

COMMENT RESPONSE DOCUMENT

EASA PAD No. 22-180

[Published on 20 December 2022 and officially closed for comments on 17 January 2023]

Commenter 1: Singapore Aero Engine Services Pte Ltd – Malek Aziz – 06/01/2023

Comment # 1

- A. Paragraph 1 states, "If, on the effective date of this AD, an engine is in a shop visit where the engine pass off test has not yet concluded, the initial inspection must be accomplished before release to service of that engine." If the engine has not reached the first threshold of 22 500 EFH, is the engine subjected to the initial inspection before release to service? If the intent of the AD is to mandate the said engine to be inspected regardless of its EFH, this sentence should be in a separate paragraph.
- B. After the effective date of the AD, an engine which has not reached its initial inspection or repeat inspection threshold is inducted into the shop visit, is the engine subjected to the AD compliance?
- C. The inspection was carried out on-wing with zero findings and the engine has not accumulated any flight hours since the inspection. It is then inducted into a shop visit. Can the shop not carry out the inspection and carry forward to the operator?
- D. The LP1 Blades were replaced during the shop visit. Should the inspection be carried out before exceeding 22 500 EFH or 4 500 EFH?

EASA response:

- A. Comment agreed. Paragraph (1) of the Final AD has been amended to clarify this point.**
- B. Comment noted. See EASA answer to point A above.**
- C. Comment not agreed. There is no need to do the inspection again until the interval (4 500 EFH) since the latest inspection has been reached.**
- D. Comment noted. The next inspection due must be determined by whether the replacement blades are new (not previously installed on any engine) or used (some EFH accumulated on another engine). For new blades, the threshold is 22 500 EFH; for SUM (serviceable used material) blades, the previously accumulated time must be taken into account to determine the (reduced) threshold. If SUM blades have previously been inspected, the next inspection is due not later than 4 500 EFH after the latest inspection. Since these kinds of actions are routine, these should be understood without elaboration in the AD.**

No changes have been made to the Final AD in response to points B, C and D of this comment.



Commenter 2: ALL NIPPON AIRWAYS CO.,LTD – Katsuya Saiki – 17/01/2023**Comment # 2**

- A. Inspection(s) paragraph (1) says "If, on the effective date of this AD, an engine is in a shop visit[...]before release to service of that engine."
This wording makes it appear that even for "less than 22 500 EFH engines" this must be implemented at every shop visit.
Please add that it should be limited to "22 500 EFH or more engines".
- B. Inspection(s) paragraph (1) says "Note 1: The EFH[...]by the Module 52 since new (first installation on an engine)".
On the other hand, the NMSB says that the inspection intervals can be reset to "less than 22 500 EFH" after 3.B of the NMSB implementation.
Does EASA approve that the inspection intervals will be reset after the incorporation of section 3.B of the NMSB?
If yes, please add this to the Note 1. We suggest adding the following sentence, for example:
"Note 1: The EFH[...]by Module 52 since new (first installation on an engine) or since last incorporation of section 3.B of the NMSB (which is lower)."
- C. Inspection(s) paragraph (2) says "If, during any inspection as[...]reduce the inspection interval."
Since on-wing and in-shop have different criteria, why not state "If, during any on-wing inspection" in this case?
- D. Corrective Action(s) paragraph (3) says "more than 29 affected parts," but wouldn't it be more appropriate to avoid specific numbers in case the limit is revised in the future?
- E. Corrective Action(s) paragraph (3) says "replace the LP turbine stage 1 blades and disc." On the other hand, NMSB says "quarantine the removed LP turbine stage 1 rotor disc." In the future, if a quarantined LP turbine stage 1 disc becomes available for re-installation, there may be situations where it is not necessarily replaced. Therefore, can the wording of the PAD be changed to "replace the LP turbine stage 1 blades and quarantine the LP turbine stage 1 disc"?

EASA response:

- A. Comment agreed. See EASA answer to Comment #1 point A above.**
- B. Comment noted. See EASA answer to Comment #1 point D above.**
- C. Comment agreed. Paragraph (2) of the Final AD has been amended to clarify this point.**
- D. Comment not agreed. If, in future, the limits are changed, a new or revised AD will be necessary. To be clear: there is no requirement to comply with the 'latest' issue of the NMSB. The AD refers to the NMSB mostly for the instructions (how to), not necessarily for the compliance times or accept/reject criteria.**



E. Comment not agreed. The purpose of the AD is to correct the engine, not to ‘manage’ parts that are off the engine. Quarantine of an LP turbine stage 1 disc is such an action. The AD does not contain any prohibition to (re)install a removed LP turbine stage 1 disc, so if the part is later determined (by Rolls-Royce) to be a serviceable part, it can be installed on any engine.

No changes have been made to the Final AD in response to points B, D and E of this comment.

Commenter 3: British Airways – Oliver Angell – 17/01/2023

Comment # 3

BAW has noted that the current compliance timeframe of Rolls-Royce NMSB 72-AK913 and EASA PAD 22-180 includes only a 90-day period to inspect engines that have operated over 22.5k flight hours since new. For the BAW fleet this will initially affect 22 engines, which will likely require a number of inspections outside of regular scheduled maintenance, together with additional aircraft de-scheduling to accommodate.

BAW also notes that, based on information provided by Rolls-Royce, at least four affected engines were inspected during shop visit (with a life in excess of 25k flight hours) which, based on the findings, would have been permitted for further service per the limitations of NMSB 72-AK913 (less than 28 cracked blade pairs).

Based on the data supplied to date, BAW believes there to be a low risk of engines currently operating with an excess of 28 blade pairs cracked (the point at which Rolls-Royce believe a blade flutter condition could occur), however despite this, the inspection timescales of NMSB 72-AK913 and PAD 22-180 provide only 90 days to comply. The mismatch in compliance timeframe vs risk is likely to cause significant operational disruption through de-scheduling to enable inspection of the affected engines, despite there being no examples of LPT blades being released in service due to this condition.

BAW requests that Rolls-Royce and EASA review the safety risk and compliance timeframes with consideration of Trent 1000 spare engine availability, aircraft de-scheduling and the above workshop inspection data.

EASA response:

Comment not agreed. Following review of all the available data from inspections that have been carried out and based on the risk profile, EASA consider a 90 day compliance as appropriate.

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

