

**LAA TYPE ACCEPTANCE DATA SHEET      TADS 334**  
**ALPI PIONEER 200 & PIONEER 200-M**

Issue 4			
Revision A	New format. Addition of 200-M microlight variant.	Dated 11/8/10	JV

## **Section 1 - Introduction**

### 1.1 UK contact

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### 1.2 Description

The Pioneer 200 is a small, two-seat aircraft supplied in the form of a fast-build kit for amateur construction, available from manufacturers Alpi Aviation. The only engine currently accepted by the LAA is the Rotax 912-UL. The Pioneer 200 is a low wing cantilever monoplane of conventional configuration, seating two side-by-side in an enclosed cockpit. The Pioneer 200 airframe is constructed of wood, using traditional construction techniques throughout. The wings and control surfaces are fabric covered.

The wings are of single spar construction, manufactured in two pieces and designed for de-rigging by the pilot for storage purposes. The leading edges are plywood covered forming a conventional D-box.

A fixed tricycle undercarriage is fitted. The large plain flaps are operated using an electric ram, the position being indicated by the position of the upper surface of the flap in relation to marks on the aileron root-ends. The ailerons, elevator and rudder are operated by a conventional system of cables, pulleys, bellcranks and pushrods. The elevators are fitted with a mechanically operated trim tab operated via a push-pull cable. Trim position is indicated by the position of the operating lever on the cockpit console.

The main undercarriage legs utilise cantilever spring suspension, while the steerable noseleg is rubber sprung. Hydraulic wheel brakes are fitted to each mainwheel, operated simultaneously by a single lever in the cockpit.

A Rotax 912-UL engine is fitted, with fixed-pitch, two-bladed wood propeller or a variable pitch AVY2HSTD propeller. The engine is mounted using a conventional welded steel tube frame which also mounts the nosewheel undercarriage. The engine installation is enclosed within conventional glass fibre cowlings.

Note that the only propeller(s) approved for an individual aircraft are those listed on the individual aircraft's Operating Limitations document or in the PTL/1 (Propeller Type List) for the type.

Following the load testing and other parts of the evaluation, a number of important modifications have been made to the aircraft in order to qualify for a LAA Permit to Fly, including a significant redesign of the flying control system. The modifications are listed in Appendix 12 of the LAA type acceptance documentation. Due to the extent of the modifications required for UK acceptance, it is not considered feasible for a Pioneer 200 built without these modifications to be retrospectively so modified.

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The basic Pioneer 200 is classified as an SEP Aeroplane in the UK; however, a microlight version of the type is available and approved by the LAA. The microlight version is designated a Pioneer 200-M and requires the incorporation of a number of modifications (detailed in Section 2.6 below). Due to weight consideration, variable pitch propellers are unlikely to be possible in the microlight version.

## **Section 2 – Mandatory information for owners, operators and inspectors**

### 2.1 Fast Build Kit 51% Compliance

The technical leaflet TL.11 shows the contents of the accepted fast build kit.

### 2.2 Build Manual

A special UK Build Manual has been created by Pioneer Aviation. A supplement is supplied for the 200-M variant.

### 2.3 Build Inspections

Build inspection schedule 54 (Pioneer 200 aircraft).

Inspector approval codes A-A or A-W or A-K (or M for the 200-M version). Inspector signing off final inspection also requires 'first flight' endorsement.

### 2.4 Flight Manual

Special UK Flight Manual supplement is supplied with kit.

### 2.5 Mandatory Permit Directives

None applicable specifically to this aircraft type.

Also check the LAA website for MPDs that are non-type specific (e.g. engine and equipment).

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

A great many modifications were required to the Italian design to qualify for LAA acceptance, too many to list here. These modifications are incorporated in the kit as supplied by Pioneer Aviation UK. Due to the extent of the modifications, it would not be feasible to retrospectively modify a kit or finished aircraft that was not supplied to the UK specification.

Modifications required to be incorporated for the Pioneer 200-M variant:

1. 34 pairs of vortex generators fitted along the entire length of both wing leading edges to reduce stall speed. The vortex generators are attached using double-sided self adhesive tape.
2. Flap gap seals and leading edge shrouds added to top and bottom surfaces, to reduce stall speed with flaps down. The upper gap seals are of moulded fibreglass construction, shaped to follow the profile of the flap as it deflects,

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and are screwed to the wing rear spar. The bottom seals are of self adhesive tape, running along the flap hinge line.

3. The wooden crew seats are replaced by lightweight fabric-type seats for reduced weight.
4. The steel wheel hubs have been replaced by lightweight alternative type aluminium alloy wheel hubs.
5. The ASI has been replaced by a Winter type ASI with an expanded scale, for better legibility within the flap operating speed range.
6. The maximum gross weight has been reduced to 450 kg and the cg range revised to reflect the lesser payload possible with the reduced max gross weight.
7. The elevator trim tab range of travel has been amended to provide increased up-trim effect for the full-flap case.
8. Gascolator and electric fuel pump removed. Conventional in-line filter substituted.
9. Lightweight grp engine cowlings and wing tips substituted.
10. Intake air box replaced by twin conical air filters.
11. One canopy gas strut deleted.
12. Electric elevator trim substituted as fitted to Pioneer 300.
13. Stainless steel exhaust system replaced with titanium exhaust system.

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

Refer to the engine manufacturer's latest documentation for the definitive parameter values.)

With Rotax 912-UL engine:

Maximum CHT: 150°C

Max Coolant Temp: 120°C (with 50/50 Glycol/water coolant)

Oil Temp Limits: 50°C to 140°C (Normal 90-110°C)

Oil Pressure: 2-5 bar, normal operation (7 bar maximum)

Minimum Fuel Pressure: 0.15 bar

**2.8 Control surface deflections**

<i>Ailerons</i>	Up: 90 mm -0/+5 Down: 65mm -0/+5
<i>Elevators</i>	Up: 20° ±2° Down: 12° -1°/+2°
<i>Elevator tab</i>	Up: TBC Down: TBC
<i>Rudder</i>	Left 25° ±2° Right 25° ±2°
<i>Flap</i>	Down 30° ±3°

**2.9 Operating Limitations and Placards**

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

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*Pioneer 200:*

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: 520 kg  
CG Range: forward limit 717 mm aft of datum at gross weights up to 360 kg, 800 mm aft of datum at 520 kg gross weight, with linear variation between these points at intermediate weights.  
Aft limit 920 mm aft of datum.  
Datum Point is: front face of the firewall.
  - 2.3 Engine Limitations  
Maximum Engine RPM: 5800  
Maximum continuous engine RPM: 5500
  - 2.4 Airspeed Limitations  
Maximum Indicated Airspeed ( $V_{NE}$ ): 125 knots IAS  
Max Indicated Airspeed Flaps Extended: 60 knots IAS  
Maximum Indicated Airspeed, Rough Air ( $V_{NO}$ ): 116 knots IAS  
Maximum Manoeuvring Speed ( $V_a$ ): 108 knots IAS
  - 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.

*Pioneer 200-M:*

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  
The aeroplane is permitted to fly only for non-aerobatic operation. In this context non-aerobatic operation includes:
    - i) Any manoeuvre necessary for normal flying

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- ii) Intentional stalls from level flight
- iii) Steep turns in which the angle of bank doesn't exceed 60 degrees

Intentional spinning is prohibited.

2.2 Loading Limitations

Maximum Total Weight Authorised: 450 kg  
CG Range: forward limit 720 mm aft of datum at gross weights up to 360 kg, 820 mm aft of datum at 450 kg gross weight, with linear variation between these points at intermediate weights.  
Aft limit 900 mm aft of datum.  
Datum Point is: front face of the firewall.

2.4 Engine Limitations

Maximum Engine RPM: 5800  
Maximum continuous engine RPM: 5500

2.4 Airspeed Limitations

Maximum Indicated Airspeed ( $V_{NE}$ ): 125 knots IAS  
Max Indicated Airspeed Flaps Extended: 60 knots IAS  
Maximum Indicated Airspeed, Rough Air ( $V_{NO}$ ): 116 knots IAS  
Maximum Manoeuvring Speed ( $V_a$ ): 108 knots IAS

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

<i>Model</i>	<i>Engine</i>	<i>Max empty weight</i>
Pioneer 200	Rotax 912-UL	338 kg
Pioneer 200-M	Rotax 912-UL	268 kg

**Section 3 – Advice to owners, operators and inspectors**

3.1 Maintenance Manual

Maintenance Manual includes manufacturer's maintenance schedule for the airframe. For airframe rigging information consult build manual. For engine maintenance consult engine manufacturer's schedule.

3.2 Standard Options

Nil known.

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

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.

Nil known for the airframe.

3.4 Special Inspection Points

- With Rotax engine fitted, Rotax 912 series installation checklist to be completed (apart from flight test section) as part of final inspections prior to applying for Permit to Fly.
- Reduction of friction in elevator control system. With a spring balance lifting the elevator trailing edge near the aircraft centerline, the force required to raise the elevator through neutral should be no more than 0.15 Kg more than the force required to allow it to fall gently through neutral (eg 1.4 Kg to fall, 1.55 Kg to raise).

3.5 Special Test Flying Issues

- Handling is straightforward and the aircraft is extremely docile and easy to fly.
- The sense of operation of the brake lever is unconventional and can seem strange initially but pilots soon become accustomed to its operation.
- During the prototype flight testing, the friction in the elevator circuit had to be reduced to provide satisfactory longitudinal stability.
- During the prototype flight testing, the friction in the trim system had to be increased to prevent the tab blowing back. To compensate for this, the length of the trim tab lever had to be increased to allow the pilot to move the lever easily with the increased friction setting.
- The stall speeds indicated on the UK prototype were found to be lower than the figures in the flight manual.

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