

**International Maintenance Review Board Policy Board (IMRBPB)
Issue Paper (IP)**

Initial Date 27 Apr 18
IP Number: IP 179
Revision / Date: 0

Title: Wear Damage Detection Task

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Applies To:	
MSG-3 Vol 1	X
MSG-3 Vol 2	X
IMPS	

Issue:

MSG-3, Rev 2007 Expanded text to better define/consider structural wear damage, including changes to the three sections listed below.

MSG-3, Rev 2009 Added a definition of Wear Damage to the Glossary [Appendix A] and added discussion of structural wear [Section 2-4-2].

Wear and its detection are currently discussed in the two Aircraft Structural Analysis sections and one Aircraft Systems/Powerplant Analysis section of the MSG-3 document as shown below. Specific mention of wear is made in Scheduled Structural Maintenance Section 2-4-2 and the inference to addressing degradation due to wear is included in Sections 2-3-1 for Systems/Powerplant MSI selection and 2-4-1 for the aircraft structural definition of wear.

2-3-1. MSI Selection

Structural items, whether designated as SSI or Other Structure, having system related functionality (e.g. firewalls, shields, integral fuel tank boundaries, flight control hinge bearings, drains, door hinges) need to be addressed in the MSI selection through coordination between Systems and Structures Working Groups...

2-4-1. Aircraft Structure Defined

The attachment fittings of the actuators to the airframe will be treated as structure, while the dynamic components such as hinge bearings will be treated as System components. Structure-to-structure attach points, not otherwise associated with an aircraft system (e.g., pylon attach fittings and diagonal braces) that feature bearings will be treated as structure. However, since the Structural Analysis Procedure may not provide appropriate tasking for maintaining such attach points, this information should be coordinated with the appropriate Systems Working Group in accordance with established transfer policy and procedures.

2-4-2. Scheduled Structural Maintenance

Where applicable, other sources of damage/deterioration, such as wear are to be considered when establishing scheduled maintenance requirements.

Wear is typically found in/at bushings, bearings, stops, latches, locks, tracks, guides, cams, rollers, cables, pulleys or floors. Wear can influence loads and strength, lead to inaccurate positioning and adverse free play or change resistance to environmental deterioration.

Wear can be systematic for parts intended to be in contact, or random for parts that should normally not come in contact or should not be subjected to relative motion.

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Based on the coordination between the Working Groups, the requirement to detect wear damage can be delegated to either of these areas.

Problem:

Wear damage has been defined as a physical deterioration of the surface and can influence loads and strength, lead to inaccurate positioning and adverse free play or change resistance to environmental deterioration. This could impact the operation of a system and/or impact loads and strength of structure. While Section 2-3-1 provides a note with guidance to Systems/PowerPlant to coordinate with Structures if system component failures impact structural integrity, the failure impacts should be identified and analysed by each group with coordination to ensure that all failure modes have been identified and to prevent task duplication.

The different failure modes should be able to be analysed by the applicable Working Group. The system wear damage may not impact the system operation even if it is out of certain limits, but this could impact the structural loads. The failure finding task should be identified in the applicable section of the maintenance program.

The MSG-3 advises the Structural Working Groups to include wear as a source of damage and to consider it when defining structural maintenance requirements. However, it provides no direction or guidance for new, or existing, members of Structural Working Groups on how to identify that an SDI task type can be selected to detect the extent of wear damage. The current definition of an SDI does not include a measurement tool or clearly identify it can be selected to measure for wear damage.

There is much resistance to changing the task definitions to prevent confusion in the Structures inspections based on what has always been done, but with many new OEM and Working Group members guidance needs to be provided to be able to analyse the wear damage impacts in the applicable Working Group, and to be able to select an appropriate task for each group.

Recommendation (including Implementation):

It is proposed that the determination of the amount of wear can be accomplished using one of two task types. The necessary quantitative check (measurement) could be performed as a FNC or as a SDI. In the case of the FNC, wear damage can be detected as impacting the quantitative or qualitative functionality of the system. In the SDI case, wear damage can be detected as a measurement against defined limits for either Systems/PowerPlant or Structures.

In the Systems/PowerPlant Section 2-3-7

- Change the Note for the GVI clarification to "Note 1".
- Add Note 2 immediately following Note 1 in the following section:

2-3-7. Task Development (Second Level),
4. Inspection/Functional Check (All Categories)

NOTE 1: A GVI identified within the MSI from which it was identified

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NOTE 2: A Special Detailed Inspection identified through application of Systems/Powerplant logic can be used to detect wear damage within specified limits using a measuring tool.

In the Scheduled Structural Maintenance Section 2-4-2

- Add a note after the second paragraph

Note:

A Special Detailed Inspection identified through application of Structures logic can be used to detect wear damage within specified limits using a measuring tool

IMRBPB Position:

Date: 27 Apr 18

Position: Closed in 2018 Meeting as IP 179

Status of Issue Paper and date:

Active

Recommendation for implementation:

Retroactive: N

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