



## 適航指令發布單

### Airworthiness Directive Issuance Form

民航局 AD 編號 AD number	CAA-2021-12-006 緊急	發布日期 Date issued	2021/12/13
適用之航空產品 Applied to (models, serial numbers or part numbers, as applicable)	Model E4 and E4P engines, all serial numbers (s/n). These engines are known to be installed on, but not limited to, Diamond Aircraft Industries DA 40 NG, DA 42 NG, DA 42 M-NG and DA 62 aeroplanes.		
主旨摘要	Engine - High Pressure Pump Driving Gear - Inspection / Replacement		
民航局 CAA <input type="checkbox"/> 本國產品 Native products <input type="checkbox"/> 其他個案 Other	設計國民航主管機構 Original Authorities <div style="display: flex; justify-content: space-between;"> <div> <input type="checkbox"/> FAA  <input checked="" type="checkbox"/> EASA  <input type="checkbox"/> Brazil  <input type="checkbox"/> Transport Canada Civil Aviation  <input type="checkbox"/> DGAC             </div> <div> <input type="checkbox"/> Germany LBA  <input type="checkbox"/> CAA-NL  <input type="checkbox"/> UK CAA  <input type="checkbox"/> Japan CAB  <input type="checkbox"/> CAA of Israel  <input type="checkbox"/> Other _____             </div> </div>		
	設計國 AD 編號 Original AD number	2021-0274-E	
	1. 直接採用原 AD 之內容?(Is the original AD directly adopted?) <input checked="" type="checkbox"/> 是(Yes) <input type="checkbox"/> 否(No) _ a. 生效日期另訂為(Re-specify the effective date as) : _____ b. 執行時限另訂為(Re-specify the compliance time or period as) : _____ 2. 使用人是否需要將 AD 執行結果向民航局提出報告?(Do Users need to report the status of compliance to the CAA?) <input type="checkbox"/> 是(Yes) <input checked="" type="checkbox"/> 否(No)		
備註 Note	This AD supersedes EASA AD 2021-0203R1(CAA-2021-09-003A) dated 24 September 2021.		
註： 1. AD 內容後附。 2. 航空器產品使用人得向民航局提出豁免、替代符合方法、執行時限之展延之申請。 3. 如有任何問題，請聯絡交通部民用航空局初始適航科。Tel：(02)2349-6331~3, Fax：(02)2545-8464, e-mail： <a href="mailto:adcaa@mail.caa.gov.tw">adcaa@mail.caa.gov.tw</a> Note： 1. The AD text is enclosed. 2. Exemption, an alternative method of compliance or adjustment of the compliance time may be proposed to the CAA for approval. 3. For further information, please contact Civil Aeronautics Administration on Tel：(02)2349-6331~3, Fax：(02)2545-8464, e-mail： <a href="mailto:adcaa@mail.caa.gov.tw">adcaa@mail.caa.gov.tw</a>			





## Emergency Airworthiness Directive

**AD No.:** 2021-0274-E

**Issued:** 09 December 2021

Note: This Emergency Airworthiness Directive (AD) is issued by EASA, acting in accordance with Regulation (EU) 2018/1139 on behalf of the European Union, its Member States and of the European third countries that participate in the activities of EASA under Article 129 of that Regulation.

This AD is issued in accordance with Regulation (EU) 748/2012, Part 21.A.3B. In accordance with Regulation (EU) 1321/2014 Annex I, Part M.A.301, the continuing airworthiness of an aircraft shall be ensured by accomplishing any applicable ADs. Consequently, no person may operate an aircraft to which an AD applies, except in accordance with the requirements of that AD, unless otherwise specified by the Agency [Regulation (EU) 1321/2014 Annex I, Part M.A.303] or agreed with the Authority of the State of Registry [Regulation (EU) 2018/1139, Article 71 exemption].

**Design Approval Holder's Name:**

AUSTRO ENGINE GmbH

**Type/Model designation(s):**

E4 and E4P engines

**Effective Date:** 13 December 2021

**TCDS Number(s):** EASA.E.200

**Foreign AD:** Not applicable

**Supersedure:** This AD supersedes EASA AD 2021-0203R1 dated 24 September 2021.

### ATA 72 – Engine – High Pressure Pump Driving Gear – Inspection / Replacement

**Manufacturer(s):**

Austro Engine GmbH

**Applicability:**

Model E4 and E4P engines, all serial numbers (s/n).

These engines are known to be installed on, but not limited to, Diamond Aircraft Industries DA 40 NG, DA 42 NG, DA 42 M-NG and DA 62 aeroplanes.

**Definitions:**

For the purpose of this AD, the following definitions apply:

**The SB:** Austro Engine Service Bulletin (SB) MSB-E4-036.

**Affected cylinder head/HPP driving gear combination:** Cylinder heads, having Part Number (P/N) E4A-12-500-000, if installed in combination with a high pressure pump (HPP) driving gear P/N E4A-30-000-601 (any revision) or P/N E4A-30-000-201 rev. AB.1.

**Affected HPP driving gear:** HPP driving gears, having P/N E4A-30-000-201 and having a s/n as listed in Table 1 of the SB, as defined in this AD.





**Serviceable part:** Any HPP driving gear, eligible for installation, which is not an affected part, provided its installation does not introduce an affected cylinder head/HPP driving gear combination on the engine.

**Groups:** Group 1 are Model E4 engines in configuration “-A”, installed on single engine aeroplanes. Group 2 are Model E4 engines in configuration “-B” or “-C” and Model E4P engines, installed on twin-engine aeroplanes.

**Reason:**

Occurrences were reported of HPP driving gear failure. Subsequent investigation determined that a certain batch of HPP driving gears was produced with a worn out assembly tool P/N AE300T012-1. Those HPP driving gears may have been damaged during assembly. Concurrently, it was determined that, for engines equipped with a certain cylinder head, a stack up of tolerances exists between the cylinder head, cylinder head backside cover, camshaft gear and HPP driving gear. Both scenarios could result in premature HPP driving gear failure.

This condition, if not detected and corrected, could lead to engine in-flight shut-down with consequent forced landing, possibly resulting in damage to the aeroplane and injury to occupants.

To address this potential unsafe condition, Austro Engine published MSB-E4-035 to provide instructions for HPP driving gear inspection on engines equipped with a cylinder head P/N E4A-12-500-000, and MSB-E4-034/1 to provide instructions for replacement of affected HPP gears, as defined in this AD. Consequently, EASA issued Emergency AD 2021-0203-E (later revised) to require inspection and/or replacement of HPP gears.

Since that AD was issued, it has been determined that an affected cylinder head/HPP driving gear combination, as defined in this AD, may cause damage to the HPP driving gears. Austro Engine issued the SB, as defined in this AD, incorporating the requirements of MSB-E4-034/1 and MSB-E4-035, to provide instructions for HPP driving gear inspection and replacement. The SB also prohibits (re-)installation of a HPP driving gear E4A-30-000-601 or P/N E4A-30-000-201 rev. AB.1 on engines having a cylinder head P/N E4A-12-500-000 installed. The SB further removes from the list of affected HPP driving gears certain engines and HPPs, which were reworked by Austro Engine pending approval of MSB-E4-034.

For the reason described above, this AD partially retains the requirements of EASA AD 2021-0203R1, which is superseded, and requires replacement of the HPP driving gear on engines with an affected cylinder head/HPP driving gear combination installed. This AD also provides requirements for HPP driving gear installation.

**Required Action(s) and Compliance Time(s):**

Required as indicated, unless accomplished previously:

**Inspection and Replacement:**

- (1) For engines equipped with an affected cylinder head/HPP driving gear combination: Before next flight after the effective date of this AD, inspect and replace the HPP driving gear in accordance with the instructions of the SB.





**Corrective Action(s):**

- (2) If, during the inspection as required by paragraph (1) of this AD, the HPP driving gear does not meet the acceptable criteria, as defined in the SB, before next flight, inspect the HPP shaft, the cylinder head, the camshaft gear and the inlet/outlet camshaft bushing in accordance with the instructions of the SB and, depending on findings, replace the parts with serviceable parts in accordance with the instructions of Austro Engine E4/E4P Maintenance Manual, Doc. No. E4.08.04, chapter 85.

**Replacement:**

- (3) For engines equipped with an affected HPP driving gear: Within the compliance time specified in Table 1 of this AD, as applicable, replace each affected HPP driving gear with a serviceable part in accordance with the instructions of the SB.

Table 1 – HPP Driving Gear Replacement

Engine Group / Flight Hours (FH) accumulated (see Note 1)		Compliance Time
1	40 FH or more	Before next flight after 14 September 2021 [the effective date of EASA AD 2021-0203-E]
	less than 40 FH	Before exceeding 40 FH
2	80 FH or more	Before next flight after 14 September 2021 [the effective date of EASA AD 2021-0203-E]
	less than 80 FH	Before exceeding 80 FH

Note 1: Unless specified otherwise, the FH in Table 1 of this AD are those accumulated by the affected HPP driving gear since first installation on the HPP.

**Credit:**

- (4) Inspection and replacement of the HPP driving gear on an engine, accomplished before the effective date of this AD in accordance with the instructions of MSB-E4-034 Revision 1 or MSB-E4-035, as applicable, are acceptable to comply with the requirements of paragraphs (1) to (3) of this AD for that engine, provided no affected cylinder head/HPP driving gear combination has been installed on that engine at any time after that inspection.

**Ferry Flight:**

- (5) For a twin-engine aeroplane that has one or two Group 2 engine(s) installed, a single ferry flight is allowed to position that aeroplane to a location where the actions required by this AD can be accomplished on the affected engine(s).

**Part(s) Installation:**

- (6) From the effective date of this AD, do not install an affected HPP gear on any engine.
- (7) From the effective date of this AD, do not install an affected cylinder head/HPP driving gear combination on any engine.





**Ref. Publications:**

Austro Engine SB MSB-E4-036 original issue dated 30 November 2021.

Austro Engine E4/E4P Maintenance Manual, Doc. No. E4.08.04 rev. 30 dated 01 July 2021.

The use of later approved revisions of the above-mentioned documents is acceptable for compliance with the requirements of this AD.

Austro Engine SB MSB-E4-034 Revision 1 dated 10 September 2021.

Austro Engine SB MSB-E4-035 original issue dated 10 September 2021.

**Remarks:**

1. If requested and appropriately substantiated, EASA can approve Alternative Methods of Compliance for this AD.
2. The results of the safety assessment have indicated the need for immediate publication and notification, without the full consultation process.
3. Enquiries regarding this AD should be referred to the EASA Safety Information Section, Certification Directorate. E-mail: [ADs@easa.europa.eu](mailto:ADs@easa.europa.eu).
4. Information about any failures, malfunctions, defects or other occurrences, which may be similar to the unsafe condition addressed by this AD, and which may occur, or have occurred on a product, part or appliance not affected by this AD, can be reported to the [EU aviation safety reporting system](#). This may include reporting on the same or similar components, other than those covered by the design to which this AD applies, if the same unsafe condition can exist or may develop on an aircraft with those components installed. Such components may be installed under an FAA Parts Manufacturer Approval (PMA), Supplemental Type Certificate (STC) or other modification.
5. For any question concerning the technical content of the requirements in this AD, please contact: Austro Engine GmbH, Rudolf-Diesel-Str. 11, 2700 Wiener Neustadt, Austria, Telephone +43-2622-23000-2525, E-mail [support@austroengine.at](mailto:support@austroengine.at).

