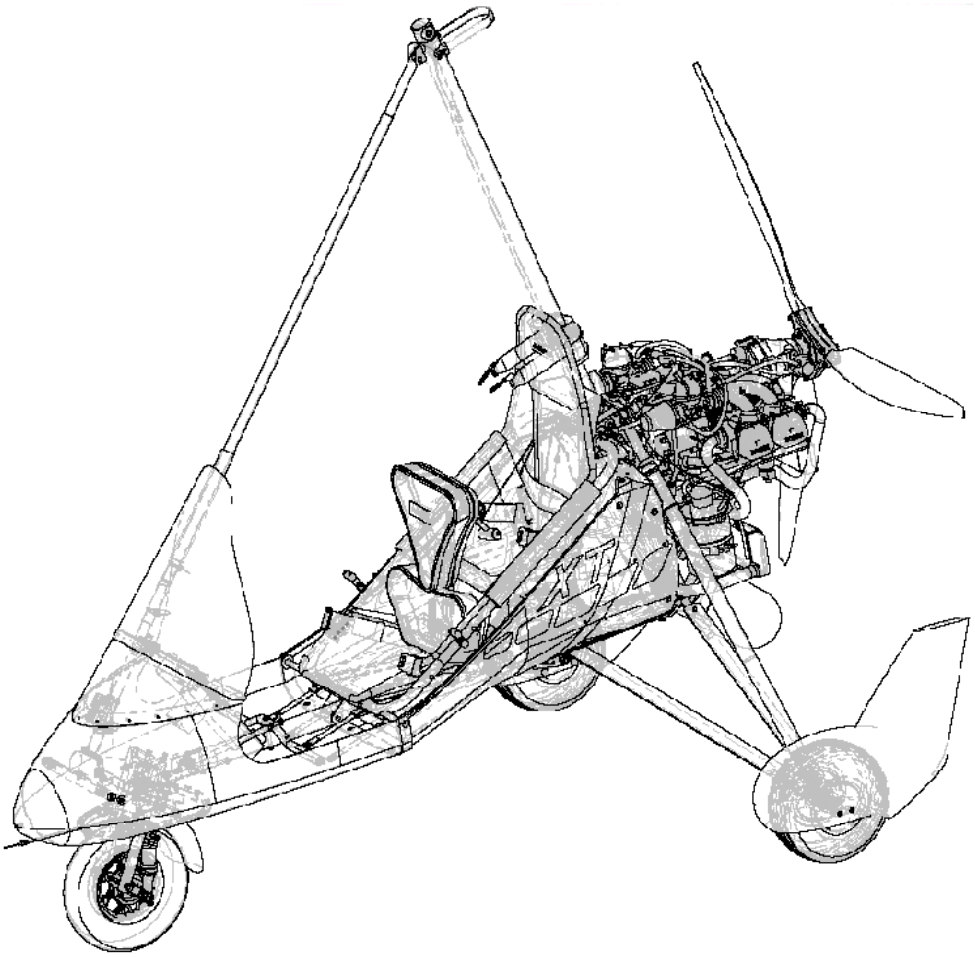

XT 912 Light Sport and Primary Category Aircraft
MAINTENANCE MANUAL
ISSUE 2.0

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Part # 108346

DATA PACKAGE

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

• **Pilot's Operator's Handbook or Aircraft Operating Handbook**	
• **XT 912 Maintenance Manual**	+
• **XT 912 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**	
• **Transponder Manual – If Installed**	

Table 1 XT 912 Data Package

REVISION HISTORY

January 2007- combined Primary Category Maintenance manual with LSA maintenance skills requirements. Insert LSA maintenance privileges section. Introduction of the XT Outback, rubber cushion front end suspension maintenance schedule and description added.

May 2007- Addition of hydraulic brake. Addition of Warp Drive propeller and pitch setting/measurement methodology. Minor changes to formatting are made throughout.

AMENDMENT RECORD SHEET

Amendment Date	Affected Sections	Affected Pages	Date Inserted	Signature

Table 2 Amendment Record Sheet

NOTE

Airbornes data packages will be revised from time to time. Owners registered on AirBorne's database will be notified of any changes to data and directed to the AirBorne website (<http://www.airborne.com.au/>) for the applicable pages. The amended pages should be printed and the prior page replaced 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.

LOG OF ALL EFFECTIVE PAGES

Page	Issue	Date	Page	Issue	Date
All of issue	2.0	May2007			

Table 3 Log Of All Effective Pages

INTRODUCTION

This manual contains factory recommended procedures and instructions for ground handling, servicing and maintaining the XT 912 Base section of this aircraft. The procedures described are to be used in conjunction with the National Airworthiness Authority (NAA) of the country of registration. Any NAA maintenance requirement takes precedence over this manual.

This manual will be used in conjunction with a certified wing, and therefore the operator is directed to reference the wing maintenance manual for any issues that are related to the wing component of the aircraft.

Skills

Only people with an adequate skill level should perform maintenance on this aircraft. A sound understanding of mechanical systems, and good experience with the necessary tools and procedures is required - as the continuing airworthiness of the aircraft relies on the competence of the person performing the maintenance. Assessment and judgement of the condition of each individual component is required, which necessitates a sound understanding of the purpose of each component in the system. All maintenance and repairs must be carried out in accordance with good aeronautical practices.

Skills and authorisations specific to Special Light Sport Aircraft

Maintenance tasks are rated in the categories listed below, according to the applicable category of registration and skill levels required to perform those tasks:

Owner— FAA regulations authorize SLSA aircraft owners who hold at least a sport pilot certificate to perform maintenance as outlined in 14 CFR Part 43. To perform inspections on aircraft condition, functional checks and maintenance in between inspections carried out by LSA Repairman Maintenance certificate holders.

LSA Repairman Maintenance— This certification authorizes a certificate holder to perform line maintenance, repairs and alterations to S-LSA as the task allows. Includes 100 hourly and yearly inspections on S-LSA.

A&P—Mechanic Certificate with Airframe and or Powerplant rating. To perform heavy Maintenance on airframes or powerplant as the rating allows.

Task Specific—Applicable to the following ratings:

LSA Repairman Maintenance with appropriate task specific training or;

A *Mechanic Certificate* with appropriate task specific training.

Authorizes the holder of mechanic certificate or a repairman certificate who has received task specific training, to perform the tasks approved under that training. Allows a repairman certificate holder to perform heavy maintenance, repairs and alterations on the SLSA.

E.g. The Mechanic Certificate holder may obtain Task Specific training on Rotax engines, to allow overhaul etc.

Skills and authorisations specific to Experimental Special Light Sport Aircraft

LSA Repairman Inspection— To perform line maintenance and inspections to be completed on an E-LSA by a responsible owner, who holds an FAA repairman certificate (light sport aircraft), with an inspection rating or equivalent.

There are no requirements for minimum certification to perform any other task on an experimental aircraft. However, Airborne recommend that only people with an adequate skill level should perform maintenance on this aircraft as described at the start of this section.

Other Categories of Registration

This aircraft is certified as a Primary Category aircraft and when supplied with this manual and Special Light Sport placards is a Light Sport eligible aircraft. This manual is created to be compliant to the standards applicable to Special Light Sport Aircraft. Skill levels required to perform tasks are applicable to Special Light Sport registered aircraft.

The category of registration may be quite varied; as such the maintenance requirements of this aircraft are to be applied in conjunction with the requirements of the National Airworthiness Authority (NAA) of the country of registration. Any NAA maintenance requirement takes precedence over this manual.

In some countries the owner is permitted to perform maintenance on their own aircraft. If there are any doubts regarding the required and appropriate maintenance then the safety of the aircraft may be jeopardised in continuing with self maintenance. In this situation an Airborne Dealer should be contacted for the correct procedures and or servicing.

Tooling

There are no specialised tools (except for the air shocks) needed for the maintenance described in this manual, following is a list of the type of tools that may be required. NB. Loctite will be required in certain locations and should **always** be replaced after disassembly.

- **Loctite (243, 567 and Antisieze Lubricant # 76764) for the frame section.**
- **The Rotax Maintenance Manual gives a list of consumable materials in section 2.5.**
- Ring / Open ended Imperial Spanner set
- Ring / Open ended Metric Spanner set
- Torque wrench

WARNING

SPECIALISED PUMPS MUST BE USED FOR THE AIR SHOCKS – PRESSURES UP TO 600 PSI EXIST.

- Air Pump (Schrader Style Valve)
- Various petroleum lubricants
- Dry Lubricant – lubricant which doesn't attract dust after application
- Tie wire, and tooling
- Wire and Swages and tooling
- Hex key set (metric and imperial)
- Petrol resistant thread sealant tape
- Various general care items

This list may not be comprehensive.

Service Difficulty Reporting

Any service difficulties or defects should be reported to Airborne using the form contained in appendix A.

WARNING

REPAIRS SHOULD NOT BE CONDUCTED UPON THE FOLLOWING ITEMS AS THEIR STRUCTURAL INTEGRITY IS CRITICAL TO SAFETY.
THE MAST STRUCTURES, HANG POINT, BASE BEAM, FRONT FORK ATTACHMENT ASSEMBLY, LANDING GEAR STRUTS.
OTHER MINOR REPAIRS CAN BE CARRIED OUT IN ACCORDANCE WITH FAA AC 43.13 1B

Format

The manual has been prepared using the ATA format, which provides a standard layout of the chapters to be included, and their content. Some of the chapters are not included as they are deemed to be not applicable to this aircraft. The content is compliant with the Light Sport Aircraft standard. Skill levels required to perform tasks are applicable to the levels of qualification issued under the Light Sport Aircraft System.
The information in this manual is based on the data that was available at the time of its publication. The latest amendments to this manual will be issued on the Airborne website in PDF format. This should be printed out and added to the manual. Therefore it is important that operators keep a regular check on the website for any amendments that have been made. If any errors or omissions are found in this manual please advise the factory.

WARNING

THE INFORMATION IN THIS MANUAL NEEDS TO BE FOLLOWED, AND IT IS NOT ACCEPTABLE TO MAKE CHANGES TO THE MATERIALS AND OR PHYSICAL FEATURES OF THIS AIRCRAFT. IN PARTICULAR THE GRADES OF BOLTS THAT HAVE BEEN UTILISED IN THE MANUFACTURE OF THIS AIRCRAFT ARE CRITICAL FOR ITS CONTINUING AIRWORTHINESS. NEVER REPLACE BOLTS WITH ANY OTHER SIZE OR GRADE. GRADE 8 BOLTS ARE NOT INTERCHANGEABLE WITH AIRCRAFT (AN) GRADE BOLTS. THE FATIGUE CHARACTERISTICS OF AIRCRAFT GRADE BOLTS ARE SUPERIOR TO OTHER BOLTS AND ALLOW LONGER SAFE SERVICE LIFE UNDER CYCLIC LOADS LIKE THOSE EXPERIENCED IN AIRCRAFT. THE LENGTH OF BOLT IS IMPORTANT. IF A SHORTER BOLT IS USED THE THREAD MAY ENCROACH ON THE LOAD BEARING AREA, WHICH INCREASES THE STRESSES EXPERIENCED BY IT.

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, PILOT'S OPERATING HANDBOOK, 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.

USE OF METRIC/ IMPERIAL UNITS

This Service Manual 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 in (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 4 Imperial / Metric Conversions

CONTENTS

LIST OF TABLES

LIST OF FIGURES

0. ASSEMBLY AND TEST FLIGHT / COMPONENT OVERVIEW

00.00.00 Trike Base Assembly.

Line	Description	Ok
0	Find overhead support suitable to lift approx 200kg.	
1	**Caution: Mast has an air strut and will move quickly when untethered!!**	
2	Remove straps and box.	
3	Remove and unwrap all parts.	
4	Remove mast support screws from the crate – leave the mast strap attached to base tube	
5	Remove front axle tie down bolts from the crate.	
6	Loosen gearbox support rope.	
7	Un-bolt base tube support frame from the crate.	
8	Use lifting mechanism such as a small hand winch to lift rear of trike to allow assembly of rear end. Attach lifting device to gearbox hub using a soft sling. (Have someone hold trike in-case of roll over)	
9	Attach struts **ensuring mast safety wire is attached**	
10	Fit rear shocks to struts.	
11	Fit rear wheels and spat outer brackets. (Maintenance Manual Section 20.)	
12	Lower trike wheels to the ground and remove lifting device.	
13	Remove crate top, mast support (leave mast attached to base tube) and vertical legs. Remove crate base.	
14	Whilst holding down on mast remove strap and raise mast slowly.	
15	Attach mast brace inner tube to mast and tighten bolt (Wing Nut, Safety Pin)	
16	Secure mast outer sleeve with both pins at bottom.	
17	Raise front of trike using sling around base tube.	
18	Fit brake drum torque arm to stainless steel bush.	
19	Fit wheel in place	
20	Insert brake drum, spacers, axle, bolt and nuts. Lower trike	
21	Fit rear wheel spats. (Maintenance Manual Section 20.)	
22	Assemble prop and fit in accordance with Maintenance Manual Section 61.	
23	Tighten all nuts and bolts in accordance to standard practice (see maintenance manual)	
24	Carry out pre-flight inspection in accordance with the pilot handbook.	
25	Ensure the production flight test has been performed. Flight testing must be performed by an authorised Airborne Dealer. Airborne form GJP 170 to be completed and returned to Airborne by an Authorised Dealer.	

Table 5 Initial Assembly Procedure (GJP144)

This list is meant as a guide and is in no way a comprehensive list of instructions. Refer to Standard Practices, Section 20 for torquing procedures and refer to Illustrated Parts Catalogue to ensure complete and safe assembly is achieved.

Each of the components that have been disassembled, have the required nuts, bolts and washers in place - ready for fitment, this ensures that the reassembly is as easy as possible.

00.10.00 General

Spare Parts Service

Spare parts may be purchased from your local dealer. Visit the Airborne Website at :
http://www.airborne.com.au/pages/dealerselect.cfm
Accessed from the homepage under Microlights / Dealer listing.

Typical Consumables

100 hour service kit Airborne part number 106907

Contents of Rotax 912, 100 Hour Service Kit		**Airborne part number 106907**
Consumable	**Airborne Part Number**	**Rotax Part Number**
OIL SHELL ADVANCE 15W-50	106786	
ENGINE 912 OIL FILTER (Use only Rotax brand filter)	105620	825701
SPARKPLUG NGK DCPR7E	106816	
SILICONE HEAT TRANSFER PASTE	106817	897 186
WASHER 18X12X1 OIL TANK XT912	105936	Gasket Ring C12x18 #250010

Consumable	**Airborne Part Number**	**External Supplier Part Number**
TYRE 6" X 6.00 STANDARD	100268	15-600x6 4K01 TL Rib Part Number: 156006RIB
TUBE INNER 6" SUIT RIM 6.00X6	100369	156006TU13
TYRE 8" X 4.00	103138	480-400x8 Hiway Part Number: Kend4008JT
TUBE INNER 8" RIGHT ANGLE VALVE	103139	4008TU87
TYRE 6IN X 8.00 TUNDRA	105244	CARLISLE 8.00-6 4 PR TITAN TURF GLIDE 9042T
AIR FILTER XT-912	105685	105284
K&N filter oil spray / K&N Filter oil 99 -1131		897 870

Table 6 100 hour service kit and typical consumables list

Additional consumables are applicable to engine maintenance and heavy maintenance. Refer to the Rotax Maintenance Manual, section 05-00-00 page 10.

A detailed illustrated parts catalogue provided with this aircraft contains reference to the consumables on this aircraft.

00.20.00 Component Overview

Important areas of the Trike base have been identified in this section to aid maintenance personnel. These photos and list of names are not comprehensive.

Aircraft Structure

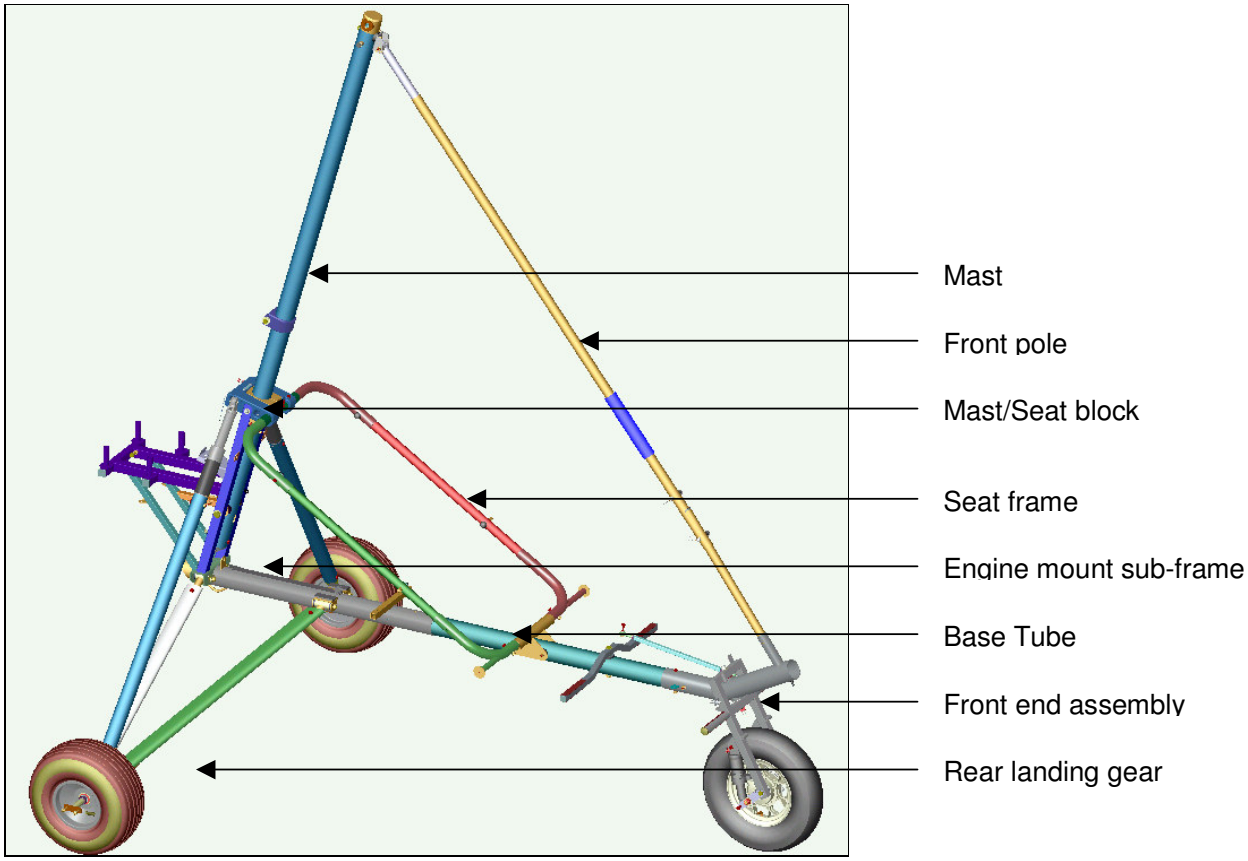

Figure 1 Main Structural Members

Cockpit

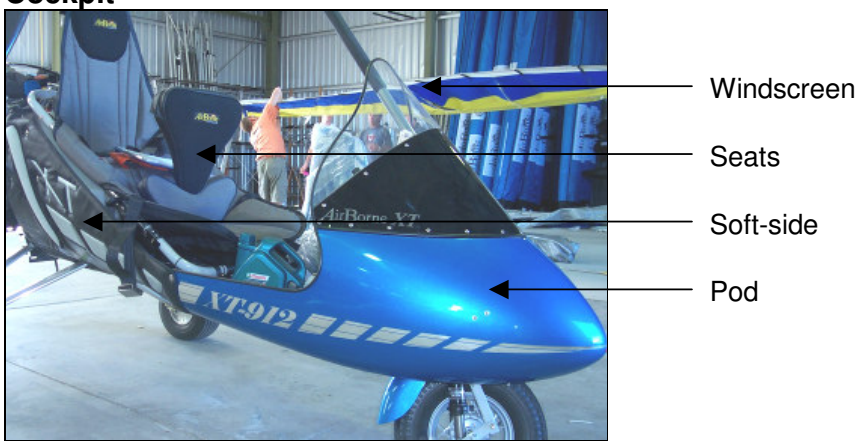

Figure 2 Cockpit

Under-Seat Bags

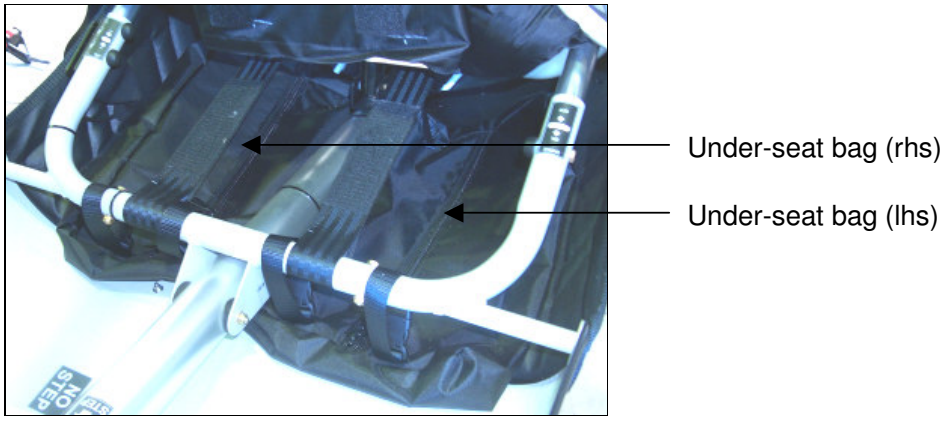

Figure 3 Under-Seat Bags

Mast Block Area

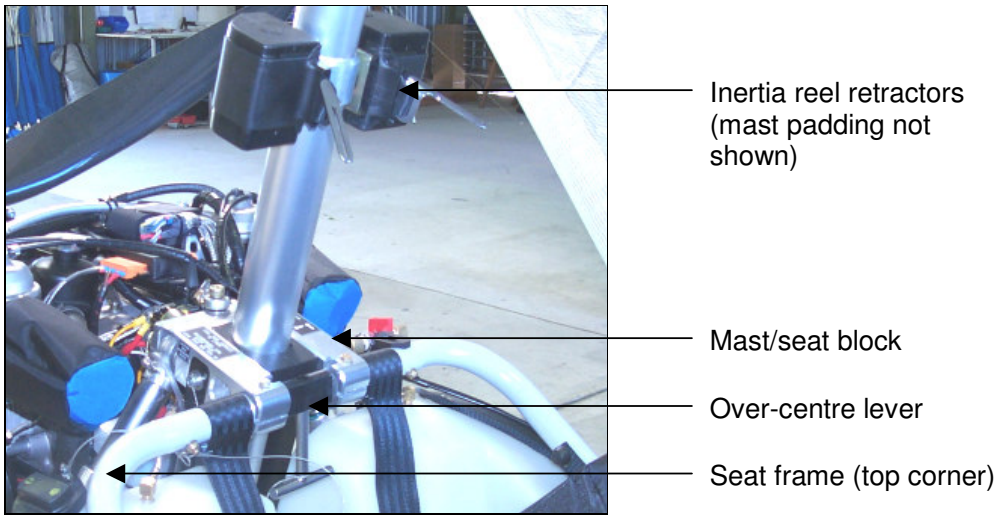

Figure 4 Mast Block Area

Steering and Foot Levers

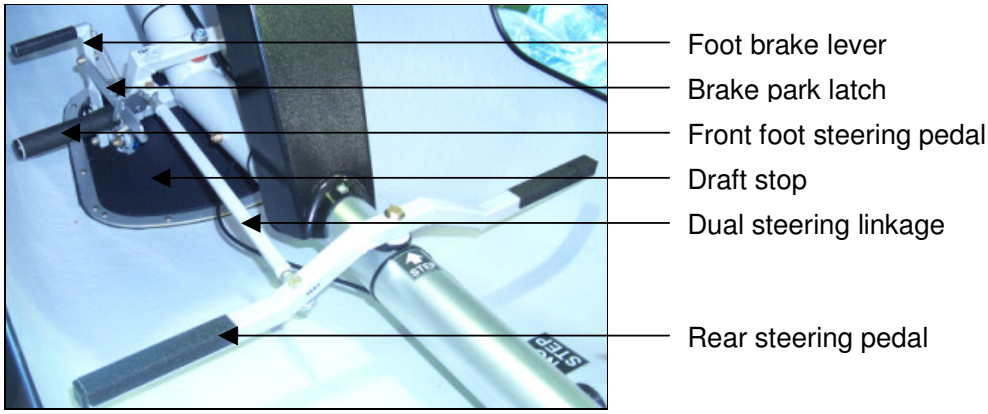

Figure 5 Steering and Foot Levers

Power Plant

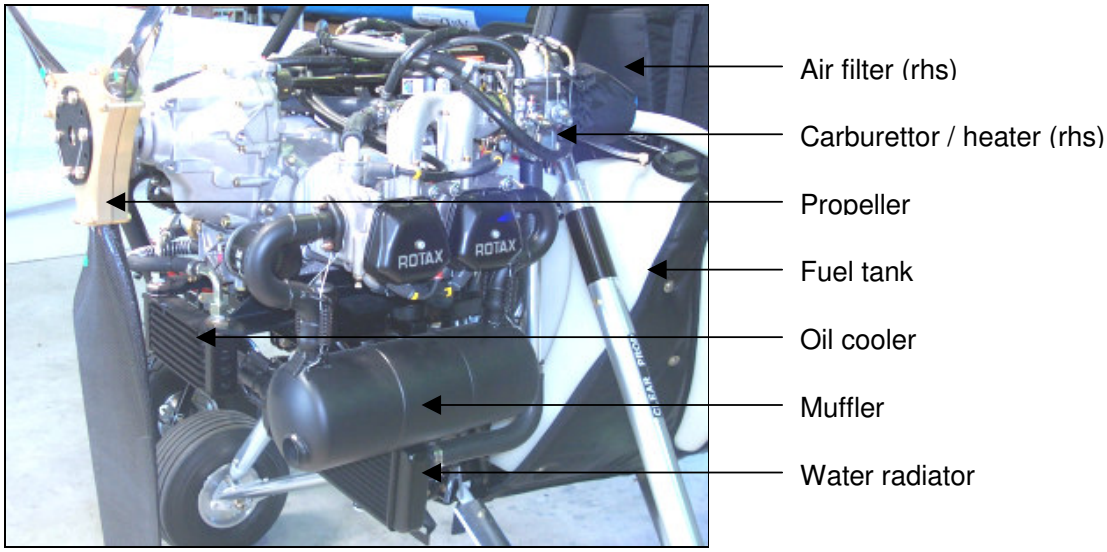

Figure 6 Power Plant

4. AIRWORTHINESS LIMITATIONS

4.00.00 General

This section sets forth each mandatory replacement time, structural inspection interval, and related structural inspection procedure required for type certification.

4.10.00 Log of Effective pages – Airworthiness Limitations

4.20.00 Airframe Limitations

Component	Life (hours)	Requirement
Heart Bolt (1 off)	100	Mandatory Replacement. (Drwg 5564)
Front Suspension Pivot Bolts (2 off) Rear Suspension Pivot bolts (4 off)	500	Remove Inspect and replace if necessary. (Drwg 5590&5787)
Masts and Base Tube	953	Check Service Bulletins (See note). Return to service if no SB action required.
Trike Structure, Excluding Masts and Base Tube Structures	8338	Check Service Bulletins (See note). Return to service if no SB action required.

Table 7 Airframe Limitations

The airframe was analysed using FAA fatigue analysis "Fatigue Evaluation Of Wing and Associated Structure on Small Airplanes FAA Report # AFS-120-73-2", in order to estimate the time life limits for the major components of the airframe, this is detailed in Airborne report 04-144ds. The estimates that have been made do not take into account any extreme loads, which will reduce the fatigue life of the airframe. The fatigue life of these components is dependent upon rigid adherence to maintenance schedules.

The bolts that are listed are known through history of operation to be affected more through mechanical wear than through fatigue, and therefore the time life for these components is less than the calculated values for the airframe.

As the service history of the airframe evolves these time life estimates are expected to be revised, amendments should be checked for regularly.

Note: See Airborne web site for Service Bulletins

5. TIME LIMITS/MAINTENANCE CHECKS

5.00.00 General

The time limits and maintenance schedule provided are in addition to any regulation of the governing body where the aircraft is being flown. Some components are subject to overhaul intervals as specified by their manufacturers, Table 5.10.00 gives the overhaul or replacement intervals for these components.
The pilot of the aircraft must ensure that the required maintenance is carried out and documented in the correct manner.
Extreme operating conditions may reduce the time limits for components, unscheduled maintenance is detailed in Section 5.50.00. AirBorne will from time to time amend these maintenance checks as the service history of the aircraft evolves. It is the responsibility of the pilot to ensure compliance with new directives (information is available on the website http://www.airborne.com.au/).

5.10.00 Time Limits

The following components are time limited and should be overhauled or replaced as indicated. This table may be updated to include more components in the future as MANDATORY SERVICE BULLETINS are amended.

Component	Life	Requirement
Engine	As specified by Rotax (www.**rotax**-aircraft-engines.com)	Overhaul or Replace
Engine Accessories	As Specified by Rotax (www.**rotax**-aircraft-engines.com)	Overhaul or Replace
Propeller	As Specified by the manufacturer. See section 5.20.20 of Maintenance Manual	Overhaul or Replace
Fuel and Oil Hoses	Five Years or to be replaced during engine overhaul – replacement	Replace
Rocket BRS	As specified by BRS-5 Manual 6 years, return (parachute cannister only) to BRS for repack. 12 years Rocket life. (**http://www.brsparachutes.com**)	Repack parachute into canister Replace rocket

Table 8 Time Limits of Components

5.20.00 Scheduled Maintenance Checks

Airborne microlights have been designed to permit easy inspection, and operators should have no difficulty in assessing problems or recognising damage if visual checks are carried out correctly.
Maintenance checks may require partial disassembly of the aircraft. Inspection should include a thorough visual check of the condition of the component and the attachment point in adequate lighting conditions. Cleaning of the component may be required for proper inspection. Significant scratches, cracks, galling or any other mechanical wear of the component is reason for replacement.

General care should include:

- Washing down the tube work with warm water and a mild detergent followed by rinsing with fresh water.
- Fabric sponged with warm water and a mild detergent and rinsed with fresh water.
- The pod and wheel spats washed and polished using commercially obtainable shampoos and polishes.
- Treat all exposed metal components (including the engine) on the trike base (only) with a dewatering compound such as WD40 or CRC spray. This guards against corrosion and makes cleaning much easier.
- Lubricate the throttle cables regularly using light machine oil.
- The cockpit area should have all litter removed to minimise corrosion and to safeguard the propeller.

Apart from the consequences of heavy landing, or of exceeding flight limitations, the major factors requiring attention are corrosion, fatigue and wear.
There are no known fatigue problems with Airborne microlights, but excessive loads and vibration can weaken the structure. Regular inspection for hair-line cracks in areas under high stress, such as bolt holes, tube junctions, etc is recommended.
Many components can be replaced with ease, for difficult repairs or if the repair process is not fully understood consult your Airborne distributor or the Airborne factory.
The airworthiness of microlights is only valid provided that all necessary maintenance, modification and service requirements are fulfilled.

These requirements include:

(a) Maintenance of aircraft as per the Maintenance Schedule in this handbook.
(b) Modification as detailed in any relevant Service Bulletins.
(c) Modification to approved details, obtained from Airborne WindSports Pty. Ltd.
(d) Repairs necessary to replace minor damage, wear or ageing.
(e) Servicing, replacement and overhaul, inspection and checking in compliance with the Maintenance Schedule.
(f) Any Airworthiness Directive (AD) issued by CASA or the NAA of the country of registration.

5.20.01 Maintenance Privileges

This manual lists task to be performed on the maintenance schedule. The minimum qualification required to perform that task is prescribed. A simple explanation of maintenance privileges permitted according to LSA category of registration is described in the table below:

	Experimental LSA				Special LSA			
	Sport Pilot	Owner Sport Pilot	LS – I Sport Pilot	LS - M / A&P / part 145 repair	Sport Pilot	Owner Sport Pilot	LS – I Sport Pilot	LS - M / A&P / part 145 repair
Modifications								
Daily Inspections								
Preventative Maintenance								
Repairs, Major Maintenance.								
100 hour inspection								
Annual Inspection								

Authorized to perform.

May perform only if the Repairman Inspector is the owner of the aircraft.

May perform only if the modification is included in the aircrafts Maintenance Manual or if the repairman is authorized to do so by the manufacturer.

May perform if the Repairman Inspector is the owner of the aircraft and not using the aircraft for compensation (training or towing), or

When using your aircraft as an Experimental aircraft for compensation (training or towing) until January 31 2010, the inspection must be performed by an LS - M / A&P or part 145 repair facility.

Not authorized to perform.

Table 9 Maintenance Privileges

_____

Note that owners and pilots are permitted to perform preventative maintenance tasks as prescribed by FAR document: Part 43, Appendix A Sec. A43.1

Limitations Due to Registered Category

S-LSA

Maintenance on a Special LSA, 100 hourly and annual inspections are to be performed by the holder of a LSA Repairman Maintenance certificate or an appropriately rated A&P mechanic.

Note: owners and pilots are permitted to perform preventative maintenance tasks as prescribed by FAR document: Part 43, Appendix A Sec. A43.1

E-LSA

The owner of an aircraft registered as an Experimental LSA has operations limited to private use and has additional maintenance privileges.

During the transition period, commercial operations may be conducted until 31 January 2010. Where an experimental registered aircraft is used for compensation (training or towing) during the transition period the option c) below does not apply to 100 hourly inspections.

The 100 hourly or annual inspections on an E-LSA are to be performed by:

a) the holder of a LSA Repairman Maintenance certificate, or

b) an appropriately rated A&P mechanic, or

c) the owner when the owner is the holder of a LSA Repairman Inspection certificate.

The pilot of the E-LSA aircraft is responsible to see that the maintenance and inspection has been performed on this aircraft as per the maintenance schedules prescribed in this maintenance manual. The maintenance schedule tasks remain applicable, where there is no minimum level of qualification required to perform maintenance on E-LSA, however a minimum skill level continues to apply to tasks. Only people with an adequate skill level should perform maintenance on this aircraft. A sound understanding of mechanical systems, and good experience with the necessary tools and procedures is required - as the continuing airworthiness of the aircraft relies on the competence of the person performing the maintenance. Assessment and judgement of the condition of each individual component is required, which necessitates a sound understanding of the purpose of each component in the system. If there are any doubts regarding the required and appropriate maintenance then the safety of the aircraft may be jeopardised in continuing with self maintenance. In this situation an Airborne Dealer should be contacted for the correct procedures and or servicing.

All maintenance and repairs must be carried out in accordance with good aeronautical practices.

5.20.02 Description of Task Classification

Preventative Maintenance

The preventative maintenance that is permissible to be performed by pilot certificate holders is defined in FAR document Part 43, Appendix A Sec. A43.1.

Line Maintenance

Includes inspections, servicing of fluids. Tasks where specific instructions are described in the manual that do not require specialized training, for replacement, repair of parts and structure or alterations described in the manual. Includes compliance with service directives that prescribe repairmen as the minimum qualification to perform the task.

Heavy Maintenance

Tasks that require a repairman rating with specialized training or mechanic with A&P rating, such as major engine work, repair of landing gear assemblies. It also includes alterations to structure where instructions are provided in the manual, such as fitment of an undercarriage kit or a tow kit.

5.20.03 Qualification Descriptions

Certification Required to Perform Light Sport Aircraft Maintenance Tasks

[O] **Owner**—Items that can be expected to be completed by a responsible owner who holds a pilot certificate but who has not received any specific authorized training.

[R] **E-LSA Repairman Inspection** - Applicable to E-LSA registration. Repairman Inspection—Items that can be expected to be completed on an ELSA by a responsible owner, who holds an FAA repairman certificate (light sport aircraft), with an inspection rating or equivalent.

[R] **S-LSA Repairman Maintenance**- Applicable to S-LSA registration. Repairman Maintenance—Items that can be expected to be completed on a S-LSA or E-LSA by a responsible individual, who holds a FAA repairman certificate (light sport aircraft), with a maintenance rating or equivalent.

[A&P] **Mechanic Certificate** with **Airframe** and or **Powerplant** Training - A&P—Items that can be expected to be completed by a responsible individual who holds a mechanic certificate with airframe or powerplant ratings, or both, or equivalent.

[RS] **Part 145 Repair Station** – Items that can be expected to be completed by a responsible organization that holds a part 145 repair Station approval.

[TS] **Task Specific** – Items that can be expected to be completed by a responsible individual who holds either a mechanic certificate or a repairman certificate and has received task specific training to perform the task.

When specifying the "task specific" level of certification, the specific training is also specified where it is appropriate.

Note that **dealers may be authorized** by the manufacturer to perform a maintenance or modification task for which they are specifically trained. These tasks are not necessarily included in the Maintenance Manual.

This Maintenance manual is created with the focus to maintain Special Light Sport Aircraft (S-LSA). This category of registration allows the aircraft to be used for hire and reward. Maintenance requirements are given in the maintenance schedule tables. Note that the level of qualification is given for each of the tasks.

Notice that this manual prescribes owner maintenance and repairman maintenance. The minimum applicable repairman ratings for each category of registration are as follows:

E-LSA registered - LSA Repairman Inspection certificate **(LS-I)**.

S-LSA registered - LSA Repairman Maintenance certificate **(LS-R)**.

In both cases of E-LSA and S-LSA, a person who holds a mechanic certificate with A&P rating, or a part 145-repair station may perform maintenance and inspections on the LSA.

The 100 hourly or annual inspections on a S-LSA are to be performed by the holder of a LSA Repairman Maintenance certificate, an appropriately rated Mechanic with Airframe and Powerplant (A&P) rating, or a part 145 Repair Station.

The holder of a sport pilot certificate may perform preventative maintenance on an aircraft owned or operated by that pilot and issued a special airworthiness certificate in the light-sport category. Items of preventative maintenance that may be performed by an owner are listed in FAR 43 appendix A, Section A43.1 (c)

5.20.04 Rotax Engine Periodic Inspections and Maintenance

Rotax periodic inspections are scheduled according to 50, 100, 200 and 600 hour inspection cycles.
100 hr Inspections occur at 100hr 300hr 500hr 700hr 900hr 1100hr.
200 hr Inspections occur at 200hr 400hr 800hr 1000hr
600 hr Inspection occurs at 600hr

For convenience the AirBorne XT base periodic maintenance has been brought into line with the above Rotax schedule.

New and overhauled engines require an inspection at 25 hours.
Rotax recommend inspections at 50 hours but state that this is not essential.
For engines operating on AVGAS 50 hour oil changes are required.
Refer to Rotax maintenance manual and Rotax maintenance logbook for the tasks and checklists to be filled when conducting engine maintenance.

5.20.05 Maintenance Task Legend

Your microlight should be maintained in accordance with the following schedules. When registered under LSA, the following schedules are mandatory. The following codes are used in these schedules:

Code

1 Oil lubricate, clean and service.
2 Check as directed.
3 Check for insecurity, cracks, wear legibility and faulty operation.
4 Remove, inspect and replace if necessary.
5 Recommend replacement or overhaul.
6 Mandatory replacement.
7 Refer to Rotax maintenance manual and Rotax maintenance logbook.

Certification required to perform Light Sport Aircraft maintenance tasks

[O] Owner
[R] E-LSA Repairman Inspection (experimental registered aircraft only)
[R] S-LSA Repairman Maintenance
[A&P] Mechanic Certificate Airframe and or Powerplant
[TS] Task Specific

5.20.06 Log Book

When maintenance is performed always fill out the appropriate check sheet supplied in Appendix A at the rear of this maintenance manual. The aircraft logbook should also be filled out when maintenance has been done.

When Service Bulletins have been completed, both the maintenance manual and the log book should be filled out. A copy of the Service Bulletin form should be sent to the factory to be stored with the aircraft QA papers.

A separate maintenance manual is supplied with the wing. The wing maintenance log should be filed out in the wing maintenance manual and aircraft log book.

5.20.10 Power Plant Maintenance Schedule

WARNING

DISCONNECT SPARK PLUG LEADS FOR ALL MAINTENANCE AND INSPECTION PROCEDURES! IF THE ENGINE IS ROTATED AT ANY POINT, IT SHOULD ONLY BE ROTATED IN THE SAME SENSE AS IT RUNS. ROTATING THE ENGINE IN THE OPPOSITE SENSE MAY INTRODUCE AIR INTO THE OIL SUPPLY AND CAUSE DAMAGE TO THE ENGINE.

POWER PLANT MAINTENANCE SCHEDULE	**Manual Section**	**AIRCRAFT OR ITEM HOURS OF OPERATION**						
Inspection Items	**Reference**	**25**	**100**	**200**	**300**	**400**	**500**	**600**
Rotax engine maintenance	72.00.10	2 [R]	2 [R]	2 [R]	2 [R]	2 [R]	2 [R]	2 [R]
Loose bolts / nuts	20.10.10	2 [R]	2 [R]	2 [R]	2 [R]	2 [R]	2 [R]	2 [R]
Engine rubber mounts	71.20.00	2 [R]	2 [R]	2 [R]	2 [R]	2 [R]	2 [R]	2 [R]
Engine platform, mounting plates. Check for cracks		2 [R]	2 [R]	2 [R]	2 [R]	2 [R]	2 [R]	2 [R]
Electrical cable harness	71.50.00	2 [R]	2 [R]	2 [R]	2 [R]	2 [R]	2 [R]	2 [R]
Fuel lines – cracks / tight (See 5.10.00 for time limits)	28.20.00	3 [R]	3 [R]	3 [R]	3 [R]	3 [R]	3 [R]	3 [R]
Fuel tank located and secure / no leaks or cracks	As directed	3 [R]	3 [R]	3 [R]	3 [R]	3 [R]	3 [R]	3 [R]
Fuel filter	28.20.00	2 [R]	2 [R]	2 [R]	2 [R]	2 [R]	2 [R]	2 [R]
Throttle cable (Few drops of light machine oil)	12.20.40	2 [R]	2 [R]	2 [R]	2 [R]	2 [R]	2 [R]	2 [R]
Air filter	12.20.50	2 [R]	2 [R]	2 [R]	2 [R]	2 [R]	2 [R]	2 [R]
Exhaust system	78.00.00	2 [R]	2 [R]	2 [R]	2 [R]	2 [R]	2 [R]	2 [R]
Muffler springs and safety	As directed	3 [R]	3 [R]	3 [R]	3 [R]	3 [R]	3 [R]	3 [R]
Tie wires	20.20.00	3 [R]	3 [R]	3 [R]	3 [R]	3 [R]	3 [R]	3 [R]
Exhaust Gas Temperature Operation	As directed	2 [R]	2 [R]	2 [R]	2 [R]	2 [R]	2 [R]	2 [R]
Cylinder head Temperature Operation	As directed	2 [R]	2 [R]	2 [R]	2 [R]	2 [R]	2 [R]	2 [R]
Engine Tachometer Operation	As directed	2 [R]	2 [R]	2 [R]	2 [R]	2 [R]	2 [R]	2 [R]
Engine Hour Meter Operation	As directed	2 [R]	2 [R]	2 [R]	2 [R]	2 [R]	2 [R]	2 [R]
Engine Oil Temperature Operation	As directed	2 [R]	2 [R]	2 [R]	2 [R]	2 [R]	2 [R]	2 [R]
Propeller bolt torquing	61.10.30	2 [R]	2 [R]	2 [R]	2 [R]	2 [R]	5[R]	2 [R]
Propeller inspection for nicks and abrasions. (see 61.20.00 if repair required)	61.10.10	2 [R]	2 [R]	2 [R]	2 [R]	2 [R]	2 [R]	2 [R]
Propeller removal, disassembly and inspection	Section 61						4 [R]	

Table 10 Power Plant Maintenance Schedule

5.20.20 Trike Base Frame Maintenance Schedule

TRIKE BASE FRAME MAINTENANCE SCHEDULE	Manual Section	AIRCRAFT OR ITEM HOURS OF OPERATION						
Inspection Items	**Reference**	**25**	**100**	**200**	**300**	**400**	**500**	**600**
Trike base tube for bend or cracking (see 4.20.00 for time limits)	As directed	3 [R]	3 [R]	3 [R]	3 [R]	3 [R]	3 [R]	3 [R]
Trike mast for bends or cracking (see 4.20.00 for time limits)	As directed	3 [R]	3 [R]	3 [R]	3 [R]	3 [R]	3 [R]	3 [R]
Drag links and rear struts for bends or hole elongation (see 4.20.00 for time limits)	As directed	3 [R]	3 [R]	3 [R]	3 [R]	3 [R]	3 [R]	3 [R]
Brake system inspect dimensions & wear limits. Disk brake fluid level	32.40 table 18/19	3 [R]	3 [R]	3 [R]	3 [R]	3 [R]	3 [R]	3 [R]
Mast brace for bend or cracking. Should. Outer brace should slide freely. (see 4.20.00 for time limits)	As directed	3 [R]	3 [R]	3 [R]	3 [R]	3 [R]	3 [R]	3 [R]
Rubber cushion, Front suspension (on XT outback only)	As directed	3 [R]	3 [R]	3 [R]	3 [R]	3 [R]	3 [R]	3 [R]
Pitot Drain, drain & reseal	34.10.10	2 (O)	2 (O)	2 (O)	2 (O)	2 (O)	2 (O)	2 (O)
Heart bolt (see 4.20.00 for time limits)	As directed	4 (O)	6 (O)	6 (O)	6 (O)	6 (O)	6 (O)	6 (O)

Table 11 Trike Base frame Maintenance Schedule

Special Instructions

Requirements for TBO

Rotech Research Ltd. is pleased to join with ROTAX in announcing the extension of the T.B.O. (Time Between Overhaul) period for Rotax® 912 and 914 series of piston aviation aircraft engines. The Austrian civil aviation authority (Certificate Authority Austro Control GmbH or ACG) has now granted all of the necessary approvals to increase the time before overhaul (TBO) of the Rotax 912 series from 1200 hours to 1500 hours. The TBO for the popular turbo-charged 914 engine has been increased from 1000 hours to 1200 hours.

These TBO increases are effective immediately and apply to both new engines and existing engines subject to compliance with applicable service bulletins. Please refer to Service Bulletins SB-912-041 / SB-914-027 and SB-912-041UL / SB-914-027UL for complete compliance information.

Reference http://www.rotec.com/whatnew.htm

Table 14 Requirements for Rotax 912 Time Between Overhaul

Time Limit for Rubber Parts

For checking the Engine Mount Rubbers, see “Mounts” Section 71.20.00, for other rubber components related to the engine, see below.
See Rotax Maintenance Manual Section 05-10-00 “Operating Hours Related Checks”

Time Limit for Coolant and Oil

See Rotax Maintenance Manual Section 05-20-00 “Operating Hours Related Checks”
See section 12.10.30 for Coolant details and section 12.10.20 for Oil details.

NOTE

There are Special Instructions when using Avgas. Consult the Rotax Service Information 18 UL 97 D/E.

Special Instructions

Fatigue

The fatigue life calculations given in Section 4. Airworthiness Limitations, give life estimates for the masts, attachments to the wing and base tube structure of 953 hours. Service announcements may increase the fatigue life as the service history of the airframe evolves.

50.00.00 Unscheduled Maintenance Checks

Unscheduled maintenance is required due to abnormal flight loads such as severe turbulence or heavy landings. The pilot will be responsible for identification of these extreme operating conditions and identification of the effected components. Where damage is found further checks should be carried out upon areas that may also be effected.
Thorough checks should also be carried out after transportation of the aircraft, and after extended storage periods.

5.50.10 Inspection after heavy landing

Check shock absorbers for normal operation. Check all attachment points and members of the suspension system. Check all welded lugs for bending or cracking of paint, which may indicate permanent deformation of the area. If any permanent deformation is identified then a more rigorous inspection of the rest of the aircraft is necessary, as permanent deformation indicates that extreme forces have been experienced by the aircraft.

5.50.11 Checking for Deformation

A straight edge may be used on the tubing to ascertain straightness. For checking the overall condition of straightness, a good check is the gap between the front mast and the mast brace.

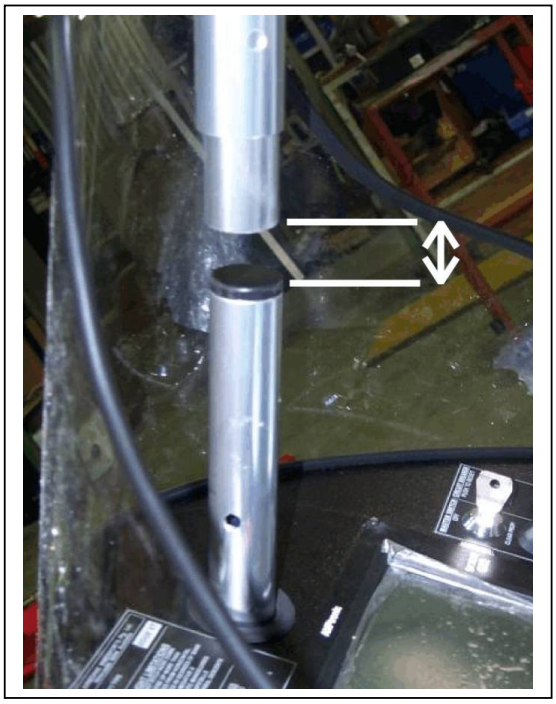

Figure 7 Front Mast to Mast Brace Check

Check Clearance
The dimension measured will have some variability, but should be in the range of 20 to 15mm.

NOTE 1
The dimension should be measured with the wing off, and no pilot in the seat, as this will alter the dimension.

NOTE 2
If the two tubes are closer than the recommended distance or interfere with each other, this indicates significant deformation of the trike base tube, and that the trike has been subjected to significant abnormal loads. The base tube should be replaced, and this necessitates a thorough checking of the rest of the aircraft.

Check Alignment
The alignment of the mast brace with the top of the mast can be checked by ensuring that the two tubes slide freely over each other.

NOTE
The sliding should be measured with the wing off, and no pilot in the seat, as this will change the alignment of the tubes.

Attachment Points
Check attachment points for the wing to the base, including the main hang bolt, wheel axles and bearings. The wing should also necessarily be checked after any heavy landing because the forces are transmitted through to the wing structure.
Check the main structure including the base tube, landing gear attachment points and engine mount. Check all other components attached to the base are in place and properly secured.

Seat Frame
If the airframe has experienced unusual loads then the seat frame should be checked thoroughly. The weight of the pilot during impacts may deform the seat frame.

5.50.20 Inspection after heavy turbulence.
Check all components attached to the base are in place and properly secured, any other items that may have shifted due to in flight movement should also be checked on a regular basis.
Turbulence is more likely to structurally effect the wing of the aircraft rather than the base. The Wing Maintenance manual should be consulted for instructions that pertain to the wing.

6. DIMENSIONS AND AREAS

6.00.00 General

This section gives general dimensions for the base of the aircraft. Imperial and Metric measurements are included. Also included is the overview of the components which make up the trike base.

Ground Line The major line through which points are measured from, being the points where the wheels would rest on level ground.

6.10.00 Major Dimensions of the 912

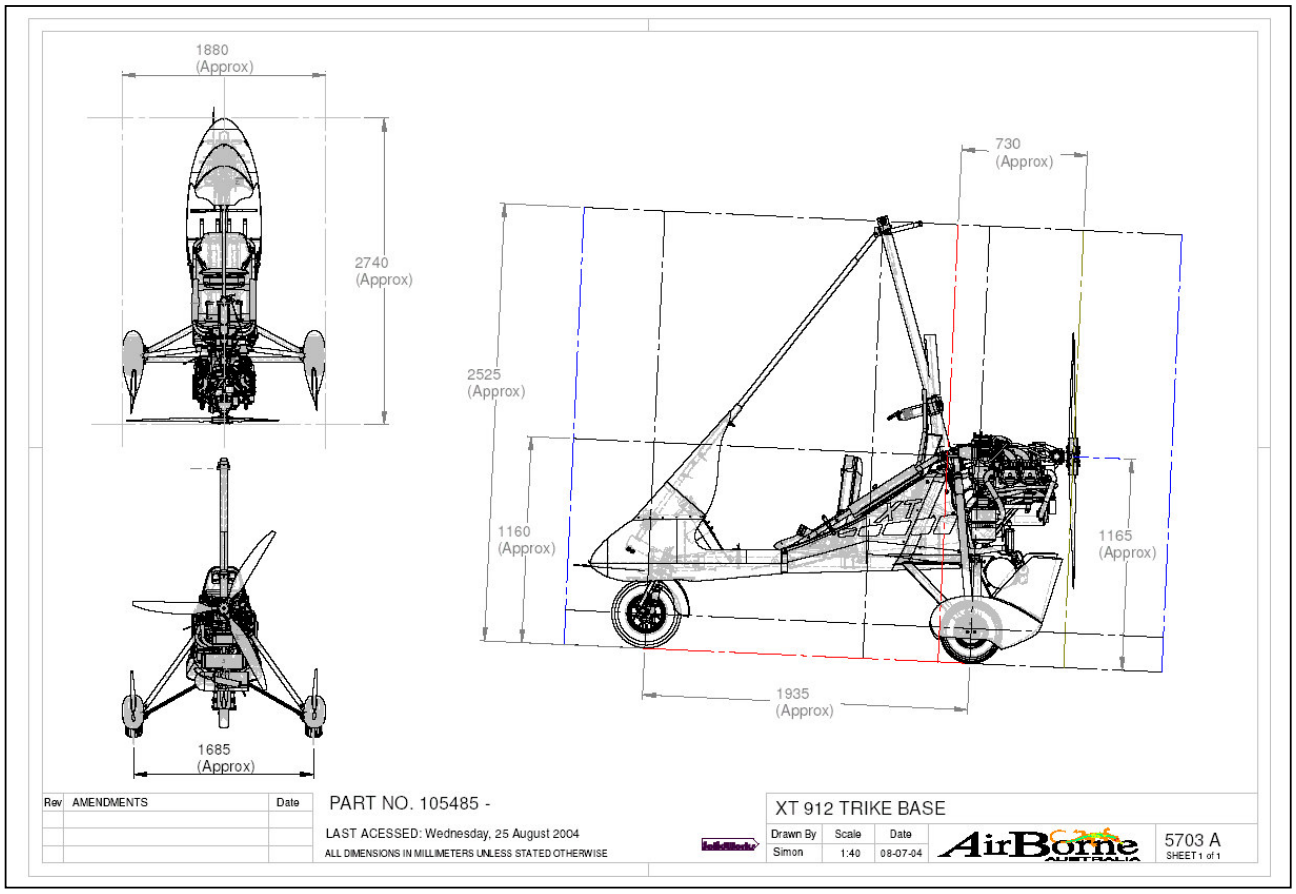

Figure 8 Major Dimensions of the XT 912

6.20.00 Significant Dimensions and Areas

General

Overall Length full cockpit XT (level attitude) (Nose Cone to Edge of Rotax Propeller Mount)	2740 mm
XT OutBack front of wheel to rear propeller	2730 mm
Overall Width (Edges of Rear Spats)	1880 mm
Height (Without Wing) (Ground to Main Bolt Centre)	2525 mm
Undercarriage Track (Wheel Centres)	1685 mm
Undercarriage Base (Axle to Axle)	1935 mm
Prop Centreline Height (Ground to Centre of Prop)	1165 mm
"Ground Line" to the Engine Mount /Mast Block Assembly intersection	1160 mm
Edge of Rotax Propeller mount to Engine Mount /Mast Block Assembly intersection	0730 mm

Table 15 General Aircraft Dimensions.

NOTE
There may be some differences in these dimensions due to suspension sagging and tyre pressures, as well as the particular way the pod and fittings are mounted.

7. LIFTING AND SHORING

7.00.00 General

The base may be lifted using the main attachment point for the wing or alternatively parts of the base may be lifted for local maintenance such as changing tyres. There are specific areas that have been designated for these purposes.

7.10.00 Jacking

Front wheel:
The front wheel is lifted by hand using the gap between the front wheel and the fibreglass pod. This is located underneath and at the front. The base's balance point allows easy lifting by hand from this point. Alternatively a strap may be placed around the base tube for long term elevation of the front end.

Rear wheels:
The rear wheel may be lifted from the ground using the jacking point located underneath at the rear of the base tube where the welded tie down point is located. As this point is jacked the rear of the trike will rest on one of the rear wheels and the front wheel allowing each of the rear wheels to be maintained in turn.

CAUTION

NOT TO BE PERFORMED IF THE FUEL TANK IS FULL AS LEAKAGE WILL OCCUR FROM THE FUEL TANK BREATHER TUBES.

Lifting the entire base
The entire base may be elevated from the ground using the main attachment point, the aircraft should be elevated no more than is necessary.

9. TOWING AND TAXIING

9.00.00 General

Moving the trike is a relatively simple operation due to its light weight and manoeuvrability. Moving is easily achievable by one person. If the front of the trike is lifted from the ground care should be taken to prevent the propeller from contacting the ground.

9.10.00 Towing

There are two alternatives for "towing" the trike.

Pulling the trike: Moving the base (with or without the wing) is facilitated by lifting the front wheel and walking the base.

Pushing the trike: The trike can be pushed using the base tube, and using a hand on the steering pedals inside the pod for directional control. The brake is available using this method.

9.20.00 Taxiing

Taxiing of the trike may be performed with or without the wing attached to the base. Braking and steering are achieved through the front wheel. The trike should never be taxied with excessive speed. Taxiing is a part of the training necessary for flying this aircraft, if a maintenance engineer without trike flying experience is working on the trike they should push the trike and not taxi it, as the control sense may be different to what they are accustomed to.

9.30.00 Ground Transportation

The base may be transported overland on a suitable trailer, usually custom built for the purpose. During transport the trike base should be firmly held at both the front and the rear to prevent movement. Tie down straps should be used with a ratchet system so preload can be applied, this allows the tyres to be compressed slightly so as to firmly hold the base in place during transport.

Rear

The rear of the trike base may be secured from the tie down hook, at the centre rear on the engine mount section.

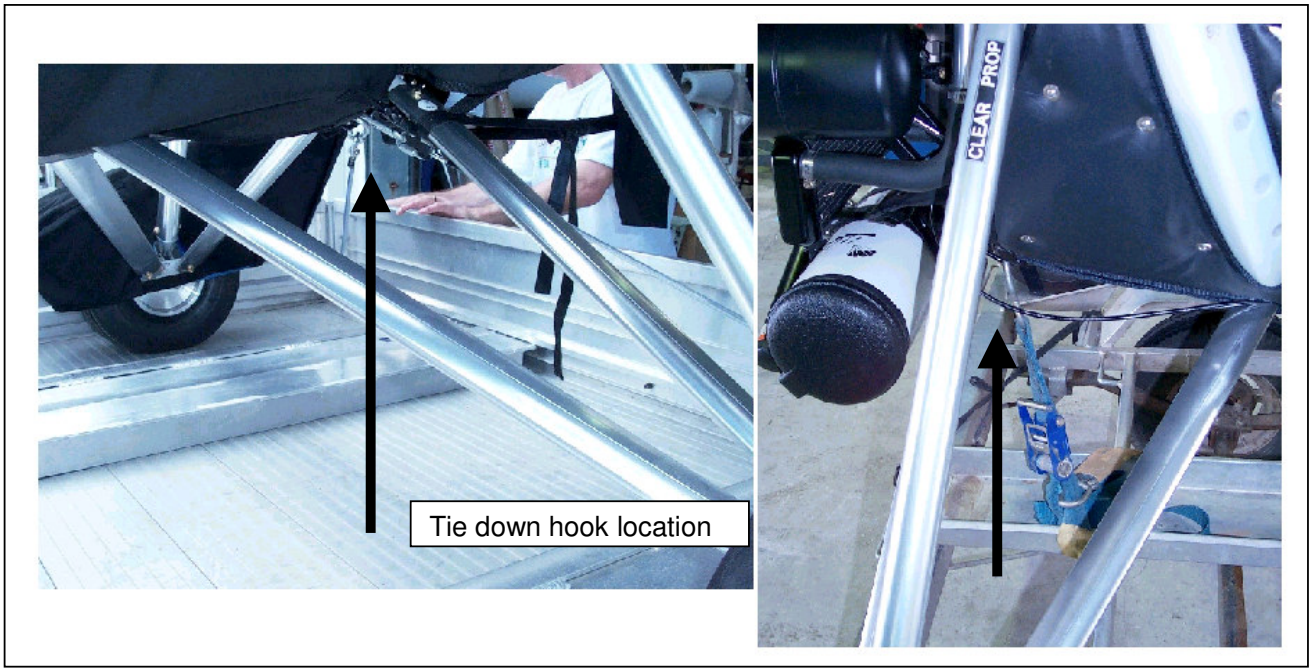

Figure 9 Tie Down Hook Location

Front

The front of the trike should be secured between the front wheel and the fork, on both sides of the axle. Make sure that the tie downs are installed correctly so the brake assembly is not interfered with. Ensure that the park brake is applied.

Figure 10 Front wheel with tie downs

The rear wheels may be tied as well. Route the tie between the drag link and rear suspension member to help prevent damage to the spat.

Figure 11 Tie on Rear Wheel

Figure 12 Trike on Trailer

The above photo shows the trike correctly secured upon a trailer and ready for transport.

10. PARKING AND MOORING

10.00.00 General

This chapter provides information concerning the correct procedures for parking, securing, storage and transport of the aircraft, without packing the trike up. If any maintenance is to be performed on the trike base it is recommended that the wing is removed. For derigging and storage see sections 9.2 and 9.3 of the pilots handbook.

10.10.00 Parking

Wing Down Park

Park the trike at 90° to the anticipated wind direction and set the brake lock on. The wing tip should then be placed onto the ground on the side of the prevailing wind. The shock cord and fastener are then used to secure the base bar to the front mast pole. This method of parking the aircraft allows the wind to flow spanwise across and over the wing. For other situations such as strong winds, pack up and hangaring, consult the pilots handbook.

Figure 13 Securing of Base Bar with Shock Cord

Figure 14 Parking of Trike

(Upwind Wing Down)

NOTE

The wing tip may be pinned to the ground using a peg such as a tent peg. This will stop the wing from shifting.

Tail To Wind Park

CAUTION

THIS METHOD SHOULD ONLY BE USED WHEN THERE IS LITTLE OR NO WIND. BE AWARE THAT WIND DIRECTION AND SPEED MAY CHANGE RAPIDLY.

Park the trike at 180° to the wind direction (propeller towards the wind) and set the brake lock on. Attach the base bar to the front mast pole, and secure with the shock cord (same method as above, except at the centre). This method causes the wind to flow over the back of the wing. This method is only recommended for very short periods of time, and in constant (and light) wind conditions.

Figure 15 Parking Trike Tail to the Wind

10.20.00 Mooring

A trike should not be left in the open in fully set up condition for any extended period of time. Consult the pilots handbook for instructions on disassembly, pack up and or hangarage.
Additionally if the trike is to be prepared for transport the pilot handbook section 9.3 should be consulted for the correct preparation and mooring procedures for trailers and transportation.

10.30.00 Long term Hangarage

Long term hangarage will require the supplied air filter covers to be put in place to prevent foreign objects contaminating the air intake area. Full covers for the base are advisable, which are available as after market items from Airborne. The Rotax manual should be consulted for long term storage practices for the engine.

11. REQUIRED PLACARDS

11.00.00 General

The placards that are present on this aircraft are a legal requirement showing safety information, emergency information and identification of the aircraft. The placards must be repaired or replaced if they become illegible or damaged in service. Replacement placards may be purchased from an Airborne dealer or direct.

In the case of the V_{ne} placard if the ASI has been disassembled the alignment of the ASI and placard should be checked.

11.10.00 Required 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.
The placards that are required for operation of this aircraft are available in the Pilot's Operating Handbook, Section 2, "Placards".

12. SERVICING

12.00.00 General

This chapter provides servicing procedures necessary to replenish or service the aircraft and its equipment as required.
The operational integrity of the aircraft systems can be seriously impaired if contaminated fuel, oil, fluids and lubricants are used or if they do not meet the required specifications. Mixtures of various brands and types of materials is undesirable and should be avoided wherever possible even though the use of such mixtures may be technically acceptable. Specified lubricants will meet requirements for extreme hot or cold temperature operations. Use of substitutes or other lubricants may cause malfunction, or excessive wear.

12.10.00 Replenishing

12.10.10 Fuel System Replenishment

Fuel Specification
The XT has a single fuel tank, capacity 70 L.

NOTE
On manufacture the fuel tank has 64 Litre capacity and is known to expand within the first month of use to the specified 70 Litre capacity, take note of this fact when planning flight times.

When the tank is being filled there may be a slight pressure differential between the sides of the tank, causing the fuel cap side to fill slightly faster than the other side. Allow time for the breather valves to equalise the pressure to allow complete filling and, check that both sides are sufficiently full. Fill to the neck of the fuel entrance.

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

Table 174 Fuel Specifications

NOTE
Due to higher lead content in AVGAS, the wear of the valve seats and deposits in the combustion chamber will increase. Therefore, use AVGAS only if you encounter problems with vapour lock or if the other fuel types are not available.
Special instructions and service intervals are specified when using AVGAS. If AVGAS is used the Rotax web site should be referenced for maintenance requirements. See Rotax service information 18-UL-97-D/E, which outlines special instructions regarding the oil system when using AVGAS.

Fuel Sampling/Draining
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 form the system.

Checking the 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 may be advisable to replace it with fresh fuel.

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.

12.10.20 Engine Oil System Replenishment

The minimum oil level is with system volume at 3L, max at 3.45L. This is checked and replenished by removing the oil sump lid. Rotax has provided service instructions which detail how to check the oil.
The sump is drained by removing the sump plug. Ensure that the sump plug is correctly replaced and lock wired prior to refilling the engine with oil. Measure the amount to be replaced, refill, check the level, run the engine and recheck. The opportunity should be taken to replace the oil filter any time that the oil is replaced. Use only Rotax oil filters.
Consult the Rotax manual and Rotax service instruction 18 UL 97, for the correct type and grade of oil for the ambient operating temperature.

Rotax Oil Replenishment Service Release

Following is a service announcement released by Rotax regarding the Oil system.

ROTAX
AIRCRAFT ENGINES

SERVICE INSTRUCTION

OIL LEVEL CHECK

FOR ROTAX® ENGINE TYPE 912 AND 914 (SERIES)

SI-27-1997 R1

3.1) Instructions
Proceed as follows for
- checking the oil level
- replenishing of oil level

WARNING: Assure both ignition circuits are "Off'(grounded) before cranking the propeller. Anchor the aircraft and ensure the have the is cockpit occupied by a competent person who will be in control of aircraft operation.
Risk of burns by hot oil and engine parts exists, use appropriate safety measures! Handle propeller with extreme care and secure engine against unintentional operation!

3.1.1) Oil level check:
a)check for oil leaks:
If leaks are evident, check cause of failure and rectify before flight.
b)check of oil quantity:
- Level aircraft for accurate reading.

Prior to oil level check, remove the oil tank cap and turn the propeller by hand in the direction of normal rotation to transfer all the oil from the engine crankcase to the oil tank.

WARNING: Propeller may not be turned in reverse of the normal direction of rotation.
The process is finished when crankcase air can be heard being forced back to the oil tank. This will be noticed as a gurgle sound, coming from the oil tank with the cap removed, verifying the crankcase is purged of residual oil.
The oil level in the oil tank should be between the two marks (max./min.) on the dip-stick, but must never fall below the min. mark.
- Remove the oil dipstick and clean it.
- Return the oil dipstick to the tank.

NOTE: Hold dipstick a few seconds in position to allow an accurate reading.
- Pull out dipstick and check the oil level.

3.1.2) Replenishing of oil quantity:
For normal engine operation maintain the oil level midway between the two marks.
- CAUTION: For longer flights replenish oil to max. mark to warrant more oil reserve.

Do not overfill oil tank, as an excessive oil level over the "max." mark will allow oil to escape via the venting.
Difference between "max." and "min." = 0.45 I (0.95 lig.ptsL If engine is equipped with the genuine ROTAX oil dipstick part no. 956151. Check compliance with Service Bulletin SB-912-040, SB-914-026, "Introduction of a new oil dipstick", current issue to verify your engine has the proper dipstick.

WARNING: Non-compliance with this recommendations could result in engine damage, personal injury or death!
- Restore aircraft to original operating configuration.

3.2) Test run
Conduct test run including ignition and oil/coolant leak checks.
3.3) Summary
These instructions (section 3) have to be conducted in compliance with section 1.5.
Approval of translation to best knowledge and judgment - in any case the original text in the German language and the metric units (SI-system) are authoritative.

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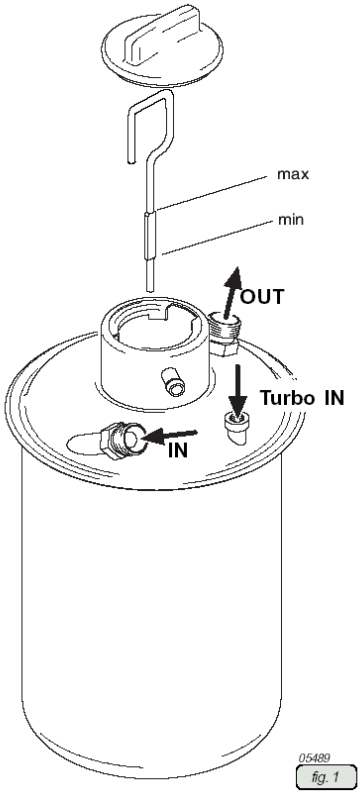
Figure 16 Rotax Oil Replenishment Service Release

4) Appendix
the following drawings should provide additional information:



The illustrations in this document show the typical construction. They may not represent full detail or the exact shape of the parts which have the same or similar function.
Exploded views are not technical drawings and are for reference only. For specific detail, refer to the current documents of the respective engine type.

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Figure 17 Rotax Oil Replenishment Service Release

12.10.30 Coolant Replenishment

Coolant Specification
A MANDATORY Rotax Directive was issued on the 25th of November 2004, which requires a change in the type of coolant that must be used with the Rotax 912 type engine. From the 23rd Feb 2005 the new coolant Evans NPG+ waterless coolant is to be used. The reason for the change is "In some instances conventional coolant (mixture ratio of 50% water and 50% antifreeze) can vaporize or boil before the max permissible cylinder head temperature is reached". Rotax Service Bulletin SB-912-043, pg # 1.

Earlier Airborne trikes have had a silicate free type high quality and long life antifreeze coolant (which is red), Airborne Part Number 106644, installed in the radiator. This coolant must be changed to the newly recommended coolant.

The directive requires that the new coolant be used, and a sticker be placed on the coolant cap, which prohibits the use of water in the coolant system.

Older model XT 912 Trikes with the red coolant may have a 0.9 bar radiator cap. If this is the case a 1.2 bar radiator cap should be installed when the coolant is replaced with the required Evans Coolant.

The coolant should be replaced according to the Rotax maintenance manual, current issue. Please refer to the directive, which is available from the Rotax website: SB-912-043, September 04.

WARNING

WATER OR WATER CONTAINING COOLANT MUST NOT BE ADDED IN ANY CASE TO THE COOLING SYSTEM WITH THE EVANS NPG+ COOLANT.

If the coolant needs to be replaced for any reason it is recommended that the Rotax manual is read, as well as the their service instructions.

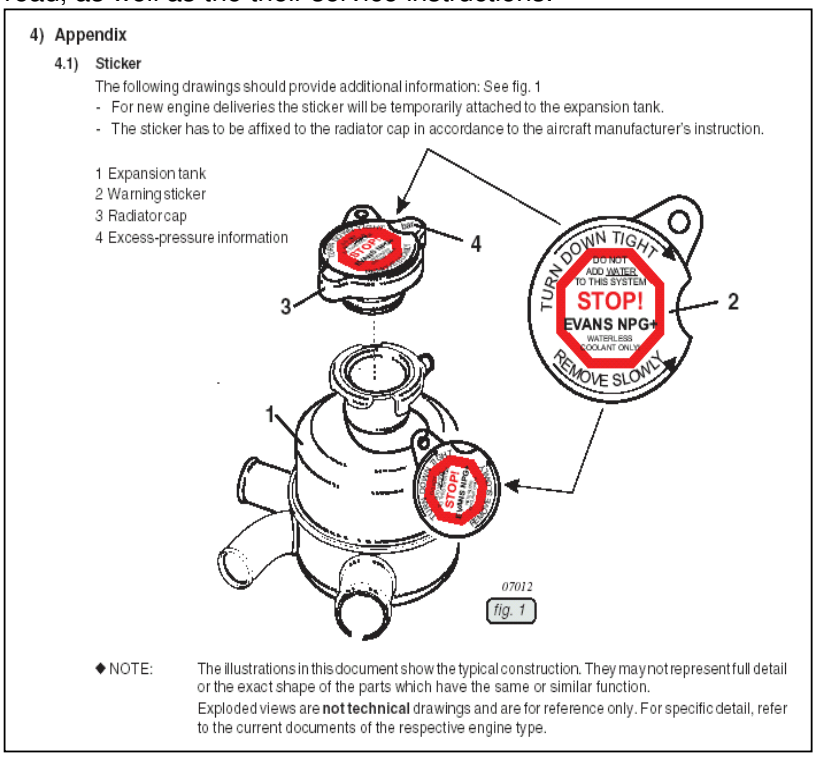


Figure 18 Coolant Warning Sticker instructions. Excerpt from Rotax Service Bulletin SB-912-043, Sept 04.

NOTE
Rotax recommends a two year or 200 hourly replacement interval for coolant.

12.10.40 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.

12.20.00 Scheduled

12.20.10 General
This section provides details necessary to carry out routine scheduled periodic maintenance on the XT airframe and is to be read in conjunction with the XT MAINTENANCE SCHEDULES (Section 5.). Should any conflict occur between information in this section and the XT Maintenance Schedules, the latter will take precedence.

12.20.20 Battery Service
The battery supplied is a Genesis, NP 18-12, 12V, 17.2AH sealed lead acid battery, which requires no maintenance. Earlier model XT 912 bases were supplied with a Century PS Series, PS12180, 12V, 18AH which can be replaced by the Genesis battery if a replacement is needed.

CAUTION

WHEN REPLACING BATTERIES USE ONLY SEALED LEAD ACID OR SEALED GEL TYPE BATTERIES, TO AVOID THE ESCAPE OF CORROSIVES ONTO THE AIRCRAFT STRUCTURE.

The SkyDAT system gives voltage readout. If the voltage drops below 12V then the battery system should be checked for correct charging and battery condition. If the battery is to be replaced a similar sealed lead acid battery may be used, please recycle old batteries.

12.20.30 Airframe Lubrication
This section identifies areas deemed necessary for lubrication and the appropriate frequency of lubrication.
Most of the pivots on the trike are open bush type pivots.
On initial assembly the following joints are assembled with a coating of petroleum jelly for ease of disassembly for maintenance or repair: fork pivot bolt, front and rear wheel axels, front suspension hinge bolt, mast hinge bolt and brake cable.
Each of the wheels on the trike has fully sealed bearings in place that should not require user service as they have been lubricated and sealed by the manufacturer.
If no lubrication interval is specified for a component, lubricate as required and when assembled or installed.

General Lubrication Notes:
- All lubrication points should be serviced when overhauled.
- Dry lubricant should be used on the brake latch.
- Throttle cable and choke cables should be lubricated with a light machine oil every 100 hrs

12.20.40 Cable Lubrication
The throttle and choke cables have been lubricated with light machine oil on initial assembly.
The Brake Cable is lubricated with Vaseline on initial assembly.

12.20.50 Air Filter
Dust and dirt that make their way into the engine are probably the greatest cause of premature engine wear. The value of maintaining the air filter in good condition cannot be overstressed. The condition of the air filter should be checked as per the maintenance schedule, and if extreme operating conditions are experienced they should be checked more frequently. Also check the condition of the air filter after any extended hangarage.

12.20.60 Air Filter Service Instructions
These service instructions apply to K&N air filters.
(1) Tap the element to dislodge any large embedded dirt, then gently brush with a soft bristle brush.
(2) Spray K&N air filter cleaner liberally onto the entire element and let soak for 10 minutes.

CAUTION

DO NOT USE PETROL, STEAM, DETERGENTS OR OTHER CLEANING SOLUTIONS OR SOLVENTS. ANY OF THESE PRODUCTS CAN CAUSE HARM TO THE COTTON FILTER OR SHRINKAGE OR HARDENING OF THE RUBBER END CAPS.

(3) Rinse off the element with low-pressure water. Tap water is OK. Always flush from the clean side to the dirty side. This removes the dirt and does not drive it into the filter.
(4) Shake off all excess water and let the element dry naturally.

CAUTION

DO NOT USE COMPRESSED AIR, AN OPEN FLAME OR OTHER HEAT SOURCES. COMPRESSED AIR WILL CREATE HOLES IN THE ELEMENT WHILE EXCESS HEAT WILL CAUSE THE COTTON FILTER TO SHRINK.

Apply K&N air filter oil to the filter after it is dry. Apply the oil along the top and bottom of each pleat. Wait 20 minutes and re-oil any white spots still showing.

12.20.70 Cleaning

Windshield
The windshield is made from a polycarbonate material and therefore a certain amount of care is required to keep it clean and in good condition. The following procedure is recommended.
1. Flush with clean water to remove excess dirt, bugs and other loose particles.
2. Wash with mild detergent and warm water. Use a soft cloth or sponge, do not rub excessively.
3. Rinse thoroughly, then dry with a clean moist chamois. Do not use volatile solvents such as gasoline, alcohol, benzine or most commercial window cleaning sprays, as they will adversely affect the plastic.

Painted Surfaces
The painted exterior surfaces of the aircraft can be washed using a mild detergent and water, alternatively an automotive liquid detergent may be used.

Engine
An engine and accessories wash down should be performed regularly to remove any oil, grease, and other residue. Periodic cleaning allows proper inspection of the engine components and can be an aid to discovering defects during inspection as well as reducing the potential for an engine fire during aircraft operation.

The engine may be washed down using a suitable solvent, then dried **thoroughly**.

During cleaning, the air intakes, BRS parachute, and the electronics should be protected with a thin plastic film, as shown in this photograph.

Figure 19 Areas to be Protected During Cleaning

WARNING

DO NOT USE PETROL OR ANY OTHER HIGHLY FLAMMABLE SUBSTANCES FOR WASH DOWN. DO NOT ATTEMPT TO WASH AN ENGINE THAT IS STILL HOT OR RUNNING. ALLOW THE ENGINE TO COOL FULLY BEFORE CLEANING. PERFORM ALL CLEANING OPERATIONS IN A WELL VENTILATED WORK AREA, PREFERABLY OUTSIDE, AND ENSURE THAT PERSONAL PROTECTIVE CLOTHING IS WORN AND THAT FIRE FIGHTING SAFETY EQUIPMENT IS READILY AVAILABLE.

CAUTION

PARTICULAR CARE SHOULD BE GIVEN TO ELECTRICAL EQUIPMENT BEFORE CLEANING. SOLVENT SHOULD NOT BE ALLOWED TO ENTER ANY OF THE ELECTRICAL EQUIPMENT. ELECTRICAL COMPONENTS SHOULD BE PROTECTED BEFORE SATURATING THE ENGINE WITH SOLVENT. ANY OIL, FUEL, AND AIR OPENINGS ON THE ENGINE AND ACCESSORIES SHOULD BE COVERED BEFORE WASHING THE ENGINE WITH SOLVENT. CAUSTIC CLEANING SOLUTIONS SHOULD BE USED CAUTIOUSLY AND SHOULD BE NEUTRALISED AFTER USE.

Propeller

The propeller should be cleaned occasionally with water and a mild detergent to remove dirt, grass and bug stains. The opportunity should be taken to visually check the condition of the propeller during cleaning.

Upholstery and Interior

The pod area should be vacuumed out to remove all loose dirt/gravel etc. All vinyl surfaces can be wiped with a product such as Armourall surface protectant. The seat is a structural part of the airframe and care should be taken to avoid any substance that will degrade the webbing material, vacuuming is recommended for the upholstery.

12.20.80 Fibreglass Repair

WARNING

THE PROPELLER IS NOT FIBREGLASS AND SEPARATE INSTRUCTIONS IN SECTION 61 HAVE BEEN INCLUDED FOR THE REPAIR OF THE PROPELLER. DO NOT USE FIBREGLASS OR POLYESTER RESIN ON THE PROPELLER AS IT IS STRUCTURALLY INFERIOR FOR THE LOADS ON THE PROPELLER AND THE RESINS MAY BE INCOMPATIBLE, AND THERFORE UNSAFE.

The fibreglass that makes up the pod and spat structures of the trike is made from polyester resin and chopped strand fibreglass. The fibreglass components may be repaired using polyester resin and fibreglass mat, or chopped strand mat which is probably the preferable choice for easy thickness build up. Make sure that the surfaces have been correctly prepared for adhesion of the repair. Full repair instructions for the fibreglass components is beyond the scope of this manual, there are many good texts available for practical composite repairs.

Some guidelines for repairs:

- Repair thickness should at least equal original material thickness in all cases, preferably half on the inside and half on the outside.
- For attachment points the repair thickness should be increased by half again.
- Repairs should overlap damage by at least 35mm on all sides.
- Repairs are prohibited within a radius of 150mm of the pitot tube.
- Repairs in the vicinity of the Pitot must maintain the original profile or the repair will adversely effect airworthiness.

12.20.90 Paint Repair

Colour matched touch up paint is available through the Airborne Dealer network.

Frame components are powdercoated, and the fibreglass fairings are 2 pack acrylic eurothane enamel. Repair methods on small damaged areas are the same for both paint systems.
Repair of small chips may be performed using brush touch of acrylic paint.
Repair of larger areas may be performed by:

- Scuffing to provide key.
- Apply epoxy based etch primer, rub back.
- Apply acrylic lacquer final coat.

Application may be by spray or brush depending on the desired finish. Paint repairs may be referred to your local automotive smash repair shop.

20. STANDARD PRACTICES - AIRFRAME

20.00.00 General

This chapter provides standard torque values and safetying procedures that are to be used in all areas of the aircraft unless otherwise specified. The use of these standard values and procedures will ensure the security of installation and prevent overstressing of components.

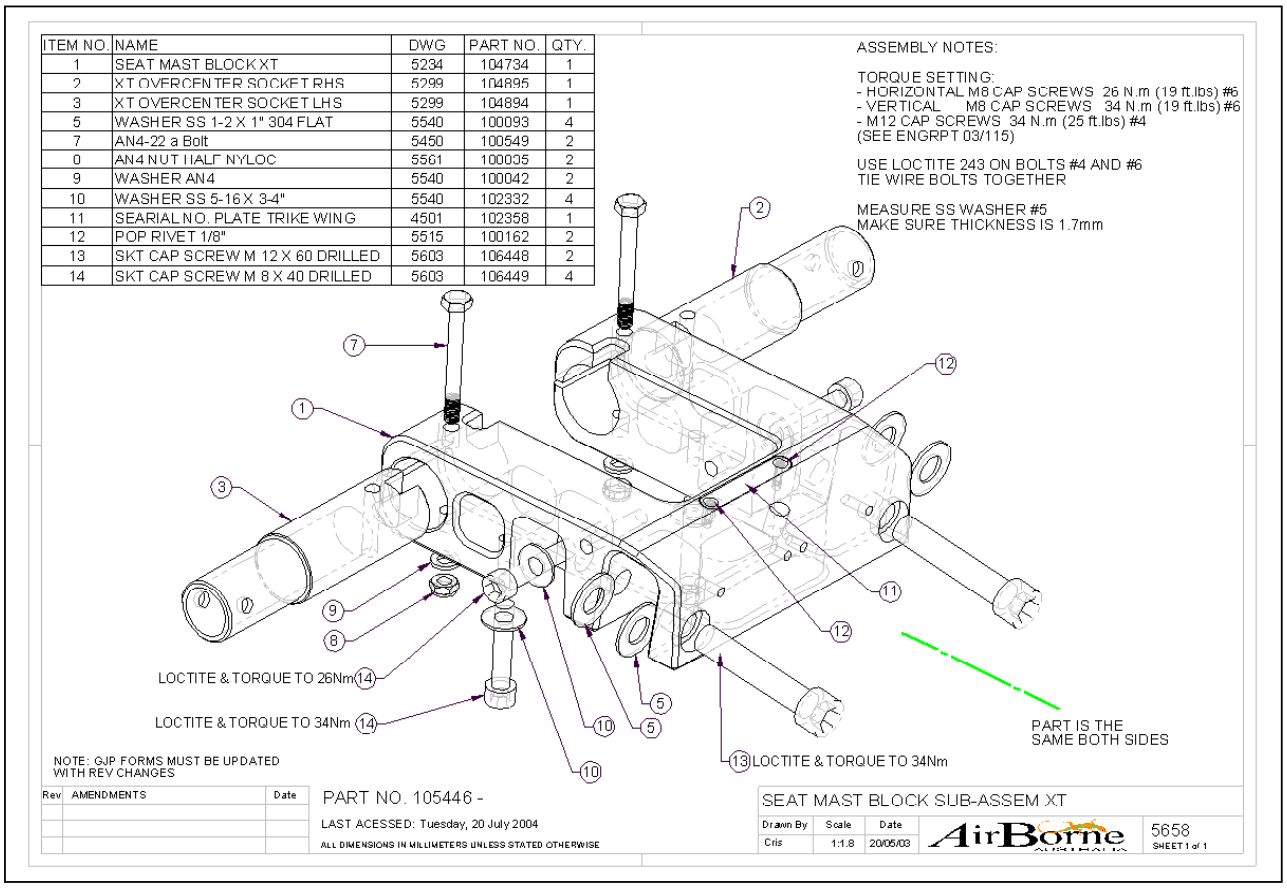
20.10.00 Torquing Procedures

Correct torquing of fasteners is critical, if a bolt or fastener is too loose it may cause unnecessary movement resulting in wear or fatigue, while over-tightening may cause tensile failure of the bolt, or crushing of components. Torques should be determined using an accurate torque wrench during installation. The torque required after the nut is fully on the shaft, but not against the mating surface should be added to the final torque value.

Special Torquing Procedures

Seat Mast Block Sub Assembly

The seat mast block has special torquing procedures that need to be followed. Drawing 5658 is supplied showing the required torque values, as well as the Loctite required.



ITEM NO.	NAME	DWG	PART NO.	QTY.
1	SEAT MAST BLOCK XT	5234	104734	1
2	XT OVERCENTER SOCKET RHS	5299	104895	1
3	XT OVERCENTER SOCKET LHS	5299	104894	1
5	WASHER SS 1-2 X 1" 304 FLAT	5540	100093	4
7	AN4-22 a Bolt	5450	100549	2
0	AN4 NUT HALF NYLOC	5561	100035	2
9	WASHER AN4	5540	100042	2
10	WASHER SS 5-16 X 3-4"	5540	102332	4
11	SEARIAL NO. PLATE TRIKE WING	4501	102358	1
12	POP RIVET 1/8"	5515	100162	2
13	SKT CAP SCREW M 12 X 60 DRILLED	5603	106448	2
14	SKT CAP SCREW M 8 X 40 DRILLED	5603	106449	4

ASSEMBLY NOTES:

TORQUE SETTING:
- HORIZONTAL M8 CAP SCREWS 26 N.m (19 ft.lbs) #6
- VERTICAL M8 CAP SCREWS 34 N.m (19 ft.lbs) #6
- M12 CAP SCREWS 34 N.m (25 ft.lbs) #4
(SEE ENGRPT 03/115)

USE LOCTITE 243 ON BOLTS #4 AND #6
TIE WIRE BOLTS TOGETHER

MEASURE SS WASHER #5
MAKE SURE THICKNESS IS 1.7mm

LOCTITE & TORQUE TO 26Nm (14)

LOCTITE & TORQUE TO 34Nm (14)

(13) LOCTITE & TORQUE TO 34Nm

PART IS THE SAME BOTH SIDES

NOTE: GJP FORMS MUST BE UPDATED WITH REV CHANGES

Rev	AMENDMENTS	Date

PART NO. 105446 -

LAST ACESSED: Tuesday, 20 July 2004

ALL DIMENSIONS IN MILLIMETERS UNLESS STATED OTHERWISE

SEAT MAST BLOCK SUB-ASSEM XT

Drawn By	Scale	Date
Cris	1:1.8	20/05/03

AirBorne AUSTRALIA

5658 SHEET 1 of 1

Figure 20 Seat Mast Block Sub Assembly

Front wheel

The front wheel axle bolts should be torqued to 27Nm on each side, before the locking bolts are tightened.

Rear Wheels

The rear wheels need to be set up in a special way because of the spat brackets.

Procedure after Shipping:
The inside two nuts and bolts are preset at the factory. The outer bolt, and bracket should tighten sufficiently, and at the same time be near to parallel to the ground, for the correct spat installation. Do not over tighten and make sure that the wheel is fully seated on the inside. If not then the full procedure should be followed.

Full Procedure:
1. With the lock bolt and the inside Nyloc nut loose, tighten the outside bolt, with incorporated spat bracket, until it is sufficiently far onto the bolt, and is resting at approximately 10 Deg to the ground, higher end at the rear. Make sure that the split washer is included.
2. Tighten the inside bolt, be careful not to over tighten to protect the bearings. Make sure that there is at least one full thread pitch showing.
3. Tighten the locking bolt. Make sure that there is at least one full thread pitch showing.

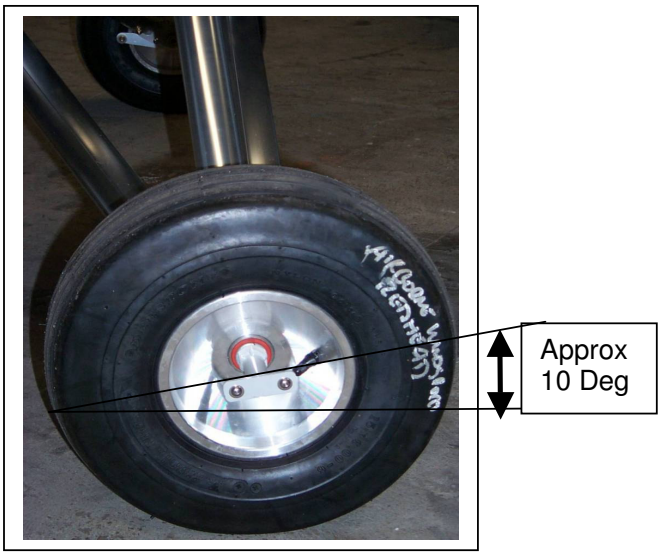


Figure 21 Outside Nut with spat bracket

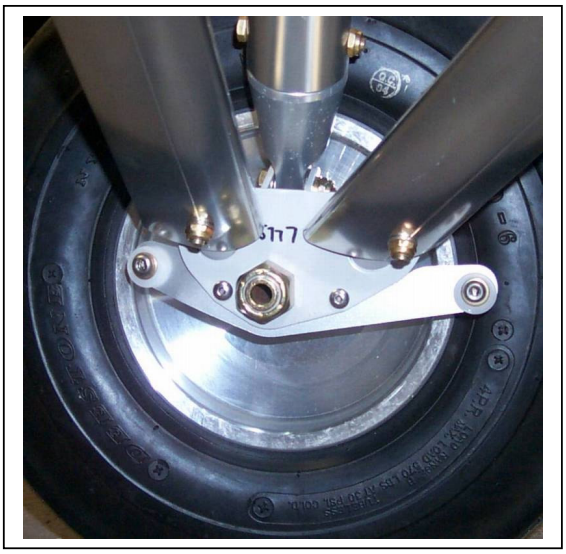


Figure 22 Inside Nut and Inner Spat Bracket

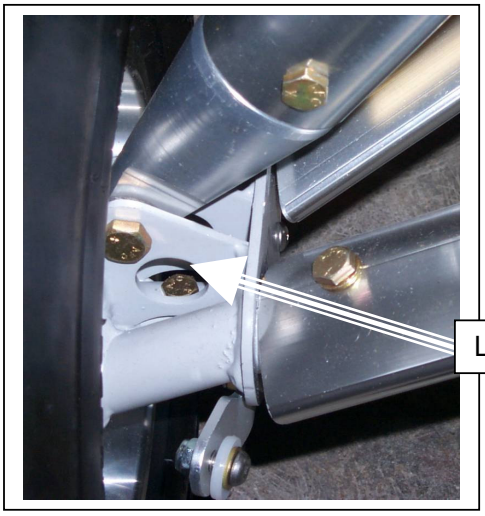


Figure 23 View of Locking Bolt head

NOTE
The Inner Spat Bracket is intentionally bent inwards at each end.

Spat Installation

The spats are made from a fibreglass polyester composite material, for this reason care should be taken to ensure they are not damaged during their installation. They are held by Nyloc nuts, for this reason they do not need to be tightened to the point of crushing the composite (fibreglass).

General Torquing Procedures

General Torquing Exceptions

1. Joints with hinges or bearings, where the specified torque value would prevent free operation.
2. Bolts, nuts and screws that attach plastic or fibreglass or aluminium tube components, where the softer material would be damaged by specified torques.
3. Engine bolts are to be torqued to the engine manufacturers specifications, and may need to be sequenced.

Applicable to the following BOLTS and SCREWS: AN3 thru AN20 AN42 thru AN49 AN73 thru AN8l AN173 thru AN186 NAS1303 thru NAS1320 NAS6600 thru NAS6608 AN509 AN525 MS20073 MS20074 MS24694 MS27039 NAS1300 NAS6605								
Applicable to the following NUTS: Tension Nuts - AN310 AN315 AN363 AN365 MS20365 MS20500 MS21042 MS21045 NAS679 NAS1021 Shear Nuts - AN316 AN320 AN364								
	TORQUE LIMITS RECOMMENDED FOR INSTALLATION (BOLTS LOADED PRIMARILY IN SHEAR)							
	FINE THREAD SERIES							
	Tension Type Nuts				Shear Type Nuts			
	Nm		in lbs		Nm		in lbs	
Thread	Min	Max	Min	Max	Min	Max	Min	Max
8-36	1.4	1.7	12	15	0.8	1	7	9
10-32	2.3	2.8	20	25	1.4	1.7	12	15
1/4-28	5.6	7.9	50	70	3.4	4.5	30	40
5/16-24	11.3	15.8	100	140	6.8	9.6	60	85
3/8-24	18.1	21.5	160	190	10.7	12.4	95	110
7/16-20	50.8	56.5	450	500	30.5	33.9	270	300
1/2-20	54.2	78	480	690	32.8	46.3	290	410
9/16-18	90.4	113	800	1000	54.2	67.8	480	600
5/8-18	124.3	146.9	1100	1300	74.6	88.1	660	780
3/4-16	259.9	282.5	2300	2500	146.9	169.5	1300	1500
	COARSE THREAD SERIES							
	Tension Type Nuts				Shear Type Nuts			
	Nm		in lbs		Nm		in lbs	
Thread	Min	Max	Min	Max	Min	Max	Min	Max
8-32	1.4	1.7	12	15	0.8	1	7	9
10-24	2.3	2.8	20	25	1.4	1.7	12	15
1/4-20	4.5	5.6	40	50	2.8	3.4	25	30
5/16-18	9	10.2	80	90	5.4	6.2	48	55
3/8-16	18.14	20.9	160	185	10.7	12.4	95	110
7/16-14	26.6	28.8	235	255	15.8	17.5	140	155
1/2-13	45.2	54.2	400	480	27.1	32.8	240	290

Table 18 Torque Table

NOTE

Castellated nuts requiring cotter pins should be tightened initially to the lower value. Torque can then be increased up to the maximum limit in order to install the cotter pin. A thick or thin washer may be added under the nut as required in order to maintain within tolerances.

20-20-00 Safetying Procedures

All bolts and nuts, except the self locking type, should be safetied after installation. This prevents them from loosening in flight due to vibration.

Lock Wiring

Lock wiring is the most positive and satisfactory method of safetying nuts, bolt heads and turnbuckle barrels that cannot be safetied by any other practical means. Two or more units are wired together in such a manner that any tendency of one to loosen is counteracted by the tightening of the wire. This is especially important for trikes in flight, as the propeller is located downstream of the flight direction, and any component that becomes loose will tend to be pushed into the propeller and engine.

Following is an excerpt from a manufacturing quality control form giving all of the locations of tie wires, which need to be checked regularly (the engine scheduled maintenance table details the time interval for checks).

TIE WIRE INSTALLED
Engine Mount Angle Cap Screws LHS
Engine Mount Angle Cap Screws RHS
Oil Pressure Relief Valve Bolt Head
Oil Tank Side Clamp
Oil Tank Drain Plug
Oil Tank Top Clamp
Engine Sump Banjo Bolt
Exhaust Springs
Compression Strut Assem to Seat-Mast Block LHS
Compression Strut Assem to Seat-Mast Block RHS
Seat Mast Block to Engine Mount LHS 2 off
Seat Mast Block to Engine Mount RHS 2 off
Engine Mount Tie Rod to Seat Block
Propeller Bolts x 6

Table 19 Excerpt from GJP 141, Complete List of Tie Wire locations

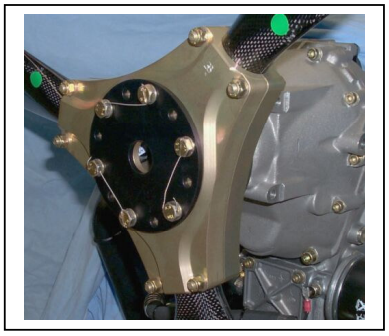


Figure 24 Tie Wires on Propeller

Figure 25 Rear Wheels Self Locking Nuts

The two photographs above give examples of safetying devices. There are special instructions in the propeller section for tie wiring.

WARNING

IT IS UNSAFE TO OPERATE THE SPAT EQUIPPED AIRCRAFT WITHOUT THE SPATS INSTALLED. THIS IS BECAUSE THE SPAT ATTACHMENT TO THE WHEEL NUT STOPS IT FROM ROTATING AND BECOMING LOOSE DURING OPERATION. THE NUT ON THE SHAFT HAS A SPRING WASHER BUT NO NYLOC OR OTHER SAFETYING DEVICE, AS IT IS UNNECESSARY WHEN ATTACHED TO THE SPAT.

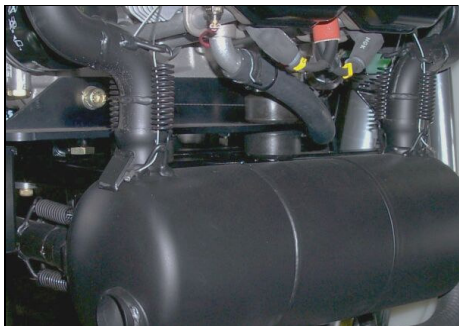


Figure 26 Muffler Safety Wire and Springs

The muffler components are attached to each other via a spring which is in turn safetied with wiring.

Soft Side Safetying

Each of the soft side securing bolts are loctited into position. This is necessary because if they were to come loose they may impact the propeller.

Mast Top

The wing (wing heart bolt not shown), wing safety strap and front pole are locked in place with wing nuts and safety clips as shown below.

Figure 27 Mast Top Safetying

Self Locking Nuts

Self locking nuts are used at joints that subject neither the nut or the bolt to rotation in service. Self locking nuts may be reused but not if they can be run on the thread by hand without using tools. After a self locking nut has been tightened at least one full thread pitch of the male thread must protrude through the nut locking feature.

20-30-00 Control Cables And Terminals

Control cables on the trike base include throttle cables, choke cables and brake cables. These need to be checked regularly for excessive friction and wear. The cables may be lubricated with light oil if necessary. Wear is most likely to occur at the ends of the cables at the attachment points.

20-40-00 Rust Proofing

During manufacture all of the steel components have been treated with rust proofing agent inside the tubing, the exterior is protected with powder coat paint.
Where steel components are removed or inspected the opportunity should be taken to inspect the interior, use a high quality rust proofing agent and apply after inspection has been completed. If the aircraft is operated in coastal areas and / or has had exposure to corrosive environments rust proofing is especially necessary.

23. COMMUNICATIONS

23.00.00 General

All maintenance and servicing of communications avionics equipment fitted to the XT 912 should be carried out by approved agents of the avionics manufacturer. Fitment of additional approved instrumentation as listed in this manual; may be performed by appropriately qualified maintenance personnel according to the procedures outlined in this manual.
The intercom and radio system schematic are shown in the electrical schematic (section 7.13) in the pilots handbook.

23.10.00 Fuses

The fuses for the electrical equipment are located in two 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.

23.20.00 Radio

Radio installation instructions for XCOM Microair radio including Lynx Interface for Edge XT.

Tools Required

Phillips head screw driver
Electrical terminal crimping tool.
Heat gun
Drill
Holesaw 56mm, 2.2”
Crescent file
Drill bit 4mm
Hex key 2.5mm
Hex key 3mm
Spanner 10mm
Side cutters
Eye and breathing protection are recommended for cutting of fibreglass components. The dust may cause irritation to exposed skin.

Bill of Materials

108160 XCOM 760 VHF TRANSCEIVER
106653 WIRING LOOM RADIO XT
106282 AERIAL BRACKET KINGPOST AIRFOIL
102230 CONNECTOR YELLOW SPADE MALE
101780 LYNX RADIO INTERFACE AND POWER ADAP
101786 LYNX POWER SUPPLY LEAD
101781 LYNX PTT SWITCH BAR MOUNT
101194 CABLE TIE (LONG) 290MM
101192 CABLE TIE (SHORT) 98MM
105032 AERIAL KIT
102029 HEATSHRINK CLEAR 13
106771 NUT NYLOC M6 FULL TURNED DOWN
100911 NUT NYLOC M 4
105601 SCREW PHILIPS CSK 10GX1IN 304

Skill level

Light sport maintenance repairman.
For other categories of registration, at a minimum a good understanding and practice on electrical systems is required.

Procedure

1. Mark out and cut hole in console as per Dwg A4-5756
2. Mark and drill holes for mounting of the Lynx Radio Interface unit.
3. Mount the Intercom Interface Unit (if used) on the side of the console prior to fitting the radio.
4. Connect the power supply leads of the Lynx Radio Interface and Radio in parallel, use the male spade connectors make the joint.
5. Slide heat shrink over the power supply lead and connect to the Radio and Lynx power supply leads. Cover with heat shrink.
6. Run power lead and aerial cable along the base bar and cable tie in place. Leave a generous loop of slack at the bottom of the mast (to facilitate mast folding). The cables route around the back of the mast pivot axle. Terminate the electrical cable at the Starting Solenoid and replace Nut on Solenoid with the slender M6 nut supplied (nut has 2mm of the hex section removed to make a slender self locking nut).
7. Run Aerial Lead through slot in Mast Block and cable tie in place. Cable tie the remainder of the aerial cable to the rear of the mast.
8. Remove the king post top plate.
9. Install aerial into the new king post top plate, install the assembly on the king post.
10. Connect the aerial cable to the aerial.
11. Install the LYNX PTT SWITCH BAR MOUNT, a common position is by hook and loop fastener onto the control bar.
12. Check wiring installation and switch power on.
13. Test the transmit and receive functionality using a second radio.
14. Store the following documents in the Aircraft Maintenance manual.
    MANUAL LYNX RADIO-POWER & GUARANTEE 106746
    MANUAL MICROAIR M760 & WARRANTY 106747

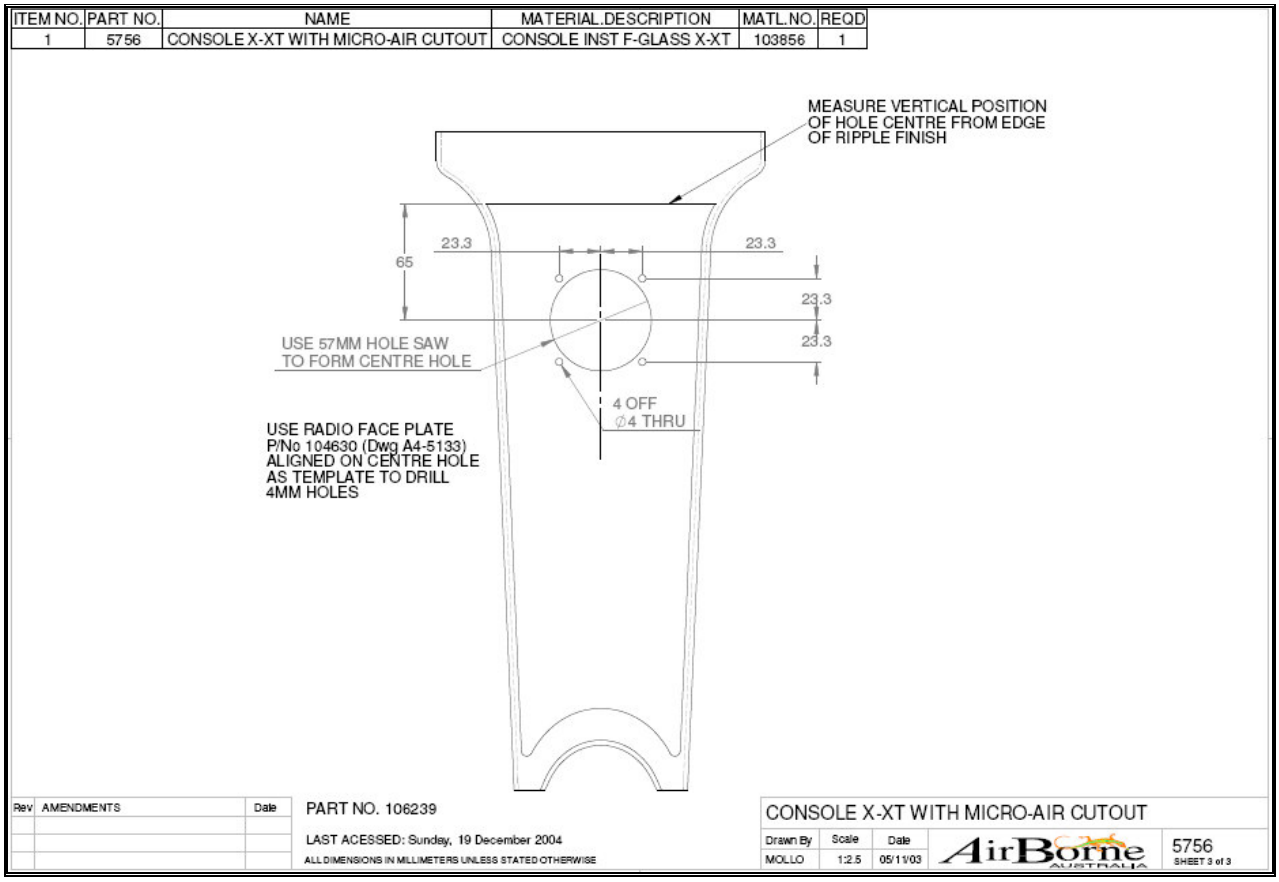


Figure 28 Radio Mounting Position

24. ELECTRICAL POWER

24.00.00 General

The 912 trike base has a 12V electrical system essentially comprising of a 12V battery, the Rotax alternator and accessories. A detailed description and schematic are available in the pilots handbook, section 7.13. The Rotax manual should be consulted for the maintenance of the engines electrical system (Rotax 912 UL).

24.10.00 Maintenance

The maintenance of the electrical system should include periodic inspection of the wiring loom for chafing and other damage throughout its entire length. Pay special attention to the areas that are subject to possible wear points such as sharp corners or proximity to parts which move. It should be noted that the electrical wires may be subject to wear through vibration in flight.
Wiring that is damaged should be replaced and if any wear points are identified then a product such as spiral wrap should be used to cover the area. The advantage with the use of spiral wrap is that it allows inspection of the wires even after it is installed.

25. EQUIPMENT/FURNISHINGS

25.00.00 General

Section 5.20.00 contains general care instructions, which should be referred to for washing and treating surfaces.

25.10.00 Flight compartments

The structural integrity of the webbing on this aircraft is critical for safe operation. All of the webbing should be inspected for signs of wear, fraying, cuts, or other mechanical damages, as well as any significant UV damage that may have occurred.

NOTE
It is preferable to store the aircraft away from direct sunlight.

25.10.10 Seats

The seat structure consists of a seat frame assembly which is attached to the mast block, and through two steel welded lugs onto the base tube. The seats themselves structurally consist of webbing which is attached to the seat frame, The padding and other areas of the seats are non structural components.

25.10.20 Occupant Restraint Systems

Both the pilot and passenger seats are fitted with both lap and shoulder belts. Both of these should be periodically checked for wear and correct operation. In particular the stitching, webbing, and all attachments. Any worn or damaged belts or fittings should be replaced, this includes belts that have been subject to extreme loads during a heavy landing. It should be noted that in order to inspect the seatbelts they need to be pulled out as far as possible from their reels.
Check the shoulder harness inertia reel for corrosion, moisture and debris. Check that the belt retracts readily and locks when pulled suddenly. Check the lap belt connector for proper operation, engagement and release.
Airborne should be contacted for spare parts.

25.10.30 Safety webbing

The top of the mast has safety webbing for the unlikely event of failure of the main mast bolt.

25.10.40 Operation of Seatbelts

The Pilot's Operating Handbook should be consulted for correct usage instructions for the seat belts.

27. FLIGHT CONTROLS

27.00.00 General

For information on the flight controls system refer to the relevant wing maintenance manual.

27.10.00 Engine Controls

The engine is controlled through cable actuated throttle levers which may be actuated by pilots in the front or rear of the aircraft. The foot throttle is only available to the front pilot, while the hand throttle is able to be actuated by both.
The cables and levers should be checked for free operation, and ensure that there are no kinks in the cables. Light machine oil may be used to lubricate the cables.

NOTE
If any sign of wear or damage is evident then the cable assembly should be replaced.

28. FUEL SYSTEM

28.00.00 General Description

This section pertains to the components which store and deliver fuel to the engine.
The XT 912 fuel system is simple and easily visually inspected. Fuel rate sensing transmitting and indicating are covered in chapter 73.

Features:
Capacity 70 Litres.
Useable fuel 67 Litres.
Fuel drain tap.
Breather system.
Safety fuel tap.
Fuel filter.
The Rotax engine contains the fuel pump. Consult the Rotax manual for instructions.
Sight gauge for remaining fuel.
Electric Flow Meter for electronic fuel usage information.
(Usage information provided by the digital flight display.)

The following schematic should be used to ensure the correct sequence of installation if the fuel lines are being repaired or replaced.

CAUTION
THE FLOW METER AND THE FUEL FILTER ARE DIRECTIONAL, THEY MUST BE INSTALLED SO THAT THE FUEL FLOWS IN THE CORRECT DIRECTION.

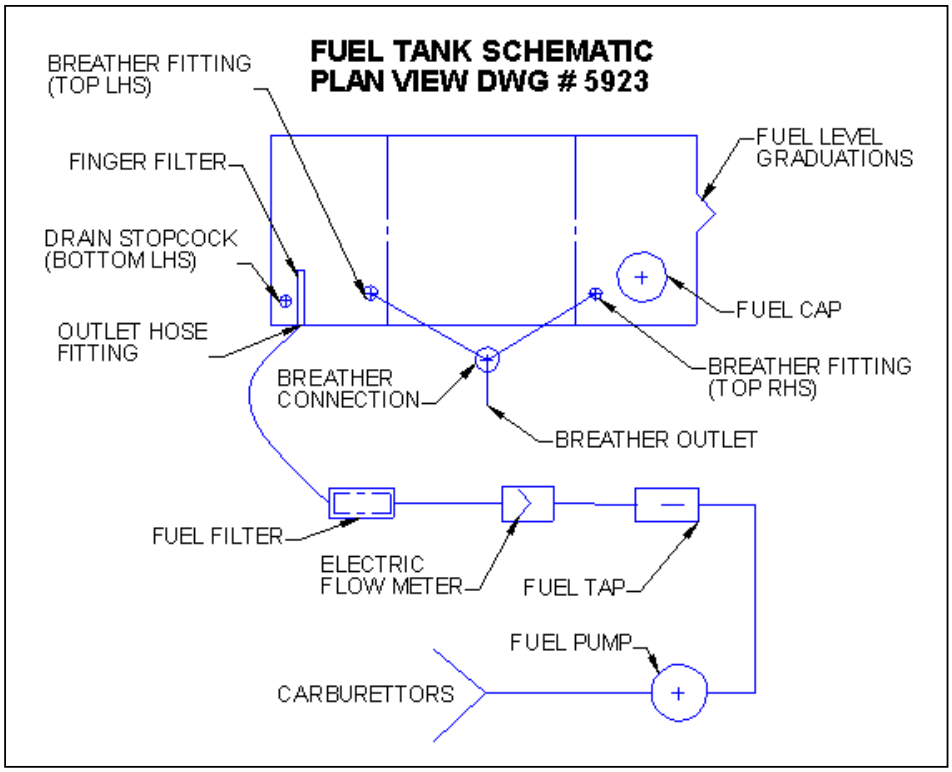


Figure 29 Fuel Tank Schematic

28.00.10 General Precautions and Procedures

WARNING

DO NOT PERFORM ANY MAINTENANCE ON THE FUEL SYSTEM IN CONJUNCTION WITH MAINTENANCE ON THE ELECTRICAL SYSTEM. NO SMOKING OR IGNITION SOURCES WITHIN 50FT OR 15M FROM THE BASE.
FUEL WILL DEGRADE WING MATERIAL AND UPHOLSTERY IN THE TRIKE, CARE SHOULD BE TAKEN TO PREVENT ANY SPILLAGES.

28.10.00 Fuel Storage

Tank
The storage system consists of a single fuel tank located underneath to the sides and to the rear of the passengers seat. Note. The actual fuel tank has no provision for repair, if the fuel tank is damaged in any way that makes it unsafe it should be replaced, contact Airborne.

Fuel Cap
The fuel cap has a one way valve attached which allows air to enter the tank, while preventing fuel escaping.

Fittings
The tank has a draincock, two ventilation fittings and the main supply fitting attached to it.

Sealant
The fittings are attached to the fittings using Loctite 567 Thread Sealant. If for any reason the fittings have to be removed, then the same sealant should be used to ensure compatibility and correct sealing. The Loctite number for ordering is 56747, and the instruction supplied with the product should be followed.

Testing the Fuel Tank
The fuel tank has been pressure tested at the factory during manufacture, if any suspected leaks are to be tested the tank should be tested to 10.35 kPa (1.50 psi). All fuel should be removed, and all fittings disconnected prior to this test being performed, so that other components of the system are not effected by the test. Do not inflate the tank more than the recommended amount for the pressure test as this may damage the tank.

28.10.10 Venting
The tank is protected from negative pressures by both the breather valves and the Fuel Cap, which allows air in if the pressure is lower inside the tank than out. The tank is protected from positive pressure build up by the breather tubes that are present at the top of both the right and left hand sides of the tank, at the top.

28.10.20 Draining and Checking
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. See section 12.10.10.

28.20.00 Distribution
The fuel supply is taken from the base of the left hand side, and is protected from large contaminants by a finger filter. The fuel is drawn by the Rotax fuel pump system. The Rotax manual should be consulted for maintenance and operating procedures for the fuel pump system.

CAUTION

ELIMINATE IGNITION SOURCES AND BE AWARE OF THE FUMES THAT EMANATE FROM THE FUEL TANK.

Breather Lines

The breather lines are attached to the breather fittings without adhesives, the interference fit is used to secure them. The breather lines are made from 6mm ID PVC tubing, which may be replaced if necessary.

Finger Filter

A horizontal finger filter is installed into the tank where the main fuel line is attached. The length of the finger filter is necessary so that a minimum amount of fuel is left in the tank. The condition of the finger filter may be visually inspected through the fuel cap hole with an empty tank, this may be assisted by jacking the back of the trike, and tilting it to the pilots right (see Jacking – Section 7.10.00).

Cleaning Main Tank Finger Filter

NOTE

The removal of the finger filter has been simplified with a non structural change to the engine mount. Check the serial number of the trike which you are performing maintenance on and follow the relevant instructions.

Serial Numbers from 61 onwards should use the following instructions:

1. Remove the fuel from the tank.
2. Turn the main fuel tap to the off position.
3. Remove the fuel hose from the 90 degree brass fitting that attaches to the finger filter.
4. Unscrew the brass fitting from the aluminium finger filter.
5. Unscrew the finger filter from the tank and remove.
6. Remove any accumulated debris from the filter, and flush the bottom of the tank thoroughly, you may need to lift the front of the base for this.
7. Check the condition of the filter, replace if damaged.
8. Installation is the reverse of removal. Check hose and fittings, use Loctite 567 on the connections between the filter and brass fitting, and the two brass fittings. Do not allow excess to enter the fuel line.

Serial Numbers from 0 to 61 should use the following instructions:

1. Remove the fuel from the tank.
2. Turn the main fuel tap to the off position.
3. Remove the fuel hose from the 90 degree brass fitting that attaches to the finger filter.
4. Unscrew the brass fitting from the aluminium finger filter.
5. Remove the front two locating bolts on the fuel tank (underneath at the front).
6. Remove the lower rear centre fuel tank bolt. Removing these bolts temporarily allows the fuel tank to move enough so that the finger filter may get past the engine mount.
7. Unscrew the finger filter from the tank, move the tank slightly to allow removal.
8. Remove any accumulated debris from the filter, and flush the bottom of the tank thoroughly, you may need to lift the front of the base for this.
9. Check the condition of the filter, replace if damaged.
10. Installation is the reverse of removal. Check hose and fittings, use Loctite 567 on the connections between the filter and brass fitting, and the two brass fittings. Do not allow excess to enter the fuel line. Use Loctite 243 on the three fuel tank screws, ensure that the split washer is also present on each.

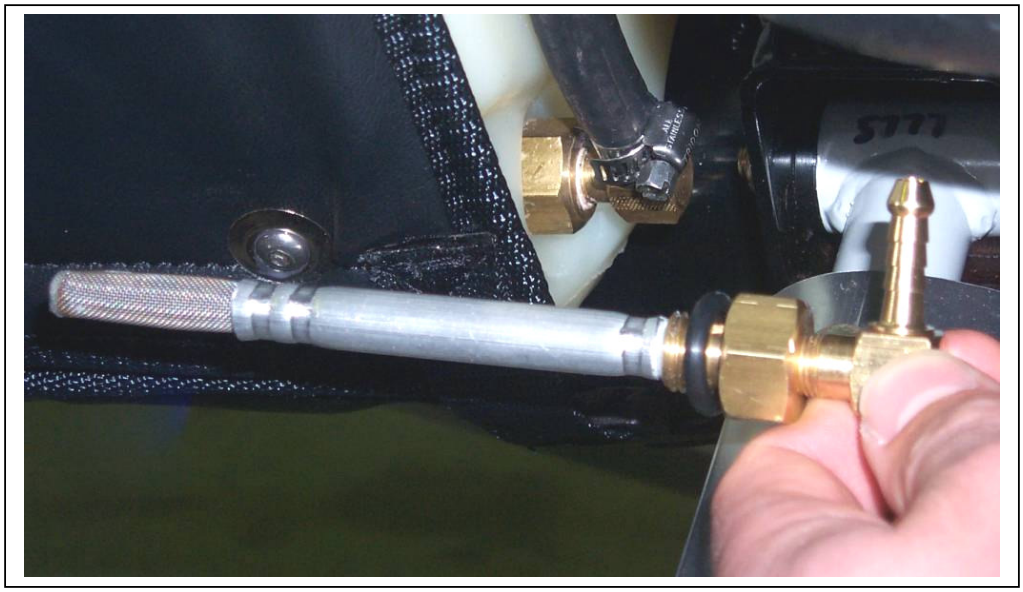


Figure 30 Finger Filter, as installed, as well as the unit prior installation.

NOTE
In the photo the components:

- Filter
- O ring
- 90 degree Fitting
- Fuel hose and clamp

Check that each joint is free from leakage.

Fuel Lines

The sequence of the fittings is critical for correct function of the fuel system. The fuel lines and components are secured using hose clamps.

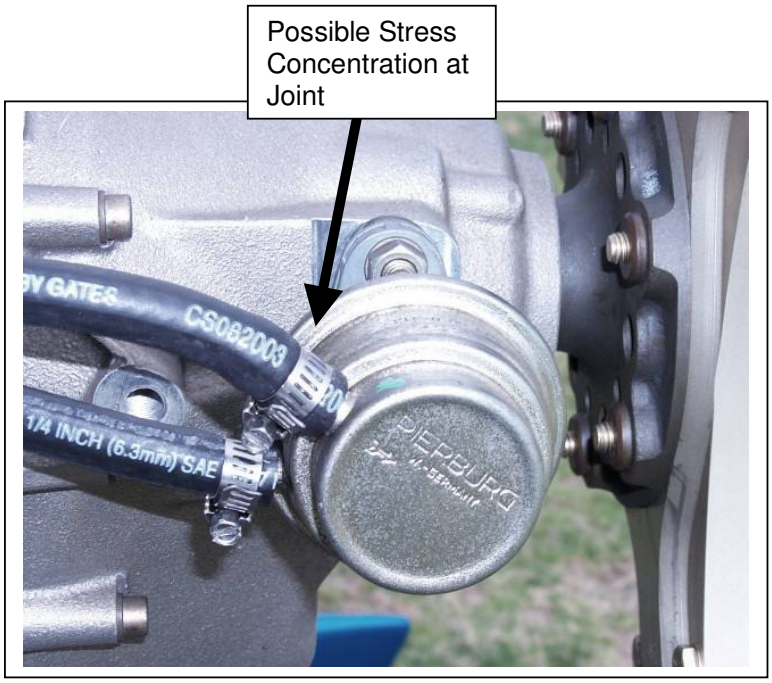


Figure 29 Fuel Line Check Example

Areas that should be checked with extra care are the interfaces between the hose and the motor. These areas are stressed to a greater degree than the rest of the tubing and are more likely to have cracks and / or wear. If fuel lines need to be replaced contact Airborne for the correct specifications, and / or replacement components.

Fuel Filter

CAUTION

THE FUEL FILTER IS DIRECTIONAL, AND HAS "IN" AND "OUT" MARKED ON IT WHICH IS VERY IMPORTANT. IF THE FUEL FILTER HAS BEEN INSTALLED INCORRECTLY IT SHOULD BE CLEANED PRIOR TO REINSTALLATION, OR REPLACED, TO AVOID DEBRIS BEING FLUSHED INTO THE ENGINE.

The first item after the tank is the fuel filter, correct operation and maintenance is extremely important for reliable operation of the engine. The fuel filter should be removed and checked for debris every 100 hours. The filter should be removed and cleaned at any time debris is seen during the preflight inspection. If any debris is present the filter may be flushed using fuel to remove the debris. If there is any damage to the filter or there are debris lodged in it then it must be replaced to avoid damage to the engine. If debris is present the rest of the system should be investigated to ascertain their source.

Fuel Meter

CAUTION

THE FUEL METERING DEVICE IS DIRECTIONAL, THE FUEL FLOW IS GIVEN BY THE ARROW ON THE SIDE OF THE METER.

NOTE
Fuel Flow Arrow, which points Downwards in this case.

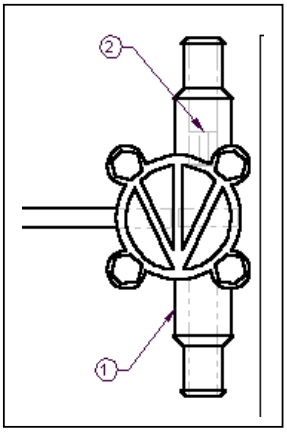


Figure 32 Fuel Flow Sender Device.

The electric fuel meter supplies usage information to the digital readout in the pod.
The fuel meter has two scales of fuel flow reading capability and if removed or renewed the correct settings must be used for the meter to read correctly. This system is able to supply consumption rates and total usage information if the computer is reset after refilling the tank. For remaining fuel it should be used in addition to the visual check, but not instead of. The visual check is described in section 28.40.00 The electrical system and schematic is described in section 8.4 of the Pilots Handbook.

Fuel Meter Maintenance
Check the fuel meter for proper rotation of the impellor and that there are no blockages or debris present. A good time to do this would be during replacement of the fuel lines or filter unit. If there is any debris present at any time then a full investigation of the origin as well as investigation of the fuel filter is absolutely necessary. The fuel filter should have prevented any debris making its way into the meter.

Replacement of the Fuel Sender Device
If the fuel sender device is being replaced then the correct installation of the flow range jet is important. Incorrect installation will cause the unit to malfunction. The jet must be fully inserted in the inlet port, with the smaller diameter end toward the inside. Push it to the inner end with a flat ended rod and tap gently to ensure it is fully seated.
Included is a photograph of a flat ended rod used for installation, the meter, and vernier callipers, the reading for a correctly seated flow range jet is 23.5mm.

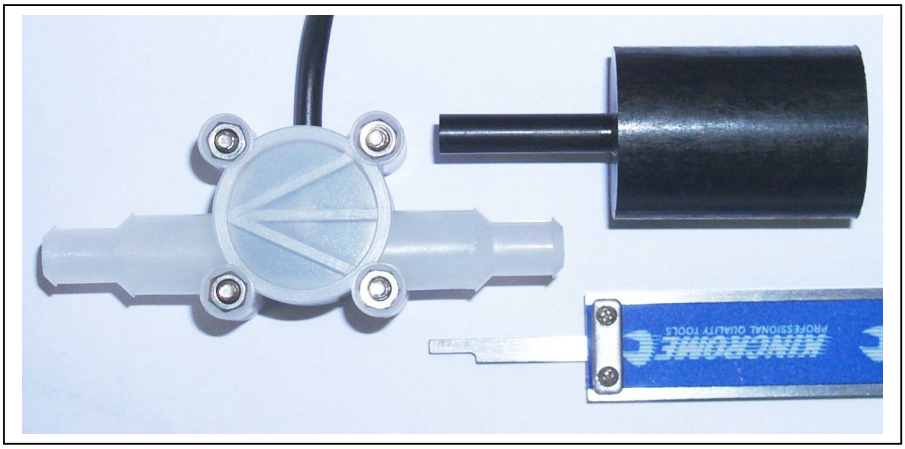


Figure 30 Fuel Sender and tools

Fuel Safety Cut-off Valve
The final component prior to the engine, is the fuel safety cut-off valve which is used both during transportation, and during any fuel or fire emergency to starve the engine of its fuel supply.

Maintenance:

CAUTION
MAKE SURE THAT IF THE SAFETY VALVE IS REMOVED IT IS REINSTALLED TO COMPLY WITH THE OPEN AND CLOSED POSITIONS OF THE PLACARD.

Handle
Make sure that the valve's actuating handle is secure.

Flow Checks
Should there be any doubts about the fuel supply to the engine, i.e. a lack of power at any RPM range, then the Safety Cut Off Valve (as well as all other fuel line components) should be checked to ensure that they allow the free flow of fuel. At least one side of the valve should be disconnected and the valve visually inspected in both the open and closed positions. When the valve is open it should be large enough that it will in no way restrict the flow of the fuel. When installed the valve should be closed to starve the engine of fuel to ensure that the valve closes fully – perform this test while on the ground only.

Stiff Operation
Should the valve become stiff to operate it may be dismantled and cleaned as required, however should there be any damage or wear evident, it should be replaced.

Reinstallation
The Loctite thread sealant should only be applied from approximately halfway from the end to the start of the thread, again keeping it from entering the fuel line.

Loose Operation
Ensure that the Safety Valve is not too loose in its operation. The valve must be firm enough that it requires a positive closing force, and will not be able to vibrate to the closed position.

WARNING

THE REINSTALLATION OF THE FUEL TAP REQUIRES THE USE OF GASOLINE RESISTANT THREAD SEALANT TAPE, AND SPECIAL CARE IS REQUIRED TO PREVENT ANY OF THE TAPE ENTERING THE FUEL LINE. THE WRAP OF THE TAPE NEEDS TO BE IN THE SAME DIRECTION AS THE THREAD, AND MUST BEGIN AWAY FROM THE START OF THE THREAD. THIS PROCEDURE CAUSES THE TAPE TO ONLY BE FORCED FURTHER ONTO THE THREAD DURING INSTALLATION, AND PRECLUDES ANY STRANDS FROM ENTERING THE FUEL LINE.

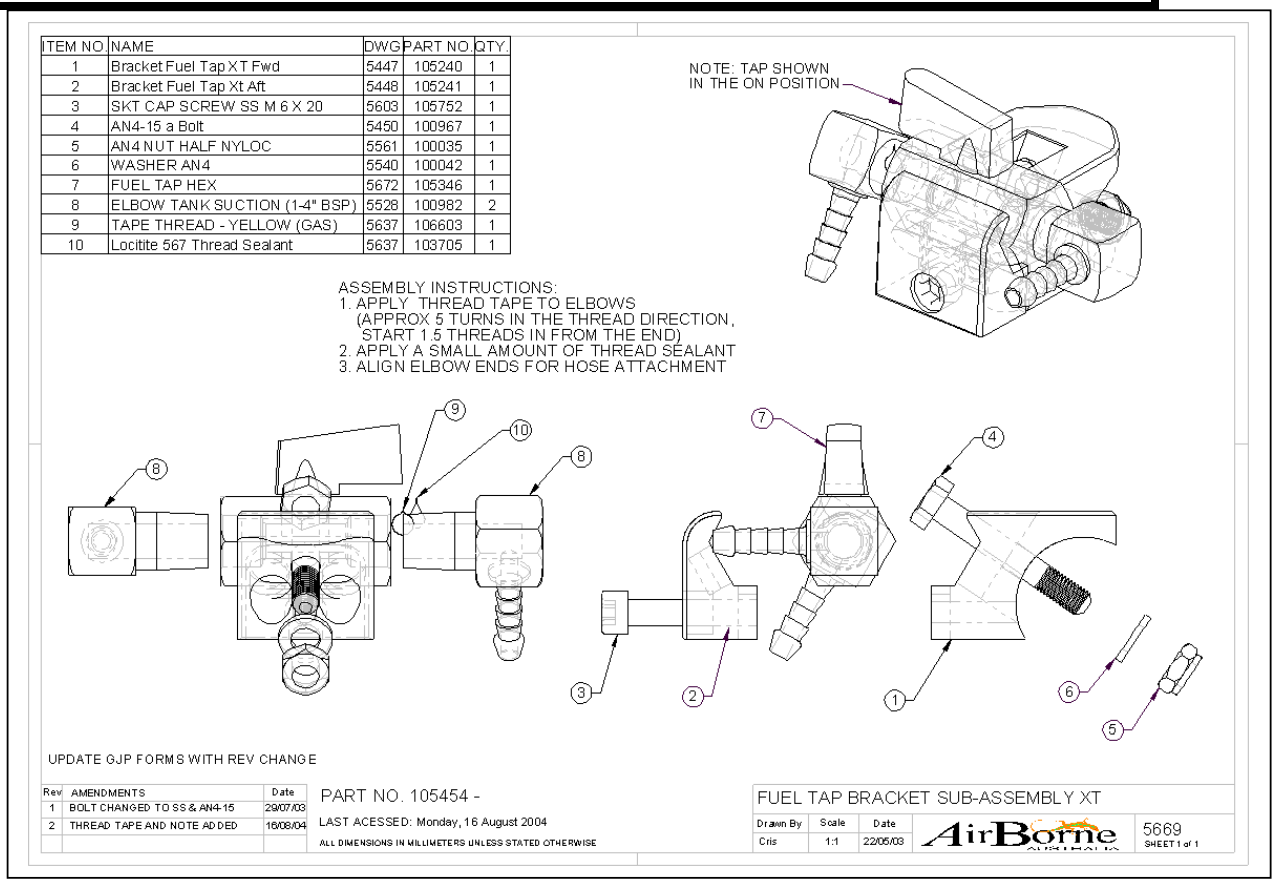


Figure 31 Fuel Tap Bracket Sub Assembly

28.40.00 Indicating

The main fuel level indication method is a visual check of the level on the exposed part of the tank on the right hand side. There are graduations imprinted on the plastic in ten litre increments up to 60 litres, it should be noted they are calibrated for use while the trike is level on the ground. “Zero” fuel level is indicated when the fuel is at the bottom of the sight gauge.

31. INDICATING/RECORDING SYSTEMS

31.00.00 General

This chapter provides a pictorial coverage of the instruments, the instrument panel, and all controls mounted on it.

The instrumentation of the base includes the AMPtronics GX2 Flight instrument and an additional air speed indicator (calibrated in knots).

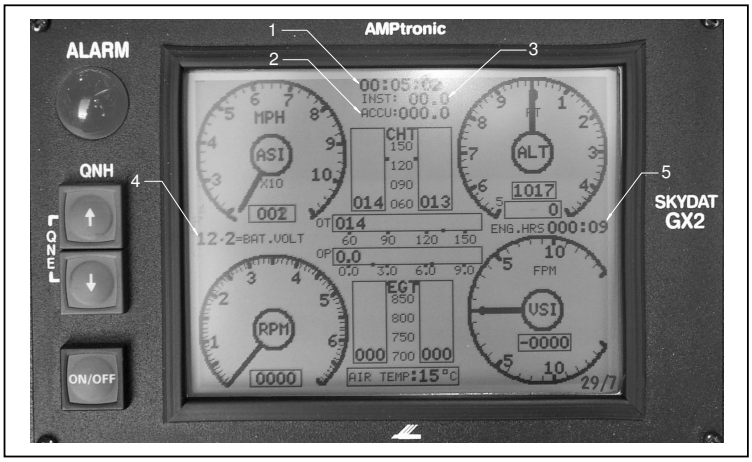


Figure 32 SkyDAT Console Photo

WARNING

IT IS PROHIBITED TO FLY THIS AIRCRAFT WITH THE AMPTRONIC SKYDAT GX2 ALARM THRESHOLDS SET OUTSIDE THE ENGINE MANUFACTURER'S LIMITS.

Features of the Instrumentation:

Standard

ASI mph, knots or kilometres	ALT (Altimeter) in feet or meters
RPM (engine revolutions per minute)	VSI (vertical speed indicator) in m/s or ft/min
Flight duration (1), in hours; minutes; seconds	Battery Voltage (4)
Engine Hours (5), in hours, minutes	2x CHT (cylinder head temperature) Celsius or Fahrenheit
Oil Temperature	2x EGT (exhaust gas temperature) Celsius or Fahrenheit
Oil Pressure, bars or PSI	Air Temperature
Additional air speed indicator (calibrated in knots)	Fuel flow data, instantaneous and cumulative, in gallons or Litres

Table 20 Features of the Instrumentation

Changing the units of the SkyDAT

The units of the SkyDAT display may be changed to match the units that are used in the country where the display is being used. The method is given in the Pilot's Handbook or Aircraft Operating Instructions as applicable, Section 7.16.

31.00.10 Maintenance

There are no user serviceable parts in any of the instrumentation for this aircraft, any maintenance required should be carried out by an approved service centre.

31.10.00 Panels

The panel for the AMPtronics system is included in the pilots handbook, section 3.4. Showing the layout of the display.

31.20.00 Independent Instruments

The additional air speed indicator is an instrument included as a fail safe in case of the failure of the electronic system. The additional air speed indicator is calibrated in knots and has red tags which indicate the V_{NE} speed for the aircraft, the aircraft is placarded in knots so it provides easy reference to V_{NE} information for pilots who prefer other air speed units.

32. LANDING GEAR

32.00.00 General

The XT trike base landing gear assembly consists of a tricycle type undercarriage. Both the front and the rear suspension incorporate air shocks that allow pneumatic adjustment of the "spring rate" and fluid flow damping.
The XT Outback has rubber cushion suspension on the front fork. Rear wheel suspension is common to all XT models.

32.10.00 Undercarriage

General Maintenance
With the weight removed from each wheel, check each of the components is not loose. Also check each of the bearings, tyre wear and the condition of the brake line.
Where excessive looseness is found, the bushes and attachment points should be checked for wear and replaced if necessary. In practice this will mean that any pivot point should not have more than 1/2mm of movement, when load is applied. The main areas that need to be checked for looseness are suspension pivots, the mast pivot, and the main mast pivot hole. For wheel and suspension pivots the wheels should be lifted from the ground when testing the movement.

32.10.10 Structure

Rear
The main (rear) undercarriage is manufactured from 6061 extruded aluminium tubing which attaches to fittings that in turn attach to the pivot locations. The rear suspension layout consists of tubular main struts for the rear suspension, an airfoil shaped drag link and airfoil shaped rear strut. These are attached to the wheels and the frame via fittings.
The fittings are manufactured from 2011 aluminium and AS 1163 steel, welded and bolted to the struts and drag link.

Front
The front suspension, steering and braking assembly is manufactured from welded AS 1163 steel. It is a regular fork type assembly with welded lugs and bushes for all attached parts. The fork carrier assembly has two bearings pressed into it for attachment onto the main frame.
The XT Outback rubber cushion suspension on the front fork, requires inspection of the rubber for cuts / cracks. The bearing surface and pivot bolt require inspection for wear. If it is appropriate to reinstall parts, clean and lubricate them prior to reassembly. Check nylon washers for wear, replace as required.

Damage
Both the front and rear undercarriage allow for minor damage that does not result in dimensional changes of the materials (permanent deformation). Tell tale signs of permanent deformation include chipped paint around highly stressed areas and crazing of the alloy members. Any permanent deformation warrants full checking of all possible effected parts.

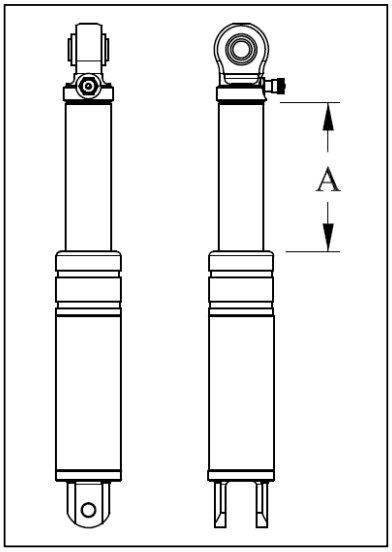
32.10.20 Air Shocks

The life of the shocks should exceed that of the aircraft due to the minimal amount of travel they will do on the ground, though they still need to be checked regularly for correct operation. If one of the shocks has lost air then they will sag a different amount on the ground relative to each other.

Rear Shocks

WARNING

THE REAR AIR SHOCKS ARE UNDER VERY HIGH PRESSURE, THEY ARE PRESET AT THE FACTORY TO 40 BAR, 580 PSI, WHICH WILL REQUIRE SPECIALISED EQUIPMENT TO BE REPRESSURISED.
IF THESE SHOCKS REQUIRE SERVICE OR PRESSURE TESTING CARE SHOULD BE TAKEN TO ENSURE THAT THE CORRECT EQUIPMENT IS AVAILABLE. CONTACT AN AIRBORNE REPRESENTATIVE IF SUCH EQUIPMENT IS NOT AVAILABLE, THE SHOCK MAY NEED TO BE REMOVED AND TAKEN TO A SUITABLE SERVICE PROVIDER FOR ADJUSTMENT OR CHECKING.



The rear shock absorber should be checked every 100 hours to confirm the dimension of the sliding tubes.

The dimension “A” should not exceed 2mm difference between the right and left shock when the shocks are completely extended, ie there must be no weight on the wheels.

If the shocks are outside the nominated tolerance AirBorne should be contacted to organise repair / replacement of the shock unit.

Figure 33 Rear Shock Dimension Check

Front Shocks

The front shocks run more user serviceable pressures. There are two reservoirs and a rebound damping adjustment available. The correct procedure for checking the pressures and resetting them if necessary is shown on the following diagram.

The shock absorber should not be adjusted unless it is out of tolerance as indicated on the following diagram.

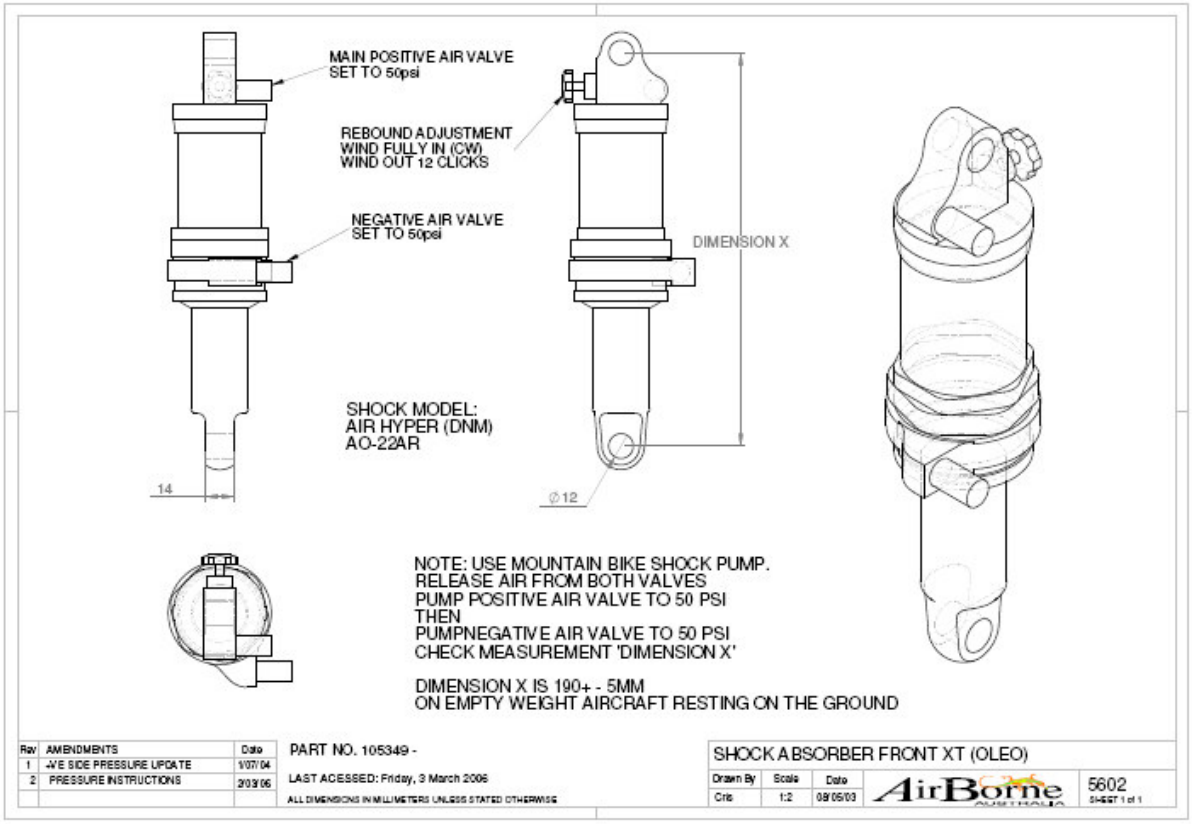


Figure 34 Front Shock Set up

Rubber cushion suspension is used on the front wheel of the XT Outback.

32.20.00 Nose Gear

The front steering is foot activated, and includes a steering damper system. The foot steering system includes a linkage to the rear passenger footrest to allow them to steer if they are piloting.

The default setting for the steering damper is light, which is achieved by rotating the shaft of the damper completely in the anticlockwise direction. The setting may be adjusted for personal preference.

WARNING

NEVER ADJUST THE DAMPER WHILE IN FLIGHT AS IT POSSIBLE TO MAKE STEERING DIFFICULT WITH A HIGH LEVEL OF DAMPING ("HEAVY" DAMPING).

Steering Damper Setting

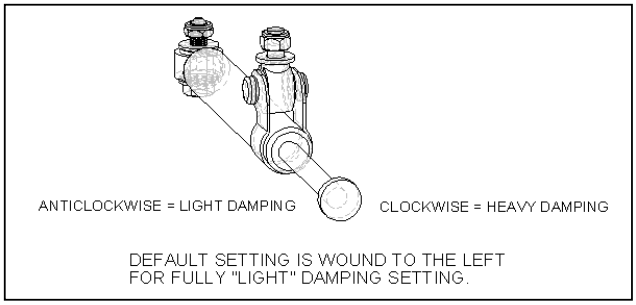


Figure 35 Steering Damper Setting, (Dwg # 5610).

32.40.00 Wheels and Brakes

Two alternate brake systems are available on the XT series:

- Front wheel drum brake only, with leading / lagging shoes and actuated by cable.
- Rear wheel disk brake only, with hydraulic actuation.

Both configurations use a brake lock mechanism, the drum brake configuration is shown in the following figure. Depress brake and raise lock lever to lock. Depress brake to unlock.

Figure 36 Brake Lock Lever.

Drum Brake Description

The drum brakes on the XT are cable actuated, leading lagging shoe type. The drum brake is the same as have been in service on Airborne trikes for many years and have provided extremely reliable service. The brake pads should be inspected during the 100 hourly inspection of the front wheel bearings. The pads should be replaced if necessary.

Brake drum			
Internal diameter	……..	90.0	mm
Internal diameter service limit	……..	91.0	mm
Brake shoe pads			
Thickness of lining	……..	4	mm
Thickness service limit	……..	2	mm

Table 21 Drum Brake Wear Limits

Drum Brake Adjustment and Maintenance

The brake system free play (depression distance until the brake actuates) may be coarse adjusted by loosening the cable clamping point, and moving the position of the cable. The cable securing nut must be tightened with sufficient torque to avoid cable slippage. If the attachment point is further towards the end of the cable then the condition of the cable where it was previously clamped should be inspected for deterioration and replaced if necessary.

Fine adjustment of the brake is made with the fine adjustment screw where the sheath is mounted at the wheel end.

Thoroughly check for free operation of the wheel and proper operation of the brake after adjustment.

The condition of the rim, spokes and other features of the rim/brake assembly should be thoroughly inspected for signs of damage or wear.

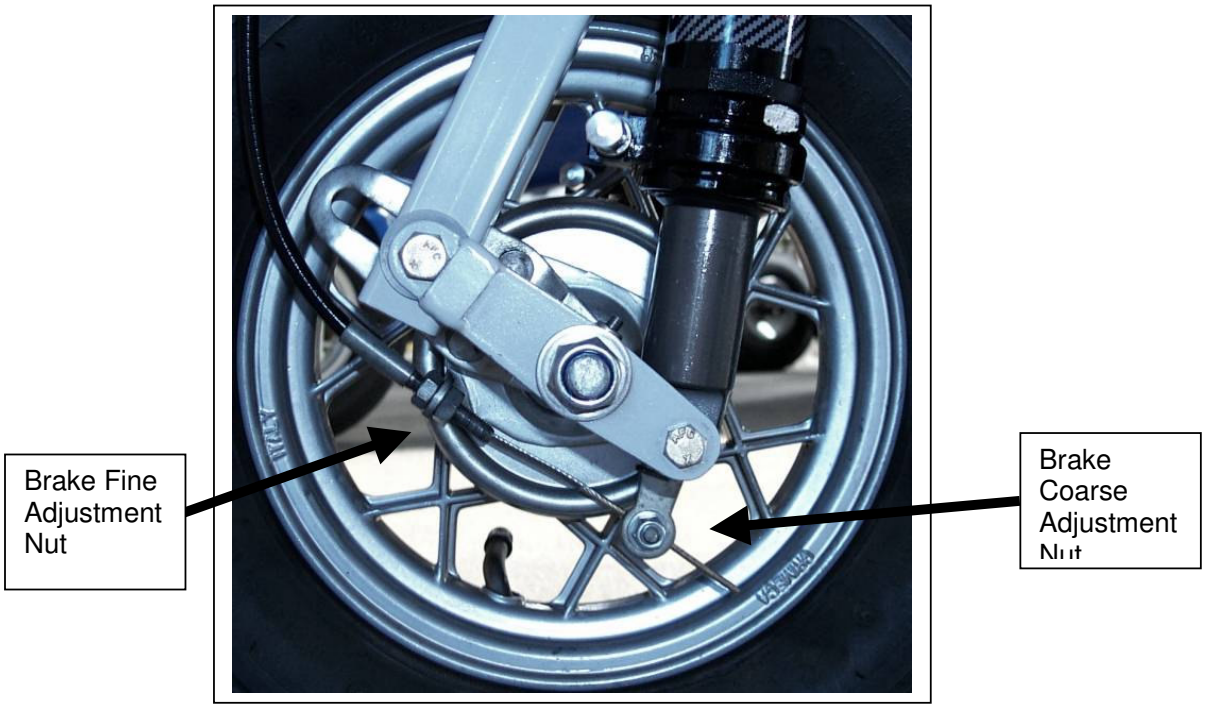


Figure 37 Front Wheel Assembly

Figure 38 Rear Disk Brake Master Cylinder Mounted on Front Fork

Rear Disk Brake Operation

The rear disk brake is actuated hydraulically via a single common circuit. Brakes are operated via the left pedal (lower pedal for aerotow equipped aircraft). A brake lever lock is provided for short term parking use only. For extended periods use wheel chocks.

Rear Disk Brake Dimensions and Fluid Specification

Brake disk			
Thickness	……..	3.2	mm
thickness service limit	……..	3	mm
Brake pads			
Thickness	……..	5.2	mm
Thickness service limit	……..	2	mm
Master cylinder			
Master cylinder piston rod to pedal clearance	……..	0.5–1.5mm	
Pedal height	……..		fixed

Working fluid

Power transmission fluid. Similar to factory supplied fluid:

Castrol
TQ DEXRON III
Automatic transmission fluid

Fluid quantity	……..	50	mL

Table 22 Disk Brake Dimensions and Wear Limits

Brake Maintenance Procedure Tools

Callipers
Allen Keys: 5/32, ¼
Spanners: open/ring ¼, 5/16, 3/8, 7/16 ,1/2.
Sockets: 3/8, 7/16
Pliers
Cutters
Screwdriver: Blade
Syringe: eg. 25ml
Drill with 13/64" 5.16mm bit. Required for brake kit installation

Disk Brake Inspection

Inspect hoses and hose shielding for wear, kinks.
Inspect complete system for oil leaks.
Measure brake disk thickness, replace if required.
Measure brake pad thickness, replace if required.
Measure the free play in the master cylinder piston rod, adjust if required.

Replenishment of Fluid

Skill Level: *Pilot Certificate*

1. Remove reservoir plug (this is the most rearward plug on the master cylinder) accessible by turning steering to the left and approach from under side of fairing on full faired versions. Remove the grit plug from the cap to enable the insertion of the Allen key.

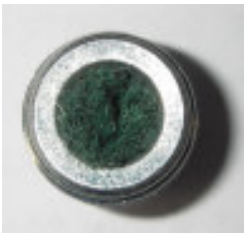


Figure 39 Cap Grit Plug, Remove the Plug from the Grub Screw for Allen Key Access.

A fine mesh is located below the grit plug to prevent dust from entering the brake fluid. Do not remove the fine mesh from the bottom of this reservoir plug.

Figure 40 Remove Reservoir Plug

2. Using a syringe, fill reservoir with auto transmission fluid. Visually sight the level to be approximately 10mm from top of housing and replace plug. A clean matchstick may be a useful dipstick.

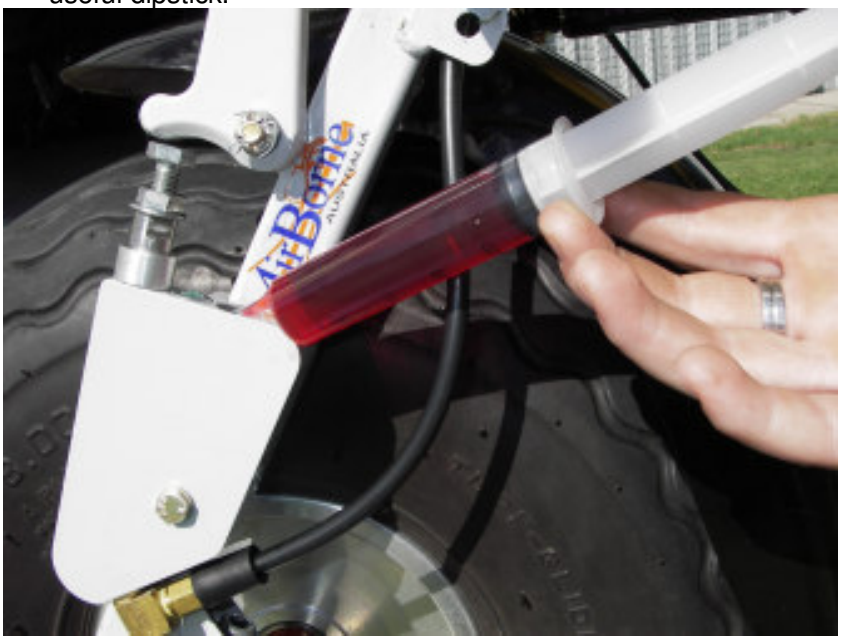


Figure 41 Brake Fluid Top Up

3. Replace the reservoir plug. Replace the grit cover cap filling into the reservoir plug, to make future access and cleaning easy.

Removal and Installation of Brake Pads

Skill Level: *LSA Repairman Maintenance*

1. Lift the rear of the aircraft by one of the means described in Section 6 LIFTING AND SHORING.
2. Remove the rear wheel spat, wheel nut and wheel.
3. Remove the disk from the callipers.
4. Remove the pad by pushing it to the centre of the callipers and slide it out.
5. Replace pads and reverse the procedure for refitting the wheel. Note that wheel nuts are tightened to position the spat bracket. Then tighten the inner nut and axle rotation lock screw. The axle nuts are designed to be tightened.

If the brake pads are being replaced, replace them as a set of four.

Installation of a Disk Brake Kit

Disk brakes are readily fitted to XT aircraft with serial numbers:
XT912-0180
XT582-0042
Order disk brake kit, part number 108469.
Previous models require a more extensive replacement parts list.

Skill Level: *LSA Repairman Maintenance*

Begin the procedure at “Removal and installation of Brake Pads” step 1.

6. Clean disc rotors with solvent
7. Bolt rear disc callipers to hubs and fit discs and wheels (ensure washer is between calliper and rim inner bearing).
8. Bolt master cylinder to pre drilled hole in left hand front fork vertical, or mark out to drawing supplied and drill hole
9. Route hoses through struts and along base tube to front fork and cable tie
10. Attach fittings to master cylinders and callipers.

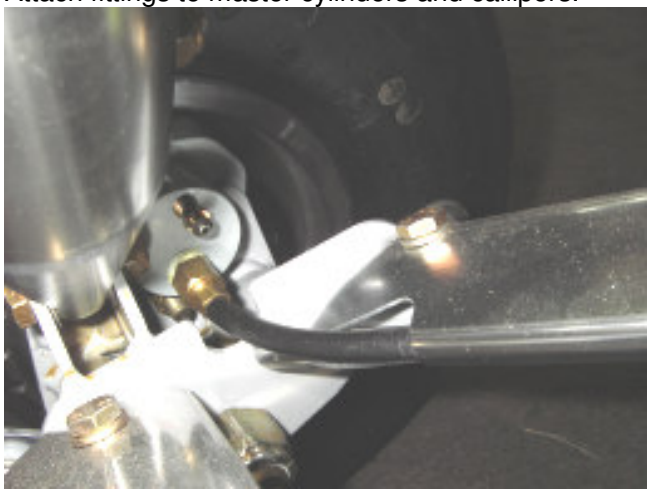


Figure 42 Attach Fittings to Callipers, LH Calliper Shown.

11. Install triple sleeving over the compression fitting connections. The large diameter tubing goes over both the sheath and the brass compression fitting nut. This is used to protect the hydraulic tube from bending at the junctions.

Figure 43 Master Cylinder, Push Triple Sleeving Over the Compression Fitting Nut

12. Fit brake lever, do not tighten, the hinge bolt. Lock with a split pin.

Brake Bleed Procedure

13. Have piston adjusting bolt set as to give 0.5 to 1mm of free play on the pedal (approximately 25 mm of piston rod is required to protrude out of the master cylinder housing this is important to allow fluid to re charge between strokes).
14. Remove reservoir plug (this is the most rearward plug on the master cylinder) accessible by turning steering to the left and approach from the left under side of fairing on full faired versions.
15. Using a syringe, fill reservoir with auto transmission fluid. This will require further top up during the brake bleed procedure every 2 bleed strokes.
    Refer to figure 41(Replenishment of Fluid)

Figure 44 fill reservoir using a syringe

16. Place clear PVC hose on bleed nipples into small collection containers.

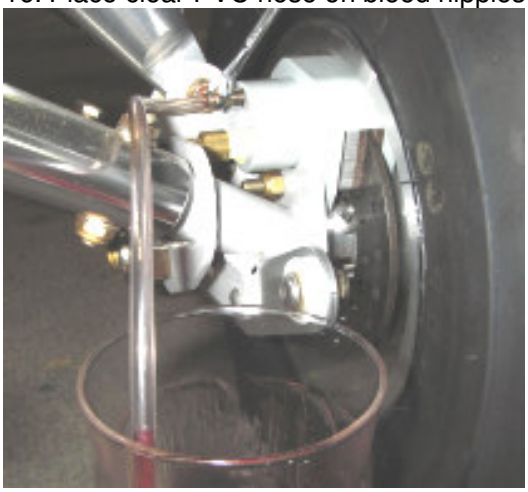


Figure 45 Bleed Drain Hose Connected

17. Undo RH bleed nipple a half turn.
18. Push brake pedal forward and hold in place with last notch on park brake.
19. Lock bleed screw.
20. Let pedal return to the vertical stop position.
21. Repeat several times until fluid reaches nipple (top reservoir up every two to three piston stroke).
22. Repeat to LH nipple until fluid appears and all visible signs of air removed.

23. Return to RH side until all visible air removed.
24. Top fluid up within 10mm from top of housing and replace plug.
25. Adjust free play in piston rod with adjusting bolt, then tighten the lock nut.

Post Installation Brake Inspection

26. Raise each wheel, one at a time. Rotate each wheel by hand, check that there is no substantial drag on each wheel.
27. Depress brake pedal and engage park brake checking for oil leaks. Leave the park brake engaged over a period (nominal 10 minute). With the brake lever lock engaged, depress the brake all the way to the stop. Note any change in resistance from prior tests due to oil leakage.

Figure 46 Inspect All Junctions for Oil Leakage

28. Re adjustment of the piston may be required to maintain the specified free play clearance from the brake lever.

Brake Run In Period

29. For initial braking, taxi around on safe open area exaggerating brake usage, (you may find that brakes do not work to full efficiency until they bed in.

Bearing Inspection and Replacement

The bearings may be inspected by removing the rear removing the rear wheel and rotating the inner race with a finger. Feel for smooth operation.

Replacement is performed by misaligning the internal spacer and using a drift to drive the opposite bearing out. Support the rim using wood or similar to protect the rim during the procedure.

Replace bearings by evenly driving the outer race with a drift.

Removal of the front wheel

The front wheel should be elevated and the axle nuts removed, care should be taken to note the sequence of removal and subsequent reassembly. The front brake mounting bolt and cable attachment may also need to be removed to release the wheel.

Tyres

Front Tyre
Kenda 4.4 X 4.8 –8 (Nylon) Pressure, 15 PSI.

Rear Tyres
Deestone 15 X 6.00 –6 (Nylon) Pressure, 15 PSI.

Outback All Tyres
Carlisle 8.00-6 Titan Turf Glide Pressure,15 PSI.

When operating on smooth surfaces increased pressure may be desirable, operator experience and tyre wear pattern may be used as a guide to determine variations to the specified pressures. When checking tyre pressures, the opportunity should be taken to examine the tyres for wear, cuts, bruises, slippage, and other defects and replaced as necessary.

Because the tyres on the trike contact the runway in an uneven manner, the rear tyres may be swapped with each other in order to utilise all of the tread. This should be done before the tyre becomes worn.

32.70.00 Supplementary Gear

The brake locking mechanism is used to stop any unwanted movement of the trike while it is on the ground. This is actuated by depressing the brake and moving the latch into one of the grooves. The next time that the brake is depressed the latch will disengage. The latch mechanism should be lubricated with a dry lubricant periodically.

The disk brake model is operated only via hydraulics, the same brake lever locking mechanism is employed. It is not advisable to leave the aircraft for an extended period of time reliant on the hydraulics to keep the aircraft from moving. Use wheel chocks on the hydraulic actuated model when leaving the aircraft unattended for a period of time.

34. NAVIGATION AND PITOT STATIC

34.00.00 General

This chapter provides information on those systems that provide the aircraft navigational data such as the Pitot static system, airspeed indicator, altimeter, outside air temperature gauge and transponder.

34.10.00 Flight Environment Data/Pitot Static

The Pitot static system for the aircraft has a single entrance at the extreme front of the pod. A single 6mm ID tube travels rearward to a tee intersection. From the splitter a 6mm ID tube continues to the pilots left and to the analogue air speed indicator. A second 3mm tube splits to the pilots right and into the SkyDAT readout. The tubes are both made of PVC and may be replaced if necessary. The length of the tubing is important in order to ensure that any moisture that may be in the tubes will tend to drain out of the front of the Pitot tubes. The other function of the length of the tubes is to ensure that there is less possibility of kinking the tubing. Interference fits are used to keep the tubing in place and some stretching may be required to get new 3mm ID tubing onto the tee intersection fitting.

34.10.10 Maintenance Practices

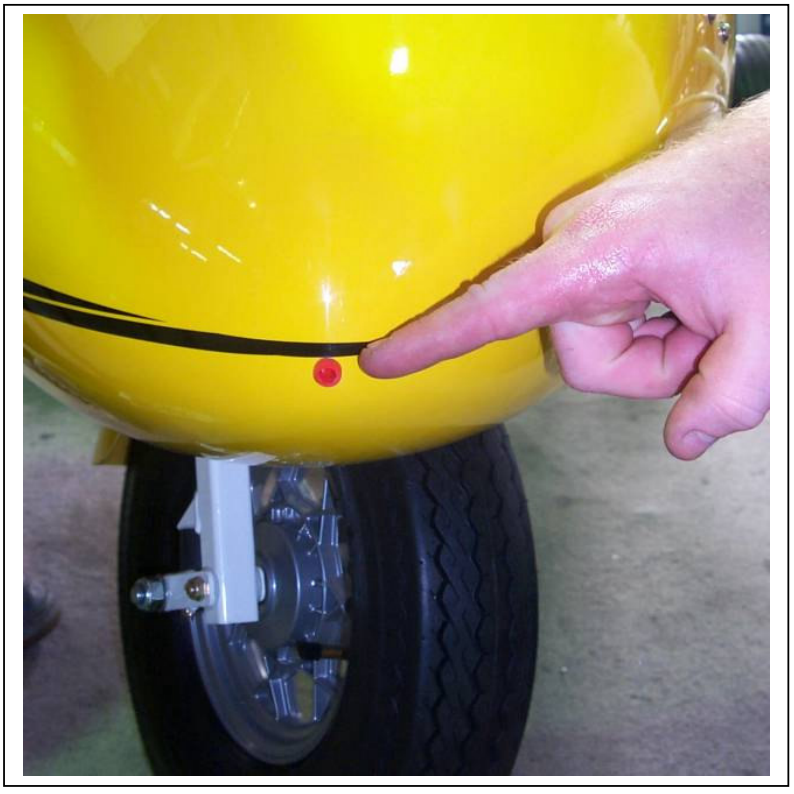


Figure 40 Dynamic Port (Pitot Entry)

Check that the Pitot port is free from obstruction, or insect nests. The lines may be visually checked from the inside of the Pod for obstructions as the tubing is clear.

CAUTION

ENSURE THAT THE PITOT SYSTEM IS NOT PAINTED OR COVERED OVER AS THE AIRSPEED INDICATORS WILL CEASE TO FUNCTION.

Leaks, moisture and obstructions are the major problems associated with Pitot static systems. Provided these problems are adequately addressed, the Pitot static system is essentially maintenance free.
If it becomes necessary to blow through either the Pitot or the static system in order to clear blockages etc the system should be disconnected at both the instrument ends and blown out with clean, dry air from that end (ensure that all lines tee'ed into the static system are disconnected).
Avoid blowing through by mouth as this will introduce moisture. Never blow air through from the source end, particularly with the instruments connected, or they will be ruined.
The full cockpit model XT has a self draining Pitot system.
The Outback model XT has a Pitot sump and drain valve to remove water from the Pitot system. Outback models require a maintenance action to check the sump for water and to drain and re-seal.

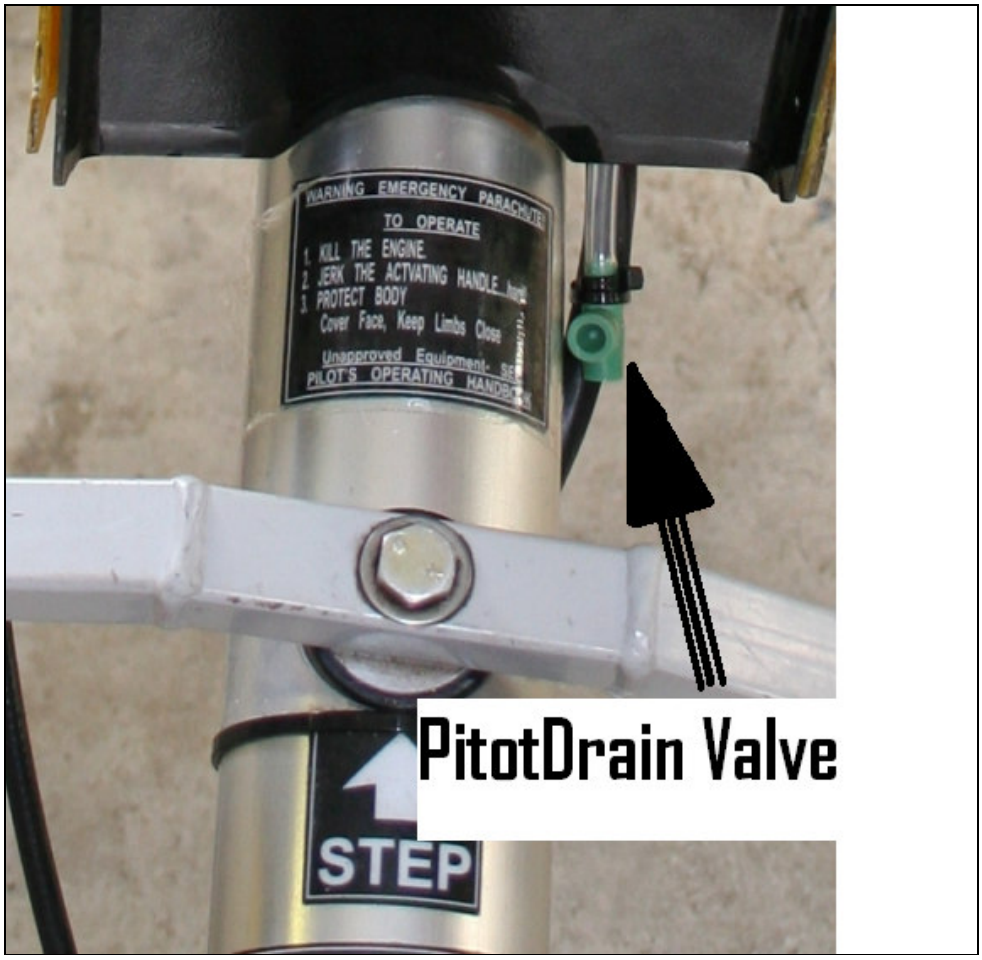


Figure 41 Pitot Drain Valve Location

34.10.20 Testing the Pitot System

The Pitot system is to be tested for leaks by applying a pressure at the Pitot head sufficient to cause the airspeed indicator to read 90 knots. There shall be no indication of restrictions in the application of the pressure and no decrease in the reading when the system is sealed for at least 10 seconds.

Testing the Static System

CAUTION

THE PITOT IS A VERY SENSITIVE INSTRUMENT, AND IS EASILY DAMAGED, READ THE INSTRUCTIONS CAREFULLY BEFORE CONTINUING WITH THE TEST PROCEDURE. UNDERSTAND THAT THE AMOUNT OF PRESSURE NEEDED TO TEST THE PITOT IS LOW. NEVER USE COMPRESSED AIR, OR BLOW INTO A PITOT SYSTEM.

Testing the Pitot can be achieved by carefully using a syringe and flexible tube, sealing it to the front of the Pitot entrance and introducing a very small amount of pressure. The amount of pressure is very minimal. At 46.3m/s (90kts) the pressure necessary is only 134mm water head or 1.34kPa (0.194PSI). In a 50cc syringe this will equate to somewhere in the region of 2 - 5mm of travel. If the flexible tube is long enough the testing can be done from the cockpit, while looking at the instruments, alternatively a helper will be required.

Outside Air Temperature Gauge

The air temperature reading is taken by the SkyDAT box that is located behind the passenger, above the engine.

34.50 Transponder

The XT may be fitted with a MicroAir or Becker transponder as a factory approved option and modification. Fitment may be considered heavy maintenance.

34.50.10 Transponder Installation

This manual section is intended as a guide for installation of a transponder on an AirBorne XT aircraft. The installation details contained should be used in conjunction with the equipment manufacturer's installation instructions.

The documentation contains factory recommended procedures and instructions. The procedures described are to be used in conjunction with the National Airworthiness Authority (NAA) of the country of registration.

Skills

FAA licensed repair shops or Repairman Maintenance qualifications are required for installation and maintenance works on the transponder on Special Light Sport aircraft. Authorized AirBorne distributors have training to perform this installation.
Where permitted by the local Aviation Authority, the installation may be performed by suitably competent owners.
In categories of registration where this is not applicable, the following skills are applicable as a minimum: A sound understanding of mechanical systems, and good experience with the necessary tools and procedures is required, as the continuing airworthiness of the aircraft relies on the competence of the person performing the maintenance.

Calibration

Calibration of the installation and installation inspection is required to be performed by an avionics service centre licensed by the local Aviation Authority. This must be performed prior to operation.

Installation Procedure

1. Install the transponder in the console below the dash (the picture below shows a Becker transponder mounted above an XCOM VHF radio) by using the template supplied by the manufacturer in the installation instructions. The transponder fits into a standard 2.25" hole. Use a 2.25" hole saw to make this hole.

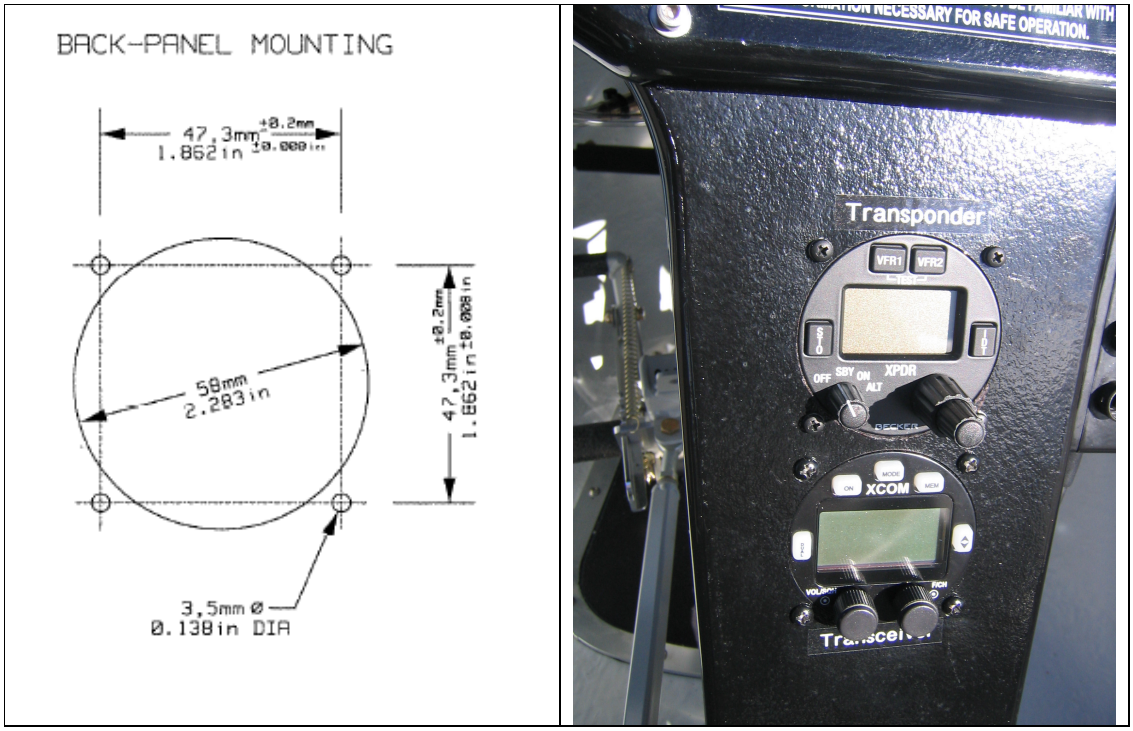


Figure 47 Section 34. Transponder Instrument Face and Mounting Detail

2 Install a ground plane for the antenna. Note that both of the following installations require the aerial to be mounted at the front of the aircraft to comply with minimum distance of critical body parts from the radiation source.

2.1 Full pod variant

Mark and drill an antenna mount hole, a ½" hole on the bottom centreline of the pod at 190mm in front of nose wheel hole so that the antenna sticks out the bottom. Use the stickey back foil ground plane. Locate it around antenna hole and smooth it into the compound curves of the pod, one panel at a time.
Push the BNC side of the antenna up through the bottom of the pod and tighten the nut.

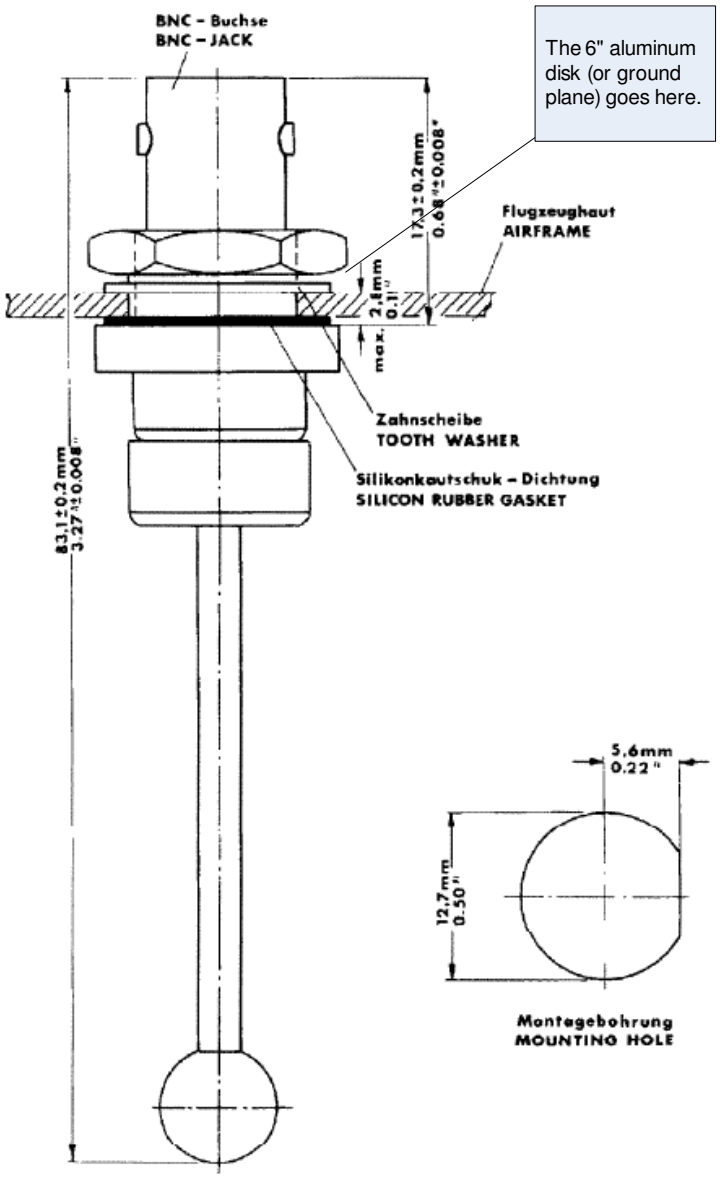


Figure 48 Section 34. Stubb Antenna Installation

2.2 Outback variant.
The ground plane is readily constructed from 2mm aluminium sheet. Cut a disk of 6" (150mm) radius or larger. Place a tangential 20° fold at 35mm from the edge of the disk. Holes are located at the centre in ½" and 5/16" hole at ¾" (19mm) from the disk edge. Mount the ground plane on the bottom of the front mast brace, using the existing nut and bolt on the front mast brace. Mount the ground plane disk such that it is horizontal. The ground plane disk need not be insulated from the frame. The aerial is mounted in the central hole of the ground plane.

3 Run a coaxial cable such as an RG-223/U or RG-58C/U cable with one female BNC and one female TNC connector from the antenna (BNC) to the TNC connector on the back of the transponder. Notes for installation on the Outback:
The Outback has access the instrument housing on the bottom right hand side, the coaxial cable is tied to the base beam using zip ties. Run the cable through the centre of the forks.

4 Mount the Mode C encoder in a location where the adjustment screws will be readily accessible. The altitude encoder may be mounted atop whichever avionics unit (the radio or transponder) is mounted higher in the console. Alternatively, the altitude encoder may be mounted to the bottom of the lower unit. Affix the encoder's mounting tray to the case
of the avionics unit using a strip of hook and loop fastener (e.g. Velcro).
Secure the installation using a pair of cable ties around the altitude encoder and the avionics unit(s).

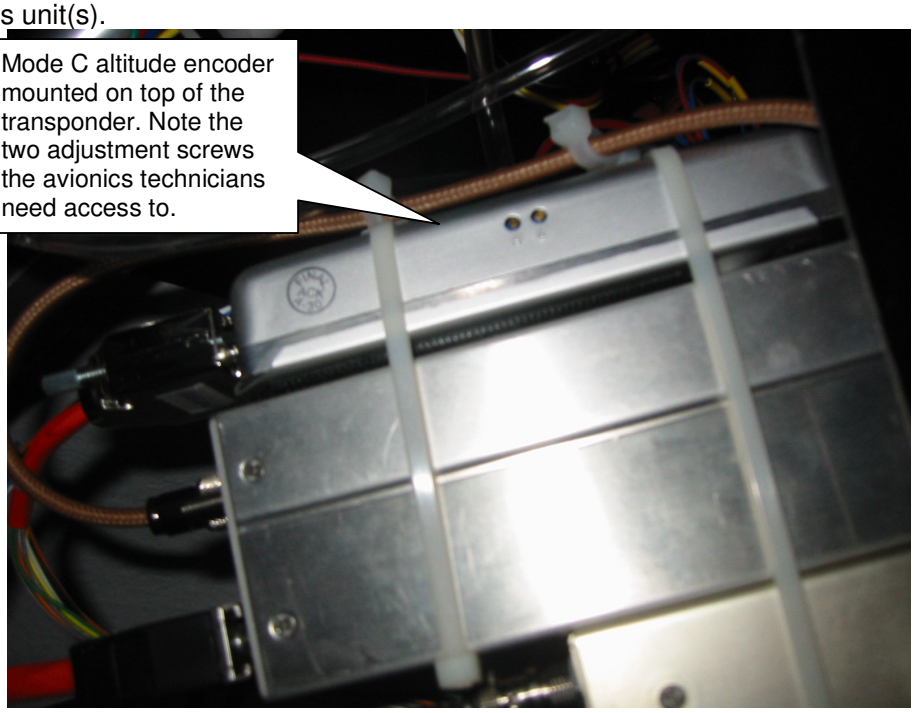


Figure 49 Altitude Encoder Mounting Detail

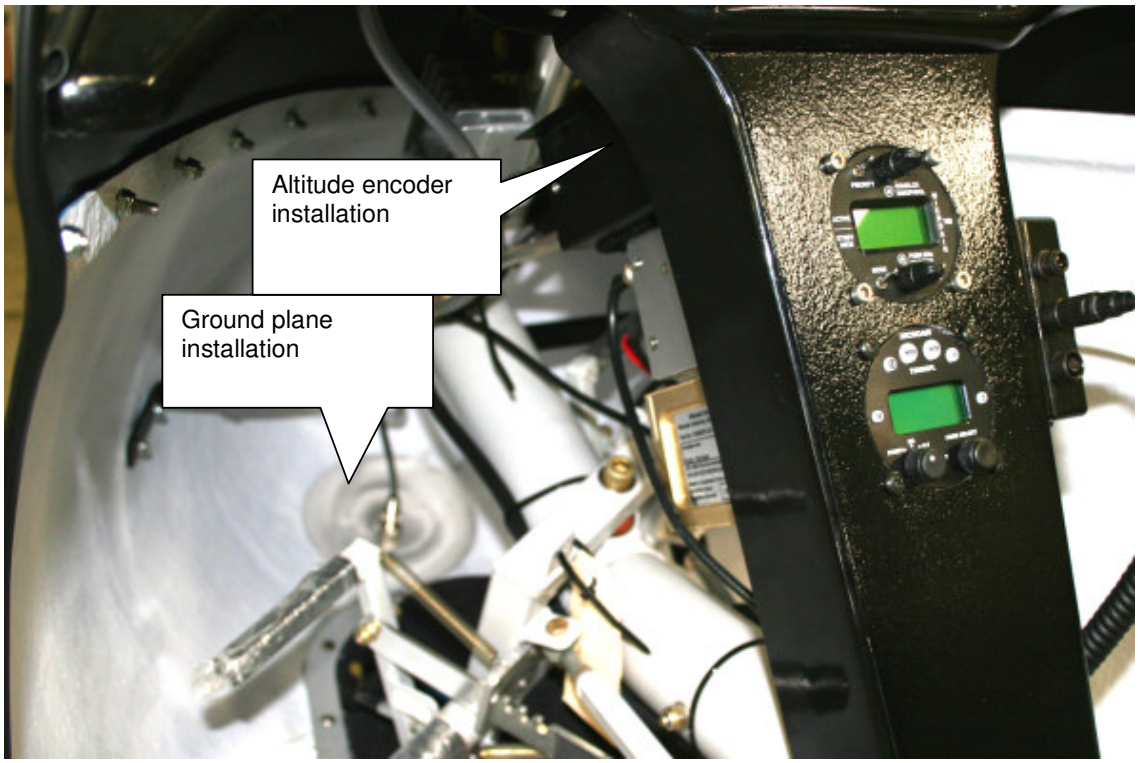


Figure 50 Transponder Ground Plane and Altitude Encoder Installation

5. The installation of transceiver and transponder is shown above for the full pod variant. Note the forward floor mounted location of the ground plane and antenna, the location an orientation of the Pitot tubes for self draining of moisture. AmeriKing Encoder is shown (black box) mounted on the transceiver, located with self adhesive hook and loop fasteners and backed up with zip ties around the upper avionics unit (transceiver) and encoder.

6 The calibration of the Mode C encoder installation requires access to the static pressure port inside the Amptronics GMX instrumentation and display unit. This section of the instructions may be performed by the Avionics shop as a part of the calibration if desired. In this stage of the installation, the altitude encoder and the Skydat altimeter have static pressure (which are vented into the cockpit) joined together and vented into the cockpit. Carefully remove the Skydat from the aircraft remove the four screws at the back and open up the instrument.

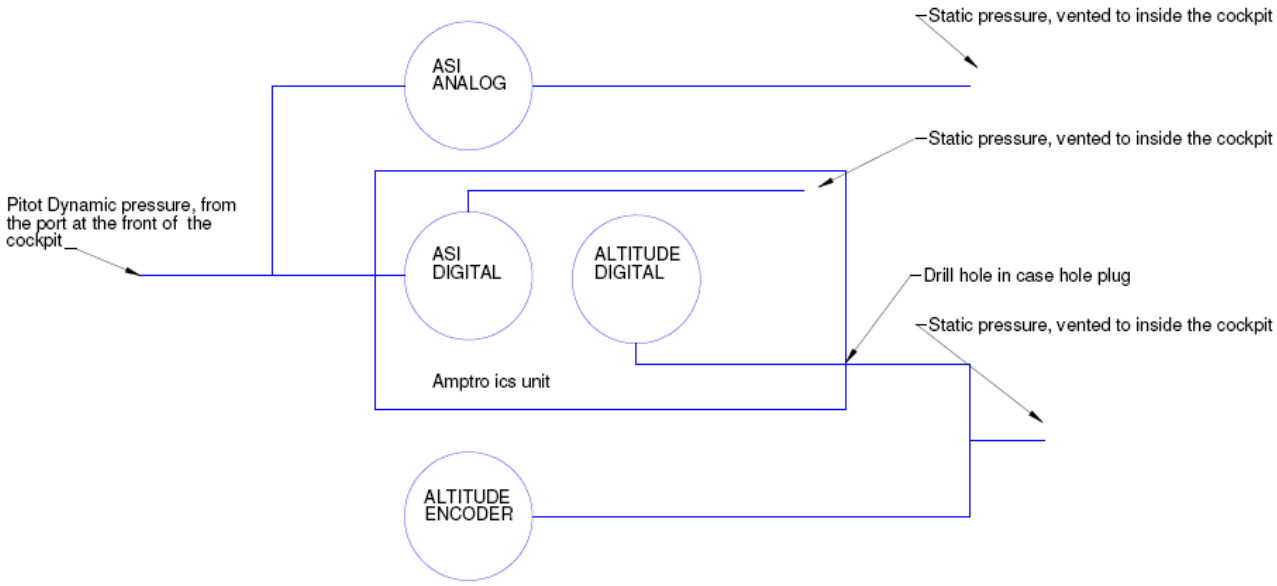


Figure 51 Pitot Dynamic and Static Pressure Plumbing Diagram

5.2 Inside the instrument you will see the two pressure sensors with two 1/8" diameter black nipples.

5.3 One is already used and a black tube runs from it to the brass nipple on the back of the case – this is the dynamic input from the Pitot tube for the ASI (running from the nose of the aircraft). The sensor without a thin hose connected to it is the static port of the altitude sensor. Attach a 1/8" inside diameter vinyl tube to this.

5.4 On the back of the Skydat case is a plastic plug – remove the plug and run the tube through the hole to the outside. In the picture below a hole has been drilled through the plastic plug large enough to accommodate a rubber grommet and the vinyl tubing is routed through the grommet. This provides a more secure installation than just running the vinyl tube through the large hole in the back of the Skydat.

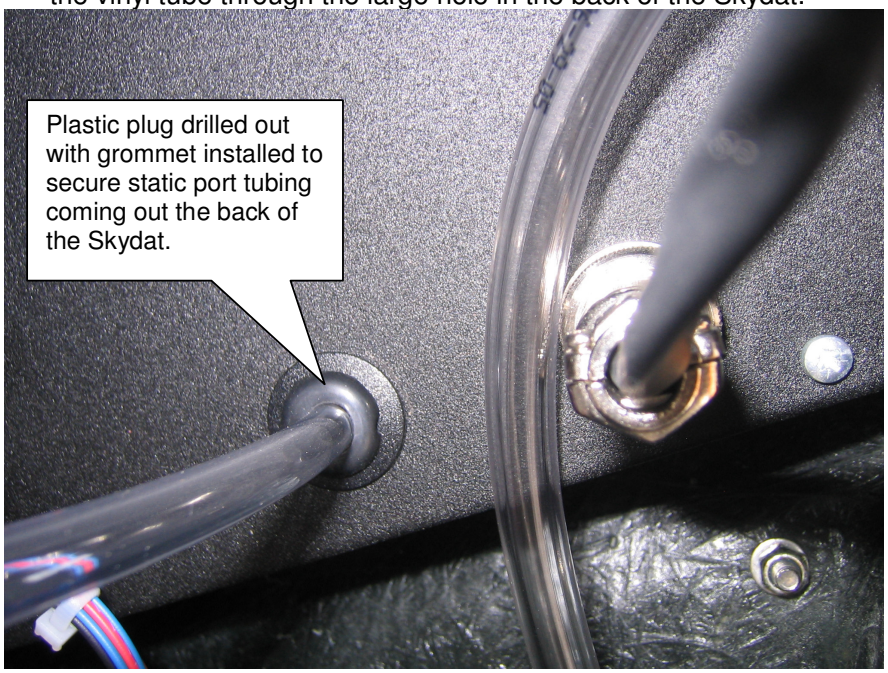


Figure 52 Amptronics GMX Case Rear View, With Altimeter Static Pressure Tube Exit Hole & Grommet.

5.5 The static port tube as installed in the previous step is now connected via a T junction to the altitude encoder. The connected pair (encoder and Skydat static port) are vented together into the cockpit via an open end of the T junction. This junction is used by the avionics technicians, giving easy access to both the static ports in the Skydat and the Mode C encoder. Install the T junction at the lowest point in the plumbing that connects the attitude encoder and the Amptronics Skydat. Place the open vent to the bottom to allow any condensate to drain automatically.

6 The wiring harness will include a 25 pin plug, a 15 pin plug, and red/black power leads. The 25 pin plug goes to the transponder. The 15 pin plug goes to the Mode-C encoder. Attach the red/black leads to the positive and negative rails of the radio transceiver power supply. This is accessed at a spade connector set at the bottom rear of the console. Airborne factory installed radio power supplies are taken from the live side of the starter motor solenoid and have a 5A fuse fitted.

7 This completes the installation. However, before you can use the transponder in the US you must have it checked and calibrated by a qualified avionics shop. Until you do the transponder must be marked with an “INOP” label and may not be turned on in flight.

1 Inspection

A thorough inspection of the installation and functionality of instruments is to be performed after completion and before flight.

- Check the installation compared to the plumbing schematic. Check that the transponder and altitude encoder are both secured.
- Ensure that all wires are secured and free from chafing hazards such as sharp edges and long free unsecured lengths. Check that the power supply leads are well insulated, protected from weather and from chafing.

- Check that fuses installed to power the transponder are of the correct capacity.

Operation of the Avionics:
Use the main avionics switch to operate the Skydat prior to start up, this is required to watch the oil pressure rise on starting. Switch on the transceiver and transponder after start up and switch both off shut down to protect them from voltage fluctuations.

Other Instruments:
Other instruments that need to be tested (such as the air speed indicator and the altimeter) should be calibrated against an independent instrument, or sent to a service agent for checking and calibration.

53. FUSELAGE

53.00.00 General

The fuselage structure of the XT has a relatively simple design. There are five main components that define the overall structure of the aircraft base. This does not include the landing gear, which is included in chapter 32.

53.10.00 Main Frame

There are five main materials that are used in the structure, 6061 T6, mild steel, 4130 steel, JIS G3445 STKM12C, 2011 T6.

The five main components from front to back are:

Fork Carrier
The fork carrier attaches to the front end of the base tube, to it attaches the front landing gear and the front mast brace.

Front Mast Brace
The front mast brace is the stabilising member that joins the front of the trike to the top of the mast.
The Front mast brace is mainly constructed of 6061 T6 aluminium.

Base Tube
This is the main longitudinal structural beam, to which all of the other structures are attached.

Mast
The mast attaches to the rear of the base tube and provides the main tension member for attachment to the aircraft's wing. It is constructed from 6061 T6 aluminium.

Engine Mount Structure
The engine mount structure is attached to the rear of the base tube and to the mast.
It is constructed mainly from mild steel (AS 1163).

53.40.00 Attach Fittings

53.40.10 General

The structures on the fuselage used for the attachment of wings, stabilisers, landing gear, engine and rotor pylons and for the support of equipment within the fuselage, including instrument brackets.

53.40.20 Wings

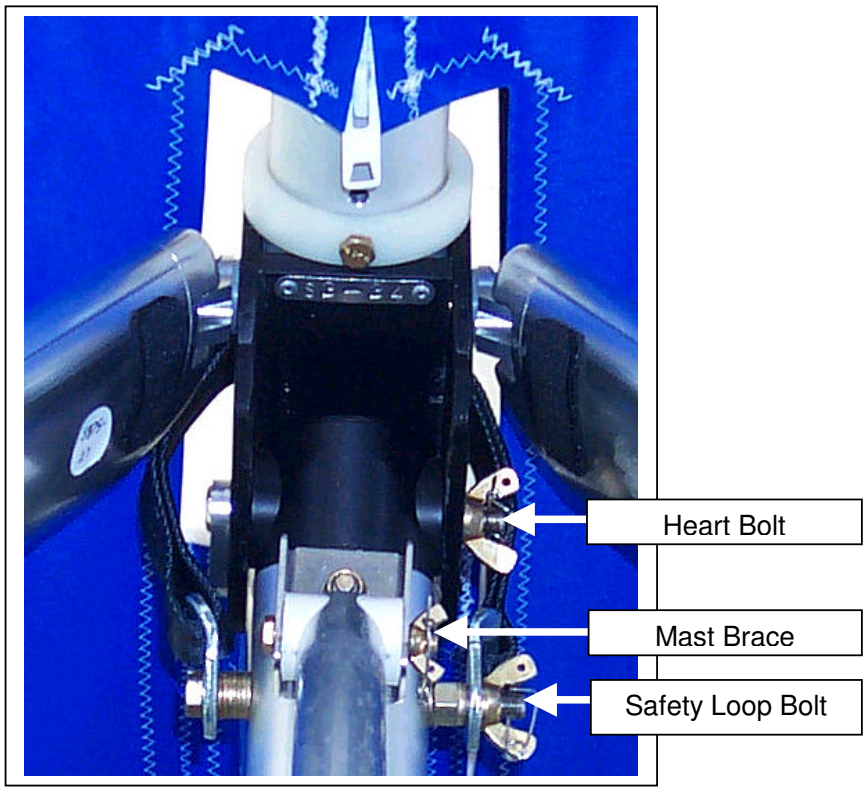


Figure 53 Top of Mast, attached to the wing

The trike base is attached to the wing using an aircraft grade bolt, which attaches to the wings U-bracket. The attachment arrangement allows the mast to move forwards/backwards and sideways relative to the hinge point. There is also the safety strap, included for the unlikely event of the main attachment failing. For instructions regarding the attachment and maintenance of the main bolt, refer to the wing maintenance manual and the Pilot's Operating Handbook/Aircraft Operating Instructions as applicable.

53.40.30 Stabilisers

The stabilisers are attached to the frame using the brackets on the inside and outside of the rear wheels. These may be clearly seen in section 20.10.00 Torquing Procedures. They are held in place with bolts and washers, where the washers are important to prevent crushing of the composite (AN4 washers on the outside, and 3/16" X ½" washers on the inside). The Illustrated parts catalogue should be consulted for the correct assembly sequence for the spats.

53.40.40 Landing Gear

The landing gear is non retractable. The front landing gear is attached to the main frame through two sealed bearings and bolt assembly. The rear is attached through three bushed pivots, one each for the drag link, rear strut and suspension member.

Figure 54 Front Landing Gear Attachment

Figure 55 Front Fork to Wheel Attachment

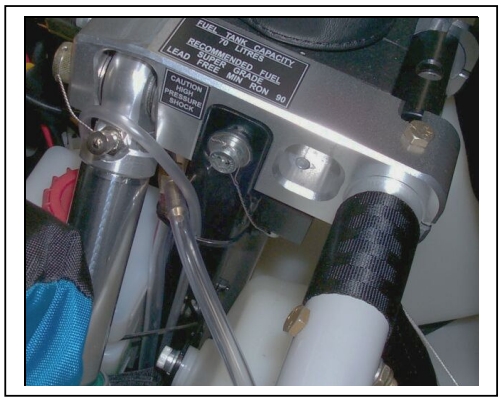


Figure 56 Rear Landing Gear and Engine Mount Attachment to Mast Block

53.40.50 Engine mount

The engine is attached to the engine mount, which is in turn attached to the mast via the mast block, and to the base tube of the aircraft. The engine mount attachment to the mast block can be seen in section 53.30.00 landing gear (above).

NOTE

There are special torques associated with the mast block, and section 20.10.00 Torquing Procedures, should be consulted.

53.40.60 Support of equipment within the Fuselage

1. Seat Attachment

The seats are attached to the mast block, and to the base tube of the trike. At the mast block, they are clamped, and on the base tube the seats are bolted to a bracket which is welded to the base tube.

2. Instrument Brackets

All of the instruments are attached to the aircraft via the fibreglass instrument panel, which is attached to the pod fairing area. This panel is attached to the frame using brackets and Nyloc bolts to hold it in place.

53.40.70 Pod Attachment

The pod is attached to the structure using bolts and brackets, and is located on the front mast pole. These attachment points are shown in the photos below.

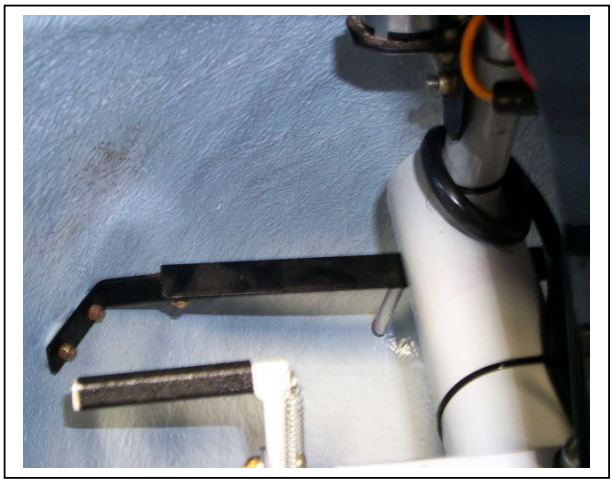


Figure 57 Pod Front Attachment

Figure 58 Pod Attachment to Mast Brace

Figure 59 Pod Attachment to Seat Frame

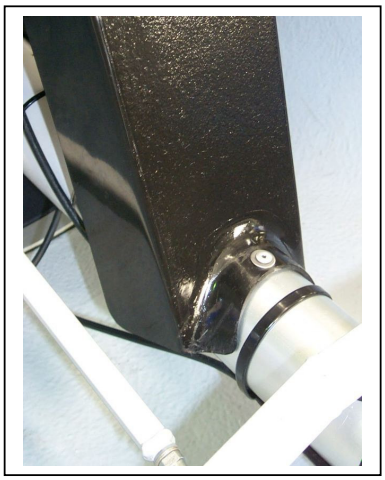


Figure 60 Pod Instrument Panel Attachment

53.50.00 Aerodynamic Fairings

The pod and spat assemblies are the only included aerodynamic fairing on the aircraft. They are constructed from fibreglass and polyester composite material, and attached to the aircraft via bolts and brackets which attach to the main structure. Each of the fairings should be checked regularly to ensure that the Nyloc bolts are secure, and that the fibreglass where it is attached is in good condition.

55. STABILIZERS

55.00.00 General

The stabiliser system for the XT trike consists of two fibreglass spats, which are attached to the rear wheels of the trike.

55.30.00 Vertical Stabilizers

The vertical stabiliser spats consist of two wheel spats with fins, which protrude from the top surface, and into the airflow, providing some yaw stability at speed. The structural integrity of the spats is important for the wheel operation, and ensuring that the outer wheel nut is secure. They should be checked every 25 hours, as noted in the maintenance schedule, as well as after any hangarage, or transport to check for impact damage that may have occurred.

NOTE
When checking the spats and other fibreglass areas, ensure that they are free from cracks, crushing and delamination that may cause them to come loose.

56. WINDOWS

56.00.00 General

The windshield of the XT is basic and should be cared for as per the instructions covered in section 12.20.50.

56.40.00 Inspection and Observation

If the windshield becomes damaged it should be replaced. Contact an Airborne distributor.

61. PROPELLERS

61.00.00 General

The XT propeller is a carbon fibre composite, three bladed propeller.
Two alternate propeller/hub assemblies are available on the aircraft.

Bolly
Blade Description: BOS 3 , 68 X 58 SL 3B
Hub/Engine Type: BOS 3, to suit Rotax 912
True Propeller size: 66" (1676mm)

Warp Drive
Blade Description: Warp Drive 68 INCH, 3 blades
Hub/Engine Type: HPL-R 914 Pattern
True Propeller size: 67.7" (1720mm)

Other standard components described in this manual refer to:
Hub Block "Base"
Hub Block "Top"
Associated bolts washers nyloc nuts and washer plate.
The Propeller is supplied with a product information package that should be read in addition to these instructions.

WARNING

IF THE ENGINE IS TO BE ROTATED AT ANY TIME, IT SHOULD ONLY BE ROTATED IN THE SAME SENSE (DIRECTION) AS IT RUNS. ROTATING THE ENGINE AGAINST THE WAY THAT IT RUNS MAY INTRODUCE AIR INTO THE OIL SUPPLY AND CAUSE DAMAGE TO THE ENGINE.

61.10.00 Propeller Service

61.10.10 Inspection

WARNING

WHEN WORKING ON THE PROPELLER REMOVE THE SPARK PLUG LEADS FROM THE SPARK PLUGS.

The intervals at which the propeller must be removed for inspection are specified in the Maintenance Schedule.
With the propeller removed from the aircraft and each of the components separated, the blades and boss should be inspected for the sort of damage described below paying particular attention to those areas which are not visible when the propeller is installed:

- Bolt holes should be examined for out of round, rough edges, and cracks radiating into the boss.
- Check the whole surface of the hub especially in all areas where there are corners. Make sure the surfaces are clean and there is good lighting. A magnifying glass will aid close inspection.
- Boss faces should be examined for damage where they have been in contact with the hub flanges, particularly at the circumference of the flanges.
- The centre bore should be examined for cracks and delamination of the plies.
- The mounting hub should be examined for corrosion, cracks, correct fit on the crankshaft, and for condition of the attachment bolts and nuts.
- Take note of any sharp nicks, cuts or scratches, as these are stress points from which further problems may occur. Act on them if required. Replace damaged LE tape. Do not operate propellers of carbon fibre leading edge construction without LE tape.
- Inspect the propeller and hub in the area around where the prop exits the hub.
- Inspect the bolts, replace if any wear or damage is present.

61.20.00 Propeller Assembly Procedure

NOTE: The following section shows photographs of assembly of the Bolly Propeller. Assembly of the Warp drive propeller requires the same procedure unless otherwise specified.

Assemble the propeller components on a flat, soft and clean surface such as a carpet. Before installing a propeller, the propeller shaft and threads should be checked for damage. Boss and hub flange faces should be checked for cleanliness, to ensure that maximum friction will be obtained. Refer to drawing number 7424 (Bolly Prop) and 7439 (Warp Drive Prop) in the Illustrated parts catalogue.

The angular position of the propeller on the hub is not important, as the pitch will be set later.
Important Note: All bolts, washers and Nyloc nuts used to clamp the hub plates, and attach propeller assembly to the engine should be assembled dry, without oil or moisture.

61.20.10 Check Material List

Part	Bolly	Warp Drive
Tie Wire	1 Length as supplied	
Washer Plate	1	1
Hub Blocks	Forward and Aft	
Blades	3	3
AN4 20A Bolts	6	12
AN4 Nyloc Nuts	6	12
AN4 Washers (Thin)	6	24
AN4 Washers (Thick)	6	0
M8 X 75 Drilled	6	6
M8 Washers	6	6

Table 23 Parts List

61.20.20 Assemble Forward Hub Block

The forward hub block is the one which has the larger counter bored holes in it.
Bolly Prop
Put the **THIN** AN4 washers onto the AN4 bolts (6 of each) and install into the counter bored holes.
Warp Drive
Put the AN4 washers onto the AN4 bolts (12 of each) and install into the counter bored holes

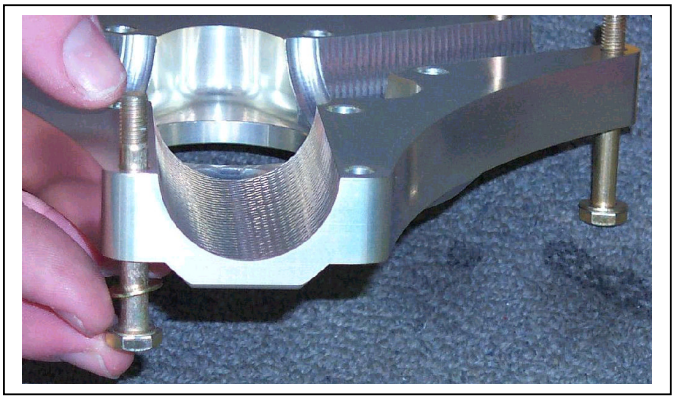


Figure 61 AN4 Bolts Into Forward Hub Block

61.20.30 Place Blades into Forward Hub Block

Place the three blades into the forward hub block, it is best to align them in the general direction they will be rotating in.

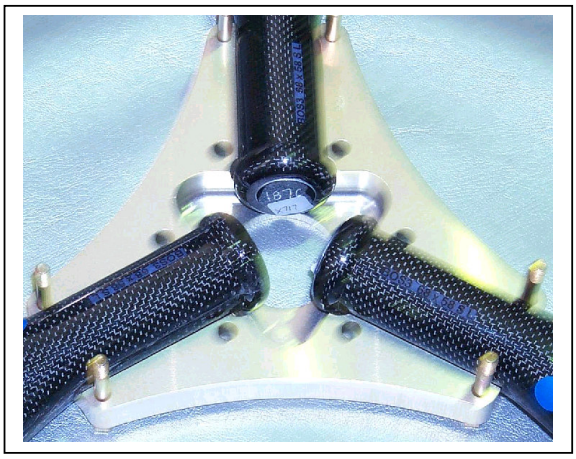


Figure 62 Place Blades into Hub Block

61.20.40 Add the rest of the components

The rest of the components that are listed are now added to the forward hub block as sequenced below:

- Place the aft hub block onto the forward hub block and over the AN4 bolts.
- Add AN4 **thick** washers and then the AN4 nuts to each of the bolts – finger tight.
- Align the washer plate with the aft hub block holes, add the M8 X 75 drilled bolts and ONE washer per bolt.

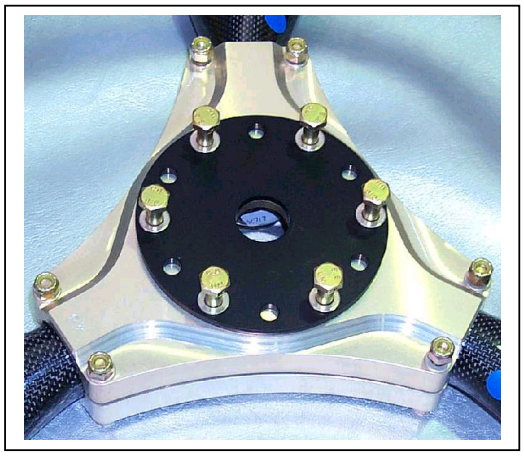


Figure 63 Propeller With All the Necessary Components

61.20.50 Place the pre-assembled propeller onto the engines mount

Carefully grip the two hub blocks together with your hands and lift from the ground to the engines propeller mount. The M8 bolts will match the engine's mount pattern. Mate the bolts to the holes while ensuring that the propellers or bolts don't fall. While still holding everything in place finger tighten the bolts in sequence (see the sequencing in the Torquing section). The propeller should now hold itself in place.

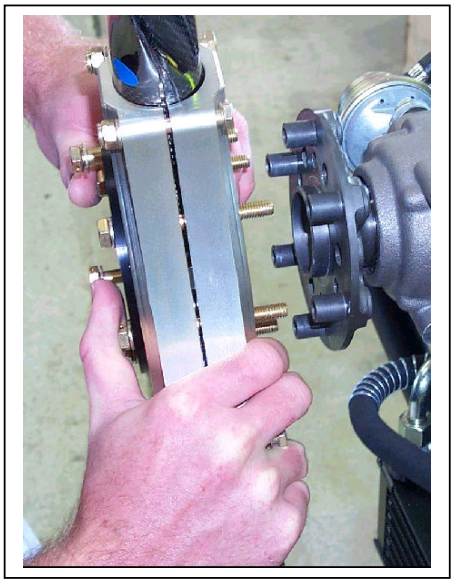


Figure 64 Mounting the Propeller

61.20.60 Nip the AN4 bolts to allow pitch adjustment

CAUTION

PULL THE BLADE RADIALLY OUTWARDS TO SEAT THE BLADE INTO IT'S HUB BLOCK LOCATION WHILE TIGHTENING THE AN4 NUTS/BOLTS, THIS ENSURES UNIFORM DIAMETRICAL POSITIONING OF THE BLADES RELATIVE TO THE HUB AND EACH OTHER.

Tighten the AN4 nuts in sequence in order that the blades can still be easily rotated by hand, but are in a positively held condition, so that they may be adjusted both easily and precisely. Evenly tighten the bolts / nuts in a sequence < bolt 1 – bolt 4 – bolt 2 – bolt 5 – bolt 6 – bolt 3>. Apply the torque to the nuts – not the bolts. Wait until after the propeller has been adjusted to fully torque either sets of bolts.

For the **Warp Drive Propeller** the inner set of bolts should be tightened as described above followed by the outer sets of bolts using the same sequence.

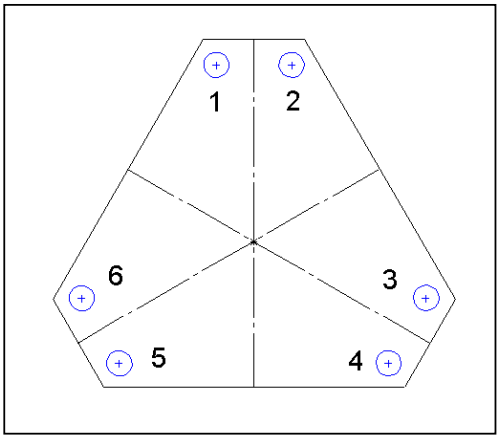


Figure 65 Propeller AN4 Bolt Tightening Sequence Numbers

61.10.20 Adjusting Pitch Angle

The setting for the propeller pitch angle is given in the table below according to the gearbox and propeller that is used.

Engine	**Propeller**	**Reduction Drive Ratio**	**Tip Angle** Reference to rear hub face	**Tip angle** Reference to drive shaft
912 UL	Bolly	2.43	12°	78°
912 UL	Bolly	2.27	9°	81°
912 UL	Warp Drive	2.43	12°	78°
912 UL	Warp Drive	2.27	9°	81°

Table 24 Propeller Pitch Setting and Gearbox Ratio

The tolerance on this angles specified is +/- 0.5°. The blade angles can be set using a digital level or a spirit level protractor.

The gear set part number stamped on the gearbox housing corresponds to the gearbox ratio at time of manufacture. Note that replacement gears are available to change the ratio within the gearbox.

Gearbox Ratio	Rotax Gear Set Part Number
2.27	996 605
2.43	887 680

Table 25 Rotax Gear Set Part Numbers

The pitch is determined during the certification of the aircraft. Settings outside this specification have an unknown effect on aircraft performance, and are not approved.

61.10.21 Move the Propellers to the Approximate Pitch Position

A part line is visible only on the Bolly Propeller, it is a useful approximation of the final pitch setting. Approximate the propeller pitch position for the Warp Drive propeller; fine adjustment is not required at this stage.

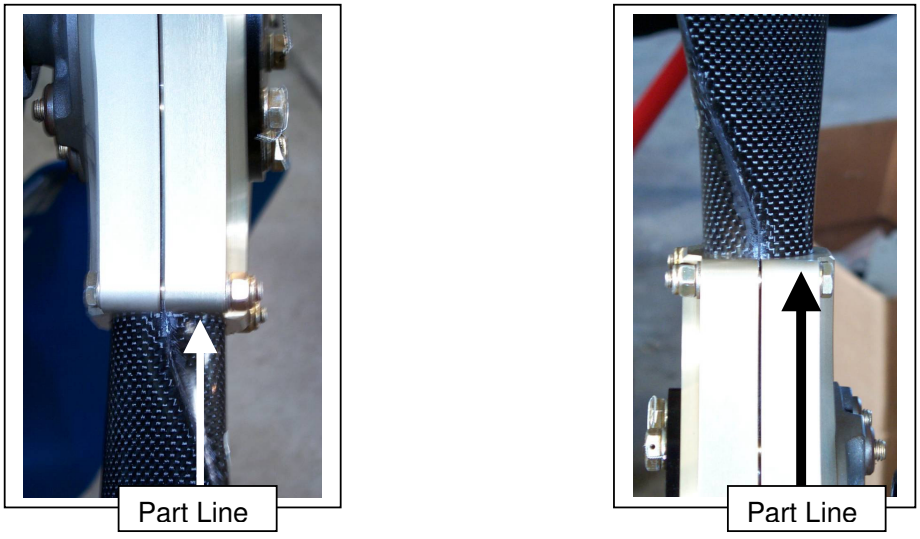


Figure 66 Propeller Part Lines

61.10.22 Ensure Prop Hub is Vertical

Level the base of the trike so that the prop hub is vertical. This is achieved by using shims under the front wheel to lift it until the flat surface of the rear of the prop hub is vertical.

Figure 67 Shims under the front wheel

NOTE
The ideal reading is 90° but +/- 0.05° is acceptable for practical application.

Figure 68 Prop Hub at 89.95 Degrees after correct shimming of front wheel

61.10.23 Rotate the Propeller Blade to be Checked to Horizontal

The propeller that is to be set should be rotated into position to be on the pilot's right of the engine.
The prop hub vertical surface is checked to be 90° to ensure the propeller is in the standard horizontal position.

WARNING

IF THE ENGINE IS TO BE ROTATED AT ANY TIME, IT SHOULD ONLY BE ROTATED IN THE SAME SENSE (DIRECTION) AS IT RUNS. ROTATING THE ENGINE AGAINST THE WAY THAT IT RUNS MAY INTRODUCE AIR INTO THE OIL SUPPLY AND CAUSE DAMAGE TO THE ENGINE.

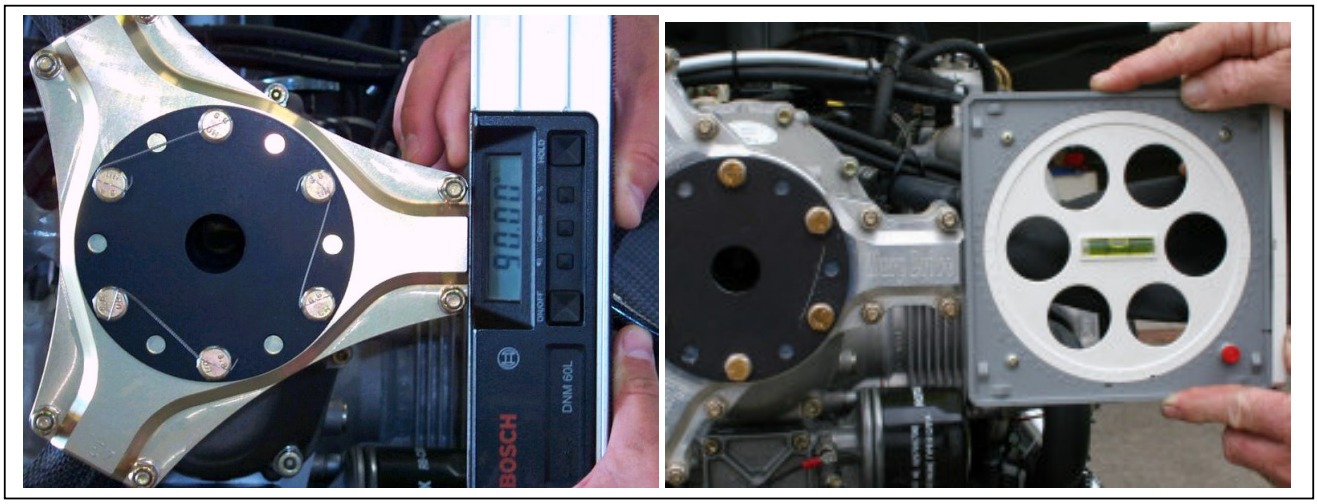


Figure 69 Propeller Horizontal Check

61.10.25 Set the Angle of the Propeller

The angle of the propeller can now be set. Place the digital level at the blade tip and adjust the pitch of the propeller to the angle as specified in table 24.

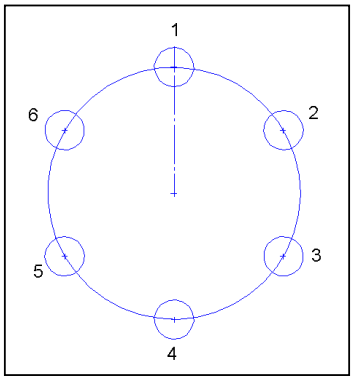
To rotate the propeller blade to the desired angle, apply gentle torque with one hand. With the other hand move the blade tip around in a circular motion.

61.10.26 Repeat for the other two blades

Repeat the procedure for the other two blades check thoroughly and then follow the sequence and torquing procedure.

61.10.30 Propeller Bolt Torquing

ONLY after the pitch has been set and confirmed:
Use a calibrated torque wrench, and evenly (side to side) tighten M8 grip bolts. Evenly tighten the bolts in a sequence < bolt 1 – bolt 4 – bolt 2 – bolt 5 – bolt 6 – bolt 3>.



WARNING
ALWAYS TIGHTEN THE BOLTS IN THE CORRECT SEQUENCE AND TO THE SPECIFIED TORQUE.

Figure 70 Propeller M8 Bolt Tightening Sequence Numbers

Torque the ¼" grip bolts in increments of approximately 3 Newton metre (20 inch-pounds) up to the recommended torque. The bolts should be tensioned in sequence as per figure 65.

Tighten M8 bolts in increments of approximately 3 Newton metre (20 inch-pounds) up to the recommended torque. The bolts should be tensioned in sequence as per figure 70

Return to grip bolts to check tension

Ensure that the washer plate is installed. If the washer plate is not installed it is possible that the bolts will become thread bound before applying pressure to the hub. Nyloc nuts should **not** be reused after the final (full torque) check has been completed. Nyloc nuts must have at least one full thread showing after they are installed.

PROPELLOR	Grip Bolts (¼")			M8 Engine Bolts		
	Newton Metre	Foot Pound	Inch Pound	Newton Metre	Foot Pound	Inch Pound
BOLLY	11 Nm	8 ft-lb	95 in-lb	13 Nm	9.5 ft-lb	115 in-lb
WARP DRIVE	13.5 Nm	10 ft-lb	120 in-lb	20 Nm	15 ft-lb	175 in-lb

Table 26 Propeller Torque Settings

61.10.40 Gap Between Hub Halves

It will be noted that when the hub is bolted together, there is a gap between the halves of nearly 1mm. This is quite deliberate, and will vary slightly as the blade grips are not perfectly circular – generally 0.6mm higher than wide. This eccentricity will at times cause a slight mismatch on the outside of the hub walls.
The advantage of this gap is that at 13Nm torque settings, the gap will not close. The hub in effect becomes a spring washer, further enhancing mounting assurance. At 13Nm there is a good balance between engine and grip bolt torque settings.

61.10.50 Tie Wire Installation

Once the torquing has been completed, recheck the pitch of the propellers before moving onto the final tie wire stage.

Tie wire is supplied as a part. Use a tie wire tool to install. The bolts are secured in pairs. Match a length of the tie wire as shown, spin it, leaving approx 20mm at the end to join onto the other bolt in the pair. Attention should be paid to the length, so that there is minimum slack between the two.

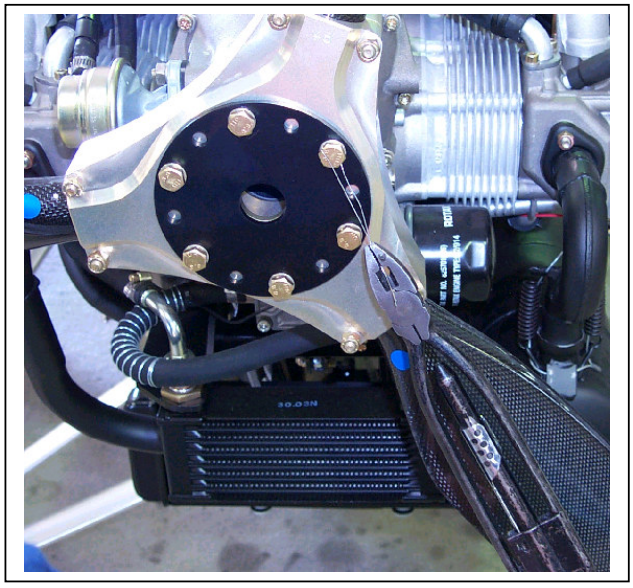


Figure 71 Tie Wiring Step 1.

The second step is to thread the last 20mm through the next bolt, spin it and trim the excess. Leave at least ten twists of the tie wire at the end.

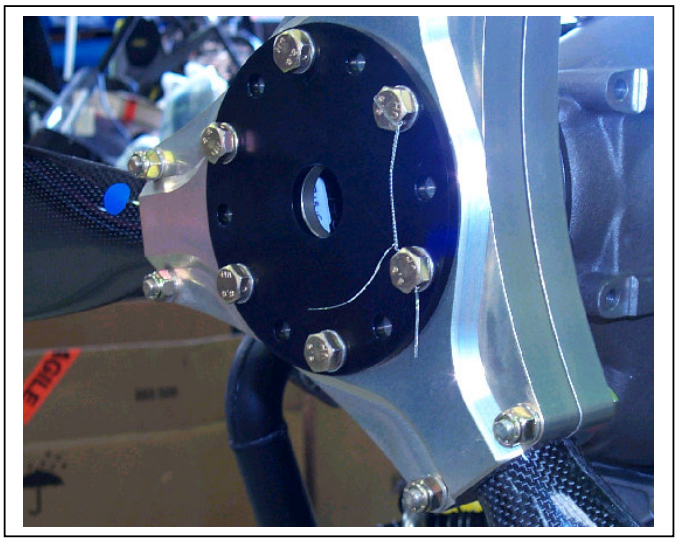


Figure 72 Tie Wiring Step 2.

61.10.30 Final Checks

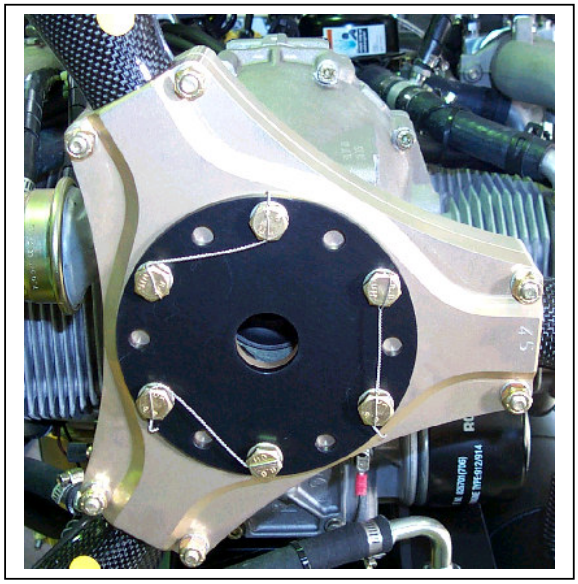


Figure 73Correctly Installed Propeller

Recheck the pitch of the propellers after they have been fully torqued. Recheck visually that all components are in place. Note the tie wiring.

WARNING

CLEARANCE BETWEEN WING WIRES, TUBES, AND THE PROPELLER SHOULD ALWAYS BE MAINTAINED. THIS SHOULD BE CHECKED IN ALL POSSIBLE CONFIGURATIONS OF PROPELLER AND WING.

61.20.00 Blade Damage and Repair

The condition of a composite propeller is important for safe flight. The pilot of the aircraft needs to check the condition of the propeller prior to each flight and ascertain its airworthiness. In general deep scratches across the chord of the propeller are most significant, along with leading edge dents and damage that may lead to delamination.
Leading edge damage is repairable as long as it is not larger than the specified sizes and that the propeller is not delaminated. In general if the damage size on the surface of the propeller is not exceeded then it will be better to leave the surface alone, as filling minor scratches will likely cause more damage. The plys of the propeller are approximately 0.15mm thick each. If any doubts exist as to the condition or repair procedure for the propeller either return the propeller to Airborne, or consult a LAME engineer or equivalent who has experience with composite materials.

61.20.10 Balancing

Balancing of the propeller should not be necessary if the damage allowances are adhered to, repairs should only be to replace what has been removed.
If there is any doubt or if propeller balancing is necessary it is best done by a person who is experienced with composites and with Level 2 LAME qualifications or equivalent. An epoxy compatible, clear spray paint applied at the tips is best, with the surface of the propeller prepared gently with 600 grade sandpaper, and cleaned to remove any oil residue.

61.20.20 Leading Edge Tape

Your standard configuration propeller blade is supplied with a light grade of Urethane LE Protective Tape applied. This will help resist the abrasive effects of dust, sand & water etc. It will not stop solid objects from damaging the blade, although it will help reduce the damage. If the LE tape is damaged, it has done its job and will need replacing.

61.20.30 Damage Allowances

All propellers will eventually suffer damage from a variety of causes and in differing degrees of damage. Varieties of damage such as water, stones, gravel & sand makes it very difficult to specify maximum damage levels before the blade should be discarded rather than repaired. For a guide see the FAA Advisory Circular AC 43.13-1B Par 8-71 through 8-109.
The design and construction (unlike wood, metal and many other composite props) is to progressively increase strength from tip to root. As such a solid tip strike is not likely to destroy the hub or root of the blade, (leading to a catastrophic failure), damage is far more likely at the tip (as tip speed is much higher) but less critical at the tip as it has less forces acting upon it (compared to the root / hub). As all forces are focused on the root and hub sections – these areas are not to be damaged. If any doubt exists as to the airworthiness of a propeller, have it properly assessed prior to flight.

61.20.40 Surface Scratches

The inner 250mm of the prop should not be damaged any further than minor nicks and scratches. This is because it carries the most forces. This area is harder to damage than further out on the radius because the speeds are lower. As a guide there should be no more than three scratches of 0.1mm deep, and 25% of the chord in this area of a blade.
From 250mm out from the hub to the tip of the propeller the depth allowance is slightly greater at 0.15mm and extending a maximum of 25% of the chord. Slightly more damage is allowable toward the tip. There should not be a concentration of scratches in one area.

61.20.50 Leading Edge Damage

Maximum allowed leading edge dent in the carbon fibre portion of the propeller is 3mm within 250mm of the root to 8mm at the tip. The depth of the dents allowable varies linearly from 250mm to 840mm (the outer diameter of the propeller), the equation for the allowable dent is as follows.
1. Measure the location from the prop hub (mm).
2. Depth = 3 + (0.00847 x (Location from Centre – 250)).

The number of dents allowable depends upon their size. It is suggested that two or three per propeller blade would be maximum.

61.20.40 Repair

To repair all dents and scratches a slow cure EPOXY resin must be used. Available from Airborne is a General Purpose Epoxy (180, 360 and 1000gm packs). Damage over 3mm MUST be filled with slurry made from a suitable Epoxy plus fine milled glass fibres (Available from Airborne is a BOS Repair Kit containing the appropriate epoxy, Glass Powder and instructions). For cosmetic scratches and dents use Talc with the epoxy. Always follow the resin instructions and apply to a clean dry surface. When cured, carefully sand the filler back to match the blade apply new LE Tape.

For a Dura-Tuff or Nickel insert leading edge propeller, these propellers are relatively maintenance free, in the event that a leading edge is damaged it is likely that the propeller is damaged as well. Leading edge inserts may be fitted to existing propellers and as replacement inserts, the propeller manufacturer must perform this procedure.

NOTE

If in doubt, or if the propeller has more damage than is able to be fixed by the maintainer then return the propeller to AirBorne for evaluation, possible repair and or overhaul.

Ground Run

After adjustments or maintenance and prior to flight the engine should be run up to check the propeller is functioning normally. The tracking of the propeller should be checked.
The aircraft should be securely chocked and the engine run up to full speed. Ensure the engine temperature is at the required operation temperature. Check that the propeller is functioning normally with minimum vibration. A correctly adjusted propeller should result in the engine being limited to 5400 RPM.

71. POWER PLANT

71.00.00 General

This chapter provides information on the installation of the engine, but not the engine itself, or its accessories. Information on these may be found in successive chapters.

71.00.10 Engine Run Up

Refer to the pilots operating handbook for run up procedures. The engine should be run up to operating temperature any time that parts or fluids are replaced, or if the engine has been overhauled follow the Rotax instructions in the Rotax manual.

71.00.20 Engine Removal/Installation

Engine removal and installation is straight forward and obvious but the following procedure may assist:

Removal

1. Ensure that the emergency fuel shut off valve is OFF.
2. Remove the propeller and mount.
3. Disconnect all fluid flexible lines, cap and identify.
4. Disconnect all instrumentation cables from the engine.
5. After the five engine mounts have been undone, the engine may be carefully removed by two people, one on each side, supporting under the cylinder heads. If one person is to perform the operation or if two willing and capable people are unavailable, there are mounting points for a hoist on the top of the engine. The Rotax manual should be consulted for the correct bolt sizes and methods.

While the engine is off

Check the condition of the engine mount, and the engine mount rubbers (see section 71.20.00), replace or repair as necessary.

Installation

The installation of the engine is the reverse of removal. When the exhaust system is rejoined Loctite Antisieze Lubricant should be used on all of the areas that butt into each other (Loctite # 76764).

71.20.00 Mounts

The engine mount is of welded steel RHS construction. The engine is supported on the engine mount assembly at five points through rubber shock mounts. These shock mounts should be inspected regularly for deterioration, excessive sagging and other damage. It is recommended – but not considered mandatory - that these be replaced at 500 hour intervals. Any damage or distortion to the engine mount structure should be repaired promptly, as apart from any loss of structural integrity, distortion or misalignment of the engine mount structure could impose abnormal stresses on the engine itself.

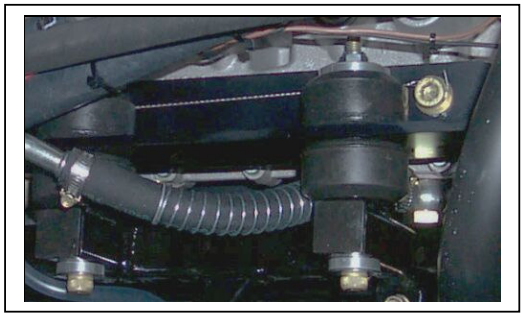


Figure 74 Engine Mount Rubbers

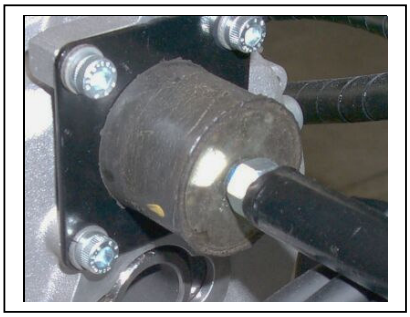


Figure 75 Top Rubber Link To Gearbox

71.40.00 Attach Fittings

The engine set-up is standard as per Rotax specifications, however there are some simply attached fittings that are extra or necessary.

The SkyDAT data collection
The SkyDAT box is mounted to the top tie rod using a small mounting plate, sticky back Velcro and two zip ties.

Radiator
The radiator is attached to the engine mount assembly via four rubber mounts. These rubber mounts should be checked for any wear of the rubber and replaced as necessary.

Oil Radiator
The oil radiator is attached to the rear of the engine mount with two bolts.

Oil Sump
The oil sump bracket has two bolts attaching it to the engine mount..

Coolant Overflow
The coolant overflow bottle is attached to the engine mount using Velcro straps.

71.50.00 Electrical Harness

The electrical harness for the system is routed between the fuel tank and the engine, it incorporates the engine's system, including the start system, and the SkyDAT wiring loom. The wiring loom is easy to find and access. The harness should be checked for security and ensure no wear points. The electrical schematic can be found in the POH / AOI section 7.14.1

71.70.00 Engine Drains

In addition to the fuel tank draincock and the oil sump drain plug there are two engine drains.
The oil sump has a drain which is routed to the rear of the engine mount at the bottom, near the oil radiator.
The coolant overflow goes down near the mast and exits at the base of the engine mount in the same position as the fuel tank overflow and breather tube.

72. ENGINE MAINTENANCE

Engine Power

Spark plugs should be the type recommended by the manufacturer. Adjusting a carburettor is a specialised job and can have a large effect on the power developed by the engine. Altitude can also affect the power available. When moving to a field with a different elevation it may be necessary to retune the carburettor.
It is recommended that only a qualified person should tune the engine. For Special Light Sport Aircraft maintenance, refer this task to a Mechanic with power plant rating.

72.00.00 General

This aircraft is fitted with a Rotax 912 UL horizontally opposed, four cylinder, water cooled engine. The engine is rated to 59.6 kW maximum take off power with full throttle at 5800 RPM, and 58 kW maximum continuous speed of 5500 Rpm.

72.00.10 Maintenance and Overhaul

Other than any specific procedures specified elsewhere in this manual , detailed procedures for the maintenance and overhaul of the Rotax 912 UL engine fitted to the XT 912 aircraft can be found in the following documents:

- Rotax Operator Manual for Rotax Engine Type 912 Series
- Rotax Documentation CD
  Documentation for Rotax engines available at www.rotax-aircraft-engines.com

The supplied manuals and documentation are supplemented by Rotax Service letters and Service Bulletins as appropriate. The Rotax website should be periodically reviewed for these updates.

Overhaul of Rotax engines should be performed by a qualified Rotax service centre. For Special Light Sport Aircraft maintenance, this task must be referred to a Mechanic with powerplant rating and task specific training on Rotax 912 engines.

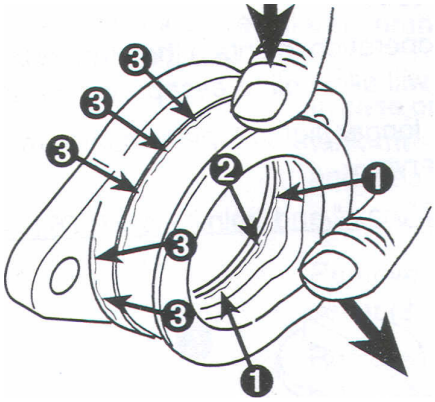
72.00.20 Carburettor

When checking the carburettor rubbers, check for cracks. There is a Rotax service announcement (1998) which points out that there is a potential issue with the rubbers.

Rotax
Aircraft Engines
MAINTENANCE MANUAL

4.7 Inspection of the Carburettor flange socket

Inspection of the carburettor flange socket See fig. 14.
Compress carburettor socket in the area of the carburettor connection to allow easier detection of existing cracks (1) and (3) also check the area of the inner diameter (2). At suspicion of cracks, renew the carburettor flange.
NOTE: The carburettor socket is subject, apart from chemical strain due to fuel and UV radiation, to stress by vibration. Excessive tightening of the clamp may also damage it causing cracks resulting in intake leaks.



(*fig. 14*) 00366

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Figure 76 Excerpt from Rotax Maintenance Manual Type 912 Series, Edition 0 of 1998 09 01

72.00.30 Radiator

If it is necessary to replace the radiator hoses it is important that the replacement hoses are identical to that supplied with the aircraft. The engine coolant is circulated rapidly through the cooling system and the fitting of hoses other than those supplied can increase flow resistance leading to excessive coolant temperatures. Refer to the Rotax Maintenance Manual for detailed radiator maintenance, and specific fluids and replacement specifications.

73. ENGINE FUEL SYSTEMS

73.00.00 General

The XT fuel system consists of one fuel tank centrally located underneath and to the rear of the passenger seat of the aircraft. There is one fuel supply line that runs from the left rear of the fuel tank and through to the mechanical fuel pump of the engine. All of the components for the engine are standard as per the Rotax manuals, which should be consulted for maintenance information.

73.20.00 Controlling

The control of the throttle and choke systems for the engine are cable actuated by the pilot. The throttle is situated on the right hand side of the aircraft, and has a double system that is actuated either by foot or hand. The cables from each of the two are routed through a mixer device which allows each to be depressed independently, even if the other is stuck for any reason. The mixer also has two cables from it to the carburettors.

The throttle system has two cables that are both attached to a hand lever on the left hand side of the seat frame.

Carburettor actuation is set up opposite to the standard Rotax sense, this modification is made with no changes to the parts as Rotax provides provision for this alternative set up. Care should be taken to replicate the changes if any carburettor replacements or overhauls are made.

73.30.00 Indicating

There is a supplementary fuel flow rate sensor that is in line with the fuel supply line. An electrical fuel flow sensor supplies information to the SkyDAT data box mounted on the Tie Rod for the engine. The digital display at the front of the aircraft displays the fuel consumption rate for the pilot. The total usage information is also available if the counter is correctly reset after the fuel tank is filled. The remaining fuel indication should be used in addition to the physical tank graduations that are visible on the pilot's right of the fuel tank.

74. IGNITION

74.00.00 General

The power supply of the engine after starting is self sufficient within the engine. No external power supply is require for the engine to operate. The engine generates excess power with the integrated generator, this powers systems which are external to the engine. The Rotax maintenance manual should be consulted for the maintenance of the engines electrical system (section 12.60.00 of the maintenance manual).

74.30.00 Switching

Main Switch

The main switch of the aircraft is located on the front instrument panel, this is used to start the engine, but not to turn it off. There are two wires, which make a double system, that are used to earth the engine stop circuit from the engine. The engine's ignition power supply is cut off, stopping the engine.

76. ENGINE CONTROLS

76.00.00 General

The fuel supply system of the trike is a cable actuated twin carburettor system.

76.10.00 Power Control

Power control is achieved in three ways.

Throttle

There are two method to actuate the throttle, either with the hand throttle or the foot actuated throttle. Both of the cables run through a mixer, which allows each to operate independently. Fully forwards opens the throttle, and fully aft closes the throttle. Section 53.00.00 Landing Gear, clearly shows a photo of the foot throttle pedal.

Choke

There is also a separate choke control, on the left hand side which faces downwards to avoid confusion of the controls.

76.10.10 Inspection and Maintenance

In order that the Bowden cables operate correctly they must:

- Not be kinked or damaged.
- Be adequately lubricated internally and not binding.
- Have the outer properly and securely clamped at both ends.
- Have the inners correctly connected to the respective engine linkage and be rotationally free so that the linkage can operate correctly through its full travel without causing binding or bending/kinking of the inner.

Any problems with Bowden type controls can usually be traced to one or more of the above. Rectify the problems as required. If the cable is damaged or kinked in any way it should be replaced. Care must be taken during installation not to kink the replacement cable and to ensure that the routing is correct and will not cause damage or kinking in service.

NOTE

The throttle cables that are supplied on the XT912 are not user serviceable, though they can be maintained. They are constructed in a special way which allows each of the cables to be actuated independently. If the throttle cable needs to be replaced and entire throttle cable assembly should be used.

It is difficult to adequately clean the sliding surfaces of an old Bowden cable. It is usually easier to replace them than to attempt maintenance.

After maintenance is necessary to carefully check the operation of the cables, and to ensure that they are correctly secured to the appropriate linkages. Check that the control can be easily operated through its full range of operation.

CAUTION

AFTER THROTTLE CABLES HAVE BEEN ADJUSTED OR REPLACED THE CARBURETTOR SYSTEM WILL NEED TO BE RE SYNCHRONISED, AS PER THE ROTAX METHOD.

76.20.00 Emergency Shutdown

Emergency shutdown of the fuel system is either achieved by shutting the motor down, which will stop the mechanical fuel pump, or by moving the main fuel supply tap to the off position which will starve the engine of fuel.

NOTE
There will still be some fuel remaining in the float system of the carburettors if the engine is not starved of fuel to shut it down.

77. ENGINE INDICATING

77.00.00 General

The engines operation is monitored by the SkyDAT electronic display system, mounted on the instrument panel. The engine operations monitored are:

RPM (engine revolutions per minute)	Battery Voltage
Flight duration, in hours; minutes; seconds	2xCHT (cylinder head temperature) Celsius or Fahrenheit
Engine Hours, in hours, minutes	2xEGT (exhaust gas temperature) Celsius or Fahrenheit
Oil Temperature	Oil Pressure, bars or PSI

Table 27 SkyDAT Monitored Operations

The normal and maximum operating range for the oil temperature, exhaust temperature, cylinder head temperature and oil pressure are indicated on the instrumentation and the alarm (Flashing Red Light) will go off if any of the settings are exceeded.

The tachometer does not have an alarm, however the maximum sustained level is 5500rpm, and 5800 rpm should not be run for more than five minutes. The pitch of the propeller set up should prevent over speeding of the engine.

The preset engine limits can be checked against the limits outlined in section 2.4.2 by noting the position of the larger square bars on the LCD display for the particular gauge.

77.10.00 Power

The SkyDAT data box collects all of the engine management data.

Tachometer
The tachometer system is connected to the Rotax sensor, the Rotax manual should be consulted for maintenance instructions.

77.20.00 Temperature

Cylinder Head Temperature
The cylinder head temperature sensors are supplied with the engine. Information for checking the sender can be found in the following section.

Exhaust Gas Temperature
The exhaust temperature sensors are located at the exit of the two front cylinders of the engine. Information for checking the sender can be found in the following section.

Oil Temperature
The oil temperature sensor is located near the oil filter at the RHS rear of the engine. The Rotax manual should be consulted for maintenance instructions.

77.30.00 Analysers

Oil Pressure
The oil pressure indicator sensor is located above the mechanical pump, on the LHS at the rear of the engine.

The SkyDAT instrument will show "open" when there is an open circuit in the CHT circuit.

To determine if the problem is the wiring or the sender simply short-circuit the sender connection to ground at the CHT sender and a message short-circuit should show on the screen for that CHT. This test determines that the wires between the CHT sensor and the SkyDAT are intact.

If there is no "Short Circuit" Signal
If the SkyDAT does not show a short circuit signal, then the wiring between the CHT and the SkyDAT needs to be checked. The best place to start the inspection would be the physical connections, before tracing the wire through. Simply checking the resistance of the wires between each section, as well as to earth (to check for short circuit) will determine the circuit's integrity. Full electrical system analysis instruction is beyond the scope of this manual.

Cylinder Head Temperature (CHT)
A "good" CHT sender measures approximately 800 Ohms (resistance) at room temperature. (when measured between the brass terminal and the block of the engine), remove the red wire from the sender to perform this test. See attached photograph.

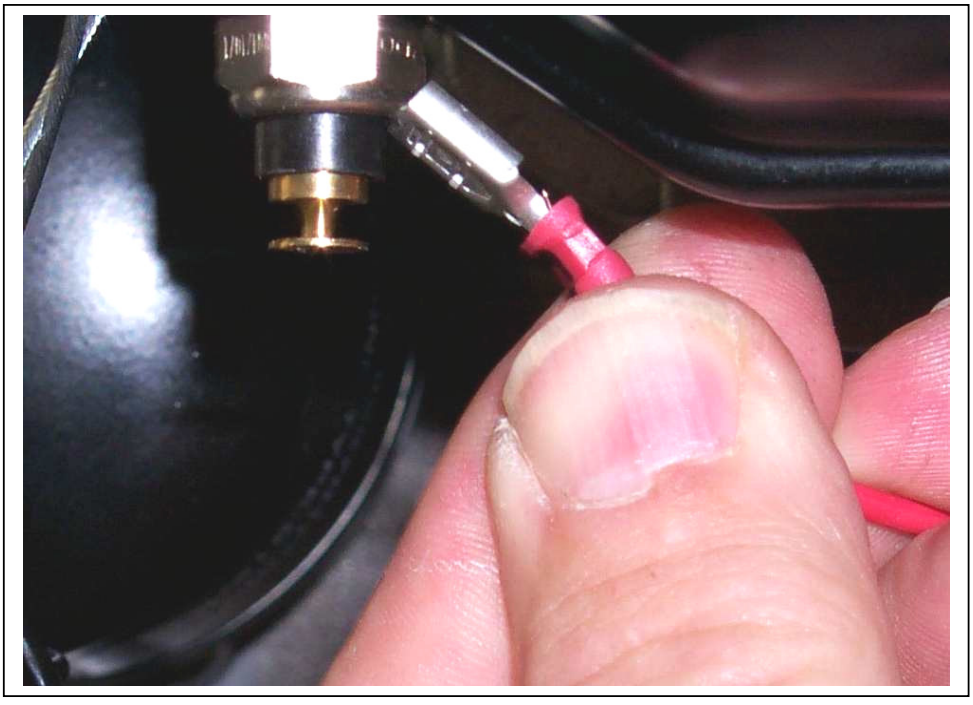


Figure 77 Earthing of CHT Sender, to Check the Wire to the SkyDAT.

Exhaust Gas Temperature (EGT)

If an EGT sender is suspected to be faulty then the best method to check the actual sender is to swap the leads that go into the SkyDAT data box. When the engine is operated if the opposite display then shows the same reading as before this will confirm a faulty sender.

To change the wires use the following procedure

1. Obtain a flathead screwdriver with an approx 2mm head.
2. Note the colour of the wires for each position. Write these down, and preferably mark the left and right hand side EGT wires to make it easy to replace them.
3. Use the small screwdriver to push into the hole above each wire connection, do not force. This releases the wire and allows each to be removed individually.

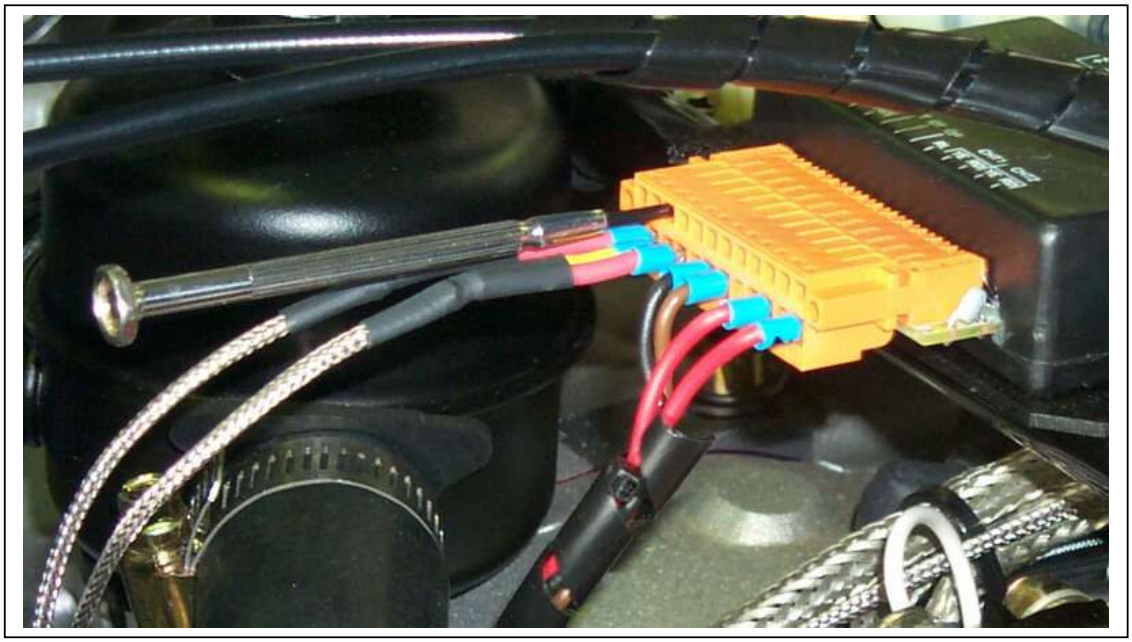


Figure 78 Photo of Screwdriver in Place to Remove Wire

4. Remove both sets of wires and place the “Faulty” EGT wires into the side which has been receiving a signal.
5. Now if there is still no signal then the EGT sender needs to be replaced.
6. A further check may be made of the resistance of the sender. Use a multimeter to measure the resistance of the sender. An open circuit clearly shows that the thermocouple circuit is broken and will need to be replaced. Typical values for the resistance of wire are:
   RHS Sender – Approximately 1.8 Ohms.
   LHS Sender – Approximately 3 Ohms.
7. Order the EGT sender, note that there is a left and right hand side as they are different lengths.

Spare Part
106220 – EGT SENDER ASM GENERIC XT-912

Figure 79 Spare parts numbers for the XT912 EGT Sender

8. Release the wires from the sender that is to be replaced, note the wire routing which is used. Undo the EGT.
9. Replace the EGT, make sure that the copper washer is in place (no sealant is required). The approximate torque for the EGT is 22Nm. Take care not to cross thread.

78. EXHAUST

78.00.00 General

There is one muffler system for the four cylinders. Each of the cylinder exhausts have a custom made manifold that routes to the Rotax muffler. The exhaust system temperature is indicated by the SkyDAT digital display, with the sensors in place at the exit of the two cylinders to the front of the engine.

78.10.00 Collector/Nozzle

The muffler connections are all of the spring loaded ball joint type to absorb engine vibration.
Removal and inspection of the exhaust system is simple and obvious. When reinstalling the exhaust system, Loctite anti seize paste should be used as recommended by Rotax, Loctite # 76764). See the Rotax manual for Loctite instructions.
If any minor damage occurs to the exhaust it may be repaired. If new components are required contact an Airborne dealer.
Inspect the general condition of the muffler for corrosion and holes that may be present. Ensure that it is correctly secured withal safety and tie wires installed. Check the ceramic coating of the exhaust and replace if it is degraded.

79. OIL

79.00.00 General

The 912 UL engine has an external sump, and the entire system is standard to the Rotax 912 engine. The oil specification is given in the Rotax Operators Manual, Section 10.2.3, Lubricants. In general use only synthetic or semi synthetic oil, API classification “SF” or “SG” or higher quality oils. Multigrade oil is recommended. These oil types are detergent types. Consult the current Rotax manual for the correct grade of oil for the ambient operating temperature. Refer to Rotax service instruction SI-18-1997 R5, or the latest version.
Oil system capacity with oil cooler is : 3.5 litre (0.92 Us gal).
Dipstick level:
Difference between maximum and minimum oil levels is 0.45 Litre (0.95 liq.pt).

79.10.00 Storage

The oil level is checked by removing the cap on the top of the oil sump and then removing the dip stick type oil level indicator. The oil level should be checked prior to each flight. Refer to Section 12.10.20, Engine Oil System Replenishment for instructions and replacement information.

79.20.00 Distribution

The distribution of the oil is standard to the 912 engine, the Rotax manual should be consulted for maintenance information.
The oil filter that is fitted is a Rotax RB-C308, the filter should be changed at regular intervals as per the maintenance schedules section of this manual in chapter 5.

79.30.00 Indicating

The SkyDAT system has an oil pressure and temperature indicating system and the information is displayed on the SkyDAT Digital readout.

80. STARTING

80.00.00 General

The electrically driven starter motor is mounted on the front left of the engine. A key start is located on the instrument panel. When the master switch is on, pushing the start button will energise the starter system.
The starter system is Rotax standard and the Rotax documentation should be used for the maintenance of the system.

95. SPECIAL PURPOSE EQUIPMENT

95.10.00 BRS Parachute System

If a parachute is fitted to this aircraft, a parachute manual will be supplied as a part of the data package. The owner must read the manual, and the manufacturers instructions followed for the maintenance and use of the parachute. The maintenance of the parachute system shall be recorded in the aircraft's log book.

The BRS system has a single handle that is located just forwards of central on the seat frame. The handle is slightly aft of the choke lever to the pilots left.

Maintenance

The maintenance of the system is limited to ensuring that the attachment point is secure, and that the cable to the BRS rocket and parachute is free from abrasion, and kinking. Also check for any other damage.
The maintenance schedule for the BRS parachute is given in the manual that is supplied with the system, and should be followed to ensure reliable operation of the parachute.

95.10.10 BRS Parachute System Installation

This manual section is intended as a guide for installation of the BRS ballistic parachute on the XT-912 trike base. The installation details contained should be used in conjunction with the equipment manufacturer's installation instructions. Extreme hazard exists from mishandling the rocket system, read the original manufacturers manual and understand the hazards before beginning work on the BRS system.
Fitment may be considered heavy maintenance.

The documentation contains factory recommended procedures and instructions. The procedures described are to be used in conjunction with the National Airworthiness Authority (NAA) of the country of registration.

All parts that are not supplied with the ballistic parachute from BRS or already installed on the aircraft, should be included with the Airborne parachute mount kit, Airborne part numbers vary according to category of registration:

- PARACHUTE MOUNT KIT BRS XT LSA, part number 108068
- PARACHUTE MOUNT KIT BRS XT PRIMARY, part number 106374

Depending on the state of the trike when delivered, some additional equipment may be required for the fitment. If the bracket which holds the parachute handle is not already attached to the trike, the seat frame will need to be drilled and the bracket bolted and riveted in place (rivet supplied).

The BRS ballistic parachute is not supplied with the aircraft by AirBorne WindSports for some countries. This is due to the deployment rocket being classified as a 'dangerous good' which incurs various shipment penalties. Hence Airborne supplies a kit to allow the distributor or owner to complete the BRS installation. Note, it is necessary to check with local regulations to ensure installation is permitted.

The information documented in this report is deemed adequate for a reasonably skilled person to install the BRS parachute system. However if you are unsure of some aspect of the installation or fitment process, please contact AirBorne WindSports or your nearest Airborne dealer.

Figure 80 Ballistic Parachute Installation, XT-912

Required Data and Kit Contents

Below is a list of drawings that accompany this document and provide some of the data for the fitment of the BRS parachute recovery system. The installation of the rocket and deployment cables are part of the BRS documentation. The list of parts below are as supplied by Airborne for the parachute installation kit.

DWG	SHEET	DWG NAME
A4-5904	1	PARACHUTE SUB-ASSEMBLY BRS XT
	2	PARACHUTE MOUNT KIT BRS XT
A4-6553	3	RELEASE TAG SAFETY (BRS KIT)

Table 28 Drawings List (see appendix A)

ITEM NO.	DWG NAME	DWG	PART NO.	QTY.
1	PARACHUTE MOUNT BRS XT COMPONENT	5905	105724	1
2	BOLT AN4-27 a	5450	100010	1
3	WASHER AN4	5540	100042	1
4	NUT NYLOC AN4 HALF	5561	100035	2
5	HOSE BUSH 6ID x 10L	5726	106720	1
6	CABLE TIE MED	5605	101193	5
7	SPLIT RING 12MM - PIP PIN	5720	100950	1
8	VELCRO LOOP 50x40	6313	106664	1
9	PARACHUTE RELEASE TAG CABLE XT	6553	106773	1
10	VELCRO HOOK 25x120 ADHESIVE	6313	106774	1
11	NUT NYLOC M 6 FULL	5604	102132	1
12	POP RIVET SS 3/16"	5515	102205	1
13	EYEBOLT AN43b- 4a	6538	100056	1
14	WASHER NYLON M6 XOD	5540	101055	2
15	BRACKET PARACHUTE HANDLE XT	6537	106624	1
16	SKT BUTTON SCREW M6 x 16	5677	101752	1
17	PLACARD EMERGENCY PARACHUTE BRS	5900	106647	1

Table 29 Parts List from A4-5904, Sheet 2

Skills

Repairman Maintenance qualifications are required for installation and maintenance works on the BRS on Light Sport aircraft. In categories of registration where this is not applicable, the following skills are applicable as a minimum: A sound understanding of mechanical systems, and good experience with the necessary tools and procedures is required, as the continuing airworthiness of the aircraft relies on the competence of the person performing the maintenance.

Installation Procedure

The BRS ballistic parachute should be installed in accordance with the instructions from the BRS documentation and this document. Note the installation of the BRS falls outside the scope of the certification for this aircraft, refer to Pilot Operators Handbook for further details.

BRS Mount and Parachute Mounting

The parachute canister is attached to the mounting bracket by means of large profile clamps, see drawing A4-5904, Appendix A. The canister is located on the parachute bracket by the deployment rocket attachment boss.

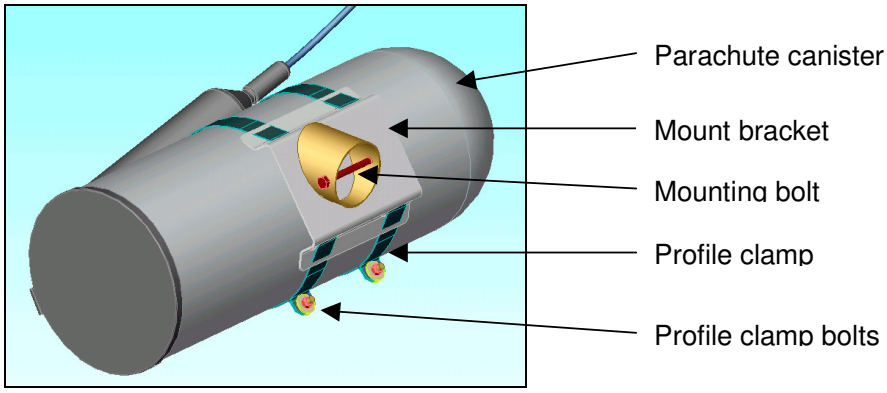


Figure 81 Parachute Bracket Attachment

Once the canister is attached to the bracket, attach the bracket to the rear of the trike. The steel base tube has a aluminium mounting tube protruding, see Figure 82 below.

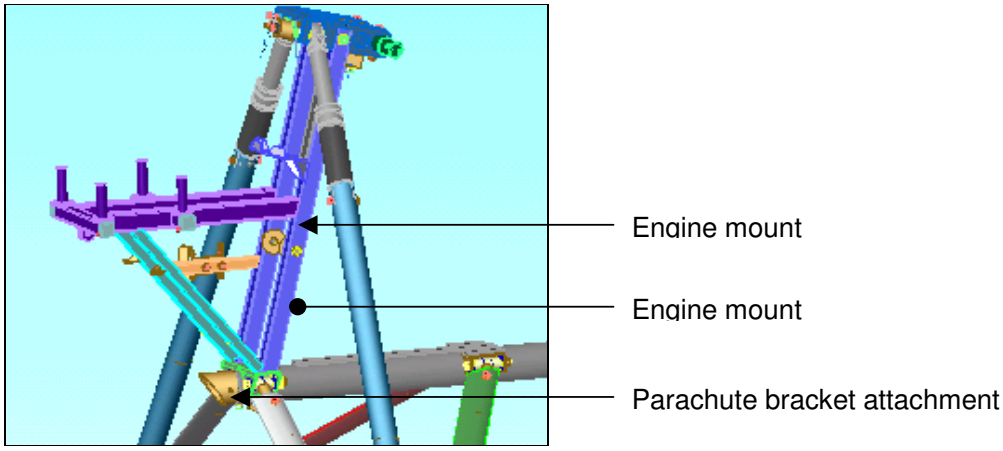


Figure 82 Parachute Mount Attachment Tube

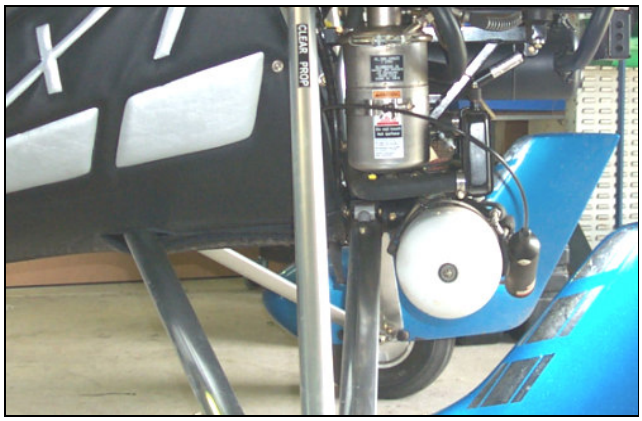


Figure 69 Side View, Parachute Attached to Trike

Rocket Assembly and Installation

Using the data supplied by BRS, remove canister plastic end cap, and assemble the rocket and cables onto the parachute canister.
Adjust rocket angle. Ensure the rocket is angled downward at an angle of approximately 25°. Sight along the rocket, it should be aimed to traject below the RHS wheel spat.

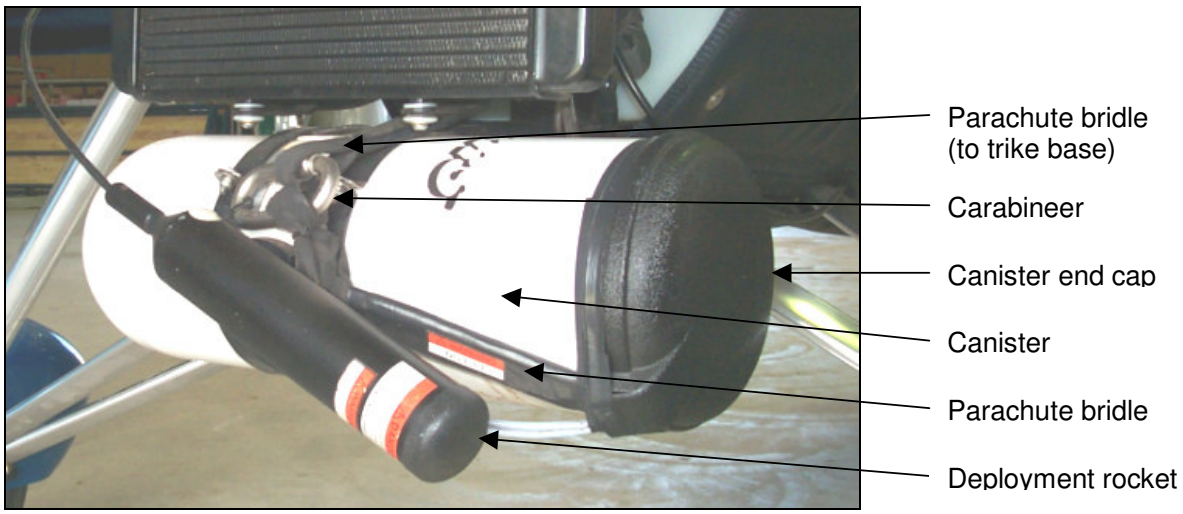


Figure 83 Rocket Angle

Parachute Bridle Attachment and Routing

Attach the end of the bridle around the engine mount uprights as shown in Figure 84 and Figure 85. Loop the end of the bridle through itself in the direction shown. Cable tie the bridle back in-between the uprights so the mast can fold back without difficulty.

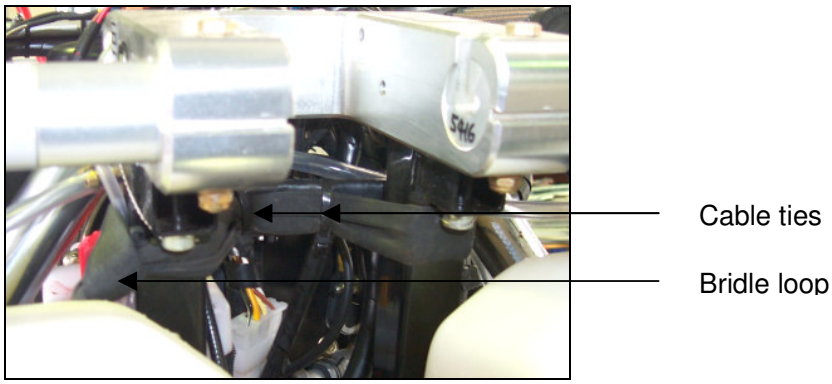


Figure 84 Bridle end Attachment

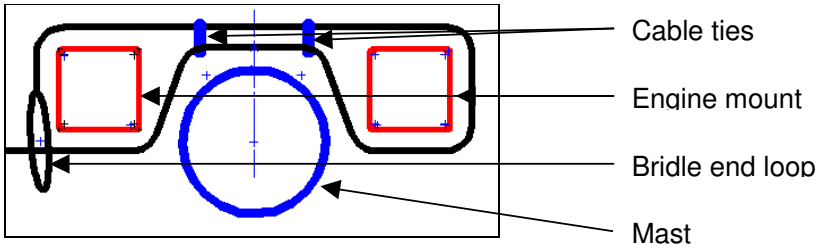


Figure 85 Schematic, Bridle Attachment

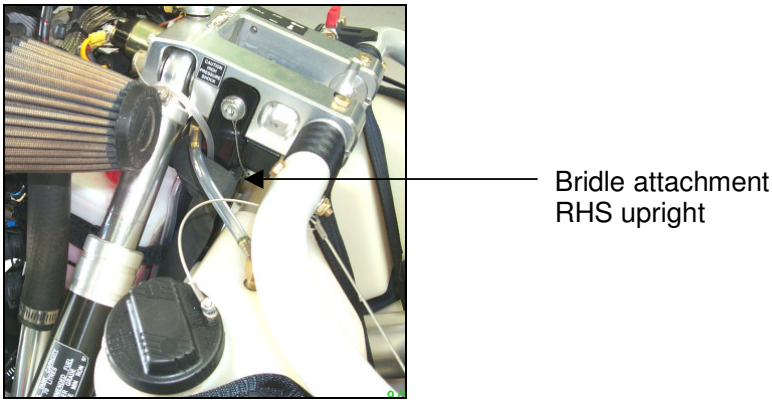


Figure 86 Side View, Bridle Attachment

Run the bridle down the RHS upright and attach to the carabiner on the parachute canister as shown in Figure 87 below. Gather together the remaining bridle and neatly cable tie in place, as shown below. The bridle can be taped with electrical tape once gathered to assist in installation.

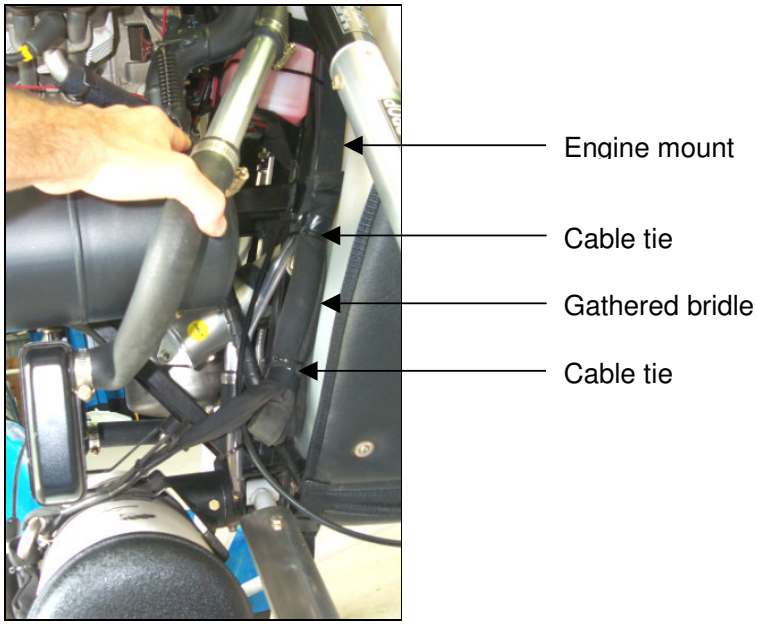


Figure 87 Gathered Bridle on Engine Mount Upright

Release Handle Attachment

If the release handle bracket is not already attached, unscrew the LHS seat frame bolt and attach bracket as shown. Using the bracket as a guide, drill the seat frame using a 4.8mm (or 3/16") drill and rivet the bracket in place (3/16" SS rivet supplied).

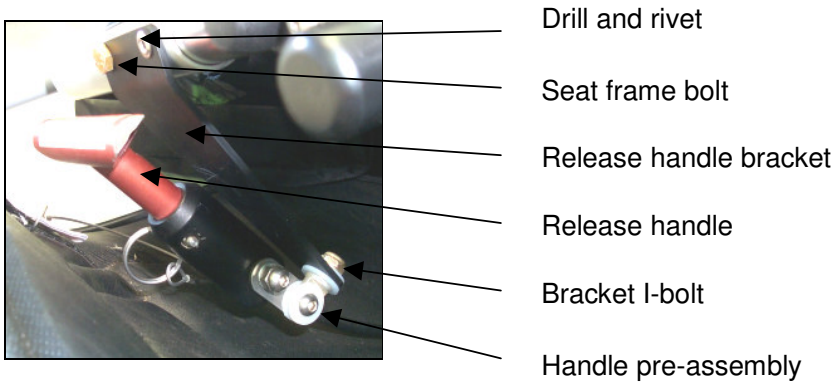


Figure 88 Release Handle Attachment

Attach the pre-assembled handle onto the bracket with the I-bolt provided, see drawing A4-5904, Sheet 2 for bracket assembly.

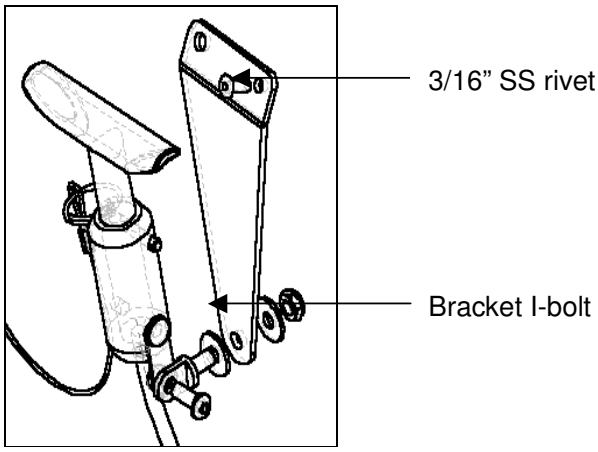


Figure 89 Release Handle Exploded View

Cable Routing and Adjustment

Route the release cable around the side of the trike as shown below. Using the hose bush and cable tie, attach the cable to the oil tank as shown in Figure 90. Ensure the cable is routed as close to the trike as possible (to avoid it being caught) without over-stressing or kinking the cable.

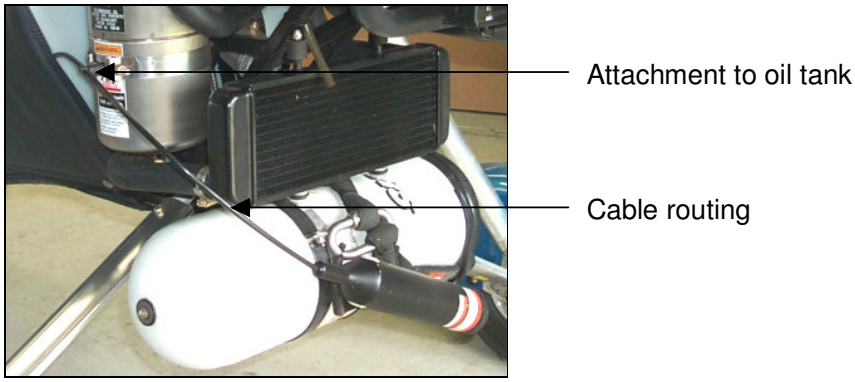


Figure 90 Cable Routing

Thread cable tie through hose bush and around the oil tank bolt and between soft side and fuel tank. The other end goes around the cable as shown. Pull the cable tie up tight to lock cable onto hose bush. Cut off the excess cable tie end.

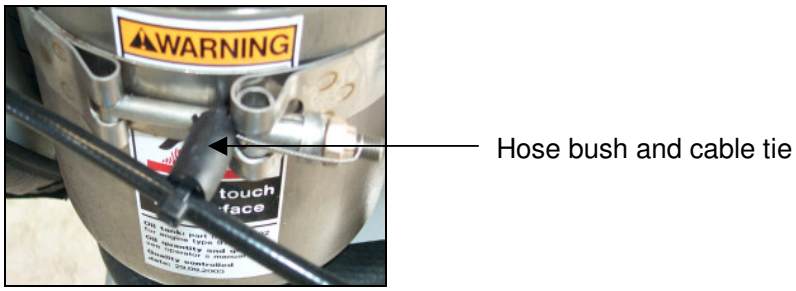


Figure 91 Cable Attachment to Oil Tank

Safety Tag Attachment and Placement

The red safety tag comes as part of the BRS parachute. Sew the 50 x 40 mm piece of Velcro loop onto the tag as shown in the figure below. Attach one end of the safety wire to the release tag and the other to the release pin, see drawing A4-6553, Sheet 3 for instructions.

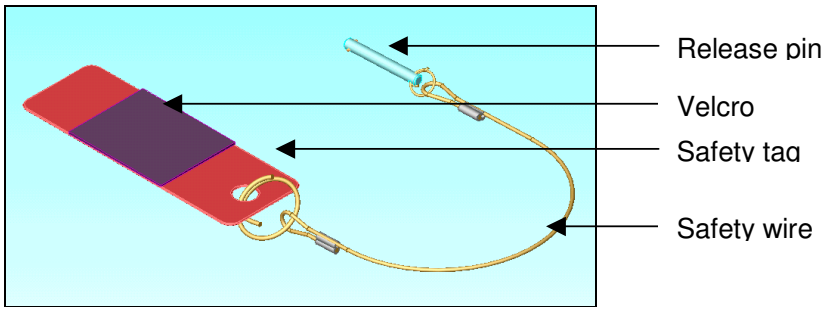


Figure 92 Safety Tag Assembly

Attach the sticky back Velcro (hook) onto the inside of the soft-side, under the red safety tag as shown in the following two figures.

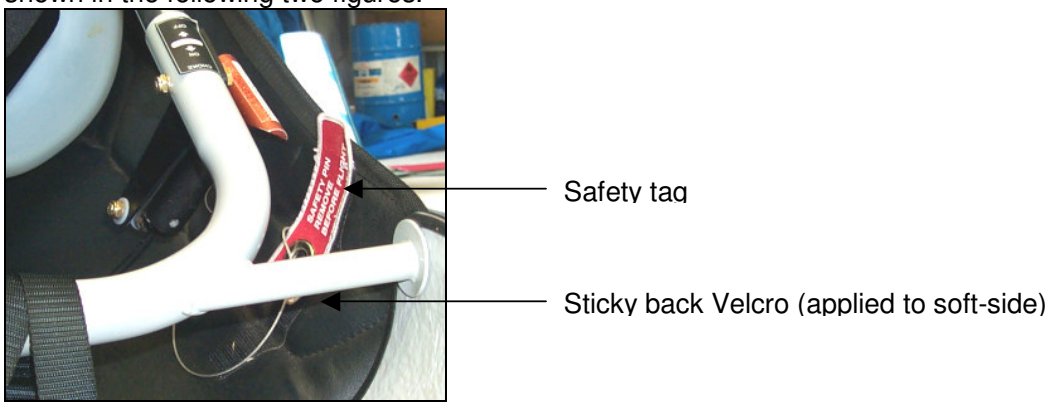


Figure 93 Safety Tag Placement

Ensure the release handle fits neatly between the seat frame and the soft side. It should be able to be reached by both occupants.

Figure 94 Release Handle

Placard Attachment

Attach the BRS warning placard on the inside of the pod as shown in figure 82.

Figure 95 Placard Placement

For XT Outback, the placards are located on the base keel beam as shown in figure 83:

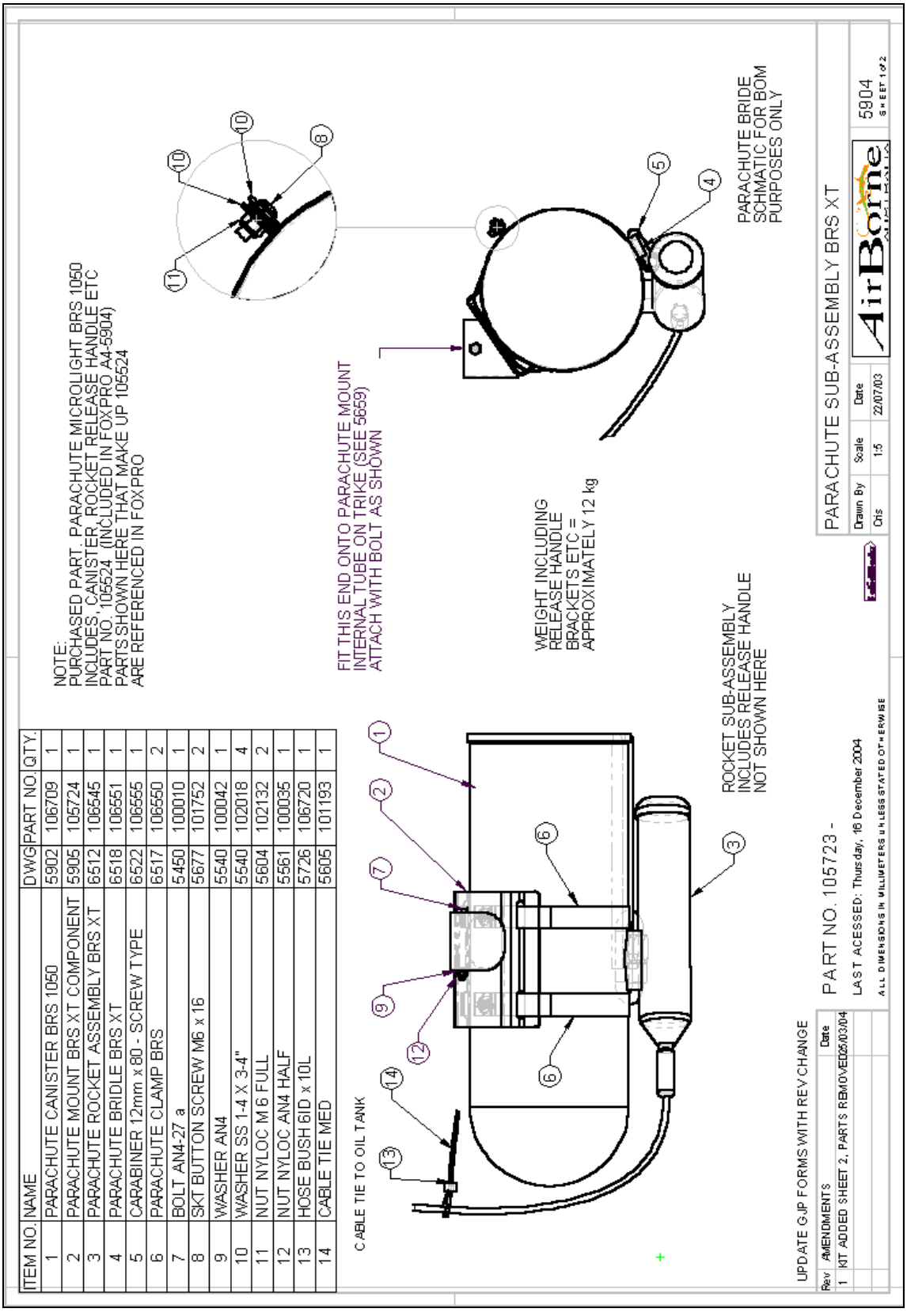
Figure 96 Placard Placement

Placards are listed from top to bottom:

Parachute placard,
Step Placard,
Limitations Placard.

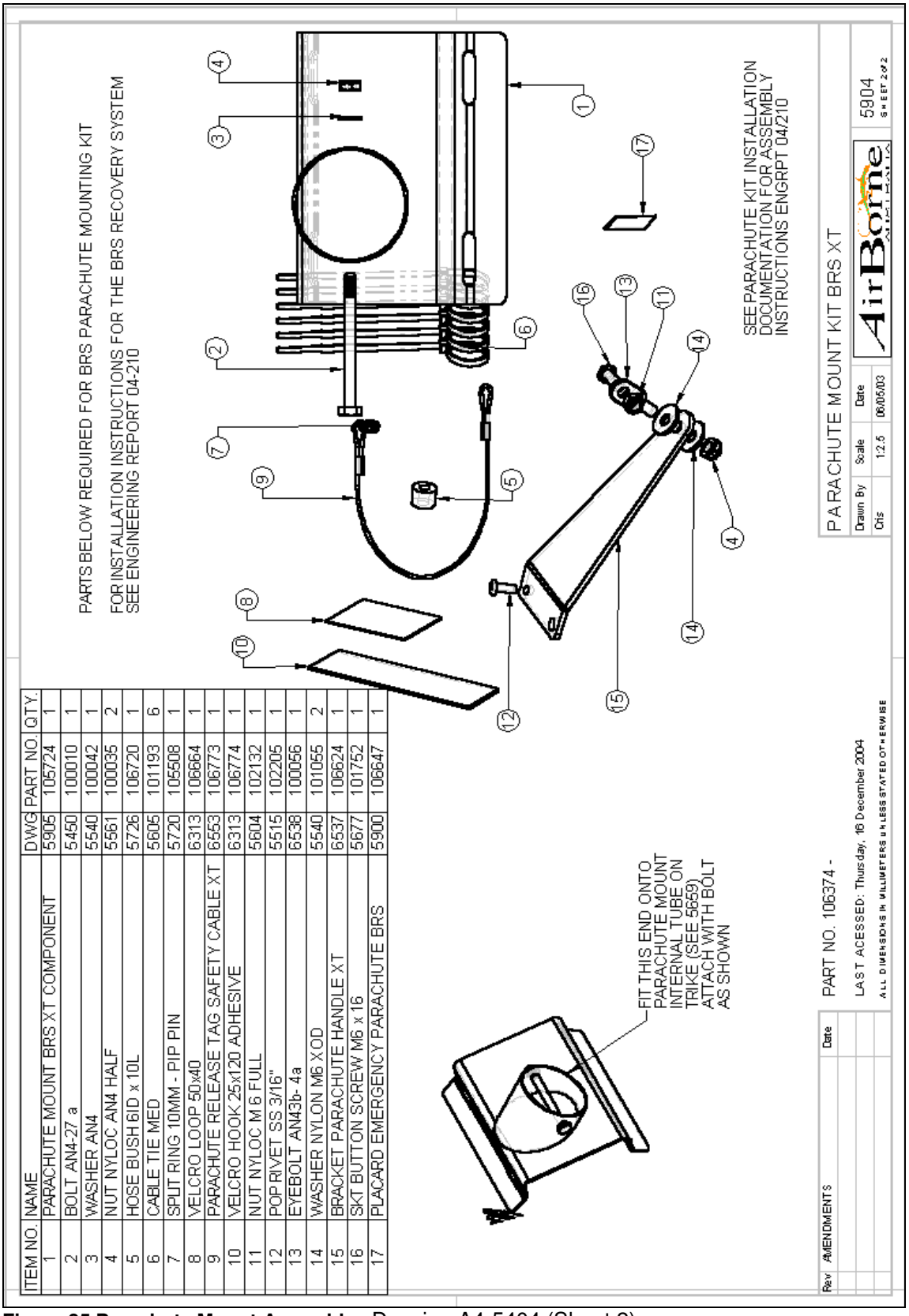
Final Inspection

1. Ensure mount bracket and internal tube is tight.
2. Ensure canister clamps are tight.
3. Ensure rocket is clamped up tight, (unable to rotate) and facing downwards, aim to clear the RHS spat.
4. Check routing of release cable, close to the side of the trike and ensure there are no kinks or sharp bends.
5. Check angle and placement of release handle. The handle can be rotated, ensure it is within reach of both occupants.
6. Release handle safety attached, pin in place.
7. Placard attached to pod as shown.



ITEM NO.	NAME	DWG	PART NO	QTY.
1	PARACHUTE CANISTER BRS 1050	5902	106709	1
2	PARACHUTE MOUNT BRS XT COMPONENT	5905	105724	1
3	PARACHUTE ROCKET ASSEMBLY BRS XT	6512	106545	1
4	PARACHUTE BRIDLE BRS XT	6518	106551	1
5	CARABINER 12mm x 80 - SCREW TYPE	6522	106555	1
6	PARACHUTE CLAMP BRS	6517	106550	2
7	BOLT AN4-27 a	5450	100010	1
8	SKT BUTTON SCREW M6 x 16	5677	101752	2
9	WASHER AN4	5540	100042	1
10	WASHER SS 1-4 X 3-4"	5540	102018	4
11	NUT NYLOC M6 FULL	5604	102132	2
12	NUT NYLOC AN4 HALF	5561	100035	1
13	HOSE BUSH 6ID x 10L	5726	106720	1
14	CABLE TIE MED	5605	101193	1

Figure 84 Parachute Assembly. Drawing A4-5404 (Sheet 1)



ITEM NO.	NAME	DWG	PART NO.	QTY.
1	PARACHUTE MOUNT BRS XT COMPONENT	5905	105724	1
2	BOLT AN4-27 a	5450	100010	1
3	WASHER AN4	5540	100042	1
4	NUT NYLOC AN4 HALF	5561	100035	2
5	HOSE BUSH 6ID x 10L	5726	106720	1
6	CABLE TIE MED	5605	101193	6
7	SPLIT RING 10MM - PIP PIN	5720	105508	1
8	VELCRO LOOP 50x40	6313	106664	1
9	PARACHUTE RELEASE TAG SAFETY CABLE XT	6553	106773	1
10	VELCRO HOOK 25x120 ADHESIVE	6313	106774	1
11	NUT NYLOC M 6 FULL	5604	102132	1
12	POP RIVET SS 3/16"	5515	102205	1
13	EYEBOLT AN43b- 4a	6538	100066	1
14	WASHER NYLON M6 XOD	5540	101055	2
15	BRACKET PARACHUTE HANDLE XT	6537	106624	1
16	SKT BUTTON SCREW M6 x 16	5677	101752	1
17	PLACARD EMERGENCY PARACHUTE BRS	5900	106647	1

Figure 85 Parachute Mount Assembly. Drawing A4-5404 (Sheet 2)

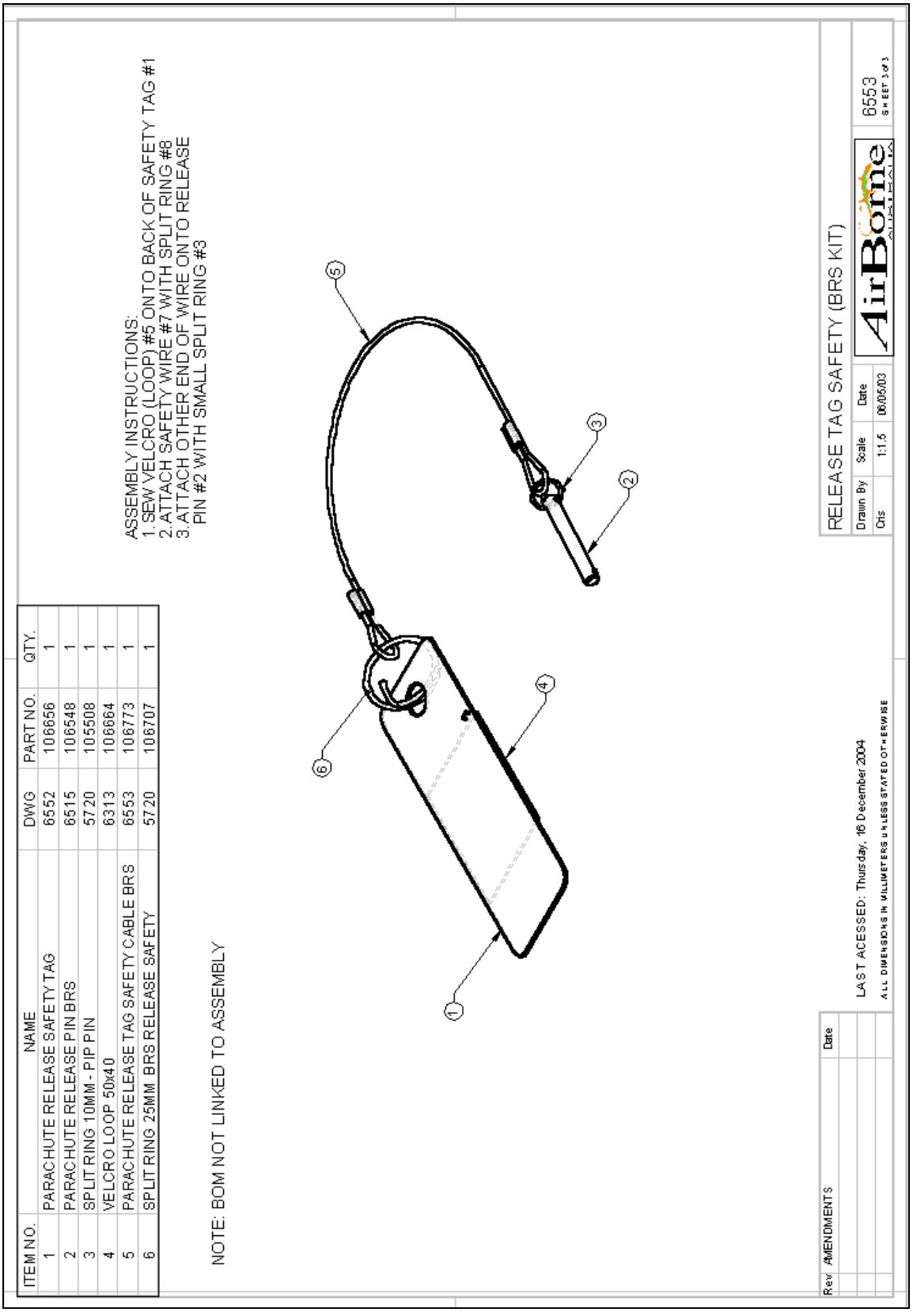


Figure 86 Parachute Mount Assembly. Drawing A4-6553 (Sheet3)

APPENDIX A – Condition Inspection Record

Aircraft: Airborne Edge XT912-B S/N: XT-912 – _____

Engine: Rotax 912 UL 2 S/N: _____

Date	Hours	Maintenance Section or Service Bulletin	Work Performed	Maintained by

APPENDIX B – Feedback Form

***Operation and Maintenance* Feedback Form**	
AirBorne AUSTRALIA	Please use a copy of this form to provide notification to the manufacturer about issues or anomalies identified during the operation or maintenance of the aircraft or in the content of the manual.
Return to AirBorne WindSports Pty Ltd PO Box 7042 Redhead New South Wales 2290 Australia Fax +61 2 4944 9199 Email trikesupport@airborne.com.au	Please provide your own contact details below
Issue Description	
If you have a proposal to remedy the issue please provide it here: Number of pages submitted including this cover page_____	

End of XT 912 Maintenance Manual