SERIOUS INCIDENT

Aircraft Type and Registration:	Piper PA-34-220T Seneca V, G-OXFF
No & Type of Engines:	2 Continental Motors Corp LTSIO-360-RB piston engines
Year of Manufacture:	2013 (Serial no: 3449485)
Date & Time (UTC):	2 November 2018 at 0830 hrs
Location:	Oxford Airport, Kidlington
Type of Flight:	Training
Persons on Board:	Crew - 2 Passengers - None
Injuries:	Crew - None Passengers - N/A
Nature of Damage:	Melted and parted rudder cable; scorch witness mark on emergency battery wiring loom
Commander's Licence:	Commercial Pilot's Licence
Commander's Age:	33 years
Commander's Flying Experience:	3,800 hours (of which 1,515 were on type) Last 90 days - 137 hours Last 28 days - 85 hours
Information Source:	Aircraft Accident Report Form submitted by the pilot and inquiries made by the AAIB

Synopsis

The aircraft was about to enter the runway for takeoff when the instructor became concerned about the feel of the left rudder pedal. He aborted the flight and taxied the aircraft back to the hangar. The subsequent engineering inspection found the left rudder cable had parted, with evidence that it had melted through due to chafing against the standby battery cable. Safety actions have been taken by the Civil Aviation Authority and the manufacturer has issued a mandatory Service Bulletin (No 1337) to reroute the emergency power wiring to give more clearance from the rudder cables.

History of the flight

The aircraft had been collected from the hangar for an instrument rating examination flight by a student and instructor. The 'A' check, start up and subsequent preparatory checks proceeded normally. However, after engine start the emergency battery circuit breaker tripped. It was reset, the battery voltage was checked and found to be normal and it did not trip again. The taxi and power checks were carried out satisfactorily. ATC cleared the aircraft to enter the runway and backtrack to the holding point and this was carried out under the control of the instructor. However, during the taxi he noticed that the left rudder pedal felt soft and was "too easy to move" with no resistance. The right rudder pedal felt

normal by comparison. He brought the aircraft to a halt and informed ATC. He asked the student to cross-check, who confirmed that the rudder pedals did not feel normal. They opened the cockpit door to observe the rudder movement. On pressing the right pedal, the rudder moved correctly to the right but when the left pedal was pressed, there was no movement. The instructor aborted the flight and taxied the aircraft back to the hangar for inspection.

Engineering investigation

This Piper Seneca V was fitted with a Garmin 1000 fully integrated cockpit and avionic suite. The system is reliant on electrical power and has a standby battery to keep the system running in the unlikely event of a twin-generator and main battery failure.

Inspection of the aircraft revealed the right rudder cable had chafed against the standby battery wiring and shorted to earth. The heat generated by the electrical short had melted through the steel-braided rudder cable. Figures 1 and 2 show the damage to the rudder control cable and standby battery wiring.

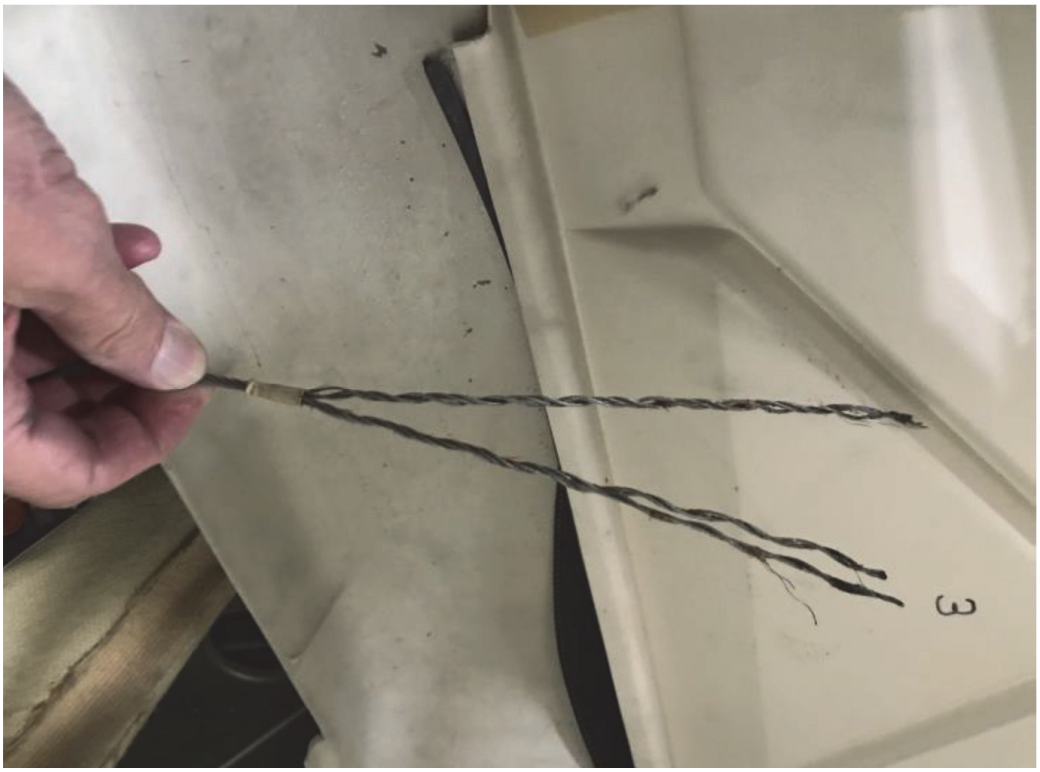

Figure 1

Damage to the rudder control cable

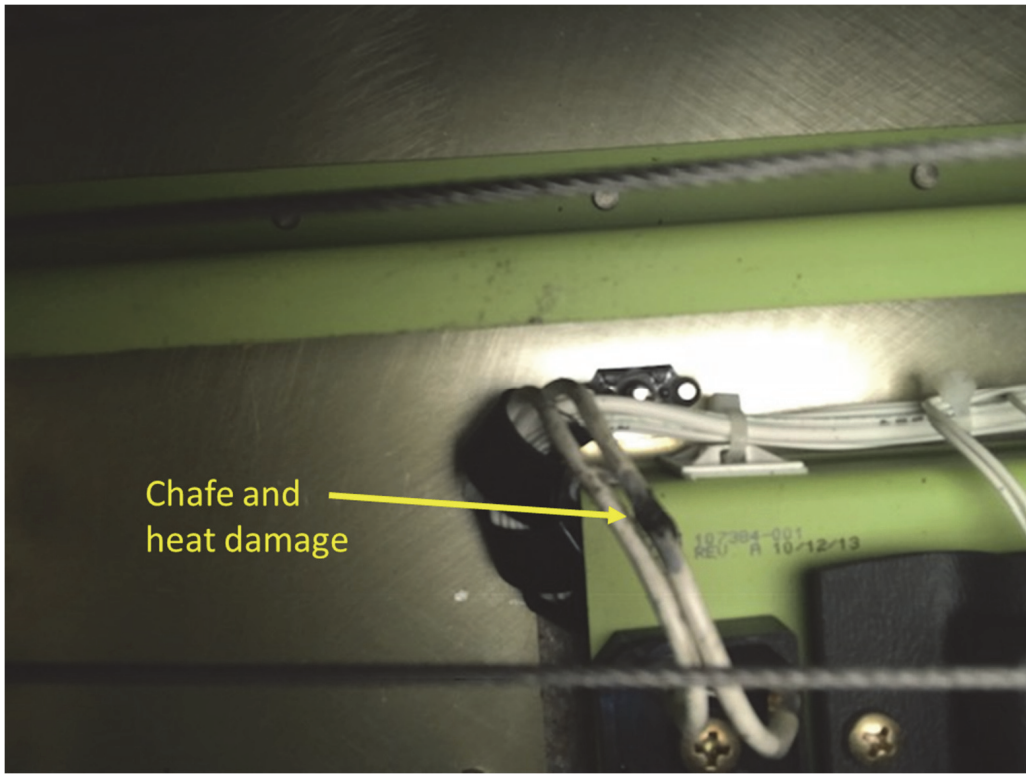

Figure 2

Chafe on the standby battery wiring

Safety action

This potentially serious risk to airworthiness was brought to the attention of the manufacturer, the CAA, EASA and the FAA. The CAA took immediate steps to inform owners and operators of similarly configured Piper Seneca V aircraft.

The manufacturer has subsequently issued a mandatory Service Bulletin (No 1337) which gives instructions to reroute a portion of the emergency power wiring to improve the clearance from the rudder control cables.