

JODEL D18

Issue 8

Correction to Max Coolant Temps

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1. UK contact

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2. Description

The Jodel D18 is a small two-seat low-wing aeroplane of all wood fabric-covered construction supplied in the form of a set of drawings. A relatively new Jodel design, introduced in 1986. The D18 is a homebuild somewhat smaller than the D11 but with an all-flying tailplane. Originally approved with a VW 1834 engine, alternative engine options cleared by the LAA include the Jabiru 2200, Rotax 912 and JPX 4TX75A.

The D18 is fitted with a tailwheel undercarriage. The D19 is a nosewheel version of the D18, no examples of the D19 have been built in the UK.

The D18 is categorised as a group A aeroplane not a microlight in the UK.

The LAA-accepted drawings for building the D18 are of French origin, originally supplied by SAB of Beaune. The drawings supplied by Frank Rogers of Australia differ from the French drawings and would be treated as a different type of aircraft.

3. Fast Build Kit 51% Compliance

Not applicable- plans built aircraft.

4. Build Manual

Nil. Construction drawing set provides all required information, consisting of the following:

Sheet

D.18. A1	Verrière Ensemble	D.18. M2	Capot Moteur Assemble
D.18. A2	Verrière Details	D.18. T1	Atterrisseur Jambe Fixe
D.18. A4	Fermeture Verrière	D.18. T2	Atterrisseur Jambe Mobile
D.18. C1	Ensemble Mauches	D.18. T3	Roue
D.18. C2	Palonnier	D.18. T4	Atterrisseur AR
D.18. C3	Cammande de Freins	D.18. V1	Aile Ensemble
D.18. C4	Renvois de Commandes	D.18. V2	Aile Details
D.18. C5	Commande de Vol details	D.18. V3	Aileron
D.18. C6	Details Commande de Tale	D.18. V4	Longeron Voilure
D.18. C7	Tab et Emsemble de sa Commande		
D.18. V5	Longeron Voilure Details		
D.18. E1	Empemmage Horiizontal	D.18. V6	Nervures d'Aile
D.18. E2	Guignol et Charnieres E.H.	D.18. V7	Nervures d'Aile
D.18. E3	Empannage Vertical	D.18.	Reservoir 65L
D.18. F1	Flanc Fuselage		
D.18. F2	Couples Fuselage AV.		

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D.18. F3	Couples Fuselage AR.
D.18. F4	Cintres Des Fuselage
D.18. F5	Fuselage AV.
D.18. F6	Fuselage AR.
D.18. M1	Bâti Moteur

5. Maintenance Manual

None available – recommend maintain in accordance with LAMS schedule.

6. Build Inspections

Build inspection schedule 1 (Wood aircraft).

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

7. Flight Manual

None available

8. Mandatory Permit Directives

None applicable specifically to this aircraft type, but note

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

9. LAA Modifications

LAA MOD/169/001 Material Specifications - LAA Classification 'C'

This information provides British equivalent specifications for plywood, aluminium and steel that can be used in lieu of the French materials detailed on the D18 plans.

LAA MOD/169/002 Use Of Spruce - LAA Classification 'C'

This information provides guidance for use by builders opting to use Spruce instead of Oregon Pine (Douglas Fir) as specified in the D18 plans. Use of Spruce rather than Oregon Pine or Douglas Fir means that the aircraft is limited to 460 Kg max gross weight even if fitted with higher power engines, due to the lower strength of Spruce.

LAA MOD/169/003 Shoulder Harness - LAA Classification 'A'

The installation of a shoulder harness is mandatory for all LAA Jodels. This Mod' provides an acceptable scheme to install a shoulder harness to D18 aircraft.

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10. Service Bulletins

- Nil known for airframe, but note that the French Airworthiness Directive **010.06.79 Stabilator Attachment - Inspection For Corrosion**. Applies to all Jodels fitted with an all-moving tailplane. As the D18 is amateur built, the AD is not a legal requirement but nevertheless LAA policy is that it should be treated as mandatory. The AD requires removing the stabilator bearing attachment plates (x 4 per aircraft) located each side of the upper rear longerons and inspect for evidence of corrosion. Corroded plates should be replaced with new parts. *This AD requires repetitive inspection every three years.*
- For Rotax 912 series engines, there are many Rotax service bulletins dealing with a variety of important safety topics. Copies of the bulletins applicable to individual engines by engine serial can be downloaded directly from the Rotax website at <http://www.rotax-aircraft-engines.com> More information is available on www.skydrive.co.uk

11. Standard Options

D19 wing flap system

12. Special Inspection Points

- **Wooden Structure - Damage And Deterioration**
Jodels are well known for their tendency to ground loop if mishandled on landing. The undercarriage is designed to collapse sideways in such a way that there is a good chance the wing spar will remain undamaged. However, instances of spar damage are known to have occurred even after apparently benign ground loop incidents. Very thorough inspection will be required after all such events. Other parts of the wooden structure particularly prone to damage are the engine firewall area behind the metal bulkhead, where moisture and oil soakage can lead to early deterioration, and in the aft fuselage tail-post area where these contaminants are also likely to collect. These areas are always worth examining closely and special attention should be given to keeping drain holes clear.
- **Wing Trailing Edge Attachment Bolts**
Jodel wing trailing edge attachment bolts (x 2) are known to be particularly subject to corrosion. It is considered wise to remove these bolt every couple of years and renew as necessary. Replacement bolts are available from Jodel parts suppliers.
- **With VW engine, design of conversion to be agreed with LAA Engineering as there is no standard design of VW 1834cc conversion. Dual ignition system (of an accepted type) required. LAA VW Engine Build checklist to be completed during build up of engine to record critical measurements. Refer to SPARS section on VW engines. Oil cooler will almost certainly be required, and careful ducting to achieve adequate cylinder cooling. Compression ratio must be set up (usually no more than 8.0:1) using choice of cylinder base shims. Failing to use base shims usually results in excessively high compression ratio and consequent excessively short engine life.**
- **With VW conversion, if gravity feed is used, check gravity flow from downstream side of carburettor float valve (by removing float chamber bowl or float chamber drain plug) rather than at carburettor fuel inlet. If an automotive carburettor (eg Stromberg CD150) is used with gravity feed, the carburettor float valve is often found to provide inadequate or very marginal flow. This is because automotive carburettors are set up for use with a pump-fed installation not gravity feed. The fuel pressure from a pump allows a carb float jet of only about 1.5 mm diameter to**

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be used, this restricts the flow too much with the much lesser fuel pressure in a typical gravity fed system. This is a common cause of lean running and engine failure. This is cured by fitting a larger diameter jet to the float valve, (typically 2.5 to 3mm diameter) or carefully opening up the existing jet and lapping it in with a household brass polish.

- With VW engine, quality of fit of propeller hub on crankshaft nose is critical to security of propeller mounting in flight.

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

Intentional spinning is prohibited

Aerobatic manoeuvres are prohibited

Loading Limitations

Maximum Total Weight Authorised: 460 Kg or 499 Kg depending on engine fit and species of wood used for construction of airframe.

CG Range: 9.0 inches to 18.0 inches aft of datum.

Datum Point is: Leading edge of the rectangular part of the wing.

Engine Limitations

Maximum Engine RPM: VW and Jabiru 2200: 3300: Rotax 912: 5800

Airspeed Limitations

Maximum Indicated Airspeed: 135 kts

Maximum Indicated Airspeed Flaps Extended (when flaps fitted)

First Stage: 80 Kts

Second Stage: 70 Kts

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"

Also, the aircraft must be fitted with a fireproof stainless steel identification plate indelibly embossed or engraved with the aircraft's G-???? registration marks. See CAA's booklet CAP 523 which is sent to aircraft owners when applying to the CAA for G-???? Registration.

14. Additional Engine Limitations/Placards

With VW:

Max CHT: 225°C Max

EGT: 800C Max

Oil temp: 90°C Max

Oil pressure Min 2.5 Kg/sq cm @3000 RPM

With Rotax 912-UL:

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

Minimum Fuel Pressure: 0.15 bar

With Jabiru 2200A:

Max CHT: 210°C

Oil temp: 50-110°C

Oil pressure 125-525 kPa @3100 RPM

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15. Maximum Permitted Weight

Max gross weight is 460 Kg with 60 BHP 1834 VW engine. With higher powered 80 BHP engine, max gross weight can be increased to 499 Kg subject to satisfactory climb performance at this weight, and subject to the airframe being built from Oregon Pine or Douglas Fir and not from Spruce.

The empty weight of the aircraft should allow sufficient payload for two 86 kg crew to be carried along with enough fuel for at least an hour's flight at max cruise speed, without exceeding the max gross weight.

16. Special Test Flying Issues

- Rotax 912 Flight test schedule if Rotax 912 engine fitted.
- Special attention to engine cooling if Jabiru 2200 or VW derived engines fitted.
- With Jabiru engine It is imperative that the cylinder head bolts and tappets are checked at 5, 10, 15 and 20 hours. Omitting this check can lead to head leaks and damage at around 25-50 hours. Have a good look around the rocker boxes and make sure oil is present and that there are no signs of overheating in the form of burnt lacquered oil. New engines with hydraulic tappets need only to have the head bolts checked.
- With Jabiru engine, encourage test pilot to work the engine quite hard to avoid glazed piston bores, vary rpm settings and do not fly at low power settings for too long.

17. Significant Airworthiness Approval Notes

LAA-169-0163	Initial acceptance with VW engine @460 Kg
LAA-169-0163	Sup 1 JPX engine and flaps @499 Kg
LAA-169-0163	Sup 3 Jabiru 2200 engine and flaps @499 Kg

18. Control surface deflections

Ailerons	Up: TBD degrees
	Down: TBD degrees
Stabilator	Up: TBD degrees
	Down: TBD degrees
Rudder	Left TBD degrees
	Right TBD degrees
Elevator tab	Up and down TBD degrees

Approved:



F.R. Donaldson
Chief Engineer

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