Boletim Especial de Aeronavegabilidade (*Special Airworthiness Bulletin*)

ATA: 29 – Hydraulic Power

BEA Nº 2021-01

Subject: Hydraulic Powerpack Failures.

Date: January 20th, 2021

Introduction:

This Special Airworthiness Bulletin (BEA) is intended to alert owners and operators of Embraer S.A. airplanes model EMB-500, equipped with PW617F-E engines, G1000 avionics system and spoiler panels (marketing designation Phenom 100E), or equipped with PW617F1-E engines, G3000 avionics system and spoiler panels (marketing designation Phenom 100EV) regarding the occurrence of powerpack failures and the effects in the aircraft.

This bulletin is informative, and the recommendations are not mandatory. Until this time, there is no airworthiness concern that would warrant an Airworthiness Directive (AD) according to Regulamento Brasileiro de Aviação Civil (RBAC) nº 39.

Manufacturer: Embraer S.A.

Affected Aeronautic Product: EMB-500, equipped with PW617F-E engines, G1000 avionics system and spoiler panels (marketing designation Phenom 100E), or equipped with PW617F1-E engines, G3000 avionics system and spoiler panels (marketing designation Phenom 100EV)

Background:

The EMB-500 hydraulic powerpack has a fully integrated DC electric motor driven pump and provides hydraulic power supply. In addition, all the essential components of a typical hydraulic system are built into this single package, including an integrated hydraulic reservoir.

For EMB-500 equipped with PW617F-E engines, G1000 avionics system and spoiler panels (marketing designation Phenom 100E) and EMB-500 equipped with PW617F1-E engines, G3000 avionics system and spoiler panels (marketing designation Phenom 100EV) a dedicated hydraulic accumulator was incorporated to provide power to the main brake system in case of hydraulic power system failure. The consequence of this change was the increase in the required hydraulic fluid quantity that must be stored. In order to accommodate this additional fluid volume, the current hydraulic reservoir, which is incorporated on the powerpack assembly, was replaced by a separate hydraulic reservoir. As a result, the powerpack was modified to eliminate its entire reservoir section.

Several events associated with the modified powerpack that has the segregated reservoir have been reported to ANAC. The hydraulic system of airplanes that have installed the powerpack with the segregated reservoir is configured to assure the normal brake system and emergency system availability in case of powerpack failures, through dedicated hydraulic accumulators, considering no additional failures in the system. In terms of combined failures with significant consequences, despite of the low

performance that the powerpack with separated reservoir has been presenting, the safety objectives for all the critical failures are still achieved, considering the data provided to ANAC at the issuance date of this Special Airworthiness Bulletin.

Still, in light of the reported occurrences, considering the undesirable effect of such recurrent failures in the aircraft systems full availability and exposure to failure combinations, ANAC is issuing the following recommendations.

Recommendations:

1. The powerpack failure investigation indicates that one of the contributors for the failure condition is the pressure drop in the integrated pump suction port. Therefore, to improve the powerpack reliability, ANAC recommends owners and operators of the affected airplanes to replace tubes, hose, and rework the support of the hydraulic suction line, according to Embraer Service Bulletin SB500-29-0007.

Note: The modification addressed in recommendation #1 is part of a set of changes with the intent to improve the powerpack reliability. This Special Airworthiness Bulletin may be revised to incorporate recommendations associated with other changes expected to be developed.

Reference documents:

1. Embraer SB500-29-0007 “HYDRAULIC POWER - HYDRAULIC SYSTEM SUCTION LINE REPLACEMENT”

For further information contact

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