FAA
Aviation Safety

SPECIAL AIRWORTHINESS INFORMATION BULLETIN

SAIB: CE-17-05
SUBJ: Electrical Power/Electrical Power System Wiring **Date:** December 16, 2016

This is information only. Recommendations aren't mandatory.

Introduction

This Special Airworthiness Information Bulletin (SAIB) alerts you, owners and operators of certain **Piper Aircraft, Inc. (Piper) Models PA-31T, PA-31T1, PA-31T2, PA-31T3, and PA-31P-350** airplanes of an airworthiness concern, specifically at the floor mounted circuit breaker panel (CB) area between the pilot and co-pilot. This SAIB also provides information on wiring conditions that could lead to chafing, thermal stress, or arcing in the area directly below the floor circuit breaker panel. Finally, this SAIB recommends best practices for securing high electric current wires in the referenced Piper airplane models.

Our reviews are ongoing, however at this time, this airworthiness concern has not been determined to be an unsafe condition that would warrant airworthiness (AD) action under Title 14 of the Code of Federal Aviation Regulations (14 CFR) part 39. Currently, the NTSB is investigating an accident involving a PA-31T where the pilot reported smoke in the cockpit and subsequently sustained an in-flight breakup and collision with tree-covered terrain near Arcata/Eureka Airport, McKinleyville, California. Evidence of thermal damage was present in the forward section of the fuselage.[1]

Background

During inspections of multiple Piper Model PA-31T airplanes, several airplanes showed unacceptable wire separation from hydraulic lines and /or adjacent structure below the floor-mounted main power distribution CB Panel. The inspections also showed early signs of chafing, which can lead to thermal stress and arcing in an area where flammable liquids are routed. These conditions could sustain an uncontrollable fire in an inaccessible area below the pressurized deck. Photos of the area are shown in the following figures.

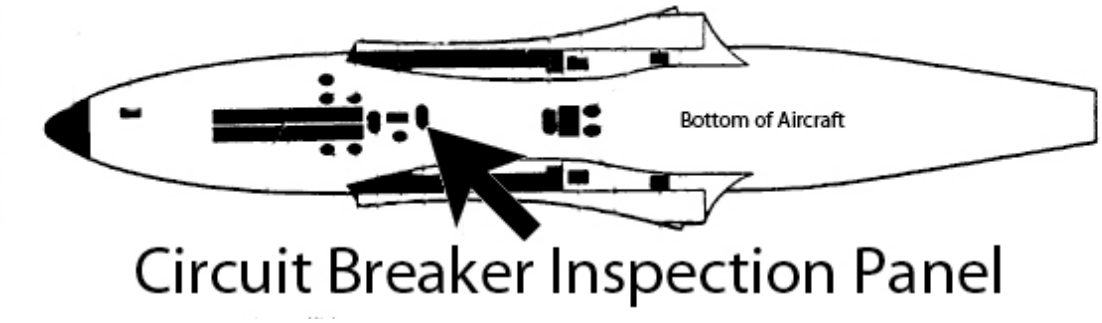

Figure 1 – Location of Circuit Break Inspection Panel

[1] Further information regarding the ongoing NTSB investigation WPR16FA153 can be found at http://www.ntsb.gov/_layouts/ntsb.aviation/brief.aspx?ev_id=20160729X31455

Figure 2 – Example of Floor Mounted CB Panel – Interior (1981 and later production)

Figure 3 – Floor Mounted CB Panel – Interior (Typical of pre-1981 production)

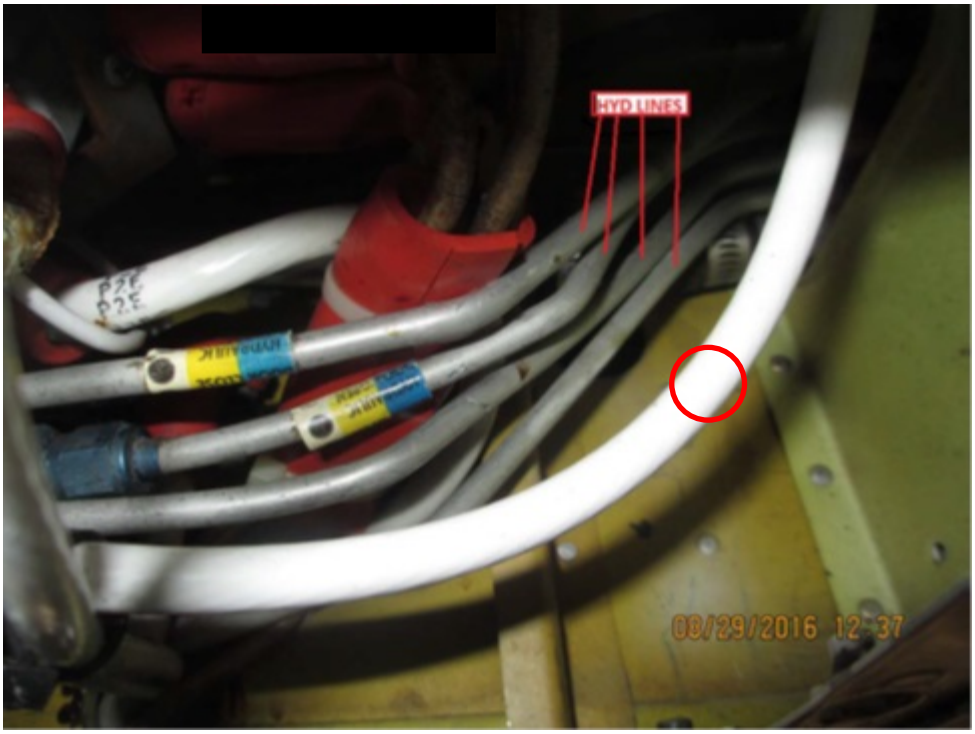

Figure 4 – View of the Hydraulic Lines in close proximity with electrical wires

Figure 5 – View of the Area with inspection panel removed

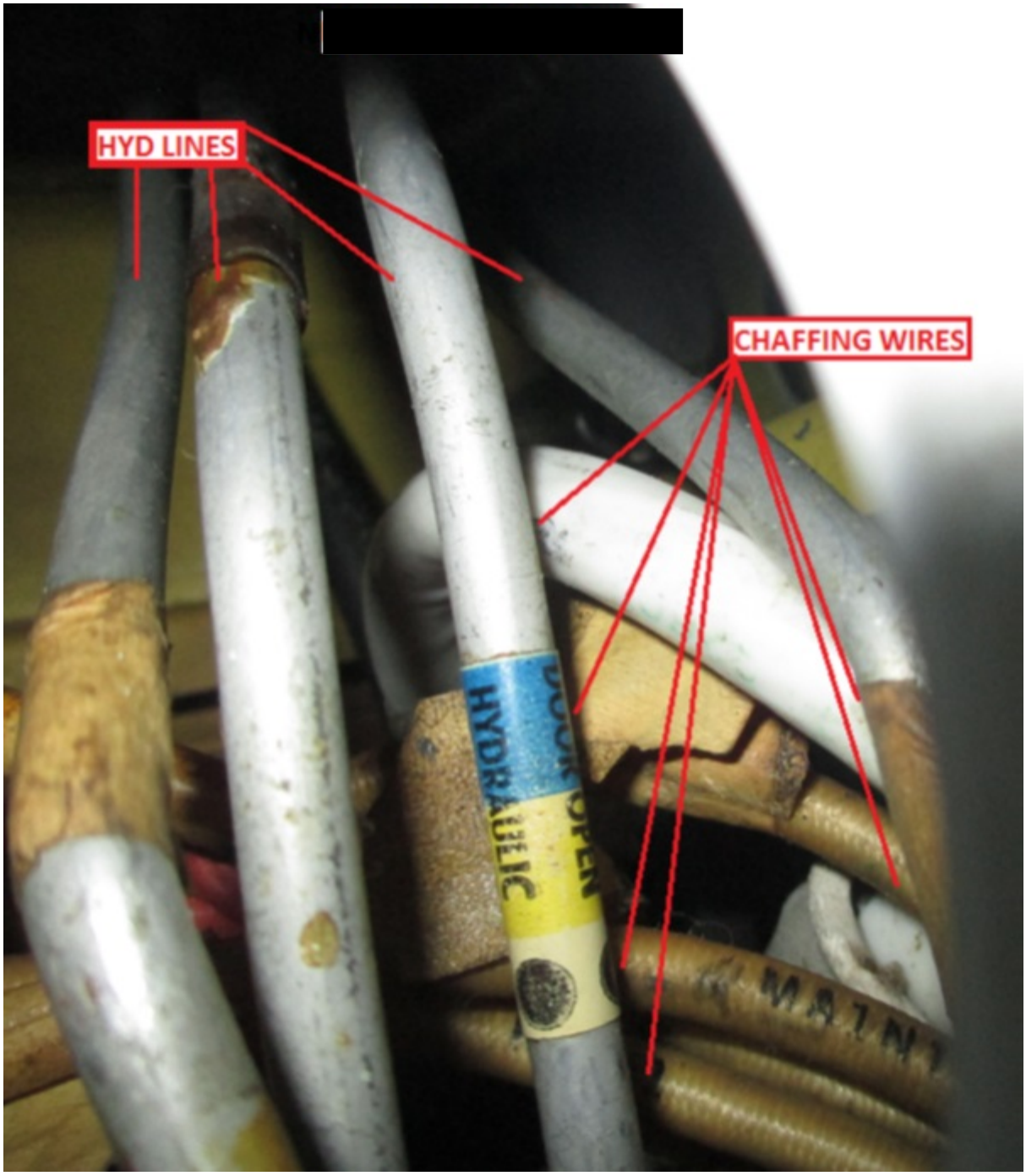

Figure 6 – Chaffing wires on hydraulic lines

The intent of this SAIB is to identify and recommend action to correct any wiring conditions that could lead to arcing, shorting, or other damage to the floor-mounted circuit breaker panel and associated wiring, which is located directly below the circuit breaker panel. In addition, the FAA is requesting to receive details and photographs of aircraft with these conditions present.

Recommendations

The FAA recommends the following:

- Inspections of the area shown in Figure 5, a mirror, a suitable light source or other equipment (small cameras, borescopes, magnification, etc.) capable of providing equal or better resolution.
- Inspections of the condition of all wiring.
- Repair or replacement of any wires with chafing, burning, breaks in insulation, corrosion, or any other apparent damage.
- Inspections for loose, corroded or broken terminals and repair or replacement on condition.
- A functional test on any electrical systems that were disturbed during any inspection.
- Reroute or rework as necessary to minimize the likelihood of chafing contact between adjacent components such as fluid carrying lines and airframe structure.
- Ensure proper hydraulic line and wire clearance is maintained. Use AC 43.13B – *Acceptable Methods, Techniques and Practices – Aircraft Inspection and Repair* as guidance.

The FAA recommends doing this inspection at the next scheduled maintenance visit and thereafter during annual airplane inspections.

Excerpt from AC 43.13-1B

"11-126. FLAMMABLE FLUIDS AND GASES.

An arcing fault between an electrical wire and a metallic flammable fluid line may puncture the line and result in a fire. Every effort must be made to avoid this hazard by physical separation of the wire from lines and equipment containing oxygen, oil, fuel, hydraulic fluid, or alcohol. Wiring must be routed above these lines and equipment with a minimum separation of 6 inches or more whenever possible. When such an arrangement is not practicable, wiring must be routed so that it does not run parallel to the fluid lines. A minimum of 2 inches must be maintained between wiring and such lines and equipment, except when the wiring is positively clamped to maintain at least 1/2-inch separation, or when it must be connected directly to the fluid-carrying equipment. Install clamps as shown in figure 11-10. These clamps should not be used as a means of supporting the wire bundle. Additional clamps should be installed to support the wire bundle and the clamps fastened to the same structure used to support the fluid line(s) to prevent relative motion."

Request for Inspection Results

If you find any conditions where wires are in direct contact with hydraulic fluid lines, aircraft structure and/or any wiring condition that could lead to arcing, shorting, or other damage to the floor mounted circuit breaker panel, please send details (registration number of the aircraft, total hours, inspection results, etc) and photographs. Please send this information to Bryan Long, Aerospace Engineer, Atlanta ACO, 1701 Columbia Ave., College Park, GA 30337; phone: (404) 474-5578; email: Bryan.Long@faa.gov. Email is the preferred method of submission.

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burden to the FAA at: 800 Independence Ave. SW, Washington, DC 20591, Attn: Information Collection Clearance Officer, ASP-110.

For Further Information Contact

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