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EV-97 EUROSTAR SL (MTOW 480kg Kit)

EV-97 EUROSTAR SL MICROLIGHT (MTOW 472.5kg RTF)

G-

MAINTENANCE MANUAL

GEN/EUR/04

Amendment Record

Issue	Details of Change	Date	Authorized
1	First Issue	12/05/14	
2	Changes to electrical circuit diagrams (Appendix 5) Change to trim tab deflection (pages 29 and 42)	15/07/14	
3	Change to cockpit instruments (page 9 sect 2.12)	01/09/14	
4	Change to weight and balance record (appendix 3 page 44)	18/12/15	
5	Inclusion of Autopilot option (page 26 sect 4.3.3) Inclusion of Autopilot wiring diagram (page 48)	23/05/16	
6	Inclusion of 2000 hour inspection schedule and 3000 hour wing replacement / wing lower spar cap replacement	09/02/17	
7	Inclusion of engine frame checks and wheel axle checks Pages 50 and 53.	15/02/18	

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The following maintenance actions, applicable to the standard EV-97 are also to be carried out on the Eurostar SL:

Compliance with SB/EUR/021.
Compliance with SB/EUR/022.
Compliance with SB/EUR/023, including repeat checks at 100hr intervals.

1. Introduction

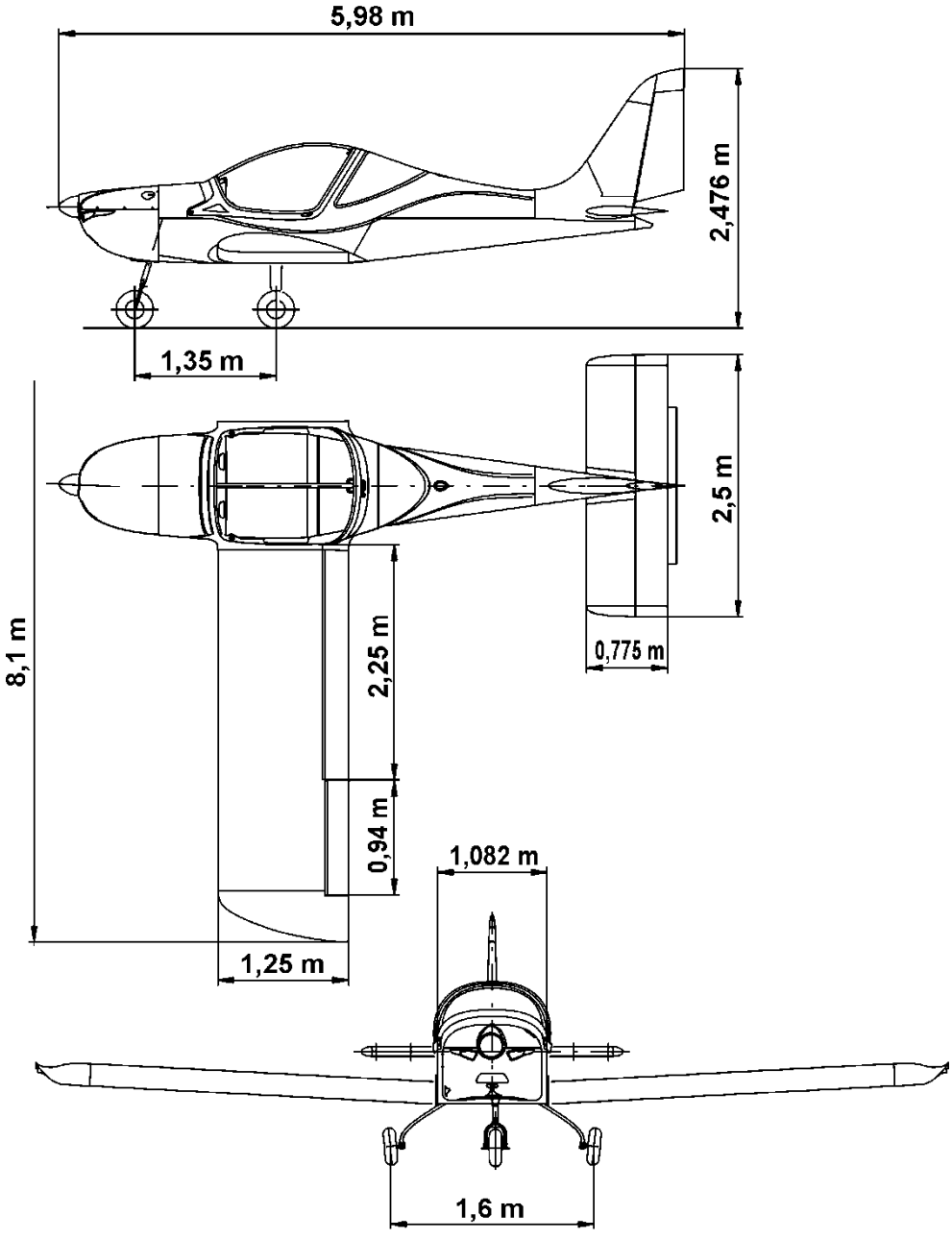
This Maintenance Manual gives recommended procedures for ensuring the continued airworthiness of the aircraft. However, the 2000 hour inspection and 3000 hour maintenance are MANDATORY. See maintenance check list and appendix 1. Maintenance requirements will depend on aircraft usage and may need amending accordingly. The operator should always be alert for developing problems and attentive to ensuring their timely rectification.

2. Aircraft Technical Description

2.1 General

The Eurostar SL airframe is a metal/composite, semi-monocoque construction formed with metal reinforcements, bulkheads and Duralumin skins. Both pop (blind) rivets and solid rivets are used for joints. All Metal parts are primary structures. All composite parts, with the exception of the undercarriage legs, are non-structural (secondary structures).

2.2 Dimensions – Drawings



2.3 Basic dimensions

Wing span	26.57	ft.	8.1m
Wing area	105.92	sq. ft.	9.84m^2
MAC	4.10	ft.	1.25m
Wing loading (MTOW, 1030 lb, 472.5 kg)	9.72	lb./sq. ft.	48 kg/m^2
Aileron area	2.26	sq. ft.	0.21m^2
Flap area	5.60	sq. ft.	0.52m^2
Fuselage length	19.62	ft.	5.98m
Fuselage width	3.41	ft.	1.04m
Fuselage height	7.68	ft.	2.34m
Horizontal Tail Unit (HTU)			
Span	8.20	ft.	2.5m
HTU area	20.99	sq. ft.	1.95m^2
Elevator area	8.61	sq. ft.	0.8m^2
Vertical Tail Unit (VTU)			
Height	4.21	ft.	1.28m
VTU area	10.93	sq. ft.	1.02m^2
Rudder area	4.67	sq. ft.	0.43m^2
Landing gear			
Wheel track	5.25	ft.	1.6m
Wheel base	4.42	ft.	1.35m
Main wheel diameter	14	in	350mm
Nosewheel diameter	14	in	350mm

2.4 Weight

Empty weight will vary with selection of options and small manufacturing variations. However there is a maximum limit to the aircraft's dry empty weight, as shown below.

Empty weight max.(standard equipment)	290.5kg + 0, - 3%
Maximum Take-off weight	472.5kg
Maximum Landing weight	472.5kg
Max. fuel weight, (standard 65 l fuel tank)	47kg
Maximum weight in Baggage Compartment	15kg

NOTE

Actual empty weight is stated on the placard "LOAD LIMITS" located on the instrument panel. Empty weight includes 2.9 litres of unusable fuel.

2.5 Centre of Gravity

Empty weight CG (standard equipment)	18 ±2% Mean Aerodynamic Chord (MAC) 200 – 250mm AoD
Operating CG	20-34% MAC 250 – 410mm AoD

2.6 Wing

The rectangular wing has a single, aluminium main spar and rear spar to which are attached ailerons and flaps. All components are riveted. The composite wing tips are attached by rivets.

2.7 Horizontal Tail Unit

The rectangular HTU comprises a stabilizer and elevator with trim tab. It has a semi-monocoque construction (i.e. the skins bear part of the load), consisting of Duralumin pressed ribs, spar and skins. The HTU width of 2.5m permits transport by road without removal.

The stabilizer is attached to the fuselage by two pins at the leading edge and secured with two screws at the trailing edge.

2.8 Vertical Tail Unit

The trapezoidal VTU comprises fin and rudder. The rudder is attached to the fin by two hinges consisting of spherical joints bolted into the fin's trailing edge spar.

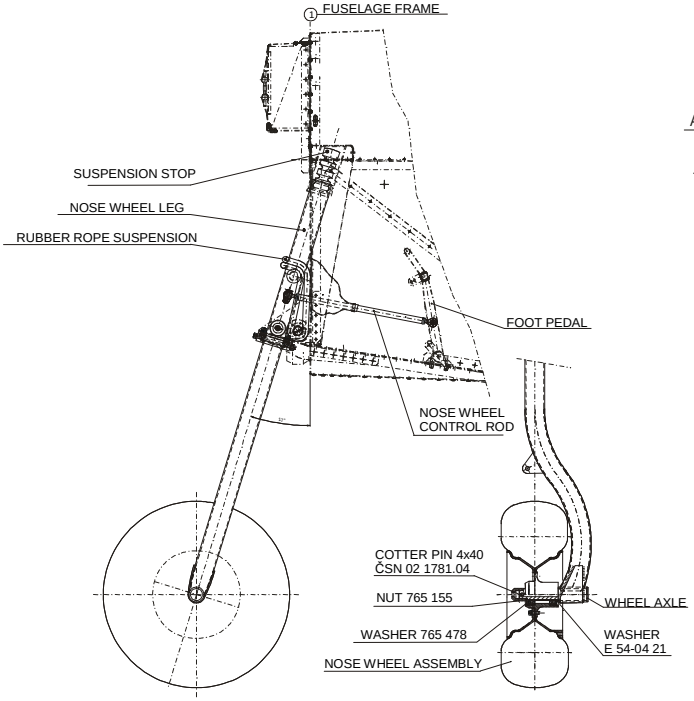
A composite fairing is fitted immediately forward of the fin, blending its surface with that of the fuselage top.

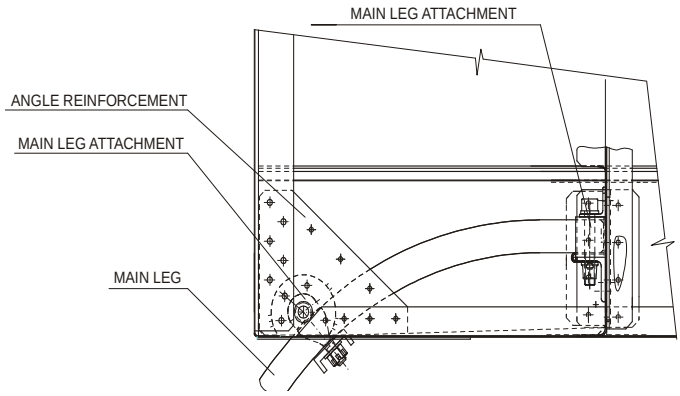
Neither composite tip, nor forward fairing takes significant structural loads.

2.9 Landing Gear

The fixed gear consists of:

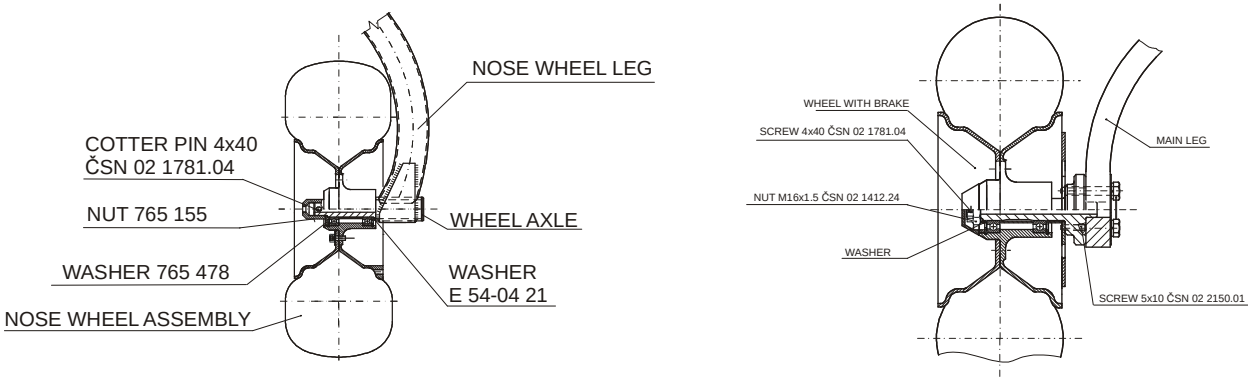
- a steerable nose wheel on a leg sprung on a rubber rope suspension. The nose leg is constructed from steel tube and mounted on the firewall on two bearings. The nose wheel is steered by two push rods connected to the rudder pedals.
- hydraulically braked main wheels and composite spring legs attached to the fuselage cross member under the seats. These legs are designed to deflect to reduce landing impact. The leg's attachment to the fuselage is shown below:





2.10 Wheels

Each wheel consists of a two-part cast alloy rim with tyre and inner tube. The main wheels are mounted on an axle secured to the composite leg by 4 bolts. Cross sections of the main and nose wheels and their axles are shown below:



2.10.1 Wheel Brakes

Both wheels on the main landing gear are equipped with hydraulic disc brakes. The brake system consists of the brake pedals (pilot standard, co-pilot as an option), hydraulic brake master cylinders, plastic hoses, brake caliper with the hydraulic brake cylinder, brake pads and the brake disc which is bolted onto the inner part of the rim.

The brakes on both wheels are controlled independently by toe brake pedals mounted on the pilot's and the co-pilot's rudder pedals.

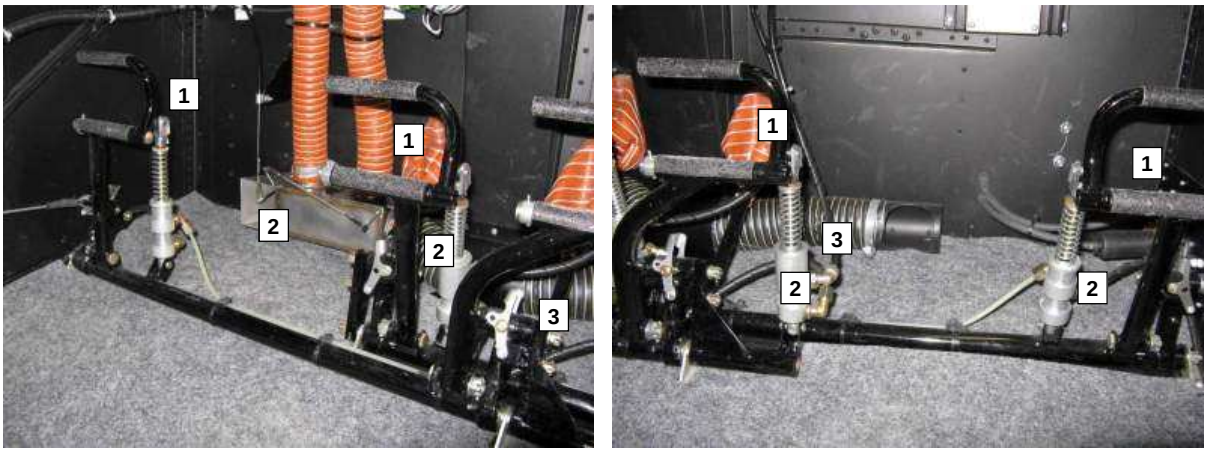


Fig. The brake control with toe brake pedals

1 – rudder pedals, 2 – brake cylinder, 3 – nose wheel steering rod

WARNING

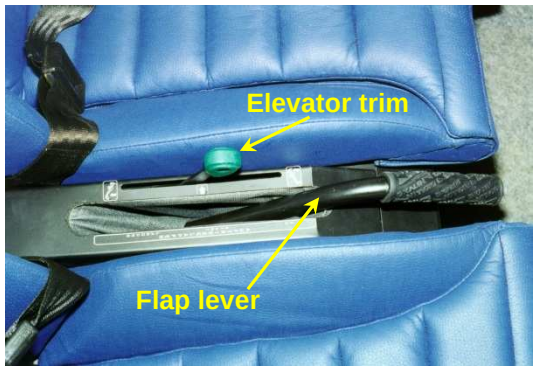
When adjusting the rudder pedals, if the plungers are not fully engaged in one of the three holes in the plate, the pedal may rotate backwards and prevent rudder movement. See Brake Pedal Adjustment section 9.2

2.11 Tyres

SAVA 14 x 4 (standard), all three wheels.

2.12 Cockpit

Two side by side seats have between them the levers for elevator trim and flaps. Floor covering is lightweight removable carpet and interior trim panels can be removed for cleaning or access.



The canopy has two parts: a fixed part to the rear and a forward-opening part at the front. Acrylic (Perspex) transparencies are used in both parts. Two gas struts aid opening and a lock is fitted to the top rear of the opening section. The lock mechanism carries a micro-switch operating a lamp on the panel showing the pilot when the canopy is properly locked.

The following electronic or analogue instruments are fitted to the panel:

1. Airspeed Indicator (ASI)
2. Altimeter
3. Compass
4. Vertical Speed Indicator(VSI)
5. Tachometer
6. Coolant Temperature (CT) gauge
7. Oil temperature gauge
8. Oil pressure gauge
9. Fuel pressure gauge
10. Fuel contents gauge
11. Engine hours indicator.

2.13 Additional Equipment List

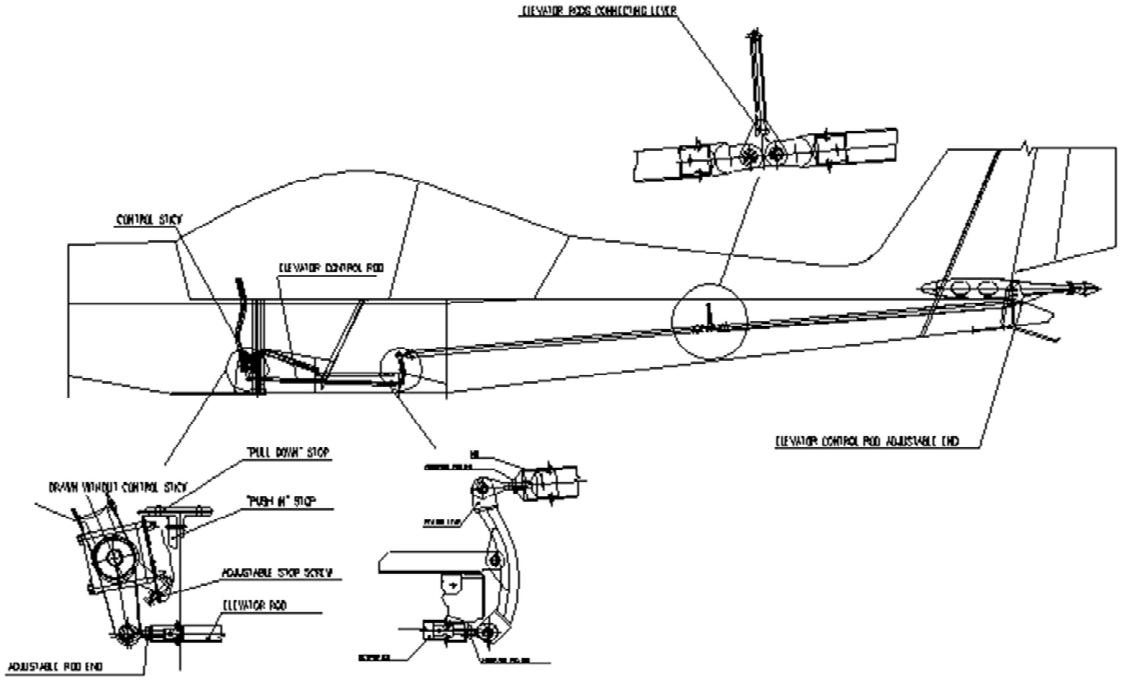
See additional equipment list Appendix 6 if applicable

2.14 Control Systems

Longitudinal Control (Pitch) – The elevator is controlled by a system of push rods. Movement of the control stick is passed into a torque tube running along the front of the seats. An arm is attached to this tube near its centre which connects a push rod to a relay arm mounted beneath the baggage bay. From here, a second push rod connects to an intermediate relay arm mount half way along the fuselage rear, and from this point a third push rod connects to the elevator horn; the system is shown below.

See additional equipment list Appendix 5 if applicable

NOTE
Optional control system covers may not be fitted on the aircraft. These can be fitted if required by the owner or operator.



Lateral Control (Roll) – ailerons are also controlled by push rods. Lateral movement of either control stick is transferred, via a short rod in the cockpit, to a long push rod in the wing, immediately in front of the main spar. A bell crank, connected to the end of the long push rod, converts span wise movement to a chord wise one, and a third pushrod terminates on the aileron horn to deflect it up or down. The short chord wise push rods can be adjusted to achieve the correct aileron deflections. The control stick base incorporates a stop.

Directional Control (Yaw) – cables, attached to arms at the end of the rudder pedals' torque tubes, are guided along the sides of the fuselage to the rudder horn. Stops, in the form of swages crimped on to the cable, are located at points where the cable passes through fuselage side stiffeners; adjusters are installed at these points.

Push rods attached to the inboard rudder pedals connect to either side of the steering yoke of the front wheel, permitting direct steering via the rudder pedals. Since this system and the rudder cables form a closed loop, rudder cable tension can be adjusted by changing the lengths of the steering push rods, using the rod ends screwed into their ends.

Toe Brakes - The brakes are controlled independently by hydraulic toe brake pedals mounted on the pilot's and the co-pilot's (optional) rudder pedals.

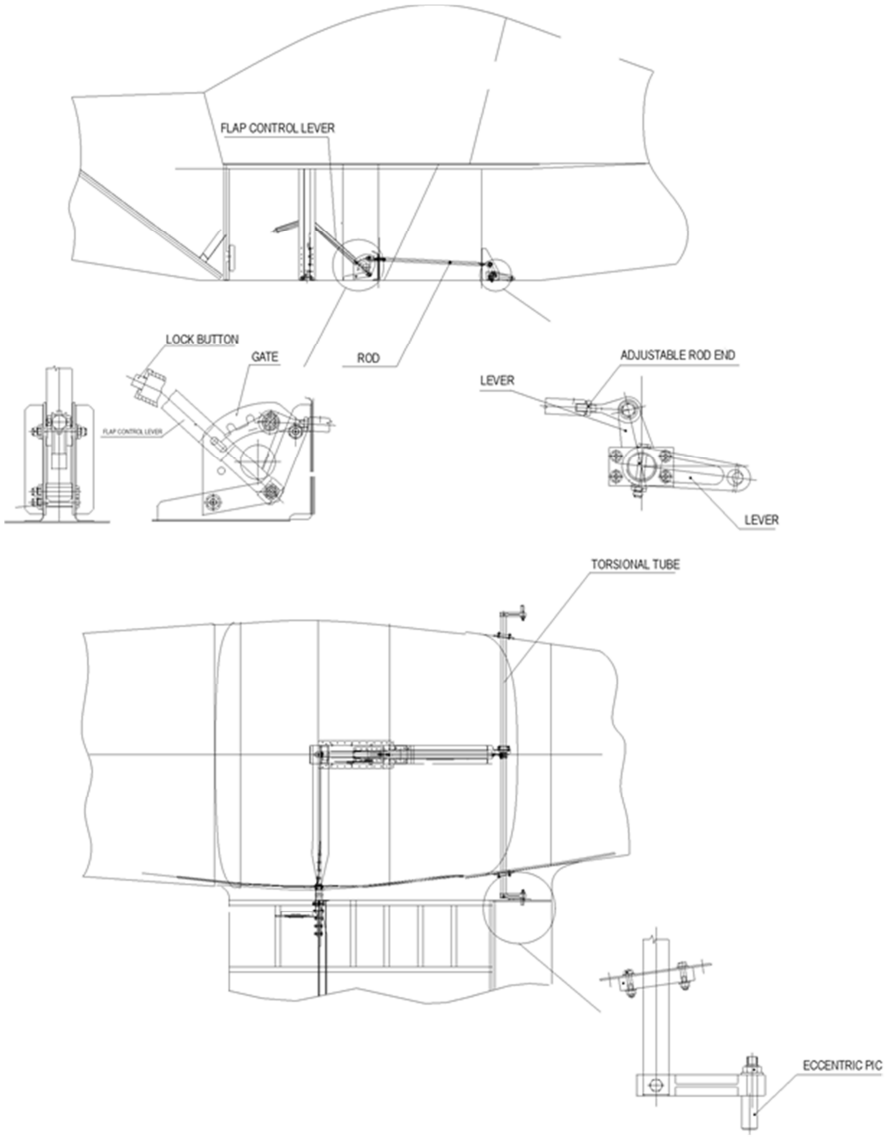
2.15 Flap Control

Wing flaps are controlled by a gated lever located between the seats; the lever is released by pressing the lock button on the lever's end.

Push – pull movement of the lever is translated into a longitudinal movement of a push rod by a quadrant mounted at its base. The other end of the push rod connects to the arm of a torque tube passing across the fuselage and exiting the wall at each side adjacent to the flap end. An arm on each end of the torque tube engages in slots in the flap end to deploy or retract the flaps. Where the arm engages in the flap end, an eccentric is provided to permit fine adjustment and balance of the flaps' deflections. The system is shown below:

2.16 Elevator Trim

The elevator's trim tab is moved by a control lever located between the seats. Movement of the lever is passed to a pair of Bowden cables which run along the fuselage floor to the elevator trim tab.



2.17 Power Plant

An 80hp Rotax 912 UL engine drives a 3 blade Woodcomp 170/3/R or a Kievprop 237/1700 propeller via a 2.27:1 reduction drive gearbox. The Rotax 912UL is a 4-stroke, 4 cylinder, horizontally opposed, spark ignition engine and has one central camshaft operating push-rods for the overhead valves. Cylinders are cooled by a combination of oil and ram air; cylinder heads are liquid cooled.

The engine has a dry sump with pumped lubrication and a dual breaker less capacitor discharge ignition system which does not require battery power for its operation. The engine is fitted with an electric starter, alternator and mechanical fuel pump.

Full technical details of the engine can be found in the Rotax Operator's Manual. Engine performance and limitations are summarized below. It should be noted that the aircraft manufacturer places certain limits on engine operation, lower than those given by the engine manufacturer:

Full details of the propeller can be found in the propeller manufacturer's Operator's Manual.

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 ℃	140 ℉
	Maximum	120 ℃ (1)	248 ℉
Coolant temp.	Maximum	115 ºC (1) & (2)	239 ℉
Oil temp.	Minimum	50 ℃	122 ℉
	Maximum	140 ℃	284 ℉
	Optimum	90 – 110 ℃	194 - 230℉
Oil pressure	Maximum	7,0 bar	
	Minimum	1,5 bar	
	Optimum	1,5-4,0 bar	
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 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)	
Propeller		Woodcomp 170/3/R or Kievprop 273/1700	
Type		3 Blade ground adjustable pitch, composite	
Propeller Pitch		28º at 350 mm radius, however see note 1.	

(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.

Note 1: propeller pitch to be set to achieve 4600rpm static at full throttle.

2.18 Engine Operational Limits

Parameter		Minimum Limit (red line)	Normal Operating (green arc)	Caution Range (yellow arc)	Maximum Range (red line)
Engine speed [RPM]		1400	1400-4800	4800-5800	5800
Coolant Temperature (CT)	**R 912 UL (80 hp)**	-	-	- -	150 ℃ (Evans coolant) 120 ℃ (glycol coolant)
Exhaust Gas Temp. (EGT)		-	-	-	880 ℃ *1616 °F*
Oil Temp.	R 912 UL (80 hp)	50 ℃ *122 ℉*	90-110 ℃ *194-230 ℉*	50-90 ℃ *122-194 ℉* 110-140 ℃ *230-284 ℉*	140 ℃ *284 ℉*
Oil Pressure		0.8 bar *12 psi*	2 - 5 bar *29 – 73 psi*	0.8 - 2 bar *12 - 29 psi* 5 – 7 bar *73 – 102 psi*	7.0 bar *102 psi* cold engine starting

2.19 Engine Mount

The engine mount is welded from chrome-molybdenum tube and is attached to the firewall by 4 bolts. The assembly incorporates 4 anti-vibration mounts (Silent blocs).

2.20 Engine Cowlings

Two composite cowlings, upper and lower, cover the power plant. Both cowlings are coated internally with fireproof paint. The upper cowling is connected to the lower cowling by quarter turn fasteners and is easily removed for pre-flight inspections. Removal of the lower cowling requires removal of the screws supporting the radiator to the front of the cowling, then removal of the screws supporting the lower cowling's rear edge.

Engine cowlings disassembly and assembly

- The upper cowling: The disassembly and assembly are both easy by releasing the quick-closing locks (or screws). The upper cowling is usually removed during engine pre-flight inspection to check the engine compartment, operating fluids quantity (oil, coolant) and to check the engine installation.
- The lower cowling: To remove it, un-screw the attachment screws connecting the cooler to the cowling face side, then remove two air hoses (unscrew sleeves) and then un-screw the attachment screws connecting the cowling to the firewall outside edge.

It is highly recommended to protect the removed cowlings so as to prevent them from inadvertent damage.
The cowling assembly is the reverse of disassembly.

2.21 Fuel System

A 65 litres fuel tank is installed behind the seat and feeds fuel to a tap located inside the cockpit on the port side, below the instrument panel. Fuel then passes through a filter to the engine fuel pump and the carburetors.

The fuel system incorporates a sump and drain valve to collect water and other contaminants in the fuel. The drain outlet is located under the fuselage, near the starboard flap root, and is accessible when the flaps are fully extended. (See photo on the right). The tank's vent also terminates adjacent to this drain outlet.

A filler cap is installed on the starboard side of the fuselage.

Fuel quantity is indicated on the panel by a gauge operating from a float sender inside the tank. The aircraft must be on level ground. It is highly recommended to have accurate knowledge of fuel load before each flight. Timing fuel burn is also recommended during each flight.

2.22 Cooling System

Two forms of cooling keep engine temperatures under control: cylinder heads are liquid cooled; cylinders are ram air cooled. A coolant radiator is mounted in the front of the lower engine cowling; coolant is forced through the radiator to the cylinder heads by a water pump driven from the crankshaft. Coolant then passes from the top of the cylinder heads to an expansion tank mounted on top of the engine. This tank allows the coolant to expand and is fitted with a pressure relief cap and return valve system. Excess coolant passes through the cap into a small plastic overflow bottle mounted on the firewall.

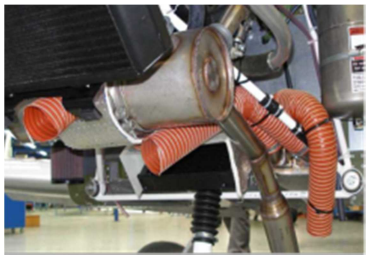
The coolant level in the expansion tank should be checked before the first flight of the day and should reach the bottom of the filler neck. Normal coolant level in the overflow bottle is level is ½ to 2/3 up the tank (0.2 litres); minimum level is 25mm from the bottom.

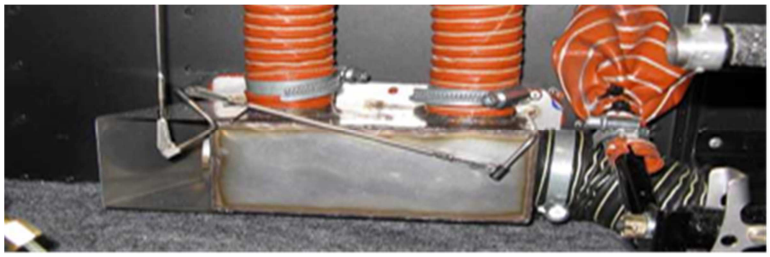
2.23 Cockpit Heating System

One intake air hose routes outside air to the heat exchanger (a jacket around the exhaust), where the air is heated. It is then led through a valve on the firewall to the mixing chamber on the cockpit floor. When the valve is closed, the air is exhausted via an outlet air hose exiting under the fuselage. A second hose feeds outside air directly through the valve on the firewall to the mixing chamber on the cockpit floor. It is recommended to fit a carbon monoxide detector

Hot air and cold air valves are operated by a Bowden cable running to small control knobs on the panel.

Demisting/defrosting of the windshield is performed by hot air being fed from the mixing chamber on the firewall to the internal space of the canopy frame molding and then through a row of holes along the bottom edge of the tinted plastic canopy.





2.24 Ventilation

2 eyeball vents mounted at either side of the canopy frame provide fresh outside air. The vents are connected to NACA scoops on the canopy. Turning the rim adjusts air volume.

2.25 Electrical System

The electrical system uses a single wire supply and chassis (negative) return for all equipment except avionics units which have their own negative wire returns.

Power for all services except engine ignition is provided by a LiFePO4 (Lithium ion Iron Phosphate) battery mounted on the firewall and charged via the engine's alternator and rectifier-regulator. The battery has its own integrated cell protection and balancing circuits.

WARNING
The battery will be damaged if allowed to completely discharge or if it is jump started. Only use the recommended charger. See battery manufacturer's maintenance manual.

All circuits except the starter motor are protected by individual circuit breakers mounted on the right hand side of the instrument panel. The main battery supply carries a 30A circuit breaker. Circuit diagrams for each of the systems are given in Appendix 5.

2.26 Pitot-Static System

The pitot static tube, located under the port wing near the aileron root, provides both dynamic and static pressures to the instruments via flexible plastic hoses.

Moisture and dirt collection reservoirs are installed inside the cockpit, on the left sidewall in front of the pilot's seat.

WARNING
Avoid blowing into the pitot-static system with the collection reservoir covers on - this may cause damage to the instruments.

2.27 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 breakaway 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.

IMPORTANT
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.

Refer to the parachute manufacturer's maintenance manual for details of maintenance required.

2.28 Stall Warning Device (SWD)

A stall warning device is fitted to the port wing which comprises a switch in the leading edge of the wing activated by a vane. The switch is connected to a piezo-electric buzzer mounted below the instrument panel. The buzzer gives a clear and distinct audible warning of an impending stall (10 knots above the stall).

IMPORTANT
Check the stall warning device for correct operation before each flight.

3. Aircraft Assembly and Disassembly of Major Parts

3.1 Wing

Ideally 3 people are needed for the removal and assembly of the wing to the aircraft; however with care it can be done by 2 people. The following tools are required:

- A rubber or nylon headed hammer to move the wing suspension pins;
- A Pozi-drive screwdriver for the wing root fairings' screws;
- Spanner to install the rear wing suspension bolts' nuts.
- For disassembly, a soft metal drift or punch to remove the pins from the wing root attachments.

CAUTION
Take care not to damage the Vortex Generators (VGs) when handling the wing.

Wing Removal:

For each wing half, proceed as follows:

1. Remove the wing root fairings.
2. Disconnect the navigation lights' wiring and pitot-static hoses.
3. Disconnect the aileron control rod.
4. Remove the safety pins from the wing pins.
5. Remove the bolt from its rear wing attachment point, tapping it out gently.
6. Take the load off the lower attachment point by gently lifting the wing tip, then remove the lower wing pin.
7. Take the load off the upper attachment point by lifting the root, then remove the upper wing pin, supporting the wing root at the same time.
8. Store the wing in a safe place, taking care not to damage the VG's.

Wing Re-installation:

1. Thoroughly clean and lightly lubricate all the wing supports and bolts with grease before assembly. Also grease the flap root slot.
2. Have one person hold the wing tip (supporting it on the spar, not the composite tip), a second person to hold the leading edge wing root and a third person the trailing edge wing root.
3. Raise the tip to shoulder height.
4. The upper wing suspension should now be carefully inserted into its location in the fuselage. Take care to avoid damage to the pitot plumbing on the port wing half, and any navigation light wiring. Insert the pin, with its head facing forward and tap it into place.
5. Lower the wing tip so that the lower suspension point is aligned; then insert its pin.
6. At the trailing edge, align the flap operating pin in its slot in the flap end. This is facilitated by moving a wing tip forward a little.
7. Install the bolt into its rear wing attachment point, tapping it home gently.
8. Secure all pins with their safety pins.
9. Connect the aileron control rod and secure their connections.
10. Connect the navigation lights and pitot-static hoses.
11. Attach the wing root fairings.

3.2 Horizontal Tail Unit (HTU)

1. Remove attachment bolts from the HTU-fuselage composite fairing.
2. Disconnect the trim tab control cables (or wire where an electric trim tab is fitted).
3. Disconnect the elevator control rod.
4. Remove the safety pins securing the castle nuts on the bolts of the stabilizer rear supports. Remove the nuts and washers.
5. Draw the HTU out of the fuselage.

Re-installation is the reverse of the above procedure. Lubricate the attachment points before re-assembly. Check elevator and trim tab deflections and adjust as necessary.

3.3 Vertical Tail Unit

1. Disconnect the rudder cables, attaching the ends together to prevent them from slipping inside the fuselage.
2. Remove the safety pin from the lower hinge bolt; remove the castle nut and washer.
3. Repeat this operation for the upper hinge bolt.
3. Remove the rudder.

Re-assembly is the reverse of the above. If necessary, insert a washer to adjust the lower hinge clearance. Use tab washers to secure the bolt heads.

4. Inspections and Scheduled Maintenance

4.1 Pre-Flight Inspection

A pre-flight inspection should be repeated prior to each flight even during the same day.

The pre-flight inspection is a visual check of the aircraft for deformations, surface damage, fuel and oil system leaks, prop damage, insecure locks, covers and cowlings, vortex generators (VGs) etc. Any damage or failure should be repaired immediately if airworthiness is affected.

It is important to perform a pre-flight inspection carefully and systematically to prevent anything from being missed. Refer to the Pilot's Operating Handbook for more details.

4.2 Post-flight inspection

A post-flight inspection is performed at the end of each flight day; the post-flight inspection events are the same as the pre-flight ones. If possible, failures, damages and malfunctions should be recorded and repaired immediately. It is recommended to clean and/or wash the aircraft, check for damage on delicate items such as the Vortex Generators (VG's) and check that the fuel and oil consumptions are in the normal range.

Record all hours flown, and other data in the appropriate log book.

4.3 Periodic inspections

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.

4.3.1 Periodic inspection intervals

The periods for overall checks and associated maintenance will depend on operating conditions and the overall condition of the aircraft. The manufacturer recommends maintenance checks and periodic inspections at the following intervals.

1) after the first 25 ± 2 flight hours
2) after every 50 ± 3 flight hours
3) after every 100 ± 5 flight hours or annual inspection
4) after 2000 flight hours repeat after every additional 1000 flight hours
5) after 3000 flight hours

Refer to the Rotax 912 Maintenance Manual for engine maintenance.

Refer to the Propeller manual for propeller maintenance.

4.3.2 Periodic maintenance and inspection work sheets

The following Periodic maintenance and inspection Work Sheets are intended for copying and serve as the Maintenance Records. It is also recommended to include small repairs and damage and their remedies or replacements. Some parts of the aircraft (engine, propeller, parachute etc.) may have special time limits - refer to the appropriate manuals.

NOTE
Optional control system covers may not be fitted on the aircraft. These can be fitted if required by the owner or operator.

All maintenance and repair work must be recorded in the appropriate log books by reference to the above Maintenance Records. The parachute maintenance must be entered into the logbook as a separate item.

4.3.3 Periodic Maintenance and Inspections.

Model:	**S/N:**	**Hours flown:**	**Date of inspection**:
	Registration:	**No. of takeoffs:**	**Inspection period:** **hrs.**

Event	**Event description**	**Inspection**					**Carried out by:**	**Inspected by:**
		after the first **25** hrs.	every **50** hrs.	every **100** hrs. or annually	at **2000** hrs repeat after additional **1000** hrs.	at **3000** hrs		
1.	Prior to the inspection clean and wash the aircraft surfaces, if needed.	☒	☒	☒	☒	☒		
2.	**ENGINE**	see engine manufacturer´s instructions						
3.	**ENGINE COMPARTMENT**							
3.1.	**Fiberglass engine cowlings**							
3.1.1.	Check condition of cowlings and Camlock Fasteners. - repair any damage			☒	☒	☒		
3.1.2.	Remove engine cowling	☒	☒	☒	☒	☒		
3.1.3.	Visually check inside fireproof primer paint - Repaint if needed - White color T 50, Norm V1000 N 56582		☒	☒	☒	☒		
3.2.	**Engine mount**							
3.2.1.	Visually check condition, attachment, security of attachment bolts: engine to mount, mount to firewall. Carefully check engine mount for cracks, abrasion and other damage.	☒	☒	☒	☒	☒		
3.2.2.	Visually check condition of rubber silentblocks - replace those cracked or excessively deformed			☒	☒	☒		
3.3.	**Induction System**							
3.3.1.	Visually check condition, attachment and security of air filters on each carburettor inlet. - clean and oil filter as necesary.	☒	☒	☒	☒	☒		
3.3.2.	Visually check condition of carb. rubber adaptors.	☒	☒	☒	☒	☒		
3.3.3.	Check carburettor - condition, control cables attachment, lubricate cables at inlet to the Bowdens‘ conduits.	☒	☒	☒	☒	☒		
3.3.4	Check coolant carb heat system for security and leaks	☒	☒	☒	☒	☒		
3.4.	**Battery**							
3.4.1.	Visually check attachment and security		☒	☒	☒	☒		
3.4.2.	Check charging – charge if needed; see note 1			☒	☒	☒		
3.4.3.	Visually check condition and attachment of battery leads – replace those damaged	☒	☒	☒	☒	☒		
3.5.	**Wiring**							
3.5.1.	Visually check condition and integrity of wires, connections, security of wires	☒	☒	☒	☒	☒		

Note 1: The Li-ion battery must only be charged with its dedicated, (constant current) charger. The use of a normal lead-acid battery charger (constant voltage) may result in damage to the battery and a reduction in its life.

3.6.	**Fuel system**							
3.6.1.	Visually check condition, integrity, attachment and security of hoses - replace those damaged	☒	☒	☒	☒	☒		
3.6.2.	Visually check fuel filter condition - replace dirty filter.	☒	☒	☒	☒	☒		
3.6.3.	Visually check system for leaks	☒	☒	☒	☒	☒		
3.7.	**Cooling system**							
3.7.1.	Visually check radiator for condition, secure attachment and leaks	☒	☒	☒	☒	☒		
3.7.2.	Visually check condition, attachment of hoses; check system for leaks	☒	☒	☒	☒	☒		
3.7.3.	Tighten hose clips if needed	☒	☒	☒	☒	☒		
3.7.4.	Check coolant quantity in the expansion tank - add or change coolant acc. to the engine manual if needed	☒	☒	☒	☒	☒		
3.7.5 3.7.6	Visually check condition and attachment of overflow bottle on the firewall. Check condition of hose from expansion tank to overflow bottle. Check overflow bottle is approx. 1/3 full when engine cold.	☒	☒	☒	☒	☒		
3.8.	**Lubrication system**							
3.8.1.	Visually check condition and attachment of oil tank	☒	☒	☒	☒	☒		
3.8.2.	Check oil cooler for condition, attachment and leaks.	☒	☒	☒	☒	☒		
3.8.3.	Visually check hoses for condition, leaks, attachment and security - replace damaged hoses. Tighten hose clips if necessary.	☒	☒	☒	☒	☒		
3.8.4.	Check oil quantity - add or change oil according to the engine manual if needed	☒	☒	☒	☒	☒		
3.9.	**Exhaust system**							
3.9.1.	Visually check exhaust pipes for condition, cracks, deformations or damage – repair or replace if necessary.	☒	☒	☒	☒	☒		
3.9.2.	Visually check condition and attachment of the muffler (silencer) - repair or replace if necessary.	☒	☒	☒	☒	☒		
3.9.3.	Check joint security	☒	☒	☒	☒	☒		
3.10.	**Reinstall lower engine cowling**							
3.10.1.	Reinstall upper engine cowling when the inspection is completed and engine test run performed	☒	☒	☒	☒	☒		
3.11	**Lubricate per Lubricating Chart**	☒	☒	☒	☒	☒		
4.	**PROPELLER**	see manufacturer instructions +						
4.1.	**Blades**							
4.1.1.	Inspect blades for abrasions, cracks, paint damage, condition of blades leading edges and tips - repair according to the propeller manual	☒	☒	☒	☒	☒		
4.2.	**Spinner**							
4.2.1.	Remove spinner and visually check condition for abrasions, cracks, paint damage; repair any damage.	☒	☒	☒	☒	☒		
4.3.	**Propeller**	see manufacturer instructions +						
4.3.1.	Check prop attachment bolt torque and security.	☒		☒	☒	☒		
4.3.2.	Check tracking			☒	☒	☒		
4.3.3.	Re-fit spinner	☒	☒	☒	☒	☒		

5.	**NOSEWHEEL LANDING GEAR**							
5.1.	**Nosewheel leg**							
5.1.1.	Check condition and attachment of the nosewheel leg (lift aircraft nose). See Section 17.	☒	☒	☒	☒	☒		
5.2.	**Rubber bungees and rubber rebound stop**							
5.2.1	Visually check rubber bungees and rebound stop for deformation, cracks, excessive wear - replace if needed.		☒	☒	☒	☒		
5.3.	**Tyres**							
5.3.1	Check tyres for condition, cuts, uneven or excessive wear and creep – replace if needed	☒	☒	☒	☒	☒		
5.3.2	Check tyre pressure – inflate if required.	☒	☒	☒	☒	☒		
5.4.	**Wheel**							
5.4.1	Visually check for cracks, permanent deformations – if damaged, replace		☒	☒	☒	☒		
5.4.2	Check valve condition near the hole in the rim		☒	☒	☒	☒		
5.4.3	Check condition of bearings, wheel free rotation, play		☒	☒	☒	☒		
5.5.	**Noseleg bearings**							
5.5.1	Check security and condition of bottom bearing and attachment bolts (appendix 1 section 1.0.7).	☒	☒	☒	☒	☒		
5.6	**Nosewheel steering system**							
5.6.1	Check control rods for condition and rod ends for condition and security		☒	☒	☒	☒		
5.6.2	Check condition of nosewheel steering rod covers – repair if necessary			☒	☒	☒		
5.7	**Lubricate per Lubricating Chart**	☒	☒	☒	☒	☒		
6.	**MAIN LANDING GEAR**							
6.1.	**Fiberglass legs**							
6.1.1.	Visually check condition of fiberglass legs – repaint damaged areas, contact aircraft manufacturer if cracks are found	☒	☒	☒	☒	☒		
6.1.2.	Inspect leg attachment into the fuselage (no play) – Lift the landing gear, (see POH sect. 8.4.3), and move each leg back & forth and up & down; at the same time check wheel play on the axle – tighten attachment bolts if the leg has any play (see Section 17). Check for any fatigue cracks in the fuselage structure where the main undercarriage legs are attached.			☒	☒	☒		
6.1.3.	Check security of axle to leg attachment bolts.		☒	☒	☒	☒		
6.1.4.	Main landing gear attachments under seat pans (appendix 1 section 1.0.6)				☒	☒		
6.1.5.	Check the main landing gear for cracks and splits (appendix 1 section 1.1.4)				☒	☒		
6.1.6.	Check cloth cover where the undercarriage leg enters the fuselage. Reattach if loose.		☒	☒	☒	☒		
6.2	**Tyres**							
6.2.1	Check tyres for condition, cuts, uneven or excessive wear and creep- replace if needed	☒	☒	☒	☒	☒		
6.3	**Wheels**							
6.3.1	Visually check for cracks, permanent deformations – replace wheel in case of cracks		☒	☒	☒	☒		
6.3.2	Check valve condition near the hole in the disc		☒	☒	☒	☒		
6.3.3	Check condition of bearings, wheel free rotation, play			☒	☒	☒		

6.4	**Brakes**							
6.4.1	Check attachment of brake system plastic hoses to the main leg		☒	☒	☒	☒		
6.4.2	Visually check brake pads for condition and uneven wear- replace pads if needed		☒	☒	☒	☒		
6.4.3	Check wear and security of brake discs		☒	☒	☒	☒		
6.4.4	Check brake system for leaks - add brake fluid and bleed the system if a brake pedal is not firm.	☒	☒	☒	☒	☒		
6.4.5	Check brake fluid level – top up to 25mm above the bottom of the reservoir as necessary.		☒	☒	☒	☒		
7	**WING**							
7.1	**Wing *not required if wings are replaced**							
7.1.1	Visually check for loose rivets, deformation, cracks and damage – contact the aircraft manufacturer if in doubt.	☒	☒	☒	☒	*		
7.1.2	Check play of wing attachments – move the wing tip upward-downward, forward-rearward. Contact the aircraft manufacturer if play exceeds tolerances (see sect. 17)			☒	☒	*		
7.1.3	Check condition and attachment of fiberglass wing tips			☒	☒	☒		
7.1.4	Check Vortex Generators (VG's) for dirt build up, damage and adhesion. (29 per wing)	☒	☒	☒	☒	☒		
7.1.4	**REPLACE COMPLETE WING OR REPLACE WING LOWER SPAR CAPS**					☒		
7.2	**Aileron**							
7.2.1	Visually check condition	☒	☒	☒	☒	☒		
7.2.2	Check free movement	☒	☒	☒	☒	☒		
7.2.3	Check aileron hinge	☒	☒	☒	☒	☒		
7.2.4	Check play (see Section 17)		☒	☒	☒	☒		
7.2.5	Check security of control rod ends	☒	☒	☒	☒	☒		
7.2.6	Lubricate per Lubricating Chart	☒	☒	☒	☒	☒		
7.2.7	Remove inspection covers from the lower wing surface to check security and to lubricate control system joints. Refit covers.			☒	☒	☒		
7.2.8	Lubricate per Lubricating Chart.	☒	☒	☒	☒	☒		
7.3	**Flaps**							
7.3.1	Fully extend the flaps and visually check condition	☒	☒	☒	☒	☒		
7.3.2	Check flap hinges	☒	☒	☒	☒	☒		
7.3.3	Check play (see Section 17)		☒	☒	☒	☒		
7.3.4	Check condition of flap control pin and wear of the groove at the flap root			☒	☒	☒		
7.3.5	Lubricate per Lubricating Chart	☒	☒	☒	☒	☒		
7.4	**Pitotstatic system**							
7.4.1	Check pitotstatic head attachment to wing.			☒	☒	☒		
7.4.2	Check pitotstatic system for leaks			☒	☒	☒		
7.5	**Wing Attachments**							
7.5.1	Remove wing root fairings.	☒	☒	☒	☒	☒		
7.5.2	Visually check condition and security of wing attachments	☒	☒	☒	☒	☒		
7.5.3	Check tolerances of wing to fuselage attachment points (apendix 1 section 2.0.1)				☒	☒		
7.5.4	Access to check wing spar caps for reference (apendix 1 section 2.0.2)				☒	☒		
7.5.5	Wing attachment points between ribs 1 and 2 for reference (apendix 1 section 2.0.3)				☒	☒		
7.5.6	Critical area of spar attachment to check (apendix 1 section 2.0.4a, b and c)				☒	☒		
7.6	**Lubricate per Lubricating Chart**	☒	☒	☒	☒	☒		

8.	**FUSELAGE**							
8.1	**Fuselage surface**							
8.1.1	Visually check for loose rivets, deformation, cracks and damage, - Contact the aircraft manufacturer if in doubt.	☒	☒	☒	☒	☒		
8.1.2	Visually check external rivets near the landing gear attachment.			☒	☒	☒		
8.1.3	Remove underside wing fillets. Inspect for warn rivet heads. Check condition of Velcro wear strip.			☒	☒	☒		
8.1.4	Check condition and attachment of equipment, eg. radio and transponder antennas.		☒	☒	☒	☒		
8.1.5	Check tail skid for condition and attachment		☒	☒	☒	☒		
8.1.6	Visually check condition and security of fiberglass wing fillets		☒	☒	☒	☒		
8.1.7	Fuselage central section attachment points (appendix1 section 1.0.1)				☒	☒		
8.1.8	Fuselage central section with seat pans removed showing the wing attachment points. Check upper and lower spar wing attachment hinge for security of the bolts and cracking or deformation (appendix1 section 1.0.2 and 1.1.3)				☒			
8.1.9	Fuselage central section with seat pans removed showing the wing attachment points. Check upper and lower spar wing attachment hinge for security of the bolts and cracking or deformation (appendix1 section 1.0.3)				☒			
8.2.0	**REPLACE FUSELAGE CENTRAL SECTION (CENTROPLAN)**					☒		
8.2.1	Wing attachment points and outer flap torque tube bush are within tolerances (appendix1 section 1.0.4)				☒	☒		
8.2.2	Stabilizer attachment points are within tolerances (appendix1 section 1.0.5)				☒	☒		
8.2.3	Left upper engine frame attachment on the fire wall (appendix1 section 1.0.8)				☒	☒		
8.2.4	Left bottom engine hinge frame attachment on the fire wall (appendix1 section 1.0.9)				☒	☒		
8.2.5	Attachment of the left upper engine hinge on the fire wall (appendix1 section 1.1.0)				☒	☒		
8.2.6	Area of the fuselage reinforcement (appendix1 section 1.1.1)				☒	☒		
8.2.7	Bottom part of the fuselage under the left bottom engine hinge (appendix1 section 1.1.2)				☒	☒		
8.3	**Cockpit canopy**							
8.3.1	Visually check canopy for cracks, scratches and damage. Contact manufacturer if in doubt.	☒	☒	☒	☒	☒		
8.3.2	Check canopy lock for condition and operation	☒	☒	☒	☒	☒		
8.3.3	Check vents for condition and operation		☒	☒	☒	☒		
8.3.4	Check gas struts operation – replace if faulty		☒	☒	☒	☒		
8.3.5	Check canopy rubber seals.			☒	☒	☒		
9.	**HORIZONTAL TAIL UNIT**							
9.1	Visually check for: – loose rivets, deformation, cracks, scratches and damage – contact the aircraft manufacturer if in doubt.	☒	☒	☒	☒	☒		
9.2	Visually check condition and attachment of fiberglass tips			☒	☒	☒		
9.3	Check elevator for free movement	☒	☒	☒	☒	☒		
9.4	Check elevator hinge	☒	☒	☒	☒	☒		

9.5	Check play in stabilizer attachments – move the stabilizer frontward-rearward, upward-downward - contact the aircraft manufacturer if play exceeds tolerances. (see Section 17)		☒	☒	☒	☒		
9.6	Check security of control rod joint	☒	☒	☒	☒	☒		
9.6.1	Check elevator control circuit for play (see Section17)		☒	☒	☒	☒		
9.6.2	Stabilizer attachment points (view 1 appendix 1 section 3.0.1)				☒	☒		
9.6.3	Stabilizer attachment points (View 2 appendix 1 section 3.0.2)				☒	☒		
9.6.4	Stabilizer spar (appendix 1 section 3.0.3)				☒	☒		
9.7	**Trim tab**							
9.7.1	Visually check condition		☒	☒	☒	☒		
9.7.2	Check hinge		☒	☒	☒	☒		
9.7.3	Check control cables condition			☒	☒	☒		
9.7.4	Check tension of trim tab control cables and check securing the adjusting screws. Adjust tension if necessary.			☒	☒	☒		
9.8	Lubricate per Lubricating Chart	☒	☒	☒	☒	☒		
10.	**VERTICAL TAIL UNIT**							
10.1	Visually check for loose rivets, deformation, cracks, scratches and damage – contact the aircraft manufacturer if in doubt.	☒	☒	☒	☒	☒		
10.2	Visually check condition and attachment of fiberglass tips			☒	☒	☒		
10.3	Check rudder for free movement	☒	☒	☒	☒	☒		
10.4	Check rudder hinge pins for wear and security	☒	☒	☒	☒	☒		
10.5	Check rudder end float (see Section 17)			☒	☒	☒		
10.6	Rudder lower bearing (appendix 1 section 3.0.4)				☒	☒		
10.7	Fin spar with rudder attachment points (appendix 1 section 3.0.5)				☒	☒		
10.8	Check security of rudder cable attachments.	☒	☒	☒	☒	☒		
10.9	Lubricate per Lubricating Chart	☒	☒	☒	☒	☒		

11.	**COCKPIT**							
11.1	**Instrument panel**							
11.1.1	Visually check condition and attachment of the instrument panel		☒	☒	☒	☒		
11.1.2	Check condition and attachment of individual instruments		☒	☒	☒	☒		
11.1.3	Check function of instruments	☒	☒	☒	☒	☒		
11.1.4	Check throttle and choke controls for free movement. Check throttle friction nut.	☒	☒	☒	☒	☒		
11.1.5	Inspect completeness and readability of placards		☒	☒	☒	☒		
11.1.6	Check parachute release, safety lock secure, placard legible.	☒	☒	☒	☒	☒		
11.2	**Seats**							
11.2.1	Visually check seat upholstery, remove upholstery			☒	☒	☒		
11.2.2	Visually check seats and backrests‘ condition			☒	☒	☒		
11.2.3	Check for loose rivets or any other damage on the seats			☒	☒	☒		
11.2.4	Visually check main landing gear leg attachments inside the fuselage			☒	☒	☒		
11.3	**Safety harness**							
11.3.1	Visually check condition, attachment, security and operation of buckles			☒	☒	☒		
11.4	**Hand control**							

11.4.1	Check hand control for free movement	☒	☒	☒	☒	☒		
11.4.2	Check all joints and bearings for wear and security.	☒	☒	☒	☒	☒		
11.4.3	Check control column stops for condition			☒	☒	☒		
11.4.4	Check pitot static hoses for water at lowest point of water collection loop (behind port cockpit side upholstery panel). Drain any water by disconnecting one end of drain loop. Reconnect after draining.		☒	☒	☒	☒		
11.4.5	Lubricate per Lubricating Chart	☒	☒	☒	☒	☒		
11.5	**Rudder control**							
11.5.1	Check for free movement.	☒	☒	☒	☒	☒		
11.5.2	Check cable tension.			☒	☒	☒		
11.5.3	Check cable stops for condition and security.			☒	☒	☒		
11.5.4	Check condition and security of cables and end fittings.	☒	☒	☒	☒	☒		
11.5.5	Check operation and security of adjustable rudder mechanism, 4 pedals.	☒	☒	☒	☒	☒		
11.5.6	Lubricate per Lubricating Chart	☒	☒	☒	☒	☒		
11.6	**Flap and trim controls.**							
11.6.1	Remove cover	☒	☒	☒	☒	☒		
11.6.2	Check free movement of levers	☒	☒	☒	☒	☒		
11.6.3	Check operation of flap control lever lock (push button)		☒	☒	☒	☒		
11.6.4	Lubricate per Lubricating Chart	☒	☒	☒	☒	☒		
11.6.5	Replace Cover	☒	☒	☒	☒	☒		
11.6.6	Check trim lever friction force. Force to move lever should be min 1.0 kg at lever end. Adjust friction if necessary.			☒	☒	☒		

12.	**Ballistic Recovery System 6/473 SD Soft B2**							
12.1	Check expiry date			☒	☒	☒		
12.2	Inspect the activation handle and safety pin			☒	☒	☒		
12.3	Inspect mounting of the Galaxy Rescue System (GRS)			☒	☒	☒		
12.4	Check the fastening straps			☒	☒	☒		
12.5	Check for unwanted objects near the GRS unit			☒	☒	☒		
12.6	All parachute maintainance must be entered into the aircraft logbook. **Refer to the parachute manufacturer's maintenance manual for details of maintenance required.**			☒	☒	☒		
13.	**Autopilot System (if fitted)**							
13.1	Remove foot guard and starboard wing fillet. Inspect the servo linkages.		☒	☒	☒	☒		
13.2	check servo arm brass sheer screws are in place		☒	☒	☒	☒		
13.3	Check security of linkages and wire conections to the servos and ensuer wiring does not obstruct servo movement		☒	☒	☒	☒		
13.4	Lubricate as per lubrication chart			☒	☒	☒		
13.5	Replace foot guard		☒	☒	☒	☒		

5. Maintenance Procedures

5.1 Rotax 912 UL engine

See Maintenance Manual for Rotax Engine Type 912UL Series (part. No. 899 372)

5.2 Oil

The Rotax 912 lubrication system in the SL has a capacity of 3.5litres. Before checking oil level in the tank, all oil which remains in the crankcase must be pumped back into the tank. To do this:

Remove the oil tank cap. With the ignition off, turn the propeller by hand in the normal direction, holding it at the cylinder peak compression points (top dead centre). Eventually a gurgling will be heard from the oil tank as crankcase pressure pushes all the oil back into the oil tank and air follows.

After completing this procedure the oil level must lie within the flat region of the dipstick.

5.3 Oil Draining

The operation is best done with a warm engine.

A drain plug is installed on the bottom of the oil tank. Remove its locking wire, unscrew the plug and allow all the oil to drain into a container. When replacing the plug, use a new copper washer.

5.4 Oil Filter Replacement

Remove both engine cowlings. Unscrew the elbow on the left front (as viewed in flight direction) exhaust pipe using a 12mm spanner. Loosen the pipe clamp on the exhaust muffler using a 13mm spanner. Disconnect the elbow from the engine and turn the exhaust pipe slightly to move it away from the oil filter. Replace the oil filter with a new one. See Maintenance Manual (Line Maintenance) for ROTAX Engine Type 912 Series for replacement instructions.

Re-connect the elbow to the engine and install the nuts finger-tight. Set the exhaust pipe so that it clears the radiator hose and oil filter. Clearance from the radiator hose must be min. 0.8 in (20 mm) and approximately 0.2 in (5 mm) from oil filter. When clearances are set, tighten the elbow and clamp and re-check. Top up the oil and re-install the engine cowlings. Run the engine for a few seconds, then re-check the oil level in the tank.

5.5 Coolant

The coolant capacity is 1.5 litres. See Rotax manual (+ bulletins) for details of permitted coolants. LSA recommends glycol coolant mixed 50% with water.

The coolant level in the small black expansion tank mounted on the engine should reach the bottom of the filler neck; the level in the overflow bottle, mounted on the firewall, should be a minimum of 25mm from the bottom.

When it is necessary to drain the coolant, disconnect the hose running from the radiator to the pump, which is the lowest point of the system.

5.6 Brake System

5.6.1 Fluid Type

Only brake fluid meeting DOT4 and J 1703c standards (for medium or severe conditions) should be used for the hydraulic brake system.

5.6.2 Brake fluid refilling

Brake fluid refilling is necessary when a loss of brake efficiency occurs, or due to wear on the pads, or a fluid leak.

The brake fluid reservoir is mounted at the top centre of the firewall. Top up to a minimum of 1" from the bottom of the reservoir.

5.6.3 Brake fluid emptying

Brake fluid absorbs water during aircraft operation and thickens. This condition causes brake efficiency loss and system failures. It is not possible to determine when this may occur. The best way to prevent trouble is to change the brake fluid every year. Bleed the system after re-filling. Bleed nipples are provided on the brake calipers, see below.

5.6.4 Brake Pad Replacement

Brake pad replacement is only necessary when a pad is worn-out.

CAUTION

Due to the possibility of brake fluid leaking, it is advisable not to loosen the hose fitting during brake pad removal. In the case of fluid loss in the brake system, filling and bleeding is necessary.

Brake pad replacement procedure

1. Jack up the airplane; see Section 11.
2. Remove the split pin, unscrew the castellated M16 nut and remove the washer from the axle.
3. Bend back the small tabs on the 3 washers and unscrew the M6 screws connecting the brake disc to the wheel rim.
4. Remove the wheel and the distance ring from the axle.
5. Take the brake disc off (leave the brake on a main leg properly supported).
6. Remove the split pins, knock out the pins and remove the brake pads.
7. Mount a new brake pad, secure the pins with split pins (diam. 2mm, length14mm) (P/N: 039300)
8. Put the brake disc on the wheel
9. Put the distance ring and the wheel on the axle (adjust the distance ring between bearings)
10. Set tab washers (6x2, P/N: 038160) on the screws, apply Loctite and attach the brake disc to the inner part of the rim. Bend the washer tabs to secure the screw heads.
11. Put the washer on the axle, tighten the castellated nut and secure with a split pin

List of parts necessary for Brake pad replacement procedure:

1. Brake pads	4	pcs		Nom.	765 210
2. Split pin	4	pcs	ϕ 2x14mm	Czech Stand. Nom.	021781.04 039 300
3. Split pin	2	pcs	ϕ 4x40mm	Czech Stand. NOM.	021781.04 040 350
4. Lock tab Washer	6	pcs	6x2mm	Works Stand. Nom.	3288.2 038 160

CAUTION
NEW BRAKE PADS REQUIRE A RUNNING-IN PERIOD TO ACHIEVE MAXIMUM BRAKING EFFICIENCY. This should be kept in mind during taxiing and landing.

5.6.5 Bleeding

Bleed the brakes whenever they feel spongy or lose efficiency. Air can enter the system if the brake fluid reservoir is not kept topped up or a leak occurs. Proceed as follows:

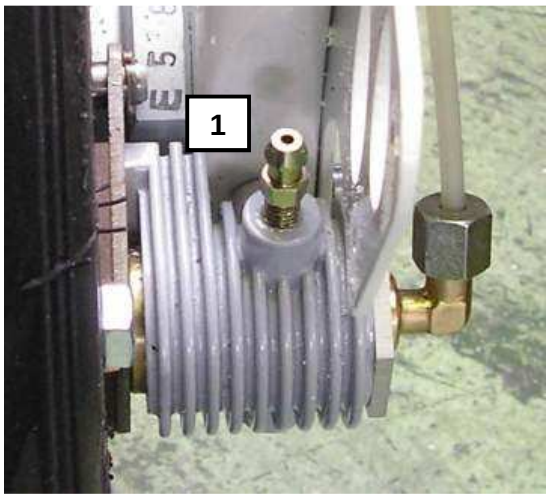


Fig. Brake system bleeding
1- Bleed screw

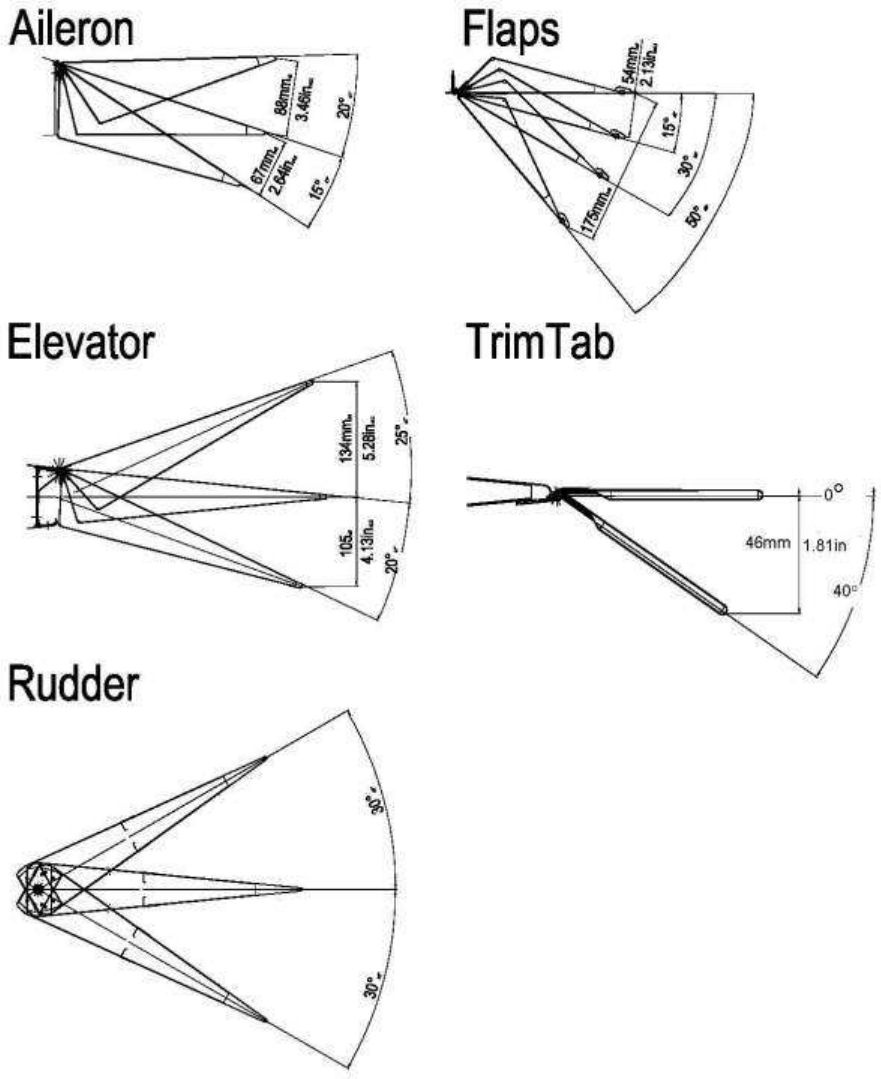
1. Connect a short clear plastic hose to the bleed nipple, (Item 1 in the photo)
2. Loosen the bleed nipple.
3. Step repeatedly on the pedal to bleed the brake system
4. Tighten the screw
5. Repeat several times or until the pedal offers resistance against motion (feels firm)

NOTE
If the brake efficiency remains unsatisfactory after bleeding or if the pedal motion is excessive, fill with brake fluid and bleed the system again. Continue until all the air is out of the system

5.7 Control Surface Deflection Setting

The neutral position of the control surfaces is used as a reference for adjustment of deflections.

The deflection of the control surfaces are specified in the Control Surfaces Deflection Record (see Appendices of this Manual) and in the following Figure.



5.7.1 Aileron

Adjustment screws can be found on the aileron control stops located on the left and right of the control stick base. These stops control the total deflection (up + down) of the aileron.

Each aileron's neutral position can be adjusted using the adjustable end of the short rod inside the cockpit. Alternatively the adjustable end of the long rod inside the wing can be used. Remove the inspection cover for access.

The ailerons have greater upward than downward deflections. Aileron differential can be set using the adjustable end of the rod connecting the bell crank inside the wing. Deflect the aileron upwards for access.

5.7.2 Flap

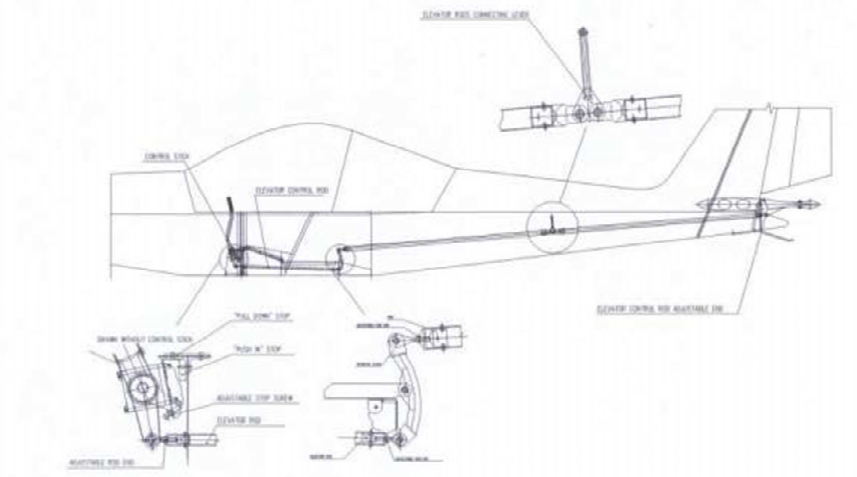
The flap deflection is controlled by the positions of the slots in the flap lever gate in the cockpit. The relative locations of these slots cannot be changed; however the flaps-up (and hence all other positions) can be adjusted as follows:

- Remove the baggage compartment floor which allows access to the rod connecting the flap control lever to the torque tube arm.
- Set the flap lever to the fully retracted position.
- Adjust the rod end to set the flaps in their correct, retracted, position under the trailing edge.

The difference between the left and right flap deflections can also be adjusted by rotating the eccentric pin locating in the inboard flap slot.

5.7.3 Elevator

Elevator stops are installed on the control stick as shown below.



The down elevator stop may be adjusted with the adjustable stop screw shown above.

To adjust the up-elevator, first draw the stick back to the stop and secure it in this position. Measure the elevator deflection from its neutral position and compare this with the values given in Appendix 2. If adjustment is required, use either the rod end fitted to the elevator horn or the rod end located beneath the baggage bay floor.

If the up-elevator deflection is adjusted, it is necessary to re-check the down elevator deflection and re-adjust this as necessary.

WARNING
When adjusting rod ends, ensure that at least 2 diameters of thread lie within the end fitting and that the locknut is secure.

When complete, ensure that all rod end adjusters are properly tightened and thread locking compound is applied to the locknut.

5.7.4 Rudder

Rudder stops in the form of swages are fitted on the cables running through fuselage side stiffeners adjacent to the seats. Measure the rudder deflections, right and left, and adjust the stops by screwing the nipples in or out as necessary. Lock the nipples when adjustment is complete.

5.7.5 Trim Tab

The trim tab Bowden cables pass through adjustable nipples immediately aft of the lever. Screw these nipples in or out, while maintaining tension on the inner cable, to place the lever in its correct position relative to its quadrant markings.

The position of the trim tab itself may be adjusted relative to the elevator surface, by adjusting the cable nipples mounted on brackets situated on the elevator's trailing edge. For larger adjustments use the inner cable clamps on the trim tab's upper and lower surfaces.

When complete ensure that all nipples are locked and that there is adequate tension in the cable. See Permissible Tolerances section (5mm maximum at the lever top with tab locked).

6. Fueling

6.1 Filling – Precaution

The following precautions should be maintained during fueling to prevent fire.

WARNING
- **No smoking or exposed flames during fueling!**
- **Fire extinguisher should be within reach!**
- **Under no circumstances add fuel with the engine running!**
- **Earth the aircraft electrically to ground prior to fueling.**
- **No person in the cockpit during fueling!**

The fuel tank filler is located on the starboard side of the fuselage, close to the rear of the cockpit canopy.

CAUTION
It is highly recommended to pour gasoline through a filter if it was not tested for water content or there is any doubt about contamination. After fueling, allow 20 min. for any water to settle to the bottom. Drain off some fuel and look for water.
Avoid getting gasoline on the canopy; it will damage the Perspex!!!

6.2 Fuel emptying

Precaution
Use the same precautions as during fueling.

Draining procedure
1. Electrically connect the aircraft to the ground, normally via the engine exhaust.
2. Open the main fuel valve
3. Fully extend the flaps
4. Put an empty container under the drainage hose (on the bottom of fuselage close to the starboard flap root)
5. Open the drain valve (under the starboard wing fillet, close to the starboard flap root)
6. Close the drain valve when desired quantity of fuel is reached
7. Close the main fuel valve
8. Retract the flaps

NOTE
Remove the fuel tank filler cap to speed up draining.

7. Lubrication

7.1 Engine

See engine operator's manual.

7.2 Airframe

Where oil is specified, use the same oil as specified for the engine.
Never use oil on the inside of Teflon lined Bowden cables.
Where grease is specified use one of the following or an equivalent.

CASTROL - Castrolease LM
MOBIL - Mobilgrease MP
SHELL - Retinax HDX2 or EPX2. Aeroshell Grease 22, 11MS or 23C

7.3 Lubricating Points

Unit	Lubricating point	After the first 25 hrs.	Every 50 hrs.	Every 100 hrs or annually	Lubricant
Engine	• oil change according to Engine Manual				
	• carburettor control cable at inlet into the Bowden cable (in engine compartment)	x	x	x	oil
	• choke control cable at inlet into the termination (in engine compartment)	x	x	x	oil
Nosewheel landing gear	• landing gear leg in the area of bushing	x	x	x	oil
	• bearings in pull rod terminals of landing gear control	x	x	x	oil
Main landing gear	• Brake pad holding pins		x	x	grease
Ailerons	• hinges		x	x	oil
	• control hinge pin			x	oil
	• bell cranks, inside the wing			x	grease
	• hinge joint of rods under the wing fillet			x	grease
Flaps	• hinges	x	x	x	oil
	• all movable joints under the quadrant cover between the seats			x	grease
	• All movable joints under the baggage compartment bottom cover			x	grease
	• Flaps control pins (at a flap root)		x	x	grease
Elevator	• Elevator hinge		x	x	oil
	• Swivel bearing in the elevator control rod termination			x	grease
Rudder	• rudder pivots			x	grease
	• rudder control cables at attachment to the rudder			x	grease
	• adjustable rudder pedal mechanism, plunger pin and lever.		x	x	oil
Trim tab	• trim tab hinge	x	x	x	oil
	• control cables at inlets to the terminations			x	grease
Control Stick	• All movable joints in the cockpit			x	grease
Rudder control and brake pedals	• All movable joints in the cockpit			x	grease
Autopilot linkages	• All movable joints		x	x	oil

7.4 Access Holes for Lubricating & Inspection

Inspection and access holes are provided as follows:

- Access covers on the wing's lower surface - access to the aileron control rods and levers and to the pitot/static installation in the outer half of the wing;
- Access cover on the fuselage lower surface under the baggage compartment close to the fuel tank - access to the fuel tank installation;
- Access cover on the fuselage lower surface in the middle of the rear section - access to the elevator control rods and relay lever;
- Wing fillets which cover the space between the fuselage and wing root - access to the wing-fuselage attachments;
- Panel covering the control stick system in the cockpit;
- Panel covering the flap & trim control levers in the cockpit;
- Baggage compartment floor – access to the elevator and flap control linkage.

8. Bolt Tightening

Unless otherwise specified bolts should be tightened in accordance with the following maximum torque values.

Note: these values are intended for guidance only and represent the maximum torque to be applied to a particular bolt type. There may be specific instances where a bolt should not be tightened to this limit to avoid damage to parts. If in doubt, consult your BMAA Inspector or LSA.

Metric thread (all coarse)		Strength class				
		4.8	5.8	8.8	10.9	12.9
M4	N.m kg.m		1,67 0,17			
M5	N.m kg.m		3,45 0,35			
M6	N.m kg.m	5,39 0,55	6,86 0,70	9,80 1,00	13,72 1,40	16,67 1,70
M7	N.m kg.m	8,82 0,90	10,78 1,10	14,70 1,50	20,59 2,10	25,49 2,60
M8	N.m kg.m	12,74 1,30	15,69 1,60	22,55 2,30	32,36 3,30	38,24 3,90
M10	N.m kg.m	24,51 2,50	31,38 3,20	44,12 4,50	61,78 6,30	73,54 7,50
M12	N.m kg.m	42,16 4,30	52,95 5,40	74,53 7,60	104,93 10,70	125,52 12,80
M14	N.m kg.m	66,68 6,80	78,54 8,00	117,67 12,00	164,75 16,80	196,13 20,00
M16	N.m kg.m	93,16 9,50	107,87 11,50	164,75 16,80	225,55 23,00	274,58 28,00
M18	N.m kg.m	137,29 14,00	171,61 17,50	245,16 25,00	343,23 35,00	411,87 42,00
M20	N.m kg.m	176,51 18,00	225,55 23,00	313,81 32,00	441,29 45,00	539,36 55,00
M22	N.m kg.m	225,55 23,00	284,39 29,00	392,26 40,00	558,97 57,00	676,65 69,00
M24	N.m kg.m	313,81 32,00	392,26 40,00	549,17 56,00	755,11 77,00	970,85 99,00
Ultimate strength (Mpa)		420	500	880	1040	1220
ϑ in %		(14)	7	12	8	8
Yield point (Mpa)		330	400	640	940	1100

9. Rudder

9.1 Rudder Cable Tension Adjustment

The rudder control cables are pre-tensioned, by means of the nose wheel control rods, to a tension of 15 ± 5 kg (33 ± 11 lb). This cable tension must be checked and maintained during aircraft operation. A special gauge is required to measure the rudder cable tension. If you do not have access to such a gauge, this job is best left to your dealer or the aircraft manufacturer. After tension adjustment, the rudder movement should be checked and adjusted if necessary. Rudder deflection should be $30° \pm 2^0$ in each direction.

9.2 Rudder Pedal Adjustment

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.

10. Trim Tab Control Cable Tension

Check the tension of the trim tab control cables according to the following procedure:

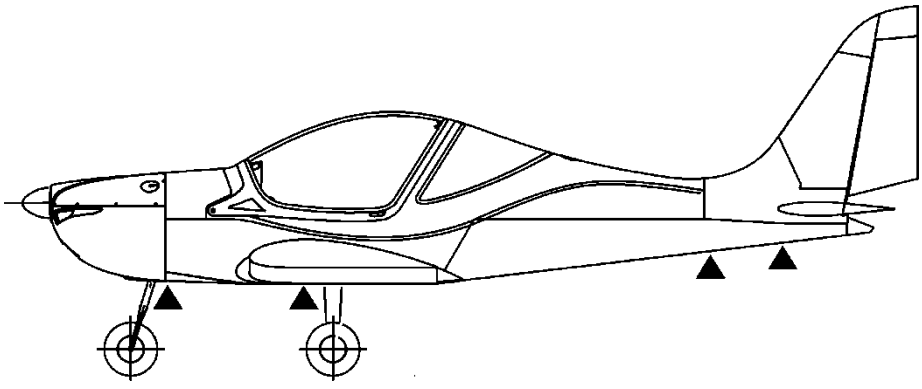
With the trim tab control lever set to the neutral position, block the elevator to prevent movement. Apply a load of 20 N (2kg) to the trim tab trailing edge using a weight or spring balance. The trim tab deflection must not exceed 5 mm from its original position. If the trim tab deflection exceeds this value, then it is necessary to adjust the trim tab cable preload using its adjusting screws.

11. Jacking the Aircraft

Because the empty weight of this airplane is low it is easy to lift the airplane using 2 people. First prepare two suitable trestles to support the aircraft.

The aircraft should be lifted by the following parts, as shown below:

- Press-down on the rear of the fuselage in front of the fin to lift the front and then support it under the firewall. The fuselage nose may be supported under the horizontal tube of the engine mount or under the nose landing gear attachment to the fuselage.
- To lift the wings, raise them using the wings lower surface at the main spar. Do not lift by the composite wing tips. Do not apply localised pressure to the skins.



12. Puncture Repair

Support the aircraft to lift the wheel with the punctured tyre.

12.1 Main wheel:

It is recommended to support the aircraft near the main gear leg entry into the fuselage. A jacking point with two tapped holes is provided on each side of the aircraft.

12.2 Nose wheel:

a) Push the rear of the fuselage down using the region immediately forward of the fin, and support the aircraft under the nose wheel leg-fuselage attachment, or
b) Load the fuselage rear near the fin (e.g. using sandbags) to lift the nose wheel above the ground. DO NOT APPLY CONCENTRATED LOADS TO THE HORIZONTAL STABILISOR SURFACE.

12.3 Puncture Repair – all tyres

1. Deflate the tyre
2. Remove the split pin securing the castle nut to the axle
3. Remove the castellated nut and washer from the axle
4. Cut the safety wire securing the bolts which join together the rim halves
5. Remove the 6 bolts connecting the rims together
6. Remove outer rim from the axle
7. Remove tyre
8. Replace the tyre and/or tube
9. Insert a new tube into the tyre and pump up slightly (put French chalk on the tube and/or in the tyre)
10. Put the valve insert of the tube into the hole in the rim
11. Put the rim with the tube and tyre onto the axle and adjust the wheel hub
12. Insert the 6 connecting screws and tighten slightly
13. Adjust the tyre and tube positions to avoid puncturing the tube
14. Tighten the screws
15. Put the washer on the axle
16. Screw the castellated nut on the axle
17. Insert a new split pin and lock the castle nut
18. Secure the screw heads with safety wire – pull the safety wire through the holes in two screw heads and twist together.

12.4 Tyre pressures (for tyre size 14 x 4 or 400 x 6)

Main and nose wheel pressure .....*26.5 + 3 psi* = 180 + 20 kPa

Tyre pressures are noted on placards located on the aircraft.

13. Small Repairs

Repair of minor damage, such as paint scratches or small dents on the aircraft's skin, can be accomplished using normal repair techniques. No special materials or techniques are required for such repairs.

Where the skin is ruptured, or badly buckled, in any location, or where airframe structural members are damaged or deformed, it is necessary to return the aircraft to Light Sport Aviation Ltd for assessment and repair.

14. Care and Cleaning Recommendations

14.1 External Paint

The external surfaces of the aircraft should be kept clean by regular washing with warm water and a mild detergent such as washing up liquid. Rinse off all cleaning solution and dry off with an absorbent cloth or chamois leather.

When washing the aircraft, avoid the use of a pressurised hose pipe as water can be forced into the engine compartment.

Locally soiled or oily surfaces may be cleaned with a solution of washing powder in warm water. If you must use abrasive polishes, such as T-Cut or other cream cleaners, then only use them very occasionally, very lightly and when absolutely necessary. Such polishes reduce protection by thinning the paint layer.

14.2 Canopy

Never clean the canopy when dry. Use copious quantities of warm soapy water and dry with a soft cotton cloth or chamois leather - never use paper towels. Take care never to expose the canopy to petrol or other hydrocarbons, or their vapours.

14.3 Upholstery

Use domestic upholstery cleaning agents for removal of dirt on the internal upholstery.

15. Leveling

Leveling is required to check the airframe alignment compared with values recorded for the new aircraft. The aircraft must be on a flat level floor. First set the aircraft in a horizontal position. The leveling points are the rivets on the aircraft which are marked with red paint. The locations of the points are shown in the Leveling Record. Use the leveling points 1(3) and 2(4) to set the aircraft in a horizontal position in the longitudinal direction, and leveling points 5 and 7 in lateral direction. Boards, under the main or nose wheel, may be used to level the aircraft. Alternatively the aircraft can be leveled by varying the tyre pressures.

Measured values should be compared with those in the Leveling Record (see Appendices). Height differences between corresponding leveling points must be calculated. A check must be carried out to prove that any differences do not exceed the tolerances permitted in the Leveling Record. If any difference exceeds the permitted tolerance, the aircraft assembly, plays in hinges and eventual permanent deformations, should be inspected.

LSA should be contacted in serious cases.

16. Control Surface Deflections

The required deflections of the control surfaces are specified in the Control Surfaces Deflection Record (see Appendix 2 to this Manual). In case of difficulty, consult with the manufacturer for the correct procedure.

17. Permissible Tolerances (Play)

The following table gives the permissible movement tolerances for critical parts of the aircraft. These values should not be exceeded in operation. The operator must also take appropriate steps if excessive play is found on/in any parts not listed below.

System	Procedure to establish play	Procedure to remedy play	Max. production play	Max. service play
Ailerons control system	Block ailerons up to the wing and move the control stick to the left and right	Check condition of bearings and replace if needed	*0.08 in* 2 mm	*0.2 in* 5 mm
Elevator control system	Block elevator up to the stabilizer, pull and push the control	Check condition of bearings and replace if needed	*0.08 in* 2 mm	*0.2 in* 5 mm
Flaps control system	Set the flaps in all positions by degrees and then, holding the flap trailing edge near the flap root, move the trailing edge up/downward to determine the play.	Check the part with the oval hole for the control pin in the flap root rib and replace the worn-out pin or the part with oval hole.	*0.08 in* 2 mm	*0.2 in* 5 mm
Trim tab control system	Block the tab to the elevator, move the trim tab control lever to determine play in control system	Check cable tension	*0.08 in* 2 mm	*0.2 in* 5 mm
Wing-Fuselage attachment	Move the wing tip and note play in wing suspensions	Check wing suspensions, replace pins	0	*0.08 in* 2 mm
Tail attachment	Move the horizontal stabilizer tip forward-rearward	Replace bearings in suspension points and bearings in control system	0	*0.08 in* 2 mm
Rudder hinges	Lift the rudder	Change swivel bearing or insert a washer under the lower hinge pin	*0.04 in* 1 mm	*0.08 in* 2 mm
Nose wheel	Push the rear part of the fuselage down (use a weight) to lift the nose-wheel, then move the wheel forward and backwards	Remove the wheel, remove the rim and tyre and replace the bearings	*0.04 in* 1 mm	*0.12 in* 3 mm
Main landing gear	Lift the wing tip (hold the wing under the main spar, not the composite tip) to lift a main leg, then move the wheel backwards and forwards; note any play in the bearings or leg attachment	Check the leg attachment, wheels attachment, replace the bearings, if necessary	*0.04 in* 1 mm	*0.12 in* 3 mm

18. Weighing the Aircraft and Centre of Gravity Calculation

WARNING
Never exceed the maximum take-off weight and C of G. range for any configuration of crew, fuel and baggage as shown in the flight manual.

The new aircraft is supplied with an empty aircraft Weight and Balance record (see Appendix 3) which can be used to calculate the loaded aircraft weight and cg position using the data provided in section 18.2, below (also included in the Pilots Operating Handbook). Any significant changes or repairs to the aircraft will require a reweighing. The new empty weight and c of g. position should be recorded in the Pilot Operating Handbook, Section 6., Weight and Balance Record / Permitted Payload Range. Then a new permitted crew weight for fuelling and baggage must be computed and recorded. The cockpit placard "Load Limits" should also be up-dated. The Eurostar SL must not be loaded outside its c of g. limit; nor must the all up weight of 472.5 kg and the baggage allowance of 15 kg be exceeded.

18.1 Empty weight determination

The empty weight of an aircraft includes all operating equipment that has a fixed location and is actually installed in the aircraft. It includes the weight of the painted aircraft, battery, standard and optional equipment, engine coolant, hydraulic fluid, brake fluid, maximum oil and unusable fuel. The aircraft is weighed without crew, usable fuel and baggage.

The following weighing procedure is recommended:

1. Remove excess dirt, grease and moisture from the aircraft before weighing;
2. Empty the aircraft of all equipment which is not fixed such as headsets and maps;
3. Either drain the tanks of all useable fuel, or measure the tank's contents;
4. Raise the flaps and close the canopy;
5. Weigh the aircraft inside a closed building to prevent errors due to wind;
6. Position and tare (zero) the scales;
7. Place the aircraft on the scales (use boards to run on to the scales or lift the aircraft - see aircraft jacking)
8. Place the aircraft in a level flight position (use suitable rests under the wheels)
9. Weigh the aircraft and record the values in Weight and Balance Record (make a copy of standard Record included in Appendix 4). If necessary make the adjustment for fuel remaining in the tank, (from weight and tank location);
10. Compute the weight and C.G. position according to the formula in the Weight and Balance Record, below
11. Compute and record permitted crew weight for fueling and baggage - see Pilot's Operating Handbook paragraph 6.2.

Up-date the placard "Load Limits" (make a new one) and attach it in the cockpit.

18.2 Operating Centre of Gravity range calculation

On the basis of moment arms, weights of items, aircraft empty weight and its C of G position it is possible to calculate the weight and C of G location according to the formula given below:

Item	**Arm to the Datum (Leading edge) $C.G._i$**		**Weight W_I**	**Moment M_i**
	[in]	**[mm]**	***[lbs]*** or **[kg]**	***[lbs.in]*** or **[kg.mm]**
Empty aircraft				
Crew	*19.69*	500		
Fuel (0.72 kg/ltr.)	36.*22*	920		
Baggage	*50.00*	1270		
			Total Weight $TW=\Sigma W_I$ ***[lbs]*** or **[kg]**	**Total Moment $TM=\Sigma M_i$** ***[lbs.in]*** **or [kg.mm]**

C.G. position from Datum (Leading edge):

$$C.G. = \frac{Total\ Moment}{Total\ Weight} = \frac{\text{\_\_\_\_\_}}{\text{.....}} = \text{.....}[in]\ or\ [mm]$$

C.G. position in % MAC

(MAC ...Mean Aerodynamic Chord = *49.2 in* i.e.1250 mm):

$$\overline{C.G.} = \frac{C.G.}{MAC} \cdot 100 = \frac{\text{\_\_\_\_\_}}{\text{.....}} \cdot 100 = \text{.....}\ [\%\ \mathrm{MAC}]$$

C.G. range limits

Empty weight C.G. range (standard equipment)	18±2% MAC or 200 – 250 mm AOD
Loaded aircraft C.G. range	27±7% MAC or 250 – 410 mm AOD

Appendix 1 - 2000 hour inspection

At 2000 flight hours, the inspection of all areas specified in the schedule must be carried out and repeated every additional 1000 hours.

Special Tools Required

- Inspection mirror
- Inspection torch
- Magnifying glass
- Rivet gun
- Drill with 3.2mm and 4mm drill bits
- 3mm punch
- Hot air gun
- Vernier calliper

Materials Required

- Emfirmastic PU50
- LM grease
- Rivets [10 of 3.2x11.1mm, 4 of 4x12.7mm and 100 of 3.2x7.9mm]
- Split pins [3 of 1.6x12mm, 2 of 2x20mm and 1 of 1x12mm]

Inspection Required

- Remove engine cowlings and wing fillets (top and bottom) and store in a safe place.
- Remove both wings and support them on trestles (Ia and Ib).
- Remove both seat pans (IIa and IIb).
- Remove the horizontal stabilizer (IIIa and IIIb).
- Remove the rudder (IVa and IVb).
- Perform the inspection in accordance with the schedule below.

Ia. REMOVAL OF WINGS

Ensure that the flap is in the zero position (fully retracted). Remove the top and bottom wing fairings. Disconnect the aileron pushrods (figure 2), pitot and static lines (figure 1a). Remove the safety pins and washers, and with the wings suitably supported drift out the main attachment and remove the rear nut and bolt (figure 3). Pull the wing off the fuselage horizontally to dis-engage the main pins and making sure not to damage the flap actuator pins(figure 1b) in the process.

Figure 1a

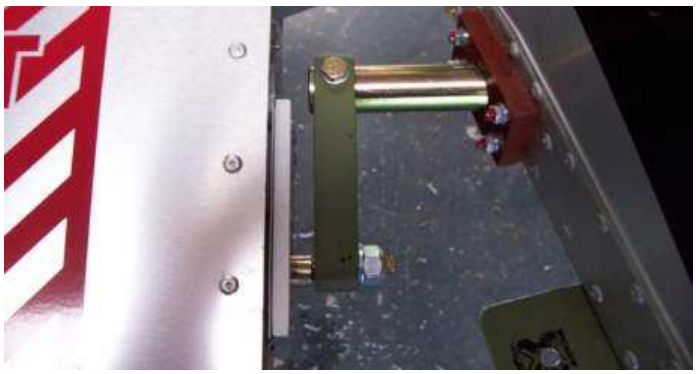


Figure 1b

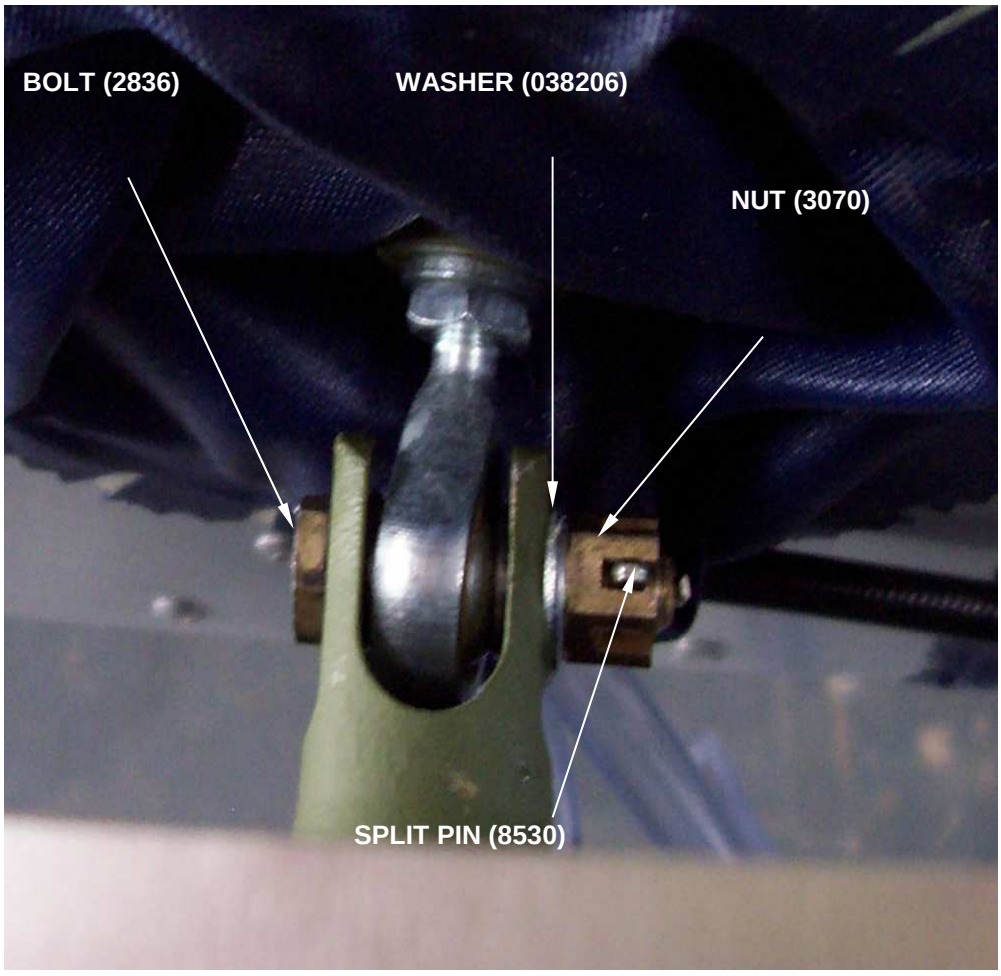
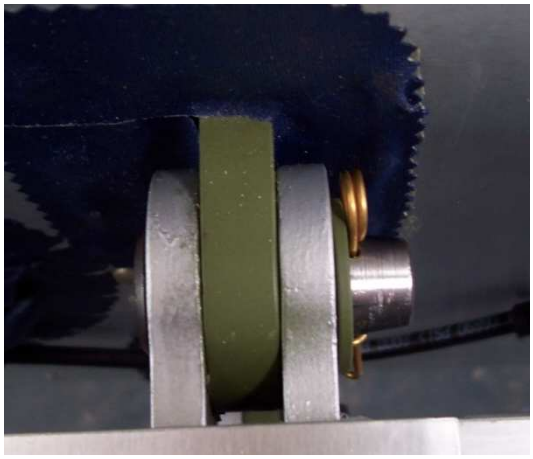
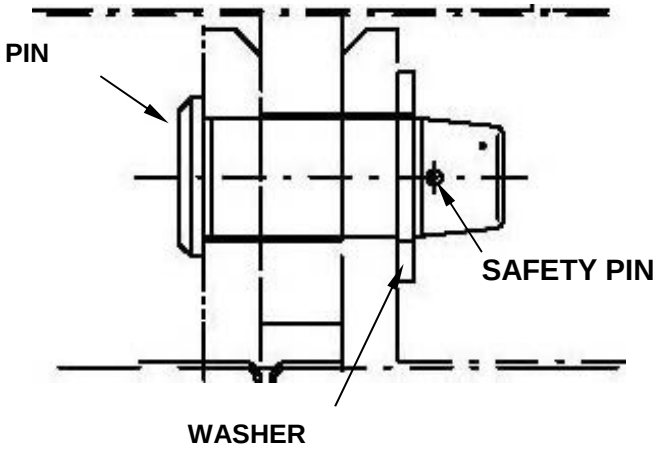


Figure 2

Ib. REPLACEMENT OF WINGS

Apply lubrication to the fuselage and wing attachment lugs to ease assembly. Align the wings with the spar attachments and fit pins top and bottom, fit bolt in the rear spar attachments. Put a washer on each main pin and secure with safety pin. Secure the rear spar attachment bolt using washer, nut and safety pin. Attach the push rod and fit a new split pin (1.6x12mm), reconnect the pitot and static lines. Replace the top and bottom fairings.





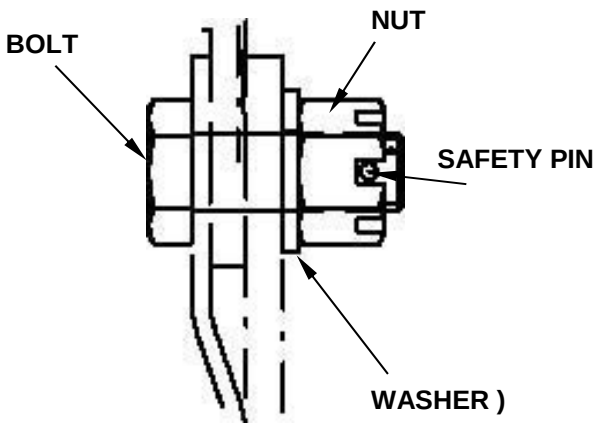


Figure 3

IIa. REMOVAL OF SEAT PANS AND STICK BACK STOPS

A. Loosen the seat belt retaining nuts and remove the flap cover by removing the eight M4 screws, foam grip and the trim knob (Figure 8), then pull the flap cover off over the flap lever.

B. Drill out all the rivets holding the seat pan in place (note: different size rivets are used). Figures 4, 5,6 and 7.

C. Using a heat gun, soften the emfirmastic attaching the seat pan to the side of the fuselage and gently separate the two with a thin knife or spatula blade and remove the seat pan.

WARNING
Removal of the seat pans must be done by an engineer experienced in the removal of aircraft rivets. If rivets are not removed correctly, damage to structural components may occur resulting in considerable expense to repair the damaged components

IIb. REPLACEMENT OF SEAT PANS AND STICK BACK STOPS

A. Fit the seat pan and replace the rivets. emfimastic should be applied only to the joint with the fuselage side (figure 4a) and between the doubler panel and the seat pan. Most rivets are 3.2 X 7.9mm. The exceptions are: six rivets (three each side) which fit through the spar cap and secure the control stick mounting brackets which are 3.2 X 11.1mm; another four (two each side) of the 3.2 X 11.1mm which fit at the inboard end of the row of rivets along the base of the pan and at the front inner end. Rivet the stick backstops in place using rivet 4 X 12.7mm Figure 5 and 6. See below for rivet part numbers

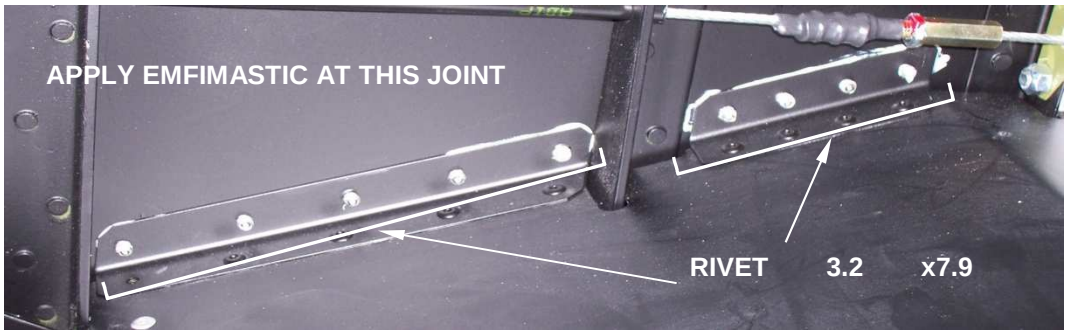


Figure 4a

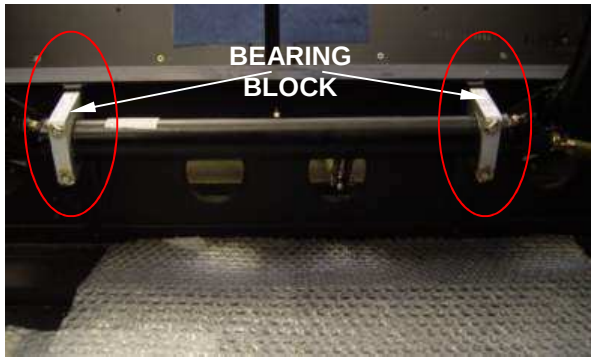


Figure 4b

Avex 3.2x7.9mm rivet part number 047560
Avex 3.2x11.1mm rivet part nimber 047565
Avex 4x12.7mm rivet part nimber 047570

Checks prior to seat pan replacement:

- Trim mechanism is secure and opperational
- Flap mechanism is secure and opperational
- Fuel hose is secure and undammaged (recommend fuel hose replacement)
- Rivet holes are not elongated or otherwise deformed or damaged
- Rivet holes for 3.2mm rivets are not greater than 3.5mm diameter
- River holes for 4.0mm rivets are not greater than 4.3mm diamter
- There is no other damage caused when removing rivets

Checks after seat pan replacement:

- The correct size and type of rivets used (an all rivets replaced)
- Rivets set satisfactorily
- Emfimastic used in correct locations
- The 3.2x11.1 rivets into the control cross tube bearing block attachment are properly inserted after replacement (Figure 4b)
- Ensure that rivets have picked up all the structure that they are intended to (particularly where rivets are holding together more than 2 metal sheets)

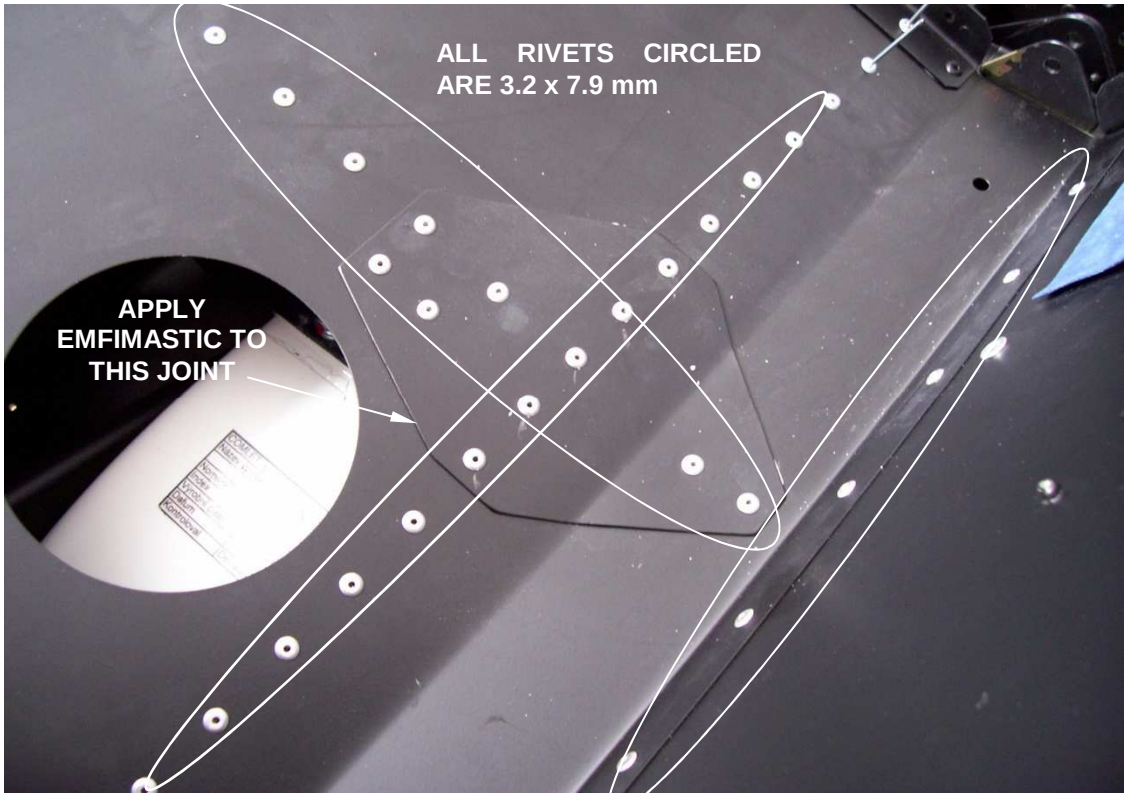


Figure 5

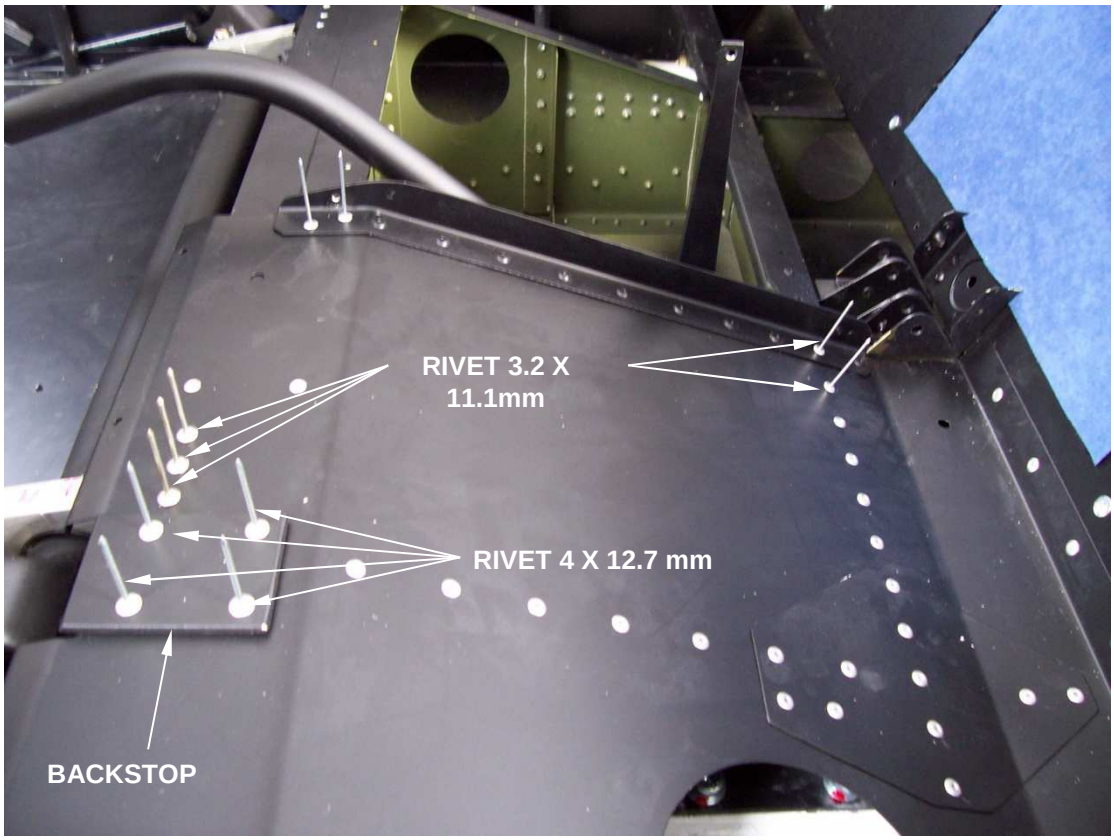


Figure 6

B. Rivet the front piece of the flap lever cover in place using two 3.2 X 7.9mm rivets.

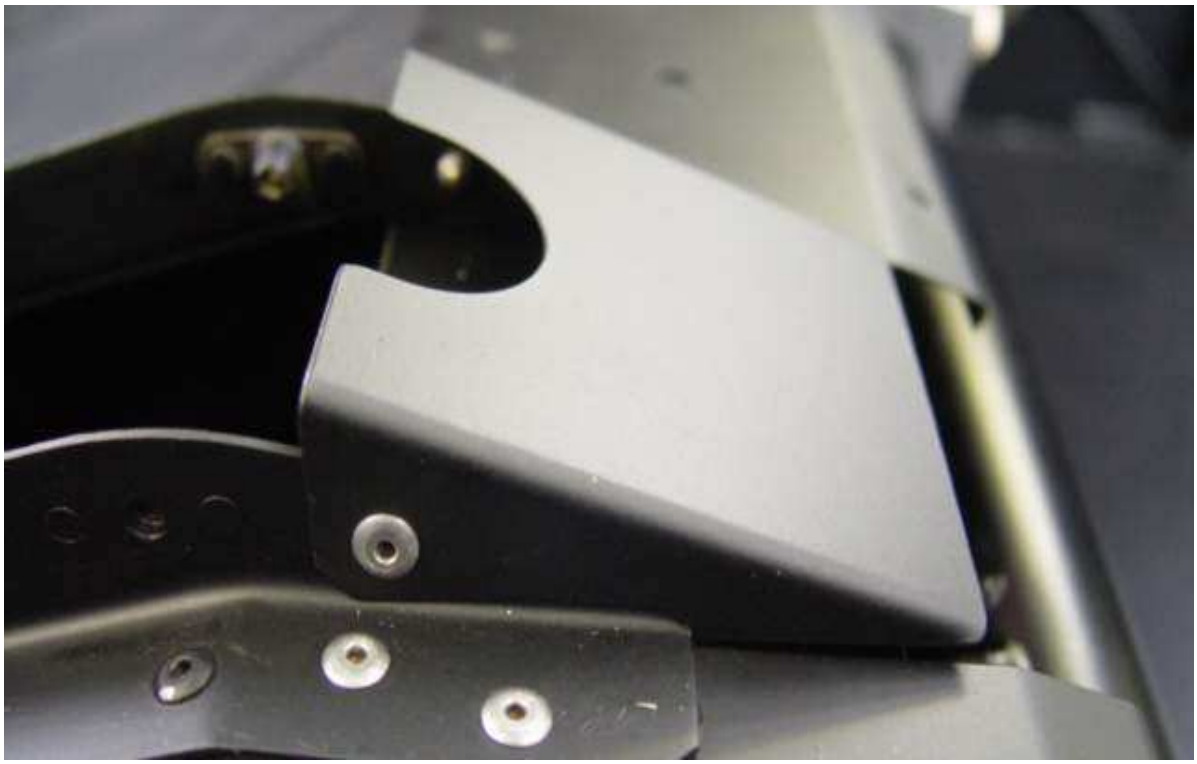


Fig 7.

C. Fit flap cover using screws M4 X 12. Fit trim lever knob and slide foam grip onto flap lever.

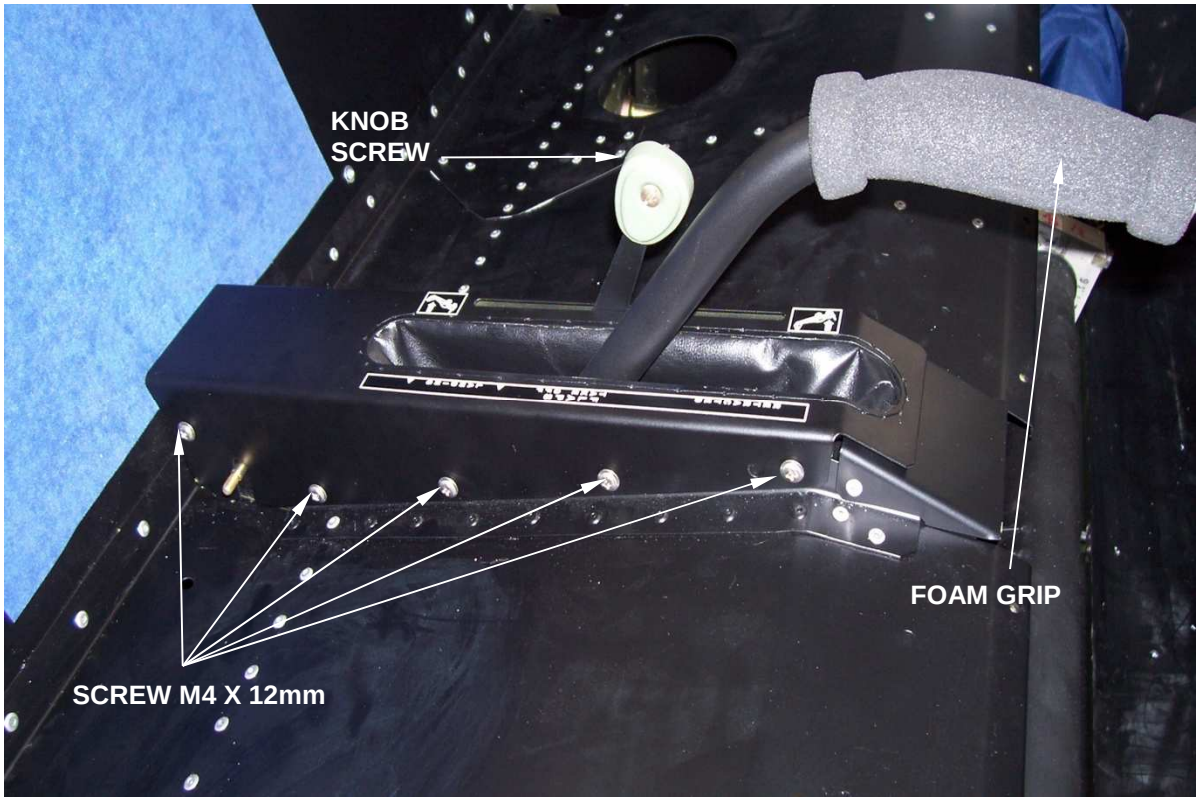


Fig 8.

IIIa. REMOVE THE HORIZONTAL STABILIZER

Remove the elevator push rod split pin, nut and bolt. Remove the split pins and M8 castle nuts attaching the stabilizer to the empennage (figure 9) and gently pull the stabilizer off the front locator pins.

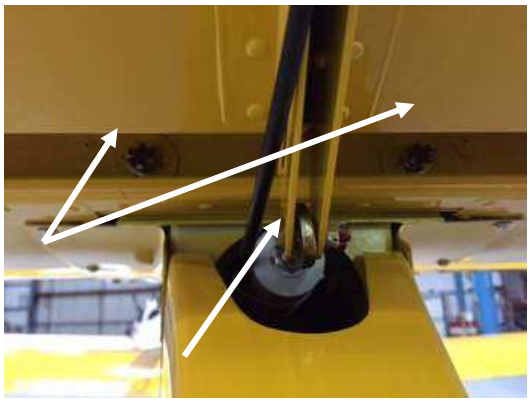


Figure 9

IIIb. REPLACE THE HORIZONTAL STABILIZER

Replace the stabilizer making sure that the two front pins are correctly located Replace the M8 castle nuts and fit new split pins (2x20mm). Reattach the elevator push rod and fit a new split pin (1.6x12mm).

IVa. REMOVAL OF THE RUDDER

Release the locking tab washers and remove the M6 bolts securing the rudder cables. Do not allow the rudder cable ends to fall into the fuselage. Remove the split pin and M5 nut (Figure 10), then gently lift the rudder until it disengages from the upper attachment pin.

Figure 10

IV. REPLACEMENT OF THE RUDDER

Grease both upper and lower rudder pivots and install rudder. Secure with M5 washer and nut M5. Fit a new split pin (1x12mm). Reinstall the rudder cables and fit new tab washers. Ensure the bolt is locked by the tab washers as shown in figure 10.

1.0.0 FUSELAGE CHECKS

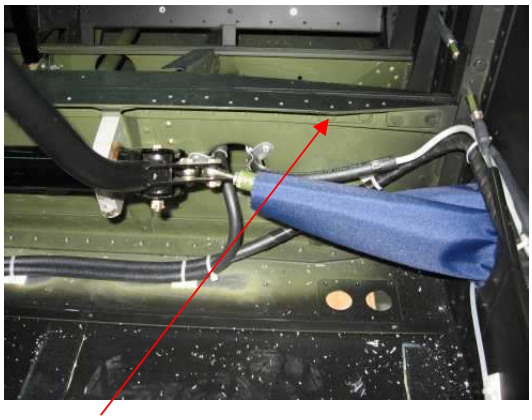
1.0.1

Fuselage central section wing attachment points (view for reference only).

1.0.2

Fuselage central section lower attachment in situ after removing seat pans.
(view for reference only)

1.0.3



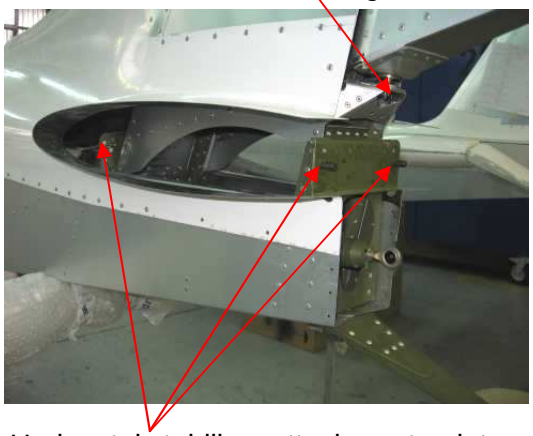
Fuselage central section upper attachment in situ after removing seat pans.
(view for reference only)

1.0.4

Max. radial play must not be more than 0.2mm

Wing attachment pins and outer flap torque tube bush
Maximum diameters of upper front attachment point ø15+0.03 mm
Maximum diameters of lower front attachment point ø15+0.03 mm
Maximum diameter of rear attachment point ø 8+0.04 mm

1.0.5 Rudder root hinge

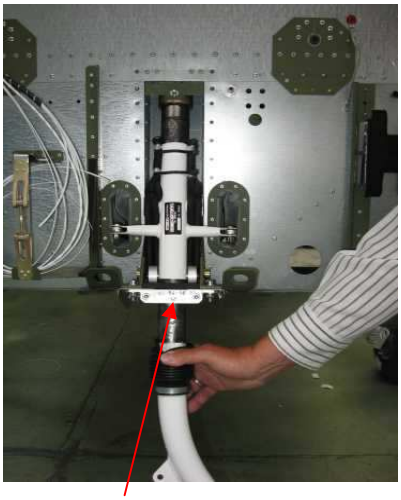


Horizontal stabilizer attachment points
Check the attachment points for loose or missing rivets.
Pin diameters: min ø6-0.04 mm (front)
ø8-0.05 mm (rear).

1.0.6

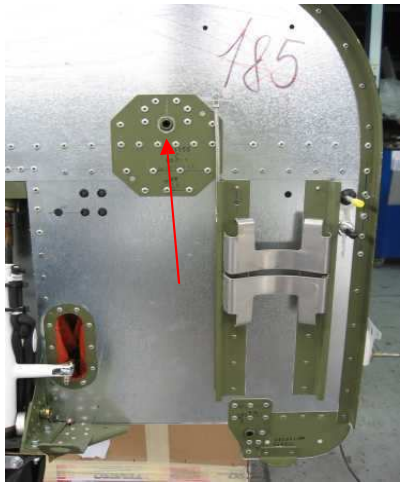
Main landing gear attachment under seats.
Check for cracking or loose rivets at the leg attachment points.

1.0.7



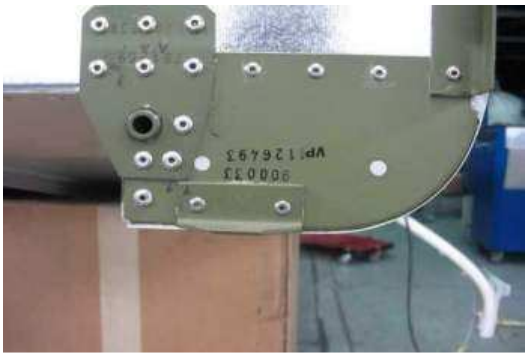
Nose landing gear attachment.
Check for wear in the lower bush.

1.0.8



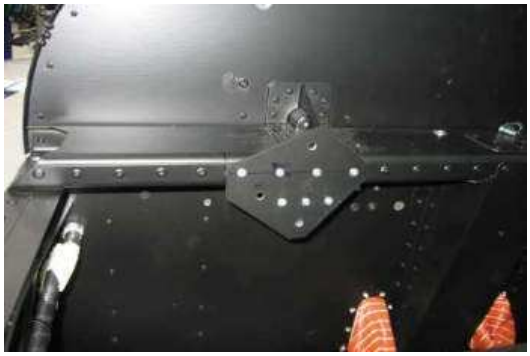
Left upper engine attachment on the fire wall.
Check for any loose rivets (front view).

1.0.9



Left bottom engine attachment.
Check for any loose rivets
(front view).

1.1.0



Security of the left upper engine attachment on the rear of the firewall.
Check for any loose rivets.
(view from inside of the fuselage).

1.1.1

Mid- fuselage reinforcement.
Check for loose or missing rivets.

1.1.2

Bottom part of the fuselage under the left bottom engine frame attachment.
Check for loose rivets.

1.1.3

Wing central section rivets.
Check for loose or missing rivets
where the central spar attaches to the floor.

1.1.4

Check main landing gear for cracks across the leg where it enters the fuselage and along the leading and trailing edges of the leg.

Check the attachment of the wheel axle for security and that the locating pins are not worn.

2.0.0 WING CHECKS

2.0.1

Check the attachment points.
Maximum diameters:
Upper front attachment point ø15+0.03mm.
Lower front attachment point ø15+0.03mm.
Rear attachment point ø 8+0.04mm.
Check that the holes are not oval and that there is no evidence of cracking.

2.0.2

Access to check the spar end caps is through the No. 1 rib fore and aft lightening holes.

2.0.3

Wing attachment bolts between ribs 1 and 2.

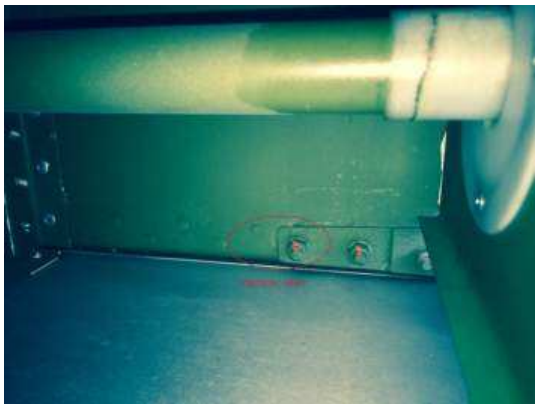
2.0.4a

The critical area of the spar cap at the end of the wing attachment hinge must be checked for cracks emanating from the bolt holes, particularly the 5th bolt.

2.0.4b

View of wing attachment bolts between ribs 1 and 2 (through the front lightening hole).

2.0.4c



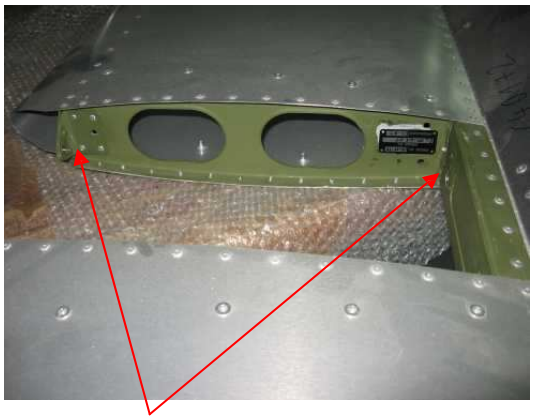
View of wing attachment bolts between ribs 1 and 2 (through the rear lightening hole).

3.0.0 EPENAGE CHECKS

3.0.1

Stabilizer attachment points.

3.0.2

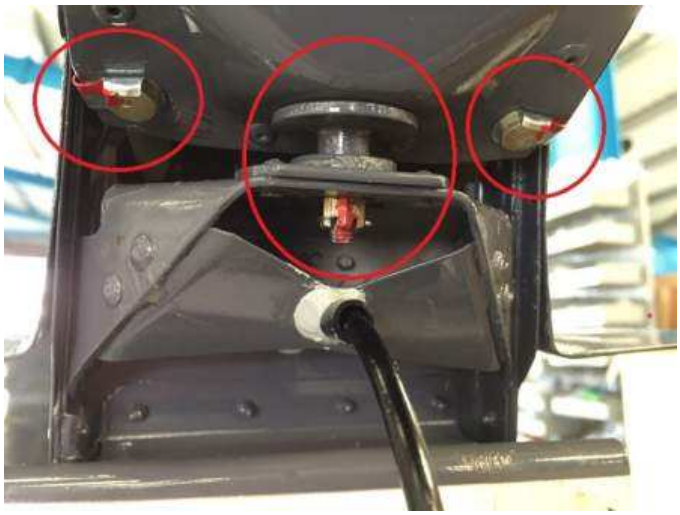


Stabilizer attachment points. Check for distortion, oval or enlarged holes and loose rivets.
Attachment point diameters:
ø8+0.04mm(rear); ø6+0.03mm (front).

3.0.3

Stabilizer spar
Check for distortion and loose rivets

3.0.4



Rudder lower bearing and rudder cable attachment.
Check the rudder for play (max. 0.25 mm) in the attachment bearing and any loose rivets around the attachment point. Check that the rudder cable attachments are secure

3.0.5

Check the vertical fin spar for distortion and the upper rose joint for security.

Engine Mount

Check the engine mount for cracks and ensure the attachment to the firewall is secure and wire locked

Notification & Recording

FOR AIRCRAFT ON THE BMAA REGISTER:

The inspection and subsequent reassembly of primary controls and primary structure are affected in this maintenance manual. A second inspection by a competent person is required for these items.

The mandatory 2000+ hour inspection (including seat pan removal and replacement) is required to be overseen by the BMAA Technical Office. Contact the Technical Office in advance of starting the work.

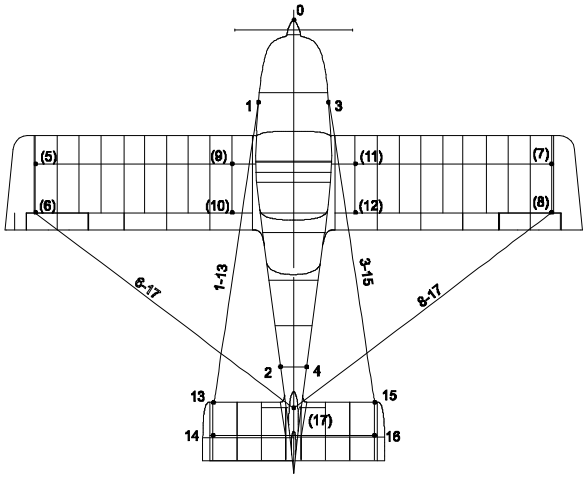
Notify Light Sport Aviation of any findings such as structural deformation, cracks and loose or sheared rivets. Record compliance with the inspection schedule in the aircraft log book.

FOR AIRCRAFT ON THE LAA REGISTER:

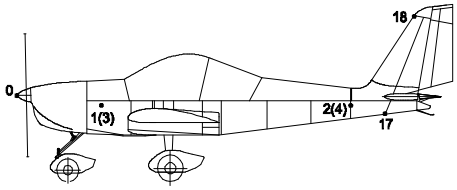
The inspection and subsequent reassembly of all the inspected parts must be completed to the satisfaction of a suitably qualified LAA Inspector. Worksheets and log book entries must be raised and signed by the inspector confirming compliance with this bulletin. Notify Light Sport Aviation and LAA Engineering of any findings such as structural deformation, cracks and loose or sheared rivets.

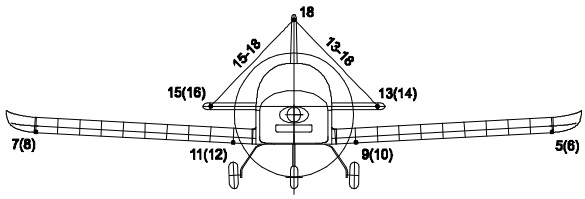
Appendix 2 - Levelling Record

Model:		**Registration:**	G-	**S/N:**	



Vertical measurement





Differences left / right side

Point	Measure
1	
2	
3	
4	
5	
6	
7	
8	
9	
10	
11	
12	
13	
14	
15	
16	
17	

Straight measurement

Points	Measure
1-13	
3-15	
6-17	
8-17	
13-18	
15-18	

Specified values			Actual
Points	Difference	Tolerance	Difference
1-3	0	*±0.08 in*	
2-4		±2 mm	
1-2	0	*±0.08 in*	
3-4		±2 mm	
5-6	0	*±0.2 in*	
7-8		±5 mm	
9-10	0	*±0.1 in*	
11-12		±3 mm	
5-9	136 mm *5.35 in*	*±0.4 in* ±10 mm	
7-11			
6-10			
8-12			
13-15	0	*±0.4 in*	
14-16		±10 mm	
1-13	0	*±0.8 in*	
3-15		±20 mm	
6-17	0	*±0.8 in*	
8-17		±20 mm	
13-18	0	*±0.4 in*	
15-18		±10 mm	

Levelling carried out by: Date:

Appendix 3 - Control Surface Deflection Record

Model:	**Registration:** G-	**S/N:**

		Specified deflection	Actual deflection
Longitudinal Control	Elevator upward deflection	25°±1°	
	Elevator downward deflection	20°±1°	
Lateral Control	Port aileron upward deflection	20°±1°	
	Port aileron downward deflection	15°±1°	
	Starboard aileron upward deflection	20°±1°	
	Starboard aileron downward deflection	15°±1°	
Rudder Control	Rudder Port deflection	30°±2°	
	Rudder Starboard deflection	30°±2°	
Wing Flaps	Port flap deflection in "TAKEOFF" position	15°±2°	
	Port flap deflection in "LANDING" 1st position	30°±3°	
	Port flap deflection in "LANDING" 2nd position	50°±3°	
	Starboard flap deflection in "TAKEOFF" position	15°±2°	
	Starboard flap deflection in "LANDING" 1st position	30°±3°	
	Starboard flap deflection in "LANDING" 2nd position	50°±3°	
	Max. difference between port and starboard flap deflections	2°	
Elevator trim tab	Max. upward trim tab deflection (elevator neutral)	0°±2°	
	Max. downward trim tab deflection (elevator neutral)	40°±5°	
	Neutral trim tab position. (elevator neutral, trim tab control lever in neutral position)	15°	

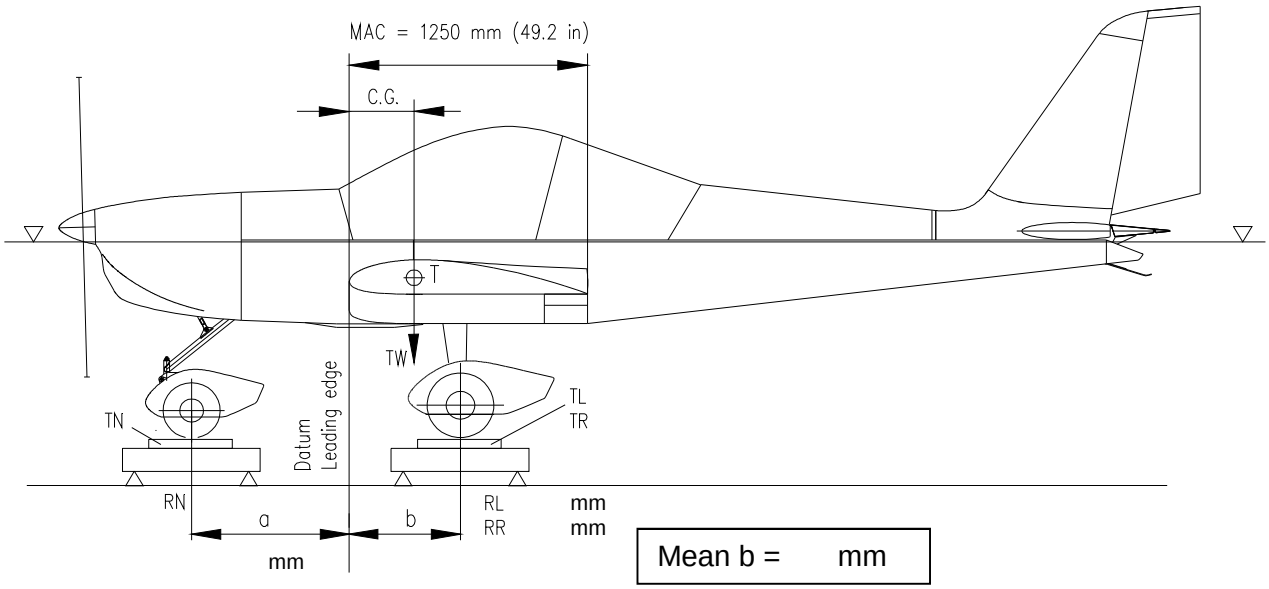
Control Surfaces Deflection compliance: YES

Measurements carried out by:

Date:

Appendix 4 - Weight & Balance Record

Model :		**Registration :**	G-	**S/N :**	
Configuration :					



Mean b = mm

Weighing Point	**Scale Reading** R_i **[lbs] or[kg]**	**Tare** T_i **[lbs] or [kg]**	**Net Weight** $NW_i = R_i - T_i$ **[lbs] or [kg]**
Nose wheel	R_N =	T_N = 0	NW_N =
Port wheel	R_L =	T_L = 0	NW_L =
Starboard wheel	R_R =	T_R = 0	NW_R =
Total Weight [lbs] or [kg] $TW=NW_N+NW_L+NW_R$ = Kg			**TW = Kg** permitted basic empty weight (standard equipment): max. 290.5 kg

Weighing carried out by: Date:

Appendix 5 - Flight Test Record

Model		**Ser. No.:**	**Registration :G-**	
Engine Rotax 912UL		**Ser. No.:**	**Take-off weight: Kg**	
Prop.: Woodcomp		**Ser. No.:**		
Test flight take-off weight = 472.5KG +0, -10 KG				
Regime:		**Limit**		**Result**
Meteorological conditions		**QNH**		
		Temperature °C		
		Wind direction/speed		
Pre-flight Engine Checks	**Full Throttle**	**Engine max. rpm static**	**>4600 rpm**	
		Oil temperature	**>50°C**	
		Oil pressure	**1.5 – 5 bar**	
	Ignition check	**At 4000 rpm**	**max. drop 300 rpm**	
			max. difference 120 rpm	
	Idle		**1400 - 1800 rpm**	
Take off & climb through 1000ft. IAS 63kt		**Engine speed**	**max. 5500 rpm**	
		Oil pressure	**1.5 – 5 bar**	
		Oil temp.	**max. 140°C**	
		CT	**max. 120°C**	
		Time to climb 1000ft	**<1min:30sec**	
		Fuel pressure	**0.15 – 0.4 bar**	
Stall speed at idle (IAS)		**Landing config. (flaps down)**	**<35kt(40mph)**	
		Cruise config. (flaps up)	**<40kt(46mph)**	
Steep turns		**Max. 60°**		
Never exceed speed		**V_{NE} = 127kt(146mph)**		
		Engine speed	**<5800 rpm**	
Cruising speed at 2000 ft		**At engine speed 4200**		
		At engine speed 4600		
		At engine speed 4800 (max. continuous)		
		Oil temperature	**50 – 120 °C**	
		CT	**50 – 120 °C**	
Max. horizontal speed at 2000 ft.		**At engine speed <5,800 rpm min. 110knots(127mph)**		
		Oil temp.	**50 – 120 °C**	
		CT	**50 - 120°C**	

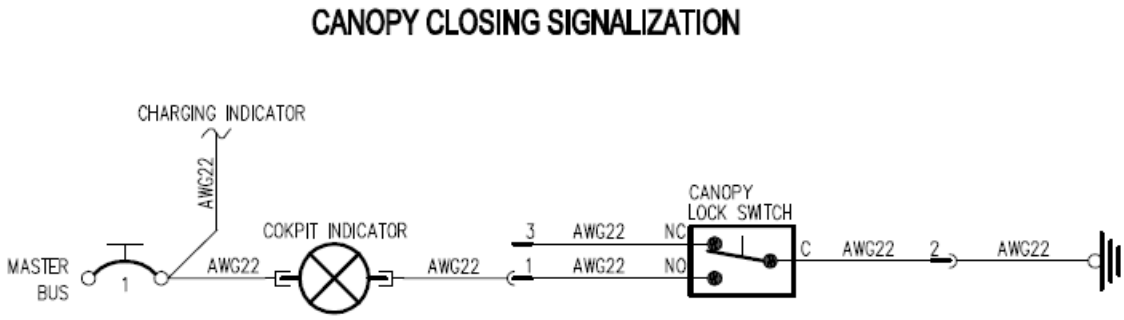
Date:	**Pilot's Signature**
Location: Wycombe Air Park	**Pilot's Name: S. Pike**

Transponder check at 3000 feet over Stokenchurch with Farnborough satisfactory / not satisfactory

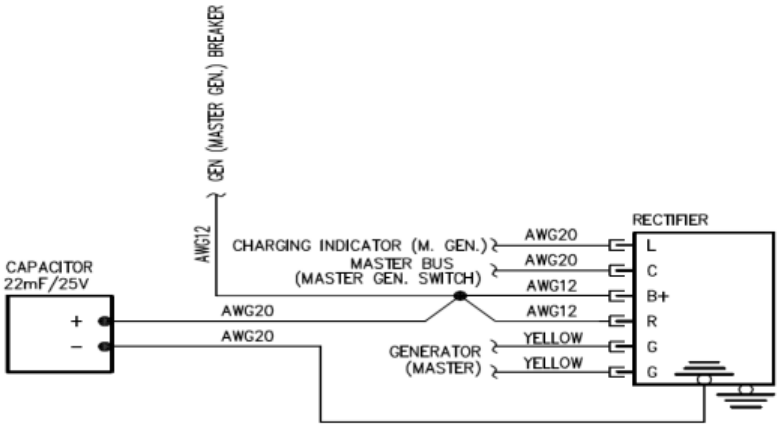
Appendix 6 – Electrical Circuit Diagrams

The following circuits are installed as standard in the Eurostar SL. Additional circuits, or amendments to those shown, may be installed depending on options selected.

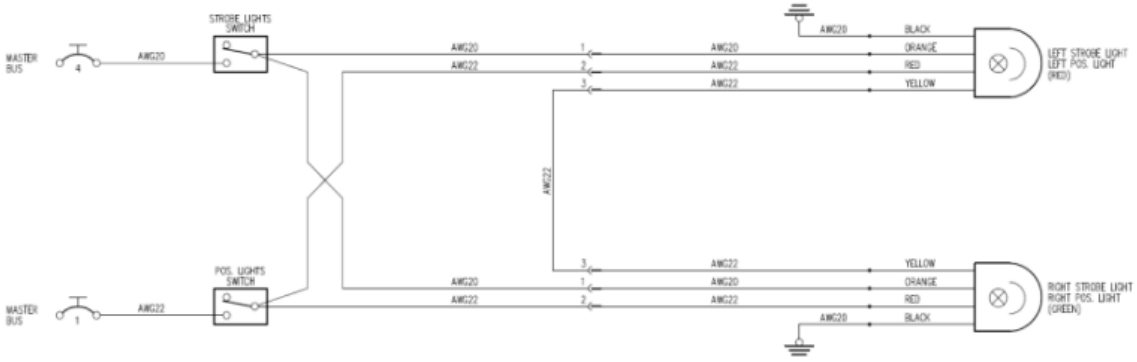
Canopy Closed Indicator



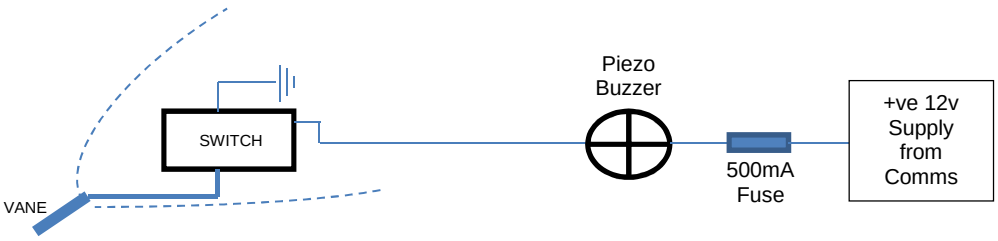
Regulator-Rectifier



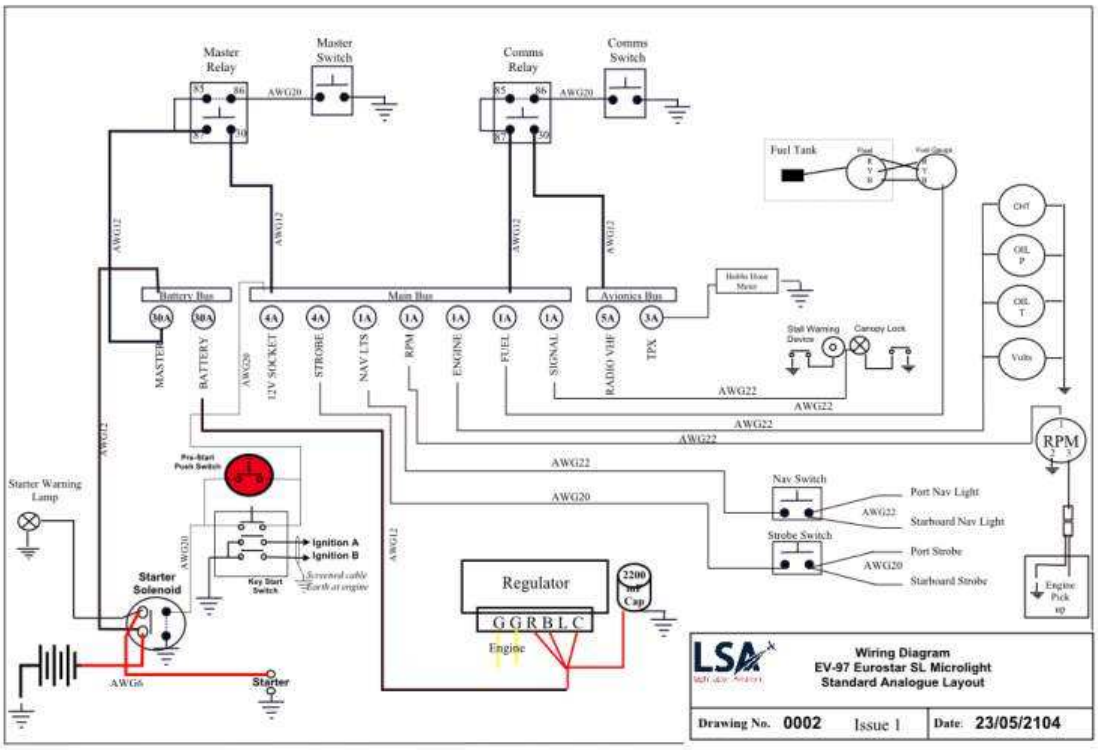
Whelen Strobe and Position Lights



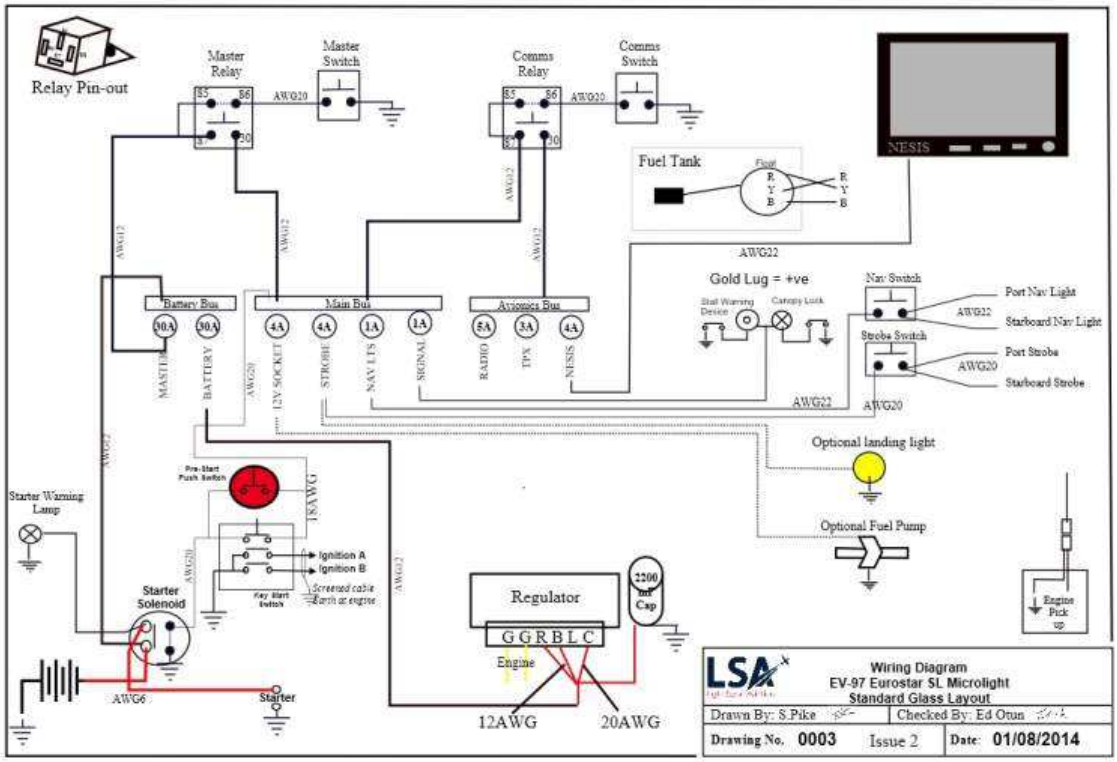
Stall Warner



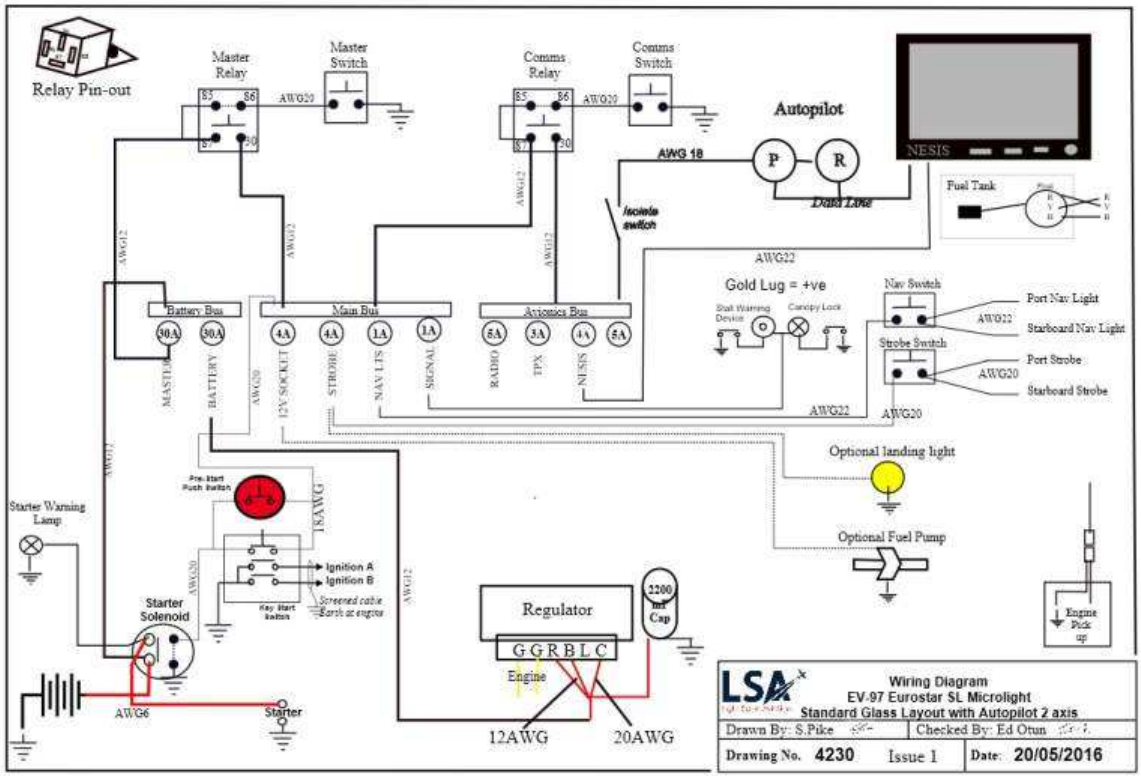
Wiring Diagram (Analogue Panel)



Wiring Diagram (Electronic Panel without Autopilot)



Wiring Diagram (Electronic Panel with Autopilot)



Appendix 7 - Additional Equipment List

EV-97 Eurostar SL Microlight Serial Number ……

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