

National Transportation Safety Board

Office of Research and Engineering

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ANC23FA074

ENGINE DATA MONITOR

Specialist's Factual Report

September 30, 2024

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A. ACCIDENT

Location: St. Mary's, Alaska
Date: September 12, 2023
Time: 2047 Alaska daylight time (AKDT)
0447 September 13, 2023 coordinated universal time (UTC)
Airplane: Piper PA-18-150, private operator, N109T

B. ENGINE DATA MONITOR SPECIALIST

Specialist Michael Portman
Senior Aerospace Engineer – Recorder Specialist
National Transportation Safety Board (NTSB)

C. DETAILS OF THE INVESTIGATION

An engine data monitor (EDM) group was not convened. The NTSB Vehicle Recorder Division received the following EDM:

Recorder Manufacturer/Model: Electronics International MVP-50P
Part Number: MVP-50P-N109T
Recorder Serial Number: 124060

1.0 MVP-50P Description

The EI (Electronics International Inc.) MVP-50P is a panel-mounted, color, electronic engine display allowing the operator to monitor and record parameters related to engine operations and user customizable parameters. Depending on the installation, parameters monitored may include: oil pressure and temperature, outside air temperature, propeller revolutions per minute (RPM), fuel flow, fuel levels, and battery voltage and amperage. User customizable parameters may be defined by installation, examples include but are not limited to sensors for door states, annunciators, and flight control positions.

The unit contains non-volatile memory (NVM) for data storage of the recorded and calculated parameters. The rate at which the data is stored is selectable by the operator. The recording function also records minimum and maximum values for each flight. The data is stored in engineering units in comma separated value (CSV) format on an internal microSD card, using a Linux file system format. The data can be downloaded to a USB memory device via a USB port on the front of the unit or by removing the internal microSD card. Each set of recorded data is grouped by power cycle and identified by an MVP-50P assigned sequential flight number.

1.1 MVP-50P Data Recovery

The MVP-50P was in good condition and the data were downloaded using the manufacturer's procedure.

1.2 MVP-50P Recording Description

The device contained 317 data files between September 20, 2018, and September 12, 2023. The accident flight was determined to be the final file. The accident flight and the preceding flight were analyzed and are included in this report. The data were downloaded in engineering units. The parameters included in this report are shown in table 1.

Table 1. EI MVP-50P Data Parameters.

Parameter Name (Unit)	Parameter Description (Unit)
CHT # (°F)	Cylinder Head Temperature # ¹ (degrees Fahrenheit)
EGT # (°F)	Exhaust Gas Temperature # ¹ (degrees Fahrenheit)
F.FLOW (GPH)	Fuel Flow (gallons per hour)
OIL P (PSI)	Oil Pressure (pounds per square inch)
OIL T (°F)	Oil Temperature (degrees Fahrenheit)
RPM (RPM)	Engine Revolutions per Minute (rpm)

The CHT sensor for cylinder 2 and the EGT sensor for cylinder 3 were determined to be invalid. CHT2 started showing invalid data on September 1, 2023, and EGT3 started showing invalid data on September 6, 2023. As a result, these two parameters are not included in this report.

1.3 MVP-50P Time Correlation

MVP-50P data were recorded in approximate local time. The time can be set by the operator. No external data were available to produce a time correlation or validation, therefore the times listed in this report are considered to be approximate.

D. FIGURES AND TABULAR DATA

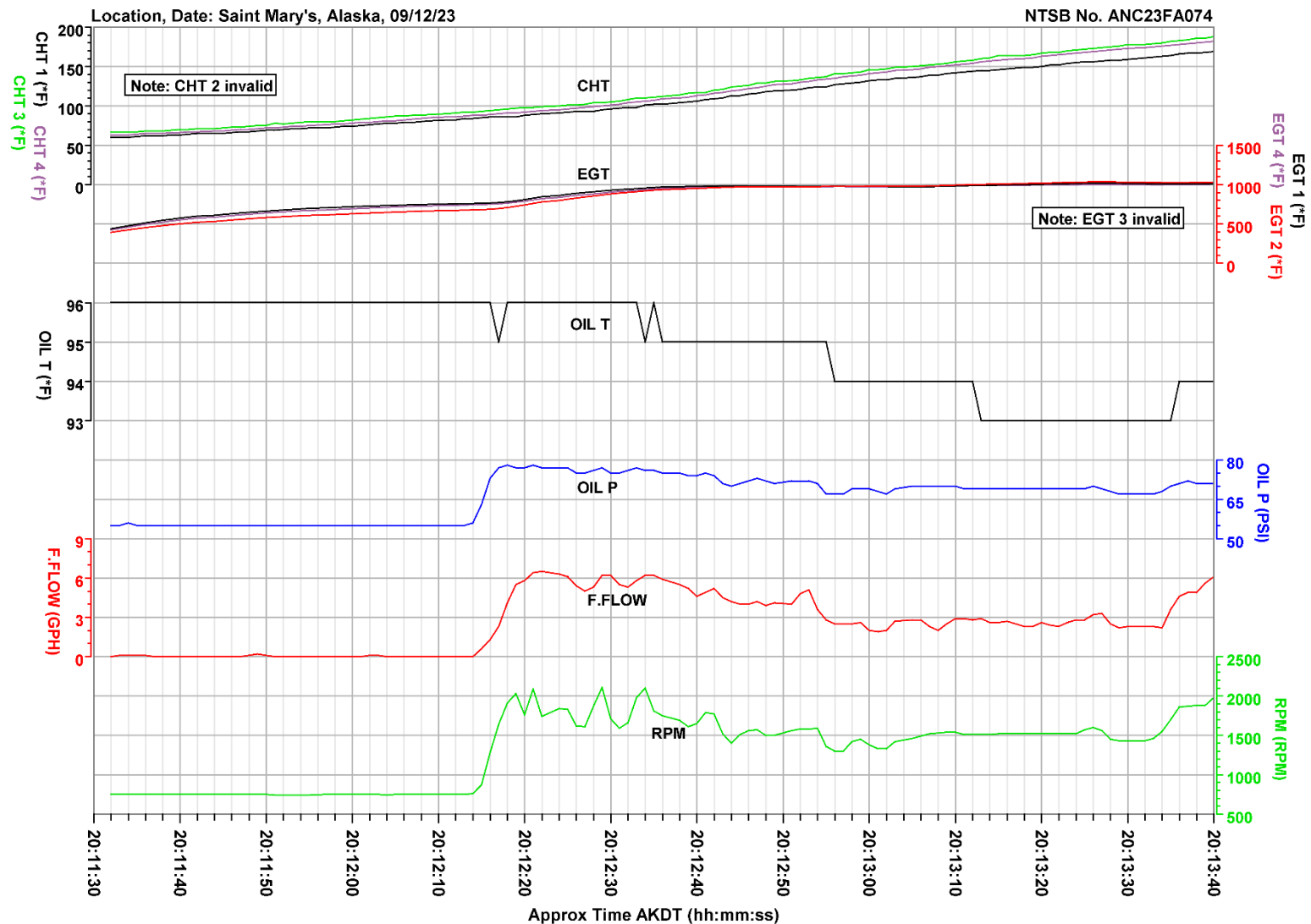
Figure 1 contains engine data recorded during the event on September 12, 2023. Analysis of the data recorded for the event flight indicated that the recording likely ended before the event flight takeoff. Figure 2 contains engine data recorded during the preceding flight on September 12, 2023. No engine abnormalities were noted in either flight. All the parameters listed in table 1 are plotted.

¹ Depending on aircraft configuration number of cylinders that are instrumented varies. In the data plots the '#' is replaced with the appropriate cylinder ID.

The corresponding tabular data used to create figure 1 are provided in electronic comma separated value (CSV) format as attachment 1 to this report. The corresponding tabular data used to create figure 2 are provided in electronic comma separated value (CSV) format as attachment 2 to this report.

Submitted by:

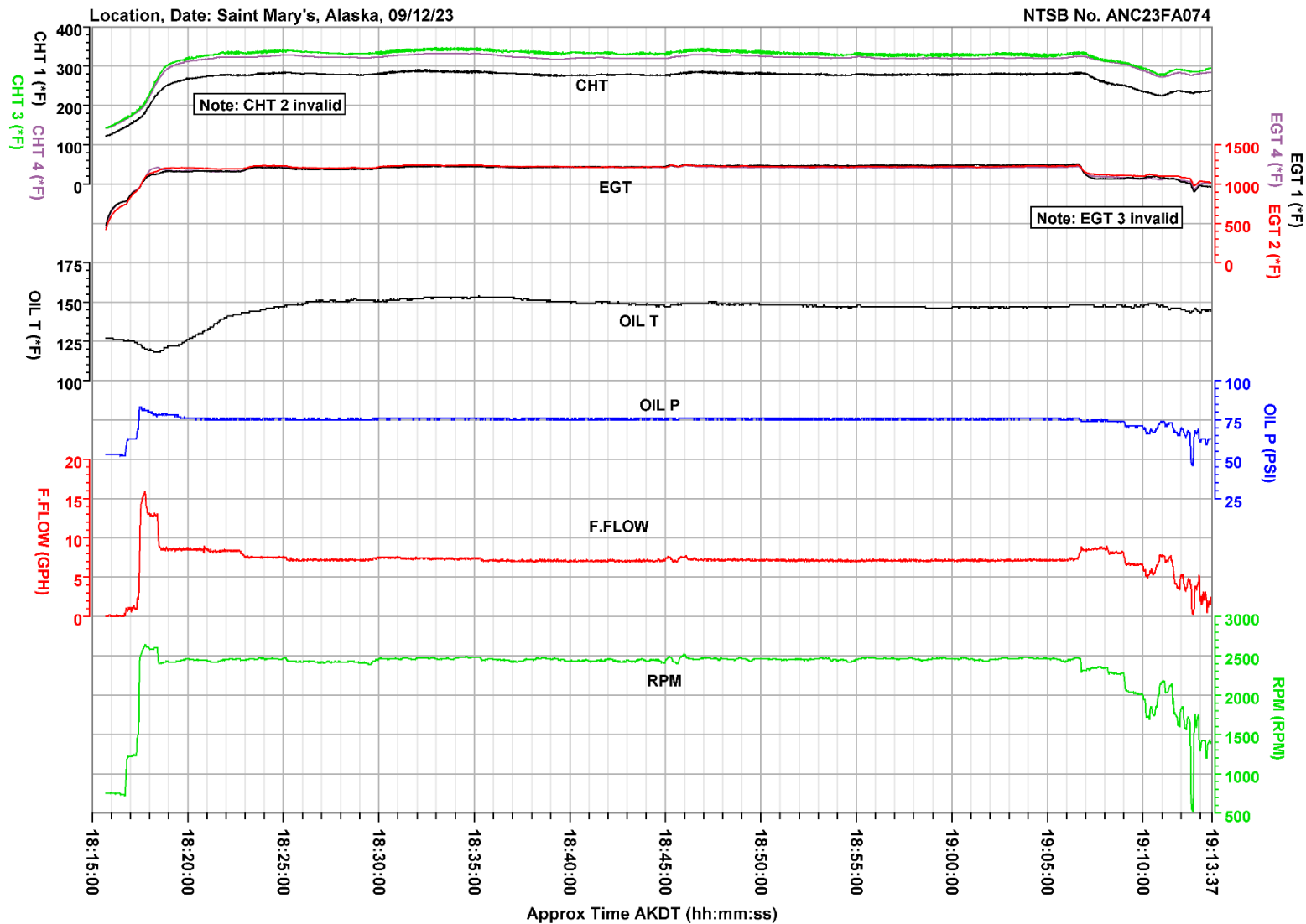
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Private, Piper PA-18-150, N109T

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Figure 1. Plot of engine parameters for the event flight.



Private, Piper PA-18-150, N109T

Previous Flight

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Figure 2. Plot of engine parameters for the preceding flight.