


EASA	COMMENT RESPONSE DOCUMENT
	EASA PAD No. 12-061 [Published on 05 June 2012 and officially closed for comments on 04 July 2012]

Commenter 1: TMA – ROLAND HADDAD – 11/06/2012
Comment # 1

Aircraft: A300F4-622R

MSN: 0872

Young aircraft which have not accumulated more than 3500 FC till now, with SB 57-6106 not incorporated, and MLG Ribs 5 not repaired in accordance with Airbus instruction R57240221/R57249121; does paragraph (8) force these aircraft to install the new bushes within a 30 month period even if there's no discrepancy? Or can an operator continue with the repetitive inspection requirements mentioned in paragraph (1) indefinitely or until any discrepancy is found then new bushes or a repair will be incorporated.

EASA response:

Paragraph 8 of PAD 12-061 is not a new requirement but simply a re-statement of the existing requirements of AD 2010-0251. Regardless of the usage of an aircraft or previous inspection results; if no previous modification or repair action has been performed to the gear rib lugs, new bushes must be installed within 30 months in accordance with modification SB A300-57-0249 rev03, A310-2090 rev03 or A300-6106 rev03 (according to aeroplane model).

Commenter 2: Lufthansa Technik AG – John Donegan – 11/06/2012
Comment # 2

PAD 12-061: „(The) MLG Rib 5 forward lug on A320 (family) aeroplanes (...) is a similar design to the A300/A300-600/A310 family...”.

It is understood that at least two A321 aircraft suffered rupture of the forward lug after installation of the EASA mandated modification (installation of interference fit bush). The root cause is believed to be stress-corrosion-cracking due to the presence of microscopic corrosion at the bore (undetectable by current on-aircraft inspection means) at the time of installation of the new bushes post-repair.

- A. Modification Service Bulletin (57-6106/57-2090 etc.) Revision 03, Paragraph 3.C.(3) Step (h) states that “(If) no damage and/or corrosion is found...go (directly) to...Installation of Bushes”. This damage could only be have found by Step (c) and/or (d) performed after bush removal. Exactly these NTM

procedures (c) and (d) are used to verify that all corrosion has been removed after any spot facing/oversizing in case that repair instructions were required after Step (i) (and also the now invalid repair instructions from previous SB revisions). As these inspection procedures are deemed insufficient to detect microscopic size corrosion, a 'final cut' was required. The "new" repair instructions referred to in SB 57-6106, 57-2090 Revision 03 etc. have further increased the final cut.

1. We understand that both the A321 aircraft with the post-modification lug ruptures did not have any 'final cut' after corrosion removal during repair. Please confirm this. If they did not have final cuts then we would question the continued direct comparison between A320 family and A300/A310 aircraft and therefore the susceptibility of A300/A310 a/c to this phenomenon, which have received final cuts in accordance with R57240221 or R57249121.
 2. What is the reasoning behind further increase of final cut with "new" repair instructions? This further reduction in material will only increase stresses. As a final solution to this problem has still not been presented by Airbus, we are reducing further the margins for any improvement/design correction.
 3. The 'final cut' (of any size) was justified by the fact that NTM 51-10-02 and 51-90-00 were inadequate when it comes to detecting very small corrosion (after repair). Why are these inspection methods deemed adequate at 3.C.(3)(h) of Revision 03 of the SBs? The detectability will not have changed using these NDT methods. Aircraft modified in accordance with Revision 03 are exempt from PAD 12-061 if no initial corrosion is found (with those methods). If this justification is used that the NDT methods will detect cracks at initial inspection (and so a potential surface defect for corrosion to initiate) then this justification must also be applied post oversizing – the NDT that shows no findings (corrosion or cracks), why do we have the need for a 'final cut' if no more cracks exist?
- B. PAD 12-061 requirement (12) Table 1 and (13) Table 2 provide threshold and interval data for re-inspections.
1. How has the time limit been calculated? If it was based on the presumption of an initial defect (corrosion) and the lug undergoing maximum stress with the new added interference fit and based on maximum bore size post modification (based on permitted oversizes defined in the SB), then what values are applicable to aircraft which have bore sizes exceeding the SB-permitted ones (and approved by RAS/RDAS)? These will assume higher stresses.
 2. For an A310 aircraft which has no findings after initial detailed visual inspection, has it been justified that the aircraft could potentially have another 774 flights before the rupture is discovered and shown to not pose a risk? We have not seen the design scenario of the landing gear operation with ruptured lugs (PAD reason "complete failure of the fitting"). However, as both the EASA and Airbus require immediate action (before next flight) once a surface crack is detected, we assume it is not a good situation to potentially fly for 774FC with a surface crack before next inspection. This is with the background that EASA have even reduced the interval to 100 FC visual inspections if an operator has done a SDET with sub-surface crack indication. For an operator who has not done (and is not necessarily required to do) the SDET (but may have an undetected crack below surface) surely the risk is just as high warranting a reduced interval. The 100 FC justification is only used for operators who "know" they have a sub-surface crack; operators who do not know are allowed 775FC! Even with a sub-surface crack indication, the aircraft could potentially fly 99 FC with a ruptured lug, before the crack is found at inspection.
- C. PAD 12-061 requirement (15) states that "If, during any DVI..., crack is detected, at intervals not to exceed 100 FC, repeat the DVI".
1. This should probably read "If...no crack is detected" as it is with odds with requirement (16) which requires action before next flight.

A number of these concerns were previously communicated by Lufthansa Technik to Airbus. However, they have not all been satisfactorily addressed, in part due to the fact that the investigation or "a complete review" was underway at the time by Airbus, not all information was available. LHT would also like to strongly encourage any efforts on the part of the EASA for a final technical solution – it is not acceptable to have this condition on the aircraft with the results from the (PAD 12-061) inspections to be a prerequisite for any solution. Based on average utilization of the worldwide fleet, a threshold of 2500FC from modification embodiment it will take several years before the significant results are available to Airbus and even longer before any trend can be identified.

EASA response: First of all, although many of the so-called comments are in fact queries, sometimes questioning the technical instructions called in by the

AD, instead of commenting the AD requirements themselves, EASA will strive to provide an answer to the commenter.

A1: The A321 SRM did not previously include a "finishing cut". For A300/A310 aircraft repair instructions R57240221Revisions A-F and R57249121 Revisions A-C did not include a finishing cut either, this was introduced from Revisions G and D respectively. Therefore a direct comparison can be made between the repaired A320/A321 and A300/A310 aeroplanes. On A320/A321 aircraft the finishing cut was not identified as the only factor; in-service investigations carried out with operators resulted in the need for additional improvements to be made to A320/A321 and A300/A310 repair instructions. New A300/A310 repair instructions R572-40425 and R572-49389 include improvements to processes, including sealant application as well as defining surface finishes and an increased finishing cut.

A2: The increase in the finishing cut of the bore and spot-face has been introduced to address the in-service findings seen following laboratory investigation of the A320/A321 gear ribs.

A3: The finishing cut was introduced in the generic repair for gear ribs where corrosion was present whilst performing either DVI or SDET inspections in accordance with mandated by AD ISB 57-6107. Once material has been removed, the repair instruction requires a further inspection using a dye penetrant with etch if applicable to confirm that there is no further damage present hidden by mechanical abrasion. This is followed by a finishing cut to ensure all potentially degraded material beyond the detectability of the inspection technique is removed. For aircraft where no corrosion is present, an inspection with dye penetrant only is required prior to modification embodiment. From in-service experience, Airbus has concluded that corrosion on the surface initiates cracking, hence if no corrosion is present there is no requirement to carry out etch or material removal prior to modification.

B1: The lives for threshold and interval inspections are based on the structure as defined for modified lugs i.e. with high interference fit bushes. For any repairs outside the limits of R57240221 or R57249121, the fatigue life and any remaining inspections are to be defined in each RDAS.

B2: Where no indication is found the pre-and post-mod inspection intervals differ due to a change of assumptions for high interference fit bushes (for both DVI and NDT). For a lug that gives an indication (either DVI or NDT), the required actions are unchanged for both pre-and post-mod i.e. DVI inspection finding leads to no further flight, NDT indication leads to 100 FC repeat DVI.

C: Agreed, the typographical error has been corrected.

Commenter 3: Lufthansa Technik – John Donegan –22/06/2012

Comment # 3

Please find an additional comment concerning PAD 12-061:

After consultation with the current revision of the A300, A300-600 and A310 NTM, please be aware that the SDET procedure (NTM 57-90-00 PART 4...) referenced in the inspection Service Bulletins is yet to be published.

We request the EASA not to include any optional actions for performance on the aircraft (i.e. SDET) in accordance with the SBs with reference to documents that have not yet been updated or available to operators at the time of publishing the AD. Please wait until the NTMs referenced in the SB has been published (or add a note to the AD that the SDET procedure may be carried out using reference to other means (yet to be defined) other means than the NTM).

EASA response:

As noted by the commenter, the SDET procedure is an optional alternative. NTM 57-90-00 Part 4 is referenced within the A310 SB A310-57-2101. This procedure is to be published in the December 2012 revision of the A310 NTM. It is not EASA intent to postpone the publication of an Airworthiness Directive until an optional procedure is made available by the Type Certificate Holder. However, EASA will think about the use of a note to highlight a

possible deferred availability of an optional procedure. It must however be emphasised that should an operator request the NTM 57-90-00 Part 4 , Airbus can provide an advanced copy of the procedure.

Commenter 4: UPS – Mark Westman –28/06/2012

Comment # 4

EASA released the subject Proposed Airworthiness Directive (PAD) to inspect rib 5 aft fitting forward lug on the A300,A310, A300-600ST aircraft due to reports of cracking on the forward lug on the A310 aircraft. In some instances, corrosion pits caused the cracking. This cracking may lead to complete failure of the fitting.

Airbus provided several service bulletins related to this PAD for the A300. The first two, SB A300-57A6105 and A300-57-6107 inspects the fitting for cracks prior to 12,000 flight cycles. The next SB, A300-57-6106 replaces the bushings with high interference and seals the fitting to prevent corrosion. This modification is considered terminating action to the existing EASA AD.

UPS has been inspecting and replacing the rib 5 bushings per Airbus service bulletin prior to aircraft reaching the 12,000 flight cycle limit. We have accomplished the bushing replacement on 30 aircraft using several revision levels including R3 of SB A300-57-6106. We have not found any fitting cracked to date with only minor corrosion in the fitting around the bushing.

The new requirements of the EASA PAD requires A300-600 operators who have accomplished termination action per Airbus SB A300-57-6106 original issue, R01 or R02 to continue inspecting per A300-57-6112 with 2,500 flight cycles after modification or 550 flight cycles after the effective date whichever occurs later. UPS believes that the threshold for A300-600 aircraft in the new PAD should be increased to half the original mandated threshold based on the following.

- Operators we accomplished the previous revisions of SB A300-57-6106 accomplished inspections, reworked and sealing of the bushings using the mandated procedures. The SB also required the area to be free from corrosion and additional damage. Therefore the fitting lug could be considered “zero timing” removing any potential stress point which could cause cracking.
- The area is treated to prevent corrosion.
- Airbus has not had a crack on the A300-600 aircraft since induction into service (approx. 50 years of in service experience).
- All the analysis to date has been based off one aircraft type design but again no cracks have been reported on the A300-600.

UPS is committed to the highest level of safety and believes that the proposed changes to the up coming PAD will provide operators with the ability to accomplish the inspections during normal maintenance intervals and ensure the structural integrity of the main landing gear. If you have any questions please contact Mark Westman (502) 329-6105.

EASA response: we disagree.

To date, two gear rib lug failures were reported on A310 aeroplanes (both in pre-modification configuration). However there have been more cases of corrosion found on A300 or A310 aeroplanes. Gear rib lugs of A300s and A310s are of a similar design than those of A320/A321. Gear rib lug failure has been reported on three A321 aircraft in the post-modification configuration i.e. with interference fit bush. However, potential SB non-conformances had been identified and have likely contributed to the gear rib lug failure.

A review of the modification SBs identified specific improvements to prevent these non-conformances to re-occur. Consistent with A320/A321 family, A300/A310 aircraft already modified in accordance with earlier revisions of modification SBs are now subject to re-inspection, for which the in-service feedback can be analyzed.