

RECOMMENDED SERVICE BULLETIN

No. RSB-E4-038/1 Supersedes RSB-E4-038

Distribution:	Portal
Date:	24-Mar-2022

1. BASIC INFORMATION

1.1. SUBJECT


Flywheel Hub inspection for cracks

1.2. ENGINES AFFECTED

Engine affected: E4 Series

Serial Numbers: All E4 engines having an affected part installed

Part affected: Hub with part number E4A-73-000-203

 To identify the flywheel hub version installed on the engine, refer to section 1.7.

1.3. REASON

A cracked flywheel hub has been identified in the field. As detecting action, perform a non-destructive testing to identify any crack.

1.4. TIME OF COMPLIANCE

<u>For</u>	<u>Having a Flywheel with</u>	<u>Perform the inspection</u>
E4A/B/C Engines	≤ 600 component flight hours	Every 600 component flight hours
	≥ 600 component flight hours	At the next scheduled maintenance, then every 600 component flight hours.

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1.5. CONCURRENT DOCUMENTS / REFERENCES

- Maintenance Manual – Doc. No: E4.08.04, latest effective issue
- ASTM E1417 Standard Practice for Liquid Penetrant Testing
- ASTM E1444 Standard Practice for Magnetic Particle Testing
- EN 4179 Qualification and approval for personnel in Non-Destructive Testing
- NAS 410 NAS Certification & Qualification of Non-Destructive Test Personnel

1.6. OTHER PUBLICATIONS AFFECTED

None

1.7. INFORMATION

This section contains guidance on identifying the installed hub version.

After gearbox removal (refer to the Maintenance Manual, Ch. 85-10-00 for instructions), check the part number of the hub.

Refer to Fig. 1 for the engraving position of the hub part number.

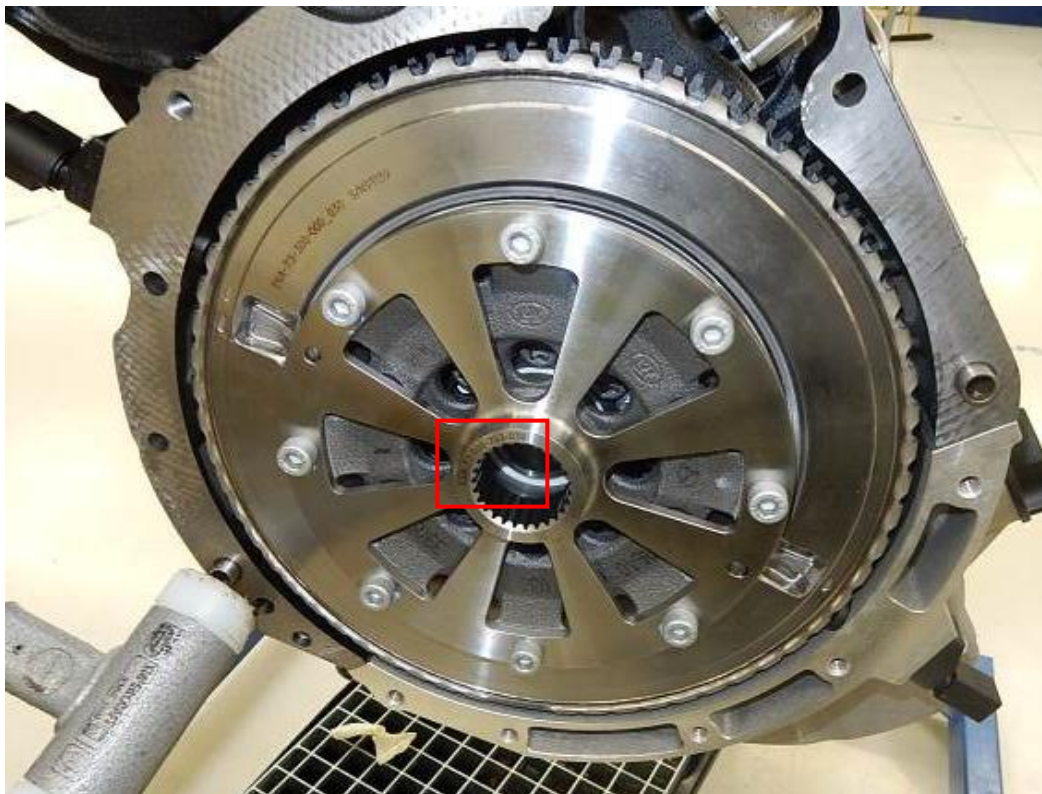


Fig. 1 – E4A hub

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2. TECHNICAL DETAILS

2.1. ACCOMPLISHMENT / INSTRUCTIONS

2.1.1. PART PREPARATION

1. Remove the Two-Mass-Flywheel according to Maintenance Manual – Doc. No: E4.08.04 Ch. 85, latest effective issue.
2. Clean the flywheel and the hub, use non-chlorinated brake cleaner (recommended product Manufacturer: Förch, Product ID.: R510)

2.1.2. AREAS ON THE PART TO BE INSPECTED

Struts (8ea.) of the hub on both sides and side walls in the area depicted in Fig. 2.

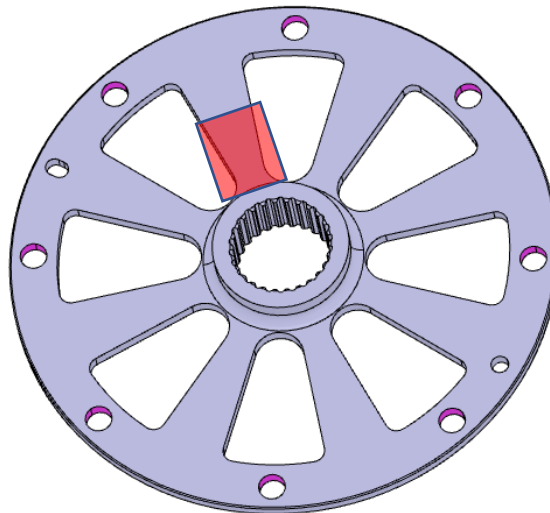


Fig. 2

2.1.3. INSPECTION METHODS

Three different NDT methods can be used alternatively for this inspection.

- A. Eddy Current Testing (preferred method)
- B. Magnetic Particle Inspection
- C. Fluorescent Liquid Penetrant Inspection

Personnel qualification

Inspection personnel must be qualified to L2 according to EN 4179, NAS 410 or equivalent standard in the method applied.

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Recommended
Service Bulletin
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A. Eddy Current Testing

Instrument: Eddy Current instrument with impedance plane display (Olympus Nortec 600 or equivalent)

Probe: Surface probe angled 90°, absolute, shielded

Inspection frequency: 300kHz

Reference standard: Ferromagnetic surface crack standard

Inspection:

- Standardize instrument on reference standard – set lift-off signal to 9 o clock direction - adjust signal of 0.02 notch to 80% FSH (Full Screen Height).
- Scan area on part to be inspected (refer to Fig. 2) with scan increments of max 1mm (.04”).
- Any vertical signal deflection over 40% FSH must be considered a crack indication.
- Use appropriate probe guidance to minimize edge effects.

B. Magnetic Particle Testing

- Inspect the part per ASTM E1444 by use of an AC Hand Yoke with adjustable legs (Magnaflux Y-2 AC Magnetic Yoke Kit or equivalent). (If available, an MT-Test bench may be used).
- Verify that the yoke lifting force is > 10lbs.
- Use fluorescent magnetic ink in aerosol can (Magnaflux 690.1 or equivalent)
- Magnetize the part and apply magnetic ink (magnetization time after application of ink min 2 seconds).
- Use at least two magnetization directions 90° displaced.
- Visually inspect the part in a darkened area using UV-light with peak wave length 365-370 nm, minimum light intensity on part surface is 1000 $\mu\text{W}/\text{cm}^2$, maximum ambient residual white is 22lx.
- Evaluate any indication.
- Any linear indication must be considered a crack.
- Demagnetize part to a tangential magnetic field strength < 2.4 A/cm.

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C. Fluorescent Penetrant Testing


- Inspect the part per ASTM E1417 process IAd, sensitivity 2.
- Inspection media must be compliant with QPL AMS 2644.
- Ensure that the surface is free of any contamination such as oil, dirt, or scale that may fill a defect or falsely indicate a flaw.
- Apply penetrant to inspection surface of hub (use a brush).
- Penetrant dwell time is 15 minutes.
- After the dwell time, remove excessive penetrant using a lint free cloth.
- Clean the part under running water - water temperature 10°C – 38°C (50°F-100°F).

Alternatively, a lint free cloth soaked with cleaning solvent may be used.

Caution: Do not "overclean" the part to avoid removal of penetrant from possible cracks!

- Check the penetrant removal under UV-light.
 - Dry the part (max temperature 71°C (160°F) – Do not use unfiltered shop air!
 - Apply developer by spraying.
 - Visually inspect the part in a darkened area using UV-light with peak wave length 365-370 nm, minimum light intensity on part surface is 1000 $\mu\text{W}/\text{cm}^2$, maximum ambient residual white is 22lx.
 - Evaluation timespan starts with developer application until 10 minutes after application.
 - Any linear indication must be considered a crack.
3. Record any concern. The HUB must be free of crack and/or any discontinuity. In case of crack or material discontinuities, replace the HUB.
 4. Clean the HUB.
 5. Install the Two-Mass-Flywheel applying Loctite 243 on the flywheel hub screws according to Maintenance Manual – Doc. No: E4.08.04 Ch. 85, latest effective issue.
 6. Mark the RSB as executed and record the component flight hours in the engine logbook.

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2.2. ILLUSTRATIONS

None

2.3. MASS (WEIGHT)

Not affected

2.4. 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

None


3.2. SPECIAL TOOLS

Part Description	Tool
Flywheel Locking Tool	

3.3. LABOR EFFORT

3h

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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 2.1 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 1.4.
- In case of doubt please contact the Austro Engine GmbH – After Sales Support (e-mail: support@austroengine.at; Tel: +43 2622 23000 2525).
- For credit information contact Austro Engine GmbH – After Sales Support (e-mail: support@austroengine.at; Tel: +43 2622 23000 2525)

5. APPENDIX

None

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