
SERVICE INFORMATION LETTER NO. SI40NG-083

NOTE: Service information letters (SILs) are used only:

1. To distribute information from Diamond Aircraft Industries Inc. to our customers.
2. To distribute applicable information/documents from our suppliers to our customers with additional information.

NOTE: Typically there is no revision service for SILs. Each new information or change will be sent along with a new SIL.

1. TECHNICAL DETAILS

1.1 Aircraft Affected

See Austro Engine MSB-E4-036, latest approved revision.

1.2 Subject

Austro Engine Mandatory Service Bulletin MSB-E4-036 - High Pressure Pump (HPP) Inspection and Replacement, and EASA AD 2021-0274-E.

ATA-Code: 72-00

1.3 Reason

Occurrences of HPP driving gear failure causing uncommanded engine shutdown have been reported. Investigation has revealed that improper use of an assembly tool was causing certain HPP driving gears to fail prematurely. During this investigation, it was discovered that certain combinations of engine components such as cylinder heads, camshafts, and HPP gears were contributing to premature HPP gear failure. Austro Engine has issued MSB-E4-036, which incorporates the requirements of MSB-E4-034 and MSB-E4-035, both of which were previously issued to address premature failures of the HPP driving gear.

EASA has issued AD 2021-0274-E mandating the execution of MSB-E4-036.

1.4 Information

For detailed technical information, refer to the latest approved revision of Austro Engine MSB-E4-036, and EASA AD 2021-0274-E, which are applicable without any further additions or restrictions.

Austro Engine MSB-E4-036 at revision 0, and EASA AD 2021-0274-E are attached to this SIL. In case of doubt, contact Austro Engine GmbH.

Diamond Aircraft Industries
SERVICE INFORMATION LETTER



2. OTHER DETAILS

To obtain satisfactory results, procedures specified in this service information letter must be accomplished in accordance with accepted methods and current government regulations. Diamond Aircraft Industries Inc. cannot be responsible for the quality of work performed in accomplishing the requirements of this service information letter. Diamond Aircraft reserves the right to void continued warranty coverage in the area affected by this service information letter if it is not incorporated. If you no longer own the aircraft to which this service information letter applies, please forward it to the current owner and send the name of the current owner to Diamond Aircraft Industries Inc. at the address below.

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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.
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.



MANDATORY SERVICE BULLETIN

No. MSB-E4-036

Supersedes MSB-E4-035 and MSB-E4-034

Distribution:	Portal
Date:	01.12.2021

1. Basic information

1.1. Subject

High Pressure Pump (HPP) Inspection and Replacement

1.2. Record of revisions

Rev.	Date	Reason
0	30.11.2021	Initial release

1.3. Definitions and Acronyms


For the purpose of this Service Bulletin, the following definitions and acronyms apply:


CH:	Cylinder Head
FH:	Flight Hours
HPP:	High Pressure Pump
n/a:	Not applicable
p/n or p/ns:	Part number or Part Numbers
SB:	Service Bulletin
s/n or s/ns:	Serial Number or Serial Numbers
Group 1 engines:	Model E4 engines in configuration “-A”, installed on single engine aeroplanes
Group 2 engines:	Model E4 engines in configuration “-B” or “-C” and Model E4P engines, installed on twin-engine aeroplanes
Serviceable part:	Any HPP driving gear, eligible for installation, which is not an affected part


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1.4. Engines affected

Engine affected:	E4 Series
Serial numbers affected:	All E4/E4P engine s/ns having an affected CH installed All E4/E4P engine s/ns having an affected HPP gear installed
Affected HPP gear:	HPP driving gear p/n E4A-30-000-201 having s/n listed in the following Table 1
Affected cylinder head:	CH p/n E4A-12-500-000, installed in combination with a HPP gear p/n E4A-30-000-601 (any revision) or p/n E4A-30-000-201 rev. AB.1

 **Note:** Table 1 lists the s/ns of the affected driving gears installed on certain batches of HPP p/n E4A-30-000-000 and E4A-30-000-BHY. To determine if an affected part is installed, s/ns of the HPP on which an affected part is installed and the engine s/n on which such HPP is installed are provided. Where the engine s/n is not indicated, the HPP was provided as a spare part. Please note that only the gear s/ns identify an affected part, engine and HPP s/ns are provided for reference only

 **Note:** To identify the cylinder head installed, refer to the maintenance manual E4.08.04 chapter 85. Additional Cylinder Head identification methods are provided in the Service Instruction no. SI-E4-016

 **Note:** In respect of the Service Bulletin no. MSB-E4-034, engines and parts were reworked by Austro Engine pending approval of the initial release. To ease the identification, removed s/ns are marked in grey and strikethrough (~~example~~)


 **Note:** For these engines where the MSB-034 or/and MSB-035 were performed, refer to the paragraph 1.9 for compliance credits

Table 1 – Affected HPP driving gear serial numbers

High Pressure Pump S/N	Gear S/N	Engine S/N	High Pressure Pump S/N	Gear S/N	Engine S/N	High Pressure Pump S/N	Gear S/N	Engine S/N
19-09-11-02-01162	0246		20-06-18-02-00889	1049		20-10-26-02-00628	1950	
19-09-11-02-01167	0414	E4-C-05107	20-06-18-02-00890	1051		20-10-26-02-00629	1968	
19-09-11-02-01168	0270	E4P-C-05003	20-06-18-02-00891	1001		20-10-26-02-00630	1775	
19-09-11-02-01169	0240		20-06-18-02-00893	1028	E4-A-00198	20-10-26-02-00631	1773	
19-09-11-02-01170	0410	E4P-C-05005	20-06-18-02-00894	0550		20-10-26-02-00632	1903	
19-09-11-02-01171	0412	E4-A-00232	20-06-18-02-00895	1041	E4-C-06042	20-10-26-02-00633	1211	
19-09-11-02-01172	0415	E4-C-05109	20-06-18-02-00896	1048	E4-C-06031	20-10-26-02-00634	1233	
19-09-11-02-01189	0382		20-06-18-02-00897	1030		20-10-26-02-00635	1363	E4-A-06082
19-09-11-02-01190	0267		20-06-18-02-00898	1027		20-10-26-02-00637	1785	
19-09-11-02-01191	0258		20-06-18-02-00899	1056	E4P-C-06027	20-10-26-02-00638	1958	
19-09-11-02-01192	0256		20-06-18-02-00900	0664	E4-A-06021	20-10-26-02-00639	1887	
19-09-11-02-01193	0261		20-06-18-02-00901	1114		20-10-26-02-00640	1982	
19-09-11-02-01194	0257		20-06-18-02-00902	0979		20-10-26-02-00641	1953	
19-09-11-02-01195	0264		20-06-18-02-00903	1061		20-10-26-02-00642	1811	
19-09-11-02-01196	0255		20-06-18-02-00904	0762		20-10-26-02-00643	1818	
19-09-11-02-01197	0274		20-06-18-02-00905	0756		20-10-26-02-00644	1890	
19-09-11-02-01198	0408		20-06-18-02-00906	1060	E4-A-00475	20-10-26-02-00645	1781	
19-09-11-02-01199	0272		20-06-18-02-00907	1023	E4-A-00408	20-12-14-02-00002	1955	
19-09-11-02-01200	0333		20-06-18-02-00908	1073		20-12-14-02-00003	1449	E4-A-06088

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High Pressure Pump S/N	Gear S/N	Engine S/N
19-09-11-02-01201	0332	
19-09-11-02-01202	0244	
19-09-11-02-01203	0330	
19-09-11-02-01204	0383	
19-09-11-02-01205	0254	
19-09-11-02-01206	0324	
19-09-11-02-01207	0262	
19-09-11-02-01208	0237	
19-09-11-02-01209	0329	
19-09-11-02-01210	0386	
19-09-11-02-01211	0265	
19-10-01-02-00755	0233	
19-10-01-02-00756	0224	E4-B-05006
19-10-01-02-00760	0226	E4-B-05004
19-10-01-02-00763	0241	E4-B-05001
19-10-01-02-00764	0416	
19-10-01-02-00768	0260	
19-10-01-02-00772	0268	E4-A-05086
19-10-01-02-00775	0248	
19-10-01-02-00779	0370	
19-10-01-02-00784	0231	
19-10-01-02-00786	0242	
19-10-01-02-00788	0235	
19-10-01-02-00790	0266	
19-10-01-02-00796	0131	E4-C-05106
19-10-01-02-00804	0228	E4-B-05002
19-10-01-02-00809	0227	E4-A-05085
19-10-14-02-00404	0222	
19-10-14-02-00405	0247	E4-C-05110
19-10-14-02-00409	0364	E4-A-05084
19-10-14-02-00410	0253	
19-10-14-02-00415	0365	E4-C-05105
19-10-14-02-00416	0232	
19-10-14-02-00420	0236	
19-10-14-02-00432	0229	E4-B-05008
19-10-14-02-00437	0411	E4-A-05075
19-10-14-02-00438	0239	E4-B-05005
19-10-14-02-00446	0374	E4-A-05087
19-10-14-02-00454	0193	E4P-B-05004
19-10-14-02-00457	0251	E4-C-05108
19-12-12-02-00002	0195	E4-A-05081
19-12-12-02-00004	0366	
19-12-12-02-00005	0169	
19-12-12-02-00009	0363	
19-12-12-02-00011	0358	
19-12-12-02-00015	0190	
19-12-12-02-00016	0376	
19-12-12-02-00017	0369	E4-A-05079
19-12-12-02-00020	0146	
19-12-12-02-00023	0225	
19-12-12-02-00029	0361	E4P-C-05001
19-12-12-02-00031	0372	E4P-C-05004
19-12-12-02-00032	0127	
19-12-12-02-00033	0177	
19-12-12-02-00034	0179	
19-12-12-02-00035	0118	
19-12-12-02-00039	0223	
19-12-12-02-00046	0367	E4-C-05111
19-12-12-02-00047	0120	E4P-B-05003
19-12-12-02-00048	0362	
19-12-12-02-00049	0197	
19-12-12-02-00057	0122	
19-12-12-02-00058	0155	
19-12-12-02-00064	0205	
19-12-12-02-00065	0119	E4P-C-05002

High Pressure Pump S/N	Gear S/N	Engine S/N
20-06-18-02-00909	1042	
20-06-18-02-00910	1066	E4-C-06043
20-06-18-02-00911	0766	
20-06-18-02-00912	1046	
20-06-18-02-00913	1044	
20-06-18-02-00914	1103	E4-C-06032
20-06-18-02-00915	1128	E4-B-00112
20-06-18-02-00916	0699	
20-06-18-02-00917	1026	E4-A-00214
20-06-18-02-00918	1100	
20-06-18-02-00919	1069	
20-06-18-02-00920	0723	E4-A-06025
20-06-18-02-00921	1127	
20-06-18-02-00922	1034	E4-A-00367
20-06-18-02-00923	1032	
20-06-18-02-00924	1036	
20-06-18-02-00925	1094	
20-06-18-02-00926	1011	E4-A-06061
20-06-18-02-00927	1038	
20-06-18-02-00928	1031	E4-C-00041
20-06-18-02-00929	1037	
20-06-18-02-00930	1015	E4-A-00604
20-06-18-02-00931	0632	E4-A-06024
20-06-18-02-00932	1082	
20-06-18-02-00933	1024	E4-A-06060
20-06-18-02-00934	0833	E4-A-00456
20-06-18-02-00935	1012	
20-06-18-02-00936	1006	
20-06-18-02-00937	1021	
20-06-18-02-00938	1004	
20-06-18-02-00939	0622	
20-06-18-02-00940	0729	
20-06-18-02-00941	0585	
20-06-18-02-00942	0769	
20-06-18-02-00943	0830	
20-06-18-02-00944	0849	
20-06-18-02-00945	0820	
20-06-18-02-00946	0571	
20-06-18-02-00947	0825	E4-A-06030
20-06-18-02-00948	0683	E4-A-06013
20-06-18-02-00949	0734	
20-06-18-02-00950	0738	
20-06-18-02-00951	1081	
20-06-18-02-00952	0690	
20-06-18-02-00953	0827	
20-06-18-02-00954	0641	
20-06-18-02-00955	0805	
20-06-18-02-00956	0625	
20-06-18-02-00957	0792	
20-06-18-02-00958	0815	
20-06-18-02-00959	0840	
20-06-18-02-00960	0839	
20-06-18-02-00961	0644	E4P-C-06008
20-06-18-02-00962	0802	E4-A-00323
20-06-18-02-00963	0810	E4-C-00091
20-06-18-02-00964	0793	
20-06-18-02-00965	0966	
20-06-18-02-00966	0783	
20-06-18-02-00967	0848	
20-06-18-02-00968	0974	
20-06-18-02-00970	0736	
20-06-18-02-00971	0856	
20-06-18-02-00972	1079	E4-A-00507
20-06-18-02-00973	0732	
20-06-18-02-00974	0674	

High Pressure Pump S/N	Gear S/N	Engine S/N
20-12-14-02-00004	1976	
20-12-14-02-00005	1938	
20-12-14-02-00006	1816	
20-12-14-02-00007	1947	
20-12-14-02-00009	1929	
20-12-14-02-00010	1988	
20-12-14-02-00011	1799	
20-12-14-02-00012	1986	
20-12-14-02-00013	1936	
20-12-14-02-00014	1368	
20-12-14-02-00017	1940	
20-12-14-02-00020	1422	E4-A-06080
20-12-14-02-00021	1941	
20-12-14-02-00024	1779	
20-12-14-02-00025	1946	
20-12-14-02-00026	1974	
20-12-14-02-00028	1969	
20-12-14-02-00035	1921	
20-12-14-02-00036	1817	
20-12-14-02-00038	1881	
20-12-14-02-00039	1346	
20-12-14-02-00043	1830	
20-12-14-02-00048	1178	
20-12-14-02-00052	1350	E4-C-00604
20-12-14-02-00053	1437	
20-12-14-02-00059	1167	
20-12-14-02-00064	1405	
20-12-14-02-00065	1331	E4-A-06076
20-12-14-02-00069	1434	E4-A-06087
20-12-14-02-00073	1375	
20-12-14-02-00074	1389	E4-A-06092
20-12-14-02-00075	1403	E4-C-06057
20-12-14-02-00079	1342	
20-12-14-02-00080	1380	
20-12-14-02-00081	1343	E4-A-06068
20-12-14-02-00086	1400	E4P-C-06049
21-02-08-02-00002	1349	
21-02-08-02-00003	1446	
21-02-08-02-00004	1319	E4-A-00115
21-02-08-02-00005	1340	E4-B-00541
21-02-08-02-00006	1439	E4P-C-06056
21-02-08-02-00007	1402	
21-02-08-02-00008	1384	
21-02-08-02-00009	1412	
21-02-08-02-00010	1372	
21-02-08-02-00011	1355	E4-A-06095
21-02-08-02-00013	1163	E4-C-06055
21-02-08-02-00015	1479	
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21-02-08-02-00030	1333	E4-A-00504
21-02-08-02-00031	1493	
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Austro Engine GmbH
Rudolf-Diesel-Strasse 11
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High Pressure Pump S/N	Gear S/N	Engine S/N	High Pressure Pump S/N	Gear S/N	Engine S/N	High Pressure Pump S/N	Gear S/N	Engine S/N
19-12-12-02-00066	0407	E4-C-05112	20-06-18-02-00975	1050		21-02-08-02-00033	1317	
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Austro Engine GmbH
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High Pressure Pump S/N	Gear S/N	Engine S/N
20-02-13-02-01418	0426	E4-C-05125
20-02-13-02-01419	0405	
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20-02-13-02-01483	0449	

High Pressure Pump S/N	Gear S/N	Engine S/N
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High Pressure Pump S/N	Gear S/N	Engine S/N
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High Pressure Pump S/N	Gear S/N	Engine S/N
20-02-13-02-01484	0542	
20-02-13-02-01485	0450	
20-02-13-02-01486	0446	
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20-02-13-02-01507	0489	
20-02-13-02-01508	0317	
20-02-13-02-01509	0529	E4-A-06011
20-02-13-02-01510	0631	
20-02-13-02-01511	0451	
20-02-13-02-01512	0472	E4-A-06009
20-02-13-02-01513	0600	
20-02-14-02-00084	1494	E4P-C-06051
20-03-04-02-00003	0563	
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20-03-04-02-00005	0435	
20-03-04-02-00006	0538	
20-03-04-02-00007	0434	
20-03-04-02-00008	0311	
20-03-04-02-00009	0463	
20-03-04-02-00010	0344	
20-03-04-02-00011	0346	E4-C-06005
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20-03-04-02-00013	0447	
20-03-04-02-00014	0492	
20-03-04-02-00015	0465	
20-03-04-02-00016	0357	
20-03-04-02-00017	0420	E4-C-06003
20-03-04-02-00018	0433	
20-03-04-02-00019	0309	
20-03-04-02-00020	0391	
20-03-04-02-00021	0424	E4-C-06004
20-03-04-02-00022	0570	
20-03-04-02-00023	0430	
20-03-04-02-00024	0305	
20-03-04-02-00025	0398	E4-C-06006
20-03-04-02-00026	0322	
20-03-04-02-00027	0484	
20-03-04-02-00029	0323	E4-C-06002
20-03-04-02-00030	0417	
20-03-04-02-00031	0403	E4-A-06001
20-03-04-02-00032	0490	
20-03-04-02-00033	0096	
20-03-04-02-00034	0313	
20-03-04-02-00035	0342	
20-03-04-02-00036	0308	
20-03-04-02-00037	0418	

High Pressure Pump S/N	Gear S/N	Engine S/N
20-08-21-02-00586	1104	
20-08-21-02-00587	1366	E4-C-06066
20-08-21-02-00588	1253	
20-08-21-02-00589	1117	
20-08-21-02-00590	1107	
20-08-21-02-00591	1176	
20-08-21-02-00592	0686	E4-A-06014
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20-08-21-02-00595	1189	
20-08-21-02-00596	1083	
20-08-21-02-00597	1137	
20-08-21-02-00598	1124	
20-08-21-02-00599	1175	
20-08-21-02-00600	1160	
20-08-21-02-00601	1142	
20-08-21-02-00602	1185	
20-08-21-02-00603	0779	
20-08-21-02-00604	1084	
20-08-21-02-00605	1135	
20-08-21-02-00606	1187	
20-08-21-02-00607	1156	
20-08-21-02-00608	1241	E4P-C-06029
20-08-21-02-00609	1129	
20-08-21-02-00610	1097	
20-08-21-02-00611	1157	
20-08-21-02-00612	1086	
20-08-21-02-00613	1146	
20-08-21-02-00614	1145	
20-08-21-02-00615	1120	
20-08-21-02-00616	1174	
20-08-21-02-00617	1139	
20-08-21-02-00618	1087	
20-08-21-02-00619	1099	
20-08-21-02-00620	1131	
20-08-21-02-00621	1186	E4-C-00182
20-08-21-02-00622	1223	E4-A-00216
20-08-21-02-00623	1108	
20-08-21-02-00624	1306	E4-C-06037
20-08-21-02-00625	1200	
20-08-21-02-00626	1182	E4-C-06047
20-08-21-02-00627	1245	E4-C-06041
20-08-21-02-00628	1312	
20-08-21-02-00629	1071	
20-08-21-02-00630	1159	
20-08-21-02-00631	1172	E4-A-06050
20-08-21-02-00632	1134	
20-08-21-02-00633	1239	
20-08-21-02-00634	1365	E4-A-00603
20-08-21-02-00635	1444	
20-08-21-02-00636	0814	
20-08-21-02-00637	1266	
20-08-21-02-00638	1164	
20-08-21-02-00639	1248	E4-C-06048
20-08-21-02-00640	1232	E4P-C-06044
20-08-21-02-00641	1218	
20-08-21-02-00642	1197	E4-C-00042
20-08-21-02-00643	1438	E4P-C-00069
20-08-21-02-00644	1195	
20-08-21-02-00645	1262	E4-A-00491
20-08-21-02-00646	1257	
20-08-21-02-00647	0834	
20-08-21-02-00648	1231	
20-08-21-02-00649	1267	E4-A-06053
20-08-21-02-00650	1212	
20-08-21-02-00651	1235	

High Pressure Pump S/N	Gear S/N	Engine S/N
21-03-03-02-02309	1505	
21-03-03-02-02310	1522	
21-03-03-02-02311	1519	E4-A-06102
21-03-03-02-02312	1539	
21-03-03-02-02313	1725	
21-03-03-02-02314	1492	
21-03-03-02-02315	1546	
21-03-03-02-02316	1524	
21-03-03-02-02317	1502	
21-03-03-02-02318	1516	
21-03-03-02-02319	1510	
21-03-03-02-02320	1475	
21-03-03-02-02321	1701	
21-03-03-02-02322	1443	
21-03-03-02-02323	1512	E4-C-00119
21-03-03-02-02325	1538	E4-A-00660
21-03-03-02-02326	1514	
21-03-03-02-02327	1526	E4-B-00063
21-03-03-02-02328	1700	
21-03-03-02-02329	1545	
21-03-03-02-02330	1556	
21-03-03-02-02331	1530	
21-03-03-02-02332	1509	E4-A-00018
21-03-03-02-02333	1513	
21-03-03-02-02334	1508	
21-03-03-02-02335	1697	
21-03-03-02-02336	1520	
21-03-03-02-02337	1537	
21-03-03-02-02339	1528	
21-03-03-02-02340	1578	
21-03-03-02-02341	1548	
21-03-03-02-02342	1565	
21-03-03-02-02343	1726	
21-03-03-02-02344	1569	
21-03-03-02-02345	1571	
21-03-03-02-02346	1511	E4-C-00088
21-03-03-02-02347	1665	
21-03-03-02-02349	1541	
21-03-03-02-02350	1550	E4-A-06100
21-03-03-02-02351	1480	
21-03-03-02-02352	1748	
21-03-03-02-02353	1531	
21-03-03-02-02354	1554	
21-03-03-02-02355	1618	
21-03-03-02-02356	1576	
21-03-03-02-02357	1486	
21-03-03-02-02358	1568	
21-03-03-02-02359	1580	
21-03-03-02-02360	1507	
21-03-03-02-02361	1567	
21-03-03-02-02362	1638	
21-03-03-02-02363	1586	
21-03-03-02-02364	1470	
21-03-03-02-02365	1577	E4-C-06077
21-03-03-02-02366	1473	
21-03-03-02-02367	1558	
21-03-03-02-02369	1555	
21-03-03-02-02370	1823	
21-03-03-02-02371	1559	
21-03-03-02-02372	1579	
21-03-03-02-02373	1440	E4-A-06097
21-03-03-02-02374	1692	
21-03-03-02-02375	1573	
21-03-03-02-02376	1549	
21-03-03-02-02377	1647	

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Austro Engine GmbH
Rudolf-Diesel-Strasse 11
A-2700 Wiener Neustadt
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High Pressure Pump S/N	Gear S/N	Engine S/N
20-03-04-02-00038	0400	E4-C-05124
20-03-04-02-00039	0500	E4P-C-06012
20-03-04-02-00040	0535	E4P-C-06006
20-03-04-02-00041	0437	
20-03-04-02-00042	0543	
20-03-04-02-00043	0473	
20-03-04-02-00044	0494	E4-C-06007
20-03-04-02-00045	0340	
20-03-04-02-00046	0515	
20-03-04-02-00047	0498	
20-03-04-02-00048	0588	
20-03-04-02-00049	0478	
20-03-04-02-00050	0541	
20-03-04-02-00051	0448	E4P-C-06002
20-03-04-02-00052	0519	E4-A-06003
20-03-04-02-00053	0495	
20-03-04-02-00054	0483	
20-03-04-02-00055	0389	
20-03-04-02-00057	0518	
20-03-04-02-00058	0506	
20-03-04-02-00059	0505	
20-03-04-02-00060	0464	
20-03-04-02-00061	0456	E4-A-06005
20-03-04-02-00062	0499	
20-03-04-02-00063	0532	
20-03-04-02-00064	0436	E4P-C-06003
20-03-04-02-00065	0427	
20-03-04-02-00066	0493	E4-A-06012
20-03-04-02-00068	0564	
20-03-04-02-00071	0458	E4P-C-06005
20-03-04-02-00072	0474	
20-03-04-02-00073	0513	E4-A-06007
20-03-04-02-00074	0534	
20-03-04-02-00075	0533	E4P-C-06004
20-03-04-02-00076	0508	E4P-C-06001
20-03-04-02-00078	0501	
20-03-04-02-00079	0610	E4-A-06017
20-03-04-02-00081	0481	
20-03-04-02-00082	0509	
20-03-04-02-00083	0488	E4-A-06002
20-03-04-02-00085	0438	
20-03-04-02-00086	0517	E4-A-06004
20-03-04-02-00088	0521	
20-03-04-02-00089	0457	
20-03-04-02-00091	0526	
20-03-31-02-00182	0624	
20-03-31-02-00183	0681	
20-03-31-02-00184	0568	
20-03-31-02-00185	0525	
20-03-31-02-00186	0687	
20-03-31-02-00187	0584	
20-03-31-02-00188	0689	
20-03-31-02-00189	0576	
20-03-31-02-00190	0609	
20-03-31-02-00191	0605	
20-03-31-02-00192	0618	
20-03-31-02-00193	0679	E4P-C-06007
20-03-31-02-00194	0663	
20-03-31-02-00195	0596	
20-03-31-02-00196	0655	
20-03-31-02-00197	0475	
20-03-31-02-00198	0636	
20-03-31-02-00199	0695	E4-A-00498
20-03-31-02-00200	0551	
20-03-31-02-00201	0552	E4-A-06015

High Pressure Pump S/N	Gear S/N	Engine S/N
20-08-21-02-00652	1226	E4-A-00244
20-08-21-02-00653	1369	
20-08-21-02-00654	1351	E4-C-00118
20-08-21-02-00655	1385	E4-C-00243
20-08-21-02-00656	0747	
20-08-21-02-00657	1264	E4-A-06064
20-08-21-02-00659	1222	E4-C-06060
20-08-21-02-00660	1208	
20-08-21-02-00661	1390	E4-C-06069
20-08-21-02-00662	1255	E4-A-06072
20-08-21-02-00663	1388	E4-A-00514
20-08-21-02-00664	1290	E4-C-06051
20-08-21-02-00665	1225	E4-A-06074
20-08-21-02-00666	1391	E4-A-00192
20-08-21-02-00667	1215	
20-08-21-02-00668	1299	E4P-C-06036
20-08-21-02-00669	1193	
20-08-21-02-00670	1361	
20-08-21-02-00671	1300	E4P-C-06037
20-08-21-02-00672	1219	
20-08-21-02-00673	1198	
20-08-21-02-00674	1213	E4-C-06063
20-08-21-02-00675	1196	
20-08-21-02-00676	1362	E4P-C-06045
20-08-21-02-00677	1354	
20-08-21-02-00678	1291	E4-A-06056
20-08-21-02-00679	1249	
20-08-21-02-00680	1263	
20-08-21-02-00681	1313	
20-08-21-02-00682	1216	
20-08-21-02-00683	1347	
20-08-21-02-00684	1381	
20-08-21-02-00685	1259	E4-C-06040
20-08-21-02-00686	1311	E4-A-06066
20-08-21-02-00687	1227	E4P-C-06043
20-08-21-02-00688	1281	
20-08-21-02-00689	1271	
20-08-21-02-00690	0581	
20-08-21-02-00691	1279	E4-A-06063
20-08-21-02-00692	1254	E4-C-06045
20-08-21-02-00693	1258	
20-08-21-02-00694	1283	
20-08-21-02-00695	1277	E4-A-06070
20-08-21-02-00696	1238	E4-C-00138
20-08-21-02-00697	1261	
20-08-21-02-00698	0824	
20-08-21-02-00699	1302	E4P-C-06039
20-08-21-02-00700	1307	E4-C-06039
20-08-21-02-00701	1284	E4P-C-06035
20-08-21-02-00702	1252	E4-B-00202
20-08-21-02-00703	1268	
20-08-21-02-00704	1244	E4-A-06069
20-08-21-02-00705	1296	E4-A-06071
20-08-21-02-00706	1276	
20-08-21-02-00707	1247	
20-08-21-02-00708	1240	
20-08-21-02-00709	1275	
20-08-21-02-00710	1251	
20-08-21-02-00711	1287	E4-A-06062
20-08-21-02-00712	1272	
20-08-21-02-00713	1297	
20-08-21-02-00714	1242	
20-08-21-02-00715	1295	E4-C-06038
20-08-21-02-00716	1289	
20-08-21-02-00717	0691	

High Pressure Pump S/N	Gear S/N	Engine S/N
21-03-03-02-02379	1582	E4P-C-06053
21-03-03-02-02380	1560	
21-03-03-02-02381	1428	E4-A-06089
21-03-03-02-02382	1574	
21-03-03-02-02384	1563	
21-03-03-02-02385	1441	
21-03-03-02-02386	1358	E4-A-06098
21-03-03-02-02387	1506	
21-03-03-02-02388	1589	E4-C-06075
21-03-03-02-02389	1572	E4-C-06080
21-03-03-02-02390	1581	
21-03-03-02-02391	1551	
21-03-03-02-02392	1557	E4P-C-06054
21-03-03-02-02393	1474	
21-03-03-02-02394	1564	E4P-C-06052
21-03-03-02-02395	1540	
21-03-03-02-02396	1553	
21-03-03-02-02397	1561	
21-03-03-02-02398	1488	
21-03-03-02-02399	1456	
21-03-03-02-02400	1657	
21-03-03-02-02401	1706	
21-03-03-02-02402	1713	
21-03-03-02-02403	1840	
21-03-03-02-02404	1907	
21-03-03-02-02405	1810	
21-03-03-02-02406	1828	
21-03-03-02-02407	1752	
21-03-03-02-02408	1325	
21-03-03-02-02409	1829	
21-03-03-02-02410	1822	
21-03-03-02-02411	1707	
21-03-03-02-02412	1742	
21-03-03-02-02414	1850	
21-03-03-02-02415	1562	
21-03-03-02-02416	1841	
21-03-03-02-02417	1658	
21-03-03-02-02418	1629	
21-03-03-02-02419	1813	
21-04-08-02-00592	1722	
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21-04-08-02-00596	1591	
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21-04-08-02-00599	1702	
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21-04-08-02-00601	1602	
21-04-08-02-00602	1603	
21-04-08-02-00603	1614	E4-A-06104
21-04-08-02-00604	1672	
21-04-08-02-00605	1640	
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21-04-08-02-00613	1605	
21-04-08-02-00614	1757	
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Austro Engine GmbH
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High Pressure Pump S/N	Gear S/N	Engine S/N	High Pressure Pump S/N	Gear S/N	Engine S/N	High Pressure Pump S/N	Gear S/N	Engine S/N
20-03-31-02-00202	0546		20-08-21-02-00718	1303	E4P-C-06034	21-04-08-02-00618	1607	
20-03-31-02-00203	0672		20-08-21-02-00719	0799		21-04-08-02-00619	1807	
20-03-31-02-00204	0482		20-08-21-02-00720	0818		21-04-08-02-00620	1613	
20-03-31-02-00205	0567		20-08-21-02-00721	1314	E4-C-06052	21-04-08-02-00621	1612	
20-03-31-02-00206	0649		20-08-21-02-00722	0735		21-04-08-02-00622	1616	
20-03-31-02-00207	0677		20-08-21-02-00723	0808		21-04-08-02-00623	1767	
20-03-31-02-00208	0512		20-08-21-02-00724	0757		21-04-08-02-00624	1723	
20-03-31-02-00209	0587		20-08-21-02-00725	0574	E4P-C-00051	21-04-08-02-00625	1721	
20-03-31-02-00210	0560		20-08-21-02-00726	0709		21-04-08-02-00626	1598	
20-03-31-02-00211	0562		20-09-02-02-00424	0657		21-04-08-02-00627	1625	
20-03-31-02-00212	0952		20-09-02-02-00425	0774		21-04-08-02-00628	1639	
20-03-31-02-00213	0659		20-09-02-02-00426	0776		21-04-08-02-00629	1729	
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20-03-31-02-00216	0601		20-09-02-02-00428	0590		21-04-08-02-00631	1667	
20-03-31-02-00217	0586		20-09-02-02-00429	0620	E4-A-06023	21-04-08-02-00632	1825	
20-03-31-02-00218	0459		20-09-02-02-00430	0640	E4-B-00297	21-04-08-02-00633	1583	
20-03-31-02-00219	0565		20-09-02-02-00431	0578	E4-A-00046	21-04-08-02-00634	1645	
20-03-31-02-00220	0558		20-09-02-02-00433	0823		21-04-08-02-00635	1594	
20-03-31-02-00221	0684		20-09-02-02-00434	0764		21-04-08-02-00636	1716	
20-03-31-02-00222	0654		20-09-02-02-00435	0817		21-04-08-02-00637	1628	
20-03-31-02-00223	0595		20-09-02-02-00436	0604	E4-C-06011	21-04-08-02-00638	1646	
20-03-31-02-00224	0553		20-09-02-02-00437	0665		21-04-08-02-00639	1584	
20-03-31-02-00225	0544		20-09-02-02-00438	0648	E4-A-06028	21-04-08-02-00640	1689	
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Austro Engine GmbH
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High Pressure Pump S/N	Gear S/N	Engine S/N	High Pressure Pump S/N	Gear S/N	Engine S/N	High Pressure Pump S/N	Gear S/N	Engine S/N
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High Pressure Pump S/N	Gear S/N	Engine S/N	High Pressure Pump S/N	Gear S/N	Engine S/N	High Pressure Pump S/N	Gear S/N	Engine S/N
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20-05-14-02-00068	1057	E4-A-06048	20-10-19-02-00544	1292	E4P-C-06040	21-05-10-02-00098	1838	
20-05-14-02-00069	0984		20-10-19-02-00545	1260	E4-A-00279	21-05-10-02-00099	1743	
20-05-14-02-00070	1055		20-10-19-02-00546	1269		21-05-10-02-00100	1801	
20-05-14-02-00071	0981		20-10-19-02-00547	1273		21-05-10-02-00101	1851	
20-05-14-02-00072	0980		20-10-19-02-00548	1214		21-05-10-02-00102	1688	
20-05-14-02-00073	0977	E4-A-06049	20-10-19-02-00549	1288	E4-A-06067	21-05-10-02-00103	1735	
20-05-14-02-00074	0993		20-10-19-02-00550	1270	E4-A-06073	21-05-10-02-00104	1885	
20-05-14-02-00075	0986		20-10-19-02-00551	1243	E4-C-06049	21-05-10-02-00105	1899	
20-05-14-02-00076	1007		20-10-19-02-00552	1217		21-05-10-02-00106	1858	
20-05-14-02-00077	0963		20-10-19-02-00553	1229	E4-C-06062	21-05-10-02-00107	1736	
20-05-14-02-00078	0983		20-10-19-02-00554	1256		21-05-10-02-00108	1772	
20-05-14-02-00079	1003		20-10-19-02-00555	1282		21-05-10-02-00109	1764	
20-05-14-02-00080	1000		20-10-19-02-00556	1246		21-05-10-02-00110	1867	
20-05-14-02-00081	0989		20-10-19-02-00558	1220		21-05-10-02-00111	1855	
20-05-14-02-00082	0998		20-10-19-02-00559	1207	E4-A-00513	21-05-10-02-00112	1734	
20-05-14-02-00083	1002		20-10-19-02-00560	1286	E4-C-06050	21-05-10-02-00113	1762	

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Austro Engine GmbH
 Rudolf-Diesel-Strasse 11
 A-2700 Wiener Neustadt
 Tel: +43 2622 23000
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High Pressure Pump S/N	Gear S/N	Engine S/N	High Pressure Pump S/N	Gear S/N	Engine S/N	High Pressure Pump S/N	Gear S/N	Engine S/N
20-05-14-02-00084	0995		20-10-19-02-00561	1228		21-05-10-02-00114	1852	
20-05-14-02-00085	0960		20-10-19-02-00562	1401		21-05-10-02-00115	1832	
20-05-15-02-00420	0548		20-10-19-02-00563	1298	E4-A-06055	21-05-10-02-00116	1898	
20-05-15-02-00421	1010		20-10-19-02-00564	1334	E4P-C-06046	21-05-10-02-00117	1901	
20-05-15-02-00422	0975		20-10-19-02-00565	1201	E4-C-06061	21-05-10-02-00118	1659	
20-05-15-02-00423	0990		20-10-19-02-00566	1237	E4P-C-06030	21-05-10-02-00119	1864	
20-05-15-02-00424	0999		20-10-19-02-00567	1234		21-05-10-02-00120	1919	
20-05-15-02-00425	0970		20-10-19-02-00568	1190		21-05-10-02-00121	1730	
20-05-15-02-00426	1008		20-10-19-02-00569	1285	E4-A-06051	21-05-10-02-00122	1732	
20-05-15-02-00430	0967		20-10-19-02-00570	1230		21-05-10-02-00123	1741	
20-05-15-02-00432	0968		20-10-19-02-00571	1202		21-05-10-02-00124	1861	
20-06-18-02-00879	1076		20-10-19-02-00572	1205	E4P-C-06042	21-05-10-02-00125	1916	
20-06-18-02-00880	0813		20-10-19-02-00573	1204	E4-A-00441	21-05-10-02-00126	1845	
20-06-18-02-00881	1014	E4P-C-06023	20-10-19-02-00574	1194		21-05-10-02-00127	1766	
20-06-18-02-00882	1078	E4P-C-06024	20-10-19-02-00575	1206		21-05-10-02-00129	1738	
20-06-18-02-00883	1092	E4P-C-06025	20-10-26-02-00622	1791		21-05-10-02-00130	1714	
20-06-18-02-00884	1090		20-10-26-02-00623	1959		21-05-10-02-00131	1737	
20-06-18-02-00885	1019	E4-C-06034	20-10-26-02-00624	1806		21-05-10-02-00132	1904	
20-06-18-02-00886	1091	E4-B-00383	20-10-26-02-00625	1797		21-05-10-02-00133	1745	
20-06-18-02-00887	1077		20-10-26-02-00626	1934		21-05-10-02-00134	1920	
20-06-18-02-00888	0639		20-10-26-02-00627	1210		21-05-10-02-00135	1873	



Note:

A Cylinder Head p/n E4A-12-500-000 is an Affected Cylinder Head only when installed in combination with a HPP gear p/n E4A-30-000-601 (any revision) or p/n E4A-30-000-201 rev. AB.1. In case of doubt, contact Austro Engine.

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1.5. 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 cover, camshaft gear and HPP gear. Cases of coloured HPP gears p/n E4A-30-000-601 or E4A-30-000-201 rev. AB.1 appeared after limited flight time on engines having CH p/n E4A-12-500-000 installed, for that reason an insufficient tolerance can only be avoided by installing, on such engines, gears p/n E4A-30-000-201 rev. AE.1. To correct the possible unsafe condition, this Mandatory Service Bulletin supersedes the MSB-E4-034 and MSB-E4-035 incorporating their requirements and prohibit the installation of HPP gears p/n E4A-30-000-601 or E4A-30-000-201 rev. AB.1 on an engine equipped with the CH p/n E4A-12-500-000. These conditions, if not corrected, may cause premature failure of the high-pressure pump drive gear, resulting in rail pressure loss and engine shutdown.

1.6. Required Actions and Time of Compliance

E4A/B/C/P Engines having an affected CH installed	Inspect and Replace the gear with p/n E4A-30-000-201 rev. AE.1	Before the next flight ⁽²⁾
E4A/B/C/P Engines having an affected CH <u>and</u> an affected HPP driving gear installed	Inspect and Replace the gear with p/n E4A-30-000-201 rev. AE.1	Before the next flight ⁽²⁾

E4A Engines having an affected HPP driving gear installed	Replace the gear	Before the total time in service of the affected driving gear reaches 40 FH ⁽¹⁾ or during the next scheduled maintenance whichever occurs first
E4B/C/P Engines having an affected HPP driving gear installed	Replace the gear	Before the total time in service of the affected driving gear reaches 80 FH ⁽¹⁾ or during the next scheduled maintenance whichever occurs first



Note ⁽¹⁾:

Total time in service of the affected driving gear must be counted from the installation of such part on an engine. For example, if an affected part is installed on an E4A Engine having 480FH, the HPP driving gear must be replaced before reaching 520FH; if an affected part is installed on an E4B/C/P engine having 480FH, the HPP driving gear must be replaced before reaching 560FH.



Note ⁽²⁾:

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 Service Bulletin can be accomplished on the affected engine(s).



Note:

Paragraph 1.9 provides Credits for these engines complying with MSB-E4-034 and MSB-E4-035

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1.7. Concurrent documents / references

Note: If not specified, the latest revision of the referenced documents applies.

- Maintenance Manual E4.08.04
- Service Instruction SI-E4-016
- Mandatory Service Bulletin MSB-E4-034 rev. 1 or subsequent approved revisions
- Mandatory Service Bulletin MSB-E4-035 rev. 0 or subsequent approved revisions

1.8. Other publications affected

None

1.9. Credits

For those engines having an affected HPP driving gear installed:

- Replacement of an affected HPP driving gear, accomplished before the effective date of this Mandatory Service Bulletin and in accordance with the instructions of Austro Engine MSB-E4-034 at Revision 1 or subsequent, is an acceptable method to comply with the requirements of the chapter 2 of this service bulletin.

For those engines having an affected CH installed, or an affected CH and an affected HPP driving gear installed:

- Inspection and replacement of an affected HPP driving gear, accomplished before the effective date of this Mandatory Service Bulletin and in accordance with the instructions of Austro Engine MSB-E4-034 at Revision 3 or subsequent, is an acceptable method to comply with the requirements of the chapter 2 of this service bulletin provided the installed HPP driving gear is the p/n E4A-30-000-201 rev. AE.1

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2. Technical Details

2.1. Removal and inspection of the HPP driving gear

1. Remove the HPP in accordance with the instructions in Maintenance Manual, Doc. No. E4.08.04, Section 73-10-03, Paragraph A.
2. Remove the drive gear from the HPP in accordance with the instructions in Maintenance Manual, Doc. No. E4.08.04, Section 73-10-03, Paragraph C.



Caution: Use only the tool p/n AE300T012-1 provided in the kit of this Service Bulletin to block the gear.

3. To remove the gear from the shaft, use a bearing extractor shown in Chapter 0
4. Clean the driving gear with non-chlorinated brake cleaner (recommended product Manufacturer: Förch, Product ID.: R510)
5. Visually inspect the driving gear against colour criteria of **Appendix II** Table 6; if the acceptable criteria are not met:
 - remove the camshafts according to the Maintenance Manual, Doc. No. E4.08.04, Section 85-30-00 Subparagraph 4A (a) - (h)
 - Inspect the HPP shaft, the cylinder head, camshaft gear, the inlet/outlet camshaft bushing in accordance with the **Appendix II** of this service bulletin and replace the parts as necessary.

2.2. Installation of the new HPP driving gear

2.2.1 Driving Gear p/n E4A-30-000-201 rev. AB1 or p/n E4A-30-000-601



Caution: DO NOT INSTALL the gear p/n E4A-30-000-201 rev. AB1 or E4A-30-000-601 if a Cylinder Head p/n E4A-12-500-000 is installed on the engine

1. Install the new drive gear in accordance with the instructions in Maintenance Manual, Doc. No. E4.08.04, Section 73-10-03, Paragraph D (replace the nut, if required).



Note: Lubricate the gear and the O-ring with engine oil before installing the HPP



Caution: Use only the tool p/n AE300T012-1 provided in the kit of this Service Bulletin to block the gear

2. Install the HPP in accordance with the instructions in Maintenance Manual, Doc. No. E4.08.04, Section 73-10-03, Paragraph B. Refer also to chapter 6 Table 2 for the tightening sequence of the screws.
3. Mark a tool cycle on the Tool Cycle Recording Sheet and fill the execution report (both included in the chapter 6 of this Service Bulletin).
4. Perform an engine ground run according to the EMM



Note: One cycle equals the disassembly of the old gear and the installation of the new gear





Caution: When the assembly tool p/n AE300T012-1 has reached 100 cycles, discard the tool

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2.2.2 Driving gear p/n E4A-30-000-201 Rev. AE.1 or subsequent

1. Install the new drive gear in accordance with the instructions in Maintenance Manual, Doc. No. E4.08.04, Section 73-10-03, Paragraph D (replace the nut, if required).

	Note:	Use a standard low-profile open-ended wrench (27 mm) instead of the special tool.
	Note:	Lubricate the gear and the O-ring with engine oil before installing the HPP

2. Install the HPP in accordance with the instructions in Maintenance Manual, Doc. No. E4.08.04, Section 73-10-03, Paragraph B. Refer also to chapter 6 Table 2 for the tightening sequence of the screws.
3. Perform an Engine Ground Run according to the Engine Maintenance Manual

2.3. Illustrations

Provided as appendix to this service bulletin

2.4. Mass (weight)

Not affected

2.5. Approval statement

The technical content of this document is approved under the authority of the DOA ref. EASA. 21J.399.

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3. Planning Information

3.1. Material & Availability

Quantity	Part Description	Part Number
1	HPP Drive Gear	E4A-30-000-601 ⁽¹⁾ <u>or</u> E4A-30-000-201 Rev. AB.1 ⁽¹⁾ <u>or</u> E4A-30-000-201 Rev. AE.1
1	Gasket	DIN7603-12x16x2.0
1	Gasket	DIN7603-A12x16-AL
1	Holder wrench HPP	AE300T012-1




	(1)Caution:	DO NOT INSTALL the gear p/n E4A-30-000-201 rev. AB1 or E4A-30-000-601 if a Cylinder Head p/n E4A-12-500-000 is installed on the engine
	Caution:	The holder wrench HPP p/n AE300T012-1 can be used for only for 100 cycles, after that the tool is not serviceable and must be scrapped.
	Note:	One cycle equals the disassembly of the old gear and the installation of the new gear



Figure 1 – Driving gear E4A-30-000-201 Rev. AE.1

3.2. Special tools

No.	Description	Note
1	Holder wrench HPP	This special tool is provided as part of this SB and it is limited to 100 cycles
2	Bearing extractor	Refer to Figure 2 (not part of the service bulletin kit)

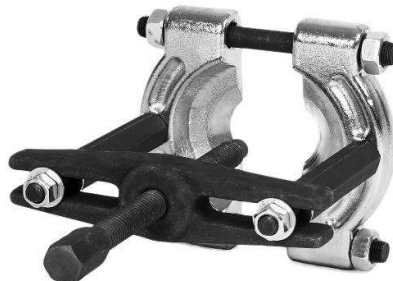


Figure 2 – Bearing extractor

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3.3. Labor effort

2 Hours for an acceptable gear up to 16 hours for a non-acceptable gear that requires additional inspections and/or parts replacement. The exact time depends on the components that might require replacement and do not include the waiting time between correspondence.

4. Remarks

NOTE:

- All measures must be carried out by a certified engine station and certified engine mechanics
- The accomplishment of the instructions shown under chapter 2 must be confirmed in the respective engine log book
- The accomplishment of the instructions must be carried out within the time of compliance according chapter 1.6
- In case of doubt please contact the Austro Engine GmbH – After Sales Support
(e-mail: service@austroengine.at; Tel: +43 2622 23000 2525)
- For credit information contact Austro Engine GmbH – After Sales Support
(e-mail: service@austroengine.at; Tel: +43 2622 23000 2525)

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5. Explanatory notes

5.1. Symbol explanation



WARNING: Disregarding these safety rules can cause personal injury or even death



CAUTION: Disregarding these special instructions and safety measures can cause damage to the engine or other components

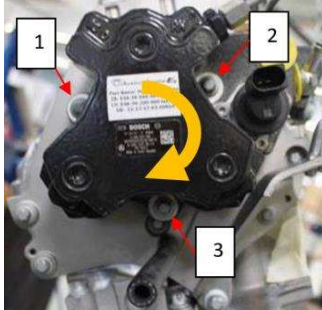


NOTE: Additional note or instruction for better understanding of an instruction

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6. Appendix I


Table 2 – HPP tightening sequence

 <p>Figure 3</p>	<p>Install the HPP tightening the screws clockwise, according to the Figure 3 sequence with 12 Nm.:</p> <ul style="list-style-type: none"> - Step 1 – 1 at 50% - Step 2 – 2 at 50% - Step 3 – 3 at 50% - Step 4 - 1 at 100% - Step 5 - 2 at 100% - Step 6 - 3 at 100%
--	---



CAUTION: DO NOT over torque

Table 3 – HPP Wrench Cycles recording sheet

		<p align="center">HPP Wrench Cycles recording sheet</p>							
<p align="center">Note: For each cycle, mark a cross on the corresponding box. When 100 cycles are reached, discard the wrench.</p>									
<p align="center">1 Gear replacement (removal & installation) = 1 cycle</p>									
1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50
51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70
71	72	73	74	75	76	77	78	79	80
81	82	83	84	85	86	87	88	89	90
91	92	93	94	95	96	97	98	99	100
<p align="center"><i>HPP Drive gear wrench p/n</i></p>									

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Table 4 – Service Bulletin Execution Report (SBER)


	Service Bulletin Execution Report	Note:
Aircraft owner:		
Aircraft Operator:		<i>If different from the owner</i>
Aircraft:		
Aircraft Serial Number:		
Aircraft Marks:		
Engine (RH) s/n:		<i>For single engine a/c, fill only one row</i>
Engine (LH) s/n:		
Flight Hours:		
Service center:		<i>Company Name or reference of the person(s) performing the oil pump replacement</i>
Removed HPP Gear s/n: Or Inspected HPP p/n and s/n:		<i>Refer to the figure below to identify the serial number</i>
NOTE: A scanned version of this form must be provided to: service@austroengine.at copy to: support-austria@diamondaircraft.com support-canada@diamondaircraft.com support@wfit.com		
NOTE: The original filled version of this form, must be packed with the removed gear, and provided to Austro Engine		



Figure 4 – Gear s/n location











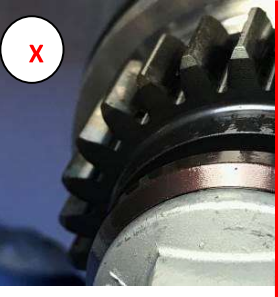



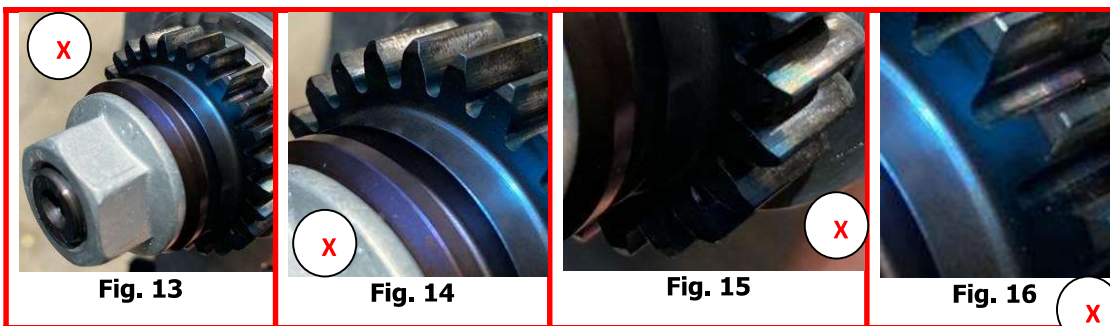
Figure 5 – HPP p/n and s/n location

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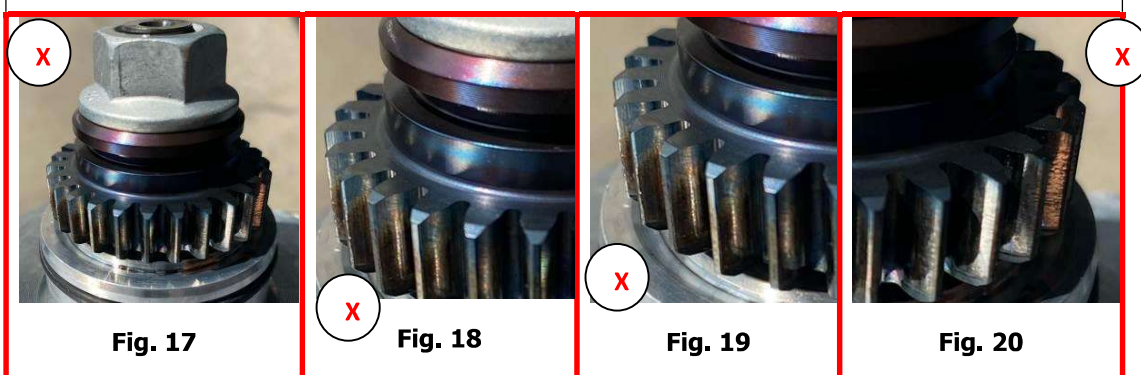
7. Appendix II

Table 5 - HPP Driving gear assembled - inspection chart

			
Fig. 1	Fig. 2	Fig. 3	Fig. 4
Examples of HPP gear in <u>acceptable</u> conditions			
			
Fig. 5	Fig. 6	Fig. 7	Fig. 8
Examples of HPP gear in <u>not acceptable</u> condition			
			
Fig. 9	Fig. 10	Fig. 11	Fig. 12
Examples of HPP gear in <u>not acceptable</u> condition			



Examples of HPP gear in not acceptable condition



Examples of HPP gear in not acceptable condition

	YES	NO	Consultation with AE required
HPP Driving gear acceptable:	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Note:	<ul style="list-style-type: none"> The possible discoloration shown in the non-acceptable gears is due to high friction, which generates heat. When present, the typical discoloration is not homogeneous and presents different shades from black/blue to violet/bronze. Check the gear according to the discoloration criteria provided. Discoloration is clearly visible on the outer surface of the gear. Check also for visible discoloration on the face of the teeth. Check for excessive wear of the gear. <p>In case of doubt, fill the Appendix III and contact Austro Engine</p>		

Table 6 - HPP Driving Gear Disassembled - Inspection chart


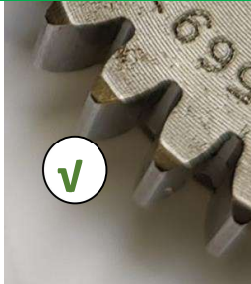




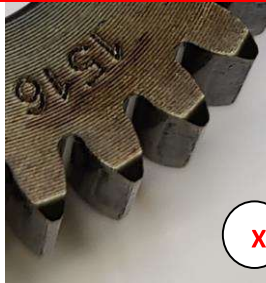


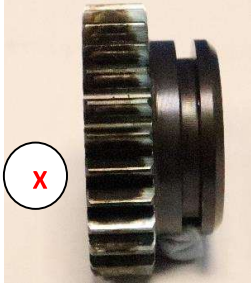

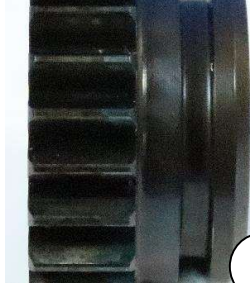
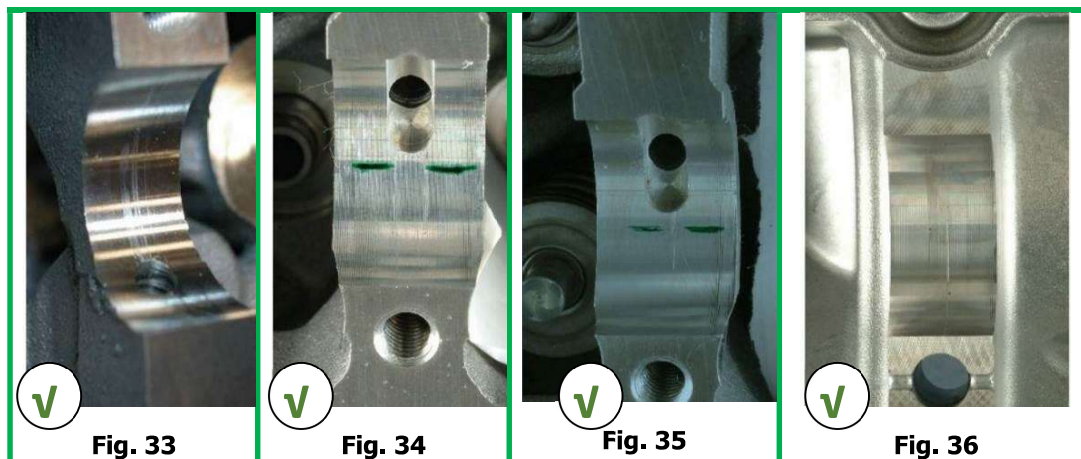
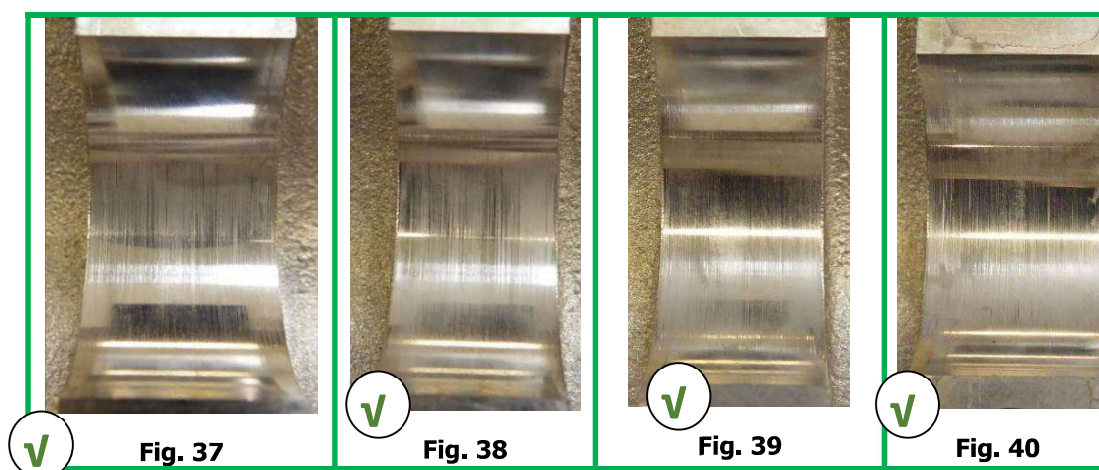
 <p>Fig. 21 ✓</p>	 <p>Fig. 22 ✓</p>	 <p>Fig. 23 ✓</p>	 <p>Fig. 24 ✓</p>
Examples of gear in acceptable conditions			
 <p>Fig. 25 ✗</p>	 <p>Fig. 26 ✗</p>	 <p>Fig. 27 ✗</p>	 <p>Fig. 28 ✗</p>
Examples of gear in not acceptable condition			
 <p>Fig. 29 ✗</p>	 <p>Fig. 30 ✗</p>	 <p>Fig. 31 ✗</p>	 <p>Fig. 32 ✗</p>
Examples of gear in not acceptable condition			
	YES	NO	Consultation with AE required
Part acceptable:	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Note:	<ul style="list-style-type: none"> The possible discoloration shown in the non-acceptable gears is due to high friction, which generates heat. When present, the typical discoloration is not homogeneous and presents different shades from black/blue to violet/bronze. Check the gear according to the discoloration criteria provided. Discoloration is clearly visible on the outer surface of the gear and in the marking zone of the gear. Check also for visible discoloration on the face of the teeth. Check for excessive wear of the gear. <p>In case of doubt, fill the Appendix III and contact Austro Engine</p>		

Table 7 - Camshaft/camshaft gear - Camshaft inlet/outlet bearing - Cylinder head – HPP Shaft inspection chart

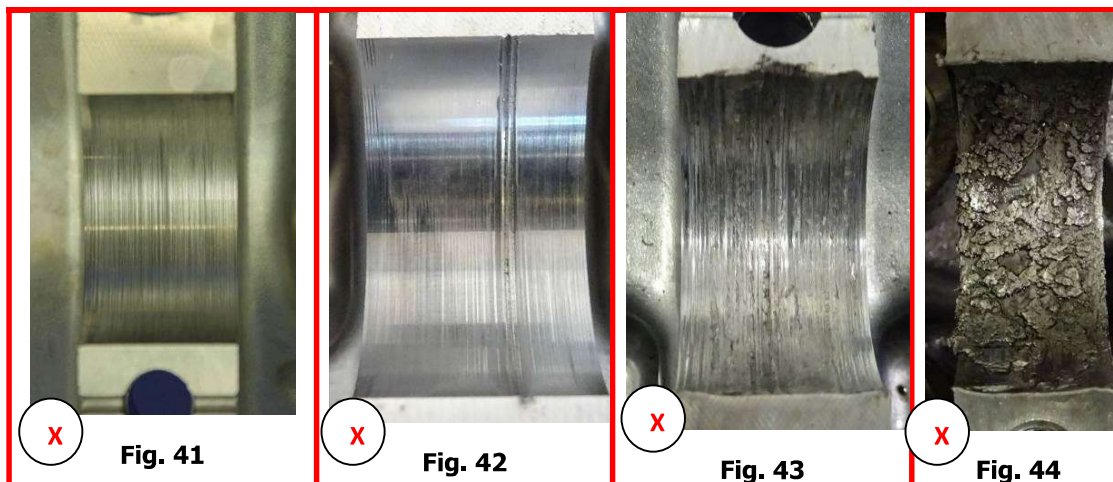


Examples of **normal wear** of the cylinder head at camshaft bearings



Examples of **normal wear** of the cylinder head at camshaft bearings

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Examples of **excessive wear** of the cylinder head at camshaft bearings

	YES	NO	Consultation with AE required
Cylinder Head acceptable:	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	<p>The wear rate of the upper bearing segments, which are located inside the cylinder head cover, and upper bearing brackets is normally higher compared to the lower bearing surfaces. This is caused by the force of the valve springs applied to the camshafts.</p> <p>Examine the bearing segments at the cylinder cover and the cylinder cover for grooves and/or scratches detectable by finger.</p> <p>In case of doubt, fill the Appendix III and contact Austro Engine.</p>		

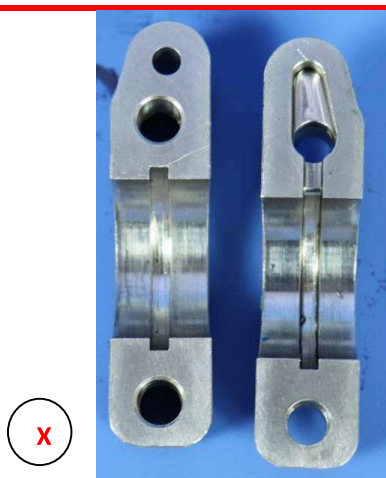


Fig. 45

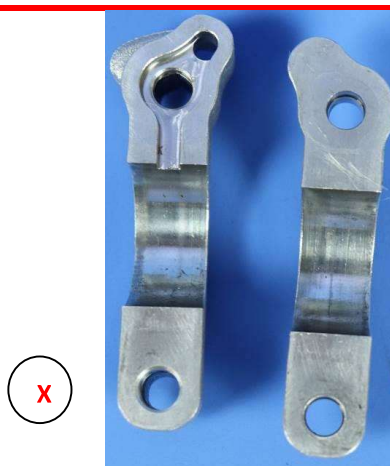


Fig. 46

Examples of camshaft bearings in not acceptable conditions



Fig. 47



Fig. 48

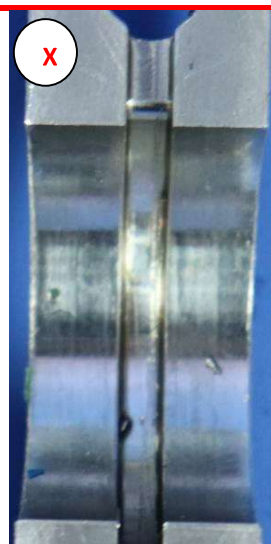


Fig. 49

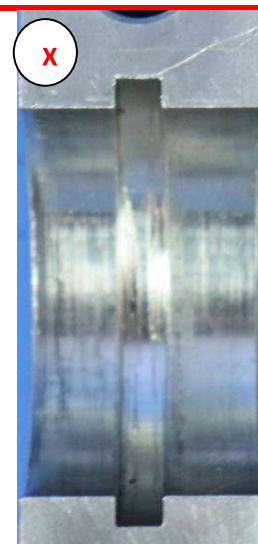
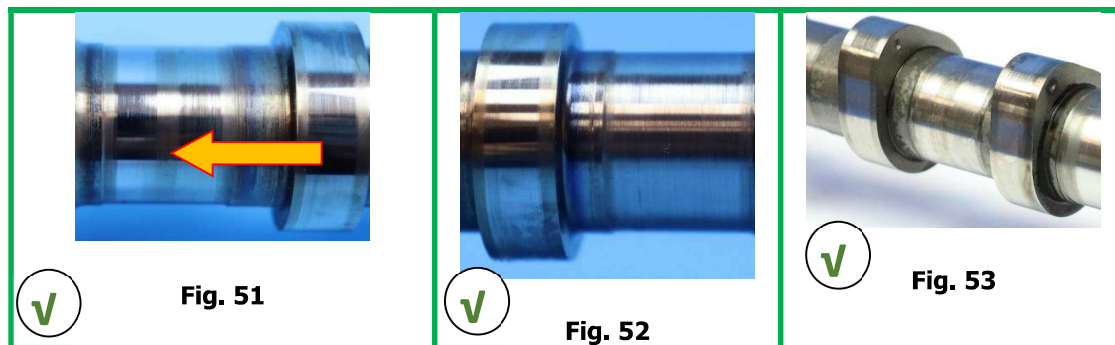


Fig. 50

Examples of camshaft bearings in not acceptable conditions

	YES	NO	Consultation with AE required
Camshaft Bearings acceptable:	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Note:	Examine the inlet/outlet bearings of the camshafts for discoloration, wear, grooves detectable by finger. In case of doubt, fill the Appendix III and contact Austro Engine		

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Examples of camshaft in **acceptable** conditions



Examples of camshaft in **not acceptable** conditions



Examples of camshaft in **not acceptable** conditions

	YES	NO	Consultation with AE required
Camshaft acceptable:	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Note:	<p>Some bearing positions show a circular discoloration; this is a normal sign of the oil supply bore located inside the lower bearing segment. Bearing surfaces are acceptable when they have:</p> <ul style="list-style-type: none"> - a homogenous, even surface - no circular sensitive running mark detectable by fingernail. <p>Camshafts with sensitive running marks detectable by fingernail are not permitted for re-use. Replace them by new ones.</p> <p>In case of doubt, fill the Appendix III and contact Austro Engine</p>		

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Fig. 58



Fig. 59



Fig. 60

Examples of camshaft gear in acceptable conditions



Fig. 61



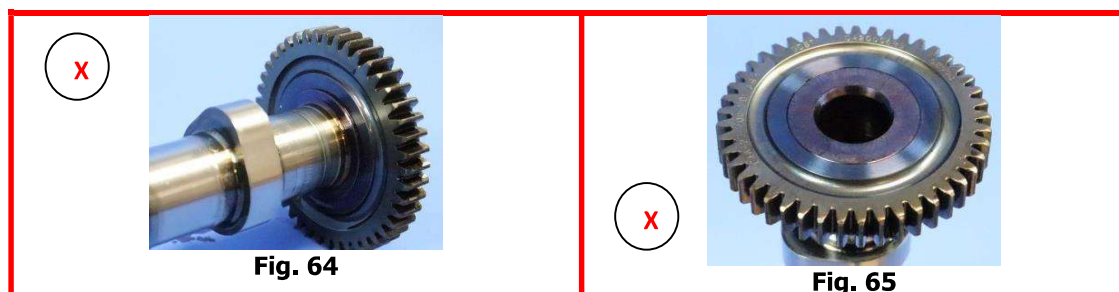
Fig. 62



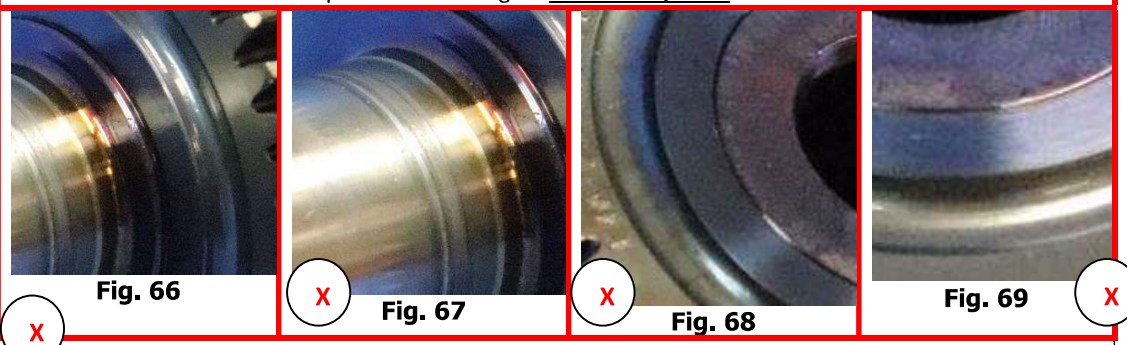
Fig. 63

Examples of camshaft gear in acceptable conditions

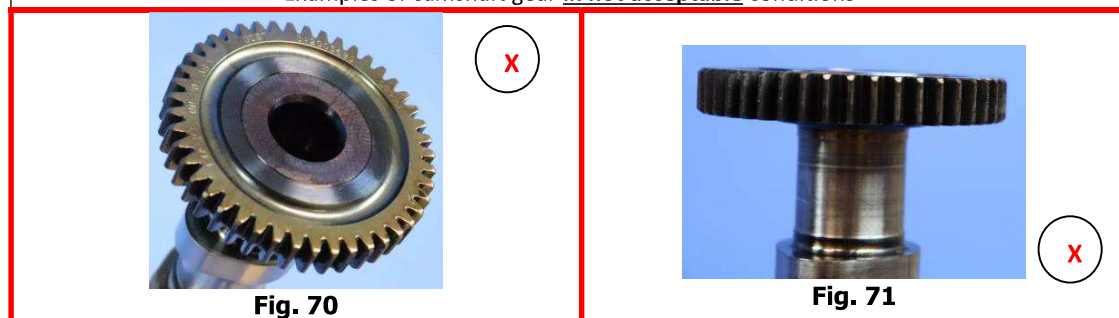
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Examples of camshaft gear **in not acceptable** conditions



Examples of camshaft gear **in not acceptable** conditions



Examples of camshaft gear **in not acceptable** conditions

	YES	NO	Consultation with AE required
Camshaft gear acceptable:	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Note:

- Check the gear according to the discoloration criteria provided.
- Darken gear without clear “overburn” discoloration are acceptable as it is the typical colour of the heat treatment of the material (e.g. figs. 61, 62, 63).
- The possible discoloration shown in the non-acceptable gears is due to high friction, which generates heat. When present the typical discoloration is not homogeneous and presents different shades from black/blue to violet/bronze.
- Shades of “burnt” material are typically present on both face of the gear, such discoloration is clearly visible on the outer surface of the gear; use a magnifier, if required, to check the inner surface.
- Check also for visible discoloration on the face of the teeth.

In case of doubt, fill the Appendix III and contact Austro Engine

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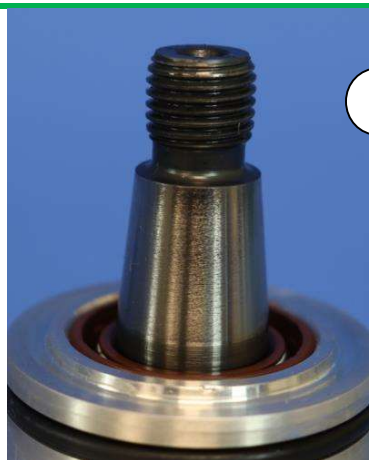


Fig. 72

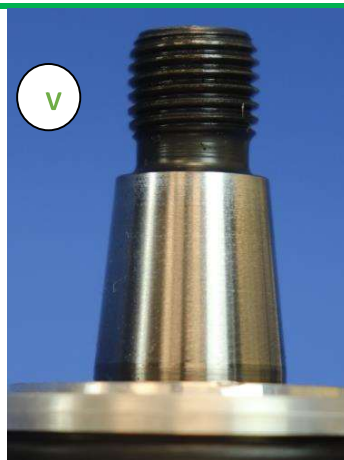


Fig. 73

Examples of HPP Shaft in acceptable conditions

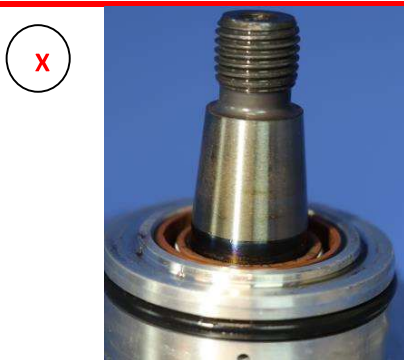


Fig. 74



Fig. 75

Examples of HPP Shaft in not acceptable conditions

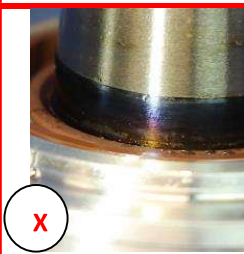


Fig. 76



Fig. 77

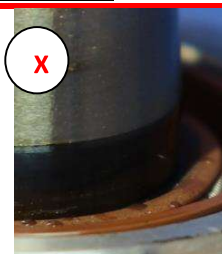


Fig. 78

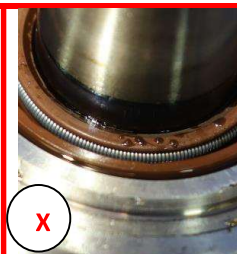


Fig. 79

Examples of HPP Shaft in not acceptable conditions

	YES	NO	Consultation with AE required
HPP Shaft acceptable:	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Note:	<ul style="list-style-type: none"> Check the shaft according to the discoloration criteria provided. Shaft darken in the lower area (e.g. figs. 74 to 79). <p>In case of doubt, fill the Appendix III and contact Austro Engine</p>		

8. Appendix III

This form must be filled in case support for inspection is requested to Austro Engine. The form should be provided to Austro Engine service, within the photos of the inspected parts. Mark only the applicable parts.

Aircraft Serial Number			
Engine Serial Number			
Service Contacts			
Note: please mark only one the applicable box. In case of not applicable/not performed, left the row blank			
Inspected and found:	OK	Not OK	Pictures attached
HPP Gear	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
HPP Shaft	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Camshaft Gear	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Camshaft	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Cylinder Head	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Bearings	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
NOTE:			
Filled by: (Name Surname) Date: (DD.MM.YYYY)			