Coolant

Type of used coolant:
Castrol Radicool NF
Mixture ratio coolant / water 1:1.5 litres (40%) (-25 °C)
Max. Coolant temperature : 120 °C (248 °F)

3 EMERGENCY PROCEDURES

No changes.

4 NORMAL PROCEDURES

No changes.

5 PERFORMANCE

No changes.

6 WEIGHT AND BALANCE

No changes.

7 AIRPLANE AND SYSTEMS DESCRIPTION

No changes.

8 AIRPLANE HANDLING, SERVICING AND MAINTENANCE

No changes.

9 REQUIRED PLACARDS AND MARKINGS

No changes.