ACCIDENT

Aircraft Type and Registration:	Rans S6-ES Coyote, G-CCJN	
No & Type of Engines:	1 Rotax 582-48 piston engine	
Year of Manufacture:	2005 (Serial no: PFA 204-13575)	
Date & Time (UTC):	18 October 2020 at 1215 hrs	
Location:	500 m east of Insch airfield, Aberdeenshire	
Type of Flight:	Private	
Persons on Board:	Crew - 1	Passengers - 1
Injuries:	Crew - None	Passengers - None
Nature of Damage:	Collapsed nose landing gear, damaged right landing gear leg and dented engine cowling	
Commander's Licence:	Light Aircraft Pilot's Licence	
Commander's Age:	67 years	
Commander's Flying Experience:	702 hours (of which 1 was on type) Last 90 days - 40 hours Last 28 days - 15 hours	
Information Source:	Aircraft Accident Report Form submitted by the pilot	

Synopsis

Shortly after takeoff the engine suddenly stopped. The pilot, unable to find a suitable landing site ahead, turned back and carried out a forced landing in a field during which the nose gear collapsed. The engine stoppage was likely to have been caused by a piece of material in the fuel line between the fuel tank and the tank selector valve.

History of the flight

The owner had recently removed the aircraft from storage and had a permit renewal inspection carried out. The LAA inspector advised the owner to replace the aircraft fuel lines and the fuel filter. This maintenance was carried out by the owner and a permit renewal check flight was then carried out.

With the check pilot in the right seat, and the owner in left, the engine was started with fuel from the left tank selected. An extended engine warm up and power check was conducted with no abnormalities identified.

The pilot reported that the takeoff and initial climb proceeded normally until approximately 180 ft agl when the engine stopped suddenly. He immediately lowered the nose to achieve a 60 mph glide and prepared for a forced landing. He assessed that there were no viable landing locations within 45° of his heading so decided to find a suitable one behind him.

He commenced a 180° turn and identified a suitable field. With limited time available, the pilot reported that he focused on the forced landing and did not attempt to change the fuel tank and a restart. On landing the nosewheel dug into waterlogged ground causing the leg to collapse. The aircraft came to rest in a tail high attitude and the occupants exited with no injuries.

Aircraft fuel system

The Rans S6-116 Coyote II is a high-wing, strut-braced aircraft with two side-by-side seats. G-CCJN had two fuel tanks mounted in the root of the wings (Figure 1). Each tank had a forward and rear outlet to allow fuel to be drawn throughout the pitch envelope. The outlet pipes ran down the rear fuselage structure and were combined at a 'Y' connector. The combined outlet pipes from each tank were connected to the fuel tank selector valve.

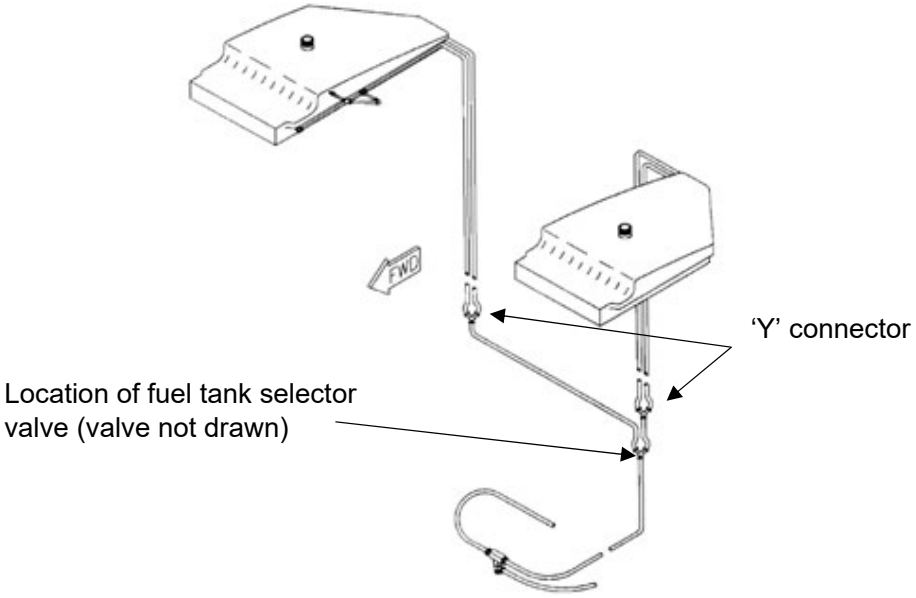

Figure 1

Rans S6 Coyote II fuel tank configuration
(Image from Rans S6ES Coyote II manual[1])

Aircraft examination by the owner

To facilitate the recovery of the aircraft from the field the fuel tanks were drained. The combined outlet of the left tank was disconnected but it was found that no fuel would flow from the pipe when the aircraft was in a nose high attitude, even though fuel was visible in the tank. When the aircraft was placed in a level attitude fuel was able to flow from the tank.

Examination of the fuel lines by the owner found a sliver of material within one of the pipes that ran from the combined left tank outlet to the fuel selector valve (Figure 2). It is likely that this obstruction caused the engine to stop in flight.

Footnote

[1] https://skycraft.ltd/acatalog/RANS-Manuals.html [accessed June 2021].

Figure 2

Sliver of material found in the fuel pipe between the left tank and engine (photograph reproduced with permission)

Comment by the AAIB

Although an extended engine ground run and power check was completed on the aircraft prior to the flight, carrying out an aircraft fuel flow assessment, such as that detailed in LAA Technical Leaflet TL 2.20– LAA[2] might have identified the restriction. TL 2.20 '*Carrying out a fuel flow check to a pumped fuel system*' provides guidance on ensuring that there is at least 125% of the maximum engine fuel flow through each tank outlet.

[2] LAA Technical Leaflets can be found here: http://www.lightaircraftassociation.co.uk/engineering/technical_leaflets.html [accessed June 2021]