

National Transportation Safety Board

Office of Research and Engineering

Washington, DC 20594



WPR24FA105

ENGINE DATA MONITOR

Specialist's Factual Report

June 5, 2024

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A. ACCIDENT

Location: Madras, Oregon
Date: March 10, 2024
Time: 1503 pacific daylight time (PDT)
Airplane: Piper PA-32-260, N3264W

B. ENGINE DATA MONITOR SPECIALIST

Specialist: Gerald Kawamoto
Recorder Specialist
National Transportation Safety Board (NTSB)

C. DETAILS OF THE INVESTIGATION

A group was not convened. The NTSB Vehicle Recorder Division received the following engine data monitor. The exact model and serial number were not identified due to the condition of the device.

Recorder Manufacturer/Model: JPI EDM-730/830
Recorder Serial Number: Unknown

1.0 JPI EDM-730/830 Description

The J. P. Instruments EDM-730/830 is a panel-mounted LCD display that the operator can monitor and record up to 24 parameters related to engine operations. Depending on the installation engine parameters monitored can include exhaust gas temperature (EGT), cylinder head temperature (CHT), oil pressure and temperature, manifold pressure, outside air temperature, turbine inlet temperature, engine revolutions per minute, compressor discharge temperature, fuel flow, carburetor temperature, and battery voltage. The unit can also calculate, in real-time, horsepower, fuel used, shock cooling rate and EGT differentials between the highest and lowest cylinder temperatures. The calculations are also based on the aircraft installation.

The unit contains non-volatile memory for data storage of the parameters recorded and calculated.¹ The rate at which the data is stored is selectable by the operator from 2 to 500 seconds per sample. The memory can store up to 20 hours of data at a 6-second sample rate. For a non-damaged unit, the data can then be downloaded by the operator using a USB flash drive and following the instructions on the unit.

¹ Non-volatile memory (NVM) is semiconductor memory that does not require external power for data retention.

1.1 JPI EDM-730/830 Data Recovery

The device as received by the Vehicle Recorder Laboratory is shown in figure 1. The extent of the damage rendered it inoperable. The non-volatile memory chip was removed, installed on a functional lab surrogate and data were downloaded normally using the manufacturer's procedures upon powering on the surrogate.



Figure 1. JPI EDM-730/830 as received.

1.2 JPI EDM-730/830 Recording Description

Data included sessions recorded from May 19, 2023, through March 10, 2024. An offset of 24,360 seconds was applied to the data such that it appears in PDT, the local time of the accident. The offset was calculated by aligning the application of takeoff power in the engine data to available ADS-B position data for the accident flight. The last session started at 13:54:54 PDT and ended at 15:04:33 PDT on March 10, 2024, and contained the accident event. Data were sampled once every 6 seconds. Table 1 describes JPI EDM-730/830 parameters provided and verified in this report.

Table 1. Verified and provided JPI EDM parameters.

Parameter Name (units)	Parameter Description (units)
C# (degF)	Cylinder Head Temperature (degrees Fahrenheit)
E# (degF)	Exhaust Gas Temperature (degrees Fahrenheit)
CLD (degF/min)	Shock Cooling Rate (degrees Fahrenheit per minute)
FF (gph)	Fuel Flow (gallons per hour)
USD (gal)	Fuel Used (gallons)
BAT (V)	Battery Voltage (volts)

D. FIGURES AND TABULAR DATA

Figure 2 is a plot of parameters of the entire accident flight. The time displayed is 13:50:00 to 15:05:00 PDT.

Figure 3 is a plot of parameters of the final five minutes of the accident flight. The time displayed is 15:00:00 to 15:04:40 PDT.

The corresponding tabular data used to create figures 2 and 3 are provided in electronic comma-separated value (CSV) format as attachment 1 to this report.

Submitted by:

Gerald Kawamoto
Recorder Specialist

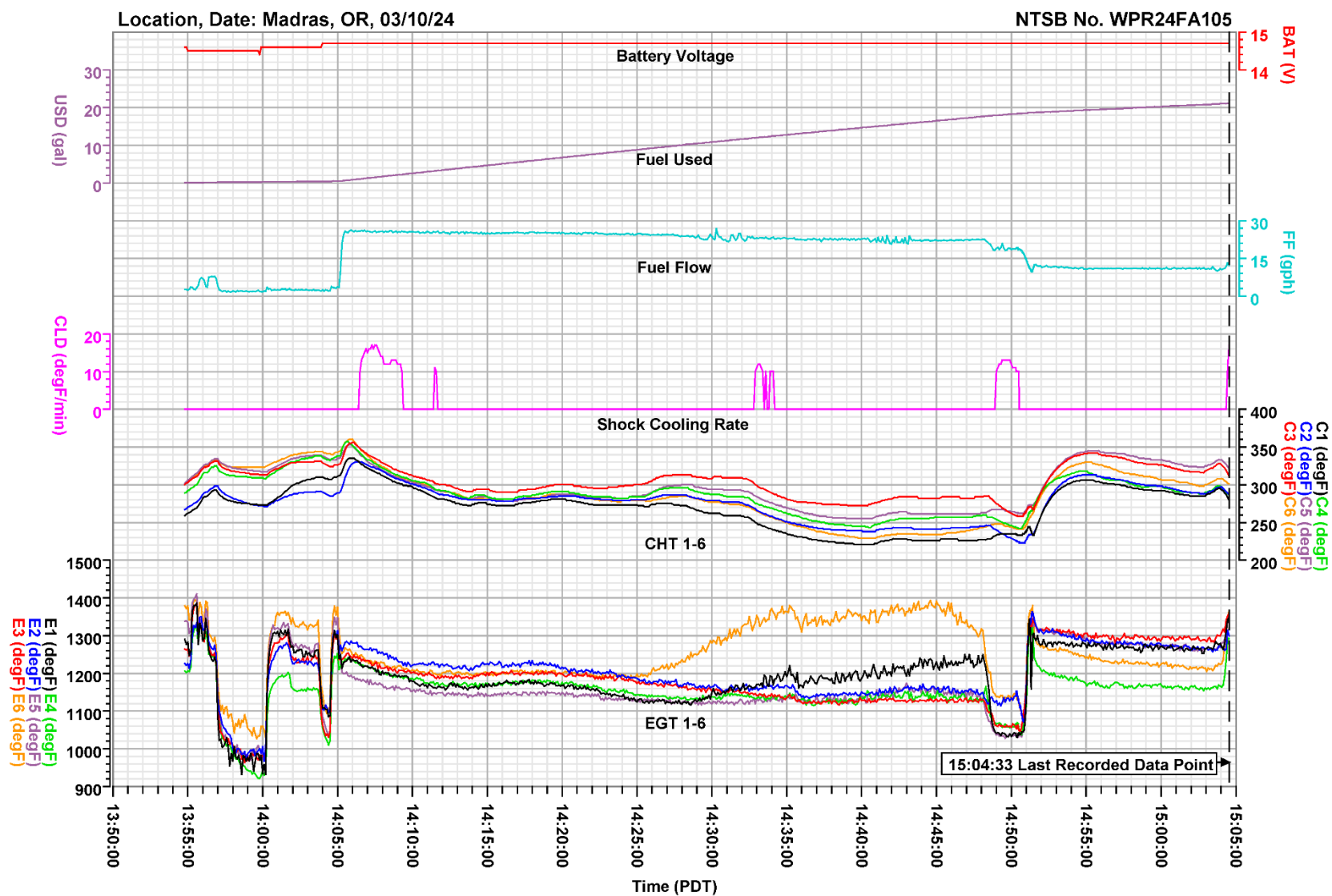


Figure 2. Plot of parameters for the accident flight recorded on the JPI EDM.

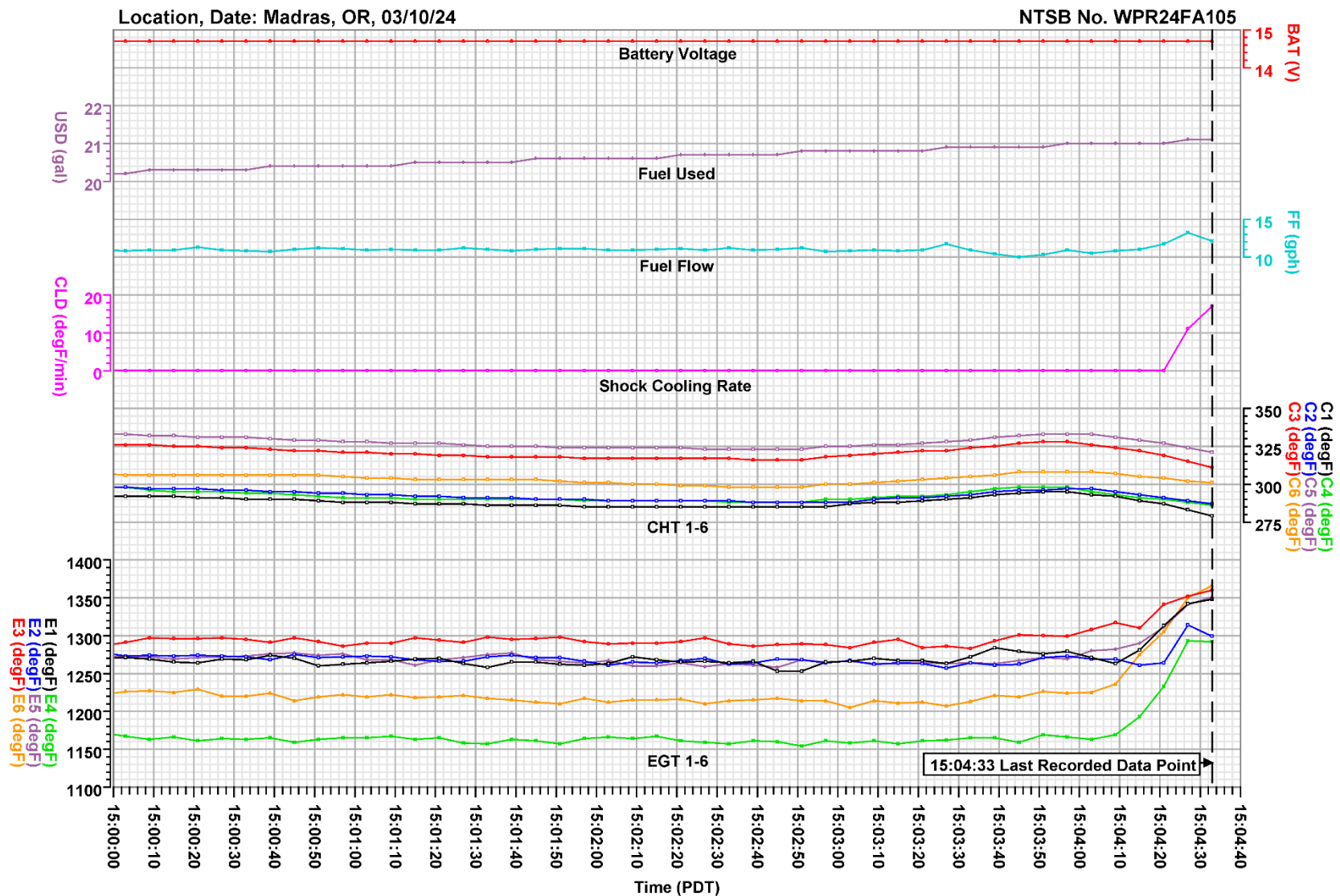


Figure 3. Plot of parameters at the end of the accident flight recorded on the JPI EDM.