EV-97 EUROSTAR SL MICROLIGHT

PILOT OPERATING HANDBOOK

POH/EUR/02

PILOT'S OPERATING HANDBOOK FOR AEROPLANE

EV-97 EuroStar SL Microlight

Model: EV-97 Eurostar SL Microlight

Registration:

Serial Nº:

This aeroplane must be operated in compliance with the information and limitations contained herein.

This POH must be available on board the aeroplane.

WARNING

This Aircraft is not fitted with a certified engine. A power failure can occur at any time. Never fly over any area on to which a safe landing cannot be made in the event of an engine failure

Flying in this and any aircraft can be dangerous either for the passenger or the pilot. You agree to fly in this aircraft entirely at your own risk.

Any acute or long term medical conditions or the taking of any medications associated with any acute or long term condition will increase your risk of flying in this aircraft safely and may lead to you becoming incapacitated at the controls. This includes the taking of any social or recreational drugs, alcohol, diving using an aqua lung, recent blood donation, cold or flu, ear infection.

On board the aircraft please ensure that loose articles are secured before flight. Loose items can jam the controls leading to a loss of control.

Stalling, spinning or any aerobatic manoeuvres during any stage of flight may lead to a loss of control.

The parachute handle safety pin can be removed at the pilot's discretion before flight. Failure to do so may result in the pilot's inability to deploy the parachute due to incapacity, adverse G and or aerodynamic forces resulting from mid air collision or loss of control.

AMENDMENT RECORD

Issue	Details of Change	Date	Authorised
1	Initial issue	12 May 2014	
2	Section 7.10 Electrical system. Pg. 33 Changes to distribution and services. Included electric pre-start system	27 August 2014	
3	Section 7.10 Electrical System. pg. 33 Changes to the warning to prevent battery discharge. Changes to warning on pg 2.	11 September 2015	
4	Section 6.2 Permitted Cockpit Loads. Pg. 29. Changes to weight, balance and weighing	18 December 2015	
5	General changes to Section 3- Emergencies Pg 15.	29 March 2016	
6	Section 7.13 Pg. 35 Autopilot operation added.	27 May 2016	
7	Warnings added. Section 4.4.1 Pg. 23 and Section 7.3 Pg. 32	06 January 2017	
8	4.4.2 point 4 – “Smooth operation “ added 8.3 was LSA	24/10/24	

Table of Contents

SECTION 1 – GENERAL INFORMATION AND TECHNICAL DATA

1.1 Introduction

This Pilot's Operating Handbook has been prepared to provide pilots with information for the safe and efficient operation of the EV-97 EuroStar SL Microlight aeroplane. It also contains supplemental data which may be found useful.

1.2 Certification basis

The EV-97 EuroStar SL Microlight has been approved by UK Civil Aviation Authority against the requirements of BCAR section S Issue 6 dated May 2013.

1.3 Warnings, cautions and notes

The following definitions apply to warnings, cautions and notes in the flight manual:

WARNING
Means that the non-observation of the corresponding procedure leads to an immediate or significant degradation of the flight safety.

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.

1.4 Descriptive Data

1.4.1 Aircraft description

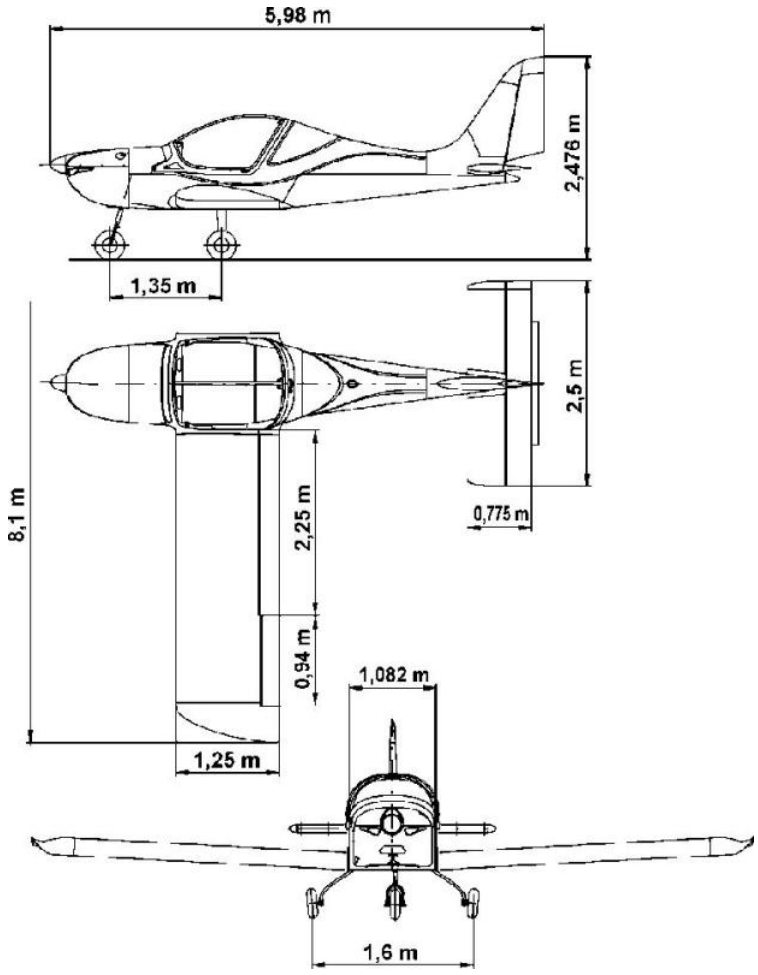
EV- 97 EuroStar SL Microlight is an aircraft intended for recreational and touring flying and is limited to non-aerobatic operations in Visual Meteorological Conditions(VMC). It is a single engine, all metal, low-wing monoplane of semi-monocoque construction with two side-by-side seats. The aeroplane is equipped with a fixed tricycle undercarriage with a steerable nose wheel. Aerodynamic controls are of the conventional 3-axis type.

The power-plant is a ROTAX 912 UL (80 hp), four cylinder, four stroke engine fitted with a gearbox having a reduction ratio of 2.27:1. The aircraft was approved with a Woodcomp Klassic 170-3R 3 blade propeller. Other alternative propeller which may be fitted is, Kiev 237/1700 3 blade propeller.

1.4.2 Technical Data

Wing				
Span	8.10	m	*26.57*	*ft*
Area	9.84	m^2	*105. 92*	*ft^2*
Mean Aerodynamic Centre (MAC)	1.25	m	*4.10*	*ft*
Wing Loading	45.7	kg/m^2	*9.37*	*lb/ft^2*
Aileron area	0.21	m^2	2.26	ft^2
Flap area	0.52	m^2	*5.60*	*ft^2*
Fuselage				
Length	5.98	m	*19.62*	*ft*
Width	1.08	m	*3.55*	*ft*
Height	2.48	m	8.12	*ft*
Horizontal tail unit				
Span	2.50	m	*8.20*	*ft*
Area	1.95	m^2	*20.99*	*ft^2*
Elevator area	0.80	m^2	*8.60*	*ft^2*
Vertical tail unit				
Height	1.28	m	*4.21*	*ft*
Area	1.02	m^2	*10.93*	*ft^2*
Rudder area	0.43	m^2	*4.67*	*ft^2*
Landing gear				
Wheel track	1.60	m	*5.25*	*ft*
Wheel base	1.35	m	*4.42*	*ft*
Main wheel diameter	350	mm	*14*	*in*
Nose wheel diameter	350	mm	*14*	*in*

1.4.3 Three-view drawing



SECTION 2 - LIMITATIONS

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 significances are shown below:

Speed		IAS Knots	Remarks
V_{NE}	Never exceed speed	126	Do not exceed this speed in any operation.
V_A	Manoeuvring speed	88	Do not make full or abrupt control movement above this speed, because under certain conditions the aircraft may be overstressed by full control movement.
V_{FE}	Maximum Flap. Extending speed	67	Do not exceed this speed with flaps extended.

2.3 *Airspeed indicator markings*

Airspeed indicator markings and their colour-code significances are shown below:

Marking	IAS value or range Knots	Significance
White arc	32–67	Positive Flap Operating Range.
Green arc	34–88	Normal Operating Range.
Yellow arc	88 – 126	Manoeuvres must be conducted with caution and only in smooth air.
Red line	126	Maximum speed for all operations.

The lower end of the white arc is 1.1 V_{SO}
The lower end of the green arc is 1.1 V_{S1}

2.4 Powerplant

Engine Model:			ROTAX 912 UL	
Engine Manufacturer:			BRP – Powertrain GMBH	
Power	Max Take-off:		59.6 kW / 80 hp at 5800 rpm, max.5 minutes	
	Max. Continuous:		56 kW / 75 hp at 5200 rpm	
	Cruising:		53 kW / 71 hp at 4800 rpm	
Engine speed	Max. Take-off:		5800 rpm, max. 5 min.	
	Max. Continuous:		4800 rpm	
	Cruising:		4600 rpm	
	Idling:		~1400 rpm	
Cylinder head temp.		Minimum	60 °C	140 °F
		Maximum	120 °C (1)	248 °F
Coolant temp.		Maximum	115 °C (1) & (2)	239 °F
Oil temp.		Minimum	50 °C	122 °F
		Maximum	140 °C	284 °F
		Optimum	90 – 110 °C	194 - 230°F
Oil pressure		Maximum	7.0 bar	
		Minimum	1.5 bar	
		Optimum	1.5-4.0 bar	
Fuel:			See 2.13 and (2)	
Fuel Pressure			min. 0.15 bar, max. 0.4 bar	
Oil:			Automotive engine oil of registered brand with gear additives, but not aircraft oil (refer to engine Operator´s Manual). API classification SF or SG. (2)	

(1) With 50/50 Ethylene Glycol/water coolant mix.
(2) Service Bulletin SB/EUR/006 Issue 1 is complied with.

WARNING

The Rotax 912 UL has not been certified as an aircraft engine and its failure may occur at any time. The pilot is fully responsible for consequences of such a failure. Never fly over an area on to which you cannot safely land in the event of an engine failure.

2.5 Power plant Instrument Markings

Analogue power plant instruments are installed in the EV-97 EuroStar SL (Microlight) aeroplane, the following markings should be provided:

	Minimum Limit	Normal Operating	Caution Range	Maximum Range
Engine speed (RPM)	1400	1400-5200	5200-5800	5800
Cylinder Head Temperature (CHT) (1)	60 °C, *140 °F*	60-100 °C *140-212 °F*	100-120 °C *212-248 °F*	120 °C *248 °F*
Coolant Temperature (CHT) (1)	60 °C, *140 °F*	80-100 °C *176-212 °F*	100-115 °C *212-239 °F*	115 °C *239 °F*
Oil Temperature	50 °C *122 °F*	90-110 °C *194-230 °F*	50-90 °C, *122-194 °F* 110-140 °C, *230-284 °F*	140 °C *284 °F*
Oil Pressure	1.5 bar	1.5 - 4.0 bar	4.0 - 5.0 bar	7.0 bar cold engine starting
Fuel Pressure	0.15 bar	0.2 – 0.3 bar	0.3 – 0.4 bar	0.4 bar

(1) When using 50/50 Ethylene Glycol/water coolant mix.

2.6 Miscellaneous instrument markings

- Fuel gauge (analogue) A fuel reserve of 11 litres (*2.42 Imp. gals*) is indicated by yellow warning lamp if installed.
- Fuel gauge (Digital) The fuel quantity is displayed by a green bar plus an indication of quantity in litres.
- In both cases this is a guide only use a dip stick to verify amount in tank.

2.7 Weight

Empty weight (standard equipment) approx. 288 kg *640 lbs*

NOTE
Actual empty weight is stated in SECTION 6, par. 6.2

Max. take-off weight 472.5kg 1041*lbs*
Max landing weight 472.5kg 1041*lbs*
Max. weight of fuel 47kg *104 lbs*
Max. baggage weight 15kg *33 lbs*

2.8 Centre of Gravity

Empty aircraft C.G. position (standard) 18±2% MAC = 200 – 250 mm AOD
Operating C.G. range 20-34% MAC = 250 – 410 mm AOD
Datum is wing leading edge.

2.9 *Approved manoeuvres*

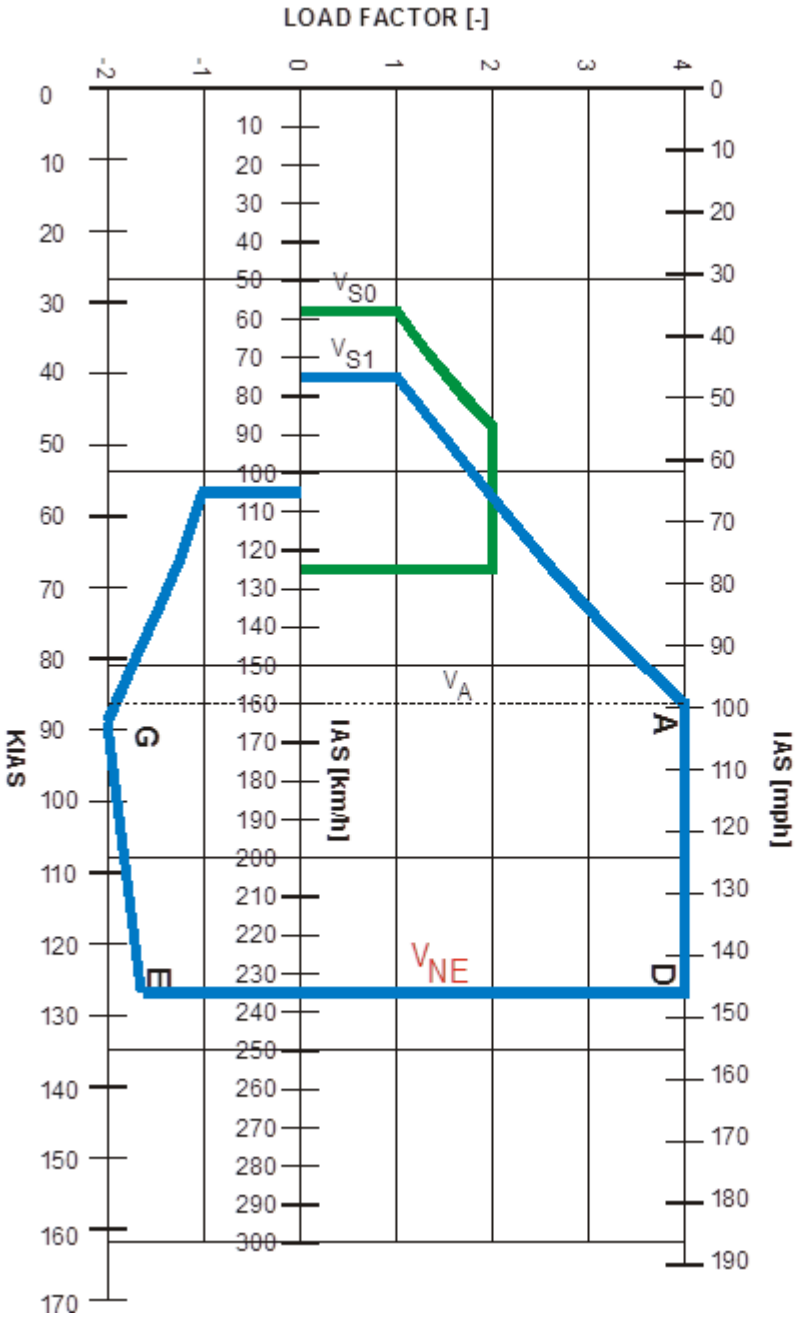
Aeroplane Category: Normal; the EV-97 EuroStar SL Microlight aeroplane is approved for normal and below listed manoeuvres:

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

All Manoeuvres must be carried out within the design envelope of the aircraft

WARNING Aerobatics and intentional spins are prohibited

2.10 *Manoeuvring Load Factor*



EV-97 EUROSTAR SL MICROLIGHT FLIGHT ENVELOPE

2.11 Crew

Minimum Crew	1
Minimum Crew Weight	55 kg, 121 lb
Maximum Crew Weight	see 6.2

WARNING
Always comply with the maximum take-off weight of 472.5kg (1041 lbs)

2.12 Kind of Operations

Daytime VFR flights only.

WARNING
IFR flights and flights under icing conditions are prohibited.

Minimum instruments required for VFR flights:

(i) Airspeed indicator, marked in accordance with 2.3
(ii) Altimeter
(iii) Magnetic compass
(iv) Slip ball

2.13 Fuel

- Premium or super unleaded automobile fuel to EN228, minimum RON 90.
- AVGAS UL 91 Certified to ASTM D7547
- AVGAS 100LL. The higher lead content in AVGAS can result in wear of valve seats and increased combustion chamber deposits. Use AVGAS only if other fuels are not available.
- For other suitable fuel types, refer to the engine Operator's Manual.

Fuel tank volume	65 litres	14.3 Imp. gals.
Unusable fuel quantity	2.9 litres	0.64 Imp. Gals.

Refer also to Engine Operators Manual and Rotax Service Instruction SI-912-016 R2 Use a dip stick to verify amount in tank.

2.14 Maximum Passenger Seating

Number of seats 2

2.15 Other Limitations

Smoking is not permitted on board.

2.16 Limitation Placards

The owner of this aeroplane is responsible for the readability of placards during the aircraft service life.

The following placards should be located on the aeroplane:

In view of the pilot:

Flight limited to daytime VFR non-icing conditions. Aerobatics and intentional spinning are prohibited. This aeroplane has not been approved to an internationally recognised airworthiness standard.

AIRSPEEDS (IAS)

V_{NE} (Never exceed speed)	126 Knots
V_A (Maximum manoeuvring speed)	88 Knots
V_{FE} (Flaps extended max. speed)	70 Knots
V_{So} (Stall speed, flaps extended)	29 Knots

ENGINE LIMITATIONS

Maximum take-off (max. 5 minutes)	5800 rpm	
Max. continuous	4800 rpm	
Idle	approx.1400 rpm	
Max. CHT	120ºC	with 50/50 antifreeze mixture
Max. coolant temp.	115ºC	with 50/50 antifreeze mixture
Max. oil temp.	140ºC	
Min. oil temp.	50ºC	
Min. oil pressure	1.5 bar	
Max. oil pressure	7.0 bar	
Minimum fuel pressure	0.15 bar	
Maximum fuel pressure	0.4 bar	

LOAD LIMITS

Capacity 65 litres

Unusable fuel 2.9 litres

Maximum take-off weight	472.5 kg
Maximum empty weight	290.5 kg
Actual empty weight	____ kg
Max. baggage weight	15 kg
Minimum total occupant weight	55 kg
Maximum total occupant weight	172 kg

FUEL LIMITS

Cockpit Load including Baggage (Kg)	Maximum fuel Load (litres)
180	10
170	24
160	38
150	52
140 or less	Full fuel

Adjacent to Oil Filler

Recommended Engine Oil
SAE 10W40 Semi Synthetic Engine Oil
that meets or exceeds JASO MA2, API SL,SAE 10W40

Adjacent to Parachute deployment handle:

WARNING - EMERGENCY PARACHUTE **To deploy pull (jerk) handle hard for at least 10 cm** Unapproved Equipment-see Pilots Operating Handbook

In the baggage area:

BAGGAGE MAX.
15 kg

On the rear area:

NOT TO BE USED FOR ADDITIONAL STORAGE

In view of both occupants:

CG LIMITS
OPERATING C.G. RANGE: 250 – 410 AOD
DATUM IS WING LEADING EDGE.

NO SMOKING

BEFORE TAKE OFF PUSH CANOPY HANDLE UP TO CHECK CANOPY IS FULLY CLOSED AND CHECK CANOPY OPEN WARNING LIGHT IS OUT.

CAUTION!
DANGER OF TRAPPING FINGERS WHEN CLOSING THE CANOPY

Adjacent to the fuel filler:

90 RON MINIMUM MOGAS UNLEADED TO EN 228, AVGAS UL91 OR AVGAS 100LL* PROLONGED USE OF AVGAS 100LL SHOULD BE AVOIDED.

SECTION 3 - EMERGENCIES

3.1 Introduction

Section 3 provides checklists and detailed 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 practised.

However, should an emergency arise, the basic guidelines described in this section should be considered and applied as necessary to correct the problem. It is normally impractical to refer to this manual after the emergency has arisen; for this reason, pilots are strongly advised to familiarise themselves with its contents before flight.

3.2 Engine failures

"Aviate/Navigate/Communicate" Make a Plan!

Engine failure during take-off run:

1. Throttle - Close to idle
2. Ignition - Switch off
3. Brake - Firmly as required

Engine failure after take-off:

1. Speed - Stick forward, set best glide at 65 Knots.
2. Field selection - Land ahead into wing, DO NOT TURN BACK
3. Landing area - choose free area without obstacles; check for cables.
4. Flaps - Extend as needed.
5. Fuel cock - Shut off.
6. Ignition - Switch off.
7. Safety harness - Tight. RT call if time
8. Master switch - Switch off before landing.

NOTE
In an emergency, the pilot's priority is to land safely.

Engine failure in flight:

1. Speed - Stick forward, set best glide at 65 Knots
2. Field selection - Use the mnemonic SSSS's Size, Shape, Surface, Etc.
3. Wind - Evaluate direction and velocity
4. Landing area - Set up a circuit pattern with key positions avoid S turns if possible
5. Checks - TIFFS mnemonic…
6. T - Throttle fully closed
7. I - Ignition off Master off trip circuit breakers Master & Charge
8. F - Flaps as required (Use full 50deg flap for final landing)
9. F - Fuel tap turn off
10. S - Secure all loose items, Tighten seat belts

Where time allows attempt to restart or fix the problem. Make a MAYDAY CALL

3.3 In-Flight Re-start

1.	Speed	- Glide at 65 Knots
2.	Altitude/Height	- Check
3.	Landing area	- Have a plan
4.	Master switch	- Check switches and Circuit Breakers are on
5.	Fuel cock	- Open
6.	Electric fuel pump	- Switch on if fitted
7.	Choke	- As necessary (for cold engine)
8.	Throttle	- Set as required
9.	Ignition	- Switch on
10.	Starter	- Turn key to start the engine

It is possible to restart the engine by diving the aircraft, a considerable airflow is needed to start the propeller rotating. Ensure there is adequate height before starting this procedure. Increase speed as necessary to start the prop rotating but do not exceed Vne, Ensure items 4 to 9 above are followed.

WARNING
The loss of altitude during in-flight engine starting is about 1300 ft and must be taken into consideration.

3.4 Smoke and fire

CAUTION
When abandoning the aircraft with the engine running! Make a MAYDAY CALL.

3.4.1 Fire on the ground:

1.	Fuel cock	- Shut off
2.	Throttle	- Open fully open to use up remaining fuel
3.	Master switch & Circuit Breakers	- Switch off
4.	Ignition	- Switch off after engine stops
5.	Abandon the aeroplane	

Extinguish fire if possible, or call the Emergency Services.

3.4.2 Fire during take-off roll:

1.	Abort take-off	- Close throttle & brake hard until stopped
2.	Master switch & Circuit Breakers	- Switch off
3.	Fuel cock	- Shut off
4.	Throttle	- Open fully open to use up remaining fuel
5.	Ignition	- switch off after engine stops
6.	Abandon the aeroplane	

Extinguish fire if possible, or call the Emergency Services.

3.4.3 Fire during take-off (climb out):

1.	Fuel cock	- Shut off
2	Master Switch & Circuit Breakers	- Switch off
3.	Throttle	- In order to descend close the throttle
4.	Speed	- 65 Knots and initiate a side slip
5.	Ignition	- Leave on until landed
6.	If engine stops	- Use engine failure plan as in 3.2
7.	After landing	- Abandon the aeroplane

Extinguish fire if possible, or call the Emergency Services.

3.4.4 Fire in flight:

1.	Fuel cock	- Shut off
2	Master Switch & Circuit Breakers	- Switch off
3.	Throttle	- In order to descend close the throttle
4.	Speed	- 65 Knots and initiate a side slip
5.	Ignition	- Leave on until landed
6.	If engine stops	- Use engine failure plan as in 3.2
7.	After landing	- Abandon the aeroplane

Extinguish fire if possible or call the Emergency Services.

NOTE
Estimated time to pump fuel out of carburettors at full power is 30 seconds.

3.4.5 Smoke in cabin

1.	Master Switch & Circuit Breakers	- Switch Off
2.	Vents	- Open, yaw aircraft to help remove fumes
3.	Aviate	- Fly the aircraft to a suitable landing area

Note: It is possible to try and establish the cause or find the faulty component by tripping all of the circuit breakers and turning on one by one until the problem reoccurs. Start with the Master and then one by one from left to right. This should be done with great caution, if in any doubt just fly the aircraft and land as soon as possible. The engine will only stop if the Ignition switch is turned to off.

3.5 Glide

Best glide:

1.	Speed	- 65 Knots
2.	Flaps	- Retracted

3.6 Emergency Landings

Emergency landings, in case of an emergency landing follow procedure 3.2 in case of engine failure and 3.7 for a precautionary landing

3.7 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 where bad weather or poor visibility present severe flight hazards.

1. Determine wind direction. Choose a suitable landing area.
2. Make a PAN PAN call on the radio and report your position & intentions.
3. Fly at 500 AGL into wind over the right-hand side of the chosen area with flaps extended one notch 15deg at a speed of 65 knots to thoroughly inspect the area. Pay particular attention to electricity or telephone cables running across the landing area; these are often difficult to see.
4. Fly a tight circuit around the field
5. Fly at 300 AGL into wind over the right-hand side of the chosen area with flaps extended by two notches 30deg at a speed of 65 knots to inspect the surface of the field.
6. Make an approach to land with flaps extended to 50deg full flap
7. Use a powered approach for a short/soft field landing
8. After stopping the aeroplane turn off all switches and circuit breakers, shut off the fuel cock, Secure the aircraft, lock the canopy, notify the land owner.

NOTE
Watch the chosen area permanently during precautionary landing.

3.8 Landing with a flat tyre

1. During the landing hold off, hold the flat wheel/tyre off as long as possible using the ailerons or elevator as required. Avoid grass if possible a hard surface is preferred.
2. Maintain direction during the landing roll.
3. Stop and inspect damage before further taxi

3.9 Landing with a defective landing gear

1. Establish contact with ATC and request a fly by for an inspection.
2. If the main landing gear is damaged, perform touch-down at the lowest speed possible and attempt to maintain direction during the landing roll.
3. If the nose wheel is damaged, perform touch-down at the lowest speed possible and hold the nose wheel over a runway using the elevator as long as possible.
4. It is the pilots choice whether to shut the engine down

2.10 Recovery from unintentional spin

WARNING

Intentional spins are prohibited! The procedure below is only for information.

The aircraft has no tendency to spontaneously enter an uncontrollable spin if normal piloting techniques are used. However there is a tendency for a wing drop at the fully developed stall if slightly out of balance.

The following standard procedure can be used to recover from an unintentional spin:

1. Throttle - Reduced to idle
2. Control stick - Ailerons/ Elevator centralised
3. Rotation - Identify direction of rotation
4. Rudder pedals - Apply full opposite rudder to rotation
5. Control stick - Forward stick on elevator control as required to stop spin.
6. Rudder pedals - immediately after rotation stops, centralise the rudder.
7. Recover from the dive, take care not to exceed V_{NE}.

3.11 Other emergencies

3.11.1 Vibration

If any forced aircraft vibrations appear:

1. Adjust the engine speed to the setting at which the vibration is minimum.
2. Land as soon as possible; perform a precautionary landing if necessary.

3.11.2 Carburettor icing

The EV-97 EuroStar SL Microlight is supplied with a coolant carburettor heater system which should prevent carburettor icing; however icing may be possible under extreme conditions.

Certain weather conditions, particularly low temperatures and high humidity, give rise to the risk of carburettor icing. The carburettor icing shows itself through a decrease in engine power, rough running and an increase in engine temperatures.

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

Speed - 65 Knots
Throttle - increase power
If possible, leave the icing area
Increase the engine power gradually to maximum power.

If necessary make a precautionary landing, depending on the circumstances.

3.11.3.1 Canopy open in flight

The canopy is fitted with two latch system, the red warning lamp will extinguish only when fully closed, two clicks. Do not fly the aircraft with the red light illuminated or if only on one latch.
If the canopy opens in flight, it is unlikely to open fully as air resistance and reduced pressure will hold it open by approximately 30cmts there will be an increase in noise and some reduction in performance. Slow the aircraft down to 65kts and apply flaps return to land or make a precautionary landing. If you have a passenger ask them to hold the handle and if possible re-secure the canopy. It is not recommended to attempt to close the canopy if you are alone as this may lead to loss of control.

SECTION 4 – NORMAL OPERATIONS

4.1 Introduction

Section 4 provides checklists and detailed procedures for normal operations. Procedures for optional systems can be found in section 9.

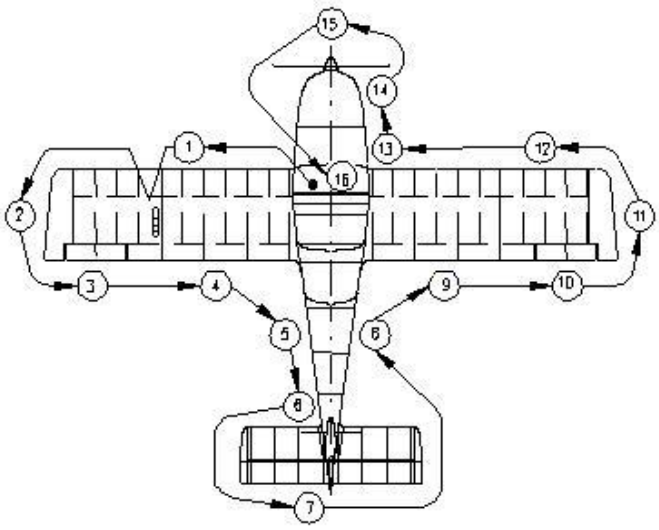
4.2 Assembly and disassembly

For assembly and disassembly procedures refer to the Technical Description, Operating and Maintenance Manual for the EV-97 EuroStar SL Microlight.

4.3 Pre-flight inspection

The pre-flight inspection is vitally important because incomplete or careless inspection could cause an accident. The following pre- flight inspection procedure is recommended by the aircraft manufacturer:
Before moving the aircraft carry out a fuel inspection, drain a small quantity into a glass container and check for debris and water, if a small amount is found a further sample can be obtained, if the problem continues seek advice.

The drain tap is located under the starboard side of the fuselage which is accessed by lowering the flaps to 50deg and reaching in, the tap can be stiff to operate and is spring loaded to ensure it stays closed. The sample is taken from the lowest part of the tank, moving the aircraft before a sample is taken may disturb any water or debris.



Open the canopy check that the ignition is switched off and the key is removed. Set flaps to full 50deg. Cockpit checks, seat belt security and condition, seat covers, carpet and panels secure, control sticks fittings and push rods free and secure, rudder pedals secure and adjusted to pilots requirements, no leaking brake fluid. Set the trim to take off position and hold the elevator to neutral against the stabulaitor the elevator trim tab should be also in the neutral position (e.g. all level) make sure the trim tab moves around this position up and down with free movement. Also see 16 below

1. *Wing*
   - Wing surfaces' condition, top and bottom.
   - Leading edge condition.
   - Pitot tube condition.

2. *Wing tip*
   - Surface condition.
   - Check of tips attachment.

3. *Aileron*
   - Surface condition, top and bottom.
   - Attachment.
   - Play.
   - Free movement.

4. *Flap*
   - Surface condition, top and bottom.
   - Attachment.
   - Play

5. *Rear part of fuselage*
   - Surface condition, top and bottom.

6. *Vertical tail unit*
   - Surface condition.
   - Play in rudder hinge.
   - Free rudder movement.

7. *Horizontal tail unit*
   - Surface condition, top and bottom.
   - Attachment.
   - Play in elevator hinge.
   - Free elevator movement.
   - Trim tab condition.

8. see **5**

9. see **4**

10. see **3**

11. see **2**

12. see **1**

13. *Landing gear*
   - Check main and nose landing gear attachment
   - Check control of steerable nose wheel.
   - Condition of tyres
   - Condition and attachment of wheel spats (if fitted)

14. *Engine*
   - Engine cowlings' condition
   - Engine mount condition, inspect welded junctions for cracks.
   - Engine attachment check
   - Oil quantity check (between dipstick marks) *****

In cases where the engine has not been run for some time, oil can drain into the engine crankcase, making the oil tank level appear low. If the level does appear low, first ensure ignition is off, then with the oil tank cap off turn the propeller slowly in its normal direction, until oil is heard to gurgle in the tank. The level can now be checked again the level should be half way up the flat area of the dip stick. Replace the cap after checking.

- Fuel and Electric system visual check
- Fuel system draining
- Other checks according to engine manufacturer instructions
- Use the dip stick to check fuel quantity

CAUTION

If turning the engine by hand. Avoid excessive pressure on a blade tip and trailing edge. The engine could rotate or even start causing injury, extreme care is need during this procedure. The propeller must only be turned in an anti-clockwise direction never clockwise, e.g in the normal direction of blade orientation.

15. Propeller

- Propeller attachment
- Blades, Hub, Spinner condition
- Other checks according to propeller manufacturer instructions.

16. Cockpit

☐	Ignition	- switched off
☐	Master switch	- switched off
☐	Instruments	- check condition
	Fuel gauge	- check fuel quantity (switch Master ON, then off again).
☐	Controls	- visual check - check correct function - check play - check flaps' extension - check full and free movement up to stops.
☐	Loose items	- properly stowed and secured.
☐	Canopy	- condition of attachment, cleanliness.

CAUTION!

When adjusting the brake pedals, if the plungers are not fully engaged in one of the three holes in the plate, the pedal may rotate backwards and prevent rudder movement. See Brake Pedal Adjustment section 9.2 in the EV-97 Eurostar SL Microlight Maintenance Manual

4.4 Normal procedures

4.4.1 Before entering cockpit

1. Aeroplane surface - check all covers removed. Including Pitot cover
2. Cockpit - check items inside the cockpit stowed correctly.
3. Ignition - off.
4. Master switch off.

WARNING

Ensure that loose articles are secured before flight so that they cannot interfere with any of the controls of the aircraft (flap lever, control sticks, aileron linkages, aileron pushrods and rudder controls). Loose items such as cameras, mobile phones, straps and pens etc. must be stowed safely in the side pockets or luggage area behind the seats.

4.4.2 After entering cockpit

1. Rudder pedals - free movement check.
2. Brakes - check function.
3. Control stick - check full and free movement.
4. Trim - check lever movement for smooth operation.
5. Flaps - check function.
6. Engine controls - throttle check friction set (check throttle closed)
7. Fuel cock - check turned on*

It is recommended that the fuel cock be left on at all times.

8. Circuit breakers - press on master and charge
9. Master switch - turn on
10. Comms switch - turn on
11. Nesis glass display - wait for system to start acknowledge warning
12. Analogue - proceed as below
13. Fuel gauge - fuel quantity check against dipped check
14. Ignition - key inserted but in off position
15. Instruments, radios - must be turned off
16. Safety harness - secure
17. Cockpit hatch - condition and canopy closed lamp off

4.4.3 Engine starting

1. Fuel cock - check open.
2. Throttle - set as required cold or warm start
3. Check start up area - free of obstructions and people.
4. Electric fuel pump - switch on (if fitted) check fuel pressure, switch off
5. Start (COLD) - push pre-start button for 5 secs with ignition off check oil presser positive movement. This is not necessary if engine has already been run.
6. Choke - pull and hold on if engine is cold. Set throttle fully closed.
7. Starter - turn ignition key to start engine.
8. After starting - slowly release choke and set throttle to idle.
9. Oil pressure - within 10 sec. min. pressure.
10. Radios - turn on and set frequency, transponder set to standby
11. Altimeter/s - set as required QFE/QNH
12. Engine warm-up - according to 4.4.4.

CAUTION!

The starter should be activated for a maximum of 10 sec., followed by a 2 min. pause for starter motor cooling.

After starting the engine, adjust the throttle for smooth running between 2000-2500 rpm. Check the oil pressure, which should increase within 10 sec. Increase the engine speed after the oil pressure has reached 2 bars (*29 psi*) and is steady.

4.4.4 Engine Check ground run only

Chock the main wheels before engine check. Initially warm up the engine at 2000 rpm for two minutes then continue to 2500- 2750 rpm until the oil temperature reaches 50°C (*122 °F*). The warm up period depends on ambient air temperature.

Check both ignition circuits at 3500 - 4000 rpm. The engine speed drop with either magneto switched off should not exceed 300 rpm. The maximum engine speed drop difference between circuits A and B should be 120 rpm.

Idle speed should be no less than 1400rpm and max static power 4600rpm. The throttle should be operated smoothly, check steady rpm change and smooth running throughout this operation. Rough running should be avoided as this can lead to damage, if rough running is detected the carburettors may need synchronising.

CAUTION
The engine check should be performed with the aircraft heading into wind and not on loose terrain (the propeller may draw in debris which can damage the leading edges of the blades).

4.4.5 Taxiing

The recommended taxiing speed is 8 knots or a steady walking pace. The aeroplane can be steered by the steerable nose wheel. Hydraulic disc brakes are controlled by toe levers on the top of the rudder pedals. Differential braking can also be used to aid steering. During taxi to the hold the rudder pedal movement can be checked plus the slip ball and DI/Compass

4.4.6 Before take-off checks

1. Brakes - fully applied.
2. Controls - full and free correct direction
3. Harness & hatches - Secure and hatches closed warning lamp off
4. Instruments - all functioning and correctly set
5. Fuel - tap open, pressure normal, quantity for flight, pump on.
6. Flaps - take-off position – (one notch = 15º)
7. Trim - set to take of position 9in line with flap lever at one notch
8. All clear - area clear for a run up
9. Power - Power checks run to full power if possible 4600rpm min then to 3500 -4000 for a mag check, turn the key back two clicks note mag drop, key back to both, after recovered rpm turn the key back one click again note mag drop. Check all Ts&Ps are normal. Set throttle to minimum note idle speed around 1400rpm. Increase power to smooth running setting.
10. Wind check - ATC or wind sock
11. All clear - check approach or as ATC
12. Eventualities - plan any actions in event of a problem

4.4.7 Take-off

By gradually increasing power, set the aircraft in motion.

The aeroplane can be steered by the nose wheel and/or by its hydraulic brakes. Slightly pull the stick back to take the load off the nose wheel. The aircraft takes -off at a speed above 40 knots. Slightly push the stick until the safety climb speed of 54 knots has been reached. The Maximum Flap Extended speed is 70 knots. Refer to para. 5.2.5 for optimum climbing speed.

WARNING

Take-off must be aborted if:
The engine is running rough.
Engine performance reduced.
The engine instruments' values are beyond operational limits.
The engine choke is open
The crosswind velocity exceeds permitted limits.
Or if for any reason it is considered dangerous to proceed

4.4.8 Climb

1.	Throttle	- max. take-off power (max. 5 min.) 5800 rpm. - max. continuous power (4800 rpm).
2.	Climb Speed	- Vy best climb speed 65 Knots
3.	Flaps	- Retract slowly above 300' if positive rate of climb
4.	Trim	- adjust as required
5.	Instruments	- CHT, oil temp. and pressure within limits.
6.	Electric fuel pump	- switch off and check fuel pressure remains in limits.
7.	Power	- reduce slightly if safe to do so maintain a safe clime speed

CAUTION!
If the cylinder head temperature or oil temperature exceeds its limit, reduce the climb angle to increase airspeed.

4.4.9 Cruise

The EV-97 EuroStar SL Microlight flight characteristics are very forgiving within permitted limits of airspeeds, configurations and CG range. The aircraft is very easy to both control and manoeuvre. For more details about horizontal flight regimes, refer to the Section 5.

4.4.10 Descent to land from base leg

1. Throttle - idle or as required for a decent
2. Speed - reduce to flap speed Vf
3. Flaps - set one stage 15deg
4. Trim - as necessary.
5. Final - approach at 55kts min with two or three stage flaps, increase speed if gusty conditions. The aircraft can be side slipped in either direction with caution.
6. Instruments - check regularly within limits.

CAUTION!
When descending from high altitude, it is not advisable to reduce the throttle control to minimum. Level off and run at normal power to warm the engine before descending further

4.4.11 Check before landing

1. Fuel - fuel quantity check
2. Safety harness - tightened
3. Brakes - check function
4. Landing area check - correct runway or into wind

4.4.14 Landing

Reduce airspeed during the float, so that the touch down speed is minimum.

Gradually pull back the stick after touch-down to hold the nose wheel just off as long as possible. Straighten the nose wheel with the rudder pedals before the nose touches to avoid loss of direction control.

4.4.15 Baulked landing

1.	Throttle	- full.
2.	Engine speed	- max.5800 rpm.
3.	Flaps	- once climbing set to the take-off position (first notch).
4.	Climb out	- at a minimum speed of 60 Knots.
5.	Trim	- as necessary.
6.	Flaps	- retract at a height of 300 ft.
7.	Trim	- adjust.
8.	Instruments	- within limits.
9.	Climb	- at 65 Knots

4.4.16 After landing

1.	Engine speed	- set as necessary for taxiing.
2.	Flaps	- retracted and locked.
3.	Trim	- neutral position.
4.	Electric fuel pump	- switch off.

4.4.17 Engine shutdown

1.	Engine speed	- idle.
2.	Instruments	- engine instruments within limits.
3.	Radio + intercom	- switch off.
4.	Ignition	- switch off.
5.	Master switch	- switch off.
7.	Fuel cock	- leave on.

CAUTION!

Rapid engine cooling should be avoided. such cooling is most likely to occur during aircraft descent, taxiing, low engine rpm or at engine shutdown immediately after landing. Under normal conditions the engine temperatures stabilise during descent and taxiing at values suitable for stopping the engine by switching the ignition off. If necessary, cool the engine at 2500 – 2750 rpm to stabilise the temperatures prior to engine shut down.

4.4.18 Flight in rain

When flying in the rain, no additional precautions are required. Aircraft handling and performance are not substantially changed.

SECTION 5 - PERFORMANCE

5.1 Introduction

Section 5 provides approved data for airspeed calibration, stall speeds, take-off performance and additional information useful for operation of the aeroplane.

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

If not stated otherwise, the performances given in this section are valid for the max. take-off weight and flight under ISA conditions.

5.2 Airspeed Indicator System Calibration.

	IAS (Knots)	CAS (Knots)
V_{SO}	29	34
V_{FE}	70	70
V_A	88	86
V_{NE}	126	121

IAS (knots)	CAS (knots)
31	35
35	38
39	43
43	46
48	50
52	54
56	58
61	62
65	66
67	67
70	70
74	74
78	77
83	82
87	85
91	90
96	93
100	97
103	99
104	101
109	105
113	109
117	113
122	116
126	121
127	122
130	124
135	129
139	132
142	136

1.3 Stall Speeds

Stall type	Flap Setting	Power Setting (rpm)	Stall Speed	
			IAS (Knots)	CAS (Knots)
Wings level stall	Retracted	Idle	31	35
		4500	31	35
	Take-off 15deg	Idle	30	35
		4500	30	35
	Landing, 1st notch 15deg	Idle	29	34
		4500	29	34
	Landing, 2nd notch 30deg	Idle	29	34
		4500	29	34
Turning flight	Retracted	Idle	32	36
		4800	30	35
	Take-off	Idle	32	36
		4800	27	32
	Landing, 1st notch 15deg	Idle	32	36
		4800	27	32
	Landing, 2nd notch 30deg	Idle	32	36
		4800	27	32

There may be a height loss of 20 to 50 ft when stalled from level flight if normal recovery procedure is initiated promptly.
There may be a height loss of approximately 30 ft when stalled from a co-ordinated turn at 30 degrees AOB, if normal recovery procedure is initiated promptly.

WARNING
A wing drop may be experienced if out of balance

5.4 Take-off performance

Take-off distances stated in the following table are valid at sea level and an ambient temperature of 15 °C (*59 °F*).

Runway Surface	Take-off run distance		Take-off distance over 50 ft (15 m) obstacle	
	[ft]	[m]	[ft]	[m]
CONCRETE	700	214	1350	411

CAUTION
The above distances assume a dry flat firm runway of concrete or tarmac. Greater take-off distances must be assumed for conditions which differ from these in any way

5.5 *Landing distances*

Landing distances stated in the following table are valid at sea level and ambient temperature of 15 °C (*59 °F*).

Runway surface	Landing distance over *50 ft* (15 m) obstacle		Landing run distance (braked)	
	[ft]	[m]	[ft]	[m]
CONCRETE	2373	723	958	292

CAUTION!
The above distances assume a dry flat firm runway of concrete or tarmac. Greater take-off distances must be assumed for conditions which differ from these in any way

5.9 *Endurance*

The following give fuel consumptions, endurances and ranges for specific engine speeds.

Fuel tank capacity 65 litres 2.9 unusable

5.10 *Environmental Effects on Flight Performance and Characteristics*

Flight performance and handling are not substantially affected by rain or the accumulation of insects or moderate dirt on the aeroplane's surface.

Flight in heavy rain should be avoided as this can cause propeller damage from rain erosion. If such flight is unavoidable, reduce the engine speed to the minimum to sustain safe flight.

5.11 *Demonstrated crosswind performance*

Max demonstrated cross wind velocity for take-off and landing 10 knots

Note: if exceeded it is possible to run out of aileron and/or rudder authority.

Max recommended head wind velocity for take-off and landing 23 knots

5.12 *Ceiling*

Service ceiling 16500 ft.

5.13 *Best Rate of Climb Speed*

65 knots Vy

5.14 *Best Glide Ratio*

14:1 in still air with engine off

SECTION 6 – WEIGHT AND BALANCE

6.1 Introduction

This section details the payload range within which the aircraft G-____ may be safely operated.

6.2 Permitted Cockpit Loads

Whenever the empty weight changes following periodic weight checks, modification or repair, revised values for the Empty Weight must be entered in the table below. This table is specific to the aeroplane to which this POH applies.

Procedure for weighing the aircraft are contained in the Maintenance Manual for the EV-97 EuroStar SL Microlight.

The Basic Empty Weight (BEW) or Zero Fuel Weight (ZFW) is weight is the empty weight of the aircraft with:

- Required equipment fitted;
- Unusable fuel only;
- Full engine oil, engine coolant, and hydraulic fluid;
- Fixed ballast.

The weight of non-required, or optional, equipment may be excluded from the Basic empty weight of an aircraft. The distinction between Required and Optional equipment is clarified below.
Optional equipment is equipment- that can be physically removed and whose removal does not make the aircraft un airworthy. To be airworthy the aircraft must be in an approved design configuration and able to be safely flown with the equipment removed. Equipment that can be removed but must be replaced with something else for the aircraft to remain airworthy is not normally considered optional equipment.

BASIC EMPTY WEIGHT = Kg
ACTUAL EMPTY WEIGHT = Kg

Maximum Permitted Crew Weight for given Baggage and Fuel Loads, kg. (AEW)										
Date	Actual Empty weight (AEW) kg	Empty CG posn. mm AOD	FUEL LOAD					Approved	
			Fuel gauge		1	3/4	1/2	1/4	Date	Signature
			Fuel volume		62 litres	47litres	31 litres	15 litres		
			Fuel weight		45 kg	33kg	22 kg	11 kg		
			BAGGAGE	max. 15kg						
				½ = 8 kg						
				None						
				max. 15kg						
				½ = 8 kg						
				None						
				max. 15kg						
				½ = 8 kg						
				None						
				max. 15kg						
				½ = 8 kg						
				None						

SECTION 7 - AEROPLANE AND SYSTEMS DESCRIPTION

7.1 Introduction

This section describes the aircraft, its systems and their operation.

7.2 Airframe

The EV-97 EuroStar SL Microlight airframe is a semi-monocoque construction, formed with metal reinforcements, bulkheads and Duralumin skins.

7.2.1 Fuselage

The fuselage cross-section is rectangular in the lower section and semi-elliptical in the upper section. The tail fin is an integral part of the fuselage. In the mid section of the fuselage there is a two-man cockpit which is accessible by raising the one-part Perspex overlap canopy. The engine section in the nose is separated from the crew by a firewall to which the engine mount is attached.

7.2.2 Wing

The rectangular wing is a mono- spar construction with an auxiliary (rear) spar for the aileron and flap attachments; all the elements are riveted together. Fibre glass wing tips are riveted to the ends of the wings.

7.2.3 Horizontal tail unit (HTU)

The rectangular HTU consists of a stabiliser and elevator with a trim tab. The semi-monocoque construction of the HTU consists of Duralumin ribs, spar and skins.

7.2.4 Vertical tail unit (VTU)

The trapezoidal fin section of the VTU is mounted to the rear section of the fuselage. The rudder is attached to the fin by two hinges. The frame of the VTU consists of a formed metal sheet spar and a Duralumin skin.

7.2.5 Stall Warner

The port wing is fitted with a stall warner on the leading edge and is set to sound at approximately 8 knots above the stall

7.2.6 Galaxy Ballistic Rescue System GRS 6 473 SD B2

The rocket engine and parachute is situated under the front scuttle and is designed to fire through a break away panel. The parachute is attached at 3 points on the fuselage, the first two being the port and starboard firewall cross-member, the third point can be found on the port side behind the pilot's seat. The red activation handle is easily visible on the lower edge of the instrument panel next to the throttle.

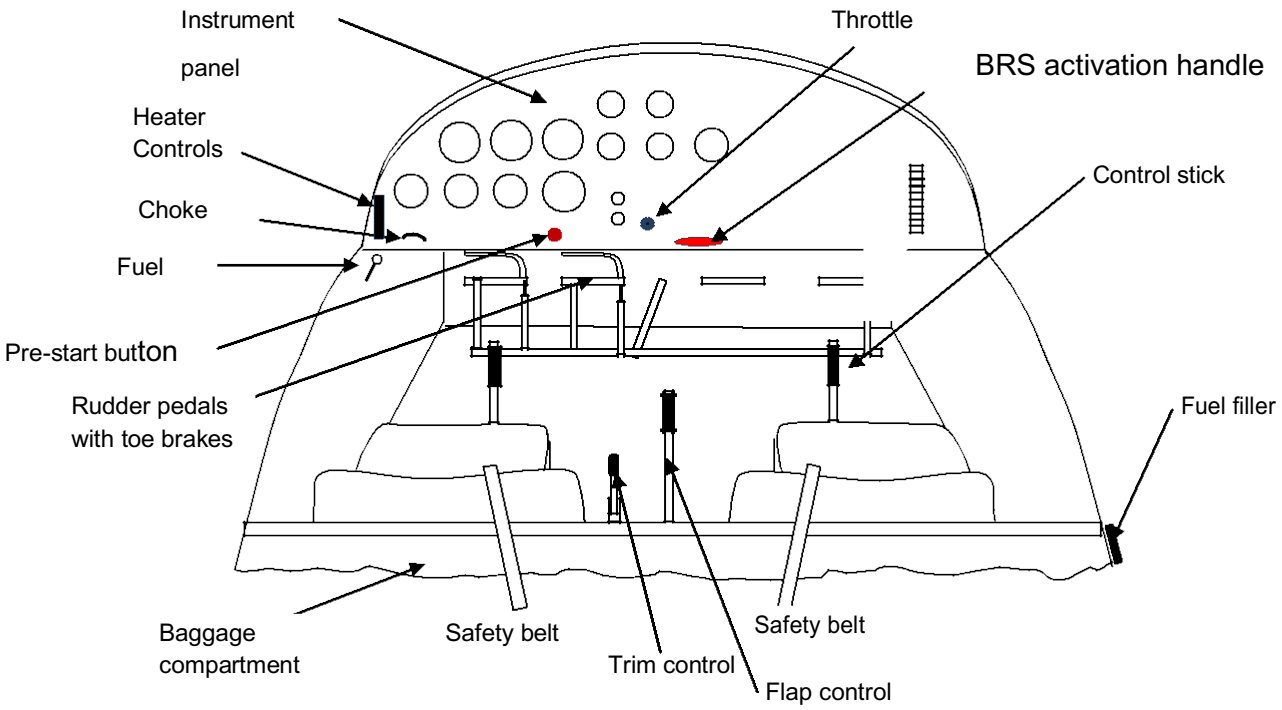
WARNING

Before working on the aircraft, ensure that the safety locking pin is inserted in the parachute deployment handle on the panel. If working on or near the parachute itself, ensure that the transit safety pin is inserted. See Manual for Galaxy GRS assembly and use.

The parachute recovery system installation has been approved by BMAA on the basis that, as far as is practicable to demonstrate, it will create no hazard to the aeroplane, its occupant(s) or ground personnel whilst the system is not deployed; and that when properly maintained, the risk of malfunction, deterioration or inadvertent deployment is minimised. The BMAA has not approved the system itself or considered the circumstances, if any, in which it might be deployed. The effectiveness of the system for the safe recovery of the aeroplane has not been demonstrated.

7.3 *Cockpit Controls*

Standard instruments and controls are shown below: This applies to both analogue and digital panels, the picture shows analogue instruments where a digital panel is used a backup ASI and Alt plus slip ball is fitted.



WARNING

Ensure no foreign objects can obstruct the operation of the flap lever, hand control sticks, aileron linkages, aileron push rods and rudder controls.

7.4 *Landing gear*

The aeroplane has a fixed landing gear with a steerable nose wheel. The main landing gear legs are compliant glass fibre providing good shock absorption. The wheels are fitted with 400-6 (14 x 4) tyres and hydraulic disc brakes controlled by toe brake levers on the pilot's rudder pedals. The nose landing gear leg is a welded steel tube construction and its suspension is rubber rope.

The nose wheel steering system is connected directly to the rudder control.

7.5 *Seats and safety belts*

The aeroplane has two side-by-side seats which are fixed, (non-adjustable) . Each seat is equipped with a four point safety belt attached to the fuselage at the side of each seat and the side of the bulkhead behind the baggage compartment.

7.6 *Baggage compartment*

The baggage compartment is located behind the seats. Maximum baggage weight is stated on the placard located near the baggage compartment.

7.7 Canopy

The semi drop-shaped canopy consists of a composite frame on which is bonded the organic glass canopy. The canopy is attached to the nose section of the fuselage by two pins which make it possible for the canopy to be tilted forward. For easier manipulation, the weight of the canopy is counter balanced by two gas struts which allow it to open effortlessly. On the lower frame there are handles outside the canopy. The canopy is equipped with a lock in the rear upper section of the frame.

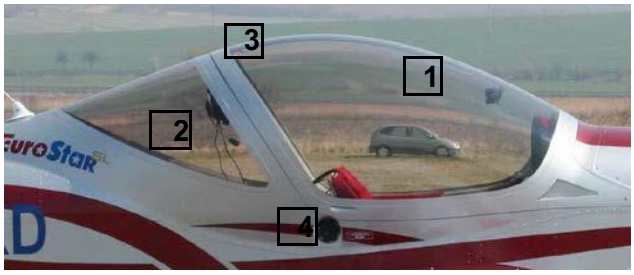


Fig. Two-parts cockpit canopy
1- front tilted canopy,
2- rear fixed canopy,
3- canopy lock,
4- fuel tank filler cap

Lock

The canopy is equipped with an automotive lock in the rear upper section of the frame. Maintenance: Spray the lock with ACF 50 spray from time to time

Check: Check the lock visually for deformations
Adjustment: Release the socket wrench screws, adjust lock position and tight the socket wrench screws

The canopy lock has a micro switch which is connected to a red light on the instrument panel to warn when the canopy is not securely closed.

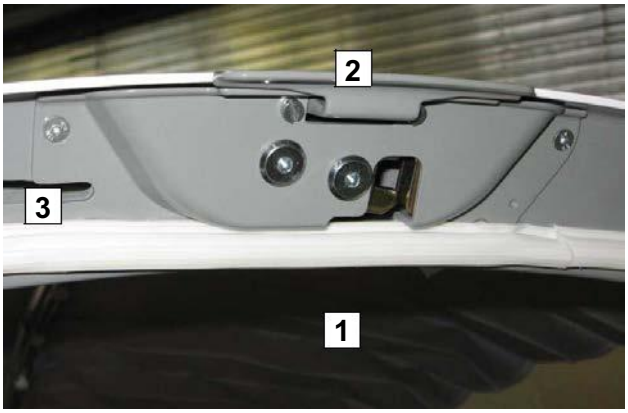


Fig. Cockpit canopy lock
1 - inside lever
2 - outside lever (with a lock)
3 – Lock

8.8 Power plant

The standard power plant of the EV-97 EuroStar SL Microlight is the ROTAX 912 UL (80 hp) engine. The Rotax 912 is 4-stroke, 4 cylinder horizontally opposed, spark ignition engine with one central camshaft-push-rod-OHV and the following features:

- Liquid cooled cylinder heads, ram-air cooled cylinders.
- Dry sump forced lubrication.
- Dual breakerless capacitor discharge ignition.

The engine is fitted with an electric starter, alternator and mechanical fuel pump. The propeller is driven via a reduction gear with integrated shock absorber.

A number of different propellers have been shown to be suitable for the EuroStar SL, these are:

- Kiev 273/1700 3 blade composite ground adjustable
- Woodcomp Klassic 170-3-R 3 blade composite ground adjustable

7.9 *Fuel system*

The fuel system consists of a 65 litre (*14.3 Imp. gals*) tank, fuel cock, filter and mechanical fuel pump on the engine. The tank is positioned in a separate space behind the seats and has a drain sump and drain valve. The outlet is situated below on the starboard side of the fuselage.

Fuel quantity is measured by a resistive float sensor located in the top of the tank. The sensor indicates the relative quantity of fuel in the tank (the corresponding quantity in litres is shown in table 6.2). and is displayed either on a separate fuel gauge on the analogue panel or on the digital display as a guide only. It is recommended that you always dip the tank and work on fuel burn of 15ltr per hour for a safe operation.

WARNING
Verify fuel quantity before flight by using a dip stick or other means

7.10 *Electrical system*

The aeroplane is equipped with a 12v DC electrical system; most services use aircraft frame return (-ve).

The engine does not require the aeroplane's DC system to function, except for starting. Its ignition system derives its power from an independent generator built into the engine. Full details of the engine's electrical system can be found in the Rotax Operator's Manual.

DC Supply

A 7.5 amp hour Aliant X3 lithium iron phosphate battery is installed on the firewall and receives charge from the engine's alternator via an electronic rectifier/regulator unit and a 30 amp fuse. The regulator is a switched mode unit and a large (22,000 µF) electrolytic capacitor is connected across its output to provide smoothing for avionics and other services sensitive to electrical noise. It also protects services from over-voltage in the event of battery disconnection.

WARNING
The battery will be damaged if allowed to completely discharge or if it is jump started. Only use recommended charger. See battery manufacturers' maintenance manual Pull the "Master" and "Charge" Circuit breakers if the engine is not run for more than 48 hours to prevent the battery from becoming discharged.

An analogue or electronic voltmeter mounted on the instrument panel monitors the battery voltage. Normal readings lie in the range 12 to 14.4 volts.

Distribution and Services

The battery is connected via a 30 amp circuit breaker to a +ve bus bar mounted behind the instrument panel, and switched by the Master Switch. The bus bar feeds all services via circuit breakers. The circuit breakers are designed to trip if there is an overload on the circuit. To reset, push the circuit breaker in. If it trips again do not reset

Electric Starter System

The high starter motor current is switched by a relay mounted on the firewall. The starter relay is energised when the Master switch is ON and the starter key switch, mounted on the instrument panel, is turned.

A warning lamp in the instrument panel, is connected to the starter relay secondary and warns if the starter relay remains closed after the starter is released.

Electric Pre-Start System

A pre-start button is provided on the panel to turn the engine over without starting it to enable the pilot to check for positive oil pressure before starting the engine.

WARNING
Ensure prop is clear before use.

7.11 Pitot and Static Pressure Systems

The pitot-static head, sensing dynamic and static air pressures, is located under the left half of the wing. Pressure is transmitted to individual instruments via flexible plastic hoses. The system must be kept clear to ensure that it functions properly.

The lowest parts of the pitot and static hoses lie on the left hand side of the cockpit, immediately in front of the seat. If water is visible in the hoses at these points, disconnect them and blow into the pitot static head to clear the water.

CAUTION
Avoid blowing into the pitot static system with the hoses connected to the instruments - this may cause instrument damage

7.12 Adjustable Rudder Pedals

At the base of each rudder pedal an adjustment mechanism permits the pedal to be moved backwards or forward to accommodate different leg lengths. Pull the top of the plunger's lever to the left on the pilot side, or to the right on the co-pilot side, to withdraw the plunger from one of the three holes in the plate. Move the rudder pedal to the desired position, then release the plunger lever. Gently move the rudder pedal so that it locates in the nearest hole. Check that the pedals are aligned when the rudder and nose wheel point straight ahead.

WARNING
If the plungers are not fully engaged in one of the three holes in the plate, the pedal may rotate backwards and prevent rudder movement.

7.13 Autopilot Operation

This section describes the basic operations with autopilot system in the NESIS instrument. If you have attached servo motors to the NESIS system you can use the NESIS as a main device for controlling the autopilot.

7.13.1 User Button

The middle button (man icon) is configured to provide quick access to the autopilot functions. A single Press will bring a popup menu as shown in Fig 1. When the autopilot is engaged, a double press will disable the autopilot.

7.13.2 Autopilot Menu

The autopilot can be used in five different modes:
• Level flight;
• Heading Hold;
• Altitude Hold;
• Vertical speed;
• Flight director mode.

Figure 1

Once you have achieved level flight at an altitude above 1000'AGL the autopilot can be engaged. First ensure the aircraft is stable and trimmed for level flight. Switch the autopilot disconnect switch to on (up) . Press the man icon on the Nesis and use the control knob to select the required autopilot input.

• **Level** – A wing level mode. Engaging the Level option will not hold your heading or altitude, the autopilot will simply try to hold the aircraft in a wing level mode.

• **Heading** – This mode will hold the current heading or alternatively a new heading can be selected by turning the control knob to a new desired heading. The aircraft will bank to the new heading but will not hold altitude.

- **Altitude** - This mode will hold the current altitude of the aircraft or alternatively a new altitude can be selected by turning the control knob to a new desired altitude. The aircraft will pitch up in an attempt to climb, as there is no auto throttle additional power will be needed to achieve a steady climb speed, once at the new altitude the aircraft will level off and a reduction in power back to cruise setting will be needed. In this mode the aircraft will not hold wings level or a heading.

Note: A combination of the above can be used, e.g. by selecting 'heading' and 'level' the aircraft will hold a heading and level flight.

- **Vertical speed** – Engage the pitch servo motor and set the desired vertical speed rate for descent or ascent. To be used with Altitude mode

- **Flight Director** – In this mode the aircraft will fly a pre-planned route. A route can be programmed into the Nesis unit by two methods.
  1. By selecting the route option and programming waypoints or
  2. By using SkyDemon, plan a route and save to a USB stick as .GPX file. Insert this in the USB slot on the Nesis, select 'route' and 'import'. Now you can select the route and activate it. This will now fly the selected route. In order to also hold a level you will need to select altitude. The route is displayed on the map page or by a bug on the DI. The display will show leg times and which leg is active.

- **Disable**- Disengage the autopilot.

7.13.3 Autopilot Status

On each flight page you can find the current autopilot status as shown in the figure below. The status box shows the state of each autopilot axes by changing colour. The state of the autopilot is active if the text is green and the autopilot is in standby mode if the text is gray. Also current parameters selected for autopilot are shown in status box. If both axis of autopilot are disabled/disengaged the status box is hidden.

Autopilot status box

7.13.4 Disabling the Autopilot

There are five different ways to disable the autopilot system:

- Select Disable option in autopilot menu,
- Double Press the man icon when the autopilot menu is active
- Make a long press on User button.
- Switch the autopilot switch to off
- Pull the autopilot circuit breaker

The servomotors of the autopilot are designed to be over-driven with external force from command stick with no damage.

7.13.5 Automatic (Safety) Disable

The Autopilot will also disengage automatically if any of the following parameters are out of range:

- Minimum IAS, 70kts
- Maximum IAS, 118kts
- Maximum vertical speed, 800f/min
- Maximum roll angle, 30deg AOB
- Maximum pitch angle. 16deg

SECTION 8 - AEROPLANE GROUND HANDLING AND MAINTENANCE.

8.1 Introduction

This section contains recommended procedures for proper ground handling and servicing of the aeroplane. It also identifies certain inspection and maintenance requirements which must be followed if the aeroplane is to retain new-plane performance and dependability. It is wise to follow a planned schedule of lubrication and preventive maintenance based on climatic and flying conditions; this should be done according to the Maintenance Manual for the EV-97 EuroStar SL Microlight.

8.2 Aircraft inspection periods

The frequency of checks and associated maintenance depends on operating conditions and the overall condition of the aeroplane. The manufacturer recommends that the minimum maintenance checks and periodic inspections be carried out as follows:

a) After the first 25 ± 2 flight hours.
b) After every 50 ± 3 flight hours thereafter.
c) After every 100 ± 5 flight hours or annually, whichever occurs sooner.

Refer to the Rotax 912 Operator´s Manual for engine maintenance.

Maintain the prop according to its manual.

Refer to the Maintenance Manual for the EV-97 EuroStar SL Microlight for more details about maintenance.

8.3 Aircraft alterations or repairs

It is essential that the relevant organisations BMAA or LAA and Airmasters are contacted prior to any modifications to the aircraft to ensure that the airworthiness of the aircraft is not invalidated.

If the aircraft weight could be affected by a modification, the aeroplane must be re-weighed to record the new empty weight and cg. The Weight and Balance record / Permitted Payload range table given in Section 6.2 and the Load Limits placard must also be amended to reflect the change.

Refer to the Maintenance Manual for EV-97 EuroStar SL (Microlight) for aeroplane repairs.

8.4 Ground handling / Road transport

8.4.1 Towing

It is easy to tow the aircraft a short distance by holding the prop blade at the root since the aeroplane's empty weight is low. The rear part of the fuselage in front of the fin, and the wing roots are suitable surfaces to hold the airframe .

CAUTION!
Avoid excessive pressure at the aeroplane airframe - especially at the wing tips, elevator, rudder, trim etc.
Handle the propeller by holding the blade root - never blade tip!

8.4.2 Parking and Tie-Down

It is advisable to keep the aeroplane inside a hangar, or other safe area, having a stable temperature, good ventilation, low humidity and a dust-free environment.

If the aeroplane is kept outside, it must be tethered to strong tie-down points, particularly if it is to be left for some time. The aeroplane is equipped with mooring eyes located on the lower surfaces of the wings.

Tie-Down Procedure:

1. Check: master & battery circuit breakers are tripped, and ignition switch is off.
2. Secure the control stick. It is not recommended to tie the sticks backwards, as

with the elevator up, water can enter the trim cable exit point and eventually corrode the trim cable. Use of a bungie rope tied between the two control sticks and wrapped around the throttle stem is satifatory.

3. Shut all the ventilation windows.
4. Close and lock the cockpit.
5. Tie down the aircraft to the ground by a rope passed through the tie-down eyes located on the lower surfaces of the wing. It is also necessary to tie down the nose wheel landing gear to a ground stake. Do not overtighten the ropes.

When parking for a long time, it is recommended that the cockpit canopy, and possibly the whole aeroplane, be covered by a suitable cover. Take great care to ensure that:

- the internal surface of such covers are clean and cannot abrade the aeroplane's surface.
- the covers are pulled down taught to prevent wind induced flutter from damaging the surface; use additional straps where necessary.
- the aeroplane is parked into the prevailing wind, or in the most sheltered area available.

8.4.3 Jacking

Because the empty weight of this aircraft is relatively low, two people can lift the aircraft easily. First prepare two suitable supports for the fuselage. It is possible to lift the aircraft as follows:

- Push down on the rear part of the fuselage, just before the fin, to lift the front of the aircraft. Then support the weight under the firewall.
- To jack the rear part of the aircraft, handle the fuselage near the auxiliary tail skid, lift it upward and support it.
- To lift the wings, push from underneath the wings only at the main spar. Avoid lifting the wings by means of handling the wing tips.

8.4.4 Levelling

Refer to the Maintenance Manual for the EV-97 EuroStar SL Microlight for more details about levelling.

8.4.5 Road transport

The aircraft may be transported by loading on to a suitable car trailer, or a purpose built aircraft trailer.

It is necessary to dismantle the wings before road transport. The aircraft and dismantled wings should be fastened down 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 petrol.

Clean the canopy only by washing it with lukewarm water and detergent. Use either a soft clean cloth, sponge or chamois leather.

CAUTION

Never clean the canopy dry and never use petrol or chemical solvents!

Upholstery and covers can be removed from the cockpit, brushed, and if necessary, washed in lukewarm water with detergent. Dry the upholstery thoroughly before reinstalling into the cockpit.

NOTE

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