Aircraft Operating Instructions

BRISTELL S-LSA

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Aircraft Operating Instructions

BRISTELL S-LSA

Registration: **VH-YVP**

Serial Number: **320/2018**

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 issue	07/2016	Petr Javorský	07/2016	07/2016	P.Javorský
1	0 1 2 3 4 5 6 7 8 9	i, ii..renumbering 0-1 to 0-8..renumbering 1-1 to 1-8..renumbering 2-4 to 2-10..engine data update 3-1,3-2, 3-6 to 3-16..new emerg.procedures added 4-1,4-5, 4-6,4-8 to 4-14..new normal procedures added 5-3,5-4,5-7 to 5-9..IAS-CAS 6-4..new WB scheme 7-2,7-3,7-6..new pito 8-2..50 hrs inspection 9-2 to 9-6..stickers update	12/2017	Petr Javorský	12/2017	12/2017	P.Javorský

0.2 List of effective pages

Section	Page	Date of Issue	Section	Page	Date of Issue
	Title	12/2017		2-5	12/2017
	i	12/2017		2-6	12/2017
	ii	12/2017		2-7	12/2017
				2-8	12/2017
0	0-1	12/2017		2-9	12/2017
	0-2	12/2017		2-10	12/2017
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				3-6	12/2017
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	2-3	07/2016			
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0.3 Table of contents

Section

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SECTION 1

1.1 Introduction

This Aircraft Operating Instruction has been prepared to provide pilots with information for the safe and efficient operation of BRISTELL S-LSA aircraft. It also contains supplemental data supplied by the Aircraft Flight Training Supplement.

1.1.1 Certification basis

BRISTELL S-LSA is a special light sport category aircraft made by
BRM Aero, s.r.o., Kunovice, Czech Republic,
based on the following airworthiness standards:

- ASTM F2245 Consensus standard for Light Sport Aircraft category
  plus other applicable ASTM Consensus Standards.
- Czech LAA UL-2
- EASA CS-VLA

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 S-LSA is airplane intended especially for recreational and cross-country flying, basic training, and non-aerobatics operation.
BRISTELL S-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 (98.6 hp), 4-cylinder, 4-stroke engine and FITI three blade ground adjustable propeller.
BRISTELL S-LSA, S/N 320/2018 is fitted with:

- Rotax 912 ULS 2 engine
- MTV-34-1-A/175-200, in-flight hydraulically variable, 3 bladed propeller providing constant speed mode.

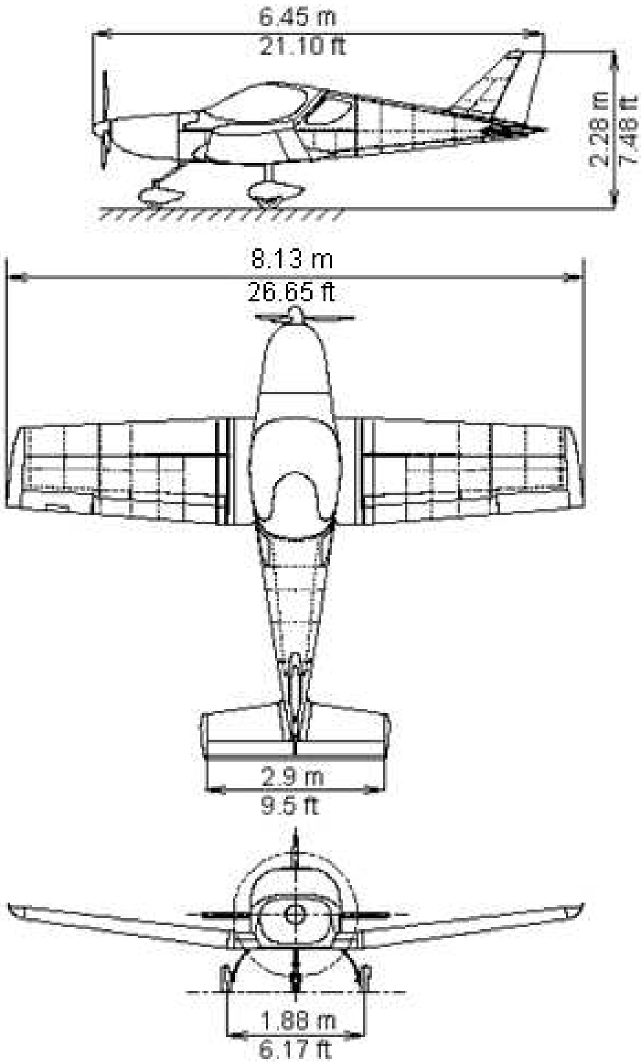
1.3.3 Aircraft dimensions

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 (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
AOI	Aircraft Operating Instructions
ASI	Airspeed Indicator
ATC	Air Traffic Control
BEACON	anti-collision beacon
CAS	Calibrated Airspeed
CG	Center of Gravity
COMM	communication transmitter
EFIS	Electronic Flight Instrument System
ELT	Emergency Locator Transmitter
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
LAA	Light Aircraft Association of the Czech Republic
lb	pound
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
ROC	Raet-of-climb
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		**Metric units**	**US units**
Gross weight (Maximum take-off weight)		600 kg	1320 lb
Top speed at sea level	MCP: 5500 rpm	228 km/h CAS	123 KCAS
Cruise speed at sea level	75%: 5000 rpm	200 km/h CAS	108 KCAS
Cruise speed at sea level	65%: 4800 rpm	185 km/h CAS	100 KCAS
Full fuel range at 4000 ft pressure altitude, at 75 % MCP (5000 rpm), No fuel reserve		1170 km	630 NM
Rate of climb at sea level.......................... **Vx**		810 fpm at 109 km/h IAS	810 fpm at 59 KIAS
Rate of climb at sea level.......................... **Vy**		860 fpm at 123 km/h IAS	860 fpm at 66 KIAS
Stall speed V_{S1} (flaps retracted)		83 km/h CAS	45 KCAS
Stall speed V_{S0} (flaps fully extended)		71 km/h CAS	38 KCAS
Total fuel capacity		120 liters	31.7 US gal
Total usable fuel		119 liters	31.4 US gal
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	
Engine Maximum takeoff power		73.5 kW (100 HP) at 5800 rpm	
Engine Maximum continuous power		69 kW (90 HP) at 5500 rpm	
Engine Cruising power 75 % of MCP		51 kW (68 HP) at 5000 rpm	
Engine Cruising power 65 % of MCP		44.6 kW (60 HP) at 4800 rpm	
Engine Cruising power 55 % of MCP		38 kW (50 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		IAS (km/h)	KIAS	Remarks
V_{NE}	Never exceed speed	***290***	***157***	Do not exceed this speed in any operation.
V_{NO}	Max. structural cruising speed	***240***	***129***	Do not exceed this speed except in smooth air, and then only with caution.
V_A	Maneuvering speed	***180***	***96***	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	***139***	***75***	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
	km/h	*Knots*	
White arc	***70-139***	***37-75***	Flap Operating Range.
Green arc	***82-240***	***44-129***	Normal Operating Range.
Yellow arc	***240-290***	***129-157***	Maneuvers must be conducted with caution and only in smooth air.
Red line	***290***	***157***	Maximum speed for all operations.

2.4 Power plant

2.4.1 Engine operating speeds and limits

Engine Model:		**ROTAX 912 ULS 2**
Engine Manufacturer:		**Bombardier-Rotax GMBH**
Power	***Max Take-off:***	**100 hp at 5800 rpm, max.5 min.**
	Max. Continuous:	**92.5 hp at 5500 rpm**
	Cruising:	**68.4 hp at 5000 rpm**
Engine RPM	***Max. Take-off:***	**5800 rpm, max. 5 min.**
	Max. Continuous:	**5500 rpm**
	Cruising:	**5000 rpm**
	Idling:	**~1400 rpm**
Coolant temperature (CT) New engines	***Minimum:***	**50 °C (122 °F)**
	Maximum:	**120 °C (248 °F)** only conventional coolant allowed
	Optimum:	**80 – 110 °C (176-230 °F)**
Oil temperature	***Minimum:***	**50 °C (122 °F)**
	Maximum:	**130 °C (266 °F)**
	Optimum:	**90 – 110 °C (190-230 °F)**
Oil pressure:	***Minimum:***	**0.8 bar (12 psi) - *below 3500 rpm***
	Maximum:	**7 bar (102 psi) - cold engine start**
	Optimum:	**2 - 5 bar (29 – 73 psi) - *above 3500 rpm***
Exhaust gases temp.	***Maximum:***	***880 ° C* (1616 °F)**

2.4.2 Fuel

ATTENTION
Obey the latest edition of Service Instruction SI-912-016, for the selection of the correct coolant.

ATTENTION
Use only fuel suitable for the respective climatic zone.

NOTE

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

Antiknock properties

The fuels with following specifications can be used.

	Usage/Description	
	912 A/F/UL	**912 S/ULS**
Anti knock properties	Min. RON 90 (min. AKI[4]	Min. RON 95 (min. AKI[4] 91)

NOTE

For fuels according to ASTM D4814 specifications following AKI (Anti Knock Index) value has to be observed: min. AKI 91.

MOGAS

	Usage/Description	
MOGAS	**912 A/F/UL**	**912 S/ULS**
European standard	EN 228 normal EN 228 super EN 228 super plus	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 A/F/UL**	**912 S/ULS**
Aviation Standard	AVGAS 100 LL (ASTM D910)	AVGAS 100 LL (ASTM D910)

4. Anti Knock Index (RON+MON)/2

Fuel volume:

Wing fuel tank volume ....2x60 l 2x16 US gal

Unusable fuel quantity..................2x0.5 l 2x0.13 US gal

WARNING
Always check that you have enough fuel for intended flight!

2.4.3 Oil

> **ATTENTION**
>
> **Obey the manufacturers instructions about the lubricants.**
> If the engine is mainly run on AVGAS more frequent oil changes will be required. See Service Information SI-912–016, latest edition.

Oil type

At the selection of suitable lubricants refer to the additional information in the Service Information SI-912-016, latest edition.

Oil consumption

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

Oil specification

- Use only oil with RON 424 classification
- 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.
- Oils primarily for Diesel engines have **insufficient high temperature properties and additives which favour clutch slipping, and are generally** unsuitable.

Oil viscosity

Use of multi-grade oils is recommended.

NOTE

Multi-viscosity grade oils are less sensitive to temperature variations than single grade oils.
They are suitable for use throughout the seasons, ensure rapid lubrication of all engine components at cold start and get less fluid at higher temperatures.

Table of lubrication

Since the temperature range of neighboring SAE grades overlap, there is no need for change of oil viscosity at short duration of ambient temperature fluctuations.

> ***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

ATTENTION
Obey the latest edition of Service Instruction SI-912-016, 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

ATTENTION
Obey the manufacturers instructions!

Applicable for engine S/N without Suffix -01.

	Mixture ratio %	
Designation	**Concentrate**	**Water**
conventional e.g. BASF Glysantine anticorrosion	50*	50
waterless e.g. Aero Cool 180°	100	0

* coolant component can be increased up to max. 65 %.

Applicable for engine S/N with Suffix -01.

	Mixture ratio %	
Designation	**Concentrate**	**Water**
conventional e.g. BASF Glysantine anticorrosion	50*	50

* coolant component can be increased up to max. 65 %.

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 ULS 98.6 hp	*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 (122 °F)*	*50-110 °C (122-230 °F)*	*110-130 °C (230-266 °F)*	*130 °C (266 °F)*
Exhaust Gases Temp. (EGT)	-	*800-850 °C (1472-1562 °F)*	*850-880 °C (1562-1616 °F)*	*880°C (1616 °F)*
Coolant Temperature (CT) Only conventional coolant allowed	*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

NOTE

Actual empty weight is shown in SECTION 6

Max. take-off weight ....600 kg 1320 lb

Max landing weight.............................600 kg 1320 lb

Weight of fuel (120 l, 16 US gal)..........87 kg 209 lb

Maximum 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

2.8 Center of gravity

Operating C.G. range ....25 to 35 % of MAC

MAC..1367 mm 53.819 in

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

2.9 Approved maneuvers

Airplane Category: LSA

The BRISTELL S-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...........................55	kg	121 lb
Maximum crew weight.............................	see SECTION 6	

WARNING

Do not exceed maximum take-off weight 600 kg (1320 lb)!

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 (is 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

3.1 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 - 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 - 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 - switch off
9. Safety harness - tighten
10. Master switch - switch off before landing
11. Land

3.3 In-flight Engine Starting

1. Electric pump - ON
2. Fuel Selector - switch to second fuel tank
3. Starter - switch on

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 - 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.

3.4.2 Fire on ground with engine running

1. Heating - close
2. Fuel selector - close
3. Throttle - full power
4. Ignition - 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.

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 - 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.

3.4.4 Fire in flight

1. Heating - close
2. Fuel Selector - close
3. Throttle - full power
4. Master switch - switch off
5. Ignition - switch off after the fuel in carburetors is consumed and engine shut down
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.

NOTE

Estimated time to pump fuel out of carburetors is 30 seconds.

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)

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 - if installed then report your location if
6. possible
7. Fuel Selector - close
8. Ignition - switch off
9. Master switch - switch off
10. 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 circuit 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.
If an unintentional spin fully developes then the following recovery technique is advised:

1.	Throttle	- idle
2.	Lateral control	- ailerons neutralized
3.	Rudder pedals	- full opposite rudder (to the mechanical stop)
4.	Following a short pause	- Elevator control – push forward until rotation stops
5.	Rudder pedals	- neutralize rudder immediately when rotation stops
6.	Recover from the 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 Carburetor icing

The carburetor icing shows itself through a decrease in engine power and an increase of engine temperatures.

To recover the engine power, the following procedure is recommended:

1. Speed - 140 km/h (75 KIAS)
2. Throttle - set to 1/3 of power
3. If possible, leave icing area
4. Increase the engine power gradually up to cruise conditions after 1-2 minutes

If you fail to recover the engine power, land on the nearest airfield (if possible) or depending on the circumstances, perform a precautionary landing according to 3.6.

NOTE

If your engine is equipped with carburetor heating, use it for extended period of descent and also in area of possible carburetor icing.
Remember: Aircraft is approved *to operate in VMC condition only!*

3.8.3 Autopilot malfunction

In the case, that autopilot (if installed) 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.

3.8.4 Loss of oil pressure

3. Reduce engine power setting to the minimum necessary
4. Carry out Precautionary landing 3.6.2.
5. Check oil system
   Possible causes are:
   Not enough oil in oil tank - Refill oil
   Too hot oil - Cool down oil.
6. Carry out an unscheduled maintenance check according to Rotax 912 Maintenance Manual Line Chapt. 05-50-00

3.8.5 High oil pressure

3.8.5.1 Oil pressure above permitted range at low ambient temperatures

1. Reduce engine power setting to the minimum necessary
2. Carry out precautionary landing 3.6.2.

3.8.5.2 High oil pressure

1. Reduce engine speed and check the oil pressure again once it has reached a higher oil temperature.
2. A maintenance inspection should be carried out.

3.8.6 Alternator failure

The Rotax 912 ULS engine has an integrated AC generator. Voltage drop below 11 volts is indicated by “Low Volt” warning lamp on the instrument panel or on EFIS display. If the alternator fails, then the instruments are supplied by onboard battery for a limited period of time (around 30 minutes). Some instruments, like Garmin G3X, may have installed an internal backup battery which will power them for given time (refer to the device manual).

In any case switch off all electrical equipmetn which is not essential for your current flight conditions and land as soon as practicable. Then, before next flight, investigate cause of alternator failure and remedy it.

3.8.7 Overvoltage

Overvoltage more than 15 Volts

1. Reduce engine speed
2. Check voltage meter for change

If voltage still out of limits:

1. Select AVIONICS OFF
2. MASTER SWITCH OFF

CAUTION

Turning OFF the AVIONICS/MASTER switch will eliminate the possibility of communications or use of GPS/AHRS, flaps, etc.

3. Carry out Precautionary landing 3.6.2.

3.8.8 Inadvertent icing encounter

WARNING

Intentional flights under icing conditions are PROHIBITED!

If icing is inadvertently encountered then:

1. Pitot heat (if installed) - ON
2. Exit icing conditions - change altitude or turn back.
3. Carb heat - pull knob to ON
4. Cockpit heating - pull knob to ON
5. Up/Down knob - pushed forward (UP) to defrost windshield

3.8.9 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.

3.8.10 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 according to appropriate procedure.

3.9 MTV-34-1-A/175-200 Propeller trouble shooting

Refer to the Propeller Operation, Installation, and Maintenance Manual, Section 8.0 Troubleshooting for a complete list of possible failures, causes and remedies.

3.9.1 Rpm in flight too high if operated as a Constant Speed Propeller

If the static rpm is within the limits, only the governor allows overspeed. Adjust rpm to the desired value in flight an turn the stop screw in after landing until it touches the governor lever.

CAUTION

Do not change position of the rpm control during final approach.
Secure screw with safety wire.

3.9.2 Rpm variations between ascend, cruise and descend although having identical propeller setting

If operated as a Constant Speed Propeller Up to ± 50 rpm normal condition. If more:

Cause:

1. Excessive friction in the hub
2. Excessive friction in the governor
3. Worn rpm tachometer

Remedy:

1. Contact manufacturer.
2. Contact manufacturer.
3. Replace/repair instrument.

3.9.3 Rpm increase during normal operation without change of propeller lever position if operated as a Constant Speed Propeller

Cause:

1. Oil leakage or hot oil
2. Worn oil transfer system causes a decrease in blade angle of attack.
3. Internal leakage in the propeller.
4. Governor drive failure or broken relief valve spring.

Remedy:

1. Check for oil leaks, replace gaskets, decrease oil temperature with higher airspeeds.

2. If the system works with cold oil and fails at high oil temperature, this will indicate high leakage in the oil transfer system on the propeller shaft. Repair engine.
3. Contact manufacturer.
4. Check governor drive and governor on the test bench.

> **CAUTION**
>
> If sudden oil leakage occurs, move power lever back until the rpm will decrease. In this condition the propeller goes back to the low pitch stop automatically and no oil pressure is needed. Adjust the propeller control for take off position. Apply power again, no more than required to remain about 100 rpm below take off rpm.

3.9.4 Rpm decrease during normal operation without change of propeller lever position if operated as a Constant Speed Propeller

Cause:

1. Speeder spring in the governor broken or sticking pilot valve.
2. Dirt in the fuel system or carburetor.
3. Control inoperative.

Remedy:

1. Check governor on the test bench.
2. Clean or repair.
3. Check free movement and positive stop contact.

> **CAUTION**
>
> If the cause cannot be found in the fuel system the flight can be continued when throttle setting is reduced, avoiding excessive manifold pressure and overheating of the engine. The rpm will remain low because the propeller pitch is on the high pitch stop.

3.9.5 Extremely slow pitch change or no pitch change on ground If operated as a Constant Speed Propeller

(rpm changes with airspeed like a fixed pitch propeller)

Cause:

1. Blocked oil line.
2. Sludge deposit in propeller piston.
3. Damaged pitch change mechanism.
4. Corrosion in the blade bearings.

Remedy:

1. Check engine.

2. Clean propeller and crankshaft.

Concerning 1 and 2:

This behavior does not appear at once and gets worse after some time. It should be observed at the preflight inspection.

3. Contact manufacturer. This error may appear suddenly.
4. Repair propeller.

3.9.6 Oil leakage (visible outside or hidden inside)

Cause: Damaged gasket

Remedy: Replace gaskets or repair propeller.

3.9.7 Rough running engine, possibly in limited rpm range only

Cause:

1. Bad static balance.
2. Bad dynamic balance.

Remedy:

1. Rebalance statically, mount balance weights to forward spinner bulkhead.
2. Rebalance dynamically. Install balance weights to rear spinner bulkhead.

SECTION 4

4 NORMAL PROCEDURES

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 S-LSA Maintenance and inspection procedures manual.

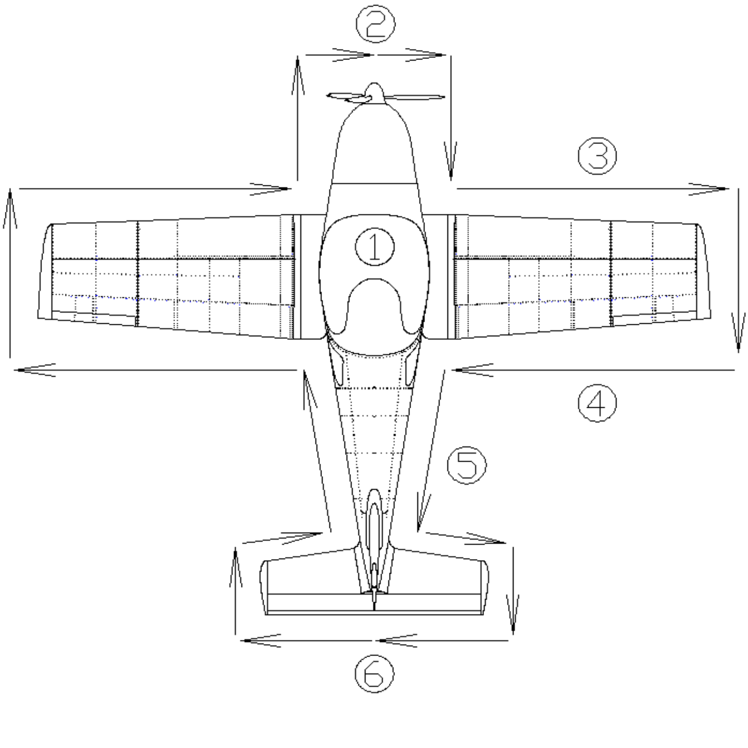
4.3 Pre-flight Inspection

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	- 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, blades and spinner condition (no blade cracks, no leading edge protection damages) – 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	

WARNING

Physically check the fuel level before each take-off to make sure you have sufficient fuel for the planned flight.

CAUTION

In case of long-term parking it is recommended to turn the engine several times (Ignition 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 pedal position - set

WARNING

Adjusting of rudder pedals position during flight is PROHIBITED.

4.4.2 Engine starting

1. Start the engine according to its manual procedure
2. Master switch - ON
3. Fuel Selector - set to LEFT fuel tank

NOTE

Aircraft fitted with Rotax 912 ULS engine is equipped with the fuel return line going only into the left tank. Do not start or take-off with the fuel selector set to the right tank if the left one is full, because returning fuel will overpressure left tank and fuel will leak from fuel tank air vent tube at the wing tip.

4. Electric fuel pump - ON if installed – only for cold engine
5. Choke (cold engine) - pull to open and gradually release after engine start
6. Starter - hold activated to start the engine

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 29 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 should be switched on (off) during ignition circuit check.

4.4.3 Engine warm up, Engine check

4.4.3.1 Engine warm up

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).

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° (122°F). The warm up period depends on ambient air temperature.

Check both ignition circuits at 4000 rpm for Rotax 912 ULS. The engine speed drop during the time either magneto switched off should not over 300 rpm. The Max. engine speed drop difference between circuits A and B should be 115 rpm.

NOTE

Only one ignition should be switched on (off) during ignition circuit check.

Set max. power for verification of max. speed with given propeller and engine parameters (temperatures and pressures).

Check acceleration from idling to max. power. If necessary, cool the engine at 3000 rpm before shutdown.

NOTE

MTV-34-1-A/175-200 propeller should be cycled at least twice to spill oil before every flight.

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 - set to LEFT fuel tank

NOTE

Aircraft fitted with Rotax 912 ULS engine is equipped with the fuel return line going only into the left tank. Do not start or take-off with the fuel selector set to the right tank if the left one is full, because returning fuel will overpressure left tank and fuel will leak from fuel tank air vent tube at the wing tip.

7. Ignition A,B - ON
8. Electric fuel pump - ON if installed
9. Wing flaps - extend as needed
10. Autopilot (if installed) - OFF

4.4.6 Take-off

1. Brakes - apply to stop wheel rotation
2. Take-off power - Move throttle lever slowly fully forward to avoid overspeed
3. Engine speed - check rpm
4. Instruments - check 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 (if installed) 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)	66 KIAS (123 km/h)
Obstacle:	Vx (best angle of climb)	59 KIAS (109 km/h)

11. Flaps - set to 10°
12. Climb at:

No obstacle:	Vy (best rate of climb)	66 KIAS (123 km/h)
Obstacle:	Vx (best angle of climb)	59 KIAS (109 km/h)

13. Trim - adjust
14. Flaps - retract at Vy 66 KIAS (123 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)	66 KIAS (123 km/h)
Obstacle:	Vx (best angle of climb)	59 KIAS (109 km/h)

9. Flaps - set to 10°

10. Climb
    No obstacle: Vy (best rate of climb) 66 KIAS (123 km/h)
    Obstacle: Vx (best angle of climb) 59 KIAS (109 km/h)
11. Trim - adjust
12. Flaps - retract at Vy 66 KIAS (123 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

3.1 Instruments - oil temperature and pressure, cylinder head/coolant temperature within limits

CAUTION

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

4.4.10 Cruise

1. Electric fuel pump - OFF if installed
2. Fuel selector - LEFT or RIGHT.

NOTE

It is recommended to switch between tanks from time to time during flight to consume fuel equally from both tanks.

MTV-34-1-A/175-200 propeller control is coupled with the throttle lever which motion is transferred to displacement of a shaped lever which is connected through a bowden cable with the propeller hydraulical governor. Once an engine rpm is selected it will be held constant at variations of airspeed and power.

Refer to Section 5, for recommended cruising regimes.

4.4.11 Descent

1. Optimum glide speed - 120 km/h (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 120-130 km/h IAS (65-70 KIAS) and check that the engine instruments indicate values within permitted limits.

4.4.12 Before landing

1. Approach speed - 120 km/h (65 KIAS)
2. Throttle - as needed
3. Electric fuel pump(s) - ON
4. Wing flaps - extend as needed
5. Trim - as needed
6. Autopilot (if installed) - 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

1. Engine speed	- idle
2. Instruments	- engine instruments within limits
3. Avionics	- switch off
4. Ignition	- switch off
5. Propeller control	- switch off
6. Circuit breakers	- switch off
7. Master switch	- switch off
8. Switch box	- turn key to switch off
9. El. pump	- off
10. Fuel Selector	- 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 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

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 engine and 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 600 kg** **Engine idle run**	**Wing flaps pos.**	**IAS** [km/h]	**CAS** [km/h]	***KIAS***	***KCAS***	**Altitude loss at recovery** [ft]
Wing level stall	**0°**	82	83	44	45	100
	20°	78	79	42	43	120
	30°	70	71	37	38	160
Co-ordinated turn 30° bank	**0°**	88	89	47	48	120
	20°	84	85	45	46	160
	30°	75	76	40	41	200

5.2.3 Take-off performance

ISA Conditions

Airport altitude H [ft]	Temperature tH [°C]	ISA pressure pH [Pa]	Relative density Δ [-]	CONCRETE Takeoff Run [m]	CONCRETE Distance over 50 ft obstacle [m]	GRASS Takeoff Run [m]	GRASS Distance over 50 ft obstacle [m]
0 ft ISA	15,0	101324,7	1,0000	200	460	280	540
2000 ft ISA	11,0	94209,8	0,9428	230	520	320	610
4000 ft ISA	7,1	87505,0	0,8880	250	580	360	680
6000 ft ISA	3,1	81191,9	0,8358	290	660	400	770
8000 ft ISA	-0,8	75252,8	0,7859	320	740	450	870
10000 ft ISA	-4,8	69670,4	0,7384	370	840	510	990

ISA + 10 °C

Airport altitude H [ft]	Temperature tH [°C]	ISA pressure pH [Pa]	Relative density Δ [-]	CONCRETE Takeoff Run [m]	CONCRETE Distance over 50 ft obstacle [m]	GRASS Takeoff Run [m]	GRASS Distance over 50 ft obstacle [m]
0 ft ISA	25,0	101324,7	0,9664	210	490	300	580
2000 ft ISA	21,0	94209,8	0,9107	240	550	340	650
4000 ft ISA	17,1	87505,0	0,8574	270	630	380	730
6000 ft ISA	13,1	81191,9	0,8066	310	710	430	830
8000 ft ISA	9,2	75252,8	0,7581	350	800	490	940
10000 ft ISA	5,2	69670,4	0,7118	390	910	550	1070

ISA + 20 °C

Airport altitude H [ft]	Temperature tH [°C]	ISA pressure pH [Pa]	Relative density Δ [-]	CONCRETE Takeoff Run [m]	CONCRETE Distance over 50 ft obstacle [m]	GRASS Takeoff Run [m]	GRASS Distance over 50 ft obstacle [m]
0 ft ISA	35,0	101324,7	0,9351	230	530	320	620
2000 ft ISA	31,0	94209,8	0,8807	260	590	360	700
4000 ft ISA	27,1	87505,0	0,8289	290	670	410	790
6000 ft ISA	23,1	81191,9	0,7794	330	760	460	890
8000 ft ISA	19,2	75252,8	0,7321	370	860	520	1010
10000 ft ISA	15,2	69670,4	0,6871	420	970	590	1140

ISA -10 °C

Airport altitude H [ft]	Temperature tH [°C]	ISA pressure pH [Pa]	Relative density Δ [-]	CONCRETE Takeoff Run [m]	CONCRETE Distance over 50 ft obstacle [m]	GRASS Takeoff Run [m]	GRASS Distance over 50 ft obstacle [m]
0 ft ISA	5,0	101324,7	1,0360	190	430	260	500
2000 ft ISA	1,0	94209,8	0,9772	210	480	290	570
4000 ft ISA	-2,9	87505,0	0,9209	240	540	330	640
6000 ft ISA	-6,9	81191,9	0,8672	270	610	370	720
8000 ft ISA	-10,8	75252,8	0,8159	300	690	420	810
10000 ft ISA	-14,8	69670,4	0,7670	340	780	480	920

ISA -20 °C

Airport altitude H [ft]	Temperature tH [°C]	ISA pressure pH [Pa]	Relative density Δ [-]	CONCRETE Takeoff Run [m]	CONCRETE Distance over 50 ft obstacle [m]	GRASS Takeoff Run [m]	GRASS Distance over 50 ft obstacle [m]
0 ft ISA	-5,0	101324,7	1,0746	170	400	240	470
2000 ft ISA	-9,0	94209,8	1,0142	190	450	270	530
4000 ft ISA	-12,9	87505,0	0,9563	220	500	310	590
6000 ft ISA	-16,9	81191,9	0,9011	250	570	340	670
8000 ft ISA	-20,8	75252,8	0,8483	280	640	390	750
10000 ft ISA	-24,8	69670,4	0,7979	310	720	440	850

5.2.4 Landing distances

ISA Conditions

Airport altitude H [ft]	Temperature tH [°C]	ISA pressure pH [Pa]	Relative density Δ [-]	CONCRETE Landing Run [m]	CONCRETE Distance over 50 ft obstacle [m]	GRASS Landing Run [m]	GRASS Distance over 50 ft obstacle [m]
0 ft ISA	15,0	101324,7	1,0000	90	290	110	310
2000 ft ISA	11,0	94209,8	0,9428	100	310	120	330
4000 ft ISA	7,1	87505,0	0,8880	100	330	120	350
6000 ft ISA	3,1	81191,9	0,8358	110	350	130	370
8000 ft ISA	-0,8	75252,8	0,7859	110	370	140	390
10000 ft ISA	-4,8	69670,4	0,7384	120	390	150	420

ISA + 10 °C

Airport altitude H [ft]	Temperature tH [°C]	ISA pressure pH [Pa]	Relative density Δ [-]	CONCRETE Landing Run [m]	CONCRETE Distance over 50 ft obstacle [m]	GRASS Landing Run [m]	GRASS Distance over 50 ft obstacle [m]
0 ft ISA	25,0	101324,7	0,9664	90	300	110	320
2000 ft ISA	21,0	94209,8	0,9107	100	320	120	340
4000 ft ISA	17,1	87505,0	0,8574	100	340	130	360
6000 ft ISA	13,1	81191,9	0,8066	110	360	140	380
8000 ft ISA	9,2	75252,8	0,7581	120	380	150	410
10000 ft ISA	5,2	69670,4	0,7118	130	410	150	440

ISA + 20 °C

Airport altitude H [ft]	Temperature tH [°C]	ISA pressure pH [Pa]	Relative density Δ [-]	CONCRETE Landing Run [m]	CONCRETE Distance over 50 ft obstacle [m]	GRASS Landing Run [m]	GRASS Distance over 50 ft obstacle [m]
0 ft ISA	35,0	101324,7	0,9351	100	310	120	330
2000 ft ISA	31,0	94209,8	0,8807	100	330	120	350
4000 ft ISA	27,1	87505,0	0,8289	110	350	130	370
6000 ft ISA	23,1	81191,9	0,7794	120	370	140	400
8000 ft ISA	19,2	75252,8	0,7321	120	400	150	420
10000 ft ISA	15,2	69670,4	0,6871	130	420	160	450

ISA -10 °C

Airport altitude H [ft]	Temperature tH [°C]	ISA pressure pH [Pa]	Relative density Δ [-]	CONCRETE Landing Run [m]	CONCRETE Distance over 50 ft obstacle [m]	GRASS Landing Run [m]	GRASS Distance over 50 ft obstacle [m]
0 ft ISA	5,0	101324,7	1,0360	90	280	110	300
2000 ft ISA	1,0	94209,8	0,9772	90	300	110	320
4000 ft ISA	-2,9	87505,0	0,9209	100	310	120	340
6000 ft ISA	-6,9	81191,9	0,8672	100	330	130	360
8000 ft ISA	-10,8	75252,8	0,8159	110	360	130	380
10000 ft ISA	-14,8	69670,4	0,7670	120	380	140	400

ISA -20 °C

Airport altitude H [ft]	Temperature tH [°C]	ISA pressure pH [Pa]	Relative density Δ [-]	CONCRETE Landing Run [m]	CONCRETE Distance over 50 ft obstacle [m]	GRASS Landing Run [m]	GRASS Distance over 50 ft obstacle [m]
0 ft ISA	-5,0	101324,7	1,0746	80	270	100	290
2000 ft ISA	-9,0	94209,8	1,0142	90	290	110	310
4000 ft ISA	-12,9	87505,0	0,9563	90	300	120	320
6000 ft ISA	-16,9	81191,9	0,9011	100	320	120	340
8000 ft ISA	-20,8	75252,8	0,8483	110	340	130	370
10000 ft ISA	-24,8	69670,4	0,7979	110	360	140	390

5.2.5 Climb performance

CONDITIONS: MCP MTOW Flaps retract.	BEST RATE OF CLIMB				BEST ANGLE OF CLIMB			
	IAS	KIAS	RATE OF CLIMB		IAS	KIAS	RATE OF CLIMB	
ALTITUDE	[km/h]	[knots]	[m/s]	[t/min]	[km/h]	[knots]	[m/s]	[t/min]
0 ft MSA	123	66	4,4	860	109	59	4,1	810
2000 ft MSA	123	66	4,0	790	109	59	3,8	750
4000 ft MSA	122	66	3,7	720	108	58	3,5	680
6000 ft MSA	122	66	3,3	650	108	58	3,1	610
8000 ft MSA	121	66	3,0	580	107	58	2,8	550
10000 ft MSA	121	65	2,6	510	107	58	2,5	480

5.2.6 Cruise

Altitude	Manifold pressure		55 %MCP 4300	65 %MCP 4800	75 %MCP 5000	MCP 5500
0 ft	27,6 inHg	IAS [knots]	88	100	104	109
		CAS [knots]	89	101	105	109
		TAS [knots]	89	101	105	109
	27,0 inHg	IAS [knots]	85	98	101	106
		CAS [knots]	87	99	102	107
		TAS [knots]	87	99	102	107
	26,0 inHg	IAS [knots]	81	93	97	102
		CAS [knots]	82	94	98	103
		TAS [knots]	82	94	98	103
	25,0 inHg	IAS [knots]	76	89	92	97
		CAS [knots]	78	90	93	98
		TAS [knots]	78	90	93	98
	24,0 inHg	IAS [knots]	72	84	88	92
		CAS [knots]	73	86	89	94
		TAS [knots]	73	86	89	94
4000 ft	24,8 inHg	IAS [knots]	85	96	99	103
		CAS [knots]	86	97	100	104
		TAS [knots]	91	103	106	110
	24,0 inHg	IAS [knots]	81	92	95	100
		CAS [knots]	83	94	97	101
		TAS [knots]	88	99	102	107
	23,0 inHg	IAS [knots]	76	88	91	95
		CAS [knots]	78	89	92	96
		TAS [knots]	83	95	98	102
	22,0 inHg	IAS [knots]	72	83	86	90
		CAS [knots]	74	85	88	92
		TAS [knots]	78	90	93	97
	21,0 inHg	IAS [knots]	68	79	82	86
		CAS [knots]	69	80	83	87
		TAS [knots]	73	85	88	93
8000 ft	22,0 inHg	IAS [knots]	81	91	94	98
		CAS [knots]	83	93	95	99
		TAS [knots]	94	104	107	111
	21,0 inHg	IAS [knots]	77	87	89	93
		CAS [knots]	78	88	91	94
		TAS [knots]	89	99	102	106
	20,0 inHg	IAS [knots]	72	82	85	88
		CAS [knots]	74	84	86	90
		TAS [knots]	84	94	97	101
	19,0 inHg	IAS [knots]	68	78	80	84
		CAS [knots]	70	79	82	85
		TAS [knots]	79	89	92	96

5.2.7 Endurance and Range

The table below shows fuel consumption, endurance and range.

NO FUEL RESERVE CONSIDERED!

Fuel tank volume =	**120**	litres
Unusable fuel =	**1**	litres

			55 %MCP	65 %MCP	75 %MCP	MCP
			4300	4800	5000	5500
0 ft	**27,0 inHg**	KIAS	85	98	101	106
		KCAS	87	99	102	107
		KTAS	87	99	102	107
		Fuel cons. [l/hour]	18,5	20,5	21,3	23,0
		Endurance [h:m]]	6:26	5:47	5:35	5:10
		Range [km/h]	1030	1060	1060	1030
		Range [NM]	560	570	570	550
	26,0 inHg	KIAS	81	93	97	102
		KCAS	82	94	98	103
		KTAS	82	94	98	103
		Fuel cons. [l/hour]	15,7	17,7	18,4	20,2
		Endurance [h:m]]	7:35	6:43	6:27	5:54
		Range [km/h]	1160	1180	1170	1120
		Range [NM]	620	630	630	610
	25,0 inHg	KIAS	76	89	92	97
		KCAS	78	90	93	98
		KTAS	78	90	93	98
		Fuel cons. [l/hour]	12,8	14,9	15,6	17,3
		Endurance [h:m]]	9:16	8:00	7:37	6:51
		Range [km/h]	1340	1330	1320	1250
		Range [NM]	720	720	710	670
4000 ft	**23,0 inHg**	KIAS	76	88	91	95
		KCAS	78	89	92	96
		KTAS	83	95	98	102
		Fuel cons. [l/hour]	14,5	16,0	16,7	18,5
		Endurance [h:m]]	8:13	7:25	7:07	6:25
		Range [km/h]	1260	1300	1290	1220
		Range [NM]	680	700	700	660
	22,0 inHg	KIAS	72	83	86	90
		KCAS	74	85	88	92
		KTAS	78	90	93	97
		Fuel cons. [l/hour]	11,6	13,2	13,9	15,7
		Endurance [h:m]]	10:13	9:01	8:34	7:35
		Range [km/h]	1480	1500	1480	1370
		Range [NM]	800	810	800	740
	21,0 inHg	KIAS	68	79	82	86
		KCAS	69	80	83	87
		KTAS	73	85	88	93
		Fuel cons. [l/hour]	8,8	10,4	11,0	12,9
		Endurance [h:m]]	13:31	11:28	10:46	9:15
		Range [km/h]	1840	1810	1760	1590
		Range [NM]	990	980	950	860
8000 ft	**21,0 inHg**	KIAS	81	91	94	98
		KCAS	83	93	95	99
		KTAS	94	104	107	111
		Fuel cons. [l/hour]	16,1	17,2	17,8	19,7
		Endurance [h:m]]	7:24	6:55	6:41	6:02
		Range [km/h]	1280	1340	1330	1250
		Range [NM]	690	720	720	670
	20,0 inHg	KIAS	77	87	89	93
		KCAS	78	88	91	94
		KTAS	89	99	102	106
		Fuel cons. [l/hour]	13,2	14,4	15,0	16,9
		Endurance [h:m]]	8:58	8:17	7:57	7:03
		Range [km/h]	1470	1530	1510	1390
		Range [NM]	800	820	820	750
	19,0 inHg	KIAS	72	82	85	88
		KCAS	74	84	86	90
		KTAS	84	94	97	101
		Fuel cons. [l/hour]	10,4	11,5	12,1	14,0
		Endurance [h:m]]	11:25	10:19	9:48	8:28
		Range [km/h]	1770	1810	1770	1590
		Range [NM]	950	980	960	860

5.2.8 Demonstrated crosswind performance

Max. permitted head wind velocity for take-off and landing	20	m/s	40	knots
Max. permitted cross wind velocity for take-off and landing				
Average pilots	8	m/s	15	knots
Skilled pilots	11	m/s	22	knots

5.2.9 Optimum glide speed

Optimum glide speed	120	km/h	65	KIAS

5.2.10 Ceiling

Service ceiling	4300	m	14.000	ft

SECTION 6

6.1 Introduction

This section contains the payload range within which the BRISTELL S-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

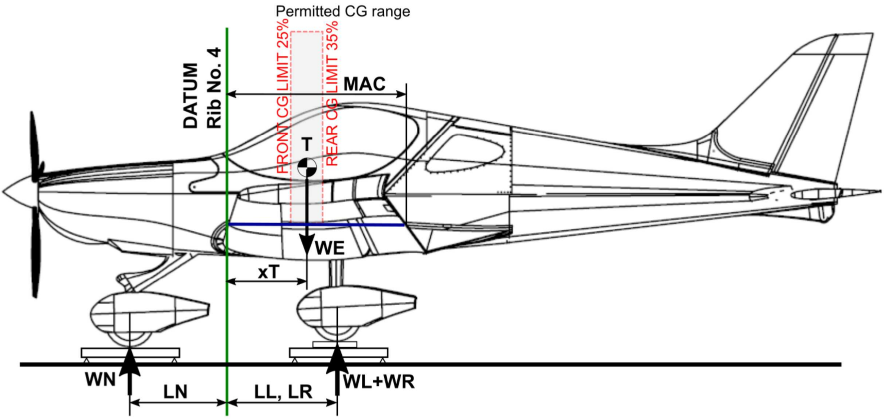
List of equipment installed in Bristell S-LSA, S/N 320/2018:

1. 12V/5V socket, USB ports on the instrument panel
2. 2 map pockets
3. 3-pos.adjustable rudder pedals on both sides
4. Airpath C2400 L4P Compass
5. AMSAFE 4-point safety belts
6. Anderson plug-External connection to power for jump start
7. Arm rest box
8. Automotive net in baggage compartment (P/N 42084)
9. Aveo eye ball vents black
10. AVEO Powerburst Daylight wing strobes/nav lights
11. Back-up ALT Winter 4 FGH 40 + Nulite
12. Back-up ASI Winter 7FMS 513 (0-160 kts) + Nulite
13. Beringer 5,00-5 10PLY wheels + in line ballanced anti-lock regulator
14. Beringer dual brakes, Parking brake
15. Cabin heat
16. Car horn (klaxon)
17. Clear canopy glass
18. Cylinder head temperature indicator (analogue) 101006
19. Elevator electric trim
20. Front locker
21. Fuel quantity gauges VDO, 101018 (2x)
22. Fuel selector on console under instrument panel
23. Garmin G3X configuration module
24. Garmin G3X flight display system
25. Garmin GA 26C GPS antenna for G3X
26. Garmin GA 35 External active GPS antenna
27. Garmin GAD 29 ARINC 429 Interface

28. Garmin GAD 29 Connector kit
29. Garmin GAP 26 angle of attack unheated probe
30. Garmin GDU 460, 10,6"
31. Garmin GEA 24 Engine Interface Module
32. Garmin GMU 22 Magnetometer
33. Garmin GSU 25 ADHRS (1x)
34. GARMIN GTN 650 GPS/NAV/COM
35. Garmin GTP 59 Temperature Probe
36. Garmin GTX 23 ES mode S transponder
37. Governor P-110-030/A
38. Instrument panel storage box on the right
39. Key switch box
40. Lambert Flaps V4_0 LED light +LINAK electric flaps actuator
41. LAMBERT LED-LEHV-CV3 Landing lights in both wings
42. Leather glareshield, Leather-textile upholstery
43. LED strip on glareshield + dimmer
44. Lockable canopy, Lockable fuel tank caps
45. Long HTU (2.9 m) with long trim and horn balance
46. Low fuel warning lights on the G3X display
47. Middle size instrument panel for G3X
48. MTV-34-1-A/175-200 propeller, separate control lever
49. Noise insulation on firewall
50. Nose gear doubled flexible rod (Teleflex)
51. Oil pressure indicator VDO, (analogue)
52. Paint scheme: #00, own design, Grey interior
53. Pierburg auxiliary fuel pump
54. PM 3000II Intercom (4 pos. Stereo IC)
55. RAMI AV-10 comm antenna
56. RAMI AV-525 VOR, LOC & GS „V“ Dipole Antenna
57. RAMI AV-74 transponder DME antenna
58. Rotax 912 ULS engine, clutch, airbox
59. Steerable nose wheel, Tail skid with wheel
60. TCW IBBS-12V-6AH backup battery for Garmin G3X
61. Tosten CS-6 grips
62. Wheel fairings (pants) for wheels 5,00"-5"
63. Whelen MB 1 tail mounted LED strobe

6.2.1 Weight and Balance Report

6.2.1.1 Empty Aircraft Weight and CG



MAC (mm): 1367,0

	ITEM	WEIGHT (kg)	ARM (mm)	MOMENT = WEIGHT x ARM (kg.mm)
EMPTY AIRCRAFT WEIGHT AND CG	RIGHT MAIN WHEEL	WR= 137,4	LR= 700	MR= 96207,9
	LEFT MAIN WHEEL	WL= 139,3	LL= 700	ML= 97478,0
	NOSE WHEEL	WN= 79,4	LN= -754	MN= -59852,1
	EMPTY AIRCRAFT	EMPTY WEIGHT (kg) WE= 356,1	CG (mm) = 375,86 CG (%MAC) = 27,5	EMPTY ACFT TOTAL MOMENT (kg.mm) MT= 133833,80

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

$$CG\ (\%MAC) = CG\ (mm)\ x\ \frac{100}{MAC}$$

Serial No.: 320/2018
Date: 2.1.2018
By: BRM Aero

6.2.1.2 Loaded Aircraft Weight and CG

	ITEM	WEIGHT (kg)	ARM (mm)	MOMENT = WEIGHT x ARM (kg.mm)
	EMPTY AIRCRAFT	356,1	375,86	133833,8
LOADED AIRCRAFT WEIGHT AND CG	PILOT		600,0	
	PASSENGER		600,0	
	BAGGAGE - BEHIND SEATS		1400,0	
	BAGGAGE - FRONT optional)		-300,0	
	BAGGAGE - WING LOCKERS		630,0	
	FUEL TANKS		200,0	
	LOADED AIRCRAFT	TAKEOFF WEIGHT (kg) TOW=	CENTER OF GRAVITY CG (mm)= CG (%MAC) =	LOADED ACFT TOTAL MOMENT (kg.mm) MT=

Max.Takeoff Weight:	600	kg
CG Range:	25	35
Forward limit:	341,8	mm
Rearward limit:	478,5	mm

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

$$CG\ (\%MAC) = CG\ (mm)\ x\ \frac{100}{MAC}$$

Serial No.:	320/2018
Date:	
By:	

6.2.1.3 Weight and CG Blank Form

	ITEM	WEIGHT (kg)	ARM (mm)	MOMENT = WEIGHT x ARM (kg.mm)
EMPTY AIRCRAFT WEIGHT AND CG	RIGHT MAIN WHEEL	WR=	LR= 700,0	MR=
	LEFT MAIN WHEEL	WL=	LL= 700,0	ML=
	NOSE WHEEL	WN=	LN= -754,0	MN=
	EMPTY AIRCRAFT	EMPTY WEIGHT (kg) WE=	CG (mm) = CG (%MAC) =	EMPTY ACFT TOTAL MOMENT (kg.mm) MT=

	ITEM	WEIGHT (kg)	ARM (mm)	MOMENT = WEIGHT x ARM (kg.mm)
	EMPTY AIRCRAFT			
LOADED AIRCRAFT WEIGHT AND CG	PILOT		600,0	
	PASSENGER		600,0	
	BAGGAGE - BEHIND SEATS		1400,0	
	BAGGAGE - FRONT optional)		-300,0	
	BAGGAGE - WING LOCKERS		630,0	
	FUEL TANKS		200,0	
	LOADED AIRCRAFT	TAKEOFF WEIGHT (kg) TOW=	CENTER OF GRAVITY CG (mm)= CG (%MAC) =	LOADED ACFT TOTAL MOMENT (kg.mm) MT=

Max. Takeoff Weight:	600	kg
CG Range:	25	35
Forward limit:	341,8	mm
Rearward limit:	478,5	mm

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

$$CG\ (\%MAC) = CG\ (mm)\ x\ \frac{100}{MAC}$$

Serial No.:	320/2018
Date:	
By:	

Max. useful load:

WU (kg) = MTOW - WE

WU (kg) = 600 -

WU (kg) =

WARNING
DO NOT EXCEED MAXIMUM TAKEOFF WEIGHT!

6.3 Permitted payload range

PERMITTED PAYLOAD RANGE OF BRISTELL (kg)								
S/N:	320/2018		Empty weight (kg):	356	MTOW (kg):	600,0		
FUEL								
	VOLUME	(litres)	20	40	60	80	100	120
	WEIGHT	(kg)	14,5	29,0	43,5	58,0	72,5	87,0
			PERMITTED CREW WEIGHT (kg)					
BAGGAGE (kg)	NO BAGGAGE	0	**229** 33,5 %MAC	**215** 32,7 %MAC	**200** 32,0 %MAC	**186** 31,3 %MAC	**171** 30,6 %MAC	**157** 29,9 %MAC
	1/2 REAR	8	**222** 34,2 %MAC	**207** 33,5 %MAC	**193** 32,8 %MAC	**178** 32,1 %MAC	**164** 31,4 %MAC	**149** 30,6 %MAC
	MAX REAR	15	**214** 34,9 %MAC	**200** 34,2 %MAC	**185** 33,5 %MAC	**171** 32,8 %MAC	**156** 32,1 %MAC	**142** 31,4 %MAC
	1/2 WING LOCKERS	20	**209** 33,5 %MAC	**195** 32,8 %MAC	**180** 32,1 %MAC	**166** 31,4 %MAC	**151** 30,7 %MAC	**137** 30,0 %MAC
	1/2 REAR + 1/2 WING	28	**202** 34,3 %MAC	**187** 33,6 %MAC	**173** 32,8 %MAC	**158** 32,1 %MAC	**144** 31,4 %MAC	**129** 30,7 %MAC
	MAX REAR + 1/2 WING	35	**194** 35,0 %MAC	**180** 34,3 %MAC	**165** 33,6 %MAC	**151** 32,9 %MAC	**136** 32,2 %MAC	**122** 31,5 %MAC
	MAX WING LOCKERS	40	**189** 33,6 %MAC	**175** 32,9 %MAC	**160** 32,2 %MAC	**146** 31,5 %MAC	**131** 30,8 %MAC	**117** 30,1 %MAC
	1/2 REAR + MAX WING	48	**182** 34,3 %MAC	**167** 33,6 %MAC	**153** 32,9 %MAC	**138** 32,2 %MAC	**124** 31,5 %MAC	**109** 30,8 %MAC
	MAX REAR + WING	55	**170** 35,0 %MAC	**160** 34,4 %MAC	**145** 33,6 %MAC	**131** 32,9 %MAC	**116** 32,2 %MAC	**102** 31,5 %MAC
	MAX.FRONT LOCKER	10	**219** 32,4 %MAC	**205** 31,7 %MAC	**190** 31,0 %MAC	**176** 30,3 %MAC	**161** 29,6 %MAC	**147** 28,9 %MAC
	1/2 FRONT LOCKER	5	**224** 32,9 %MAC	**210** 32,2 %MAC	**195** 31,5 %MAC	**181** 30,8 %MAC	**166** 30,1 %MAC	**152** 29,4 %MAC

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

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SECTION 7

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 aluminium sheet metal riveted to aluminium angles with Avex rivets. This high strength aluminium alloy construction provides long life and low maintenance costs thanks to its durability and corrosion resistance characteristics.
The wing has a high lift aerofoil 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 (optionally) 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 centred 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. Do not use baggage compartment B for heavy objects (max. 1 kg).

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

Optionally also a front locker in a space between the instrument panel and firewall may be installed. Maximum baggage is 10 kg (22 lb).

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

Canopy open button is located only on the fuselage left side. To open the canopy push the button and simmultaneously raise the canopy frame up by second hand. Access to the cockpit is then 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 ULS S engine 98.6 hp is installed. Rotax 912 ULS 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 mechanical fuel pump. Prop drive via reduction gear with integrated shock absorber.

Propeller:

- MTV-34-1-A/175-200, 3 blade variable pitch propeller with a hydraulically operated blade pitch change mechanism providing the operation mode "Constant speed" The hub is milled out of aluminium alloy. The blades have a laminated wood structure with a composite fiber cover. The leading edge of the blade is protected by a stainless steel erosion protection sheath. EASA type certified.

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 carburettors. 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 Ignition Switch

Ignition must be on BOTH to operate the engine: For safety, remove key when engine is not running.

NOTE

All switches and or engine controls are "up" or "push forward" for operation, except the choke, cabin heat and carburetor pre-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.

7.11 Pitot and static pressure system

Pitot tube (optionally heated) is located below the left 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 S-LSA S/N 320/2018 is fitted with:

1. 12V/5V socket, USB ports on the instrument panel
2. Arm rest box, 2 map pockets
3. 3-pos.adjustable rudder pedals on both sides
4. AMSAFE 4-point safety belts
5. Anderson plug-External connection to power for jump start
6. Automotive net in baggage compartment (P/N 42084)
7. Aveo eye ball vents black
8. AVEO Powerburst Daylight wing strobes/nav lights
9. Beringer 5,00-5 10PLY wheels + in line ballanced anti-lock regulator
10. Beringer dual brakes, Parking brake
11. Cabin heat
12. Car horn (klaxon)
13. Elevator electric trim
14. Front locker
15. Fuel selector on console under instrument panel
16. Governor P-110-030/A
17. Instrument panel storage box on the right
18. Lambert Flaps V4_0 LED light +LINAK electric flaps actuator
19. LAMBERT LED-LEHV-CV3 Landing lights in both wings
20. Leather glareshield, Leather-textile upholstery
21. LED strip on glareshield + dimmer
22. Lockable canopy, Lockable fuel tank caps
23. Middle size instrument panel for G3X
24. Noise insulation on firewall
25. Nose gear doubled flexible rod (Teleflex)
26. Pierburg auxiliary fuel pump
27. RAMI AV-10 comm antenna
28. RAMI AV-525 VOR, LOC & GS „V“ Dipole Antenna
29. RAMI AV-74 transponder DME antenna
30. Steerable nose wheel, Tail skid with wheel
31. Tosten CS-6 grips
32. Wheel fairings (pants) for wheels 5,00"-5"
33. Whelen MB 1 tail mounted LED strobe

7.13 Instruments and Avionics

BRISTELL S-LSA S/N 320/2018 is fitted with:

Flight Instruments:

1. Back-up ASI Winter 7FMS 513 (0-160 kts) + Nulite
2. Back-up ALT Winter 4 FGH 40 + Nulite
3. Airpath C2400 L4P Compass
4. Garmin G3X flight display system, including:
   - Garmin GDU 460, 10,6" display unit
   - Garmin GSU 25 ADHRS (1x)
   - Garmin GEA 24 Engine Interface Module
   - Garmin GMU 22 Magnetometer
   - Garmin GTP 59 Temperature Probe
   - Garmin GAP 26 angle of attack unheated probe
   - Garmin GA 26C GPS antenna for G3X
   - Garmin GA 35 External active GPS antenna
   - Garmin GAD 29 ARINC 429 Interface
   - TCW IBBS-12V-6AH backup battery for Garmin G3X

Engine instruments:

1. Cylinder head temperature indicator, (analogue)
2. Oil temperature indicator, (analogue)
3. Oil pressure indicator VDO, (analogue)
4. Fuel quantity gauges VDO, 101018 (2x)
5. Low fuel warning lights on the G3X display

COM/NAV instruments:

1. GARMIN GTN 650 GPS/NAV/COM
2. Garmin GTX 23 ES mode S transponder
3. PM 3000II Intercom (4 pos. Stereo IC)

NOTE

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

7.14 Cockpit

7.14.1 Cockpit layout

BRISTELL S-LSA, S/N 320/2018 has the following cockpit layout:

7.14.2 Instrument panel

BRISTELL S-LSA, S/N 320/2018 is fitted with Middle size instrument panel with the following instruments arrangement:

SECTION 8

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 the first 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

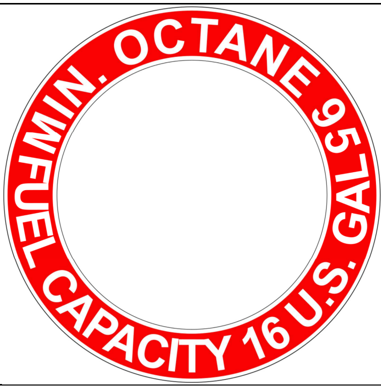
The airplane must be placarded with:

- All fuses
- Ignition switches
- Choke
- Starter
- Trim: Nose heavy, 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 opening/closing instructions
- Fuel capacity: 60 l (15.87 U.S. gallons) / min. 95 Octane - at filler neck
- Fireproof Identification plate attached to the fuselage port side, in front of the horizontal tail unit.

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 F37.	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. 15 KG MAX. 33 LB	Maximum weight of baggage in the Baggage compartment – A, behind the seats.
MAX. 1 KG MAX. 2 LB	Maximum weight of baggage in the Baggage compartment – B, behind the main baggage compartment.
MAX. 20 KG MAX. 44 LB	Maximum weight of baggage in each wing locker, if installed.
MAX. 10 KG MAX. 22 LB	Maximum weight of baggage in fuselage front locker, if installed.
UNUSABLE FUEL QUANTITY 0.5 l	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 600 KG	Maximum Takeoff Weight Limitation. 600 kg (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.
	Located around static ports on both sides of the fuselage tail.
	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 fuselage between canopy and rear window
	Placard located in place rocket egress

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
12/2017	02	Description of the aircraft S/N 320/2018

10.3 Inserted Supplements

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.

Aircraft Operating Instructions

SUPPLEMENT No. 02

AIRCRAFT DESCRIPTION

Registration: **VH-YVP**

Serial number: **320/2018**

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 S-LSA, S/N 320/2018.

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 coolant used by aircraft manufacturer:
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.