LAA TYPE ACCEPTANCE DATA SHEET
TADS 181A
VANS RV-6 & 6A

Issue 15	Addition of Vans SL and SB	Dated 25/7/18	JV

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

There is no UK agent. Contact Vans direct: Van's Aircraft Inc, 14401 NE Keil Road, Aurora, Oregon, 97002, USA
Tel: 001 (503) 6786545
Website: www.vansaircraft.com

UK Vans owners club – 'RV Squadron': www.rvuk.co.uk or email rvsqn-owner@yahoogroups.com

1.2 Description

The RV-6 and RV-6A are all-metal, low-wing, two-seat, side-by-side, sporting/touring aeroplanes which have been built in numbers in many countries. They have now been superseded by the RV-7 and RV-7A which are slightly improved versions. The RV-6 and -6A could be built from a standard or fast-build kit. Pre-built wing spars were also available. All are acceptable subject to the inspector being entirely satisfied with the quality of workmanship of part-built assemblies.

Solid-riveted sheet aluminium construction is used throughout. The aircraft is fitted with integral wing fuel tanks and sealed during construction using a proprietary sealant. For UK-built examples recommend suitable corrosion protection of aluminium airframe throughout, e.g. epoxy primer on aluminium parts and assembly compound where steel parts are assembled to aluminium parts.

The RV-6 is similar to the RV-6A except that the RV-6 has a tailwheel rather than nosewheel undercarriage.

150-180 BHP Lycoming O-320, IO-320, O-360 and IO-360 engines may be fitted as recommended by Vans. Also accepted with equivalent 'XP' type engines manufactured by Superior Air Parts. Consult LAA regarding acceptable models of Superior Air Parts engines. In general, a modification application is required for electronic ignition installations on Lycoming/clone engines.

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.

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

The contents of the standard fast build kit is accepted as compliant with the 51% 'major portion' requirements on the basis that it is the same kit standard that has been accepted as 51% compliant by the FAA.

2.2 Build Manual

RV-6/-6A Assembly Manual and RV-6/-6A drawings. Vans's newsletter, the RVator, provides useful additional guidance. A useful compilation of the content of past 'RVators' is also available from Vans.

2.3 Build Inspections

Build inspection schedule 44 (Vans RV Aircraft).
Inspector approval codes A-A, A-M, or K. Inspector signing off final inspection also requires 'first flight' endorsement.

2.4 Flight Manual

Nil. Build manual contains section with advice on flight testing.

2.5 Mandatory Permit Directives

None applicable specifically to this aircraft type:

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)

Reference	*Description*	*Applicability*
MOD/181A/001	Addition of aural artificial stall warning device (supersedes MOD-181-002)	All variants
MOD/181A/002	Inspection for cracking in tailplane front spar	All variants
MOD/181A/003	Inspection for cracks in elevator forward spar	All variants

The RV-7/-7A type engine mount may be fitted to RV6/-6A aircraft, but not vice-versa.

Note also LAA advisory letter regarding water leakage past fuel filler caps dated 3.9.02

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: 25 to 32°* *Down: 15 to 17°*
Elevators	*Up: 25 to 30°* *Down: 20 to 25°*
Rudder	*Left 30 to 35°* *Right 30 to 35°*
Flap	*Down 40°*

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: RV-6: 1600 lb; RV-6A: 1650 lb
   CG Range: 68.7" to 76.8" aft of datum
   Datum Point is: a point 60.0" forward of the leading edge of the wing

   2.3 Engine Limitations
   Maximum Engine RPM: 2700 (2600 rpm when Sensenich 70CM 2-blade metal propeller fitted to O-320 or IO-320 engines)

   2.4 Airspeed Limitations
   Maximum Indicated Airspeed (V_{NE}): 184 knots IAS

Max Indicated Airspeed Flaps Extended: 87 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.

When certain types of metal propeller are fitted, RPM ‘avoid bands’ are necessary as specified by the propeller manufacturer, in which case these must also be placarded.

Alternative limitations for those aircraft cleared for limited aerobatics:

Aerobatic Limitations

Intentional spinning is prohibited.
The following aerobatic manoeuvres only are permitted, not exceeding +6g or -3g
Maximum airspeed for full control deflection, VA = 134 mph IAS

Manoeuvre	*Entry air speed*
Inside loop	150 mph
Aileron roll	138 mph
Slow roll	138 mph
Stall turn	138 mph
Barrel roll	138-150 mph
Roll off the top	160 mph
Cuban eight	160 mph

Loading Limitations
Maximum aerobatic weight: 625 kg (1375 lb)
CG Range, aerobatic category: 68.7" to 75.37" aft of datum.

Aircraft cockpit to be placarded: "Warning: this is a high performance aircraft in which care is required particularly during aerobatic manoeuvres to avoid exceeding structural limits and/or maximum permitted airspeeds".

“In the event of an inadvertent erect spin, the aircraft responds to standard recovery actions ie throttle closed, check ailerons centred, apply full opposite rudder followed by progressive forward stick until rotation ceases”.

“Aerobatics prohibited with baggage in baggage compartment”.

2.10 Maximum permitted empty weight

N/A

Section 3 – Advice to owners, operators and inspectors

3.1 Maintenance Manual

Nil. In the absence of a manufacturer's schedule, LAMS can be used as a guide to required inspections and this is reflected in the check list in Section 1 of the LAA's Permit renewal application form. Alternatively the LAA Generic Maintenance Schedule may be used.

Vans service information should also be reviewed. Maintenance is typical of riveted aluminium alloy airframe. Engine maintenance as appropriate to the engine manufacturer's advice (e.g. Lycoming).

3.2 Standard Options

Vans offer a great number of options in their catalogue of accessories, the majority of which are accepted by the LAA. Refer to LAA technical leaflet TL3.08 for details.

Some examples of the RV-6 and -6A may be cleared for limited aerobatics. This is subject to a number of special requirements and a special flight test. A g meter must be fitted for aerobatic clearance. Contact LAA Engineering for the procedure to clear an aircraft for aerobatics.

The following items are also permitted to be fitted as optional equipment, without further reference to LAA Engineering. Installations must be inspected by an LAA Inspector against the supplied installation instructions and a PMR entered into the logbook.

- Andair TQX series throttle quadrant with or without flap switches.
- Andair lockable fuel caps.
- Andair tailwheel (ref LAA mod 11225).
- Andair fuel pump PX375-TC (on fuel injected engines only and only pump serial numbers 30453 and on).
- AntiSplatAero nose leg brace and fairing fitted in accordance with the manufacturer's instructions entitled 'The Nose Job' (ref LAA mod 13274).
- Affordable Panels Inc modular instrument panel (ref LAA mod 11302).
- Briggs Airmotive nosewheel bearing spacers (ref LAA mod 12265).
- Vans fixed windscreen/rearward-sliding canopy.
- Bell tailwheel fork (ref LAA mod 12276).
- Sega tailwheel fork (ref LAA mod 12414).
- Rocket tailwheel steering link (ref LAA mod 11575).
- Replacement of removable canopy hinge pins with appropriate bolts and nuts.
- JD Air Parts Tailwheel Fork Assembly.
- JD Air Parts Lightweight Tailwheel.
- JD Air Parts Tailwheel Steering Link.
- RV-6 original fin and rudder substituted with RV-8 fin and rudder (as per later standard for RV-6). Aircraft must be re-weighed and cg checked. Aircraft fitted with wooden propellers may suffer from excessively aft cg. Following check by LAA inspector and PMR issue, flight checks to be carried out to verify satisfactory flight behaviour and LAA notified of change made on page 3 of Permit Revalidation application form (FWR-1).
- Dynon pitot head on a Gretz mount (ref LAA mod 13559).
- Dynon pitot head on a Safeair1 mount (ref LAA mod 12599).

- Garmin GAP 26 pitot head on a Gretz mount (ref LAA mod 14694).
- Bonding of canopy (ref LAA mod 13847, see instructions).

Note: the manual flap lever is difficult to operate in flight and the optional electric flap system available from Vans is recommended. Similarly, the manual elevator trimmer system is not very easy to use and the optional electric trim system available from Vans is recommended.

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. Copies of service information can be downloaded from Vans' Website.

Service Letters:

Dated	*Description*
21.3.18	Cracks near the top of the step
16.11.16	Tip-up canopy operation
23.12.15	RV – Aerobatic gross weight
24.10.14	Heat muff screen installation
3.7.14	SAIB HQ-14-16 all-metal lock nuts
20.12.11	Fuel valve lever II installation
19.4.11	A letter to prospective buyers of flying RVs
26.11.07	Soft rivets
16.11.07	Inspect master switch
9.11.07	Nose gear leg and fork upgrade
6.9.07	Tricycle gear aircraft nose wheel torque
5.4.07	Dynafocal II mounts
18.10.06	#2 Battery cables
13.2.06	60 amp alternator
10.05	Filtered Airbox advisory
10.03.05	Nose gear design
11.8.04	Buying a second hand RV kit
30.6.04	Buying a flying RV
4.9.03	GAS-3 gascolator recall
3.03	Hartzell HC-C2YR prop
3.03	Hartzell HC-C2YK prop
14.11.01	CT 82Fand CT 83F
12.6.00	Fuel pickup tube anti-rotation bracket

Service Bulletins:

Reference	*Description*
SB 18-05-21	Proper installation of gauge plug in fuel spider
SB 16-03-28	Cracking of wing aft spar web at the inboard aileron hinge bracket attach rivets
SB 14-12-22	Nose stop flange installation
SB 14-02-05	Cracks in elevator spar (see also LAA MOD/181A/003)
SB 14-01-31	Horizontal stabiliser cracks (see also LAA MOD/181A/002) (Updated 14/10/16)
SB 11-9-13	Fuel tank slosh inspection

SB 07-11-09	Nose gear leg and fork upgrade
SB 07-4-12	Securing flap motor rod end bearing
SB 07-2-6	Affixing the passenger control stick permanently
SB 06-9-20	Trim cable anchor
SB 06-2-23	Safetying of standard and flop-type fuel pickup tubes (see also related LAA letter)
SB 04-3-1	Electric flap motor recall
SB 04-2-1	Fuel tanks
SB 02-12-1	Pre-manufactured hoses
SB 99-06-1	Overhead rudder pedals
SB 98-10-1	Nose gear check
SB 98-03-1	Floor pedal reinforcement
SB 96-10-3	Flap motor recall
SB 96-10-2	Full swivel tail wheel
SB 96-10-1	Filtered airbox
SB 96-09-01	Nosewheel fork

3.4 Special Inspection Points

- Builders not familiar with the form of solid construction used in this type are encouraged to practise on scrap test pieces to learn techniques of riveting before starting on actual construction.
- These are high-performance aircraft and top quality workmanship is essential.
- The engine compartments of these aircraft are fairly cramped and care should be taken to avoid overheating problems, charring of the cowlings near the exhaust, vapour-lock due to pre-heating of fuel in gascolator, etc. Insulating the exhaust pipes has been found to help, but can cause problems with premature and hidden corrosion of the exhaust pipes underneath.
- The flaps are operated by rod-ends on the operating pushrods without any back-up capturing feature and therefore the rod-ends must be checked carefully for wear to ensure that there is no possibility of a rod-end coming adrift from a flap.
- Check that fuselage fairing around rear of tailplane is well secured since if this fairing comes loose it could cause the elevator to jam.
- Take care to minimise operating friction in flying controls by careful attention to hinges, rod-ends, lubrication etc.
- Note that the trailing edge profile on control surfaces is critical to control characteristics.
- Engine mount cracks have been reported in the vicinity of the undercarriage leg sockets on tailwheel RV-6 model, especially when operated from grass fields.
- With the RV-6A model, to avoid problems with the nosewheel jamming in the spat it is important to trim the nosewheel spat to ensure generous clearance between the tyre and the wheel aperture in the spat (circa half an inch), and to maintain the correct nosewheel tyre pressure. It is also important to maintain suitable preload on the nosewheel axle bearings, torquing up the axle nut gently as required in the absence of a conventional spacer between the bearings. Note that the wheel spats may be used as part of the locking system for the axle nuts, so if the aircraft is operated with spats removed, alternative means of locking the axle nuts is required. Later type nosewheel forks provided by Vans seek to improve this issue by raising the ground clearance of the noseleg.
- If manual elevator trim fitted, refer to SB-06-9-20 regarding problems with rear attachment of trim cable.
- Longitudinal levelling datum for weight is the cockpit rails.

3.5 Special Test Flying Issues

- VP Prop flight test schedule required if VP prop is fitted.
- Adjustments to lateral trim can be made by lightly dressing aileron trailing edges.
- These are high-performance aircraft but nevertheless the designs are well developed and thanks to good handling characteristics they have achieved a good accident-free record.
- Problems have been experienced with the RV-6A noseleg, especially when operating off grass, with instances of the nosewheel bending back and the strut digging into the ground, causing a rapid stop and further damage. In order to avoid this risk, it is important to maintain the correct nosewheel tyre pressure, and to trim the spat to ensure generous clearance between the tyre and the wheel aperture in the spat (circa half an inch). It is also important to maintain suitable preload on the nosewheel axle bearings, torquing up the axle nut gently as required in the absence of a conventional spacer between the bearings. It is also important to land the aircraft on the mainwheels first and hold the nosewheel off the ground during the initial part of the landing roll, rather than landing on all three wheels together which encourages wheelbarrowing and overloading the nosewheel.
- The stall warner vane may need adjusting to sound the hooter at the correct airspeed.
- With a Lycoming O-320 engine as supplied through Vans in a Vans airframe, some owners have found that engines supplied with an IO-5217 carburettor ran too lean, leading to rapid temperature rise and a serious risk of overheating in the climb and unduly high temperatures in the cruise. This may be because the Vans intake ducts are more efficient than normal and allow a greater airflow than in other Lycoming installations. This appears to be a particular serious problem when constant speed propellers are used, allowing the engine to develop full power (and therefore maximum heat) in the climb. In some cases this has meant having to throttle back at about 1000 ft agl after take-off, to avoid exceeding engine temperature limits and risking engine damage. Some owners have resorted to drilling out the carburettor main jet with a #39 drill to cure the problem, but this modification presumably negates the warranty. Marvel-Schebler suggest that their alternative IO-3678-32 carburettor is set up to more rich than the IO-5217, and should be suitable in this application, but some owners report this causing a flat spot between 1300 and 1500 RPM.

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