# Aircraft Operating Instructions

# BRISTELL S-LSA

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## Aircraft Operating Instructions

# BRISTELL S-LSA

Registration: **VH-YUU**

Serial Number: **274/2017**

**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*

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## 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<br>Initial issue | 05/2017 | Petr Javorský | 05/2017 | 05/2017 | P.Javorský |
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# SECTION 1

## 1 General Information

### *1.1 Introduction*

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## 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., Uherske Hradiste, 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 274/2017 is fitted with:

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

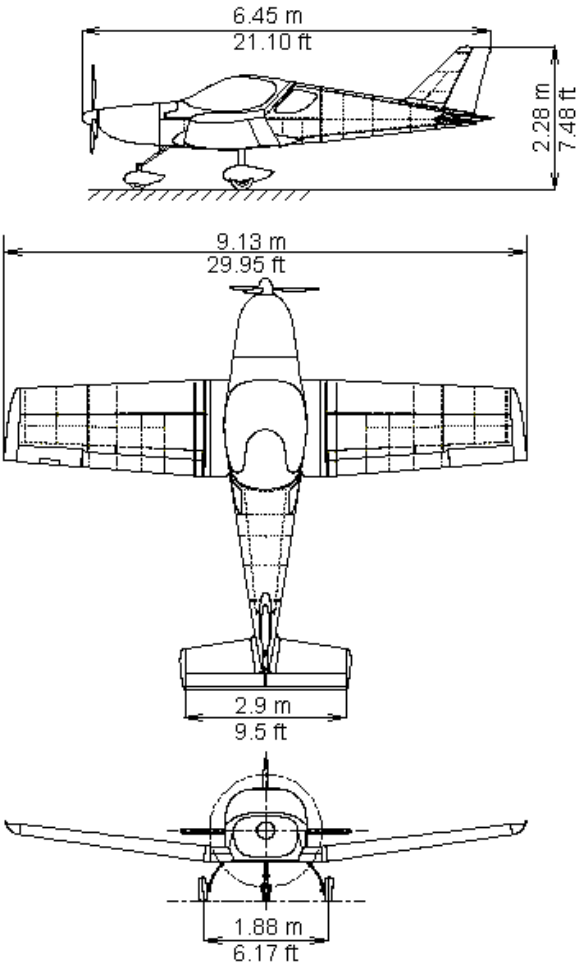
### 1.3.3 Aircraft dimensions

| | | | | |
|---|---|---|---|---|
| Wing span | 9.13 | m | 29.95 | ft |
| Length | 6.45 | m | 21.10 | ft |
| Height | 2.28 | m | 7.48 | ft |
| Wing area | 11.5 | $m^2$ | 123.79 | sq ft |
| Wing loading | 52.17 | $kg/m^2$ | 10.66 | 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) | 81 km/h CAS | 44 KCAS |
| **Stall speed $V_{S0}$** (flaps fully extended) | 63 km/h CAS | 34 KCAS |
| **Total fuel capacity** | 120 liters | 31.7 US gal |
| **Total usable fuel** | 119 liters | 31.4 US gal |
| **Approved types of fuel**<br><br>**ATTENTION:** Obey the latest edition of Service Instruction SI-912-016, for the selection of the correct fuel. | Min. RON 95<br>(min. AKI4 91)<br>Mogas: EN 228 super<br>Mogas: EN 228 super plus<br>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* | |
| **Red line** | ***62*** | ***33*** | Stalling speed with full flaps |
| **White arc** | ***62-139*** | ***33-75*** | Flap Operating Range. |
| **Green arc** | ***80-240*** | ***43-129*** | 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)**<br>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

**General note**

**NOTICE** Obey the local codes and the latest edition of Service Instruction SI-912-016 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.

**Knock resistance**

The fuels with following specifications can be used:

| Fuel specifikationen | | |
|---|---|---|
| | Usage/Description | |
| **Knock resistance** | **912 A/F/UL** | **912 S/ULS** |
| | Min. RON 90 (min. AKI* 87) | Min. RON 95 (min. AKI* 91) |

* Anti Knock Index (RON+MON)/2

**MOGAS**

| | Usage/Description | |
|---|---|---|
| **Mogas** | **912 A/F/UL** | **912 S/ULS** |
| European standard | EN 228 Normal | |
| | EN 228 Super | EN 228 Super |
| | EN 228 Super plus | 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) |

**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

**General note**

**NOTICE**

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**

For the selection of suitable lubricants refer to 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 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 a slipping clutch 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 primarity 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.

***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-912-016 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**

**NOTICE** Obey the manufacturers instructions about the coolant.

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..... | 1350 | mm | 53.1 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 EMERGENCY PROCEDURES

### *3.2 Engine Failure*

**3.2.1 Engine failure during take-off run**
**3.2.2 Engine failure during take-off**
**3.2.3 Engine failure in flight**

### *3.3 In-flight Engine Starting*

### *3.4 Smoke and Fire*

**3.4.1 Fire on ground at engine starting**
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### *3.5 Glide*

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**3.6.3 Landing with a flat tire**
**3.6.4 Landing with a defective landing gear.**

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**3.8.1 Vibration**
**3.8.2 Carburetor icing**
**3.8.3 Autopilot malfunction**
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**3.8.6 Alternator failure**

**3.8.7 Overvoltage**
**3.8.8 Inadvertent icing encounter**
**3.8.9 Loss of primary instruments**
**3.8.10 Loss of flight controls**

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

**3.9.1 Rpm in flight too high if operated as a Constant Speed Propeller**
**3.9.2 Rpm variations between ascend, cruise and descend although having identical propeller setting**
**3.9.3 Rpm increase during normal operation without change of propeller lever position if operated as a Constant Speed Propeller**
**3.9.4 Rpm decrease during normal operation without change of propeller lever position if operated as a Constant Speed Propeller**
**3.9.5 Extremely slow pitch change or no pitch change on ground If operated as a Constant Speed Propeller**
**3.9.6 Oil leakage (visible outside or hidden inside)**
**3.9.7 Rough running engine, possibly in limited rpm range only**

## 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
7. emergency landing area
8. Emergency landing - perform according to 3.6
9. Leave the airplane
10. 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.

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 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

1. Reduce engine power setting to the minimum necessary
2. Carry out Precautionary landing 3.6.2.
3. Check oil system
   Possible causes are:
   Not enough oil in oil tank - Refill oil
   Too hot oil - Cool down oil.
4. 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:

3. Select AVIONICS OFF
4. MASTER SWITCH OFF

**CAUTION**

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

5. 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.<br>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.<br>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.<br>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 **Chyba! Nenalezen zdroj odkazů.**.

## 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

### *4.2 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**
**4.4.4 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 S-LSA Maintenance and inspection procedures manual.

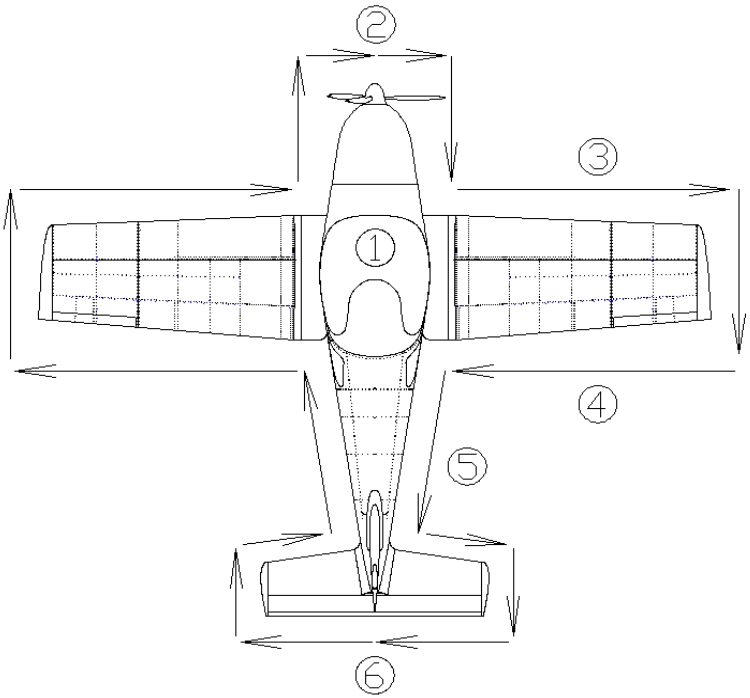
## 4.3 Pre-flight Inspection

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<br>- 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 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 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 – 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
7. Electric fuel pump - ON – only for hot engine after it starts.

**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(s) - ON
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 125 km/h (67 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 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) | 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 67 KIAS (125 km/h) or at 150 ft

### 4.4.9 Climb

1. Best ROC speed - 125 km/h (67 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. El.pump - OFF
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 lever is located together with the throttle control and choke control lever on a quadrant between seats. Propeller control lever 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 125 km/h (67 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*

### *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 engine and propeller.

## 5.2 Performance

5.2.1 Airspeed indicator system calibration

| | IAS (km/h) | CAS (km/h) |
|---|---|---|
| VS0 | 62 | 63 |
| | 70 | 71 |
| VS1 | 80 | 81 |
| | 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 |

| | KIAS | KCAS |
|---|---|---|
| VS0 | 33 | 34 |
| | 38 | 39 |
| | 40 | 41 |
| VS1 | 43 | 44 |
| | 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 | 129 | 128 |
| | 135 | 134 |
| | 140 | 139 |
| | 145 | 144 |
| | 150 | 149 |
| VNE | 157 | 156 |

5.2.2 Stall speeds

| Conditions:<br>Max.takeoff-off weight<br>Engine idle run | Wing<br>flaps pos. | IAS<br>[km/h] | CAS<br>[km/h] | *KIAS* | *KCAS* | Altitude loss<br>at recovery<br>[ft] |
|---|---|---|---|---|---|---|
| **Wing level stall** | **0°** | 80 | 81 | *43* | *44* | 100 |
| | **20°** | 75 | 76 | *40* | *41* | 120 |
| | **30°** | 62 | 63 | *33* | *34* | 160 |
| **Co-ordinated turn 30° bank** | **0°** | 86 | 87 | *46* | *47* | 120 |
| | **20°** | 81 | 82 | *43* | *44* | 160 |
| | **30°** | 67 | 68 | *35* | *36* | 200 |

## 5.2.3 Take-off performance

| ISA Conditions | | | | CONCRETE | | GRASS | |
|---|---|---|---|---|---|---|---|
| Airport altitude H [ft] | Temperature tH [°C] | ISA pressure pH [Pa] | Relative density Δ [-] | Takeoff Run [m] | Distance over 50 ft obstacle [m] | Takeoff Run [m] | 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 | | | | CONCRETE | | GRASS | |
|---|---|---|---|---|---|---|---|
| Airport altitude H [ft] | Temperature tH [°C] | ISA pressure pH [Pa] | Relative density Δ [-] | Takeoff Run [m] | Distance over 50 ft obstacle [m] | Takeoff Run [m] | 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 | | | | CONCRETE | | GRASS | |
|---|---|---|---|---|---|---|---|
| Airport altitude H [ft] | Temperature tH [°C] | ISA pressure pH [Pa] | Relative density Δ [-] | Takeoff Run [m] | Distance over 50 ft obstacle [m] | Takeoff Run [m] | 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 | | | | CONCRETE | | GRASS | |
|---|---|---|---|---|---|---|---|
| Airport altitude H [ft] | Temperature tH [°C] | ISA pressure pH [Pa] | Relative density Δ [-] | Takeoff Run [m] | Distance over 50 ft obstacle [m] | Takeoff Run [m] | 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 | | | | CONCRETE | | GRASS | |
|---|---|---|---|---|---|---|---|
| Airport altitude H [ft] | Temperature tH [°C] | ISA pressure pH [Pa] | Relative density Δ [-] | Takeoff Run [m] | Distance over 50 ft obstacle [m] | Takeoff Run [m] | 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:

Max.Continuous Power – 5500 rpm

Weight – 600kg (1320 lb)

| 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 | 76 | 123 | 66 | 4,4 | 860 | 68 | 109 | 59 | 4,1 | 810 |
| 2000 ft ISA | 76 | 123 | 66 | 4,0 | 790 | 67 | 108,6 | 59 | 3,8 | 750 |
| 4000 ft ISA | 76 | 122 | 66 | 3,7 | 720 | 67 | 108,2 | 58 | 3,5 | 680 |
| 6000 ft ISA | 76 | 122 | 66 | 3,3 | 650 | 67 | 107,8 | 58 | 3,1 | 610 |
| 8000 ft ISA | 75 | 121 | 66 | 3,0 | 580 | 67 | 107,4 | 58 | 2,8 | 550 |
| 10000 ft ISA | 75 | 121 | 65 | 2,6 | 510 | 66 | 107 | 58 | 2,5 | 480 |

## 5.2.6 Cruise

| | | | 55 %MCP | 65 %MCP | 75 %MCP | MCP |
|---|---|---|---|---|---|---|
| | | | 4300 | 4800 | 5000 | 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 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*

## 6.1 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

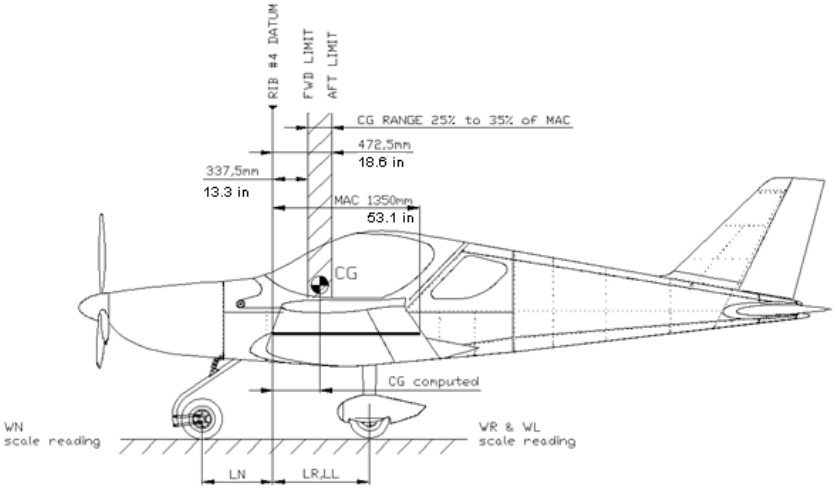
List of equipment installed in Bristell S-LSA, S/N 274/2017:

1. 12V/5V socket on instrument panel
2. 2 map pockets
3. 3-pos.adjustable rudder pedals on both sides
4. 4-point safety belts
5. additional 12V/5V socket on instrument panel
6. Andair fuel selector on console under instrument panel
7. Anderson plug-External connection to power for jump start
8. Arm rest box
9. Automotive net in baggage compartment
10. Aveo eye ball vents black
11. AVEO wing strobes/nav lights
12. Back-up ALT Winter 4 FGH 40
13. Back-up ASI Winter 7FMS 513 (0-160 kts)
14. Beringer 5,00-5 10PLY wheels + in line ballanced anti-lock regulator
15. Beringer dual brakes
16. Cabin heat
17. Clear canopy glass
18. CM-24S / south Magnetic Compass
19. Control sticks for Tosten grips
20. Cylinder head temperature indicator (analogue)
21. Dark Grey interior
22. Elevator electric trim
23. Front locker
24. Fuel quantity gauges (2x)
25. Garmin G3X flight display system
26. Garmin GA 26C GPS antenna for G3X
27. Garmin GA 35 External active GPS antenna

28. Garmin GAP 26 angle of attack unheated probe
29. Garmin GDU 460
30. Garmin GEA 24 Engine Interface Module
31. Garmin GMU 22 Magnetometer
32. Garmin GSU 25 ADHRS (2x)
33. GARMIN GTN 650 GPS/NAV/COM
34. Garmin GTP 59 Temperature Probe
35. Garmin GTX 23 ES mode S transponder
36. Governor P-110-030/A
37. Horn (klaxon)
38. Instrument panel storage box on the right
39. Key switch box
40. Landing lights in both wings
41. Leather glareshield and upholstery
42. LED strip on glareshield + dimmer
43. Long HTU (2.9 m) with horn balance
44. Low fuel warning lights
45. Middle size instrument panel for G3X
46. MTV-34-1-A/175-200 propeller
47. Noise insulation on firewall
48. Nulites
49. Oil pressure indicator (analogue)
50. Oil temperature indicator (analogue)
51. Paint scheme: own design
52. Parking brake
53. Pierburg auxiliary fuel pump
54. PM 3000II Intercom (4 pos. Stereo IC)
55. RAMI AV-74 transponder DME antenna
56. Rotax 912 ULS engine, clutch, airbox
57. Stainless steel rivets
58. Tail skid with wheel
59. TCW IBBS-12V-3AH backup battery for Garmin G3X
60. Tie down points rear luggage area
61. Tosten CS-6 grips
62. VOR antenna
63. Wheel fairings (pants)
64. 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): 1350,0

| | ITEM | WEIGHT (kg) | ARM (mm) | MOMENT = WEIGHT x ARM (kg.mm) |
|---|---|---|---|---|
| EMPTY AIRCRAFT WEIGHT AND CG | RIGHT MAIN WHEEL | WR= 137,9 | LR= 720 | MR= 99283,3 |
| | LEFT MAIN WHEEL | WL= 142,9 | LL= 720 | ML= 102875,8 |
| | NOSE WHEEL | WN= 82,1 | LN= -750 | MN= -61575,8 |
| | **EMPTY AIRCRAFT** | **EMPTY WEIGHT** (kg) **WE= 362,9** | **CG (mm) = 387,41** **CG (%MAC) = 28,7** | **EMPTY ACFT TOTAL MOMENT** (kg.mm) **MT= 140583,33** |

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

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

| |
|---|
| **Serial No.: 274/2017** |
| **Date: 2.6.2017** |
| **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 | 362,9 | 387,41 | 140583,3 |
| 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: | 337,5 | mm |
| Rearward limit: | 472,5 | mm |

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

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

| |
|---|
| Serial No.: 274/2017 |
| 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= 720,0 | MR= |
| | LEFT MAIN WHEEL | WL= | LL= 720,0 | ML= |
| | NOSE WHEEL | WN= | LN= -750,0 | 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 | $CG\ (mm) = \frac{\text{Total Moment}}{\text{Total Weight}}$ |
| CG Range: | 25 | 35 | |
| Forward limit: | 337,5 | mm | $CG\ (\%MAC) = CG\ (mm) \times \frac{100}{MAC}$ |
| Rearward limit: | 472,5 | mm | |

| | |
|---|---|
| Serial No.: 274/2017 | |
| 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: | 274/2017 | | | | Empty weight (kg): | 363 | 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 | **223** *34,2 %MAC* | **208** *33,5 %MAC* | **194** *32,8 %MAC* | **179** *32,1 %MAC* | **165** *31,3 %MAC* | **150** *30,6 %MAC* |
| | 1/2 REAR | 8 | **215** *34,9 %MAC* | **201** *34,2 %MAC* | **186** *33,5 %MAC* | **172** *32,8 %MAC* | **157** *32,1 %MAC* | **143** *31,4 %MAC* |
| | MAX REAR | 15 | **164** *35,0 %MAC* | **193** *35,0 %MAC* | **179** *34,3 %MAC* | **164** *33,5 %MAC* | **150** *32,8 %MAC* | **135** *32,1 %MAC* |
| | 1/2 WING LOCKERS | 20 | **203** *34,3 %MAC* | **188** *33,6 %MAC* | **174** *32,8 %MAC* | **159** *32,1 %MAC* | **145** *31,4 %MAC* | **130** *30,7 %MAC* |
| | 1/2 REAR + 1/2 WING | 28 | **194** *35,0 %MAC* | **181** *34,3 %MAC* | **166** *33,6 %MAC* | **152** *32,9 %MAC* | **137** *32,2 %MAC* | **123** *31,4 %MAC* |
| | MAX REAR + 1/2 WING | 35 | **139** *35,0 %MAC* | **170** *35,0 %MAC* | **159** *34,3 %MAC* | **144** *33,6 %MAC* | **130** *32,9 %MAC* | **115** *32,2 %MAC* |
| | MAX WING LOCKERS | 40 | **183** *34,4 %MAC* | **168** *33,6 %MAC* | **154** *32,9 %MAC* | **139** *32,2 %MAC* | **125** *31,5 %MAC* | **110** *30,8 %MAC* |
| | 1/2 REAR + MAX WING | 48 | **169** *35,0 %MAC* | **161** *34,4 %MAC* | **146** *33,7 %MAC* | **132** *32,9 %MAC* | **117** *32,2 %MAC* | **103** *31,5 %MAC* |
| | MAX REAR + WING | 55 | **115** *35,0 %MAC* | **146** *35,0 %MAC* | **139** *34,4 %MAC* | **124** *33,7 %MAC* | **110** *33,0 %MAC* | **95** *32,3 %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 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 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 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. Is not recommended give too heavy things into baggage compartment B.

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

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 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 274/2017 is fitted with:

1. 3-pos.adjustable rudder pedals on both sides
2. additional 12V/5V socket on instrument panel
3. Andair fuel selector on console under instrument panel
4. Anderson plug-External connection to power for jump start
5. Automotive net and tie-down points in baggage compartment
6. Aveo eye ball vents black
7. AVEO wing strobes/nav lights
8. Beringer 5,00-5 10PLY wheels + in line ballanced anti-lock regulator
9. Beringer dual brakes + parking brake
10. Cabin heat
11. Clear canopy glass
12. Control sticks for Tosten grips
13. Dark Grey interior
14. Elevator electric trim
15. Front locker fro baggage
16. Propeller governor P-110-030/A
17. Horn (klaxon)
18. Instrument panel storage box on the right
19. Landing lights in both wings
20. Leather glareshield and upholstery
21. LED strip on glareshield + dimmer
22. Middle size instrument panel for G3X
23. MTV-34-1-A/175-200 propeller
24. Noise insulation on firewall
25. Nulites
26. Pierburg auxiliary fuel pump
27. Stainless steel rivets
28. Tail skid with wheel
29. Tosten CS-6 grips
30. Wheel fairings (pants)
31. Whelen MB 1 tail mounted LED strobe

## 7.13 Instruments and Avionics

BRISTELL S-LSA S/N 274/2017 is fitted with:

**Flight instruments:**

1. Garmin G3X flight display system including:
   - Garmin GDU 460
   - Garmin GEA 24 Engine Interface Module
   - Garmin GMU 22 Magnetometer
   - Garmin GSU 25 ADHRS (2x)
   - Garmin GTP 59 Temperature Probe
   - Garmin GA 26C GPS antenna for G3X
   - Garmin GAP 26 angle of attack unheated probe
   - TCW IBBS-12V-3AH backup battery for Garmin G3X
2. CM-24S / south Magnetic Compass
3. Back-up ALT Winter 4 FGH 40
4. Back-up ASI Winter 7FMS 513 (0-160 kts)

**Engine instruments:**

1. Garmin G3X flight display system including:
   - Garmin GDU 460
   - Garmin GEA 24 Engine Interface Module
2. Cylinder head temperature indicator (analogue)
3. Oil pressure indicator (analogue)
4. Oil temperature indicator (analogue)
5. Fuel quantity gauges (2x)
   + Low fuel warning lights

**COM, NAV:**

1. GARMIN GTN 650 GPS/NAV/COM
   + Garmin GA 35 External active GPS antenna
   + VOR antenna
2. PM 3000II Intercom (4 pos. Stereo IC)
3. Garmin GTX 23 ES mode S transponder +
   RAMI AV-74 transponder DME antenna

***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 274/2017 has the following cockpit layout:

### 7.14.2 Instrument panel

BRISTELL S-LSA, S/N 274/2017 is fitted with Middle size instrument panel with the following instruments arrangement:

# 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 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*

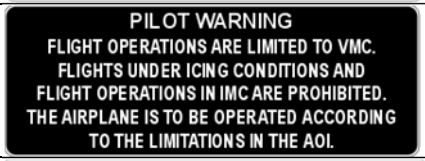
### *9.2 Miscellaneous placards and markings*

## 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: Open - Close
- 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.

# Aircraft Operating Instructions

| | |
|---|---|
|  | Passenger warning for LSA category aeroplanes.<br>Located on the instrument panel. |
|  | Passenger notice for LSA category aeroplanes.<br>Located on the instrument panel. |
|  | Operation limitation.<br>Located on the instrument panel. |
|  | Operation limitation.<br>Located on the instrument panel. |
|  | Main baggage compartment behind the seats. |
|  | Additional baggage compartment behind the Baggage compartment A.<br>NOT TO BE USED FOR HEAVY ITEMS! |
|  | Maximum weight of baggage in the Baggage compartment – A, behind the seats. |
|  | Maximum weight of baggage in each wing locker, if installed. |
|  | Maximum weight of baggage in fuselage front locker, if installed. |
|  | Unusable fuel quantity in each tank.<br>Located on the instrument panel or in the cockpit. |
|  | Airspeed limitations.<br>Located on the instrument panel or fuselage side. |

| | |
|---|---|
|  | Engine speed limitations.<br>Located on the instrument panel or fuselage side. |
|  | Maximum Takeoff Weight Limitation.<br>600 kg (1320 lb) limit for Light sport aeroplanes.<br>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. |

| | |
|---|---|
|  | **If BRS rescue system is installed:**<br><br>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 |
| 05/2017 | 02 | Description of the aircraft S/N 274/2017 |
| | | |

## *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.

# Aircraft Operating Instructions

## SUPPLEMENT No. 02

## AIRCRAFT DESCRIPTION

Registration: **VH-YUU**

Serial number: **274/2017**

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 of S/N 274/2017.

## *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.