

VANS RV7 AND RV7A

Issue 8 Limited aerobatics option included 19.02.08

1. UK contact

There is no UK agent. Contact Vans direct: Van's Aircraft Inc, PO Box 160, North Plains, Oregon, 97133. USA. Tel. 001 (503) 6475117. UK Vans owners club - RV Squadron, run by Harry Hopkins, Cheltenham Tel. 01242 260242. Enthusiast and 2 x RV Builder, Nigel Reddish, Nottingham. Tel. 01623 752330.

2. Description

The RV7 and 7A are developments of the former RV6 and RV6A models, the improvements being mainly in ease of build and improved payload and performance using up to 200 BHP Lycoming engines. The RV7 and RV7A can be built from standard or fast-build kit. Pre-built wing spars are also available. All are acceptable subject to the inspector being entirely satisfied with the quality of workmanship of any part-built assemblies. Solid-riveted sheet aluminium construction is used throughout. Many hundreds of these kits have been sold. 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 RV7 is similar to the RV7A except that the RV7 has a tailwheel rather than nosewheel undercarriage.

150-200 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 particular choice of ignition system.

3. 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.

4. Build Manual

RV7/7A Assembly Manual and RV7/7A drawings. Vans's newsletter, the RVator, provides useful additional guidance. A useful compilation of the content of past 'RVators' is also available from Vans.

5. 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.

6. Build Inspections

Build inspection schedule 44 (Vans RV Aircraft).

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

7. Flight Manual

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

8. Mandatory Permit Directives

None applicable specifically to this aircraft type, but note

MPD: 1998-019-R1 Flexible Fuel Tubing Applies to all permit aircraft

MPD: 1999-003 and -004 applies to MTV-9 and MTV-3 propellers

9. LAA Mandatory Modifications/Operating Restrictions

MOD/181/002 Mandatory addition of aural artificial stall warning device

MOD/323/001 Vans RV-7/7A P2 Control Column Attachment

The larger rudder as described in Vans service bulletin SB-02-6-1 is required by LAA for LAA.

The RV-7 / 7A type engine mount must be fitted to RV7 / 7A aircraft rather than the similar but weaker RV-6 / 6A engine mount even though the two appear interchangeable.

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

Aerobatics and spinning prohibited.

10. Service information

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

Service Letters

#2 Battery cables	18.10.06
60 amp alternator	13.2.06
Filtered Airbox advisory	10.05
Nose gear design (tricycle u/c models)	10.3.05
RV7/7A empennage	10.11.04
Buying a second hand RV kit	11.8.04
Buying a flying RV	30.6.04
GAS-3 gascolator recall	4.9.03
Hartzell HC-C2YR prop	3.03
Hartzell HC-C2YK prop	3.03
CT 82F and CT 83F	14.11.01

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Fuel pickup tube anti-rotation bracket 12.6.00

Service Bulletins

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 Replace manual elevator trim cable rear attachment WD-415 by improved version
SB 06-2-23 Safetying of standard and flop-type fuel pickup tubes
SB 05-1-1 Tip up canopy fuselages
SB 04-3-1 Electric flap motor recall
SB 04-2-1 Fuel tanks
SB-02-6-1 Larger rudder * * mandatory for LAA, see above
SB-02-12-1 Pre-manufactured hoses
SB 96-10-2 Full swivel tail wheel
SB 96-10-1 Filtered airbox

11. 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 7 and 7A may be cleared for limited aerobatics. This is subject to a number of special requirements and special flight test. A g meter must be fitted for aerobatic clearance.

12. Special Inspection Points

- 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 similar tailwheel RV-6 model, especially when operated from grass fields.
- With the similar RV-6A model, problems have been experienced with the nosewheel jamming in the spat and 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

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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.

13. Operating Limitations and Placards

Maximum number of occupants authorised to be carried: Two

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:

Aerobatic Limitations

Aerobatics prohibited.
Intentional spinning is prohibited.

Loading Limitations

Maximum Total Weight Authorised: 1800 Lbs
CG Range: 78.7" to 86.82" aft of datum point.
Datum Point is: A point 70.0" forward of the leading edge of the wing.

Engine Limitations

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

Airspeed Limitations

Maximum Indicated Airspeed: 230 mph
Maximum Indicated Airspeed with flaps extended: 100 mph

Other Limitations

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

Additional placard must be prominently mounted in the cockpit:

'Recommended climb speed 90 kts (103 mph). Refer to RV7 Pilot's Note ref RV7/PN/1'

Additional Placard

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

In addition, when certain types of propeller are fitted to the RV-7/7A , RPM 'avoid bands' are necessary as specified by the propeller manufacturer, in which case these must also be placarded.

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

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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=142 mph

<u>Manoeuvre</u>	<u>recommended entry speed</u>
Inside loop	150 mph
Aileron roll	138 mph
Slow roll	138 mph
Barrel roll	138 - 150 mph
Stall turn	138 mph
Roll off the top	160 mph
Cuban eight	160 mph

Maximum Aerobatic Weight: 727 kgs (1600 lbs)

CG Range aerobatic category: 78.7" to 84.5" aft of the datum point.

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".

14. Maximum Permitted Empty Weight

N/A

15. 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.

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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.

Due to the onset of neutral longitudinal stability in the climb configuration at lower airspeeds, a placarded recommendation to climb at an airspeed of 90 knots (103 mph) has been included by LAA for RV7/7A types. Further details are provided in LAA note RV7/PN/1, available from LAA.

Problems have been experienced with the similar 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.

16. Significant LAA Airworthiness Approval Notes

PFA-323/450 issue 1	RV7, IO-360 engine, MTV-12 prop, restricted aft cg limit
PFA-323/450 issue 2	RV7, O-360 engine, MTV-12 prop cg aft limit restriction removed
PFA-323/250 supplement 2	RV7, O-360 engine, fixed pitch Sensenich 72FM8 propeller
PFA-323/479 issue 1	RV7A, O-320 engine, MTV-12 propeller, standard aft cg limit

Approved :



F.R. Donaldson
Chief Engineer

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