

SERVICE LETTER: JSL 004-1
Issue: 1
Date: 29th January 2008
Subject: J230 Family Engine Cooling

1	APPLICABILITY	1
2	BACKGROUND	1
2.1	GENERAL	1
3	MODIFICATION DETAILS	2
3.1	COWL LIP MODIFICATIONS	2
3.2	GULL-WING BAFFLE.....	2
3.3	OIL COOLER DUCT.....	3
3.4	OPERATIONAL FACTORS	4
4	COMPLIANCE – IMPLEMENTATION SCHEDULE:	5
5	AIRWORTHINESS NOTE:	5

1 Applicability

The changes detailed herein are primarily designed for production J230 aircraft. However, they may be applied to any Jabiru Aircraft with a 3-door fuselage and cowlings as shown below.

Serial Number Range: J292 to J578

Note: For aircraft in Light Sport Aircraft categories this letter is considered a Manufacturer’s Safety Direction.

2 Background

2.1 General

The engine and oil cooling systems of the J230 family have passed several sets of certification testing - testing typically designed to allow for ambient temperatures of around 38°C. However, recent weather conditions in many parts of Australia have recorded temperatures significantly above these levels, and some operators have found that in these conditions oil temperatures can quickly become excessive.

The following document details some changes to the configuration of Jabiru J230 aircraft designed to improve engine cooling – particularly oil cooling – in these conditions.

3 Modification Details

3.1 Cowl Lip Modifications

Figure 4 shows the standard cowl for a J230 at the time of writing. Visible are two lips on the cowl outlet opening – one either side of the nose leg.

These lips must be included on the cowl assembly for the modifications detailed below to work. Sections 3.2 and 3.3 detail modifications which affect the amount of air which flows through the cowls and where that air is distributed.

Without lips fitted to the cowl the overall volume of air passing through the cowls is reduced. This changes the dynamics of the airflow and may prevent the modifications detailed from having the designed effect.

Jabiru Service Bulletin JSB 016 details the installation of similar lips to the Jabiru J160 model family. The information contained within this bulletin may be referenced for the J230 family, however note that there is no “Large” cowl lip option for the J230 family.

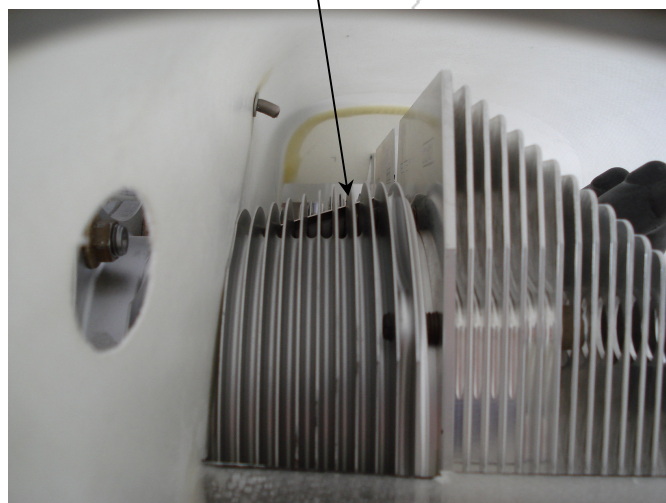
3.2 Gull-Wing Baffle

Figure 1 below shows the gull-wing baffles which have been fitted to factory-built J230 aircraft as standard.

These baffles are to be removed as a part of this modification.

Removing the baffles has the effect of blowing cool air over the sides of the crankcase and sump – while moving hot air produced by the exhaust out of the cowls more quickly.

Gull wing baffle viewed through front air inlet of cowlings



Gull wing baffles in place

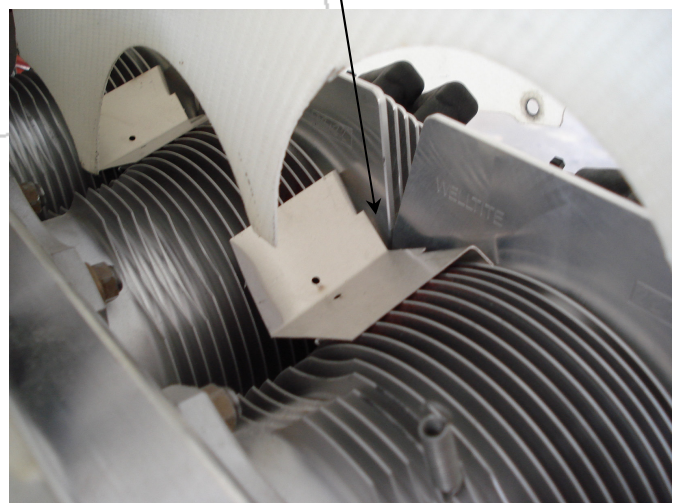


Figure 1 – Gull Wing Baffle Installation

Jabiru Service Letter: J230 Family Engine Cooling

JSL 004-1

29th January 200

3.3 Oil Cooler Duct

Figure 2 and Figure 3 show an oil cooler duct assembly (P/No. 4A442A0D) fitted to an Aero-Classics type oil cooler. The same duct is used on Positech oil coolers (identified by their gold colour) which are also used on some aircraft. Installation details for the duct are given below.



Figure 2 – Duct Assembly

End baffles to stop excess air leaking past the ends of the duct

Air flows through opening in duct and blows onto the sump

Match drill duct to cooler and fit with 2x 4mm screws & locking nuts.

Match drill duct to cooler and fit using 2 off self-tapping screws



Figure 3 – Duct Installation

Jabiru Service Letter: J230 Family Engine Cooling

JSL 004-1

29th January 200

Cowl lip must be cut back as shown to enlarge opening to oil cooler.

Note size of lips on cowl



Figure 4 – Cowl Inlet Modification

3.4 Operational Factors

- Jabiru Engines have a cautionary oil temperature range from 100°C to 118°C. This is generally listed in Flight Manuals / Pilot Operating Handbooks as a “5-minute” or “take-off” allowance. This temperature range is there to be used – it is normal and acceptable for an engine to have oil temperatures in this range for **short** periods. This limit is set because **prolonged** operation in this temperature range may have a detrimental effect on the engine’s service life.
- Engine Condition can affect oil temperatures – cylinder sealing in particular. Leak-down results must be checked during normal maintenance. Oil discharge from the breather must also be monitored – high oil discharge rates from the engine breather can indicate poor piston / cylinder sealing. Poor sealing between the piston and cylinder results in hot combustion gasses entering the crankcase, increasing temperatures and blowing oil out the breather.
- Engine oil level has a strong effect on oil temperatures. For all 3300 engines, the lowest oil temperatures are achieved when the oil level is set on the lower dipstick mark. Generally, this oil level is suitable for circuits or flights up to 3 hours duration. Note that testing has shown that setting the oil level slightly above the upper dipstick mark (i.e. slightly “over-full”) can result in oil temperatures 15°C higher than when set at the lower mark. Figure 5 shows the length of the Jabiru 3300 dipstick.

CAUTION

This applies to all Jabiru 3300 engines and to Jabiru 2200 engines prior to S/No. 22A-2440. HOWEVER, more recent Jabiru 2200 engines (S/No. 2440 onwards) have a different sump (easily identified by it’s lack of fins). Setting the oil level on the lower mark in these engines will give oil levels lower than is optimal.

Jabiru Service Letter: J230 Family Engine Cooling

JSL 004-1

29th January 200

NOTE

The information given above on oil levels is intended as a guide only. Owners must familiarise themselves with their particular engine's oil consumption rates and plan their oil levels accordingly. It is the pilot's responsibility to ensure that the engine has sufficient oil for the planned flight.

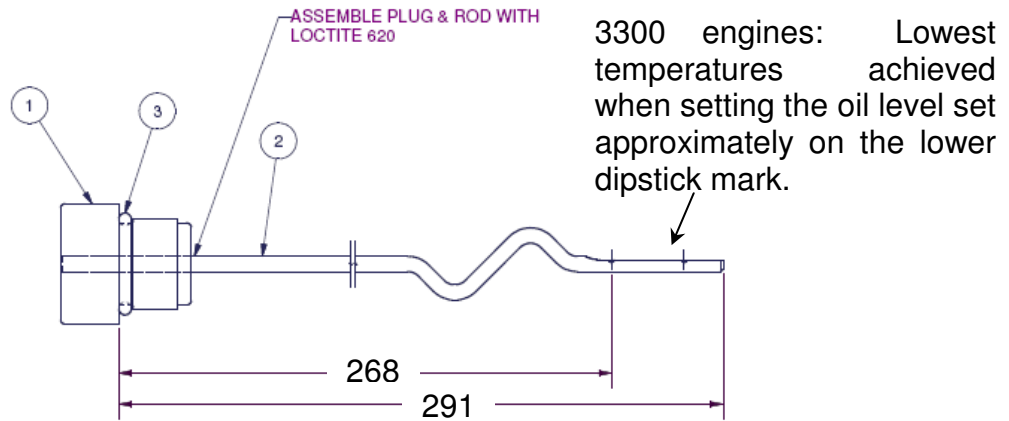


Figure 5 – Dipstick Assembly

- Ambient temperatures have a significant effect on the oil temperature. During cross-country flights it is generally best to take off and immediately climb to the highest available altitude. Air temperature generally decreases at approximately 2°C per 1000 feet, so at 5000' the air will normally be over 10°C cooler than at ground level. If necessary, the oil temperature precautionary range is to be used during the climb – once at altitude power can be reduced initially to drop oil temperatures.

4 Compliance – Implementation Schedule:

NOTE: The modifications detailed in this document – removing gull-wing baffles, fitting the oil cooler duct and trimming the cowling oil cooler opening – apply to J230 family aircraft only.

For any Jabiru aircraft in the J230 family whose cowlings match those shown above the modifications detailed herein are optional and may be omitted if the operator is satisfied with the current operating temperatures for their aircraft. This includes factory-built aircraft.

However, applying the modifications is strongly recommended by Jabiru Aircraft.

5 Airworthiness Note:

Any work called for by this letter must be carried out by authorised personnel. For J230 family models in Australia, this means the owner, an RA-Aus Level 2 holder or a Licensed Aircraft Maintenance Engineer (LAME) – as appropriate to the aircraft's registration and use (Private or Air Work operations).

On completion of the work, the authorised person must note the completion of the actions required by this letter in the aircraft's maintenance logbook. This note should note what work was carried out, reference this Service Letter, indicate the date of the work and the identity (including licence number where appropriate) of the person carrying out the work.