

# SERVICE LETTER

CUSTOMER SUPPORT AND SALES DIVISION  
40220 Tarnos – France  
Tel. (33) (0) 5 59 74 40 00  
Telex 570 042  
Fax (33) (0) 5 59 64 74 98

**Technical Support Department**  
Fax (33) (0) 5 59 74 45 34

CC/FL/ML

## **General Service Letter No. 2283/04 – 5<sup>th</sup> issue**

**This Service Letter supersedes the issue dated July 10, 2006**

**Subject: All engines  
Cycle counting**

Bordes, October 17, 2012

Dear Sir or Madam,

In February 2004, TURBOMECA published General Service Letter No. 2283/04. That letter was in response to our operators' requests for clarification regarding cycle counters, and it laid out TURBOMECA's position on the subject as well as that of the Airworthiness Authorities.

This fifth issue of the General Service Letter deals with the following:

- Details added on the precautions related to the use of counting aid systems.
- Update of the list of primary counting systems in Appendix 1.
- Update of the list of counting aid systems in Appendix 2.

At the European Certification Authority's request, the cycle counting systems have been classified into 2 types:

- **Primary counting systems,**
- Non-primary counting systems. If TURBOMECA validates non-primary counting systems, they will be referred to as **counting aid systems.**

In all cases and for any counting system used, it is the responsibility of the operator to track and record cycles in the engine log book and/or log cards of the relevant modules. We remind you that inaccurate cycle counting may result in an uncontained disk burst.

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➤ **Primary counting system:**

For each engine, chapter 5 of the Maintenance Manual specifies the counting methods that have been certified as **primary counting**. The list of **primary counting systems** is provided as a reminder in Appendix 1 of this General Service Letter.

For **primary counting systems**, the maintenance operations to be done and their frequencies are specified in chapter 5 of the engine Maintenance Manual concerned.

➤ **Counting aid systems:**

Automatic counters currently validated by TURBOMECA as **counting aid systems** require a daily coherence check of the cycles counted by the aid system, as well as a routine check of the cycle counting function.

▪ **Cycle coherence check:** It must systematically be performed by the crew after the last flight of the day. This check is aimed at locating a cycle counting discrepancy between the number of cycles given by the counting aid system and that given by the primary counting method.

After the last flight of the day:

- For twin-engine aircraft: check the coherence of the gas generator C1 and power turbine C2 cycle consumptions between the two engines with the same operating conditions.
- Make sure there is no discrepancy from the certified method (refer to chapter 5 of the engine Maintenance Manual concerned) with the same profile of mission.

If the result is compliant, the consumed cycle values given by the counting aid system can be recorded in the engine log book, taking into account the counting specificities of each unit (e.g.: partial cycles that cannot be counted by the unit).

If the result is not compliant:

- Ignore the values given by the counting aid system,
- Calculate the number of cycles with the certified method: refer to chapter 5 of the engine Maintenance Manual concerned,
- Do a troubleshooting procedure for compliance establishment of the counting aid system per the supplier's recommendations.

**Note:** Each time the profile of the mission changes, do a counting procedure with the certified method (refer to chapter 5 of the engine Maintenance Manual concerned) to characterize the mission.

▪ **Check of the cycle counting function:** You must perform a routine check of the counting aid system to verify its correct operation, in order to make sure that there is no system malfunction which may not be detected by the coherence check. For systems designed and sold by TURBOMECA, this task is specified in chapter 5 of the engine Maintenance Manual concerned. For other systems, the operator must refer to the manufacturer's documentation.

If the test result is not compliant:

- Ignore the values given by the counting aid system,
- Calculate the number of cycles with the certified method: refer to chapter 5 of the engine Maintenance Manual concerned,

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- Do a troubleshooting procedure for compliance establishment of the counting aid system per the supplier's recommendations.

The list of automatic counters validated as **counting aid systems** is provided as information in Appendix 2 of this General Service Letter.

TURBOMECA cannot confirm the accuracy of the cycle counts produced by cycle counting systems that do not fall within either of the above-mentioned categories. It is therefore up to the users of such counters to verify the accuracy of such counting.

TURBOMECA Service Bulletins notify operators of any changes to systems designed and sold by TURBOMECA. For systems not designed by TURBOMECA, the operator must refer to the manufacturer's documentation.

Please do not hesitate to contact your usual TURBOMECA representatives for additional information or assistance.



C. CANEILLES  
Technical Support Department

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## APPENDIX 1

### List of the primary counting systems

- Digital Engine Control Unit (DECU) fitted on ARRIEL 2 engines (all variants)
- Digital Engine Control Unit (DECU) fitted on ARRIUS 2 engines (all variants, 2F excluded)
- Digital Engine Control Unit (DECU) fitted on TM 333 2B2 and 2M2 engines
- Digital Engine Control Unit (DECU) fitted on MAKILA 2 engines (all variants)
- Digital Engine Control Unit (DECU) fitted on ARDIDEN 1 engines (all variants)
- Digital Engine Control Unit (DECU) fitted on ARRIUS 1A1 engines

## APPENDIX 2

### List of the counting aid systems

➤ **Systems sold by TURBOMECA:**

- Digital Engine Control Unit (DECU) fitted on MAKILA 1 A2 engines
- Tachometer box that has the cycle counting function and display unit fitted on certain ARRIEL 1 engine variants (this system does not count partial cycles C2)\*

➤ **Systems sold by EUROCOPTER :**

- VEMD fitted on EC 120 aircraft
- VEMD fitted on AS 350 B2 / ARRIEL 1D1 engines (this system does not count partial cycles C2)\*
- EUROARMS system fitted on AS 332 MK2 / MAKILA 1A2 engines (only the values of cycles consumed mission per mission can be used)
- M'ARMS system fitted on:
  - EC 145 / ARRIEL 1E2 engines (this system does not count partial cycles C2)\*
  - EC 135, EC 155, AS 365 N3, EC 225/725 engines (only the values of cycles consumed mission per mission can be used)

➤ **System sold by SMITHS INDUSTRIES:**

- Counter fitted on AS 332 MK 1 / MAKILA 1A/1A1 engines

➤ **Systems sold by AKV, Inc.:**

- P/N 350NGTEC – Linear Ver. Rev 1 – ARRIEL 1B, 1D and 1D1 engines
- P/N BK1172XCC – Linear Ver. Rev 1 – ARRIEL 1E2 engines

\*Note: For systems that do not count C2 partial cycles, these cycles must systematically be counted per the method specified in chapter 5 of the engine Maintenance Manual concerned and added to C2 cycles that are calculated by the system.