

## COMMENT RESPONSE DOCUMENT

EASA PAD No. 20-120

**[Published on 12 August 2020 and officially closed for comments on 09 September 2020]**

### **Commenter 1: Air Caraïbes, French Bee and Air France – Loïc Bourdais – 18/08/2020**

#### **Comment # 1**

Rolls Royce has communicated to A350 Operators that only Alert NMSB 72-AK632 would be covered by an AD as it is the inspection driver. The accomplishment instructions have been issued separately through NMSB 72-K633 to ease the task update in the future if needed as this second NMSB would not be covered by the AD.

Alert NMSB 72-AK632 Chapter 3. Accomplishment Instructions clearly refer to NMSB 72-K633, it is not possible to perform the inspection otherwise.

Therefore, is it possible to remove the sentence 'The inspection NMSB: Rolls-Royce NMSB TRENT XWB 72-K633.' from AD Definitions chapter in order to only keep a mention to NMSB 72-K633 in the Ref. Publications chapter.

#### **EASA response:**

**Comment not agreed. It is common, not only for EASA ADs, to refer in an AD to the design approval holder's document that contains the instructions that are required by the AD to be accomplished. In addition, EASA ADs usually indicate that "The use of later approved revisions of the ...-mentioned documents is acceptable for compliance with the requirements of this AD." So including reference to NMSB 72-K633 in this AD will not complicate a task update, if needed.**

**No changes have been made to the Final AD in response to this comment.**

### **Commenter 2: Singapore Aero Engine Services – Muhammad Farhan – 18/08/2020**

#### **Comment # 2**

A. The accomplishment of this AD is at intervals not exceeding 200EFC. Are the blades to be tracked individually or as a set?



B. In AK72-633 D.2. it mentioned, “ If the Front Bearing Housing (FBH) is removed and the IP Compressor Rotor1 Blade root front faces are exposed as part of the engine workscope, a visual inspection of the IP compressor Rotor 1 Blade root front faces is considered an acceptable alternative to the borescope inspection”. Is the AD claimable if the blades are being inspected at piece part as mentioned in D.2. of the NMSB?

**EASA response:**

**A. Comment noted. For the purpose of this AD, it is sufficient to track the blades as a set. Note 1 has been amended in the Final AD.**

**B. Comment agreed. The AD requires the inspection to be accomplished “in accordance with the instructions of the inspection NMSB” and this alternative method is part of those instructions.**

**No changes have been made to the Final AD in response to Point B of this comment.**

**Commenter 3: Lufthansa Technik – Idris Coban – 20/08/2020**

**Comment # 3**

AD refers to inspection of affected parts (IPC blades) only, where clarification is required:

- A. Based on our current knowledge it is not possible during SB inspection procedure to verify IPC blade S/N. Therefore the requirement of tracking against IPC stage 1 blades is not possible to be performed.
- B. In case one new blade is installed during a shop visit of a 2500 FC old engine without crack findings is my understanding right that the 1ea new blade must be first inspected when reaching 2300 FC, whereas the other 33ea blades need to be inspected every 200 FC since last inspection? Is EASA considering tracking this inspection on blade level rather than engine level and keep in mind above issue?

**Proposal for both is to change wording as follows:**

- Within the compliance time specified in Table 1 of this AD, as applicable, and, thereafter, at intervals not to exceed 200 EFC, accomplish an on-wing or in-shop inspection of the blade root of each **engine having an affected part installed** in accordance with the instructions of the inspection NMSB.
- **Note 2: Inspection Threshold and interval for an engine must always be counted from blade with highest number of EFC since new or last inspection.**
- C. In previous SB setup (72-AK612/613) there was a requirement to inspect all engines in shop independent of their life as a precautionary measure, e.g. at 500 FC since new. The current AD requires to do the next inspection latest at 200 FC, even though the technically defined threshold of 2300 FC is not yet reached. Please include a clarification in the AD that in case a shop inspection was performed well below 2300 FC threshold the first repeat inspection must be performed before reaching 2300 FC only and not in intervals of 200 FC since first inspection.



**EASA response:**

- A. Comment noted. See Comment # 2, Point A, above. Note 1 has been amended in the Final AD.**
- B. Comment noted. It is the operator decision to track blades individually or as a set, provided the requirement of the AD is fulfilled for each individual blade. Paragraph (1) of the Final AD has been amended.**
- C. Comment not agreed. Credit given to action(s) done per NMSB 72-AK612 or -AK613 may be taken, when that is beneficial for an operator, e.g. when 2 300 FC has been exceeded and the latest action was recent. In that case, the interval (200 FC) since that latest action can be applied, rather than the 50 FC after the effective date of the AD. It should be noted that taking such credit is optional, not a requirement. No action is mandatory on any engine before the effective date of this AD.**

**No changes have been made to the Final AD in response to Point C of this comment.**

**Commenter 4: Lufthansa Technik – Rene Schinkel – 01/09/2020**
**Comment # 4**

Due to further SB assessment there is an additional comment for PAD 20-120 regarding PAD requirements (1) and (2):

- SB 72-K631 requires via an EM task the removal, quarantine of affected IPC stage 1 blades, inspection of the IPC drum and reinstallation of new IPC stage 1 blades:

- A. Question for PAD action (1): Is this SB eligible to reset counter to zero for IPC stage 1 blade inspections? Please detail in PAD how this document interacts with 72-AK632/72-K633 inspection regime.**
- B. Question for PAD action (2): Is this SB the required corrective action for replacement of blade set where one or more blades are found cracked? If yes please detail in the final AD.**

**EASA response:**

- A. Comment noted. Rolls-Royce may use SB 72-K631 to provide the approved corrective action instructions of paragraph (2) of the AD. Installing new IPC R1 blades on an engine would reset the counter to zero for that engine regarding the inspections in this AD. Note 1 has been amended in the Final AD.**



***B. Comment noted. EASA is aware of the content of SB 72-K631. Depending on the results of the on-going investigation, the approved corrective action instructions provided by Rolls-Royce may evolve. This AD is considered an interim action and further AD action may follow. This has been added to the Reason section of the Final AD.***

**Commenter 5: Delta Air Lines – James Thompson – 02/09/2020**

**Comment # 5**

**References:**

- (1) EASA Proposed Airworthiness Directive: PAD No. 20-120, dated 12 Aug 2020
- (2) Rolls-Royce Alert Non-Modification Service Bulletin (NMSB) TRENT XWB 72-AK632
- (3) Rolls-Royce NMSB TRENT XWB 72-K633

Upon reviewing Ref (1), DAL has the following comments to the PAD.

- A. Ref. (1) defines the affected part as intermediate pressure (IP) compressor rotor 1 (R1) blades with part number KH21559, and the inspection interval is given as EFC accumulated by an affected part since first installation on an engine. The IP compressor R1 blade is not a typical serialized tracked part in the operator's record system. Therefore, showing compliance to the inspection on each individual IP compressor R1 blade would not be possible. This would require the installed position of each individual IP compressor R1 blade in the compressor rotor assembly, which is not documented in the engine logbook or provided by the MRO facility.  
  
Additionally, any engines with less than 2,300 cycles since new will have an entire set of IP compressor R1 blades that are subjected to the initial inspection threshold, and any engines in the shop that have the initial inspection performed will remain on the repetitive interval unless a new (not previously installed) set of IP compressor R1 blades are fitted. Furthermore, Ref. (3) requires the inspection to be done on all 34 IP compressor R1 blade root dovetails. Therefore, tracking the compliance on an individual blade should not be necessary, as each inspection will have to be performed on the entire blade set even if blades having different EFC are fitted on the same engine. DAL is requesting the compliance to the inspection to be shown on a set of IP compressor R1 blades instead of each individual blade.
- B. According to Rolls-Royce's communication to operators, they intend to introduce NMSB 72-K631 to allow tracking of the IPC R1 blade replacement. Would EASA please consider incorporating this NMSB in the final AD to help the operator reset the inspection on engines to the initial interval?
- C. Table 1 Ref. (1) defines the interval for the initial inspection, and paragraph (1) also requires the repeat inspection before 200 EFC thereafter. However, Ref. (1) does not provide any clarification on engines that may have been inducted into shop visits early with significant cycles remaining to the 2,300 EFC initial inspection interval. Per the current wording of the PAD, the initial and repeat inspection must be accomplished in accordance



with the instructions of Ref. (3). Paragraph D.(2) of Ref (3) allows a visual inspection of the IP compressor rotor 1 blade in the shop if the front bearing housing (FBH) is removed in-lieu of the borescope inspection. This means that any engine in the shop with the FBH removed could potentially comply with the AD requirement, even with significant cycles remaining to the 2,300 EFC initial inspection interval. Also, in Ref. (1), one definition of serviceable part is an affected part that has not exceeded 2,300 EFC since first installation on an engine. These serviceable used parts could undergo normal serviceability inspection in the shop prior to installation on an engine. It could be argued that these serviceable used parts could have the initial inspection performed and therefore are subjected to the repeat inspection interval. This could drive significant on-wing maintenance burden for engines that have received early shop visits. Furthermore, Ref. (2) paragraph D.(2) allows the in-shop inspection as an optional alternative to the on-wing inspection per the direction of operator via the workscope. DAL is requesting similar wording to Ref. (2) paragraph D.(2) to be included in the final AD to clarify when shop inspections can be used to satisfy the intervals outlined in the AD. Alternatively, DAL would like to request a minimum EFC count to be added to the AD to better define when the initial inspection is first required.

- D. According to Rolls-Royce communication, the content of Ref. (3), will ultimately be incorporated as an AMM task. Furthermore, Ref. (2) paragraph 3 already refers to Ref. (3) for the accomplishment instruction of the inspection. Could EASA consider mandating the accomplishment instructions in Ref. (2) instead of Ref. (3)? This would allow easier update to the inspection instructions for both Rolls-Royce and operators in the future if necessary.
- E. Since the Ref. (1) mandates the inspection be done in accordance to Ref. (3), all accomplishment instructions in Ref. (3) must be followed. This includes the reporting requirement in paragraph 3.A.(7). The above paragraph in Ref. (3) requires the inspection results to be reported back to Rolls-Royce immediately. However, due to local record keeping policy, this requirement could not be achieved. Could EASA consider waiving the reporting requirement or allow 90 days for the inspection results to be reported back to Rolls-Royce?

**EASA response:**

- A. Comment noted. See EASA answer to Comment #2, Point A, and Comment #3, Point A, above. Paragraph (1) and Note 1 have been amended in the Final AD.**
- B. Comment noted. See EASA answer Comment #4, Points A and B, above.**
- C. Comment not agreed. See EASA answer to Comment #3, Point C, above.**
- D. Comment partially agreed. See EASA answer to Comment #1 above. If instructions – providing equivalent safety to the inspections required by this AD – are made available in an AMM and a later revision of the inspection NMSB (72-AK633) includes references to that AMM task, using that later revision of the inspection NMSB is acceptable for compliance with this AD.**
- E. Comment not agreed. It is EASA standard that, when reporting is required, it must have a safety benefit (e.g. not only reporting accomplishment of SB action) and the AD will include a paragraph to require such reporting, including compliance time(s), as appropriate. By default, when such a paragraph is not explicitly included in an AD, following SB reporting instructions is at operator's discretion.**



***No changes have been made to the Final AD in response to Points C, D and E of this comment.***

***Commenter 6: Japan Airlines – Shunsuke Yamaguchi – 08/09/2020***

***Comment # 6***

About the chapter of Inspection(s) (1), it is described as follows: Within the compliance time specified in Table 1 of this AD, as applicable, and, thereafter, at intervals not to exceed 200 EFC, accomplish an on-wing or in-shop inspection of the blade root of each affected part in accordance with the instructions of the inspection NMSB. For the instructions we should obey, the inspection NMSB (SB 72-K633) is called out. We would like to confirm about the following matters:

- A. The SB 72-K633 includes taking pictures of cracks (if any crack is found) and reporting to Rolls-Royce regarding the inspection results for all inspections. We understand that these actions are not included in AD requirements. Is our understanding correct?
- B. The SB 72-K633 includes the cleaning process as Appendix 2, in case that IPC Rotor 1 Blade roots makes it difficult to determine whether a crack is present. We understand that EASA Alternative Method of Compliance (AMOC) is not needed for our own locally manufactured cleaning tool and delivery tool. Is our understanding correct?
- C. About the chapter of Inspection(s) (1) Note 1, it is described as follows: Unless indicated otherwise, the EFC specified in Table 1 of this AD are those accumulated by an affected part since first installation on an engine. We would like to confirm the above wording:  
We understand that the above wording means that if the engine which are replaced all IPC Rotor 1 blades with new in previous shop visit, we should perform the initial inspection prior to 2,300 EFC after installation of the engine and repeat inspection every 200 EFC since initial inspection. Is our understanding correct?

***EASA response:***

- A. Comment agreed. JAL understanding is correct. See also EASA answer to Comment #5, Point E, above.***
- B. Comment partially agreed. JCAB should approve your method as AMOC to the AD (our AD adopted by JCAB, or a JCAB equivalent AD). See our related [AMOC FAQ](#).***
- C. Comment agreed. JAL understanding is correct. Initial inspection time depends on the EFC accumulated by the (set of) blades since new, i.e. its first installation on an engine. See also EASA answer to Comment #2, Point A above. Note 1 has been amended in the Final AD.***

***No changes have been made to the Final AD in response to Points A and B of this comment.***



**Commenter 7: Cathay Pacific Airways – John Chiu – 08/09/2020****Comment # 7**

PAD refers to NMSB 72-AK633 inspection. Can EASA clarify that whether the SB instruction Step A (7) “Complete the form in Appendix 1 (or similar) for all inspections carried out and return immediately to your Rolls-Royce Airline Support Team Representative” is part of the feedback and NOT part of the inspection. As the PAD requests for an inspection only, is the feedback step not mandated by the PAD?

**EASA response:**

**Comment agreed. See EASA answer to Comment #5, Point E, above.**

**No changes have been made to the Final AD in response to this comment.**

