

ADVERTENCIA 292/DAG R2

The purpose of this **WARNING** is to inform about a situation that may be of interest to Aeronautical Repair Workshops, operators and/or aircraft owners, for this reason it is issued for information purposes, and the recommendations contained therein are not mandatory.

Ciudad Autónoma de Buenos Aires, 26 de febrero de 2024.

DIRECTED TO:

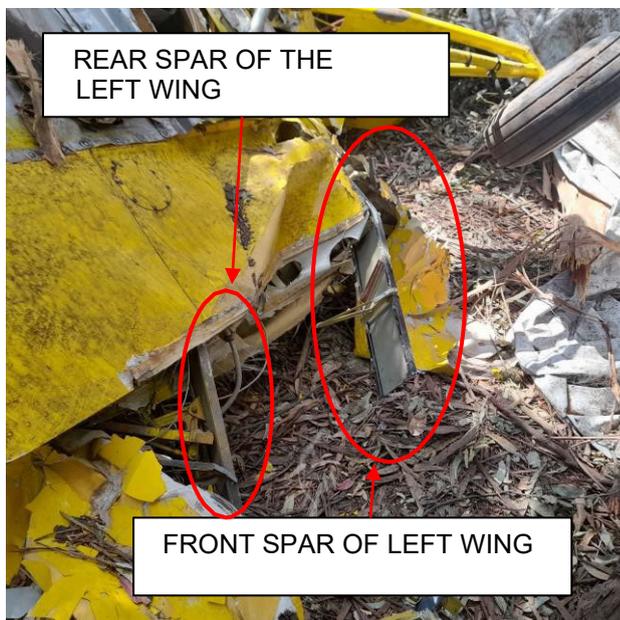
Aeronautical Repair Shops, Owners and Operators of PIPER, CHINCUL, LAVIA aircraft, PA-25 series models, all S/N.

REASON:

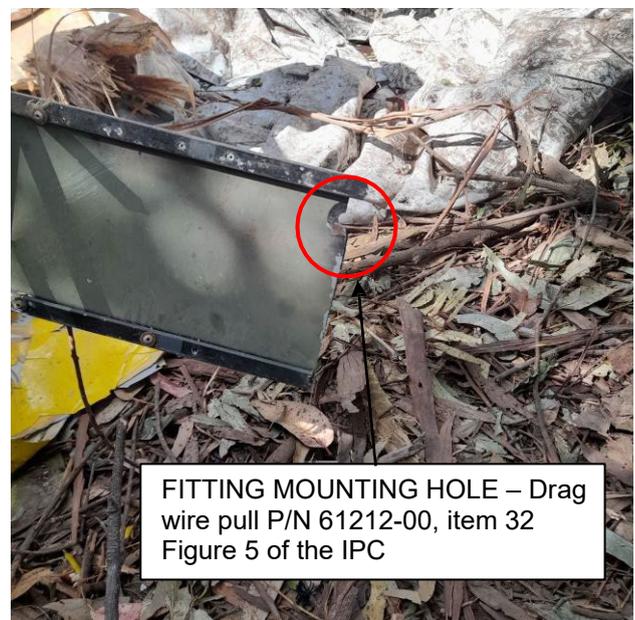
Presence of cracks / breakage of wing spars.

BACKGROUND:

- 1- On 27-09-23 a PA-25-235, manufactured in 1980, with more than 2800 hours of TG, crashed due to the breakage of the front spar of the left wing. Below are some photographs showing the state of the spar after the accident.



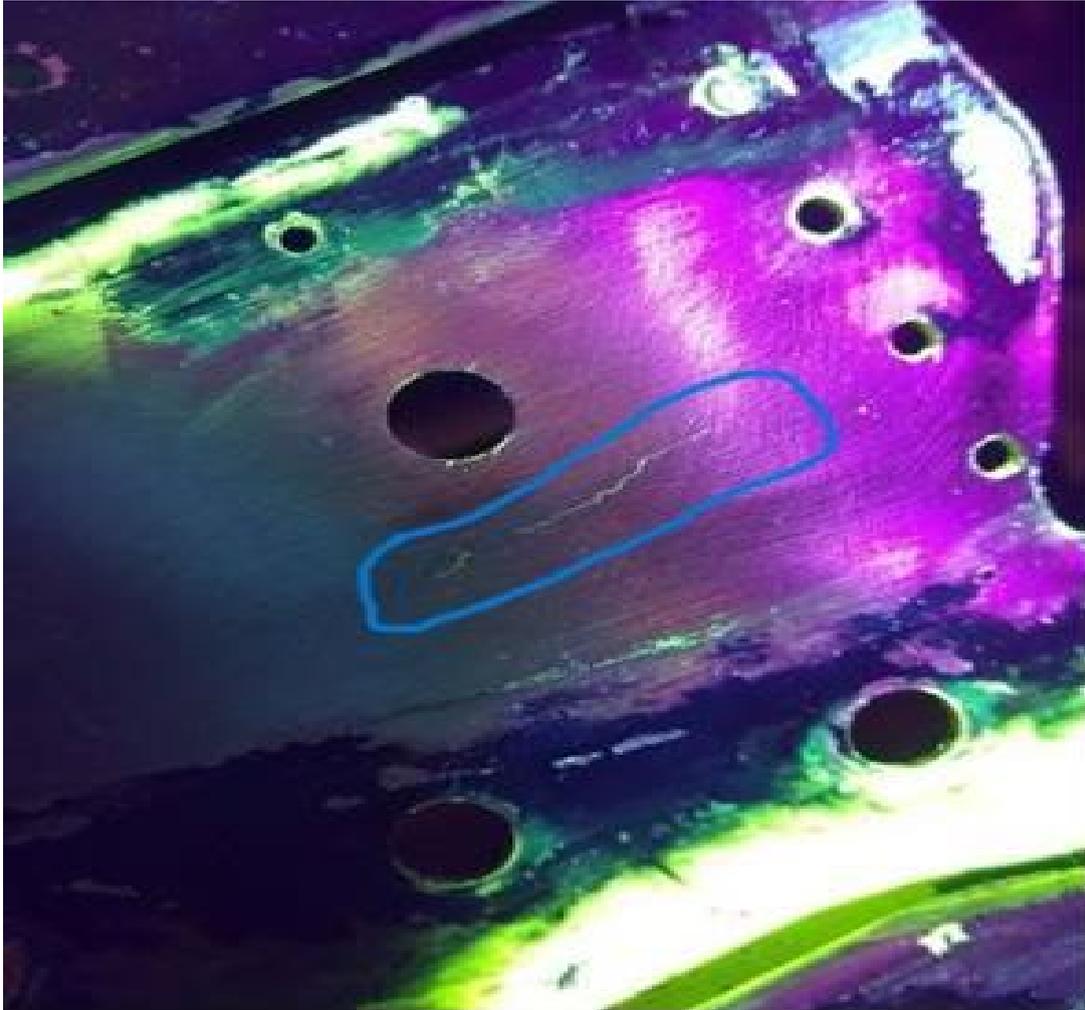
In this photograph, with the aircraft inverted, you can see both spars of the left wing.



In this photograph, you can see the part of the front spar that was attached to the fuselage.

- 2- On the other hand, a WORKSHOP that has the scope to carry out NDT in its EEOO, sent us some photographs of a PA-25-235 spar, where a crack can be seen in the web of a spar. Unlike the accident described above, this crack:
 - a. Is located in the rear spar.
 - b. Is located close to the fixing area of the 1st compression tube.
 - c. It does not have a direction perpendicular to the spar, but longitudinal to it.
 - d. It doesn't appear that the crack starts in any hole in the spar.

One of the photographs from this report is below.



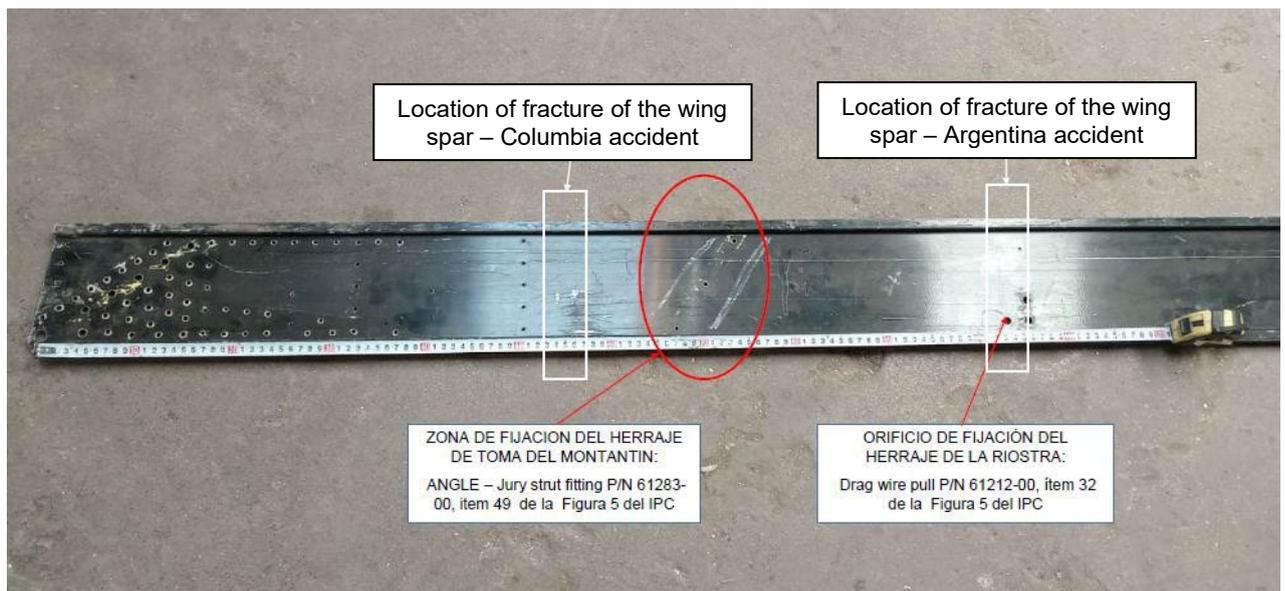
- 3- Recently, the Transportation Safety Board informed ANAC of an incident that occurred in Colombia with a PA-25-260 aircraft, in which the aircraft crashed as a result of the failure of the front spar of the right wing. From the REPORT prepared by the Brazilian Institute of Aeronautics and Space, as a result of the investigation carried out on the remains of the aircraft, the following information is derived, which is transcribed verbatim:

“Analysis indicates that there was a fatigue failure in one of the holes present in the front spar of the right wing. Fatigue cracks began inside the hole in areas with the presence of corrosion and plastic deformations. As the crack grew, a progressive reduction of the resistant section of the spar occurred, compromising its capacity to resist the stresses applied to the aircraft wing, resulting in a sudden failure due to the overload of the rest of the section of the front spar and, consequently, the overload fracture of the rear spar and the loss of structural integrity of the right wing.”

The report is accompanied by photographs showing the location of the front spar failure, one of which is attached below.



For a better spatial location on the front spar of the fractures reported in paragraphs BACKGROUND 1 and 3, the following photograph is attached.



- 4- Following these events, the JST decided to resume the investigation of an accident that occurred in 2018, to a PA-25-235 aircraft, with a TG of approximately 4600 hours, manufactured by PIPER (USA). Investigators suspect that the cause of the accident could be similar to that of the aircraft indicated in paragraphs 1 and 3. Below are photographs of the state of the front spar of one of the wings of this aircraft, as it was found after the accident.



For this reason, due to the similarity in the way both spars broke, the JST has sent remains of the spar of this aircraft, together with remains of the aircraft that crashed in 2023 to a TEST LABORATORY, to try to determine, if possible, the cause of the breakage of the spars. The break observed in the spar is located approximately 1 mt. from the root of the wing.

- 5- After a few days of work with the remains of the spars, the laboratory has revealed, but without being able to confirm it yet, that there are signs that allow us to assume that the fractures would have been produced by fatigue processes originating in holes existing in the upper plates of the spars. In the following photographs of the spars of the aircraft that crashed in Argentina in 2018 and in 2023, it can be seen that the fracture fronts passed through holes existing in the plates, as in the accident that occurred in Colombia.



PA-25-235, ACC en 2018

PA-25-235, ACC en 2023

PA-25-260, Colombia

- 6- DAG personnel have been able to observe in a spar similar to that of the PA-25 series, a spar that was installed in a PIPER aircraft whose wings are constructed similarly to those of the PA-25, the existence of cracks that originated in the holes where the fasteners are placed to fix the leading edges and the ribs. Below are some photographs that show these holes and the cracks





- 7- The FAA issued FAA AD 80-21-08 in 1980, applicable to PA-25 aircraft fitted with STC SA501SW, which is NOT APPLICABLE to the vast majority of PA-25 aircraft, but the interesting thing about this AD is that it defines sectors of the spar caps where the placement of fasteners, whether fasteners or rivets, is UNACCEPTABLE (PROHIBITED). The directive includes this graphic where these sectors are defined.

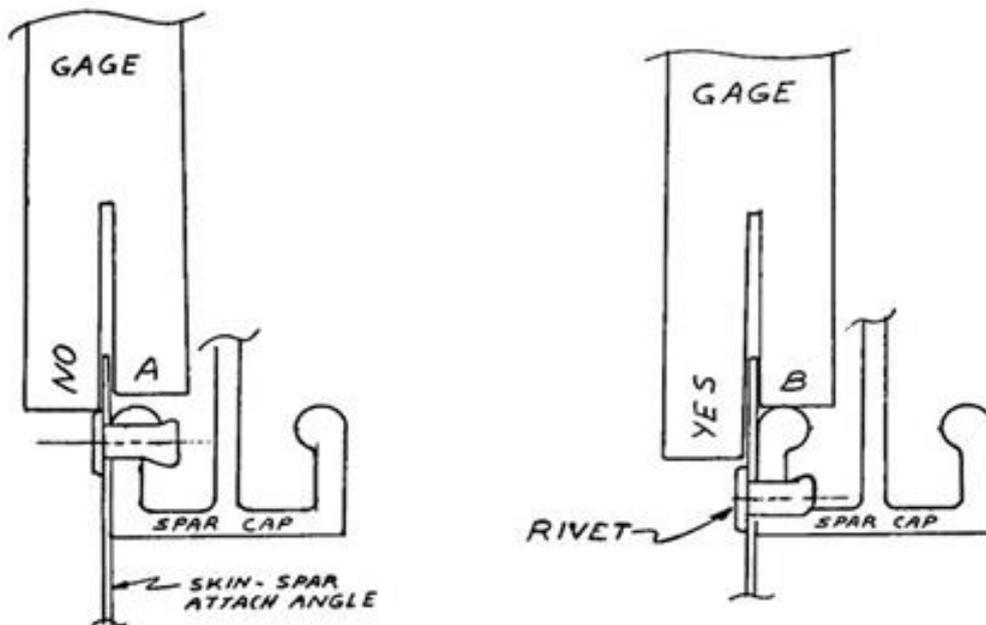


FIGURE NO.3 UNACCEPTABLE FASTENER
INSTL.

RECOMMENDATIONS:

Based on the above, and the seriousness of the consequences that may arise from the breakage of any of the wing spars, it is recommended that the owners of the aircraft to which this Warning applies, as soon as possible, and without failing to comply with ANAC DAE 2023-12-01 in full, carry out a detailed inspection of the wing spars, with the following premises:

- 1- Access is gained to the front spars, in an area covering 50cm to the right and 50cm to the left, of the P/N 61282-00 FITTING JURY STRUT (ITEM 48 OF FIGURE 5 OF THE IPC) strut attachment hardware, which is located approximately 700mm from the wing attachment hole to the fuselage, either by uncovering this section of the wings or through inspection covers.
- 2- Using a BOROSCOPE, inspect the UPPER CAPS of both spars for:
 - a. Fasteners incorrectly positioned as indicated in BACKGROUND 7.
 - b. Holes overlapping transversely in the beams, as can be seen in the 1st photograph of BACKGROUND 6
 - c. Overlapping holes, enlarging the original holes, as can be seen in the 3rd photograph of BACKGROUND 6
 - d. Cracks starting from one of the holes present in these areas.
- 3- If any of the defects indicated above are found, immediate replacement of the spar is recommended.

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