LAA TYPE ACCEPTANCE DATA SHEET
TADS 189, A, B, C, D
AVID (VARIOUS)

Issue 2	Addition of MOD/189/008	Dated 05/02/21	JV
Revision A	Addition of Flaperon Mass balance Inspection point. Minor editorial changes.	Dated 24/03/21	MR

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

This TADS covers the following Avid models:

LAA Type Number	*Type Name*
189	Avid Flyer, C, Commuter, Aerobat (modified)
189A	Avid Flyer (modified)
189B	Avid Hauler Mk 4
189C	Avid Speedwing (modified), Speedwing Mk 4
189D	Avid Flyer Model AV

2.6 UK contact

There is no UK importer at this time.

The factory contact information at the time of this TADS update is as follows:

Tel: n/a
Email: mmendick@avidkitplanes.com
Website: https://avidkitplanes.com/

1.2 Description

The aircraft is a two seat (side by side) high wing design normally configured with a conventional fixed tail wheel undercarriage although some nose wheel variants are also available. The Avid was designed by Dean Wilson in 1985 and originally manufactured in kit form by Light Aero Inc of Idaho USA and the design spawned many similar types such as the Denney Kitfox. Most UK kits were manufactured by Avid Aircraft Inc of Caldwell, Idaho and with a few exceptions are made up of C model and Mk 4 types. Over 50 kits were imported into the UK and Eire. The company has changed hands a couple of times over the years and effectively folded in around 2001.

More recently, the rights to Avid Aircraft were acquired by Mark Mendick of Unionville, Iowa, USA. At the time of this TADS update, the plan is to start producing 'Mark IV' kits again in 2018 and can supply parts for all models.

In general the aircraft types can be identified as those with a radiator fitted against the firewall (Model B and C) and those with a pair of radiators immediately behind the propeller (Mk 4). There are a small number of A models which defy even this simple description.

The fuselage is manufactured from welded 4130 Chro-Moly steel tube rigid joint truss structure. The wings consist of twin 6061 aluminium alloy spars with plywood ribs bonded with epoxy adhesive and fibreglass wing tips. Early marques had additional nose ribs and wire trailing edges that were later replaced with aluminium sheet leading and formed trailing edges. Wing control surfaces are flaperons which combine ailerons and flap functions. Welded 4130 is used for steel lift struts, main gear legs and tail surface assemblies. Push/pull tubes and bell-cranks link the flaperons and elevator to control columns, single wire cables link rudder to pedals. All surfaces are covered with 1.6 oz Dacron fabric, dope sealed and painted.

Average empty weight for B & C models is 485 lbs and 550 lbs for Mk 4 types. Some builders have exceeded these figures with extras and suffer reduced climb performance as a result.

UK Avids have been fitted with a variety of engines including various Rotax 2-Strokes, Rotax 912UL, Jabiru 2200A, Hirth and BMW R100 engines. Propellers from a number of manufacturers have been installed including amongst others: GSC, GT Propellers, Ivoprop, Lodge and Warp Drive.

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.

The aircraft is classed as an SEP ("Group A") type.

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, these aircraft are only accepted in slow-build kit form with the fuselage and tail surfaces supplied as pre-welded assembles but the wing requiring assembly from components.

2.2 Build Manual

A build manual is supplied with the kit.

2.3 Build Inspections

Build inspection schedule: 9 (tubular aircraft)
Inspector approval codes A-A, A-M or K. The Inspector signing off final inspection also requires 'first flight' endorsement.

2.4 Flight Manual

There is no specific flight manual for the Avid and with so many different airframe/powerplant/propeller/equipment combinations each individual aircraft is likely to behave differently to another.

There is an owners' forum, AvidFoxFlyers, which might provide useful (although unverified) information.

2.5 Mandatory Permit Directives

There is one MPD applicable specifically to this aircraft type:

MPD 2002-002	Provision of Elevator Down Stop

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

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

The following modifications and inspection procedures are considered mandatory by the LAA:

PFA Letter 17/06/92	Flaperon rigging method
PFA MOD/189/001	Avid noseleg reinforcement
PFA MOD/189/002	Avid seat mountings/control restriction
PFA MOD/189/003	Cracks in flaperon hanger
PFA MOD/189/005	Fuel shutoff valve – fuel flow restriction
PFA MOD/189/006	Provision of elevator down stop
PFA MOD/189/007	Lift strut threaded rod end inspection
PFA MOD/189/008	Nosegear bolt alignment

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

Notes:

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

2.8 Control surface deflections

The aircraft build manual should be consulted for airframe specific control deflections due to the variety of airframe configurations.

Note: flap deflection must be limited to a maximum of 15°

2.9 Operating Limitations and Placards

Note: Due to the wide variety of airframe configuration, engine and propeller combinations found across the Avid fleet, the wording on an individual aircraft's Operating Limitations document takes precedence.

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: Refer to Operating Limitations
CG Range: Refer to Operating Limitations
Datum Point is: Refer to Operating Limitations

2.3 Engine Limitations

Maximum Engine RPM: Refer to Operating Limitations
Maximum continuous engine RPM: Refer to Operating Limitations

2.4 Airspeed Limitations

Maximum Indicated Airspeed (V_{NE}): Refer to Operating Limitations
Max Indicated Airspeed Flaps Extended: Refer to Operating Limitations

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

Not applicable.

Section 3 – Advice to owners, operators and inspectors

3.1 Maintenance Manual

There is no dedicated maintenance manual provided for the aircraft and with a wide variety of engine and propeller combinations available, all available manufacturers' maintenance information should be referenced wherever possible. The LAA Generic Maintenance Schedule (based on the CAA LAMS schedule) should be used as a guide for required maintenance inspections.

There may be some useful (though unverified) information found on the AvidFoxFlyers forum.

For Rotax powered aircraft, the Rotax Technical Documentation online site provides access to all current Rotax engine information.

3.2 Manufacturer's/Standard Options

None.

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.

Reference	Description	Applicability
Avid Directory AD#004	Aileron control rod end binding	All variants
Avid Directory AD#005	Jury strut attachment	All variants
Avid Directory AD#006	Wooden propeller installations	All aircraft fitted with wooden propellers
Avid Directory AD#007	Correct installation of flaperon counterweights and lift strut fairings	All variants
Avid Directory AD#008	Possible contamination of fibreglass fuel tanks	Avid Flyer B, C, Mk IV s/n 300 and up, any aircraft with fibreglass fuel tanks
Avid Directory AD#009	Correct installation of aluminium leading edge	All aircraft with aluminium leading edges
Service Letter	Fuel venting issues	All aircraft with fibreglass fuel tanks
Service Letter	Possible damage to turtle decks	All variants
Safety Notice 27/04/89	Correct installation of Peery propellers	All aircraft fitted with Peery propellers
Safety Notice 16/05/89	Various subjects	All variants

3.4 Special Inspection Points

1. PFA Letter: Avid Fuel System Contamination This information requires a 'one time' inspection for contamination of fuel systems in Avids with GRP fuel tanks. Repeat inspection whenever appropriate.

2. PFA MOD/189/004 concerns the inspection of elevator push rod guide wear.

3. Circumferential cracking has previously been discovered that had developed from a through bolt hole used to retain a stop bushing (or lower bearing sleeve) on the nose gear strut. These holes had been drilled aligned with the fore and aft axis of the aircraft and were in the area of highest stress whenever the gear flexed, for example, during touchdown. This was despite the recommendation provided in PFA MOD/189/001, part of which advises that the bolt hole should be drilled perpendicular to the line of flight, rather than fore and aft. Inspectors should check the alignment of the bolt holes in question on any nose leg equipped Avid aircraft that they inspect. If the bolt holes are incorrectly aligned, cease flying the aircraft immediately and contact LAA Engineering for appropriate advice.

4. Specifically all wing pivot and securing bolts should be well lubricated and examined regularly for wear especially if the wings are folded frequently.

5. Refer to the construction manual with reference to the flaperon setting method described in PFA Letter 17/06/92. Minimise control stiction, lost motion etc. by careful fitting of links, bell-cranks, bearings, etc.

6. Ensure that the elevator push/pull tube front rod end bearing does not "wrap up" on control column torque tube at full nose down position. Fitting an over-travel stop is advisable to prevent stressing the threaded end of the push/pull tube due to gust loads whilst parked or trailering without adequate surface locks fitted.

7. All Avids have particularly light controls and undue friction can rob control feel. In particular ensure rudder system is free otherwise directional stability will be impaired.

8. Flaperon maximum deflection should be set to 15 degrees otherwise loss of roll control may be experienced.

9. Aircraft that are towed and rigged frequently will often show wear in the wing pickup trunnions or pins. Replacement of all major wing attachment hinge pins and bolts should be carried at reasonable intervals.

10. Examination of the weld clusters particularly around the upper carry through tube assemblies is recommended.

11. Bungees should be regularly examined for fraying around the exit points in the fuselage especially if their clearances are small, Avid Safety Notice 16/5/89 refers.

12. Wheel bearings can lose adjustment quickly if the rear bearing spacer tubes cut into the disc brake mounting plates. Interspersing a large diameter steel washer prevents this occurring and ensures that braking efficiency isn't lost through poor adjustment.

13. Disc brake pads seized on guide pins often cause poor braking.

14. Regular visual inspections of the rod ends (parts F-40 and F-39) in the aileron control stick sub-assembly should be performed. A proper installation should allow the rod end to pivot freely on its ball socket with no binding or contact with

any adjacent parts, throughout the control stick's range of movement. Refer to Avid Directory AD#004 for further information.

15. It is important to ensure that jury struts remain tightly fastened to the wing lift struts. Refer to Avid Directory AD#005 for further information.

16. As with other Rotax equipped aircraft ozone damage to the rubber manifold connectors to the Bing carburettors is prevalent especially on older models with often the front unit showing worst cracking with age. Similarly rubber fuel feeder pipes and pulse line to the fuel pump are often found to be tired on many examples at renewal inspections.

17. Windscreens often exhibit cracking around the front carry through tube clearances and can be expected to require replacement as stop holes are rarely successful. Making a new screen using the old as a pattern is a simple task. Similarly door window panels suffer loss of clarity from fuel spillage which attacks the Lexan material. Using PVC base materials as replacements offers protection from fuel damage.

18. Cracked exhaust brackets occur on examples with poor initial construction and suggest either excessive engine vibration or over stiff mountings.

19. Exhaust ball joints on Rotax systems must be properly lubricated with Copperslip.

20. Broken radiator mount tabs on Mk 4 models are generally caused by loss of flexibility in the coolant hoses particularly in the port side. A useful source of replacements can be made from Morris Minor top and bottom hoses that have the correct internal diameters.

21. Heavy landings cause fuselage distortion that is easily determined. In the case of a tail-dragger the ladder section ahead of the seat front is sometimes distorted and pulled downwards. Bent members may be cut out and replaced with minimal fabric stripping. Tricycle undercarriage types often damage the section of bottom longeron aft of the main wing strut pickup through buckling and sometimes the diagonal tube running from the pickup cluster to the seatback centre similarly through buckling. In either case repair methods detailed in AC43.13 should be employed.

22. Due to ground loops etc, some aircraft have occasioned damaged flaperon hangers that may be repaired by approved methods agreed with the LAA. Refer to PFA MOD/189/003 for further information.

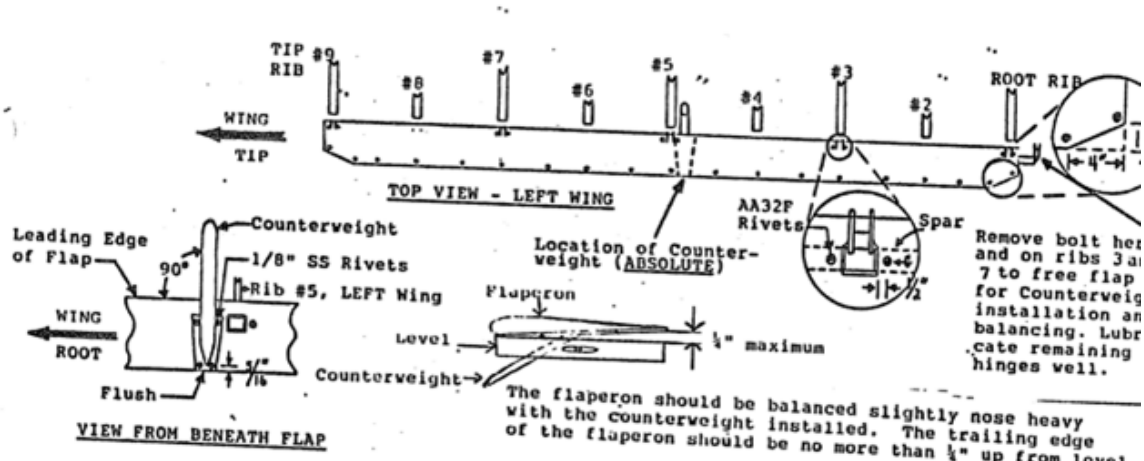
23. Due to the difficulty of proper lubrication, nose legs are prone to stiffness and possible seizure resulting in flight handling difficulties when the leg and wheel fail to centralise when airborne. Nose legs should be regularly checked for stiffness and the leg dismantled and lubricated if necessary.

24. The biggest single factor in reported accidents has been loss of control during landing, but loss of power or complete engine failure has featured in half a dozen or so forced landings.

25. Aircraft have been lost to fire when fuel system leaks have developed, so inspectors should pay particular attention to ensuring the integrity of fuel system pipes and connections.

26. Flaperon Mass Balance – It has become apparent that due to the aging fleet of Avid types that understanding of the correct procedure for correctly balancing the flaperons may be less widespread, potentially leading to improperly balanced surfaces. Note that the flaperon mass balances for Avid types are

provided slightly overweight and require 'trimming' down to the correct weight to balance a particular aircrafts flaperon(s). An extract for the original guidance can be seen below.



1) Free the flaperon by unbolting as indicated above.
2) Rotate the flap up to 90 degrees to aid the installation process.
3) The counterweight attaching flange should be drilled for 4 rivets as shown above, filed and sanded smooth, with all corners rounded. Align the trailing edge of the flange flush with the trailing edge of the flaperon, and 90 degrees to the length of the flaperon.
4) Using only two clecos in the forward flange holes (into the flaperon spar), attach the counterweight to the flaperon temporarily.
5) Cleco the counterweight on the inboard side of the flaperon hinge at #5 rib on the LEFT wing.
6) Cleco the counterweight on the outboard side of the flaperon hinge at #5 rib on the RIGHT wing.
7) Level the flaperon, and balance it by trimming away small amounts of lead from the counterweight. Go slowly. Do not trim too much. A maximum deviation from "level" when balanced of 1/4" at the trailing edge of the flaperon would be acceptable (i.e., slightly nose heavy). See draving above.
8) Remove the counterweights, round any remaining edges, deburr, Zinc Chromate, let dry, and rivet in place on the underside of the flaperon using 1/8" Stainless Steel rivets.
9) Re-attach the flaperon to the wing, and to control linkages. Readjust as necessary.

3.5 Special Test Flying Issues

1. No problematic handling procedures except a high sink rate on the Speedwing types if the approach speed is allowed to decay below Vstall x 1.3, particularly at gross weight operation.

2. The stall speed is very weight dependent and can range between 48-55 mph at gross. Full span variants range between 42-49 mph under the same conditions.

3. The type is in theory capable of lifting its own empty weight again as useful load so test pilots and operators should expect a wide range of handling characteristics between solo and gross.

4. Check that there is a reasonable correlation between indicated airspeed and actuality. Some builders have installed instrument static sources of a dubious nature resulting in considerable instrument error. Simple filtered sources taken from within the cabin have in most cases provided a fair indication of actual airspeed at least in balanced flight.

5. Observe EGT limits especially at part throttle settings for over lean mixtures. Overly high readings may also be due to improper propeller matching or incorrect probe position.

6. C models can suffer from poor engine cooling due to the radiator position or cowl leakage especially in high alpha climbs.

7. All two stroke powered types must be adequately warmed before application of full power to minimise the risk of cold seizures.

8. Ensure correct maximum static engine revolutions for engine type before take-off, especially at maximum take-off weight.

3.6 Standard Modifications

None

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