

From: [Doud, Les](#)
To: [Liedler Courtney](#)
Subject: FW: CEN19LA292 - N53432 Alternator Exam findings
Date: Tuesday, November 12, 2019 11:32:42 AM
Attachments: [H-O100492 ATP Results.pdf](#)

[CAUTION] This email originated from outside of the organization. Do not click any links or open attachments unless you recognize the sender and know the content is safe.

Courtney,

We boxed and shipped the alternator components in the disassembled state back to you via UPS Tracking 1Z3547E20278665170.

Here is what we found during the exam on 10/22/19:

Attendees: Anna Williams – FAA, Birmingham FSDO Inspector
Les Doud – Hartzell ASI
Corey Broussard – Hartzell Engine Tech Alternator Product Engineer
Kris Jones – Hartzell Engine Tech Warranty Technician/QA

Alternator P/N: DOFF10300BR (R indicates factory Rebuilt)
S/N: H-O100492 (2014 date code)
28V/60A Ford unit

1. The shipping box was received in a damaged condition with one side torn open and the majority of bubble wrap protecting the alternator was deflated.
2. The fan and pulley had impact damage to one side with no indication of rotational damage suggesting impact after rotation had stopped. This damage was consistent with photos of the alternator before shipping so unlikely due to shipping damage. The fan fins were bent but none appeared to be touching the housing.
3. The pulley groove had normal wear with no indication of excessive belt slippage.
4. A small piece of old, oil-soaked foreign debris that appeared to be a piece of wire insulation fell out of the alternator during handling on the bench. The debris material is not something used in construction of the alternator.
5. The Field terminal post was loose. This terminal is loosened to remove the wire terminal ring and may not have been retightened afterward. There was no apparent damage to the post and internal contacts showed no signs of arcing or damage indicating it was loose while installed and operating.
6. The field coil showed internal resistance when continuity checked from the slip rings while still installed; the coil circuit was intact and not broken/open
7. The alternator would still not rotate after removal of the damaged pulley and fan.
8. The front housing was cracked and deformed adjacent to one supporting leg causing the forward bearing housing to move off-axis.
9. Once the rotor was removed, the field coil resistance was measured to be 12.1 ohms vs. spec of 11.5-12.5.

10. The brushes and slip ring were in good condition with no unusual wear.
11. The field coil retention winding tape had debonded in what appeared to be two areas.
There were small bits of tape residue distributed around the ID of the stator ring indicating some tape had been exposed to the rotating gap between the rotor poles and stator ring. However, there was no evidence this impeded rotation in any way.
12. There was some corrosion on the shaft under the retention collar.
13. The drive key was present, intact and appeared undamaged with no clear signature indicating impact during rotation.
14. The front bearing spun freely with no binding or harshness.
15. There was one area on the ID of the stator ring that appeared to have some light contact damage with the field pole shoes. The damage signature indicated contact after rotation stopped.
16. There was what appeared to be light contact damage on two field pole shoes that correspond to the damage on the stator ring.
17. An exemplar front case/housing was installed on the alternator for functional testing. With the serviceable front case/housing, the rotor spun freely by hand force. A new fan and pulley were installed and the alternator was run on the ATP bench. The alternator met factory specifications (test results attached).
18. Further disassembly of the alternator for inspection of the stator coils and diodes was deemed unnecessary.

Alternator Conclusions:

1. The damage to the pulley and cooling fins were caused by impact after rotation had stopped.
2. Impact damage to the front housing caused the front bearing to move off-axis and rotor group to come into contact with the stator ring, thus causing binding and inability to rotate.
3. The damaged front housing was replaced with an exemplar unit and the alternator passed the Acceptance Test Procedure for a new/rebuilt alternator
4. There were no discrepancies noted that would prevent or degrade normal operation, all damage was due to high impact force.

<u>Regulator</u>	Zeftronics	P/N R25400 S/N Z05100
-------------------------	------------	--------------------------

1. No examination or testing was conducted on this alternator control unit.

Misc. Wiring

1. Some aircraft wiring was shipped with the alternator and regulator. None of the wires had an identification label or other means of identification. The wiring included the aircraft-side connector and harness for the alternator control unit as well as two misc. pieces of wiring.
2. The wiring from the alternator control unit appeared old with some areas of insulation

cracking and exposing wires.

3. The aircraft-side alternator control unit connector pin sockets were loose with no apparent sealing or strain relief on the backshell.
4. The two wires that had crimp splices had good continuity even when pulled and manipulated.
5. There were several wires that had worn/broken insulation that exposed wires; it could not be determined if those areas were damaged by chaffing or impact damage.

Les Doud

Air Safety Investigator

Hartzell Propeller / Hartzell Engine Technologies

Office: [REDACTED]

Mobile: [REDACTED]
[REDACTED]

This electronic communication, including attachments, may contain information that is confidential and protected by the attorney-client, work product or other privileges and constitutes non-public information intended to be conveyed only to the designated recipient(s). This electronic communication, including attachments, is also covered by the Electronic Communications Privacy Act, 18 U.S.C. sections 2510-2521. If you are not the intended recipient, an employee or agent of intended recipient who is responsible for delivering it to the intended recipient, or if you believe that you have received this communication in error, please notify the sender immediately by return e-mail and promptly delete this e-mail, including attachments, without reading or saving them in any manner. The unauthorized use, dissemination, distribution or reproduction of this e-mail, including attachments, is strictly prohibited and may be unlawful. Receipt by anyone other than the intended recipient(s) is not a waiver of the attorney-client, work product or other privilege.