



**U.S. Department
of Transportation
Federal Aviation
Administration**

SAFO

Safety Alert for Operators

SAFO 18001
DATE: 12/19/17

Flight Standards Service
Washington, DC

http://www.faa.gov/other_visit/aviation_industry/airline_operators/airline_safety/safo

A SAFO contains important safety information and may include recommended action. SAFO content should be especially valuable to air carriers in meeting their statutory duty to provide service with the highest possible degree of safety in the public interest. Besides the specific action recommended in a SAFO, an alternative action may be as effective in addressing the safety issue named in the SAFO.

Subject: Textron King Air 90-Series Airplane Boost Pump Failure and CROSSFEED Operational Information

Purpose: This SAFO provides safety information to Textron King Air 90-Series airplane owners, operators, and training departments/centers on the possibility of dual engine failure due to improper fuel management during CROSSFEED operation.

Background: The Federal Aviation Administration (FAA) noted in Safety Recommendation (SR) 16.127 that a BOOST PUMP failure in King Air 90-series airplanes leading to automatic CROSSFEED operation could result in dual engine failure if not managed properly by the pilot.

Discussion: With a BOOST PUMP failure and the CROSSFEED switch CLOSED, the High Pressure (HP) Fuel Pump on the side with the failed BOOST PUMP is able to suction-feed fuel from its Nacelle Fuel Tank and both engines continue to operate. During normal operation, the CROSSFEED switch is in the AUTO position and will automatically OPEN in the event of BOOST PUMP failure.

If the BOOST PUMP fails, the emergency procedure in Section 3 of the Aircraft Flight Manual directs the pilot to momentarily close the CROSSFEED valve to determine which pump failed and then open it again, turning off the failed BOOST PUMP. The Emergency Checklist further states "If continued flight with the CROSSFEED closed is required", CLOSE the CROSSFEED and monitor for power fluctuations.

With a BOOST PUMP failure and CROSSFEED OPEN, fuel consumption is double the normal amount from the side with the operating BOOST PUMP. If improper fuel planning allows fuel to be depleted on that side, both engines will most likely flameout while usable fuel remains in the tanks on the side of the inoperative BOOST PUMP.

If that happens, options become limited. If the CROSSFEED valve is subsequently closed manually, the HP Fuel Pump on the side of the inoperative BOOST PUMP may still suction-feed, but if CROSSFEED remains OPEN, the HP fuel pump may instead only suction air through the empty CROSSFEED line. There is no engineering data to determine either way. As such, there is clear risk that a simple BOOST PUMP failure, if not managed properly, could result in dual engine failure.

Recommended Action: During training and operation, King Air 90-series owners, operators, and training departments/centers should emphasize the following:

- In the event of BOOST PUMP failure, if the pilot chooses to continue flight with the CROSSFEED valve OPEN, adequate fuel quantity should be verified on the side with the operating BOOST PUMP considering fuel burn on that side will be double with the CROSSFEED OPEN.
- In the event of BOOST PUMP failure, if CROSSFEED remains OPEN and fuel is depleted on the side with the operating boost pump, a DUAL engine Flameout will most likely occur.
- In the event of BOOST PUMP failure, the CROSSFEED valve must be CLOSED for the HP Fuel Pump to scavenge-feed fuel from the side of the inoperative BOOST PUMP.
- In the event of BOOST PUMP failure, proper fuel monitoring and management is crucial to avoid fuel starvation leading to engine failure and/or fuel imbalance beyond limitations.

Contact: Questions or comments regarding this SAFO should be directed to the Aircraft Evaluation Division's Small Aircraft branch at (816) 329-3233