

**Aviation Safety Investigation Report
199701563**

**Saab Aircraft AB
340**

16 May 1997

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NOTE: All air safety occurrences reported to the ATSB are categorised and recorded. For a detailed explanation on Category definitions please refer to the ATSB website at www.atsb.gov.au.

The Bureau did not conduct an on scene investigation of this occurrence. The information presented below was obtained from information supplied to the Bureau.

Occurrence Number: 199701563 **Occurrence Type:** Incident
Location: Bindook, VOR
State: NSW **Inv Category:** 4
Date: Friday 16 May 1997
Time: 0742 hours **Time Zone:** EST
Highest Injury Level: None

Aircraft Manufacturer: Saab Aircraft AB
Aircraft Model: SF-340B
Aircraft Registration: VH-OLM **Serial Number:** 205
Type of Operation: Air Transport Domestic Low Capacity Passenger Scheduled
Damage to Aircraft: Minor
Departure Point: Dubbo NSW
Departure Time:
Destination: Sydney NSW

Crew Details:

Role	Class of Licence	Hours on	
		Type	Hours Total
Co-Pilot/1st Officer	ATPL	450.0	7200
Pilot-In-Command	ATPL	5000.0	8700

Approved for Release: Friday, September 19, 1997

A significant proportion of this report is based on information provided by the operator.

Whilst approaching Bindook at FL180, on a scheduled air transport flight from Dubbo to Sydney, the crew of a SAAB 340B observed the right engine air intake caution light illuminate. The abnormal procedures checklist for this condition was carried out and the caution light extinguished.

A short time later a strong burning smell became evident on the flight deck. However, there were no associated warning indications. Discussions with the flight attendant (FA) revealed that the smell was isolated to the cockpit, indicating that the burning smell may have been associated with the right air conditioning system, which supplied conditioned air to the cockpit. The 'Air Conditioning Smoke' emergency checklist was not utilised. The right engine bleed air valve was closed in an attempt to further diagnose the problem. Several minutes later the bleed air valve was re-opened. The burning smell in the cockpit intensified. Reports from the FA continued to indicate no noticeable smell in the cabin.

The co-pilot then looked out the right, side window and reported to the pilot in command (PIC) that there was a fire in the right engine. There were no fire warning indications in the cockpit. The engine fire checklist was carried out, the right engine fire bottle was discharged, and the engine shut down. An inflight emergency was declared to Air Traffic Control, who initiated a distress phase and expedited the entry of the aircraft to Sydney.

All three crewmembers then prepared for an emergency landing at Sydney. The PIC advised the FA that the landing would be normal, and would be followed by a normal disembarkation on an adjacent taxiway. With local emergency services in attendance, the aircraft subsequently landed safely on runway 07 and was stopped on taxiway G3. All occupants disembarked normally through the main cabin door and were transported to the terminal.

An engineering examination revealed that the right engine lower intake anti-ice duct had short-circuited and was excessively burnt around the inner-upper lip at the particle separator mounting flange. The damage was consistent with the duct material smouldering for some time. Based on the recollection of the co-pilot, there had been no visible flames but rather a very bright red/orange glow inside the intake. The lower duct, and the particle separator, were replaced with serviceable items and the aircraft returned to service.

The engine intake anti-ice system consists of electrically heated intake ducts. The heater elements are made of a copper alloy material sprayed onto a glass fibre mat and covered with an outer glass mat. The mat is bonded to the metal inlet, making them an integral unit. Should the duct intake surface suffer damage which allows moisture to penetrate to the heater elements, short-circuits can occur. Although required as part of the engine fire emergency checklist, the activation of the fire extinguisher has no effect on the engine intake duct. The intake duct anti-ice remote circuit breaker is designed to trip as a result of a short-circuit. In this case the circuit-breaker failed to trip.

The aircraft manufacturer has been aware of short-circuiting intake duct heaters in aircraft equipped with this particular type of intake, and had developed a specific checklist titled 'Intake Sparks' to cover this particular situation. At the time of this occurrence the checklist was being distributed as an amendment to the Aircraft Operations Manual, but had not been available to the flight crew.

Local safety action.

As a result of this occurrence the company has introduced improvements to flight operations training and procedures, designed to assist flight crews in the recognition and handling of intake duct problems. In addition, both flight and cabin crew emergency disembarkation procedures are being reviewed.

Other safety actions include increasing the frequency of engineering inspections and resurfacing of duct heater elements, as well as streamlining procedures to ensure new information from the aircraft manufacturer is distributed to all crews without delay.
