

LAA TYPE ACCEPTANCE DATA SHEET
TADS 181
VANS RV-4

Issue 6	Addition of Vans SB	Dated 25/7/18	JV
Revision A	Addition of Safety Spot articles	Dated 17/9/19	JH
Revision B	Note added to Vans SB 16-03-28	Dated 2/9/20	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@yahoo.co.uk

1.2 Description

The RV-4 is an all-metal, low-wing, two-seat, tandem, sporting/aerobatic aeroplane which has been built in numbers in many countries. The RV-4 can be built from plans or from a kit. Pre-built wing spars are 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, LAA recommends 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.

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 'Lycoming clone' engines. Consult LAA technical leaflet TL 3.15 for acceptable choices of clone engines. In general, a modification application is required for electronic ignition installations on Lycoming/clone engines.



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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 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. Unlike most of the other RV models, there is no fast build kit for the RV-4.

2.2 Build Manual

RV-4 Assembly Manual and RV-4 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/181/001	Placard requirements (see also section 2.9) and carbon monoxide indicator	All variants
MOD/181/002	Inspection for cracks in elevator forward spar	All variants

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

<i>Ailerons</i>	<i>Up: 25 to 32°</i> <i>Down: 15 to 17°</i>
<i>Elevators</i>	<i>Up: 25 to 30°</i> <i>Down: 20 to 25°</i>
<i>Rudder</i>	<i>Left 30 to 35°</i> <i>Right 30 to 35°</i>
<i>Flap</i>	<i>Down 40°</i>

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: 705 kg (1550 lb)
CG Range: 68.7" to 77.4" 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
 - 2.4 Airspeed Limitations
Maximum Indicated Airspeed (V_{NE}): 210 mph (182 knots) IAS
Max Indicated Airspeed Flaps Extended: 100 mph (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.



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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 to the RV-4, 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 permitted not exceeding three turns.

The following aerobatic manoeuvres only are permitted, not exceeding +6g or -3g
Maximum airspeed for full control deflection, $V_A = 118$ knots IAS

<i>Manoeuvre</i>	<i>Entry air speed</i>
Inside loop	120 knots
Half loop and roll out	125-140 knots
Stall turn	100 knots
Barrel roll	110-120 knots
Aileron roll	110-120 knots

Loading Limitations

Maximum Total Weight Authorised: 705 kg (1550 lbs)

Maximum aerobatic weight: 625 kg (1375 lb)

CG Range, normal category: 68.7" to 77.4" aft of datum

CG Range, aerobatic category: 68.7" to 75.9" aft of datum.

Datum Point is: A point 60.0" forward of the leading edge of the wing.

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".

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-4 may be cleared for limited aerobatics. This is subject to a suitable engine/prop combination 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 fuel pump PX375-TC (on fuel injected engines only and only pump serial numbers 30453 and on).
- JD Air Parts Tailwheel Fork Assembly.
- JD Air Parts Lightweight Tailwheel.
- JD Air Parts Tailwheel Steering Link.

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:

<i>Dated</i>	<i>Description</i>
<u>23.12.15</u>	RV – Aerobatic gross weight
<u>24.10.14</u>	Heat muff screen installation
<u>3.7.14</u>	SAIB HQ-14-16 all-metal lock nuts
<u>20.12.11</u>	Fuel valve lever II installation
<u>19.4.11</u>	A letter to prospective buyers of flying RVs
<u>26.11.07</u>	Soft rivets
<u>16.11.07</u>	Inspect master switch
<u>5.4.07</u>	Dynafoal II mounts
<u>18.10.06</u>	#2 Battery cables
<u>13.2.06</u>	60 amp alternator

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10.05	Filtered Airbox advisory
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 82F and CT 83F
12.6.00	Fuel pickup tube anti-rotation bracket

Service Bulletins:

<i>Reference</i>	<i>Description</i>
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 (note that the rectification actions given in this bulletin are acceptable to LAA and no separate repair application is necessary)
SB 14-02-05	Cracks in elevator spar (see also LAA MOD/181/002)
SB 11-9-13	Fuel tank slosh inspection
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 02-12-1	Pre-manufactured hoses
SB 97-05-1	Rear seat reinforcement
SB 96-12-1	Rudder pedal / cable attachment
SB 96-10-2	Full swivel tail wheel
SB 96-10-1	Filtered airbox

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 engine mount and firewall in the vicinity of the undercarriage leg sockets on the RV-4 model, especially when operated from grass fields.

- 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 Operational Issues

The following Safety Spot articles are relevant to Van's RV-4 aircraft

Light Aviation issue [March 2014](#)

Checks for empennage cracks

Relevant to RV-4s. Four RV-6s found with cracks in the tail plane, all cracks slightly different and if found contact LAA engineering with repair program so it could be looked at by structures specialists. [LAA/AWA/14/02](#) [LAA/AWA/14/03](#)

Light Aviation issue [June 2016](#)

Rear spar web cracks

Van's SB [SB 16-03-28](#) released detailing possibility of cracking at the inboard aileron hinge bracket. More likely found on high-use examples of type.

- 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.
- The stall warner vane (if fitted) may need adjusting to sound the hooter at the correct airspeed.
- Care must be taken not to overload the back cockpit otherwise the rear cg is likely to be exceeded and this will cause diminished pitch stability.
- 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