



AVIATION



HIGHWAY



MARINE



RAILROAD



PIPELINE

Stay in the Groove: Check Ignition Switch/Key Integrity

Worn surfaces on keys and internal switch components can result in switch positioning errors and unintended engine startup

The problem

- Over time, key-type ignition switches and associated keys can become worn such that it is possible to remove the key from a switch position other than the OFF position.
- A loss of ignition switch-to-key integrity can result in an ungrounded magneto, which could lead to unintended engine startup during hand movement of the propeller and possible injuries or fatalities if anyone is near or in the path of the propeller at the time.

Related accidents

The National Transportation Safety Board (NTSB) has investigated the following fatal accident and non-fatal incidents involving this issue:

- A private pilot was fatally injured when he was struck by the propeller of a Cessna 182P during a preflight inspection; the ignition key was in his pocket at the time of the accident. Postaccident examination found the ignition switch slightly rotated clockwise from the OFF position. **The key's removal from the switch at this position allowed the engine to momentarily start because the right magneto wasn't grounded. Further examination revealed that worn surfaces on the ignition key and switch cylinder allowed removal of the key from the ignition switch when positioned at any of the switch's five positions.** ([ERA18LA199](#))
- During a preflight inspection before a flight lesson on a cold morning, an instructor chose to turn the propeller to facilitate engine start while the student pilot pushed in the primer. The instructor told the student to check that the magneto and master switches were in the OFF position, which the student confirmed. On the propeller's second turn, the engine started and ran for about 5 seconds. Although the instructor was initially clear of the propeller, he slipped and his leg contacted the turning propeller, resulting in serious injury. **The investigation found that the key wasn't in the ignition switch when the engine started. Further examination revealed that the key could be removed while the ignition switch was in the left magneto position.** ([CHI87DER02](#))
- The pilot of a Beech E33 reported that he shut off the battery and alternator switches, moved the ignition switch to the OFF position, removed the key, and exited the aircraft. Subsequently, the engine started, and the airplane travelled across the ramp and struck another airplane. A **teardown of the switch revealed that the contacts were burned and the lock cylinder chamber was worn such that the key could be removed with the ignition switch in the right**

magneto position. A review of the airplane's maintenance records found no evidence of compliance with [Airworthiness Directive \(AD\) 76-07-12](#), which required repetitive inspection of the Bendix ignition switch, as described in [Service Bulletin \(SB\) No. 583](#), to detect possible malfunction. (NYC82FNA13)

What can pilots and mechanics do?

- **Pilots and mechanics should always assume that a magneto is in an ungrounded condition and proceed with caution when around any propeller.**
- **Pilots, be sure to verify the integrity of your ignition switch-to-key connection to ensure that the key can only be removed from the ignition switch in the OFF position; if the key can be removed at any position other than the OFF position, repair or replace the switch.**
- **Pilots should comply with service bulletins and airworthiness directives concerning the integrity of the aircraft's ignition switch. Although there may be SBs and ADs related to the ignition switch for your airplane, they may not address this safety issue.**
- **Mechanics should maintain vigilance when inspecting the integrity of the ignition switch to key connection and repair or replace it, if needed.**
- **Mechanics should make owners aware of this potential safety issue and provide options to aircraft owners when needed.**
- **Pilots and mechanics need to be aware that aging aircraft can be more susceptible to worn ignition switches and additional vigilance may be necessary to detect and resolve this safety issue.**

Interested in more information?

- **Bendix SB No. 583**, dated April 1976, provides inspection procedures, as well as procedures for repair or replacement of faulty Bendix ignition switches.
- **AD 76-07-12**, effective August 1977, requires inspection of Bendix switches identified in SB No. 583 every 100 hours.
- **Teledyne Continental Mandatory SB No. 636**, dated August 1992, provides inspection procedures and promotes continual switch integrity for all key-type ignition switches and keys. [Cessna Service Bulletin # SEB92-29](#), dated October 9, 1992, transmitted Teledyne's SB to owners of airplanes with applicable switches installed and recommended immediate inspection before the next flight.

A companion video to this safety alert can be accessed from the [Safety Alerts](#) web page.

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