LAA TYPE ACCEPTANCE DATA SHEET
TADS 245
CYCLONE AX3K/582

Issue 1	Initial issue	Dated 24/01/18	JP

This TADS is intended as a summary of available information about the type and should be used during the build, operation and permit revalidation phases to help owners and inspectors. Although it is hoped that this document is as complete as possible, other sources may contain more up to date information, e.g. the manufacturer's website.

Section 1 contains general information about the type.

Section 2 contains information about the type that is **MANDATORY** and must be complied with.

Section 3 contains advisory information that owners and inspectors should review to help them maintain the aircraft in an airworthy condition. If due consideration and circumstances suggest that compliance with the requirements in this section can safely be deferred, is not required or not applicable, then this is a permitted judgement call. This section also provides a useful repository for advisory information gathered through defect reports and experience.

Section 1 - Introduction

1.1 UK contact

Product support is provided by P&M Aviation.

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1.2 Description

The Cyclone AX3K/582 is a two-seat aeroplane based upon the Ultralair Premier AX3 design. This French ultralight is, in turn, a derivative of the original American Weedhopper 2-axis machine. The aircraft is very similar to the Cyclone AX3/503 already cleared by the CAA for operation as a microlight aircraft under BCAR Section S. The main differences in the 582 version are the increase in maximum gross weight to 450 kg and the substitution of the higher powered Rotax 582 powerplant.

This amateur built kit aeroplane is a two seat, side by side, enclosed cabin, high wing monoplane. It has a high keel tube running the length of the airframe to which are mounted all the major components, i.e. wings, empennage and engine. It is generally similar in layout to the Thruster and is equipped with a tricycle type undercarriage.

It is powered by an upright Rotax 582 liquid cooled two stroke engine with 3.47:1 type E gear reduction unit, rated at 64 BHP at 6500 rpm. One aircraft on the LAA fleet has been powered by a Rotax 618 engine.

The standard propeller is a GSC Tech III 72" diameter three bladed ground adjustable unit. This propeller has wooden blades, plastic root fittings and an aluminium hub. Note that the only propeller(s) approved for an individual aircraft are those listed on the individual aircraft's Operating Limitations document.

The aircraft has a single control column mounted centrally in the cockpit and two sets of rudder pedals. The aircraft is fitted with a non-structural cockpit fairing and has forward hinged removable doors. There is a 28 litre fuel tank mounted on the back of each cockpit seat. The main undercarriage tube is of composite construction.

The aeroplane is generally constructed of D65S aluminium tube (equivalent to 6261 T6) covered on wings, tail and fuselage by Ultralam man-made fabric pre-sewn envelopes. This 155 gsm man-made fabric consists of a polyester substrate with a PVF film covering and is produced by GTS Flexible Materials Ltd of Bracknell.

The Cyclone AX3 components were largely manufactured by Ultralair SA in France, who had been producing the aircraft for many years. The modifications required to meet the Cyclone AX3/582 design standard were incorporated into the kit by Cyclone Airsports Ltd, the UK importer. Cyclone Airsports Ltd is no more and aircraft support is now provided by P&M Aviation (P&M Aviation itself being a merger of Pegasus Aviation and Mainair Sports).

The aircraft is classed as a microlight (previously termed group D).

Section 2 – Mandatory information for owners, operators and inspectors

At all times, responsibility for the maintenance and airworthiness of an aircraft rests with the owner. Condition No 3 of a Permit to Fly requires that: *"the aircraft shall be maintained in an airworthy condition".*

2.1 Fast Build Kit 51% Compliance

Not applicable

2.2 Build Manual

The aircraft kit is supplied with an operators' manual which includes a build manual, pilot's notes and maintenance notes, which are considered satisfactory.

2.3 Build Inspections

Build inspection schedule: 9.

Inspector approval codes: A-A, A-M, K or M. Inspector signing off final inspection also requires 'first flight' endorsement.

2.4 Flight Manual

The aircraft kit is supplied with an operators' manual which includes a build manual, pilot's notes and maintenance notes, which are considered satisfactory.

2.5 Mandatory Permit Directives

The following MPDs are applicable specifically to this aircraft type:

MPD Number	*Description*
MPD 1997-012	Main beam fatigue failure
MPD 1998-005	Aileron control system
MPD 1998-014	Rudder bolt lifing:

Also check the LAA website for MPDs that are non-type specific (TL2.22).

2.6 LAA Required Modifications (including LAA issued AILs, SBs, etc)

For information purposes, the following list defines the differences between the AX3K/582 model and the AX3/503 model as cleared as a microlight under BCAR Section S:

1. The AX3K/582 is fitted with a Rotax 582 engine with Rotax E type gearbox of 3.47:1 reduction and GSC Tech-11 72" diameter propeller.
2. A Facet electric fuel pump of the type recommended by Rotax has been fitted to ensure fuel flow can be maintained in the event of a failure of the Mikuni pulse-pressure operated pump. The pump is operated by a cockpit switch in the normal fashion.
3. The Cyclone coolant carburettor heater unit is fitted to each carburettor, providing a permanent source of heat to prevent ice forming on the carburettor components, without significantly raising the temperature of the intake air.
4. A Cyclone intake air silencer has been fitted.
5. A modified brake system has been fitted to at least one aircraft: hand operated by a transverse cable rather than a foot pedal.
6. Suspension stops have been omitted. These items were added to the AX3/503 to satisfy the requirements of BCAR S but due to the different requirements of the corresponding section of JAR-VLA these are not considered necessary for the AX3K/582 variant.
7. Twin fuel tanks are fitted. These are mounted adjacent to one another and are connected together at their base so that fuel is fed simultaneously from both tanks. The tanks do not share a common vent, but the vents are close together and it is considered that the installation is at least as reliable as a single tank, single vent installation.
8. Maximum total weight authorised is raised from 390 kg to 450 kg and CofG range moved forward. Forward limit moved from 888 mm aft of datum to 815 mm aft of datum. Aft CofG limit moved from 976 mm aft of datum to 910 mm aft of datum.
9. Additional flight and engine instrumentation is fitted.

2.7 Additional engine operating limitations to be placarded or shown by instrument markings

Notes:

- Refer to the engine manufacturer's latest documentation for the definitive parameter values and recommended instruments.
- Where an instrument is not fitted, the limit need not be displayed.

2.8 Control surface deflections

Ailerons	Up	24°
	Down	24°
Elevators	Up	27°
	Down	23°
Rudder	Left	37°
	Right	37°

2.9 Operating Limitations and Placards

(Note that the wording on an individual aircraft's Operating Limitations document takes precedence, if different.)

1. Maximum number of occupants authorised to be carried: Two

2. The aircraft must be operated in compliance with the following operating limitations, which shall be displayed in the cockpit by means of placards or instrument markings:

2.1 Aerobatic Limitations

Aerobatic manoeuvres are prohibited.
Intentional spinning is prohibited.

2.2 Loading Limitations

Maximum Total Weight Authorised: 450 kg
CG Range: 815 mm to 910 mm aft of datum.
Datum Point is: Centreline of the bolt attaching wing leading edge to keel tube.

2.3 Engine Limitations

Rotax 582:

Maximum engine RPM: 6800
Maximum continuous engine RPM: 6500
Minimum static engine RPM: 6000

Rotax 618:

Maximum engine RPM: 7000
Maximum continuous engine RPM: 6700
Minimum static engine RPM: 6000

2.4 Airspeed Limitations

Maximum Indicated Airspeed (V_{NE}): 90 mph

2.5 Other Limitations

The aircraft shall be flown by day and under Visual Flight Rules only.
Smoking in the aircraft is prohibited.

Additional Placards:

"Occupant Warning - This Aircraft has not been Certificated to an International Requirement"

A fireproof identification plate must be fitted to fuselage, engraved or stamped with aircraft's registration letters.

2.10 Maximum permitted empty weight

The maximum permitted empty weight for the type is as follows:

1. Rotax 582: 260 kg
2. Rotax 618: 255 kg

Section 3 – Advice to owners, operators and inspectors

3.1 Maintenance Manual

The aircraft kit is supplied with an operators' manual which includes a build manual, pilot's notes and maintenance notes, which are considered satisfactory.

Continuing airworthiness information including a Parts Catalogue and Service Bulletins is available at P&M Aviation Downloads.

It should be noted that some of the information may be for the AX3/503 version but may still be useful reference material for the AX3/582.

3.2 Standard Options

There are no standard options for the aircraft type. Any modifications from the original kit require a mod application through LAA Engineering.

3.3 Manufacturer's Information (including Service Bulletins, Service Letters, etc)

Service Bulletin	*Subject*
SB No AX2010	Aileron control system
SB No AX2016	Rudder bolt lifing
SB No AX3001	Fuel tank drain outlet
SB No 3	Fuel pump drain
SB No 4	Magneto switches
SB No 5	Saddle washers
SB No 6	Throttle icing
SB No 7	Main beam fatigue failure

In the absence of any over-riding LAA classification, inspections and modifications published by the manufacturer should be satisfied according to the recommendation of the manufacturer. It is the owner's responsibility to be aware of and supply such information to their Inspector.

3.4 Special Inspection Points

1. MPD 1997-012 Main beam fatigue failure

   Examples of fatigue cracking have been reported on the main beam (member running beneath the seats, connecting the lower cockpit tubes together and to which the wing struts are attached), of the Cyclone AX3. This MPD requires dye-penetrant inspection and eventual mandatory replacement. Compliance with this MPD must be entered into the aircraft log book. Pegasus Aviation SB No 7 refers.

2. MPD 1998-005 Aileron control system

   There has been an example of a failure of an aileron return pulley bracket attachment, close to its mounting hole. In addition, it has been noticed that it is possible for the root batten extraction cord loop to engage over the aileron horn. Aileron control could be affected in both cases. This MPD is issued to require inspection and modification of AX3 and AX2000 aircraft. Compliance with this MPD must be entered into the aircraft log book. Pegasus Aviation SB No AX2010 refers.

3. MPD 1998-014 Rudder bolt lifing

   There has been an example of cracking of one of the bolts attaching the rudder bracket to the fuselage. This was determined to have been a fatigue failure. This MPD requires the addition of saddle washers and an introduction of a bolt replacement life of 1000 hours. Compliance with this MPD must be entered into the aircraft log book. Pegasus Aviation SB No AX2016 refers.

4. Other inspection points of note are covered in the Service Bulletins listed in Para 3.3

3.5 Special Test Flying Issues

Handling is considered typical of the type with no known issues.

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Please report any errors or omissions to LAA Engineering: engineering@laa.uk.com