

VIKING CYGNET SF-2A

Issue 5 Addition of note regarding VW prop hub security dated 8.1.07

1. UK contact

Nil. Contact plans suppliers directly: Viking Aircraft Ltd, PO Box 646, Elkhorn, WI 53121, USA. Tel: 414 723 1048.

2. Description

The Viking Cygnet (previously known as HAPI Cygnet) is a small two-seat shoulder wing strut braced monoplane of mixed welded steel tube and wood construction, available as a set of plans for construction by amateurs. It has a conventional tailwheel undercarriage. The wings are slightly swept forward, of two spar wood construction and use a latticework of thin diagonal wood strips attached to the top and bottom surfaces of the wings to form the drag and anti-drag bracing and, together with the two spars form a substantial wing torque box. Originally designed for an 1834cc VW engine, the Cygnet has also been cleared by the LAA with a Rotax 912-UL engine.

The Cygnet is an SEP Aeroplane (colloquially known as 'group A category') with a maximum gross weight of 1100 Lbs. It is not a microlight.

3. Fast Build Kit 51% Compliance

Not applicable – plans-built aircraft.

4. Build Manual / Drawings

A set of conventional aircraft drawings is the only source of information. For details of powerplant installation, instrumentation etc not shown on the drawings, refer to standard aeronautical practice for this class of aircraft eg as portrayed in Tony Bingelis's books.

5. Maintenance Manual

Nil available. In the absence of a maintenance manual, refer to LAMS for guidance.

6. Build Inspections

Build inspection schedule 3 (Wood and metal aircraft)
Inspector approval codes A-A, or A-M with A-W for inspecting the wing construction. Inspector signing off final inspection also requires 'first flight' endorsement.

7. Flight Manual

Refer to 'HAPI Cygnet Pilots Notes G-BRZD'

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8. Mandatory Permit Directives

Nil specific to this aircraft type, but note

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

9. LAA Mandatory Modifications

- For new-build aircraft, firewall to be manufactured from stainless steel 0.015 inch thick or galvanised steel 0.018" thick per Viking drawing update and Viking letter dated 1.7.99. Alternatively, if original aluminium alloy firewall is fitted, the fireproof properties must be improved by fitting Fibrefax fireproof material behind aluminium firewall.
- An effective artificial stall warner to be fitted
- Elevator trim control to be fitted with ratchet or other means to ensure irreversibility ie pressure on tab must not be able to move the tab control system.

10. Service Bulletins

- Nil known for airframe – but Viking letter of 1.7.99 alerts builders to change in firewall material (see section 9 above)
- 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

N/A

12. Special Inspection Points

- 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 (e.g. 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 be used, this restricts the flow too

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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.
- With Rotax 912-UL engine, refer to LAA for design of engine mount
- With Rotax 912-UL engine, Rotax 912 series installation checklist to be completed and submitted along with permit to Fly application.

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: 1100 Lbs

CG Range: 20.5 inches to 25.0 inches aft of datum.

Datum Point is: bottom edge of instrument panel

Engine Limitations

Maximum Engine RPM: 3400 (with VW engine)

5800 (with Rotax 912-UL engine)

Airspeed Limitations

Maximum Indicated Airspeed: 135 mph

Other Limitations

The aircraft shall be flown by day and under Visual Flight Rules only.

Smoking in the aircraft is prohibited.

Additional Placard

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

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

14. Additional Engine Limitations/Placards

With VW :

Max CHT: 225C Max

EGT: 800C Max

Oil temp: 90C Max

Oil pressure Min 2.5 Kg/sq cm @3000 RPM

With Rotax 912-UL: Maximum CHT: 150C

Max Coolant Temp: 115C (with 100% Evans coolant)

Oil Temp Limits: 50C to 140C (Normal 90-110C)

Oil Pressure 2-5 Bar

Minimum Fuel Pressure: 0.15 bar

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15. Special Test Flying Issues

Adequacy of engine cooling with VW engine

16. Significant Airworthiness Approval Notes

LAA-182-351 Initial acceptance

17. Control surface deflections

Ailerons	Up:	TBD degrees
	Down:	TBD degrees
Elevators	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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