AIRCRAFT OPERATING INSTRUCTIONS
Light Sport Aircraft

EDGE X SERIES MICROLIGHTS with Wizard 3 or Streak 2 Wing

Approved: . Date: October 2007

Delegate of *A*irBorne WindSports Pty Ltd

Serial No. Base	**X**	
Serial No. Wing		
Registration No.		

This manual is compliant with the ASTM designation f2457 – 05 Standard Specification for Required Product Information To Be Provided With Weight-Shift-Control Aircraft.

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AIRCRAFT OPERATING INSTRUCTIONS - DETAILS

Aircraft Operating Instructions Issued By	
Date	
For AirBorne WindSports Pty. Ltd.	

Table 1 Section 0. Aircraft Operating Instructions

MANDATORY SERVICE BULLETINS

AS THE SERVICE HISTORY OF THE AIRFRAME EVOLVES AIRBORNE WILL FROM TIME TO TIME ISSUE MANDATORY SERVICE BULLETINS WHICH DETAIL ANY CHANGES TO THE MAINTENANCE MANUALS, AIRCRAFT OPERATING INSTRUCTIONS, OR ANY OTHER DETAILS THAT AIRBORNE DEEMS NECESSARY FOR OWNERS TO BE NOTIFIED OF.
THE WEB ADDRESS FOR SERVICE BULLETINS IS:
HTTP://WWW.AIRBORNE.COM.AU/
IT IS THE RESPONSIBILITY OF THE OPERATOR TO KEEP UP TO DATE WITH ANY ROTAX DIRECTIVES THROUGH THE ROTAX WEBSITE.

DATA PACKAGE

This issue of the Aircraft Operating Instructions constitutes one part of the complete data package that accompanies the aircraft. Following is a list of each of the components which are required.

• Aircraft Operating Instructions	+
• EDGE X Maintenance Manual	
• EDGE X Illustrated Parts Catalogue	
• Wing Maintenance Manual	
• Wing Illustrated Parts Catalogue	
• Rotax Owners Manual	
• Rotax Maintenance (Compact Disk)	
• Radio Manual – If Installed	
• BRS Parachute Manual – If Installed	

Table 2 Section 0. X Series Data Package

Certification documentation is held by the aircraft manufacturer,
Contact Information:

Airborne WindSports Pty Ltd
PO Box 7042 Redhead
NSW 2290
Australia

Telephone +61 2 49449199
Web address: http://www.airborne.com.au

Or for recovery of the certification documentation, should the above contact not be available; contact the Civil Aviation Safety Authority of Australia.
Web address http://www.casa.gov.au/

AMENDMENT RECORD SHEET

Amendment Date	Affected Sections	Affected Pages	Date Inserted	Signature

Manuals will be revised from time to time and reissue of amended pages will be achieved by sending the pages to the current owner registered on AirBorne's database. Amendments will also be available on the Airborne Website (http://www.airborne.com.au/). The amended pages should be printed and the prior page replaced in the manual's folder as soon as possible. The amendment table should at that time be updated with the appropriate details and date.

Table 3 Section 0. Amendment Record Sheet

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CONTENTS OF GENERAL SECTION 1

1 GENERAL

This document, Aircraft Operating Instructions (AOI) is structured with various sections to comply with the General Aviation Manufacturers Association (GAMA) handbook specification. The GAMA format has been adopted and used where applicable for this weight shift controlled microlight.

The AOI contains information for the Airborne X series aircraft of the following configuration:
Classic; Rotax 582 powered, full pod and spats
Outback; Rotax 582 powered, instrument binnacle, open wheels
Redback; Rotax 503 powered, instrument binnacle, open wheels
Wizard wing
Streak wing

1.1 Introduction

This microlight series has been designed and manufactured in accordance with the ASTM designation 2317-04 Standard Specification for Design of Weight-Shift-Control Aircraft.

As an Australian Company, we are proud of our range of microlight aircraft. Our microlights have been developed to provide the economy and durability required to meet the exacting demands of our Australian conditions.

The success of our microlights is based upon a high standard of product quality, innovative design engineering and exceptional standards of reliability and performance that have been established since 1983.

Regular maintenance is required to keep your microlight in a safe condition. Detailed maintenance requirements are outlined in the wing and base maintenance manuals. Please reference these manuals to ensure your microlight is maintained correctly.

The AirBorne Team has developed from the long-standing friendship of a group of enthusiasts who share conviction in the intrinsic advantages of weight shift controlled aircraft. The AirBorne Team is confident your new microlight will provide you with many years of enjoyable flying, and we wish you and your family safe and happy flying for the future. The operating procedures outlined in these Aircraft Operating Instructions are the result of AirBorne's knowledge and experience gained since 1983.

NOTE
AirBorne data packages will be revised from time to time. It is therefore important that owners promptly notify Airborne of any changes to their contact details. Owners registered on AirBorne's database will be notified of any changes to data and directed to the AirBorne web site (http://www.airborne.com.au/) for the applicable pages. The amended pages should be printed and the replacement pages inserted in the folder as soon as possible. The amendment table should at that time be updated with the appropriate details and date. Revised pages will be sent by mail if requested from AirBorne WindSports, the contact details are at the front of this manual.

1.1.1 Warning Notice

WARNING

THERE ARE INHERENT RISKS IN THE PARTICIPATION IN RECREATIONAL AVIATION AIRCRAFT. OPERATORS AND PASSENGERS OF RECREATIONAL AVIATION AIRCRAFT, BY PARTICIPATION, ACCEPT THE RISKS INHERENT IN SUCH PARTICIPATION OF WHICH THE ORDINARY PRUDENT PERSON IS OR SHOULD BE AWARE. PILOTS AND PASSENGERS HAVE A DUTY TO EXERCISE GOOD JUDGMENT AND TO OBEY ALL ORAL OR WRITTEN WARNINGS, OR BOTH, PRIOR TO OR DURING USE OF THE AIRCRAFT, OR BOTH.

THE OWNER AND OPERATOR MUST UNDERSTAND THAT DUE TO THE INHERENT RISK INVOLVED IN FLYING A MICROLIGHT/ULTRALIGHT/TRIKE/POWERED HANG GLIDER, NO WARRANTY IS MADE OR IMPLIED, OF ANY KIND, AGAINST ACCIDENTS, BODILY INJURY OR DEATH OTHER THAN THOSE, WHICH CANNOT BY LAW BE EXCLUDED.

THE SAFE OPERATION OF THIS AIRCRAFT RESTS WITH YOU, THE PILOT.

WE BELIEVE THAT IN ORDER TO FLY SAFELY YOU MUST MATURELY PRACTICE AIRMANSHIP.

OPERATIONS OUTSIDE THE RECOMMENDED FLIGHT ENVELOPE SUCH AS AEROBATIC MANOEUVRES OR ERRATIC PILOT TECHNIQUE MAY ULTIMATELY PRODUCE EQUIPMENT FAILURE. YOU ARE REFERRED TO THE OPERATING LIMITATIONS IN SECTION 2 OF THIS MANUAL

THE SETTING UP AND BREAKING DOWN OF A MICROLIGHT/ULTRALIGHT/TRIKE/POWERED HANG GLIDER, TRANSPORTATION AND FLYING WILL HAVE AN EFFECT OVER TIME ON ITS STRUCTURAL INTEGRITY.

THE AIRCRAFT WILL REQUIRE MAINTENANCE AS OUTLINED IN THE APPLICABLE MAINTENANCE MANUALS.

LIKE ANY AIRCRAFT, SAFETY DEPENDS ON A COMBINATION OF CAREFUL MAINTENANCE AND YOUR ABILITY TO FLY INTELLIGENTLY AND CONSERVATIVELY.

WE HOPE THAT YOUR AIRCRAFT WILL PROVIDE YOU WITH MANY HOURS OF SAFE AND ENJOYABLE FLYING.

1.1.2 Definitions

Definitions used in these Aircraft Operating Instructions such as **WARNING, CAUTION** and **NOTE** are employed in the following context.

WARNING

OPERATING PROCEDURES, TECHNIQUES, ETC. WHICH IF NOT FOLLOWED CORRECTLY, MAY RESULT IN PERSONAL INJURY OR DEATH.

CAUTION

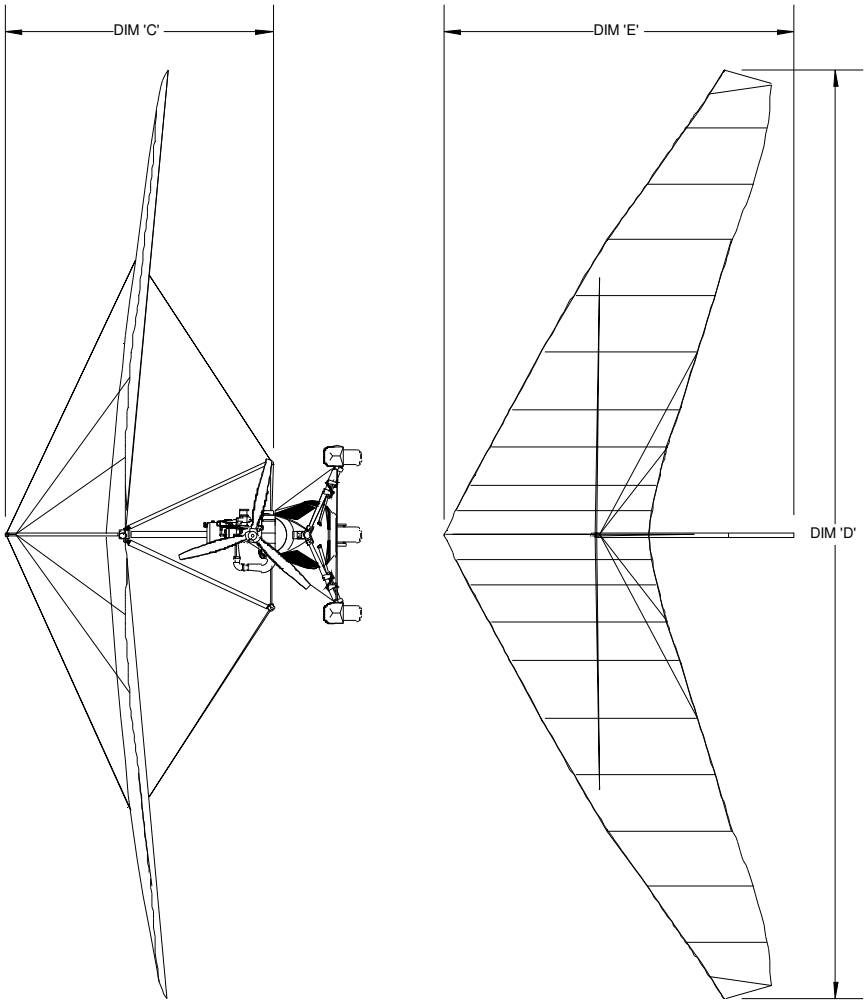
OPERATING PROCEDURES, TECHNIQUES, ETC. WHICH IF NOT STRICTLY OBSERVED, MAY RESULT IN DAMAGE TO THE AIRCRAFT OR ITS INSTALLED EQUIPMENT.

NOTE

Operating procedures, techniques, etc. which it is considered essential to highlight.

1.2 General Description

1.2.3 Aircraft 3 View



	WIZARD WING	STREAK WING
DIM 'A'	3.745M	3.785M
DIM 'B'	4.600M	4.600M
DIM 'C'	2.830M	2.830M
DIM 'D'	9.960M	9.970M
DIM'E'	3.360M	3.200M

Figure 1 Section 1. Aircraft 3 View

1.2.4 Photographs to illustrate dimensions for hangarage

Figure 2 Side View Control Bar Forward

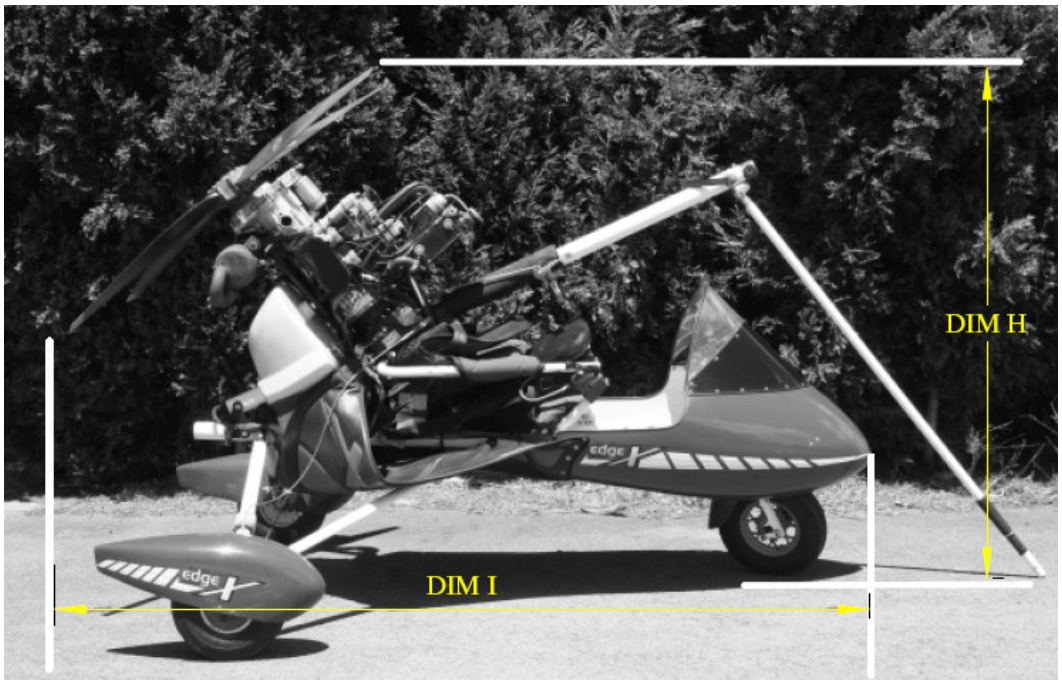


Figure 3 Side view, Base Folded

1.2.5 General Dimensions

1.2.5.1 Wizard Wing

DIMENSIONS	Australian	European	USA
Wing Span	9.96 m	9.96 m	32.7 ft
Wing Area	17.6 sq m	17.6 sq m	189 sq ft
Aspect Ratio		5.6	
Wing Weight	49 kg	49 kg	108 lbs
Wing (Packed) Length	5.96 m	5.96 m	19.6 ft
Wing Length (Short Packed)	4.2 m	4.2 m	13.8 ft
Height on Classic X, maximum	3.8 m	3.8 m	12.5 ft
Height on Classic X, control bar forward	3.55 m	3.55 m	11.7 ft
Height on Outback/Redback X Tundra, maximum	3.83 m	3.83 m	12.6 ft
Height on Outback/Redback X Tundra, control bar forward	3.58 m	3.58 m	11.8 ft

1.2.5.2 Streak Wing

DIMENSIONS	Australian	European	USA
Wing Span	9.97 m	9.97 m	32.7 ft
Wing Area	14.4 sq m	14.4 sq m	155 sq ft
Aspect Ratio		6.9	
Wing Weight	51 kg	51 kg	112 lbs
Wing (Packed) Length	5.6 m	5.6 m	18.4 ft
Wing Length (Short Packed)	4.2 m	4.2 m	13.8 ft
Height on Classic X, maximum	3.81 m	3.81 m	12.5 ft
Height on Classic X, control bar forward	3.46 m	3.46 m	11.4 ft
Height on Outback/Redback X Tundra, maximum	3.81 m	3.81 m	12.5 ft
Height on Outback/Redback X Tundra, control bar forward	3.46 m	3.46 m	11.4 ft

1.2.5.3 Edge X Outback / Redback with Tundra Wheels

DIMENSIONS	Australian	European	USA
Trike Length	2.7 m	2.7 m	8.86 ft
Trike Width	1.96 m	1.96 m	6.4 ft
Wheel Track	1.72 m	1.72 m	5.6 ft
Wheel Base	1.79 m	1.79 m	5.9 ft
Trike Height to mast top	2.57 m	2.57 m	8.4 ft
Cockpit Width	0.7 m	0.7 m	2.3 ft
Height hang point	2.52 m	2.55 m	8.25 ft
Trike length, mast folded, propeller on (Figure 3, DIM I)	2.74 m	2.74 m	9.0 ft
Minimum trike transport height wheels on, propeller on, With mast top supported (Figure 3, Dim H)	1.79 m	1.79 m	5.9 ft
Base empty weight, typical refer to section 6.3			

Edge X Classic

DIMENSIONS	Australian	European	USA
Trike Length, with mast up	2.80 m	2.80 m	9.2 ft
Trike Width	1.91 m	1.91 m	6.3 ft
Wheel Track	1.71 m	1.71 m	5.6 ft
Wheel Base	1.78 m	1.78 m	5.8 ft
Trike Height to mast top	2.53 m	2.53 m	8.3 ft
Cockpit Width	0.7 m	0.7 m	2.3 ft
height hang point	2.51 m	2.51 m	8.22 ft
Trike length, mast folded, propeller on (Figure 3, DIM I)	2.86 m	2.86 m	9.4 ft
Minimum trike transport height wheels on, propeller on, With mast top supported (Figure 3, Dim H)	1.76 m	1.76 m	5.8 ft
Base empty weight, typical refer to section 6.3			

Heights for non tundra, Binnacle model trikes are as per the Classic.

Table 1 Section 1. General Dimensions

1.2.5.4 Hangar dimensions

Hangarage of trikes is performed in various ways, including:

- Complete and assembled, roll in.
- Complete and assembled, mount on caster wheel platform, roll in sideways.
- Remove wing from trike base and store separately.
  - Wing storage assembled separately.
  - Wing pack up into bag.
  - Store on trailer.
- Combinations of the above.

Dimensions are provided for the outer dimensions related to the storage of assembled aircraft. The hangarage dimensions of combinations of wing and trike base models are provided in the table below.

Hangar Dimensions	X Classic Streak	X Classic Wizard	X Binnacle Standard wheels Streak	X Binnacle Standard wheels Wizard	X Binnacle Tundra Streak	X Binnacle Tundra Wizard
Max height with wing	3813	3803	3813	3803	3843	3833
Min height with wing control fwd, mast up	3460	3550	3460	3550	3490	3580
Min height with wing on, mast low	2868	2858	2868	2858	2868	2858
Wingspan	9970	9960	9970	9960	9970	9960
Length with wing on, mast up	3465	3701	3340	3576	3370	3606
Length with wing on, mast low	3640	4005	3515	3880	3515	3880

Hangar Dimensions	X Classic Streak	X Classic Wizard	X Binnacle Standard wheels Streak	X Binnacle Standard wheels Wizard	X Binnacle Tundra Streak	X Binnacle Tundra Wizard
Max height with wing	3813	3803	3813	3803	3843	3833
Min height with wing control fwd, mast up	3460	3550	3460	3550	3490	3580

Table 2 Section 2. Assembled Aircraft Hangarage Dimensions

Trailer dimensions, Trailer Plans
Trailer dimensions are available on the trailer drawing, available for free download from the Airborne website
http://www.airborne.com.au/images/pdf/trailer.pdf

1.3 General Description

1.3.5.1 Base

The X series trike base is a two seat (in-line) weight shift controlled aircraft. Two options of engine power are available with further variant breakdown as follows:

- Redback, Rotax 503 two-stroke engine producing 50 HP, with the following configurations:
    - Redback, Standard undercarriage, 6IN X 6.00 Standard tyres rear
    - Redback, Tundra undercarriage, 6IN X 8.00 balloon tyres all wheels.
- Rotax 582 two-stroke engine producing 65 HP. Available in three configurations:
    - Classic, full pod cockpit with wheel spats
    - Outback, open wheel, open cockpit with instrument binnacle
        - Outback, Standard undercarriage, 6IN X 6.00 Standard tyres rear
        - Outback, Tundra undercarriage, 6IN X 8.00 balloon tyres all wheels.

X Series Classic

It's smooth aerodynamic lines have been a winner with many of our customers over the years. The Classic is a robust and reliable aircraft. The fairing offers protection from the elements, the soft sides give you a place to store baggage, and it looks stunning in any of the four available colours.

The Classic comes virtually fully optioned with most of the extras you would want to go flying XC.

The Classic is a 2 place aircraft with in line seating, is powered by a Rotax 582, is a white framed full cockpit model, with windscreen, wheel spats and electric start.

X Series Outback

The Outback is a workhorse and the model favoured by many farmers. It is easy to get in and out off, the fit-out allows for great visibility. Photographers love the openness of the Outback. The Tundra option allows for landing in harsher than normal terrain than the standard undercarriage. It's an idea that trike pilots in Alaska have been using successfully for years and works a treat on sand.
Add the tundra option to the 582 powered Outback and you will own one of the most versatile aircraft you can buy. The big tundra tire option coupled with the Wizard 3 wing will give you some amazing landing options. The Outback in this configuration also makes for a great hang glider tug or workhorse for towing banners and stock mustering!

The Outback is a 2 place aircraft with in line seating, is powered by a Rotax 582, is a red framed, open cockpit model, with instrument binnacle, open wheels, electric start and may be fitted with standard or tundra wheels.

X Series Redback

This two seater trike offers pilots ultimate simplicity. It's light weight allows for a higher pilot passenger weight because it has less bells and whistles than our other models which add to the overall take-off weight. The Redback trike makes for an excellent aerial photography platform, as it offers the pilot and passenger less restricted views than fully faired versions.

The Redback is a 2 place aircraft with in line seating, is powered by a Rotax 503, is a red framed, open cockpit model, with instrument binnacle, open wheels, pull start and may be fitted with standard or tundra wheels.

1.3.5.2 Wing

Streak 2B

The Streak 2B wing is the result of continued refinement of AirBorne trike wings. The wings are fairly typical of an established class of swept, tapered, flexible fabric wings with enclosed crossbars and a relatively high aspect ratio.

The Streak 2B sail has several cloth and velcro shear ribs, which combined with an excellent sail "fit", produces a wing that has light handling with impressive "feel" in turbulence. The battens ends are a unique design, which can be adjusted to vary tension for tuning the wing. The batten mechanism allows easy installation and removal of the battens.

A round aluminium section is used for the down tubes and king post for strength and the simplicity of fittings.

Wizard 3

The Wizard Wing is a well refined slow flying and nimble handling wing. Used for short field take off and landing, this wing is ideal for farming uses as well as aerotowing of ultralight gliders and banners.

1.3.5.3 Power Plant

Model	Rotax 503 - UL	Rotax 582 - UL
Displacement	497 cc	581 cc
Max Horsepower	49.6 HP @ 6500 rpm	64.4 HP @ 6500 rpm
Ignition System	Dual Ignition	Dual Ignition
No. of Cylinders	2	2
Carburettor	2xBing 36mm	Bing 54 Double Float
Fuel Grade	Unleaded Fuel (min. RON 90)	Unleaded Fuel (min. RON 90)
Fuel Mixture	50:1 - 2 Stroke (super 2-stroke oil, meet/exceed ASTM/CEC standard API-TC)	50:1 - 2 Stroke (super 2-stroke oil, meet/exceed ASTM/CEC standard API-TC)
Lubrication [1]	Oil-in-fuel mixture	Oil-in-fuel mixture
Cooling System	Air Cooled	Liquid cooling
Cooling System Capacity Mixture Ratio	Not Applicable	4 litres (50ml of inhibitor to 3.95 litres water)
Recommended Cooling System Additive	Not Applicable	Loctite All Seasons Radiator Care
Rotary Valve Oil Reservoir	Not Applicable	Fill to level indicator using Castrol TT oil
Approved Propeller / GearBox Combinations Gear Box Oil SAE 140 EP	C-Type (Reduction 3.47 : 1) BROLGA 68” x 4 Blade Ground Adjustable . Pitch Setting 14° pitch blocks Bolly BOS 68” x 3 Blade Ground Adjustable . Pitch Setting 10° blade tip. Warp Drive 68” x 3 Blade Ground Adjustable . Pitch Setting 10° blade tip C Type Gearbox. Oil qty 120 ml	E-Type (Reduction 3.47 : 1) BROLGA 68” x 4 Blade Ground Adjustable . Pitch Setting 17° pitch blocks Bolly BOS 68” x 3 Blade Ground Adjustable . Pitch Setting 16° blade tip. Warp Drive 68” x 3 Blade Ground Adjustable . Pitch Setting 16° blade tip E Type Gearbox. Oil qty 180 ml

Table 3 Section 1. Power Plant Specifications

1.3.5.4 Standard Instrumentation

Altimeter, Airspeed Indicator, Hour Meter and Tachometer.

1.3.5.5 Optional Instrumentation

Altimeter with sub scale, Exhaust Gas Temperature, Cylinder Head Temperature, Water Temperature and Compass. See Section 1.3 for details of instruments fitted with this aircraft.

1.3.6 Approved Wing and Trike Combinations

The aircraft is **only** to be operated using the Airborne Wings and Trike units as detailed below. Only these combinations have been demonstrated to meet the requirements for the Design Standards to which the aircraft.

Trike Base	Streak Wing	Wizard Wing
Edge 582 X Series	√	√
Edge 503 X Series	√	√

Table 4 Section 1. Trike Base and Wing Combinations

1.4 Symbols Abbreviations and Terminology

In these Aircraft Operating Instructions:

"AOI" means Aircraft Operating Instructions

"Airfield Pressure Altitude or QNE" means the altitude of the airfield as indicated on an altimeter with the subscale adjusted to 1013.2 millibars or hectopascals.

"AUW" (**A**ll **U**p **W**eight) means the weight of the aircraft including occupants, fuel quantity, engine fluids, and removable and disposable equipment.

"CG" means the Centre of Gravity.

"Empty Weight" Refer to the note at Section 6.2 for the defined empty weight.

"FAA" United Stated Federal Aviation Administration

"fpm" means feet per minute.

"HGFA" means the Hang Gliding Federation of Australia.

"KCAS" means Knots Calibrated Airspeed

"KIAS" means Knots Indicated Airspeed as displayed on the cockpit mounted airspeed indicator.

"kg" means weight in kilograms.

"Landing Approach Speed" means the airspeed that allows control in turbulence, wind gradient or sudden engine failure during landing.

"Manoeuvring Speed" means the indicated airspeed above which the pilot may not make full or abrupt control movements.

"QNH" means the pressure setting, that if set on the subscale of a sensitive altimeter, will cause the altimeter to indicate the correct local altitude above mean sea level.

"RAA" means the Recreational Aviation Australia.

"Stall Speed" means the indicated airspeed at which an uncontrolled downward pitching motion of the aircraft occurs or the forward control bar limit is reached.

"Take Off Safety Speed" means the airspeed that allows control in turbulence, wind gradient or sudden engine failure during the climb following take-off.

"Trim Speed" means the indicated airspeed at which the aircraft remains in a stabilised condition without pilot input.

"V_d" means the aircraft design diving speed.

"V_h" means maximum level speed.

"V_{NE}" means the indicated airspeed that the aircraft is never to exceed.

1.5 Use of metric / imperial units

This AOI uses the metric unit system as the basic system of measurement. Where common usage or available instrumentation refer to the Imperial system both units are quoted. The following conversion factors are presented as a ready reference to the conversion factors that have been used in this manual.

1 Pound (lb)	=	0.4536 Kilogram (kg)
1 Pound per sq inch (psi)	=	6.895 Kilopascal (kPa)
1 Inch (in)	=	25.4 Millimetres (mm)
1 Foot (ft)	=	0.3048 Metre (m)
1 Statute mile	=	1.609 Kilometres (km)
1 Nautical mile (NM)	=	1.852 Kilometres (km)
1 Millibar (mb)	=	1 Hectopascal (hPa)
1 Millibar (mb)	=	0.1 Kilopascal (kPa)
1 Imperial gallon	=	4.546 Litres (l)
1 US gallon	=	3.785 Litres (l)
1 US quart	=	0.946 Litre (l)
1 Cubic foot (ft^3)	=	28.317 Litres (l)
1 Degree Fahrenheit (F)	=	(1.8 X C)+32
1 Inch Pound (in lb)	=	0.113 Newton Metres (Nm)
1 Foot Pound (ft lb)	=	1.356 Newton Metres (Nm)

Table 5 Section 1. Metric/Imperial Conversion Factors

LIMITATIONS

2 LIMITATIONS

2.1 General

The limitations section of this AOI outlines the various operating limitations, instrument function and placards necessary for the safe operation of this aircraft, engine and standard equipment.

2.2 Wing Combination Limitations

The aircraft is **only** to be operated using the Airborne Wings and Trike units as detailed below. Only these combinations meet the requirements of the accepted Design Standards to which the aircraft complies.

Trike Base			Streak Wing	Wizard Wing
Edge Series	582	X	√	√
Edge Series	503	X	√	√

Table 1 Section 2. Wing Combinations

2.3 Airspeed Limitations

X Series Aircraft

	Streak Wing (IAS)	Wizard Wing (IAS)
V_{ne}	81 knots (93 mph)	54 knots (62 mph)
Manoeuvring speed	81 knots (93 mph)	54 knots (62 mph)
Trim Speed Fwd CG	45-55 knots (52-63 mph)	34-36 knots (39-41 mph)
Trim Speed Middle CG	40-50 knots (46-58 mph)	32-34 knots (37-39 mph)
Trim Speed Rear CG	35-45 knots (40-52 mph)	30-32 knots (35-37 mph)
Stall Speed (Power Off) Take Off Weight (250 kg)	24.0 knots (27.6 mph)	23.0 knots (26.5 mph)
Stall Speed (Power Off) Take Off Weight (340 kg)	29.0 knots (33.4 mph)	26.0 knots (29.9 mph)
Stall Speed (Power Off) Take Off Weight (401 kg)	34.0 knots (39.1 mph)	28.0 knots (32.2 mph)
Take Off Safety Speed & Nominated Approach Speed Take Off Weight (250 kg)	34 knots (39 mph)	31 knots (36 mph)
Take Off Safety Speed & Nominated Approach Speed Take Off Weight (340 kg)	39 knots (45 mph)	34 knots (39 mph)
Take Off Safety Speed & Nominated Approach Speed Take Off Weight (401 kg)	44 knots (51 mph)	37 knots (43 mph)
Maximum Level Speed	80 knots (92 mph)	50 knots (58 mph)
Max wind operating conditions (At ground level)	20 knots (23 mph)	20 knots (23 mph)
Cross winds of up to	11 knots (13 mph)	11 knots (13 mph)

Table 2 Section 2. Airspeed Limitations

2.4 Airspeed Indicator markings

The standard pressure airspeed indicator on the left side of the dash has dual red radial markings indicating V_{ne}. for the Streak and Wizard wings. The pilot should be aware of the combination of wing and base and be familiar with the appropriate V_{ne} marking.

2.5 Power Plant

Engine Model Applicable Aircraft	Rotax 503 – UL X Series Redback	Rotax 582 - UL X Series Outback and Classic
Approved Propeller / GearBox Combinations	C-Type (Reduction 3.47 : 1) BROLGA 68" x 4 Blade Ground Adjustable. Pitch Setting 14° pitch blocks. Bolly BOS 68" x 3 Blade Ground Adjustable. Pitch Setting 10° blade tip. Warp Drive 68" x 3 Blade Ground Adjustable. Pitch Setting 10° blade tip.	E-Type (Reduction 3.47 : 1) BROLGA 68" x 4 Blade Ground Adjustable. Pitch Setting 17° pitch blocks. Bolly BOS 68" x 3 Blade Ground Adjustable. Pitch Setting 16° blade tip. Warp Drive 68" x 3 Blade Ground Adjustable. Pitch Setting 16° blade tip.

Table 3 Section 2. Gearbox and Propeller Limitations

2.5.1 Engine Limitations

ENGINE LIMITATIONS	Rotax 503		Rotax 582	
ENGINE SPEED	**Metric**	**Imperial**	**Metric**	**Imperial**
Take Off (Max 5 mins)	6800 rpm	6800 rpm	6800 rpm	6800 rpm
Maximum Continuous	6500 rpm	6500 rpm	6500 rpm	6500 rpm
PERFORMANCE				
Performance @ 6500rpm	37 KW	50 hp	48 KW	64.4 hp
COOLANT TEMPERATURE				
Maximum			80°C	175°F
Minimum			65°C	150°F
CYLINDER HEAD TEMPERATURE				
Maximum	250°C	480°F	150°C	300°F
Normal	180 – 220°C	350 – 430°F	110 - 130°C	230 - 270°F
EXHAUST GAS TEMPERATURE				
Maximum	650°C	1200°F	650°C	1200°F
Normal	460-580°C	860 -1000°F	500-620°C	930 -1050°F
AMBIENT START & OPERATING TEMPERATURE				
Maximum	50°C	120°F	50°C	120°F
Minimum	-25°C	-13°F	-25°C	-13°F

Table 4 Section 2. Engine Limitations

The cockpit may be fitted with a cylinder head temperature gauge (CHT) and or an exhaust gas temperature (EGT) gauge. Aircraft fitted with the Rotax 582 water cooled engine may also have a water temperature gauge fitted.

The maximum operating temperatures are indicated by a **RED** mark on the gauge.

2.5.2 Engine Cylinder Head Temperature Limitations

	503 UL	582 UL
Normal Operating Range	180 to 220 deg C 356 to 428 deg F	110 to 130 deg C 230 to 270 deg F
Maximum Operating Temperature	250 deg C 482 deg F	150 deg C 300 deg F
Difference between 2 Cylinders	20 deg C 36 deg F	10 deg C 18 deg F

Table 5 Section 2. Engine Cylinder Head Temperature Limitations

2.5.3 Engine Exhaust Gas Temperature Limitations

	503 UL	582 UL
Normal Operating Range	460 to 580 deg C 860 to 1000 deg F	500 to 620 deg C 930 to 1150 deg F
Maximum Operating Temperature	650 deg C 1200 deg F	650 deg C 1200 deg F
Difference between 2 Cylinders	25 deg C 43 deg F	25 deg C 43 deg F

Table 6 Section 2. Engine Exhaust Gas Temperature Limitations

2.5.4 Engine Water Temperature Limitations

	503 UL	582 UL
Normal Operating Range	Not Applicable	65 to 80 deg C 150 to 175 deg F
Maximum Operating Temperature	Not Applicable	80 deg C 175 deg F

Table 7 Section 2. Engine Water Temperature Limitations

The instrument panel may be fitted with an engine tachometer gauge, and the operation of the engine rpm can be monitored using this gauge. The maximum rpm is indicated with a **RED** mark on the gauge.

	503 UL	582 UL
Engine Tachometer Limitations (5 minute maximum for Take off speed)	6800 rpm Max	6800 rpm Max
Cruising speed	6500 rpm	6500 rpm

Table 8 Section 3. Engine Water Temperature Limits

2.5.5 Fuel Grades

FUEL	
Preferred Fuel Type	En228 Premium/Regular. Super grade gasoline, lead free, min RON 90
Optional Fuel Type	AVGAS (see note)

Table 9 Section 2. Fuel Specification

NOTE
Due to higher lead content in AVGAS deposits in the combustion chamber will increase. Therefore, use AVGAS only if you encounter problems with vapour lock or if the other fuel type is not available.

Use of AVGAS requires higher frequency maintenance intervals. Refer to the maintenance manual.

Refer to section 2.6.7 for fuel capacities and limitations

2.5.6 Engine Lubricating Oil

Aircraft using Rotax 582 powerplant supply engine lubrication via the oil injection system which is gravity fed. The oil quantity is defined by engine rpm and the lever position. The lever is actuated via a Bowden cable connected to the throttle cable. The oil injection tank has a capacity of 2 litres.

Aircraft using Rotax 503 powerplant use fuel premixed with two stroke oil.

	503 UL	582 UL
Engine lubricating oil. Fuel oil mixture ratio	50:1 fuel and oil premix	Automatic oil injection

Table 10 Section 2. Engine Lubrication Oil

Engine Lubricating Oil Specifications
Oil used is Super two stroke ASTM/CEC standards, API-TC classification (consult your Rotax dealer for a recommended oil to suit your operating environment).

2.5.7 Rotary Valve Lubrication

Applicable to X Outback and Classic, 582 powered aircraft.

Rotary valve lubrication is supplied via a small tank mounted on the top right hand side of the engine. The tank has a maximum fill level with a capacity of 60 mL of oil. The oil has the same specifications as the oil injection system.

Oil Specifications
Oil used is Super two stroke ASTM/CEC standards, API-TC classification (consult your Rotax dealer for a recommended oil to suit your operating environment).

2.5.8 Gearbox Lubrication

	503 UL	582 UL
Gearbox lubricating oil.	C type 120 ml	E type 180 ml

Table 11 Section 2. Engine Lubrication Oil

Gearbox Lubricating Oil Specifications
Gear oil API-GL5 or GL6, SAE 140 EP or 85W – 140 EP

2.5.9 Cooling System

WARNING

DO NOT OPEN THE COOLING SYSTEM WHEN THE ENGINE IS HOT. SEVERE SCALDING AND OTHER INJURIES MAY RESULT.

The Rotax 582 powerplant uses a water-cooling system, with coolant capacity of 4.0L. See maintenance manual for further details.

Coolant Specification
Rotax specifies use of: 50% antifreeze concentrate with additives against corrosion and 50% pure water, or use of an equivalent premixed coolant.

AirBorne has had satisfactory results using the brand Nulon Red which is silicate free and is a Mono Ethylene Glycol product containing 1040 gm glycol per litre.

The Rotax 503 powerplant is air cooled.

2.5.10 Propeller

2.5.10.1 Brolga Propeller

Manufacturer: Aerofibre Industries

Model: 68" x 4 BROLGA

Type: 4 Blade Composite, ground adjustable using pitch blocks

Diameter: 1727mm +/- 5mm

Pitch: determined by pitch block installation

Hub Manufacturer: Competition Aircraft

Hub Type: Ultra-Prop

Engine Model Applicable Aircraft	Rotax 503 – UL X Series Redback	Rotax 582 - UL X Series Outback and Classic
Approved Propeller BROLGA 68" x 4 Blade Ground Adjustable	Pitch Setting 14° pitch blocks	Pitch Setting 17° pitch blocks

Table 12 Section 2. Brolga Propeller Specifications

2.5.10.2 Warp Drive Propeller

Manufacturer: Warp Drive Propellers

Model: 68 INCH

Type: 3 Blade Composite ground adjustable

Diameter: 1727mm +/- 5mm

Pitch: Standard pitch is given in Table 13.

Hub Type Warp Drive HPL-R 914 Pattern

True Propeller size: 67.7" (1720mm)

Engine Model Applicable Aircraft	Rotax 503 – UL X Series Redback	Rotax 582 - UL X Series Outback and Classic
Approved Propeller	Warp Drive Pitch Setting 10° blade tip, reference to rear face of hub.	Warp Drive Pitch Setting 16° reference to rear face of hub.

Table 14 Section 2. Warp Drive Propeller Specifications

2.5.10.3 Bolly BOS Propeller

Manufacturer: Bolly BOS

Model: 68 INCH

Type: 3 Blade Composite ground adjustable

Diameter: 1727mm +/- 5mm

Pitch: Standard pitch is given in Table 15

Hub Type Bolly BOS 3 blade, 582 Pattern

True Propeller size: 67.7" (1720mm)

The maximum propeller speed of 1960 RPM has been determined by test. The maximum propeller speed occurs when the engine RPM reaches 6800 RPM.

Engine Model Applicable Aircraft	Rotax 503 – UL X Series Redback	Rotax 582 - UL X Series Outback and Classic
Approved Propeller	Bolly BOS 3 Blade Pitch Setting 10° reference to rear face of hub.	Bolly BOS 3 Blade Pitch Setting 16° reference to rear face of hub.

Table 16 Section 2. Bolly BOS Propeller Specifications

2.6 Weight limits

	Streak Wing with Edge X Base	Wizard Wing with Edge X Base
Max number of occupants	2 persons	2 persons
Max empty weight Edge & Edge E series base	188 kg	188 kg
Max empty weight Edge X series base	191 kg	191 kg
Max take off weight	401 kg	401 kg
Max landing weight	401 kg	401 kg
Min total occupant weight	65 kg	65 kg
Max total occupant weight	180 kg.	180 kg
Max positive manoeuvring load factor	4.0 G	4.0 G
Negative load factors	Prohibited	Prohibited
Load factors below 1.0 G	To be avoided	To be avoided

Table 17 Section 2. Weight Limits

Empty weight is defined in section 6.2.

The microlight aircraft must **only** be flown **solo** from the **front seat.** Minimum pilot weight flown solo is determined in section 2.7.9.

All aircraft operations may be carried out whilst solo, as when the aircraft is flown dual. With lighter aircraft AUW the full-power setting may have to be reduced to get a safe climb angle after lift off.

The approved combination of microlights are designed to carry a maximum cockpit weight of 180 kg with maximum fuel capacity of 44 litres (30.8 kg) for Edge X series bases.

Having the trike unit attached to the wing from a single universal bracket, variations of cockpit loading and fuel loading cannot influence the aircraft's balance. The Edge X is therefore not critical in regards to centre of gravity although the distribution of load in the trike base effects the in-flight attitude of the trike base. This change in attitude of the trike base has a secondary influence on aircraft pitch control.

Edge series trikes should **only** be attached to the wing using the bracket and connecting bolt supplied. The bracket on the wings is designed with three trim settings allowing the trim to be preselected.

The rear CG position must only be used with MTOW of less than 340 kg.

2.7 Operational Limits

2.7.1 Centre of Gravity limits

Centre of gravity limits are not critical on the base of a flex wing microlight. Having the trike unit attached to the wing from a single universal bracket, variations of cockpit loading and fuel loading cannot influence the aircraft's balance. The Edge X is therefore not critical in regards to centre of gravity although the distribution of load in the trike base has a minor affect on the in-flight attitude of the trike base.

The wings have three attachment points on the universal bracket. The forward setting will increase the trim speed and the aft setting will decrease trim speed.

The variation of attachment point has been designed to allow the pilot to pre-select the centre of gravity position prior to flight.

Under normal operations the trike base should be attached to the wing in the middle position. The rearward trim position must be used with MTOW of 340kg or less. In flight the only noticeable difference is the control bar pitch pressure, which increases as the hang point is moved rearward.

The fuel capacity must always be considered when measuring the AUW of the aircraft. Remember that fuel is measured at 0.7 kg per litre and may slightly alter the aircraft's performance during take off and landing.

The table below are the minimum and maximum allowable CG range for AirBorne wings. The CG position should not be outside of these dimensions.

Base Suspension Range - Measured from the line joining the leading edge nose bolts to the suspension point.	**MAXIMUM REARWARD CG**	**MINIMUM FORWARD CG**
STREAK WING	1260 mm	1210 mm
WIZARD WING	1630 mm	1580 mm

Table 18 Section 2. Centre of Gravity Limits

2.7.2 Manoeuvring Limits

All aerobatic manoeuvres including spinning is prohibited.

Aerobatic manoeuvres including whipstalls, stalled spiral descents and negative "G" manoeuvres are not permitted. It must be emphasised that a whipstall, spiral descent or negative G manoeuvre can never be conducted safely. These manoeuvres put the aircraft outside the pilots control and put both the aircraft and its occupants in extreme danger.

Do not pitch nose up or nose down more than 45 degrees from the horizontal. The front support tube of the trike and the pilot's chest limits the fore and aft movement of the control bar respectively.

2.7.3 Bank Angle

Do not exceed 60 degrees of bank angle. In roll there is no stop for the control movement. For the purpose of pre-flight check of control freedom; check by lowering each wing to within 10 cm of the ground (on ground level).

2.7.4 Flight Load Factor Limits

Max positive manoeuvring load factor	4.0 G
Negative load factors	Prohibited
Load factors below 1.0 G	To be avoided

Table 19 Section 2. Flight Load Factor Limits

2.7.5 Flight Crew Limits
Minimum flight crew is 1 person (Front Seat)

2.7.6 Kinds of Operation Limits
The aircraft is only to be flown under visual flight rules (VFR), and the minimum equipment required to operate under VFR conditions are an air speed indicator, altimeter, and instruments as required by the engine manufacturer.

In Australia, when operated at a public aerodrome or on a cross country flight, a compass and reliable time piece are required. Additional equipment may be required for some overseas operations.

2.7.7 Fuel Limitations

Minimum Usable Fuel (note 1)	37 litre	9.8 US Gal
Maximum Usable Fuel (note 2)	43 litre	11.4 US Gal
Fuel tank sump capacity Edge X Series	350 millilitres	12 oz

Table 7 Section 2. Fuel Limitations

CAUTION

SIGHT GAUGE 10 LITRE GRADUATIONS INDICATE TOTAL FUEL, NOT USABLE FUEL. ZERO USABLE FUEL IS INDICATED WHEN THE FUEL IS LEVEL WITH THE BOTTOM OF THE SIGHT GAUGE

Note 1. The minimum useable fuel is defined by the first evidence of engine malfunctioning occurring at the full power setting, climbing at the safety take off speed with minimum aircraft weight.

Note 2. The maximum useable fuel is defined by the first evidence of engine malfunctioning occurring at the power setting established for level flight in the cruise configuration with maximum weight.

2.7.8 Maximum Passenger Seating Limits

One passenger maximum allowed. Maximum pilot weight is 100kg per seat.

2.7.9 Minimum Pilot Weight

The microlight aircraft must only be flown solo from the front seat**.** Minimum pilot weight flown solo shall not be below 55 kg. Maximum power at minimum TOW can cause an abrupt climb rate that, if uncorrected, may cause a wing attitude of greater than the placarded maximum of 45 degrees. Approximately 2/3 of maximum take off power is considered comfortable for a minimum weight takeoff. should not be below 55 kg. If the pilot weight is below 55 kg it may be necessary to carry ballast in water bags. Ensure the bags are watertight and safely secured in the soft side pockets. Take off distance will be extended at reduced power.

2.7.10 Other Limitations

Maximum Cross Wind	12 knots	13 mph
Maximum Wind Strength	20 knots	23 mph
Maximum Ambient Operating Temperature	50 deg C	120 deg F

Table 8 Section2. Other Limitations

No person who is untrained or unqualified in weight shift controlled flight or, who is unfamiliar with the wing and base combination, should ever attempt to pilot the aircraft unless under professional instruction.

The effect of light rain on the aircraft can increase the stall speed. It is extremely important to maintain speeds in excess of the take off and landing safety speeds when the wing is wet. If the aircraft has been left out in the rain or heavy dew it is necessary to wipe the wing down prior to take off. It is also recommended that the aircraft be flown solo first to ensure all excess moisture is removed. A chamois or sponge is recommended to remove the water.

Continued operation in heavy rain is not recommended due to the abrasive effect of raindrops on the propeller. Do not use waterproofing agents on the wing as the consequent beading of water droplets can significantly increase the stall speed.

CAUTION

MOISTURE ON THE WING CAN INCREASE STALL SPEED AND SHOULD BE REMOVED PRIOR TO TAKE OFF.

2.8 Placards

The placards on the aircraft are designed to provide information regarding general aircraft limitations and other details for the safe operation of the aircraft. Listed on the following pages are details of the placards fitted to the aircraft.

2.8.1 Flight Limitations Placard

62mm

AIRBORNE WINDSPORTS Pty. Ltd.
Newcastle. NSW. Australia

AIRCRAFT TYPE: *EDGE*

FLIGHT LIMITATIONS

DO NOT PITCH NOSE DOWN
OR NOSE UP MORE THAN
45 DEGREES FROM HORIZONTAL
OR EXCEED 60 DEGREES OF BANK

NO NEGATIVE G

NO AEROBATIC MANOEUVRES

NO WHIPSTALLS
NO STALLED SPIRAL DESCENTS

ENGINE LIMITATIONS

FUEL/OIL MIXTURE RATIO	*50:1*
MAXIMUM RPM	
CHT NORMAL (Deg C)	
CHT MAXIMUM (Deg C)	

LOADING LIMITATIONS

EMPTY WEIGHT			
TRIKE BASE	EDGE WING	STREAK WING	WIZARD WING
kg	*53 kg*	*49 kg*	*47 kg*
TOTAL	kg	kg	kg

MAXIMUM TAKEOFF WEIGHT (kg)	
MAXIMUM WEIGHT OF OCCUPANTS	*180kg*

FLY SOLO FROM FRONT SEAT ONLY

136mm

PART No.103835

Figure 1 Section2

Location	The flight limitation placard is located on the trike base tube between the steering carrier and the rear passenger foot rest	
Series	Edge X	
Configuration	With Streak Wing	With Wizard Wing
Placard	103835	103835

Table 9 Section 2. Flight Limitations Placards

2.8.2 Aircraft Operating Instructions Placard

Figure 2 Aircraft Operating Instructions Placard Part # 107592

Location	The Aircraft Operating Instructions placard is located on the instrumentation dash
Series	Edge X Series

Table 10 Section 2. Hand Book Placard

2.8.3 Wing V_{ne} ASI Placard

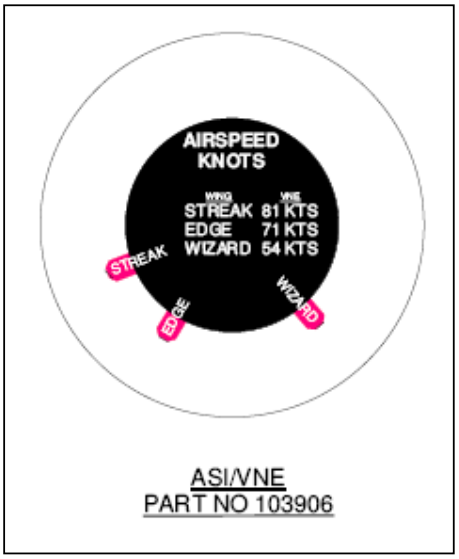


Figure 3 Section 2. V_{ne} Placard

Location	The V_{ne} Placard is located on the air speed indicator on the left side of dash.
Series	Edge X Series

Table 11 Section 2. Wing V_{ne} ASI Placard

2.8.4 Take Off Safety Speed Limitations Placard

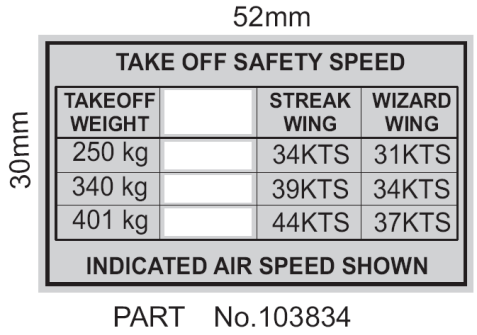


Figure 4 Section 2

Location	The Take Off Safety Speed Placard is located on the dash adjacent to the mast brace tube.
Series	Edge X Series

Table 20 Section 2. Take Off Safety Speed Limitations Placard

2.8.5 Fuel Capacity Placard

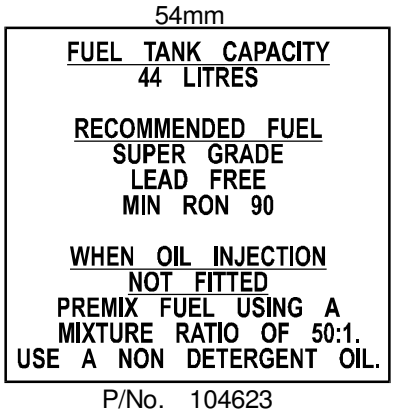


Figure 5 Section 2. Fuel Capacity Placard

Location	The fuel capacity placard is located on the fuel tank adjacent the fill point.
Series	Edge X Series

Table 13 Section 2. Fuel Capacity Placard

2.8.6 Useable Fuel Placard

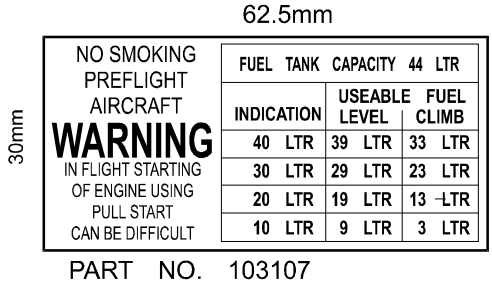


Figure 6 Section 2. Useable Fuel Placard

Location	The fuel useable fuel placard is located on the aircraft dash.
Series	Edge X Series

2.8.7 Fuel Tap Placard

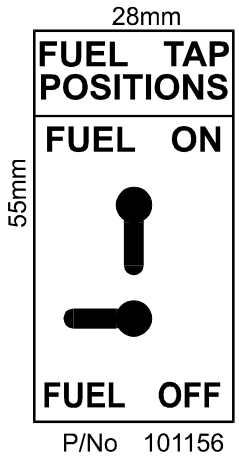


Figure 7 Section 2. Fuel Tap Placard.

Location	**582 Edge X** The fuel tap placard is adjacent to the fuel tap at the front of the engine on the **starboard** side of the aircraft. **503 Edge X** The fuel tap placard is adjacent to the fuel tap at the front of the engine on the **port** side of the aircraft
Series	Edge X Series

Table 14 Section 2. Fuel Tap Placard

2.8.8 Hand Throttle and Ignition Placard

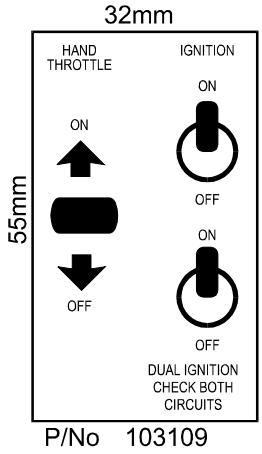


Figure 8 Hand Throttle and Ignition Placard

Location	The hand throttle placard is located on the right side seat frame adjacent to the hand throttle lever.
Series	Edge X Series

Table 21 Section 2. Hand Throttle and Ignition Placard

2.8.9 Choke Placard

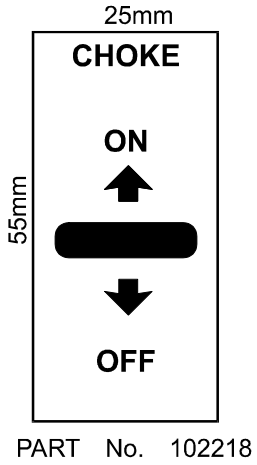


Figure 9 Section 2

Location	The hand choke placard is located on the left side seat frame adjacent to the hand choke lever.
Series	Edge X Series

Table 16 Section 2. Choke Placard

2.8.10 Earth Placard

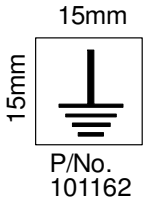


Figure 10 Section 2

Location	The Engine Earth placard is located on the top seat frame on the starboard side
Series	Edge X Series

Table 17 Section 2. Earth Placard

2.8.11 Circuit Breaker and Power Socket Placard

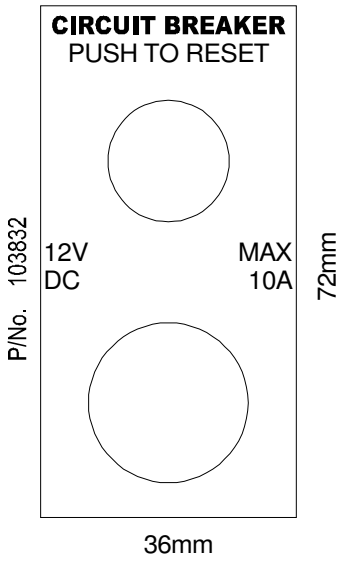


Figure 11 Section 2 Circuit Breaker and Power Socket Placard

Location	The master switch / circuit breaker placard is located on the right side dash.
Series	Edge X Series

Table 18 Section 2. Circuit Breaker and Power Socket Placard

2.8.12 Master Switch and Electric Start Placard

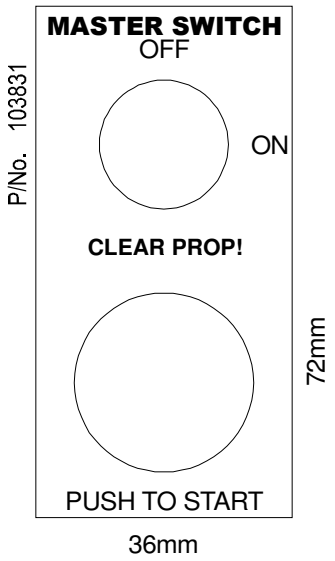


Figure 12 Section 2 Master Switch and Electric Start Placard

Location	The master switch / circuit breaker placard is located on the right side dash. The electric start placard is fitted on the aircraft which have the electric start option fitted.
Series	Edge X Series

2.8.13 Table 18 Section 2. Master Switch and Electric Start Placard

2.8.14 Hang Glider Aerotow Limitations Placard

Figure 13 Section 2 Aerotow Limitations Placard

Location	When a tow system is fitted the Hang Glider Aerotow Limitations placard is located on the dash adjacent to the mast brace tube.
Series	Edge X Series

Table 19 Section 2. Aerotow Limitations Placard

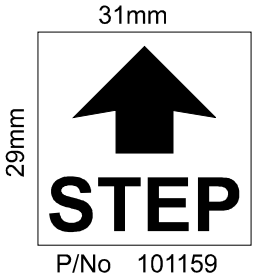
2.8.15 No Step Placard

Figure 14 Section 2. No Step Placard

Location	The no step placards are located on the floor of the cockpit, either side of the base tube.
Series	Edge X Series

Table 20 Section 2. No Step Placard

2.8.16 Step Placard



2.8.17 Figure 15 Section 2. Step Placard

Location	The step placard is on the trike base tube at the hinge point for the rear foot rest.
Series	Edge X Series

Table 21 Section 2. Step Placard

2.8.18 Step and No Step Placards

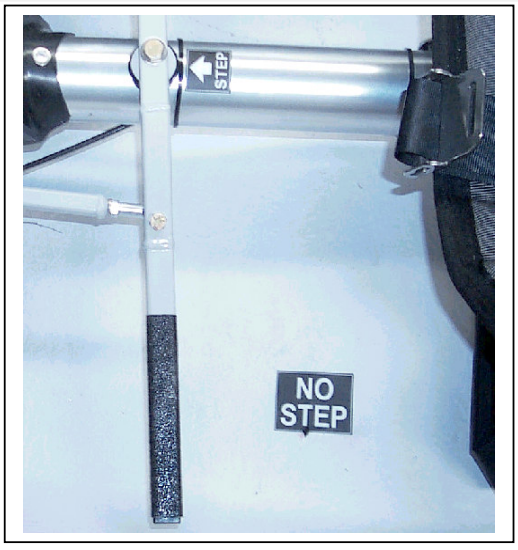


Figure 16 Section 2. Step and No Step Placards

NOTE
There is a symmetrical no step placard on the other side of the pod.

2.8.19 Data Plate

Part Number 107568 Model Edge X-503-L Serial Number E503-NNNN
Part Number 107569 Model Edge X-582-L Serial Number E503-NNNN

Figure 17 Section 2. Data Plate

Location	The Microlight Base data plate is located on the fuel tap plate. X-503 aircraft (Redback) mount is port side beside the throttle cable mixer slider. X-582 aircraft, (X series Outback and Classic) mount is starboard side above the fuel tap.
Series	X Series

Table 25 Section 2. Data Plate

2.8.20 Emergency Parachute

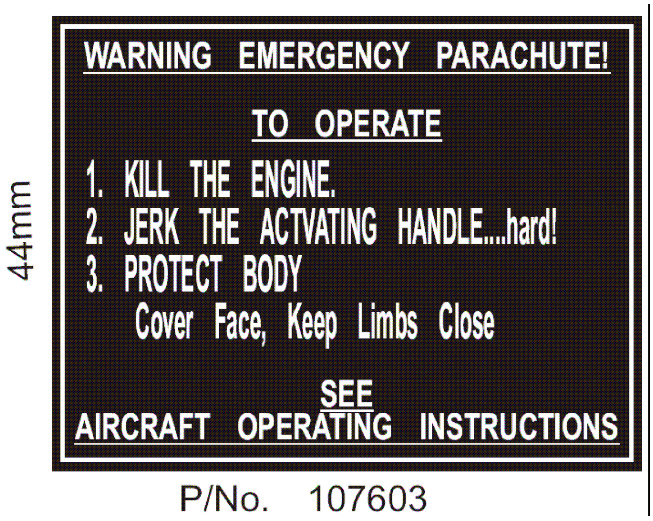


Figure 18 Section 2. Emergency Parachute Instructions

Location	The emergency parachute (when installed) placard is located on the inside left rear of the cockpit when the optional emergency parachute is fitted. When the Outback option is fitted the placard is located on base tube aft of instrument binnacle.
Series	Edge X Series

Table 26 Section 2. Emergency Parachute

2.8.21 Emergency Parachute Placard Location

Figure 19 Section 2. Parachute Placard Location – (Pilots Left on Pod near to Seat Frame)

2.8.22 Emergency Parachute Warning Placard

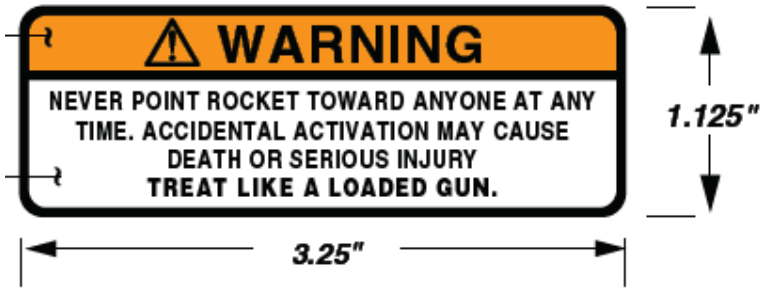


Figure 20 Section 2. Emergency Parachute Warning

Location	The emergency parachute warning placard is located on the parachute rocket at the rear of the aircraft.
Series	Edge XT Series (optional fitment)

Table 27 Emergency Parachute Warning

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EMERGENCY PROCEDURES

3 EMERGENCY PROCEDURES

3.1 General

This section of the AOI describes the procedures to be adopted in the event of an emergency or abnormal situation occurring in this aircraft.

These procedures are arranged in the sequence considered to be the most desirable in the majority of cases. Steps should be performed in the order listed unless a suitable reason to deviate exists.

This section contains operating procedures for flight and system emergency conditions that are essential for the continued safe operation of the aircraft.

Always maintain correct airspeed and altitudes in the circuit area.

Never fly in uncertain weather conditions and always fly within your proven ability. Be sure only to extend your capabilities under planned training situations.

Carry out safe airmanship whilst flying and be aware of possible emergency landing areas along your flight path. If possible check these areas from the ground as you enter the airfield or flying site. This technique is for safety reasons as engines are susceptible to stopping, no matter how reliably manufactured or maintained.

Keep a good lookout for other aircraft, always be thoughtful and show your intentions. Demonstrate good airmanship always!

It should be remembered that the manufacturer cannot foresee all conceivable circumstances. Particular circumstances such as multiple or unanticipated emergencies, adverse weather etc. may require modification to these procedures. A thorough knowledge of the aircraft and its systems is required to analyze the situation correctly and to determine the best course of action.

3.2 Airspeeds for Emergency Operations

Speed	Wizard	Streak
Maximum Manoeuvring Speed (Va)	68 knots IAS	75 knots IAS

Table 1 Section 3. Airspeeds for Emergency Operations

3.3 Emergency Procedures Check List

3.3.1 Engine Failure on Climb Out

If your engine fails on climb out, maintain airspeed, reduce angle of attack and land straight ahead if possible. Proceed as follows:

C Maintain **C**ontrol

A Maintain **A**irspeed - take off safety speed

L Forced **L**anding (straight ahead if possible)

3.3.2 Engine Failure at Height

If the engine stops while operating at cruise or full power when the aircraft is well clear of the ground, check:

C Fuel **C**ontents

F **F**uel tap on

I **I**gnition on

If your engine fails in flight, do not attempt to restart the engine unless one of these items is found to be incorrect and is able to be rectified. Relax and maintain control whilst concentrating on correct forced landing techniques.

3.3.3 Full Power Engine Shutdown (In Flight)

If the throttle should jam full open in flight proceed as follows:

C Maintain **C**ontrol.

H Get **H**eight. With engine at full power adjust height and ground position to improve the outcome of a forced landing.

A Increase **A**irspeed to keep the climb angle less than 30 degrees above the horizontal.

I Switch off **I**gnition.

L Prepare for forced **L**anding

3.3.4 Forced Landings

Proceed as follows:

C Maintain **C**ontrol and airspeed - nominated approach speed

T **T**hrottle Closed

I **I**gnition off

F **F**uel tap off

S **S**eat belts tight

H **H**elmets tight

L **L**imbs (arms and hands) inside seat frame

L Carry out final approach and **L**anding as closely as possible to normal power off landing procedure.

3.3.5 In Air Engine Fire

For fire occurring whilst in flight, the initial procedure would be to maintain control of the aircraft and evaluate the extent of the fire. This emergency is unlikely to occur but to avoid any further problems, use common sense and land the aircraft safely. Proceed as follows:

C Maintain **C**ontrol

F **F**uel tap off

T Full **T**hrottle (to exhaust engine system fuel as soon as possible and maximise slipstream to clear flames from passengers and airframe).

When fuel is exhausted then:

I **I**gnition off

L Forced **L**anding

B After landing release seat **B**elt

P Release **P**assenger seat belt

E **E**vacuate aircraft

3.3.6 On Ground Engine Fire

For fire occurring whilst in motion on the ground proceed as follows:

C Maintain **C**ontrol

S Use remaining **S**peed to clear people, aircraft and buildings

T **T**hrottle closed

I **I**gnition Off

B After stopping release seat **B**elt

P Release **P**assenger seat belt

F **F**uel tap off

E **E**vacuate aircraft

3.3.7 Propeller Damage

The indication of propeller damage is usually felt by extreme vibration and lack of thrust.

C Maintain **C**ontrol

T **T**hrottle closed

F **F**uel tap off

I **I**gnition off

L Forced **L**anding

WARNING

AT FULL ENGINE REVS THE TIP OF THE PROPELLER IS SPINNING AT SPEEDS IN EXCESS OF 650 KILOMETRES PER HOUR. EVEN SMALL OBJECTS CAN CAUSE SIGNIFICANT DAMAGE TO THE PROPELLER.

This problem may be avoided if precautions are taken prior to take off. Inspect the strip or ground you are to use as your take off area for sticks, rocks or any debris that may be flicked up by the tyres and sucked through the propeller.

Ensure that all items carried by occupants (such as cameras and sunglasses) are secured so they are not able to come loose and pass through the propeller.

3.3.8 Sail Damage

If you encounter damage to the sailcloth during flight, the first procedure is to maintain control of the aircraft. If the sail damage is not impairing the flight characteristics of the aircraft, land at the nearest landing field to inspect the damage.

3.3.9 Emergency Parachute

The emergency ballistic parachute can be fitted as an option.

The parachute-operating handle is fitted with a safety pin. This pin should be removed before each flight and the safety pin must be replaced before the pilot alights from the aircraft. A force of approximately 15 – 20 kg pull on the actuating handle is required to activate the BRS rocket motor.

The parachute is only to be used in emergency situations as a last resort and when you are certain that:

- the aircraft has suffered structural damage to the extent that control is not possible; or
- if the aircraft is in an irrecoverable situation where structural damage is likely to occur.

WARNING

IT IS IMPORTANT TO REALISE THAT WHILST THE PARACHUTE CONTROLS THE RATE OF DESCENT, THE PILOT WILL HAVE NO CONTROL OVER THE PLACE THE AIRCRAFT WILL "LAND".

To operate the parachute pull the handle at least twenty centimetres for the parachute rocket projectile to be activated. The parachute will allow the complete aircraft to be lowered to the ground. The aeroplane

will descend with a steep nose down attitude and tilted to the left. Further information can be found in section 7.16.

Proceed as follows:

T **T**hrottle closed

I **I**gnition off

S **S**eat belts tight

P Check parachute **P**in removed

D **D**eploy parachute

L Forced **L**anding

3.3.10 Ignition Circuit Failure

The Rotax engine requires a short circuit on the ignition circuit to stop the engine. If the ignition circuit is broken using full choke to flood the engine should stop the engine.

It is possible to starve the engine by switching the fuel tap off. This method is not as quick as using the chokes.

Do not restart the engine until the fault has been fixed.

3.3.11 Spins and Spiral Descents

Deliberate spinning is prohibited.

A spiral dive may develop after a stall if the bar is maintained at the forward limit and a large roll rate is allowed to develop. If this condition is not corrected it will lead to large and increasing roll attitudes (beyond the 60 degree limit). Increasing attitude, increasing speeds and large control bar feed back forces will occur. Incipient spiral dives can be terminated at any time by rolling wings level. If the spiral dive is allowed to develop to extreme roll attitudes, recovery is expedited by relieving control bar forces before rolling wings level and recovering from high-speed condition.

WARNING

DO NOT ATTEMPT TO SPIN THE AIRCRAFT.

SPIRAL DIVES SHOULD NOT BE ATTEMPTED.

DURING DESCENDING TURNS AIRCRAFT ATTITUDE MUST BE KEPT WITHIN PLACARDED PITCH, ROLL AND AIRSPEED LIMITS.

3.3.12 Unusual Attitudes

Unusual attitudes where the nose is raised or lowered more than 45 degrees from the horizontal are to be avoided. On recognising a situation where the aircraft is approaching these pitch angles proceed as outlined below.

3.3.12.1 Nose High Attitude

To recover from the situation where the nose of the aircraft is pitched up more than 45 degrees from the horizontal proceed as follows:

H **H**old attitude - Do not attempt to pull control bar in

P Reduce **P**ower

O As energy dissipates the aircraft will rotate nose down - keep control bar **O**ut

P once the attitude lowers level the wings and increase **P**ower to prevent over pitching

R **R**ecover from dive and **R**esume desired flight path

3.3.12.2 Nose Down Attitude

To recover from the situation where the nose of the aircraft is pitched down more than 45 degrees from the horizontal proceed as follows:

O Raise attitude - push **O**ut

P Apply **P**ower

R **R**ecover from dive and **R**esume desired flight path

3.3.13 Instrument Failure

Instrument failure may occur through an electrical fault or through exposure to High Intensity Radio Fields (HIRF).

The aircraft is equipped with an analogue ASI as well as a digital engine management system. The analogue ASI will not be effected by either an electrical fault or HIRF. If there is a problem with the digital system the correct procedure is to fly to the nearest safe landing area and investigate the cause of the malfunction.

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NORMAL PROCEDURES

4 NORMAL PROCEDURES

4.1 General

This section of the AOI describes procedures for normal operations of this aircraft.

WARNING

NO ATTEMPT SHOULD BE MADE TO FLY THE AIRCRAFT WITHOUT APPROPRIATE WEIGHT SHIFT AIRCRAFT FLIGHT TRAINING WITH AN APPROVED INSTRUCTOR.

4.1.1 Speeds & Performance for Normal Operation

		503-UL				582-UL			
		Streak Wing		Wizard Wing		Streak Wing		Wizard Wing	
		Min Weight	Max Weight	Min Weight	Max Weight	Min Weight	Max Weight	Min Weight	Max Weight
V_{ne}	knots (IAS)	81	81	54	54	81	81	54	54
	mph	93	93	62	62	93	93	62	62
Manoeuvring speed	knots(IAS)	60	60	54	54	60	60	54	54
	mph	83	83	62	62	83	83	62	62
Trim Speed	knots (IAS)	40-50	40-50	30-36	30-36	40-50	40-50	30-36	30-36
(Middle Hole)	mph	46-58	46-58	35-41	35-41	46-58	46-58	35-41	35-41
Stall Speed	knots (IAS)	23	30	23	30	23	30	23	30
Power Off	mph	27	35	27	32	27	35	27	32
Take Off	knots(IAS)	35	45	31	37	45	50	31	37
Safety Speed	mph	40	52	36	43	52	58	36	43
Nominated	knots (IAS)	45	50	31	37	45	50	31	37
Approach Speed	mph	52	58	36	43	52	58	36	43
Maximum	knots (IAS)	75	80	50	50	75	75	50	50
Level Speed	mph	86	92	58	58	86	86	58	58
Cross winds of up to	knots	11	14	11	14	11	14	11	14
	mph	13	16	13	16	13	16	13	16
Climb Rate	fpm		447		430		717		525
at take off safety speed									
Cruising Speed	knots (IAS)	60	65	40	45	60	65	40	45
Fwd CG	mph	69	75	46	52	69	75	46	52
SinkRate	fpm		1184		450		1184		450
at cruising speed									
Sink Rate at V_{ne}	fpm		2355		904		2355		904
Glide Ratio (engine off)		6.6 : 1 @50kt	6.6 : 1	7.3 : 1 @37kt	7.3 : 1	6.6 : 1 @50kt	6.6 : 1	7.3 : 1 @37kt	7.3 : 1
Take Off Distance	metres		260		220		218		240
Landing Distance	metres		228		210		228		210
Min airstrip length	metres		364		310		305		340
Max wind	knots	20	20	20	20	20	20	20	20
operating conditions									
(at ground Level)	mph	23	23	23	23	23	23	23	23

Table 1 Section 4. Speeds for Normal Operation

4.1.2 Normal procedures Check List

This section is provided to supply the pilot with more comprehensive information of the normal procedures required to operate this aircraft and is written assuming the pilot has been trained in the assembly and use of a weight shift controlled microlight.

The ultimate responsibility for determining whether the aircraft is in a safe condition to be flown is with **YOU** the pilot in command. Pre-flight inspections are outlined in the following sections and are your responsibility if you are the pilot in command. Unlike the highway, there is no place to pull over and remedy an unsafe problem once you are airborne.

4.2 Wing Assembly Procedure

The following instructions apply to both the Streak 3 and Cruze wings. The sequence of procedures assumes that the wing is packed up. If the wing and base were already assembled this section is not required.

4.2.1 Wing Assembly Procedure

Your instructor should demonstrate the correct assembly and disassembly procedures for your microlight. This section is intended as a reference only and assumes prior knowledge of assembly. AirBorne trike wings should be assembled standing on the control frame. Assembling the wing on the control frame keeps the sail off the ground and therefore less prone to being soiled or damaged. The suggested assembly procedure is as follows:

UNZIP THE BAG. Lay the wing down with the zip up and the nose facing approximately 120 degrees from the wind direction. Unzip the bag but do not completely remove it from the wing. Undo centre 2 clips.

4.2.2 Assemble Control Frame

Remove control bar and down tube padding. Spread the control bar down tubes out and insert the base bar onto the alloy knuckle. The pip pin is then inserted from front to back. Ensure that the pip pin end cap is secure. It should not be possible to remove the cap without depressing the pip pin button. Check that all the rigging wires are outside the control frame. 1/4 " diameter aircraft bolt with wing nut and safety pin may be provided with your aircraft as an alternate to the PIP pin.

Figure 1 Section 4. Assemble Control Frame

Optional:

If training bars are to be fitted to the control frame follow this procedure.

The left hand side training bar attachment is shown in figure 2, illustrating the correct attachment of the bar on the inside of the control frame. The detail view shows the sequence of components.

1. Bolt, head to the inside of the control frame.
2. Tube
3. Nylon Washer
4. Down Tube Clamp (Both Sides)
5. Wing Nut, turned until both side of the down tube clamp contact. Ensure the training bars are held securely.
6. Safety Pin

Note:
The attachment to the base bar, a PIP pin or bolt secures the training bar to the base bar, and also secures the control frame knuckle. A longer Pip Pin is necessary for the larger diameter tube of the training bar.

The welded base bar attachment has been made to be slightly loose, for ease of fitment.

The right hand side training bar is secured in the same way and is also on the inside of the control frame.

Figure 2 Section 4. LHS Training Bar Attachment

4.2.3 Stand The Wing Up

Rotate the control frame to the vertical position so that the wing is resting on the control bar. Do not attempt to connect the nose catch now. Remove the glider bag and unclip all the wing straps

Figure 3 Section 4. Stand the Wing Up

4.2.4 Spread Leading Edges

Carefully spread both leading edges out half way then spread them both out to the approximate flying position. It is essential that the keel and the leading edges are kept in the same plane or damage will result. Each wing should be kept low to the ground whilst moving forward.

4.2.5 Insert King Post

Remove king post base padding and plug the kingpost into the socket on the rear most hole of the keel. Make sure that the cross bar wires are not twisted and are on either side of the king post.

Figure 4 Section 4. Insert King Post

4.2.6 Insert Main Sail Battens

Remove the battens from the bag. Lay out the top surface battens (curved) in order of descending length toward the tip. Place the “red” battens in the left wing (curve forwards), and the “green” battens in the right. Insert the top surface battens except for the last three battens. Start with the battens closest to the keel. The battens are inserted into the pocket with gentle pressure until they meet resistance. When securing the battens lift trailing edge, push fitting in to sail pocket and rotate fitting downward to lock hinge.

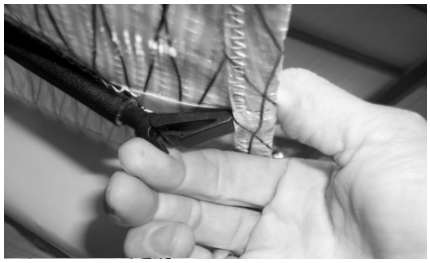


Figure 5 Section 4. Insert Main Sail Battens

4.2.7 Tension Cross Bars

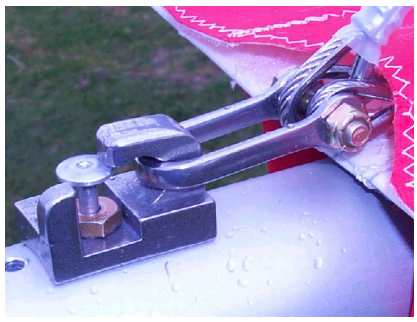


Figure 6 Section 4. Tensioning Cross Bar and Shackle Located in Block.

Pull the webbing handle to tension the crossbars. The handle pull back system gives a mechanical advantage of 2:1. Tension until the cross bar wire shackle is located in the quick clip block, behind the safety button.

4.2.8 Install Pull Back Cover

Ensure that the front Velcro tabs are folded back and secured to the top of the cover.

Figure 7 Section 4. Install Pull Back Cover

4.2.9 Attach Nose Catch

The nose catch should now be attached so that the pip pin is inserted through both the nose catch and channel. Ensure the pip pin cap is secure.

Figure 8 Section 4. Attach Nose Catch

4.2.10 Locate Nose Battens

Insert both nose battens tail end first. Locate the front of the batten on the alloy stubs on the front of the keel tube.

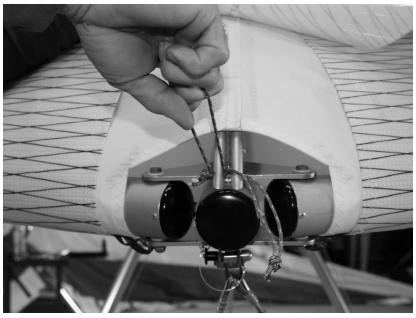
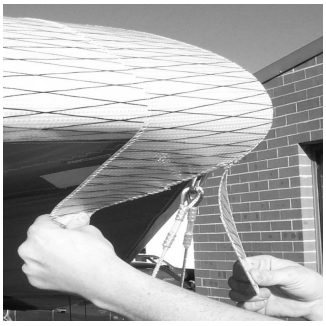


Figure 9 Section 4. Locate Nose Battens

4.2.11 Install Nose Fairing



Attach the nose fairing by applying the top Velcro first then gently tension over the nose plates and attach the Velcro to the undersurface.

Figure 10 Section 4. Install Nose Fairing

4.2.12 Insert Remaining Main Sail Battens

Insert remaining main sail battens at the tips.

4.2.13 Insert Undersurface Battens

Undersurface battens are applicable to the Streak wing. The undersurface battens should be inserted as far as possible, without forcing them. The batten should then be pushed with your thumb so that the end is inside the pocket. Use the string to pull the batten back to the rear of the pocket.

The Wizard wing does not have undersurface battens.

Figure 11 Section 4. Insert Remaining Sail Battens

4.2.14 Load Tip Strut

The tip strut is applicable to the Streak wing. Reach in through the tip and feed the end of the strut out through the undersurface and locate on red webbing. Pull on the bracket in the center of the strut until the strut over centers. Position hand so that it will not get caught in lever mechanism. Note that the photo shows the undersurface undone for improved clarity of operation.

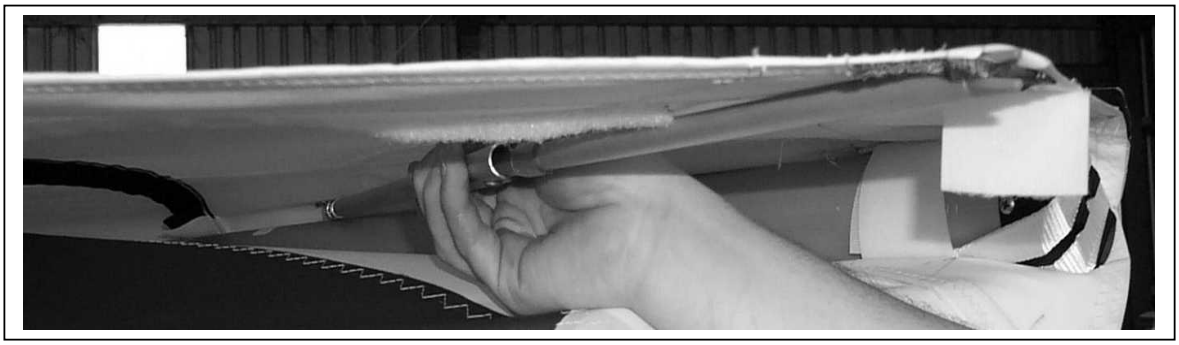


Figure 12 Section 4. Load Tip Strut

You are ready for the wing pre-flight inspection. It is imperative that you carry out this inspection **every time you rig and before you fly.**

CAUTION

ONCE THE WING HAS BEEN PRE-FLIGHTED. CHECK THAT ALL INSPECTION ZIPS ARE FULLY CLOSED.

4.3 Wing Pre-flight inspection

The design of the wing is such that junctions not open to view may be reached from zipped inspection panels. Start at the nose and move around the wing making the following condition inspections, check for damage, wear and security.

Wing pre-flight inspection	
Nose catch, nose bolts, sail tangs (on nose bolts), nose battens	√
Nose cone aligned	√
Leading-edge tubing	√
Cross-bar hinge junction & cross bar tubing	√
Centre undersurface zip	√
Sail tip secure and webbing	√
Tip struts	√
Battens secure and pockets free from damage	√
Reflex bridle lines	√
Cross bar tensioner routing and catch	√
Velcro pull back cover	√
Hang-point / universal bracket & bolts	√
Control frame tubes, hinges, knuckles, connections	√
Control frame cables fittings & terminations both ends	√
Junction cross bar & leading edge	√
Top rigging, kingpost located	√
All inspection zips	√
Sail condition inspection, tears, abrasion, stitching & attachment	√
Sail free from water accumulation	√
General inspection of complete wing	√
Full / free movement of the wing when attached to the trike base – to be completed before flight, see section 4.8.1	√
Inspect all cables – inspect for kinks fraying, corrosion – particularly around the NICO press fittings	√

Table 2 Section 4. Wing Pre Flight Inspection

If the wing has been left fully set up for any period, then the following additional checks should be performed:

Extended set up Wing pre-flight inspection	
The symmetry of the wing (batten profile check).	√
All tubes straight, undamaged and without cracks.	√
All cables undamaged, no fraying with secure thimbles/swages.	√
All nuts and bolts secure and locked appropriately.	√
All quick-release fittings secure.	√
Universal bracket undamaged, heart-bolt and back-up strap secure.	√
Sail tension settings correctly aligned and symmetrical.	√
Battens undistorted, and in good condition.	√
All sail seams intact, with no frayed stitching.	√
No tears or nicks in the sail.	√
Trimmer functional and wires not damaged.	√

Table 3 Section 4. Extended Wing Pre-flight

4.4 Attaching Wing to Base

4.4.1 Position The Trike And Wing

Position the wing on its control frame, facing into the wind, with the nose on the ground. The keel extension must be in place to assist with the next stages of assembly.

4.4.2 Position The Propeller

Switch both ignition circuits off. Treat the propeller as if the ignition is live.

Move the propeller to a position where the keel can sit between blades. The 503 powered model rests the keel extension on the engine cooling cowling. The 582 powered model rests the keel on the interlink between the radiators.

Figure 13 Position the wing and base

4.4.3 Fold the Mast

Remove the front mast brace PIP pins and slide the mast brace apart. Fold the seat, pulling the frame forward from beside the pilots backrest. Fold the mast forward.

Wheel the trike behind the wing, rolling the front wheel over the control bar. Apply the trike park brake.

Figure 14 Section 4. Position the Trike and Wing, Fold the Mast

4.4.4 Attach Mast To Wing U-Bracket

Turn the wing U-bracket to vertical. Raise the mast head into the wing U-bracket. Insert the bolt with bolt head retaining unit. Tighten wing nut firmly and secure safety pin. The wing should only be attached using the central hole on the U-bracket as shown.

Figure 15 Section 4. Attach Wing to Wing U-Bracket

4.4.5 Position Heart Bolt Retainer in U-Bracket

The standard position for the heart bolt in the U-bracket is in the centre hole, which is the only available point for attachment. The heart bolt retainer is positioned in rear open hole to prevent rotation of the bolt.

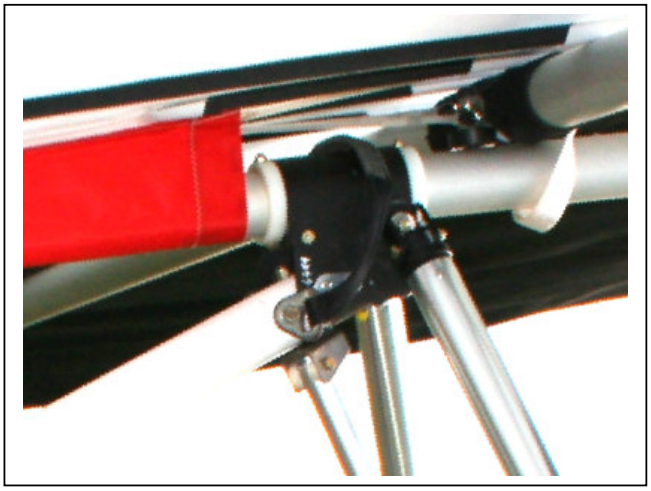


Figure 16 Section 4. Heart Bolt Retainer Position

4.4.6 Attach Back Up Loop

Connect back up loop so that it passes over the keel and back to the mast. Locate the strap over the top of the keel, fore of the kingpost and rear of the crossbar. Ensure the wingnut is secured and the safety pin is installed.

4.4.7 Rotate Wing

Move the trike front wheel behind the wing control bar. Apply the park brake. Go to the nose of the wing and with the mast brace tube in one hand and the control bar in the other lift the base bar. Rotate the wing until the rear of the keel rests on the mast. In strong winds maintain a firm grip on the wing. The angle of attack may be kept lower by using a helper to lift the keel high.

Figure 17 Section 4. Rotating Wing

4.4.8 Lock Seat and Mast Brace

Holding the front mast brace and the control bar, push the control bar upwards and rearwards and lock the seat frame into place by pushing the seat frame in the centre, down and rearwards. With the wing control bar on the seat, bring mast brace into position and allow the outer sleeve to slide into position. Install the top PIP pin and cap. Pull the front mast brace down to expose the lower PIP pin hole, install the lower pip pin and cap.

Figure 18 Lock Seat and Mast Brace

4.4.9 Park The Aircraft

The aircraft should be parked in a crosswind position with the wings base tube secured to the mast brace with the bungie supplied.

NOTE
The wingtip facing the wind should be lowered.

Figure 19 Section 4. Park the Aircraft

Complete Trike Pre-Flight Inspection

Ensure that the ignition switches are off prior to inspection. Daily inspections as outlined in the Rotax Operator's Manual should be carried out in conjunction with the following inspections.

Trike base Pre-flight Inspection	
No leaks from fuel system and engine, fuel lines secure.	√
No leaks from oil system and engine.	√
Fuel On/Off valve in the ON position.	√
Fuel filter clean and operational.	√
Fuel drain valve - check for any water in tank sump by draining a small quantity into a container.	√
Sufficient fuel for flight.	√
Oil level for oil injection OK.	√
Coolant level. Between max and min level on coolant bottle.	√
Rotary valve oil level OK.	√
Radiator hoses secure and operational.	√
Propeller: free of splitting, denting, delamination, nicks. Blade tape condition.	√
Propeller hub assembly secure and tie wired.	√
No cracking in tyre treads, or evidence of cracking around the rim.	√
Rear end and wheel spats secure.	√
No bolts bent, fractured or evidence of corrosion.	√
Electrical & instrumentation system secure and operational.	√
Throttle operation, both foot and hand throttle. Verify free and full movement..	√
Seat belt attachments secure.	√
Steering damper - adjust to desired setting.	√
All engine components secure - air filter, muffler, plug leads, locking wires.	√
Mast brace PIP pins secure.	√
Mast over centre latch loaded and secure.	√
Vents: oil tank, fuel tank, Pitot entry.	√
Mechanical components. Rotate propeller clockwise and observe for noise or excessive resistance.	√
General inspection of complete trike.	√
Wing & base universal bracket secure. Back up webbing strap secure.	√

Table 4 Section 4. Complete Trike Pre-Flight Inspection

4.5 Fuelling

Fuel flow is from a single fuel tank fitted with a self-venting tube. The fuel system is fitted with a shut off valve located:

503 powered aircraft on the port side beside mast

582 powered aircraft on the starboard side beside the mast

Be sure this valve is in the **ON** position before starting engine.

Never refuel if fuel could be spilled on hot engine components. Use only safety approved fuel containers and never transport fuel in an unsafe manner.

The fuel tank has a water drain mounted at the base and to the rear of the tank. The fuel system has an in-line fuel filter, which is mounted at the front of the tank. This filter can be easily disassembled for cleaning and inspection (see base maintenance manual).

WARNING

ENSURE THE AIRCRAFT IS EARTHED TO AVOID STATIC DISCHARGE IGNITING FUEL DURING THE REFUELLING OPERATION.

The Edge X series fuel levels are marked on the right side of the fuel tank. The fuel levels are marked at 10 litres, 20 litres, 30 litres, 40 litres.

4.5.1 Fuel Tank Capacity

The properties of the fuel tank material cause an increase in capacity after the first 2 to 3 tanks of fuel. Initial capacity is slightly reduced, with the "aged" capacity of 44 litres. The fuel level markings have been positioned for the fuel tank after it has aged and grown to 44 litres capacity.

4.5.2 Fuel Quantity

A sight gauge is provided on the starboard side of the aircraft. Its purpose is to provide fuel volume measurement for calculation of aircraft weight during fuelling of the aircraft and to provide the pilot with a visual indication of the quantity of the remaining fuel. The calibration is valid for the aircraft sitting on level ground and indicates total fuel, not usable fuel.

The trike base assumes various flight attitudes according to weight, flight, speed and power effecting the indicated value of fuel quantity in flight. The useable fuel quantity is selected for the worst case condition of aircraft attitude.

The first signs of engine fuel starvation occurs with the following conditions and fuel quantities:

- Cruise condition 0.85 litres of unusable fuel remaining.
- Maximum climb condition, maximum continuous power 6.8 litres of unusable fuel remaining.

The following placard attached to the aircraft provides quick reference:

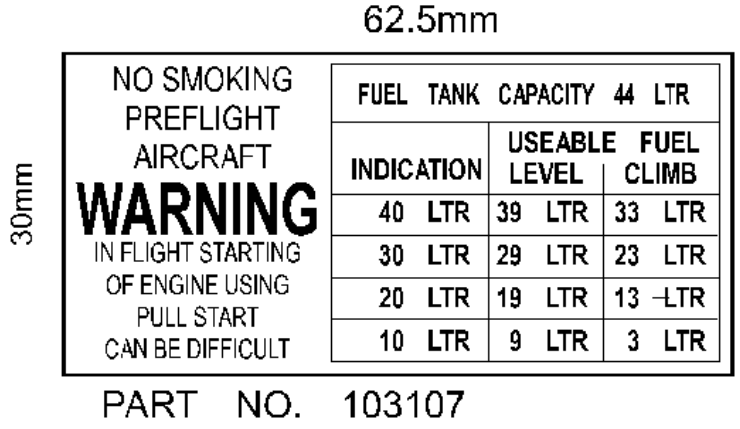


Figure 20 Section 4. Useable fuel

4.6 Engine Lubricating Oil

X Series Outback and Classic are powered by the Rotax 582 engine, for which, engine lubrication is supplied via the oil injection system which is gravity fed. The oil consumption is defined by engine rpm and the lever position. The lever is actuated via a Bowden cable connected to the throttle cable. The oil injection system has a capacity of 2 litres.

The nominal oil usage is 50:1 (2%) which would require 880 ml of oil for a full tank of fuel.

The X Series Redback is powered by a Rotax 503, for which premixed fuel and lubricating oil is required. The mixture ratio is 50:1 (2%) which would require 880 ml of oil for a full tank of fuel.
A standard fuel container containing 20 Litres of fuel will require 400ml of oil.

Oil Specifications
Oil used is Super two stroke ASTM/CEC standards, API-TC classification (consult your Rotax dealer for the recommended oil to suit your operating conditions).

4.7 Helmet Recommendation

The open cockpit of the Edge X exposes the occupants to the elements during flight and exposes them to objects outside of the aircraft in an emergency situation.

Helmets and eye protection are recommended for occupants for protection from precipitation, strike by insects and birds. Helmets are also recommended for risk reduction during an emergency landing of the aircraft. The helmets recommended for use in the aircraft are those certified to the EN 966 standard, that is applicable to helmets for air sports. The standard prescribes tests for penetration resistance, shock absorbing properties, field of vision and head mobility.

4.8 Normal Procedures Check List

The following checklists should be used as a reference. More detailed procedures are found in the Amplified Procedures section, which follows.

Prior to flight a thorough pre-flight inspection of the aircraft should be carried out. Details of the pre-flight inspection are shown earlier in this section.

4.8.1 Before Starting Engine

Pre-Flight Inspection	Completed
Full / free movement of the wing when attached to the trike base	Completed
Passenger Briefing	Completed
Safety Belts	Secure
Helmets	Secure
Intercom Connection	Secure
Brakes	On / Park
Intercom Connection	Secure
Parachute (If fitted)	Remove Safety Pin

Table 5 Section 4. Before Starting Engine Check

4.8.2 Starting Engine

Foot Brake	On
Fuel Cock	Open
Hand and Foot Throttle	Off - (Idle Position)
Key	On
Instrument	On
Ignition	On – (Remind yourself of the kill switch location during starting)
Choke	On
Propeller	Clear
Choke	Off
Depress Start Button / Pull Start	Push - When engine fires Release / Pull Start
Engine Running	Adjust Idle to 2000 rpm (2 mins)

Table 6 Section 4. Starting Engine Check

4.8.3 Before Take Off

Choke	Off
Warm Up	Adjust Idle to 2500 rpm (temp to reach 65 deg C)
Ignition Check	3000 rpm Speed drop with only one ignition must not exceed 300 rpm
Trimmer	Set Fast (Increase trim speed)
Fuel Quantity	Check Sufficient for task
Instruments	Check
Circuit Breaker	Check
Harnesses	Secure
Helmets	Secure
Throttle Response	Full On (3 seconds)
Controls	Pitch and Roll Full and free movement – completed before engine start as well as just prior to take off.

Table 7 Section 4. Before Take Off Check

4.8.4 Take Off and Initial Climb

Park Brake	Off	
Pitch Control	Neutral	
Hand Throttle	Off	
Foot Throttle	Full On (Reduce for minimum TOW)	
Directional Control	Nose Wheel Steering Straight	
Airspeed	Wizard	37 KIAS
Airspeed	Streak	44 KIAS

Table 8 Section 4. Take Off and Initial Climb Check

4.8.5 Climb

Foot Throttle	Full On (Reduce for minimum TOW)	
RPM	5800 RPM (Reduce to 5500 rpm once climb established. No change if using a reduced power take off)	
Airspeed	Wizard	30 KIAS
Airspeed	Streak	40 KIAS

Table 9 Section 4. Climb Check

4.8.6 Operating Airspeeds and Performance Data

		503-UL				582-UL			
		Streak Wing		Wizard Wing		Streak Wing		Wizard Wing	
		Min Weight	Max Weight	Min Weight	Max Weight	Min Weight	Max Weight	Min Weight	Max Weight
V_{ne}	knots (IAS)	81	81	54	54	81	81	54	54
	mph	93	93	62	62	93	93	62	62
Manoeuvring speed	knots(IAS)	60	60	54	54	60	60	54	54
	mph	83	83	62	62	83	83	62	62
Trim Speed	knots (IAS)	40-50	40-50	30-36	30-36	40-50	40-50	30-36	30-36
(Middle Hole)	mph	46-58	46-58	35-41	35-41	46-58	46-58	35-41	35-41
Stall Speed	knots (IAS)	23	30	23	30	23	30	23	30
Power Off	mph	27	35	27	32	27	35	27	32
Take Off	knots(IAS)	35	45	31	37	45	50	31	37
Safety Speed	mph	40	52	36	43	52	58	36	43
Nominated	knots (IAS)	45	50	31	37	45	50	31	37
Approach Speed	mph	52	58	36	43	52	58	36	43
Maximum	knots (IAS)	75	80	50	50	75	75	50	50
Level Speed	mph	86	92	58	58	86	86	58	58
Cross winds of up to	knots	11	14	11	14	11	14	11	14
	mph	13	16	13	16	13	16	13	16
Climb Rate	fpm		447		430		717		525
at take off safety speed									
Cruising Speed	knots (IAS)	60	65	40	45	60	65	40	45
Fwd CG	mph	69	75	46	52	69	75	46	52
Sink Rate	fpm		1184		450		1184		450
at cruising speed									
Sink Rate at V_{ne}	fpm		2355		904		2355		904
Glide Ratio (engine off)		6.6 : 1 @50kt	6.6 : 1	7.3 : 1 @37kt	7.3 : 1	6.6 : 1 @50kt	6.6 : 1	7.3 : 1 @37kt	7.3 : 1
Take Off Distance	metres		260		220		218		240
(See Note 1)									
Landing Distance	metres		228		210		228		210
(See Note 1)									
Min airstrip length	metres		364		310		305		340
Max wind	knots	20	20	20	20	20	20	20	20
operating conditions									
(at ground level)	mph	23	23	23	23	23	23	23	23

Table 10 Section 4. Operating Airspeeds and Performance Data

4.8.7 Cruise Speeds

Hand Throttle	Adjust for Level Flight	
Airspeed	Wizard 40 – 45 KIAS	Streak 60- 65 KIAS

Table 11 Section 4. Cruise Check

4.8.8 Descent

Foot Throttle	Reduce	
Hand Throttle	Off	
Airspeed	Wizard 31 – 37 KIAS	Streak 45- 50 KIAS

Table 12 Section 4. Decent Check

4.8.9 Landing

Hand Throttle	Off	
Airspeed	Wizard 31 – 37 KIAS	Streak 45- 50 KIAS
Directional Control	Nose Wheel Steering Straight	
Braking	Off Then as required	

Table 13 Section 4. Landing Check

4.8.10 After Landing

Parking Brake	On As required
Ignition Switch	Off
Electrical Switch	Off
Radio Equipment	Off
Controls	Secure
Parachute (If fitted)	Insert Safety Pin

Table 14 Section 4. After Landing Check

4.9 Amplified Procedures

4.9.1 Before Starting

Safety is everyone's business. Included are only some important safety tips. Keep a good lookout, be thoughtful and always show your intentions prior to starting.

Prior to flight a thorough pre-flight inspection of the aircraft should be carried out. Details of the pre-flight inspection are shown earlier in this section. Make sure all engine controls are operative and you understand the on/off positions of the throttle and ignition. These controls are readily accessible and you must be able to operate them instinctively without hesitation.

The primary throttle control is foot-operated and complemented by the hand throttle (forward for full power and rearward for power off). The ignition switches are on the right hand side of the seat frame (forward for on and rearward for off).

Never run the engine on the ground with the propeller turning unless you are doing so in a run up area and can observe anyone or anything entering the danger area. It is recommended that the engine not be run for any long periods whilst stationary on the ground. Possible damage to the engine may occur due to overheating of the engine fluid.

WARNING

LOCK THE WHEEL BRAKE TO REDUCE ANY POSSIBILITY OF DANGER TO ANY PERSON/S DURING ENGINE STARTING.

Before starting your engine you should read and be familiar with the engine manual.

Run through the following checklist (pronounced "twimpfish") prior to starting the engine for each and every flight.

T **T**hrottle - full and free movement

Tyres - inflated and serviceable

W **W**ind - check direction and strength

Wires - secure and airworthy

M **M**ixture - chokes off

P **P**ins - fitted and secured

F **F**uel - On and sufficient

I **I**nstruments - check, set and operational

S **S**witches - ignition check (all switches on)

C **C**ontrols - pitch and roll - full and free movement

Chocks - removed (secured in aircraft)

H **H**arness and **H**elmet in place and secure

Remember that the pilot in command has the ultimate responsibility for the airworthiness of the aircraft in which they fly.

4.9.2 Starting the engine

All controls should be checked with the ignition OFF. Passengers should have seat belts secure and be briefed for the flight.

The engine should be started with the pilot in the front seat. The following procedure should be used:

CAUTION
REMEMBER CLEAR PROP!

- Park brake is locked in the on position
- Fuel cock open
- Hand and foot throttle off
- Turn key switch and power up instrument
- Switch both ignitions **ON.** Remind yourself of kill switch location in case of a need to switch off during the starting procedure.
- Apply full choke unless the engine is hot
- Check visually that the propeller area is clear and call **"Clear Prop"** out loud
- Depress start button. If the engine refuses to start, switch off the ignition before investigation
- When the engine starts, increase the engine RPM to a little above idle and release the chokes
- Warm up the engine. Minimum Temperature should be reached before take off. Operate for 2 min at 2000 rpm continue at 2500 rpm until minimum temperature of 65 deg C is reached

WARNING
NEVER LEAVE YOUR AIRCRAFT UNATTENDED WHILE THE ENGINE IS RUNNING.

Keep an aircraft log and enter any unusual engine behaviour. Do not fly unless you have corrected a given problem and recorded the correction in the log.

4.9.3 Taxiing

With the engine idling, the brake lever should be depressed which will disengage the park brake. The control frame should be positioned so that it is in the approximate position for normal trim speed. The pilot's feet actuate steering on the ground. Left turn occurs when the right footrest is pushed forward. Right turn occurs when the left footrest is pushed forward.

NOTE

Control sense for turning is opposite to that of a conventional three axis aircraft.

When taxiing in strong wind conditions the following procedures apply:

- **Head Wind** conditions requires the nose of the wing to be lowered just below the trim position
- **Down Wind** conditions requires the nose of the wing to be raised just above the trim position
- **Cross wind** conditions requires the upwind tip to be lowered

4.9.4 Before take off

Before flight a full-throttle check is to be carried out. During this operation the pilot must be seated in the cockpit and prepared to switch off the ignition at very short notice if an emergency should arise.

CAUTION

BEWARE OF LOOSE STONES IN THE RUN UP AREA. LOOSE STONES CAN BE SUCKED UP BY THE PROPELLER AND CAUSE SEVERE PROPELLER DAMAGE IN A VERY SHORT TIME. RUN UPS ARE BEST CONDUCTED ON A CLEAR SEALED SURFACE OR ON GRASS, NEVER ON GRAVEL

The two ignition circuits should be tested with the engine running at 3000 rpm. Ignition one should be switched off and the RPM drop should not exceed 300 rpm. Both ignitions should be in the on position and ignition two should be turned off and the RPM drop should not exceed 300 rpm. Ensure both switches are in the on position after ignition circuit testing.

4.9.5 Take Off

AirBorne trike wings have a neutral static balance allowing a safe take off that is controllable under all suitable flying conditions.

Take off should be made on full power with only the foot activated throttle used during take off.

The take off run is the measured ground distance covered until the aircraft reaches a height of 50 feet above the average elevation of the runway used. Refer to Section 5 for details of takeoff performance.

During the take off run, the wing should be held in the trim position with the wings level. Accelerate smoothly to the take off safety speed. If the aircraft is fully loaded you will require full power.

When the aircraft reaches the take off safety speed the control bar should be pushed steadily forward until the trike lifts and rotates quickly on the main wheels. As the aircraft leaves the ground the control bar must be eased back to maintain take off safety speed.

CAUTION

HIGH-ANGLE CLIMB-OUTS NEAR THE GROUND SHOULD BE AVOIDED.

Maintain your engine in top condition and assume it's going to stop running at any time. Leave yourself a way out for an unexpected engine failure.

Never fly your aircraft at locations, airspeeds, altitudes, or under any circumstances from which a successful engine off landing cannot be attempted.

4.9.6 Climb

Initial climb out should be made on full power for maximum take off weight. Approximately 2/3 of maximum take off power is considered comfortable for a minimum weight takeoff. Take off distance will be extended at reduced power.

WARNING

AT LOW ALL UP WEIGHTS, THE TAKE OFF CLIMB OUT AT THE TAKE OFF SAFETY SPEED CAN RESULT IN HORIZONTAL PITCH INCLINATIONS IN EXCESS OF THE PLACARDED 45 DEGREES MAXIMUM. THE PILOT MUST BE AWARE OF THIS AND SHOULD KEEP WITHIN THE PLACARDED LIMITATIONS BY LOWERING THE ATTITUDE OR REDUCING ENGINE POWER.

Once climb is established power should be reduced to maximum continuous power or of 6500 rpm or less. A minimum of take off safety speed should be used. At this speed the aircraft would round out nicely into a glide should the engine fail.

Avoid pitching the nose of the wing up more than 45 degrees to the horizon. Very steep climbs are dangerous and can result in a stall followed by a severe pitching of the nose forward. Professional training is required for the correct procedures of unusual attitude recovery.

WARNING

REDUCED POWER TAKE OFFS WILL EXTEND TAKE OFF DISTANCE. IT IS THE PILOT'S RESPONSIBILITY TO ENSURE THAT THERE IS SUFFICIENT RUNWAY AVAILIABLE TO CLEAR ALL OBSTACLES WHEN CONDUCTING REDUCED POWER TAKE OFFS.

4.9.7 Cruise

When the desired flight altitude is reached the aircraft may be levelled out and throttle reduced to that required to maintain level flight.

The hand-operated throttle on the right side of the seat frame can be used to set engine rpm. Once the hand throttle is adjusted the pressure on the foot pedal may be removed. When the hand throttle is actuated increase power can still be achieved with the use of the foot throttle. The rpm will always return to the cruise setting when foot pressure is removed. If the hand throttle is set a reduction in RPM is not achievable using the foot throttle. The hand throttle must be in the off position to achieve low RPM.

4.9.8 Stalls

In practice it is only possible to induce a nose down stall of the aircraft in level flight at high take off weights. The onset of stall is indicated by a significant increase in control bar loads.

WARNING

NEVER STALL THE AIRCRAFT WITH THE NOSE PITCHED UP BEYOND 45 DEGREES. MANOEUVRES BEYOND THIS ARE DANGEROUS AND CAN RESULT IN A TAIL SLIDE FOLLOWED BY A SEVERE TUMBLE.

REFER TO SECTION 3.3.12 OF THIS FLIGHT MANUAL FOR DETAILS OF THE PROCEDURES FOR RECOVERY FROM UNUSUAL ATTITUDES.

Recovery from a mild stall is very gentle, whether power is on or off. Recovery is quick, with height loss of less than 50 ft with no tendency to break away suddenly. A stall would have to be forced violently, to induce a danger.

When practising stalls make sure you have sufficient altitude. Push the control bar out so that the airspeed is reduced at a maximum of 1 knot per second, and the aircraft will reach a minimum steady flight speed without dropping a wing. The sink rate will increase in this minimum speed mode more than two fold.

If the airspeed is decreased by rapidly raising the nose the wing will stall. Rapid decrease of airspeed in the order of 2-3 knots per second will see an altitude loss of up to 100ft. See section 3.3.12 for recovery procedures.

Never stall with the nose pitched up too high. This is a dangerous manoeuvre and can result in a tail slide followed by a severe tumble. As a guideline, the nose up angle at which the aircraft stalls is about the nose down angle it will recover at.

4.9.9 Descent, Approach and Landing

Landing should always be into wind with a long straight approach.

The landing distance specified in section 5 is the measured ground distance covered from an approach at 50 feet above the average elevation of the runway used until the aircraft makes a complete stop.

An approach to the airstrip may be made with or without power, but in either case the airspeed should be maintained above the nominated approach speed.

The aircraft should be flown on final approach at or above the nominated safety speed. The additional airspeed allows for wind gradient, and to provide greater controllability in the rough air that may lie close to the ground. Maintaining airspeed on final is very important for engine-off landings, allowing a margin for round out before touchdown.

The trike is designed to land with the rear wheels touching down slightly before the nose wheel. Once firmly on the ground aerodynamic braking may be achieved by pulling in the control bar, then applying the front nose wheel brake.

NOTE

In the case of a heavy landing the maintenance manuals for both the wing and the base should be referenced. It must be noted that after a hard landing, your aircraft must be completely checked.

4.9.10 Cross Wind Landing and Take Off

Pilots with less experience should avoid landing or taking off in conditions with high crosswind components, as skills do not always match the capabilities of the aircraft. Crosswind landings or take off with low wind components up to 8 knots are quite safe and controllable, even to the inexperienced pilot.

The nominated approach speed should be increased by 5 knots when landing in cross wind conditions of 10 knots or more.

After touchdown in cross wind conditions the relative airflow over the wing will become increasingly span wise (from tip to tip) as the aircraft slows down. The upwind wing tip should be lowered slightly (the amount depends on the wind strength), and the undercarriage wheels will retain firm contact with the ground.

Take off procedure is unchanged for the nominated crosswind limit. The upward wing may need to be lowered at the start of the take off procedure in higher cross winds.

4.9.11 Baulked Landing

During a situation where a baulked landing (go around) is required, normal take off power and procedures should be used.

4.9.12 Stopping the Engine

To stop the engine after a period of running, the ignitions should be switched off at idle. Switching off at high RPM floods the engine and makes restarting difficult. If the engine has been running under full power allow the engine to cool at idle, before switching off.

4.10 After Landing / Securing

After landing and when in the parking area apply parking brake and lock. Switch the ignition, electrical switch and radio equipment off. The aircraft should be parked in a crosswind position with the base tube secured to the mast brace with the bungie supplied. The emergency parachute safety pin should be inserted before leaving the aircraft.

4.10.1 Low Hangar Position

The lowest convenient total aircraft height may be achieved by separating the front mast brace, then tilting the wing nose up as shown in the figure below.

Figure 21 Low Hangar Position

4.11 De-Rigging Procedure

Careful attention to the recommended rigging and de-rigging sequences will protect the aircraft from the risk of unnecessary damage.

The de-rigging procedure is a direct reversal of the rigging procedure. A summary of the procedure follows:

4.11.1.1 Remove Wing from Base

See section 4 (Attaching Wing to Base) and use reverse procedure

- Apply park brake.
- Remove pip pins from the front support compression tube. Slide outer mast brace up and insert pip pin through lower hole (this will secure the inner and outer tubes for the lowering phase).
- Unload and remove over centre latch.
- Lower the wing until the control bar is on the ground.
- Secure mast with strap to base tube.
- Unbolt the trike from the U-bracket; remove safety loop and wheel out the trike unit.
- Reinstall keel extension tube.

4.12 Wing Break Down Procedure

This section assumes that the wing has been removed from the base. The wing should have the keel extension fitted with the clevis pin and ring installed. This section is intended as a reference only and assumes prior knowledge of the break down procedure. Further reference for cover positioning can be found in the wing Illustrated Parts Catalogue (IPC).

4.12.1 Detension Tip Struts

Fold the tip struts pushing the hinge joint towards the center of the wing. Once the sail end of the strut is inside the undersurface fold the strut forward and towards the tip of the wing and locate on top of leading edge.

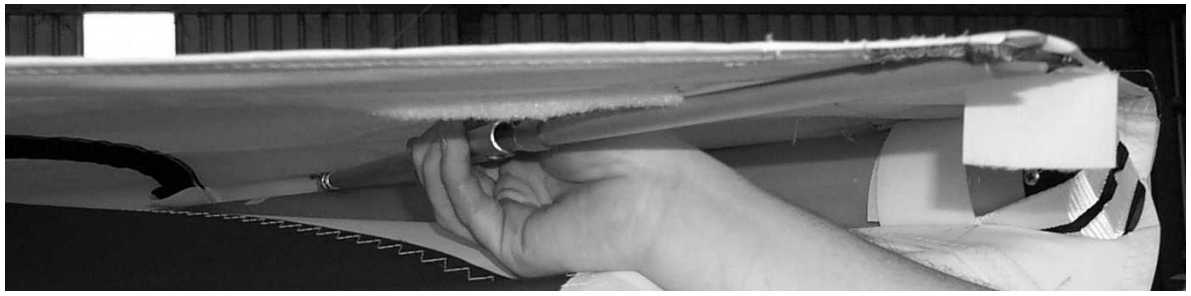
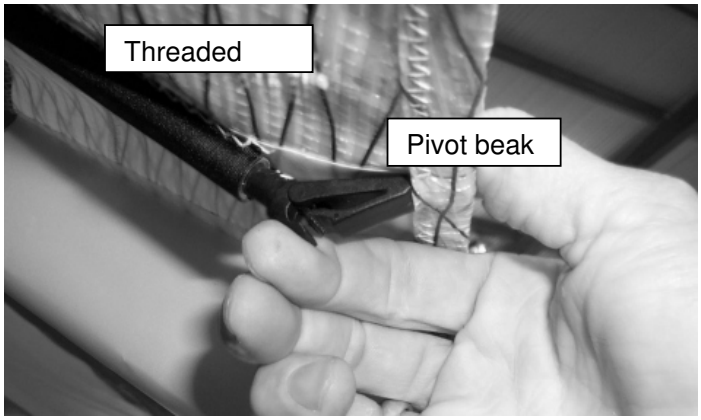


Figure 22 Section 4. Detension Tip Strut

4.12.2 Remove Tip Battens



Remove outermost three tip battens. Unclip 'pivot beak' from 'threaded end'. Rotate *pivot beak* and remove from sail as shown. To adjust batten load tension, release *pivot beak* from sail and rotate batten clip. See maintenance manual for adjustment details.

Figure 23 Section 4. Remove Tip Battens

4.12.3 Remove Undersurface Battens

Insert finger through string loop and pull batten forward. Once the batten is forward pull string down to remove from oval pocket. Slide batten rearward until all the way out.

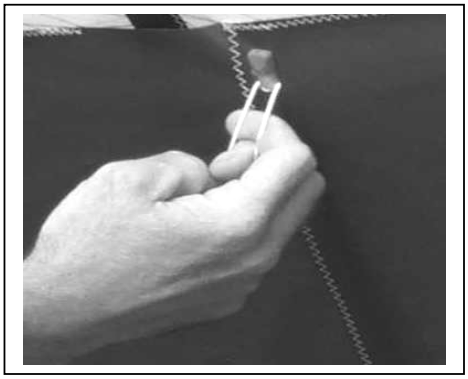


Figure 24 Section 4. Remove Undersurface Battens

4.12.4 Fit Tip Bags

Roll sail at the tips inwards and parallel to the leading edge. Slide the tip bag over the end of the leading edge. The barrel lock unit can be used to tension the bag bungee.

Figure 25 Section 4. Fit Tip Bags

4.12.5 Fit U-Bracket Cover

Unzip undersurface approximately 1 metre to allow better access to fit the U-bracket cover. Pass the cover up over the keel with the webbing strap facing to the rear of the wing. Velcro around each down tube (photo shown is a rear view).

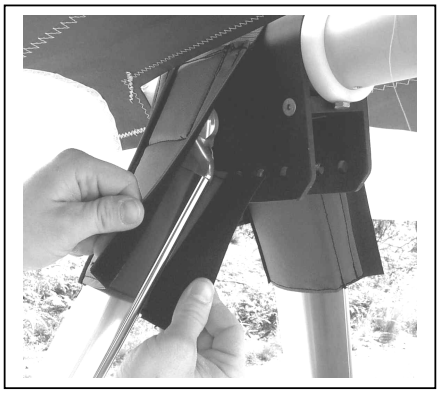
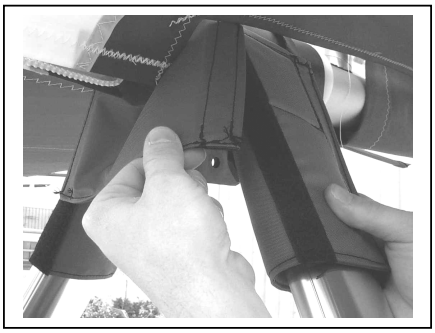


Figure 26 Section 4. Fit U-Bracket Cover

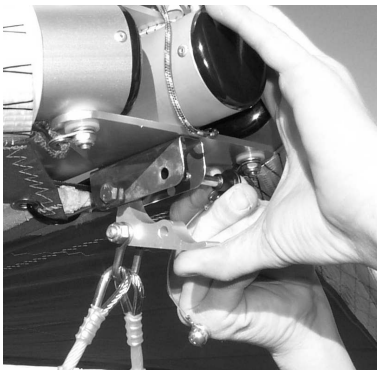
4.12.6 Velcro U-Bracket Face Cover



Position the face cover so that it is facing forward. The cover is designed to protect the wing bag when packed (photo shown is a front view).

Figure 27 Section 4. Velcro U-Bracket Face Cover

4.12.7 Disconnect Nose Catch and Remove Nose Cone



Remove the nose cone. Disconnect nose catch by removing the pip pin. The pip pin button should be depressed with the thumb while simultaneously pulling the pip pin out. Re-insert pip pin in nose channel for storage.

Figure 28 Section 4. Disconnect Nose Catch and Remove Nose Cone

4.12.8 Remove Sail Cowling

Undo the securing Velcro tabs at the front of the cowl. Remove the sail cowling from the top of sail.

Figure 29 Section 4. Remove Sail Cowling

4.12.9 De-Tension Pull Back Cable

Depress quick clip with left thumb. Use right hand to pull on the webbing handle. Remove the shackle from the quick clip block and allow webbing handle to move forward.

Figure 30 Section 4. De-tension Pull Back Cable

4.12.10 Remove Main Sail Battens

Pull the leading edges together approximately 1/2 metre. Remove the remaining main sail battens. Insert battens in the batten bag.

NOTE
The straight battens are inserted in separate pockets.

Figure 31 Section 4. Remove Main Sail Battens

4.12.11 Remove King Post

Remove the king post by lifting upward. Fit the quick clip king post base cover around the quick clip. Insert the king post in to pouch.

Figure 32 Section 4. Remove King Post

4.12.12 Fold Leading Edges

Fold both wings in symmetrically, bringing both leading edges back at the same time or in small steps side to side.

Roll the sail inwards parallel to the leading edge. Attach a strap around one wing. Repeat for the other side. Fit the keel end pouch.

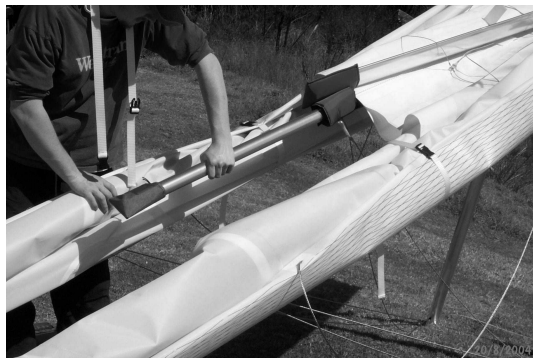


Figure 33 Section 4. Fold Leading Edges

4.12.13 Attach Straps

Once the leading edges are together apply slight pressure downwards on the keel to raise the leading edges above the down tubes and attach strap around both wings and keel. Attach remaining straps so that they are evenly spaced.

4.12.14 Fit Wing Bag

Position the wing bag to the nose of the wing. Stretch bag down the wing to enclose the tips.

4.12.15 Roll Wing

Hold the wing and down tube and roll the wing onto its back with the control frame to the side.

4.12.16 Disconnect Base Bar

Depress pip pin button and remove pip pin from base bar. Fold down tubes together with base bar folded out. Re-insert the pip pin.

4.12.17 Fit Padding

Fit the base bar and down tube covers. Velcro the base bar cover in whilst holding the base bar in position.

Figure 34 Section 4. Fit Padding

4.12.18 Fold Control Frame

Undo centre two wing straps. Route flying wires between the down tube and lower the control frame into the wing whilst holding tension on wires. Avoid kinking the flying wires.

4.12.19 Position Battens

Stow the battens with the curve down at the rear of the glider bag. Reattach wing straps so that the control frame and battens are within the leading edge pockets. Zip up the wing bag.

Figure 35 Section 4. Position Battens

4.13 Transportation and Storage

The wing must always be transported inside its bag, and the bag zip should face downwards to prevent the entry of rainwater. During transportation, or when stored on slings, the wing must be supported at its centre and at two points not more than one metre from each end. The padding supplied with the wing must be used to prevent chaffing during transport.

Supports should be softly padded, and any support systems used for transport, such as roof racks, must use attachment straps that are sufficiently secure to eliminate the possibility of damage from vibration and movement.

Avoid damage to your wing by using well-padded racks. As the wing is quite heavy a strong set of racks are required. Flat straps should be used for tie downs to avoid damage to leading edge Mylar.

When transporting the trike base the use of trike and prop covers to protect your aircraft from road grime (and idle fingers) is recommended. Tie the propeller to the trike to stop it from rotating at speed.

Check that the back of the wing is well clear of the front mast with the trike on the trailer. Remember that you have an overhanging load when manoeuvring in tight places.

Store the wing in a dry room off the ground; air the wing out regularly to avoid mildew, and never store wet.

See your Rotax Manual for precautions to be observed if you intend to store the aircraft without use for extended periods.

4.14 Noise Characteristics

Model	Rotax 503 - UL C-Type (Reduction 3.47 : 1)	Rotax 582 - UL E-Type (Reduction 3.47 : 1)
BROLGA 68" x 4 Blade Ground Adjustable .	Pitch Setting 14° pitch blocks. Air filter intake and Rotax muffler only: **63.8 dB(A)** Test as per 101.55, Subsection 9	Pitch Setting 17° pitch blocks Air filter intake and Rotax muffler only: **64.2 dB(A)** Test as per 101.55, Subsection 9
Bolly BOS 68" x 3 Blade	Pitch Setting 10° blade tip. ------ Air filter intake and Rotax muffler only. Noise levels to be advised	Pitch Setting 16° blade tip. Intake silencer, Rotax Muffler and after silencer fitted: **58.9 dB(A)** Test as per DULV overflight at 100m ------- Air filter intake and Rotax muffler only. Noise levels to be advised
Warp Drive 68" x 3 Blade Ground Adjustable .	Pitch Setting 10° blade tip Air filter intake and Rotax muffler only. Noise levels to be advised	Pitch Setting 16° blade tip Air filter intake and Rotax muffler only. Noise levels to be advised

Table 15 Section 4. Noise Characteristics

PERFORMANCE

5 PERFORMANCE

5.1 General

The performance data in the following section has been computed from actual flight tests with the aircraft and power plant in good condition and using average piloting techniques. It should be noted that piloting techniques, climatic conditions and aircraft condition will cause significant variation to these performance figures.

5.2 Take Off and Landing

5.2.1 Take Off Edge X

		503-UL		582-UL	
		Streak Wing	**Wizard Wing**	**Streak Wing**	**Wizard Wing**
Take Off Distance	metres	260	220	240	218

Table 1 Section 5. Take Off Performance

Takeoff distances are specified for:

Sea Level with:

Max Take Off Power

A level dry runway

With short grass

Still wind

And temperature of 15 deg C.

The following factors will increase takeoff distance:

Reduced Power Take Off

Higher drag runway surfaces such as wet or long grass

Tail wind

Uphill takeoff

OAT above 15 deg C

Runway altitude above sea level

The pilot is required to take into account the effect of the above when determining takeoff distance.

5.2.2 Landing Edge X

Performance at MTOW	Streak	Wizard
Landing Distance from 15 m (50 ft)	228 m	210 m

Table 2 Section 5. Landing Performance

Landing distances are specified for:

Sea Level with

A level dry runway

With short grass

Still wind

And temperature of 15 deg C.

The following factors will increase landing distance:

Lower drag runway surfaces such as tarmac

Tail wind

Down hill landing

OAT above 15 deg C

Runway altitude above sea level.

The pilot is required to take into account the effect of the above when determining landing distance.

Crosswind components of up to 12 knots at maximum AUW are within aircraft operating limitations.

Always exercise judgement when selecting locations for take off and landing. Leave adequate margin for appropriate control action in the event of sudden engine failure or turbulence being encountered.

CAUTION

TAKE OFF AND LANDING DISTANCES MUST BE INCREASED BY 20% FOR EACH 1000 FEET OF ALTITUDE ABOVE SEA LEVEL.

5.3 Climb

	503-UL		582-UL	
	Streak Wing	Wizard Wing	Streak Wing	Wizard Wing
Climb Rate fpm at take off safety speed	447	430	717	525
Take Off knots(IAS)	45	37	50	37
Safety Speed mph	52	43	58	43
Sea Level Gradient of Climb	10.1%	11.6%	14.7%	14.2%

Table 3 Section 5. Cruze Climb

Climb data is for ISA conditions (Sea Level at 15 deg C), with tests performed at 430kg take off weight.

5.4 Airspeed Calibration

All Air Speeds in this AOI are expressed as Knots Indicated Air Speeds (KIAS) unless otherwise noted. Below is a table showing the relationship between Indicated Air Speed and Calibrated Airspeed. The table assumes zero instrument error.

Indicated Air Speed (KIAS)	Calibrated Air Speed (KCAS)
25	26
30	30
35	35
40	39
45	44
50	48
55	53
60	57
65	61
70	66
75	70
80	75

Table 4 Section 5. Airspeed Calibration

5.5 Stall Speeds

Stall Performance		Streak Wing	Wizard Wing
Stall Speed Power Off	knots (IAS)	35	32
	mph	40	37

Table 5 Section 5. Cruze Stall Speeds

5.6 Glide

Glide figures have been determined with the engine off at maximum take off weight.

Performance - MTOW	Streak Wing	Wizard Wing
Descent Rate	1184 ft/min	517 ft/min
Glide ratio at cruise speed	4.9:1 @ 60 KIAS	7.2:1 @37 KIAS
Glide Distance from 1000ft AGL	1485 m	2200 m

Tests performed under conditions of sea level and Streak TOW 450kg, Wizard TOW 401 kg.

Glide descent rate data is for ISA conditions (Sea Level at 15 deg C)

Table 6 Section 5. Glide at Cruise Speed

5.7 Performance at Cruise Speeds

5.7.1 Edge X 582 Performance at Cruise Speed

Performance at MTOW with Streak	Metric	Imperial
Cruise Speed	50 kts	57 mph
Typical Fuel Burn @ Cruise (See Note)	14 L/hr	3.7 gal/hr
Range @ Cruise	284 km	176 miles

Table 7 Section 5. Edge X582 Performance at Cruise

5.7.2 Edge X 503 Performance at Cruise Speed

Performance at MTOW with Wizard	Metric	Imperial
Cruise Speed	43 kts	49 mph
Typical Fuel Burn @ Cruise (See Note)	14 L/hr	3.7 gal/hr
Range @ Cruise	210 km	130 miles

Table 8 Section 5. Edge X503 Performance at Cruise

NOTE
Fuel consumption figures are included as a guide only. The consumption figures should not be used for planning purposes. Changes in aircraft configuration, load, altitude, wind strength and direction as well as climatic conditions will cause significant variation in fuel consumption.

WEIGHT BALANCE AND EQUIPMENT

6 WEIGHT BALANCE AND EQUIPMENT

6.1 General

This aircraft must only be flown solo from the front seat. All aircraft operations may be carried out whilst solo, as when the aircraft is flown dual.

The fuel capacity must always be considered when measuring the AUW of the aircraft. Remember that fuel is measured at 0.7 kg per litre and fuel quantity will alter the aircraft's performance during take off and landing. A fuel volume calculator can be found in section 6.3.2.

6.2 Aircraft Weight

The table in section 6.2.1 shows the weight of the aircraft as weighed during final Quality Assurance at the factory. The following page shows, if applicable, the options that were included when the aircraft was weighed. The empty weight shown below can also be found on the limitations placard on the aircraft dash panel. A second issue section is included which allows the weight to be revised if any additional equipment is installed or if the empty weight of the aircraft changes for any reason. If the empty weight has changed then revised placards are available from Airborne. The weight calculators allow for additional weight to be accounted for.

6.2.1 Aircraft Weighing Information

Typical wing weight Streak (50 kg), Wizard (49 kg).

Aircraft Type: AirBorne WindSports EDGE X Series				
	Serial No	Issue	Date	Empty * Weight (kg)
Trike Base	X Series	1		kg
Unusable Fuel	2 Litres	1		1.4 kg
Wing	-	1		kg
Training Bars	1.4 kg (If applicable)	1		
			Issue 1 Aircraft Empty Weight*	kg

Trike Base	X Series	2		kg
Unusable Fuel	2 Litres	2		1.4 kg
Wing	-	2		kg
Training Bars	1.4 kg (If applicable)	2		
			Issue 2 Aircraft Empty Weight *	kg

Table 1 Section 6. Aircraft Weight

*Empty Weight for the aircraft comprises of:

- Standard equipment as per section 6.2.2
- Optional equipment as per section 6.2.3
- Full coolant, full engine oil and unusable fuel

The keel extension and pack up gear are not included in the empty weight

6.2.2 Standard Equipment

STANDARD EQUIPMENT	X Classic	X Outback	X Redback
Engine Type	ROTAX 582 UL DCDI / mod 99	ROTAX 582 UL DCDI / mod 99	ROTAX 503 UL DCDI
Engine Serial Number			
Gear Box Type	E Type 3.47 : 1	E Type 3.47 : 1	C Type 3.47 : 1
Propeller Type	BROLGA 68" 4blade	BROLGA 68" 4blade	BROLGA 68" 4blade
Airspeed Indicator (Knots)	Standard	Standard	Standard
Hour meter	Standard	Standard	Standard
Tachometer	Standard	Standard	Standard
Exhaust Gas temperature	Standard	Standard	
Cylinder Head Temperature			Standard
Water Temperature	Standard	Standard	
Electric Start	Standard	Standard	

Table 2 Section 6. Aircraft Weight Standard Equipment

6.2.3 Optional Equipment

OPTIONAL EQUIPMENT	FITTED (Yes/No)
BRS Emergency Parachute	
Radio	
Intercom	
Training Bars	
Compass	
Propeller net	

Table 3 Section 6. Aircraft Weight Optional Equipment

6.3 Typical Aircraft Weights

	X Classic lbs	kg	X Outback lbs	kg	X Redback lbs	kg
Empty Weight Trike base only, dry weight, (with coolant only)	317 lbs	144 kg	309 lbs	140 kg	271 lbs	123 kg
Empty Weight + 172 kg crew + 1 hr Fuel (26.5 litres /19 kg)	741 lbs	336 kg	732 lbs	332 kg	683 lbs	310 kg
Empty Weight + 86 kg pilot + full fuel (44 litres / 32kg)	575 lbs	261 kg	569 lbs	258 kg	531 lbs	241 kg

Table 4 Section 6. Typical Aircraft Weights

6.3.1 Weighing Procedure

The wing should be lifted when assembled by routing a webbing strap around the king post top.
The trike base should be lifted by the suspension point on the top of the mast.

Prior to weighing ensure that all fuel is drained and all baggage is removed from the aircraft. The weight, if changed due to option fitment should be recorded as a new issue and dated accordingly in section 6.2.

6.3.2 Weight and Loading Form Data

Wheel weight balance for a weight shift control aircraft is non critical.
Payload distribution for each seat is up to 100 kg per seat.

The tricycle undercarriage is suspended from the wing hang point. The location of this point is important for the safe operation of the aircraft, a range for this position is given for the purpose of adjusting the trim speed of the aircraft.

Use the forward hang point position to increase trim speed. Use the rearmost hang point position to decrease the trim speed.

Wizard wing hang point position range
Hang point within a range of 1645mm to 1585mm, rearward of the datum point on the nose plate, reference, at the centre of a line between the nose plate bolts for each leading edge.

Streak 2B wing hang point position range
Hang point within a range of 1195mm to 1285mm, rearward of the datum point on the nose plate, reference, at the centre of a line between the nose plate bolts for each leading edge.

AIRCRAFT & SYSTEMS DESCRIPTION

7 AIRCRAFT & SYSTEMS DESCRIPTION

7.1 General

This section provides descriptions of the aircraft and its systems as well as methods of operation where appropriate.

Information on the aircraft flight controls is detailed in this section, but it is mandatory that you receive professional training prior to any solo flight. It is illegal to operate this aircraft in Australia without a licence issued by the HGFA or RAA.

7.2 Airframe

Wing

The Streak and Wizard wings are wire braced weight shift controlled micro light wings. The airframe is constructed from 6061-T6 multi sleeved aluminium tubing.

The multi sleeved leading edge construction is 63.5, 60.0 and 57.0 mm tube. This large diameter construction designed along with the sail luff curve, acts to preload the leading edge and maximise trailing edge tension throughout the speed range.

The main-sail cloth is 6 oz Dacron with a Mylar insert in leading edge pocket. A trailing edge band provides minimum stretch when loaded.

The Streak wing is load tested in excess of 2450 kg, the Wizard in excess of 2335 kg. Excellent engineering contributes to the relatively light wing total mass of 50 and 49 kg respectivly.

Base

Attached to the wing by way of a universal joint is the trike base. The universal joint allows the free movement of the trike base in pitch and roll by which control is effected. The trike base includes the characteristic tricycle undercarriage, pusher power plant and open cockpit.

The engine is mounted to the engine platform at the base of the engine. A long-range fuel tank is mounted beneath the engine platform.

The pilot cockpit is designed to allow for various size pilots. The cockpit has soft sides attached to the pod and encloses the trike base tube and most of the fuel tank.

The maximum tyre pressure is 30 psi (205 kPa) and optimum pressure for general operations is 15 psi (103 kPa).

7.3 Flight Controls

Flight controls are as follows:

- Control bar move right = Left turn
- Control bar push out = Pitch up
- Push right toe = Throttle open
- Hand throttle forward = Throttle open
- Tighten trim cable = Slow trim

7.4 Ground / Flight Control

Ground Controls are as follows:

- Push left pedal = Taxi steering right
- Push Left Toe = Brakes on
- Ignition switch forward = Switch on
- Choke forward = Choke on
- Fuel Tap Aligned with tap body = Fuel on

7.5 Instrument panel

The instrument panel consists of the following minimum instrumentation:

An analogue airspeed indicator (knots), an hour meter an altimeter and engine temperature indication.

All models have a power circuit breaker, 12V DC outlet.

Various models have additional instrumentation as described in the training supplement Section 9.

7.6 Undercarriage System

The microlight uses a tricycle undercarriage with a braking system via a nose wheel drum brake unit. Rubber sprung and rubber dampened front shock absorbers are used.
The rear suspension articulates the wheel at the end of the struts. The springs used are wound rubber shock chord.

7.7 Seat Adjustment

The front seat backrest on the Edge X trike has a simple for and aft adjuster on the base tube. To adjust the seat backrest forward the following procedure should be adopted:

1) Remove pin and bolt from channel.
2) Rotate seat back forward and replace bolt in channel one hole further forward.
3) Replace safety pin through bolt.

To move backrest rearward the bolt should be moved one hole back.

7.8 Occupant Restraint Harness

Both front and rear seats are fitted with a lap restraint system. This system is chosen for its simplicity and freedom of movement of the pilot.

When flying the trike solo it is important to fasten the rear seat belt to prevent contact with hot engine components in flight.

7.9 Engine

Refer to Section 2.5 for engine and gearbox specifications.

The engines used are:

Rotax 503 – UL, as used on Redback model trike.

Rotax 582 - UL, as used on Outback and Classic model trikes.

The Rotax engine is fitted with a gearbox, which delivers smooth thrust via a reduction drive. This power unit is complemented with a ground adjustable propeller giving the ultimate in performance and reliability. The engine is naturally aspirated with carburettors and an external dry filter.

7.10 Propeller

Three alternate propeller/hub configurations are available for use on the Edge X.

These propeller designs are well described in section 2.5.10, the models include:

Aerofibre Industries, 68" x 4 BROLGA , 4 Blade Composite.

Warp Drive Propellers, 68 INCH, 3 Blade Composite.

Bolly BOS, 68 INCH**,** 3 Blade Composite.

Table 1 Propeller model listing

The propeller pitch setting and checking procedure is outlined in the Base Maintenance Manual. The pitch setting is determined as a part of certification of the aircraft. Settings outside this specification have an unknown effect on aircraft performance, and are not approved. Propeller pitch setting effects engine rpm. If the engine exceeds its rpm limits, check to see that the propeller pitch is set correctly.

7.11 Brake System

A front wheel drum brake system with leading lagging shoe design is used. Depressing the brake lever on the left hand side of the front footrest actuates the brake, on aerotow equipped trikes the aerotow release is the lever on the top left, painted yellow. A brake lever lock is provided. To engage, depress foot lever and raise locking lever by hand. To disengage, depress the foot lever.

Use wheel chocks when leaving the aircraft stored over long periods.

7.12 Electrical System

An electrical schematic for the aircraft is shown in the diagram on the following page.

The Electrical circuits comprise:

- an instrumentation circuit. The 12 V DC supply is protected by a 15 amp fuse at the battery and a 10 amp circuit breaker mounted on the dash. The master switch on the dash, when in the off position, disables the DC power socket, flight instrument and the electric start push button;
- an engine management circuit; and
- an ignition circuit.

A fuseable link is used to connect to the battery, this is used to protect against short circuit. The fuseable link has continuous rating 30 A . 60 A 15-20 sec. 180 A 5 sec. Replacement fuseable link for X series aircraft, part number is 103333.

It should be noted that the ignition circuit is a fail-safe system whereby the engine will run in the event of the ignition circuit becoming disconnected. Switching the coil to ground stops the engine.
When stopping the engine both switches on the side of the seat should be switched off. The master switch on the dash should then be turned to the off position to remove supply to the accessories.

If necessary the motor can be stopped using the chokes as detailed in section 3.3.10 of this issue of operating instructions.

Refer to the Rotax manual for more details for the engine electrical system.

7.12.1 Electrical Schematic X Series Classic / Outback

Electrical Schematic for X Series Aircraft fitted with Rotax 582 U/L Engine.

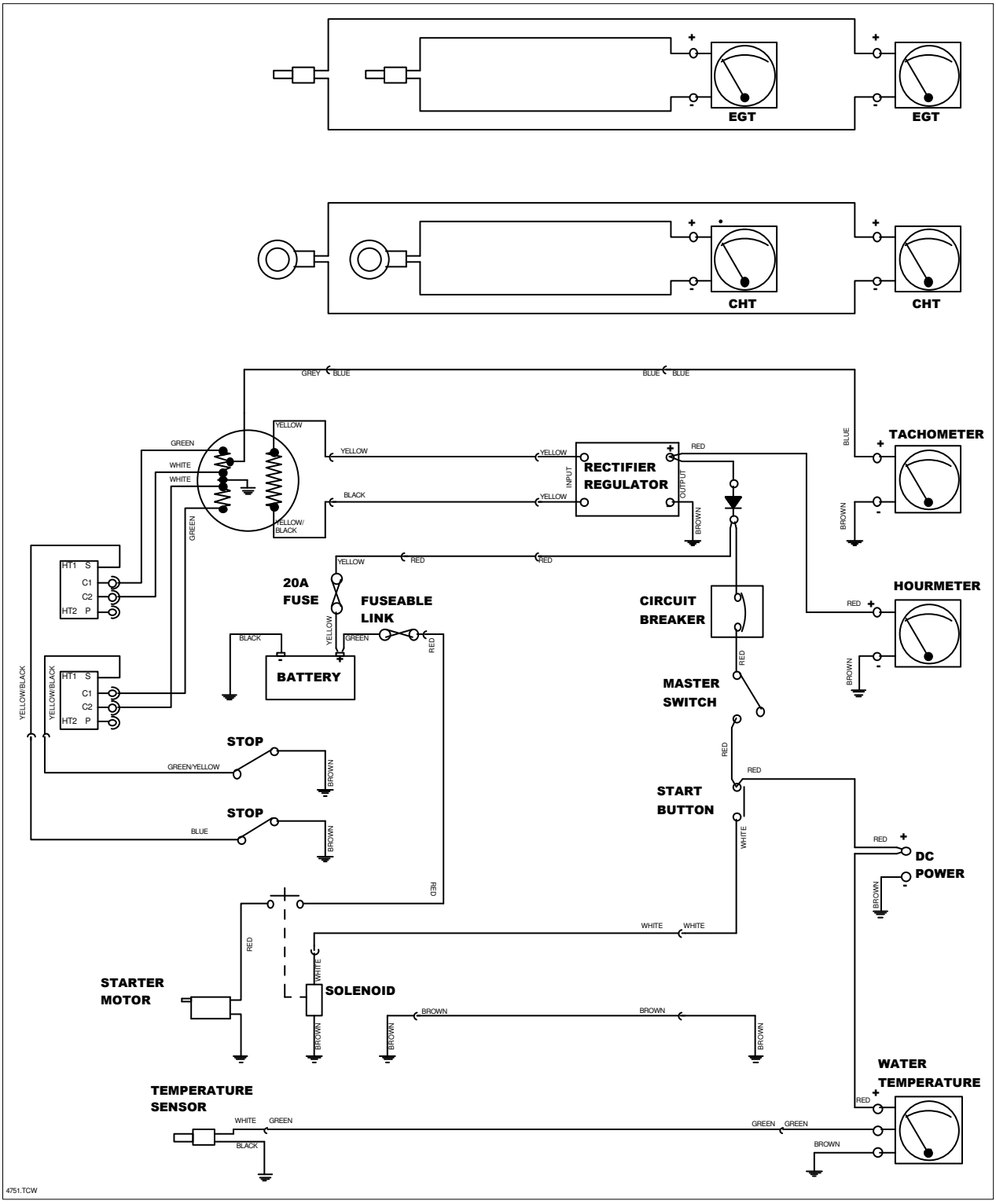


Figure 1 Section 7. Electrical Schematic 582

7.12.2 Electrical Schematic X Series Redback

Electrical Schematic for X Series Aircraft fitted with Rotax 503 U/L Engine

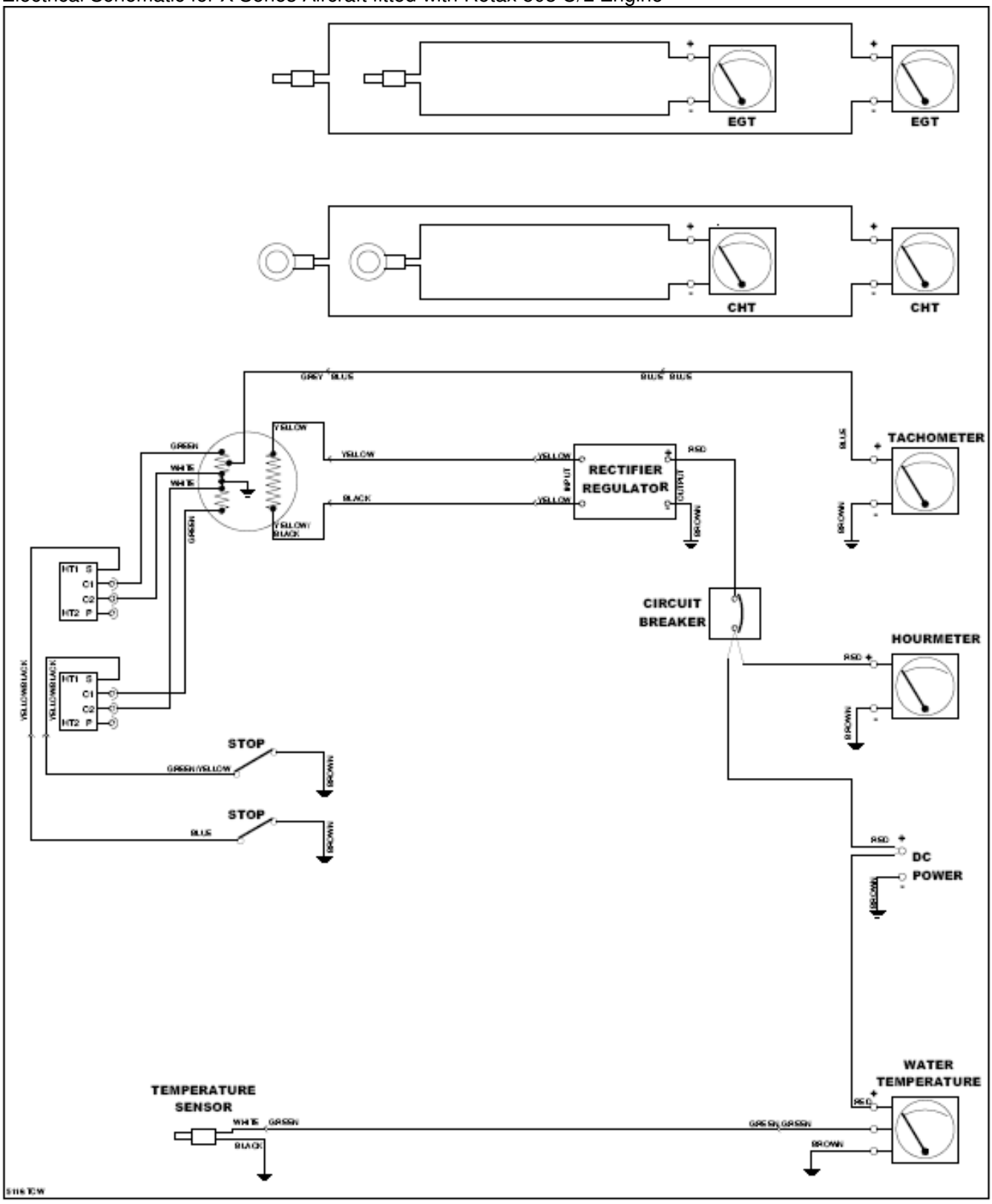


Figure 2 Section 7. Electrical Schematic 503

7.13 Pitot Static System and Instruments

The Pitot static system supplies ram air pressure to the air speed indicator from the nose of the cockpit. The static pick up is at the rear of the instrument, under the dash.

7.14 Instrument Function

The standard fitted instrumentation is listed for models in section 6 Weight and Balance.

Functionality of the range of instrumentation over all models is described:

The **Air Speed Indicator** is driven by differential pressure between the Pitot inlet and the reference pressure inside the cockpit, speed is indicated in knots.

The **Hour Meter** is operational when the engine is generating a voltage.

The **Altimeter** is analogue and QNH is set using the protruding knob.

The **Tachometer** is analogue with redline clearly marked.

The **Exhaust Gas Temperature gauge** contains indicators for both cylinders, needles overlap such that non equal temperatures are readily identified by the overlapping point being off centre.

The **Water Temperature gauge** is a single needle indicator with redline clearly marked.

The **Cylinder Head** Temperature gauge contains indicators for both cylinders, needles overlap such that non equal temperatures are readily identified by the overlapping point being off centre.

The **Compass** is a fluid damped Steering compass manufactured by Silva. The Compass is supplied with a quickly installed mount, to be attached to the front mast brace, just above the instrumentation dashboard. Ensure that when purchasing a compass it is suited for your geographic location.

The Radio has it's own operators instruction booklet included with the Aircraft operating instructions when they are factory installed. Please refer to the respective instruction booklets.

7.15 Emergency Parachute – Optional Equipment

NOTE
The parachute is optional unless the governing body of the country where the aircraft is to be flown requires a parachute.

WARNING

THE BRS EMERGENCY PARACHUTE RECOVERY SYSTEM INSTALLATION HAS BEEN APPROVED BY CASA ON THE BASIS THAT, WHILST NOT DEPLOYED, IT WILL NOT CAUSE HAZARD TO THE AEROPLANE, ITS OCCUPANTS OR GROUND PERSONNEL.
CASA HAS NOT APPROVED THE SYSTEM ITSELF OR CONSIDERED IN WHAT CIRCUMSTANCES, IF ANY, IT MIGHT BE USEFULLY DEPLOYED, THE SYSTEM HAS NOT BEEN DEMONSTRATED TO BE EFFECTIVE IN SAFELY RECOVERING THE AEROPLANE.

The BRS emergency parachute system has a double action firing mechanism. The parachute-operating handle is fitted with a safety pin and is located on the left side of the seat frame. This pin should be removed before each flight and the safety pin must be replaced before the pilot alights from the aircraft. A force of approximately 15 – 20 kg pull on the actuating handle is required to activate the BRS rocket motor.

Emergency procedures for use of the BRS can be found in section 3.3.9 of this manual. Additional information including service and maintenance requirements can be found in the BRS manual.

7.16 Ignition Switches

The ignition switches are located on the lower right side of the seat frame. Operation is forward for on and rearward for off. When the switches are in the off position the switch shorts the engine coils to earth causing the engine to stop.

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HANDLING SERVICE AND MAINTENANCE

HANDLING SERVICE AND MAINTENANCE

8.1 Introduction

This section contains factory recommended procedures for proper ground handling and routine care for your aircraft. Included in this section is relevant information required by the operator.

WARNING

IT IS THE PILOT'S RESPONSIBILITY TO ENSURE THAT ALL AIRWORTHINESS DIRECTIVES HAVE BEEN ADDRESSED. IT IS ALSO THE PILOTS RESPONSIBILITY TO ENSURE SERVICING AND MAINTENANCE HAS BEEN PERFORMED AS OUTLINED IN THE APPROPRIATE MAINTENANCE MANUAL AND IN ACCORDANCE WITH THE APPLICABLE AVIATION REGULATIONS.

8.2 Identification Plate

The aircraft has two identification plates. The wing identification plate can be found on the negative plate of the universal bracket. The base identification plate can be found on the fuel tap mount plate.
seat mast block on the left side of the aircraft. The Serial number should be quoted when corresponding with the factory.

Identification Plate

Location	**582 Edge X** The fuel tap placard is adjacent to the fuel tap at the front of the engine on the **starboard** side of the aircraft. **503 Edge X** The fuel tap placard is adjacent to the fuel tap at the front of the engine on the **port** side of the aircraft
Series	Edge X Series

Table 1 Section 8. Identification Plate Location

8.3 Aircraft Documents

The Aircraft Operating Instructions are one of a series of documents required to safely operate this aircraft. A document list can be found in section 0 of this manual under DATA PACKAGE.

8.4 Aircraft Inspection, Maintenance and repair

Maintainer qualifications vary from country to country. The operator / maintainer should be familiar with the local requirements. Maintenance requirements are outlined in the base maintenance manual for the base unit and in the wing maintenance manual for the wing. The following sections have been included because it is considered that the information may be required on a more regular basis.

8.5 Fuel System

8.5.1 Filling Fuel Tanks

The properties of the fuel tank material cause an increase in capacity after the first 2 to 3 tanks of fuel. Initial capacity is slightly reduced. The fuel level markings have been positioned for the fuel tank capacity at 44 litres.

The Edge X has a single fuel tank.

8.5.2 Fuel Specification

FUEL	
Preferred Fuel Type	En228 Premium/Regular. Super grade gasoline, lead free, min RON 90
Optional Fuel Type	AVGAS (see note)

Table 2 Section 8. Fuel Specification

NOTE: Due to higher lead content in AVGAS deposits in the combustion chamber will increase. Therefore, use AVGAS only if you encounter problems with vapour lock or if the other fuel type is not available. Use of AVGAS requires higher frequency maintenance intervals. If AVGAS is used the Rotax web site should be referenced for maintenance requirements. Refer to section 2.12 for fuel capacities and limitations.

8.5.3 Fuel Sampling

There is a draincock on the base of the fuel tank at the left hand side, which may be used to check the quality of the fuel, and to drain fuel if necessary, it is especially important to remove any water that may have been introduced from the system.

8.5.4 Checking Fuel

The fuel is checked for water and contaminants by draining a sample of the fuel into a clear glass container. Once a sample has been taken the quality of the fuel can be checked by looking for any water at the bottom of the glass, and checking for any other visual contaminants.
If the fuel has been sitting for an extended period without use, it is advisable to replace it with fresh fuel.

8.5.5 Draining the Fuel

Ensure that a suitable receptacle is found for the fuel that is to be drained, position the trike above the receptacle and depress the draincock. Ensure that there are no ignition sources and that the fuel is disposed of correctly.

8.6 Engine Lubricating Oil

For Edge X Outback and Classic aircraft with Rotax 582 powerplant, engine lubrication is supplied via the oil injection system which is gravity fed. The oil consumption is defined by engine rpm and the lever position. The lever is actuated via a Bowden cable connected to the throttle cable. The oil injection system has a capacity of 2 litres.

WARNING
THE OIL INJECTION TANK HOLDS ENOUGH OIL TO LUBRICATE 100 LITRES OF FUEL. THE OIL INJECTION TANK SHOULD BE FILLED EVERY TIME THE FUEL TANK IS FILLED.

For Edge X Redback aircraft with Rotax 503 powerplant, engine lubrication is supplied via fuel and oil premix in the fuel tank.
The nominal oil usage is 50:1 (2%), 43 L of fuel will mix with 0.860 L of oil.
A 20 L quantity of fuel mixes with 0.400 L of oil at a ration of 50:1.

Oil Specifications
Oil used is Super two stroke ASTM/CEC standards, API-TC classification (consult your Rotax dealer for a recommended oil to suit your operating environment).

8.7 Rotary Valve Lubrication

This is applicable to Rotax 582 engines.
Rotary valve lubrication is supplied via a small tank mounted on the top right hand side of the engine. Oil quantity on a new installation is approximately 310mL. Before every flight check the oil level (approximately mid height of the bottle). If there is a notable consumption of oil (in excess of 1 ccm/hr) look for a leak. If a leak cannot be found consult the Rotax Maintenance Manual.
Oil Specifications
Oil used is Super two stroke ASTM/CEC standards, API-TC classification (consult your Rotax dealer for a recommended oil to suit your operating environment).

8.8 Gearbox Lubrication

The gearbox on the Edge X has two configurations:

	503 UL	582 UL
Gearbox lubricating oil.	C type 120 ml	E type 180 ml

Oil Specifications
Gear oil API-GL5 or GL6, SAE 140 EP or 85W – 140 EP

See maintenance manual for further details.

8.9 Cooling System

For Edge X Outback and Classic aircraft with Rotax 582 powerplant, water cooling is used.

WARNING

DO NOT OPEN THE COOLING SYSTEM WHEN THE ENGINE IS HOT. SEVERE SCALDING AND OTHER INJURIES MAY RESULT.

The water level in the overflow bottle should be checked prior to flight. The level should be between the low and high mark on the overflow bottle. Water-cooling system capacity is 4.0 L. See maintenance manual for further details.

Coolant Specification
Rotax specifies use of: 50% antifreeze concentrate with additives against corrosion and 50% pure water, or use of an equivalent premixed coolant.
AirBorne has had satisfactory results using the brand Nulon Red which is silicate free and is a Mono Ethylene Glycol product containing 1040 gm glycol per litre.

For Edge X Redback with Rotax 503 powerplant, air cooling is used.

8.10 Tyre Inflation

The recommended tyre inflation pressures are 15 PSI for both the front and rear tyres. When checking the tyre pressures the opportunity should be taken to examine the tyres for wear, cuts, bruises, slippage and other defects.

8.11 Suspension System

Front undercarriage suspension and damping is provided with a rubber cushion per side, operating a knee joint. Condition monitoring is performed by checking for cracking / perishing of the rubber.

Rear undercarriage suspension and is provided by camber changing rear axle pivot. Pivoting support is provided by rubber shock chord “bungie” wraps around the rear compression strut. Condition monitoring is performed by checking for abrasion of the bungie chord and noting static deflection. The suspension should be against its uppermost stops (zero deflection) with the aircraft sitting on the ground at empty weight.

9 Circuit Breaker and Fuses

The fuses for the electrical equipment are located in the following positions.
1. The Lynx intercom system has a 1.5A fuse screwed into the side of the box where the headsets and push to talk cables are plugged in.
2. The power supply cables for the radio are protected at the rear of the aircraft with inline fuses which terminate at the right hand side of the mast block. A 5A fuse is to be used for the radio and intercom power supply. The fuse holder is marked with the correct Current rating for the fuse.
3.The battery charging circuit is protected with a 20A fuse, which also terminates at the right hand side of the mast block. The fuse holder is marked with the correct Current rating for the fuse.
4. A 10 A circuit breaker is located on the left hand side of the dash, or centrally on the console between the pilots legs. The circuit breaker protects the dash instrumentation and the DC socket.
5. A fuseable link is used to connect to the battery, this is used to protect all wires that are not a part of the ignition circuit against short circuit.

9.1 Parking and Ground Handling

Parking and ground handling information can be located in section 4.

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SUPPLEMENTS

9 TRAINING SUPPLEMENT

9.1 Edge X Flight Training Supplement

This supplement is intended to outline the unique characteristics of the Edge X weight-shift control (WSC) airplane with Wizard or Streak wing. It is not intended to outline all aspects of a WSC aircraft. The supplement is intended to be used by a pilot / operator who already has extensive knowledge of WSC aircraft operation. The performance, procedures and unique features of the Edge X are summarized here and the details are referenced to the appropriate section within the AOI.

Normal Procedures found in Section 4 of the Aircraft Operating Instructions (AOI) covers all the Normal Procedures in detail.

9.2 Assembly and Break Down

Sections 4.2 to 4.4 and 4.11 to 4.41 outline wing assembly and break down procedures for the aircraft. Airborne suggests assembling the wing on the control frame as this method keeps the sail off the ground resulting in less chance of the wing being soiled or damaged.

The wing can be assembled and installed on the base by one person.
It should be noted that the batten tips utilise a unique hinged catch system to secure the battens to the trailing edge. This system allows easy installation and provides extraordinary flexibility in wing tuning (see wing Maintenance Manual for tuning instructions).
AOI Section 4.3 contains the wing pre-flight inspection checklist while AOI Section 4.5 contains the base and engine pre-flight checklist.

9.3 Aircraft Operation

Aircraft operation information is contained in AOI Sections 4.8 to 4.10. Section 4.9 covers normal flight operations in checklist form while 4.10 amplify those procedures in detail.

9.4 Startup

See AOI Sections 4.8 and 4.9.1-2 for engine start-up details.

The master switch should be turned on (keyed switch on the panel). Ensure that the fuel tap is in the on position and both ignition switches are on. Once satisfied that all other checks as outlined in section 4.9.1-2 are complete the starter button on the right side of the dash can be depressed.

Warm up the engine. Minimum temperature should be reached before take off. Operate for 2 min at 2000 rpm continue at 2500 rpm until minimum temperature is reached:

- For **582 engines**, water temperature of 50 deg C (140˚ F)
- For **503 engines** fitted with cylinder head temperature indicators, 180°C is at the lower end of the normal operating temperature range.

9.5 Take Off

See AOI Section 4.9.3-5 and 4.10.3-6 (Amplified Procedures) for take off and climb procedures.
Many WSC instructors recommend pulling the control bar in towards the pilot past the wings' trim position after lift off. As the Streak and Wizard wing designs have the trim speed equal to or greater than 1.3 V_s (stall speed) it is not necessary to "pull" the control bar back. The wing will return to the trim speed and achieve take off safety speed if the controls are relaxed.

Initial climb out should be made on full power for maximum take off weight. Approximately 2/3 of maximum take off power is considered comfortable for a minimum weight takeoff. Take off distance will be extended at reduced power.

Once climb is established power should be reduced to below maximum continuous power of 6500 rpm. A minimum of takeoff safety speed should be used. At this speed the aircraft would round out nicely into a glide should the engine fail.

9.6 Cruise and Stalls

Cruise and stalls are covered in AOI Sections 4.10.7 and 4.10.8 respectively.

Stalls are very mild in the Streak and Wizard wings, and in fact, very difficult to do unless the aircraft is heavily loaded. Recovery is the same as in other WSC aircraft.

9.7 Landing

See AOI Section 4.9.7-8 for descent and landing procedures.

It is not necessary to approach at a higher speed than trim speed unless conditions are extremely turbulent. Generally trim speed allows an adequate margin for landing.

9.8 Emergency Procedures

See AOI Section 3 for emergency procedures.

9.9 Control Locations & Operation

9.9.1 Flight Controls

The Edge X has standard WSC flight controls. See Section 7 for a complete description of the aircraft and its systems.

9.9.2 Engine Controls

Control	Location and Operation
Pull Start	On 503 engine, on mast, pull to operate. On 582 engine. On front of engine, operate from starboard side in front of wheel. Use electric start for normal operation. The pull start is located within reach of the throttle and kill switch.
Starter Button	Lower right instrument panel below Master Switch. Push button to engage starter. (See AOI Section 7.6)
Choke Lever	Left side of pilot mounted to seat frame. Push lever down to turn choke on.
Foot Throttle	Right foot above the nose wheel steering bar.
Ignition Switches	Right side of pilot mounted to seat frame. Switches moved forward to turn ignition on.
Hand Throttle	Right side of pilot mounted to seat frame above ignition switches. Push throttle up and forward to increase power.

Table 1 Section 9. Engine Controls

9.9.3 Instrument Panel Redback 503 Powerplant

See AOI Section 7.16.1 for a complete description.

Top Row L to R: Hour Meter, CHT
Bottom Row L to R: ASI, Tachometer, Altimeter
Bottom: Circuit Breaker, Power Outlet

Figure 1 Section 9. Instrument Panel Redback (503 Powerplant)

9.9.4 Instrument Panel X Series Outback 582 Powerplant

See AOI Section 7.16.1 for a complete description.

Top Row L to R: Circuit Breaker, Hour Meter, Power Outlet
2nd Top Row L to R: ASI, Altimeter
Vertical column top to bottom: Tachometer, EGT, Water Temperature, Instrument Power Switch, Electric Start.

Figure 2 Section 9. Instrument Panel Outback (582 Powerplant)

9.9.5 Instrument Panel Classic 582 Powerplant

See AOI Section 7.16.1 for a complete description.

Top Row L to R: EGT, Hour Meter, Water Temperature
2nd Top Row L to R: Circuit Breaker, Power Outlet, ASI, Tachometer, Altimeter, Instrument Power Switch, Electric Start
Vertical Column Top to Bottom: Radio.

Figure 3 Section 9. Instrument Panel Classic (582 Powerplant)

9.10 Aircraft Performance Data

See AOI Section 5 for detailed discussion on performance. The information provided below is based on standard atmospheric conditions at sea level at Maximum Take Off Weight (MTOW):
Distances are specified for:

Sea Level with:

Max Take Off Power

A level dry runway

With short grass

Still wind

And temperature of 15 deg C.

	X 582 Wizard	X 582 Streak
Take off / Landing distance over 50' obstacle	218m (715") 210m (689")	240m (787") 228m (748")
Stall at 401kg MTOW:	32 KIAS (37mph)	35 KIAS (40 mph)
Glide Ratio at cruise speed	4.9:1 @ 60KIAS	9.4:1 @ 45KIAS
Average Fuel Burn at 75%continuous performance:	20.5 lt/hr (5.4 gph)	20.5 lt/hr (5.4 gph)

	X 503 Wizard	X 503 Streak
Take off / Landing distance over 50' obstacle	220m (722") 210m (689")	260m (853") 228m (748")
Stall at 450kg MTOW:	32 KIAS (37mph)	35 KIAS (40 mph)
Glide Ratio	4.9:1 @ 60KIAS	9.4:1 @ 45KIAS
Average Fuel Burn at 75%continuous performance:	15 lt/hr (4.0 gph)	15 lt/hr (4.0 gph)

Table 2 Section 9. Performance Data

9.11 Training Recommendations

The X Series handles predictably in all flight regimes so there are no unique training requirements in any area. Like all WSC aircraft aerobatic maneuvers are strictly prohibited.

End of Aircraft Operating Instructions