The wrong part

It looks the same, costs less, and won't take three days to order in. Why not use it?

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A SKYFOX aircraft recently ended its flight upside down in a swamp shortly after take-off when the pilot was presented with a sudden engine failure. The maintenance organisation that recovered the aircraft advised that the engine failure occurred because the internal lining of an Aeroduct SCEET air intake hose had collapsed and blocked the engine intake air flow.

This was the most recent in a series of incidents involving engine failures in Skyfox or Gazelle aircraft caused by the use of Aeroduct SCEET or SCAT hoses as an engine air intake duct.

The manufacturer of Aeroduct hoses, Thermoid HRD Industries, does not approve SCEET and SCAT hoses for use in negative pressure applications. Should either a SCAT or a SCEET hose lose the bond between the outer hose material and the steel helix support wire, the hose material can be sucked in, effectively cutting off the air flow. SCEET hose is particularly dangerous in a negative pressure environment. SCEET hose differs from a SCAT hose in having an inner liner which may improve air flow, but presents another opportunity for a loss of material to wire bonding to result in the collapse of the inner liner and a blockage of air flow.

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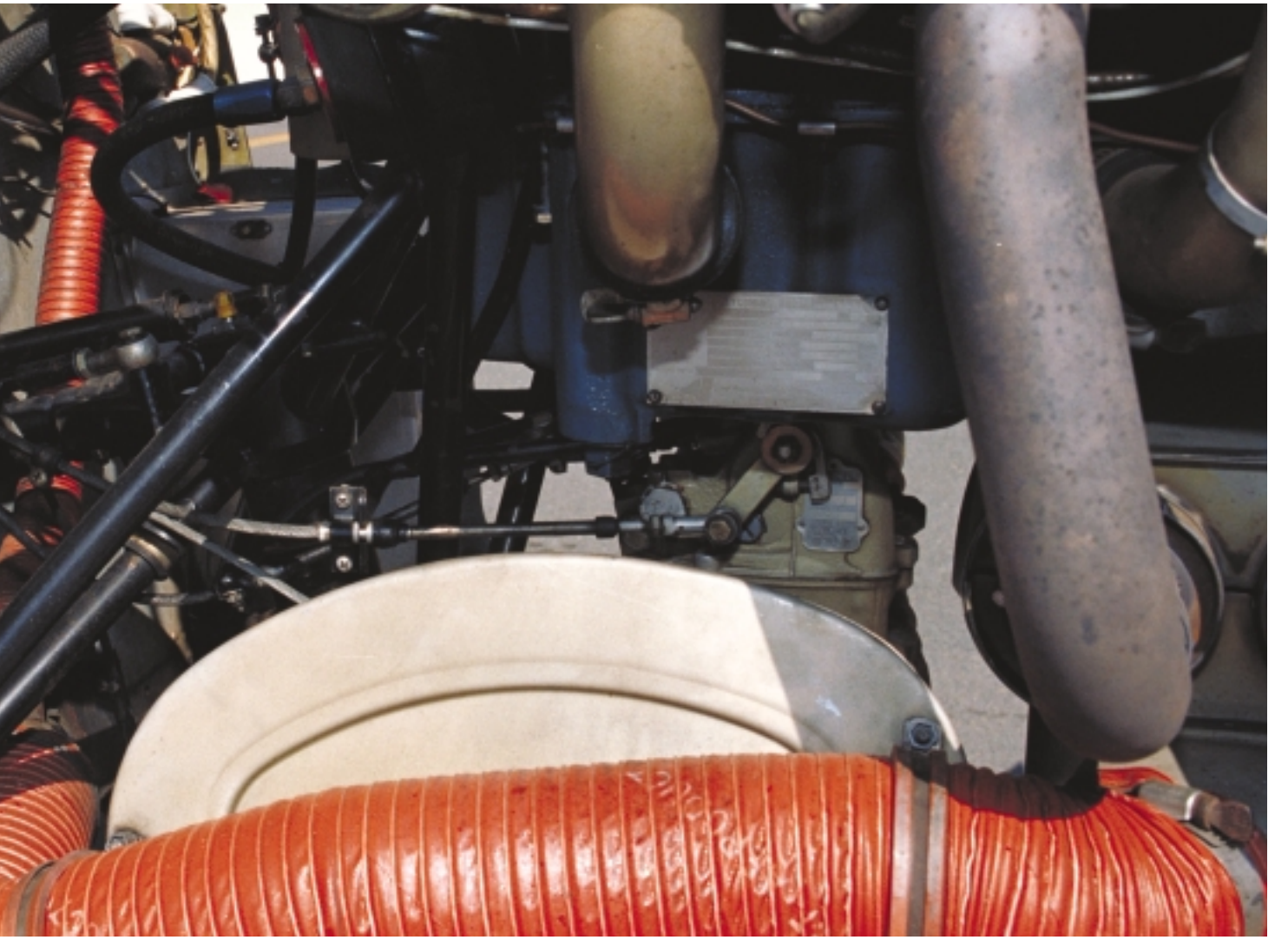
While the Skyfox intake hose failures have been addressed by CASA, the reported use of a SCAT or SCEET hose as a replacement for the air intake hose detailed in the original equipment manufacturer's (OEM) part catalogue remains a concern. Civil Aviation Regulations permit an aircraft component to be replaced with an identical component. However, just because two parts look the same doesn't mean they are identical.

Piston engine air intake ducting is a classic example. In comparison to the OEM hose, a similar looking SCAT or SCEET hose is dirt cheap. Not only that, a length of the right diameter may be hanging up at the back of the hangar store.

At first glance the cheaper part appears to be the better option. However, if you allow for the financial and human costs incurred by a typical in-flight engine failure – an event which is much more likely if an unapproved hose is fitted – the cheap part starts to look positively unaffordable.

An OEM air intake hose is manufactured and



approved to a specification satisfying aircraft engine induction type certification requirements. For example, the Piper specification for flexible intake ducts covers six pages. Unless a SCAT or SCEET hose meets those specifications it is not identical to the Piper item. To be an acceptable alternative to the OEM flexible air intake duct, the SCAT or SCEET hose must have been approved as an alternative through CAR 36, an APMA, a PMA, or the applicable aircraft OEM.

The same requirement applies to the replacement of any OEM flexible duct or hose whether it is for cooling air or the cabin heater system.

If it has an OEM part number, it can only be replaced with an identical component or an approved alternative. The aircraft system served by the hose may be considered not to be essential for safety of flight, but CAR 42W still applies.

However, using the correct part is only one issue. Improper installation can undo all the benefits of installing an approved part.

Cooling air hoses and ducts are there for a reason. There is no point fitting a new cooling air hose if the hose end is crimped by over zealous tightening of the end clamp. Crimping the hose end can reduce or even block the cooling airflow. If a cooling air hose connects to a baffle that directs the cooling air around a component, routing adjacent hoses or leads between the baffle and the component defeats the purpose of having cooling air supplied.

Should premature failure of that component occur, the cause might well be related to overheating. A bench strip would not disclose the real reason for the failure. The aircraft owner or operator may be lucky and get warranty, but someone eventually pays for a simple case of slack maintenance. (Of concern, the replacement component may well suffer the same fate.)

Everyone who owns or operates aircraft should be aware of the risks of using an unapproved part or installing a part incorrectly. Owners of Skyfox and Skyfox Gazelle aircraft should be particularly vigilant about the flexible hoses installed in their aircraft. A spate of Aeroduct related engine failures in Pilatus Britten-Norman BN-2 Islanders five years ago would suggest that owners of those aircraft should take similar precautions.

An Airworthiness Directive (AD) specifically dealing with SCAT/SCEET hoses in Skyfox aircraft became effective on 12 July 2001, and details the steps required to ensure that engine air intake hoses on Skyfox aircraft are safe and efficient. The AD is available at www.casa.gov.au

Unapproved parts are a major issue for aircraft owners and it pays to confirm with your maintenance organisation that a non OEM component is approved before it is installed in your aircraft.

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