



Air Accident Investigation Unit Ireland

FACTUAL REPORT

INCIDENT

**Cessna 150M, EI-HJX
Ballingen, Co. Wexford**

12 May 2023



An Roinn Iompair
Department of Transport

FINAL REPORT

Foreword

This safety investigation is exclusively of a technical nature and the Final Report reflects the determination of the AAIU regarding the circumstances of this occurrence and its probable causes.

In accordance with the provisions of Annex 13¹ to the Convention on International Civil Aviation, Regulation (EU) No 996/2010² and Statutory Instrument No. 460 of 2009³, safety investigations are in no case concerned with apportioning blame or liability. They are independent of, separate from and without prejudice to any judicial or administrative proceedings to apportion blame or liability. The sole objective of this safety investigation and Final Report is the prevention of accidents and incidents.

Accordingly, it is inappropriate that AAIU Reports should be used to assign fault or blame or determine liability, since neither the safety investigation nor the reporting process has been undertaken for that purpose.

Extracts from this Report may be published providing that the source is acknowledged, the material is accurately reproduced and that it is not used in a derogatory or misleading context.

¹ **Annex 13:** International Civil Aviation Organization (ICAO), Annex 13, Aircraft Accident and Incident Investigation.

² **Regulation (EU) No 996/2010** of the European Parliament and of the Council of 20 October 2010 on the investigation and prevention of accidents and incidents in civil aviation.

³ **Statutory Instrument (SI) No. 460 of 2009:** Air Navigation (Notification and Investigation of Accidents, Serious Incidents and Incidents) Regulations 2009.



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In accordance with Annex 13 to the Convention on International Civil Aviation, Regulation (EU) No 996/2010 and the provisions of SI No. 460 of 2009, the Chief Inspector of Air Accidents, on 12 May 2023, appointed Paul Farrell as the Investigator-in-Charge to carry out an Investigation into this Incident and prepare a Report.

Aircraft Type and Registration:	CESSNA 150M, EI-HJX	
No. and Type of Engines:	1 x Teledyne Continental Motors, O-200-A	
Aircraft Serial Number:	15076223	
Year of Manufacture:	1975	
Date and Time (UTC)⁴:	12 May 2023 @ 17:15 hrs	
Location:	Ballinglen, Co. Wexford, Ireland	
Type of Operation:	General Aviation	
Persons on Board:	Crew – 2	Passengers – Nil
Injuries:	Nil	
Nature of Damage:	Minor	
Commander's Licence:	European Union Commercial Pilot Licence (CPL), issued by the Irish Aviation Authority (IAA)	
Commander's Age:	53 years	
Commander's Flying Experience:	3,357 hours, of which 2,353 were on type	
Notification Source:	Aircraft Owner	
Information Source:	AAIU Report Form submitted by the Instructor AAIU Field Investigation	

⁴ **UTC:** Co-ordinated Universal Time. All times in this report are quoted in UTC unless otherwise stated; local time was UTC + 1 hour on the date of the accident.

SYNOPSIS

While flying at an altitude of approximately 2,500 feet, north-east of Gorey, Co. Wexford, with a student and instructor on board, the instructor observed hot engine oil flowing from the instrument panel of the Cessna 150M aircraft, and that the engine oil pressure gauge had no pressure indication. A precautionary landing was completed into an agricultural field. The occupants evacuated the aircraft unaided. Subsequently, it was identified that an unapproved repair had been carried out on the engine oil pressure gauge supply pipe, and that this repair had failed. There were no injuries or fire.

NOTIFICATION AND RESPONSE

The AAIU was notified of the event by the aircraft owner at approximately 17:35 hrs on the day of the occurrence. Two Inspectors of Air Accidents deployed to the site, arriving there at approximately 19:30 hrs, and an Investigation was commenced.

1. FACTUAL INFORMATION

1.1 History of the Flight/Occurrence

The aircraft, with an Instructor and a Student on board, departed Newcastle Airfield (EINC) in Co. Wicklow at 14:55 hrs and completed a touch and go at Waterford Airport (EIWF), at approximately 16:50 hrs. Following the touch and go at EIWF, the aircraft routed north to return to EINC.

The Investigation was informed that there were no abnormal indications until the aircraft entered an area north-east of Gorey, Co. Wexford, at an altitude of approximately 2,500 feet (ft). The Instructor stated that at this time a *'pungent engine smell'* was noticed and that the aircraft doors were unlatched to ventilate the aircraft. The Instructor said that moments later, as he was attempting to confirm that there was nothing wrong with the aircraft, hot oil started to flow from the instrument panel and the area at the Instructor's feet. The Instructor also noted at this time that the oil pressure gauge was indicating *'no pressure'*.

The Instructor informed the Investigation that he briefed the Student that it would be necessary to carry out a precautionary landing and that he was going to select one of a group of fields into which he would land. Having selected what was judged to be the best available field, the Instructor stated that he began his approach while completing the Emergency Landing memory items as well as briefing the Student.

The Instructor stated that a Mayday call was broadcast and that the field selected was located just to the west of Tara Hill near Gorey. The Instructor stated that the precautionary landing was completed without incident and that his familiarity with practice forced landing drills, from his instructional duties, was advantageous to him in dealing with this event⁵. He estimated that the time taken for both occupants to evacuate the aircraft, once it had come to a stop, was between five and ten seconds. There was no fire.

⁵ AAIU Report No. 2013-013 noted that *'practice forced landings should be conducted regularly and on an on-going basis so that, if it occurs for real, the pilot is adequately practiced and mentally prepared for such an eventuality. This is particularly so since forced landings can occur in difficult terrain and where small uneven fields are prevalent.'*



1.2 Injuries to Persons

No injuries were notified to the Investigation.

1.3 Damage to Aircraft

The aircraft was not damaged during the landing, and came to rest in an agricultural field, the surface of which was covered in long grass (**Photo No. 1**).



Photo No. 1: Position of EI-HJX following landing

The aircraft wheels made curved track marks (approximately 55 metres (m) in length) on the grass surface before the aircraft came to rest on a magnetic heading of approximately 350 degrees (**Photo No. 2**).



Photo No. 2: Curved ground track made by the aircraft wheels

When inspected in the field, the Investigation noted that the instrument panel was open and that oil had pooled on top of the aircraft's transponder unit (**Photo No. 3**).



Photo No. 3: Open instrument panel with oil pooled on transponder unit

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Examination of the area behind the instrument panel identified that a pipe supplying engine oil from the engine to the oil pressure gauge had fractured and allowed engine oil to discharge into the aircraft cockpit (**Photo No. 4**).

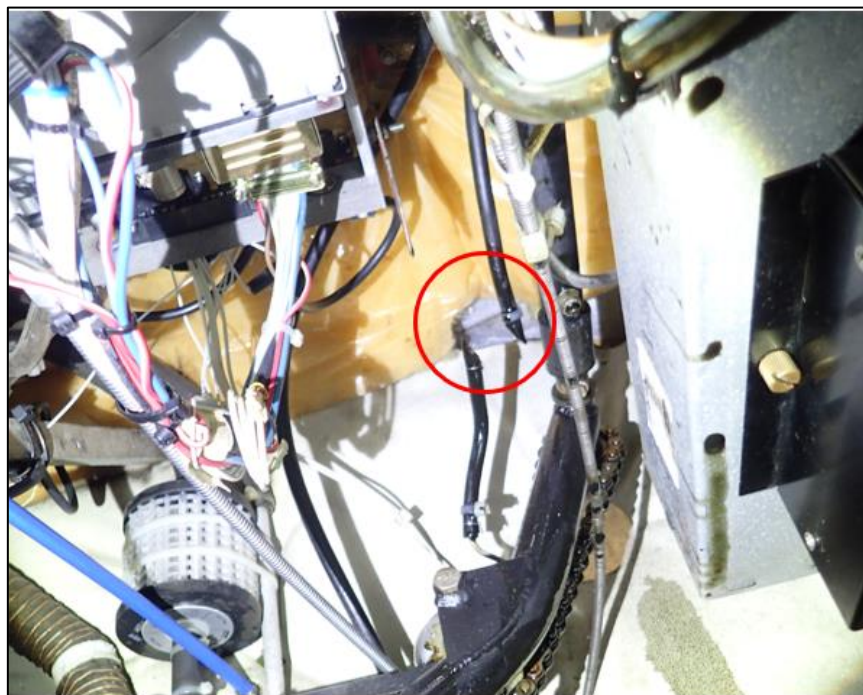


Photo No. 4: Fractured pipe (ringed in red) behind instrument panel (as viewed from below)



1.4 Aircraft Information

The Cessna 150M is a high-wing aircraft, equipped with a fixed tricycle landing gear and, electrically actuated wing-flaps. It is powered by a single, four-cylinder, horizontally opposed reciprocating engine. The fuselage and empennage are of an all-metal semi-monocoque design. The wings are externally braced and have two metal fuel tanks. The aircraft was equipped with dual controls. The accident aircraft had a certified maximum take-off weight of 726 kg.

The IAA issued the aircraft with a Certificate of Registration on 2 February 2023. On 21 March 2023 an Airworthiness Review Certificate (ARC) for an aircraft complying with Part ML⁶ was issued by an IAA-authorized signatory. A Part ML Certificate of Release to Service following prescribed maintenance work was issued on the same date, by the same person, under a Part-66 Aircraft Maintenance Licence.

1.5 Examination of the fractured pipe

The two sections of the fractured pipe (designated Section A and Section B for the purposes of this Report) were removed from the aircraft in the field, under the supervision of the Investigation, by one of the Operator's technical personnel (**Photo No. 5**).

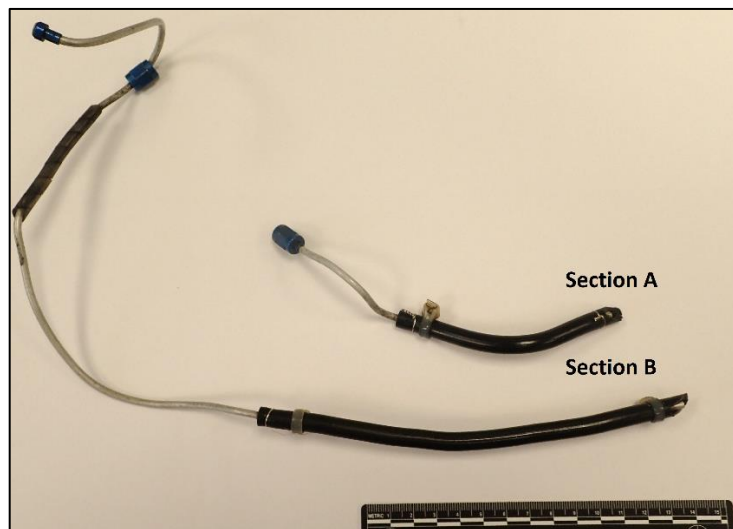


Photo No. 5: The two sections of the fractured pipe

The pipe in question, part number 0400311-78, was designated as Item 12 in the Oil System Schematic provided in the Cessna 150/A150 (1970-1977), manual number P691-12, dated March 1, 1996 (**Figure No. 1**). Detail E in **Figure No. 1** shows that item 12 connects to a union and then another tube with larger fittings (Item 14) which connects to the oil pressure gauge.

⁶ **Part ML:** Annex Vb (Part-ML) to Commission Regulation No (EU) 1321/2014 on Continuing Airworthiness is applicable to certain Non-Complex Motor Powered aircraft that are not listed on the air operator certificate of an air carrier licensed in accordance with Regulation (EU) No. 1008/2008; the subject aircraft qualified for inclusion in a Part-ML maintenance programme because it has a maximum take-off mass (MTOM) less than 2,730 kg.

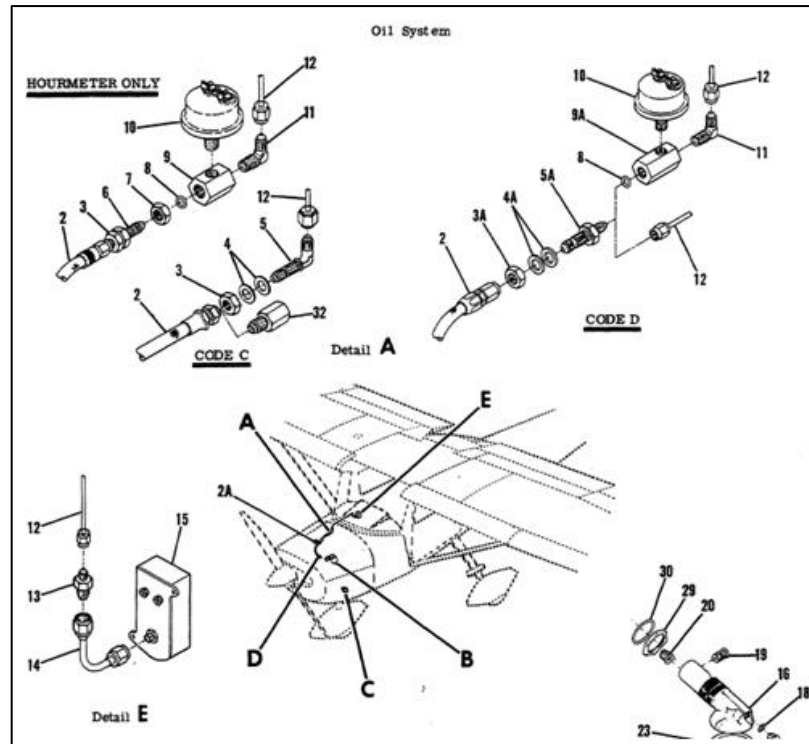


Figure No. 1: Oil system schematic from the aircraft manual

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On examination of the removed sections, it was noted that the pipe which had been fitted to the aircraft comprised two separate metal pipe sections whose ends had been cut square. During examination it was noted that square-cut ends exhibited roughness and marking similar to that which would be seen if the pipe had been cut with a hack saw (**Photo No. 6**).

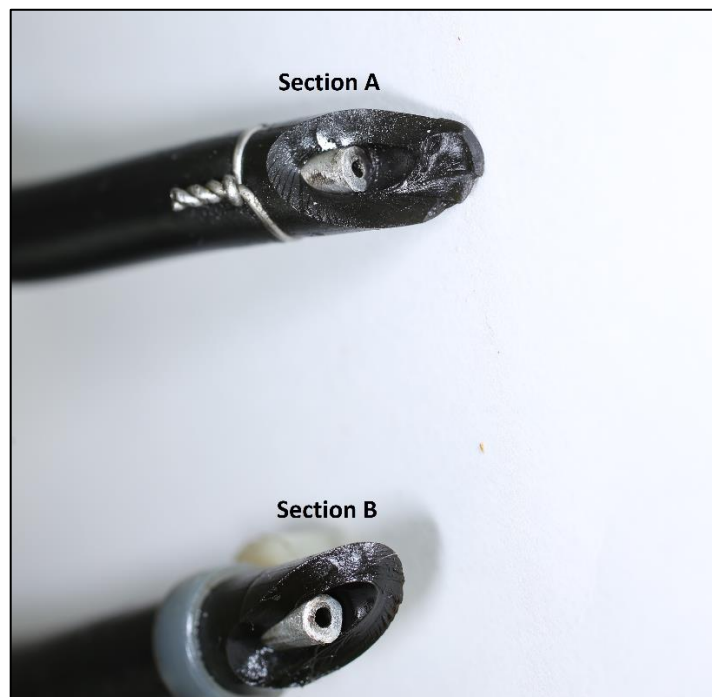


Photo No. 6: Square-cut ends of metal pipe and the failed plastic sleeve



It appears that the two square-cut metal pipes were then inserted into a plastic sleeve that was approximately 27 centimetres (cm) in length. The section of the pipe that was attached to the pressure gauge (Section A) was pushed into the sleeve to a depth of approximately 10 cm, while the section of pipe that was attached to the engine (Section B) was pushed into the sleeve to a depth of approximately 17 cm. The plastic sleeve was secured at each end (i.e. on each section of pipe) with a plastic tie-wrap and a section of locking wire. At the region of the plastic sleeve where the metal pipes met, there was a section of locking wire on the cockpit side (Section A) and a tie-wrap on the engine side (Section B). The plastic sleeve had broken at the point where the two square-cut sections of pipe met, and this was the cause of the oil leak.

The AAIU found no evidence that the practice of joining two metal pipes with a plastic sleeve, secured with tie-wraps and locking wire was, or is, an approved method of repair.

A review of the available maintenance records did not contain any specific reference to the subject pipe and accordingly it was not possible to identify when the pipe, as found, may have been fitted, or how long the aircraft has been operating with the subject pipe installed.

1.6 Meteorological Information

Met Éireann, the Irish meteorological service, was asked to provide details of the estimated weather conditions prevailing in the Ballinglen area at the time of the incident. Details from the report received are reproduced in **Table No. 1**.

Meteorological Situation:	A ridge of high pressure, extending from an anticyclone to the south-west, covers Ireland generating a light to moderate northerly airflow.
Surface Wind: Wind at 2,000 feet (ft): Surface to 300 ft:	North to north-east 8-10 knots (kt). Northeast 10-15 kt. Similar to surface.
Visibility:	30 + kilometres (km).
Weather:	Sunny, with some fair-weather cloud.
Cloud:	Few (1-2/8ths) cumulus clouds with bases around 2,000-2,500 feet, and a scattered (3-4/8ths) clouds with bases around 5,500 ft.
Surface Temperature/Dew Point:	17/10 degrees Celsius.
Mean Sea Level (MSL) Pressure:	1028 Hectopascals (hPa).
Freezing Level:	8,000 ft.

Table No. 1: Estimated Weather conditions in the Ballinglen area at the time of the incident

2. AAIU COMMENT

Having identified that the aircraft had developed a significant oil leak, a field was selected, and a precautionary landing was carried out without further damage to the aircraft and with no reported injuries to personnel.

The Investigation identified that the cause of the oil leak was the failure of an unapproved repair that had joined two sections of metal pipe butted together using a plastic sleeve secured with tie-wraps and locking wire.

While the provenance of the unapproved repair could not be determined from the available maintenance records, this incident demonstrates the importance of only using correct parts and repair schemes whenever maintenance is being carried out on an aircraft.

Familiarity with forced landing drills, as identified by the Instructor in this event, and in AAIU Report No. 2013-013, is desirable and advantageous when such manoeuvres are required during aircraft operations.

- END -



In accordance with Annex 13 to the Convention on International Civil Aviation, Regulation (EU) No. 996/2010, and Statutory Instrument No. 460 of 2009, Air Navigation (Notification and Investigation of Accidents, Serious Incidents and Incidents) Regulation, 2009, the sole purpose of this investigation is to prevent aviation accidents and serious incidents. It is not the purpose of any such investigation and the associated investigation report to apportion blame or liability.

Produced by the Air Accident Investigation Unit

AAIU Reports are available on the Unit website at www.aaiu.ie



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