



The National Transportation Safety Board

Office of Aviation Safety
Central Region
Memorandum for the Record
Engine Examination Findings
CEN22LA144
Minot, North Dakota
March 11, 2022

A detailed examination of the engine was performed at Continental Motors, Mobile, Alabama, under the supervision of the NTSB. According to maintenance records, the most recent oil change was completed @1086.7 hours; entry dated February 14, 2022. The engine was removed from the shipping container and placed on a disassembly stand. The magneto to engine timing was checked as received. Continental specification is 22° BTC the timing was found to be right magneto 23° left magneto 22°. It was noted some of the cylinder barrel paint was discolored from overheating. The breakaway torque was measured as the cylinders were removed and no anomalies were found. When the cylinders were removed it was noted that all six piston heads had indications of detonation or preignition. The number six piston was damaged the most and portions were melted away. The damage to the pistons appeared to have happened over an unspecified/unknown time.



Photo 1 Piston Damage #1 through #6



Photo 2 Closeup Views of #6 Piston Damage

The connecting rod bearings were inspected and exhibited varying degrees of heat damage consistent with lubrication distress. The number three connecting rod & bearing showed the most heat damage.



Photo 3 Closeup View of #3 Connecting Rod & Bearing Showing Thermal Distress

The oil sump was examined, and aluminum particles were noted on the interior of the sump, The oil filter was examined and contained aluminum particles from the damaged pistons. The oil pump was examined and exhibited signs of hard particle passage on the wall if the pump housing.

The crankshaft and main bearings exhibited a slight amount of lubrication distress. The extent of damage found at the number six piston was consistent with the lubrication distress found in the engine.

The remaining internal engine components exhibited normal operating signatures, with no anomalies.

The fuel distribution spider valve appeared normal with no obstructions. The fuel injectors appeared normal and were not obstructed.

Downloaded engine monitoring data showed that cylinder #6 failed in flight. The data also shows cylinder's #2 & #4 failing shortly after, resulting power to be reduced drastically. The data plots are attached to this memorandum.

Spark Plugs

Cylinder #6, #4, and #2 top & bottom spark plugs had severe impact damage and the electrodes showed severe impact damage. #1, #2, and #5 spark plugs were not observed. Each spark plug electrode appeared to be "hammered" closed. The porcelain portion of the spark plugs showed impact damage. The wear patterns of the spark plugs could not be determined due to the impact damage.



Photo 4 #2 Top Spark Plug (Courtesy of FAA)



Photo 5 #2 Bottom Spark Plug



Photo 6 #4 Top Spark Plug



Photo 7 #4 Bottom Spark Plug



Photo 8 #6 Top Spark Plug



Photo 9 #6 Bottom Spark Plug

Alexander Lemishko



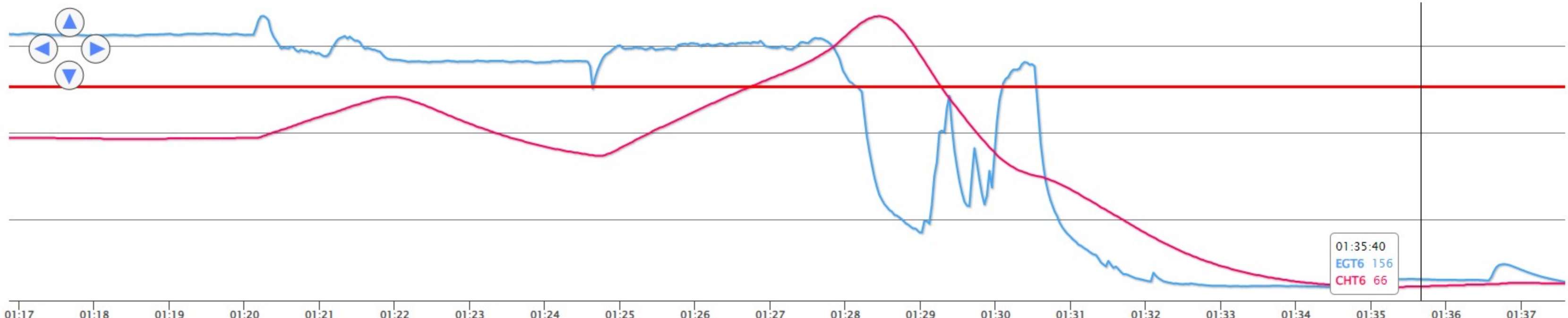
Senior Air Safety Investigator
NTSB Central Region Aviation

EGT

- AllOddEvenEGT1EGT2EGT3EGT4EGT5EGT6TIT1TIT2
- AllOddEvenCHT1CHT2CHT3CHT4CHT5CHT6

CHT

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RPM



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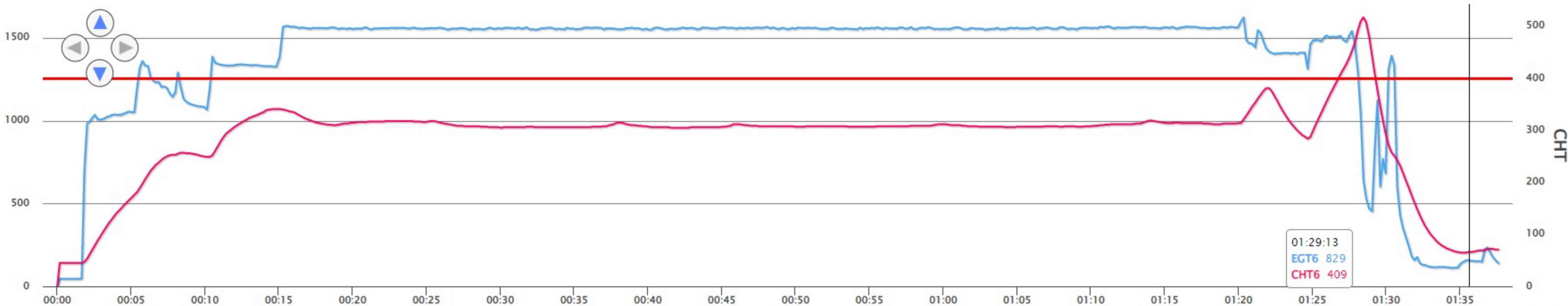
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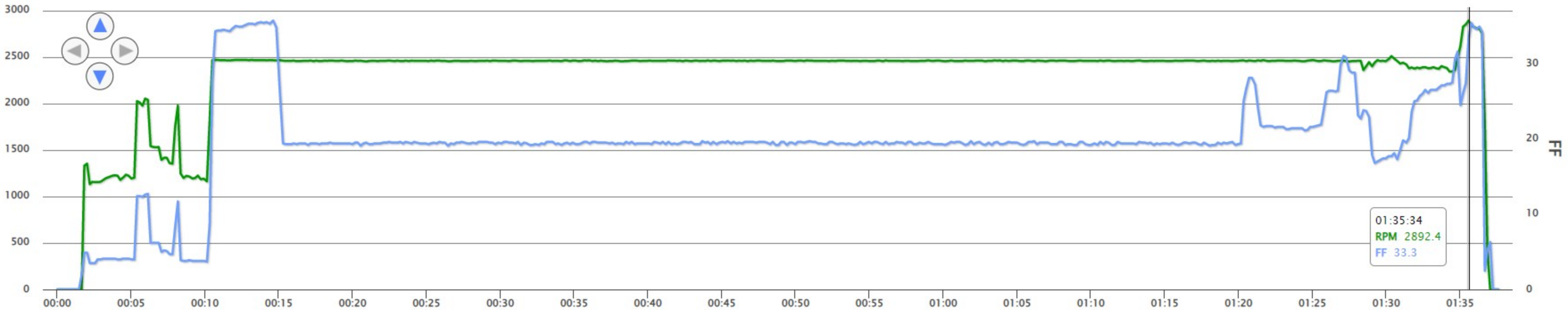
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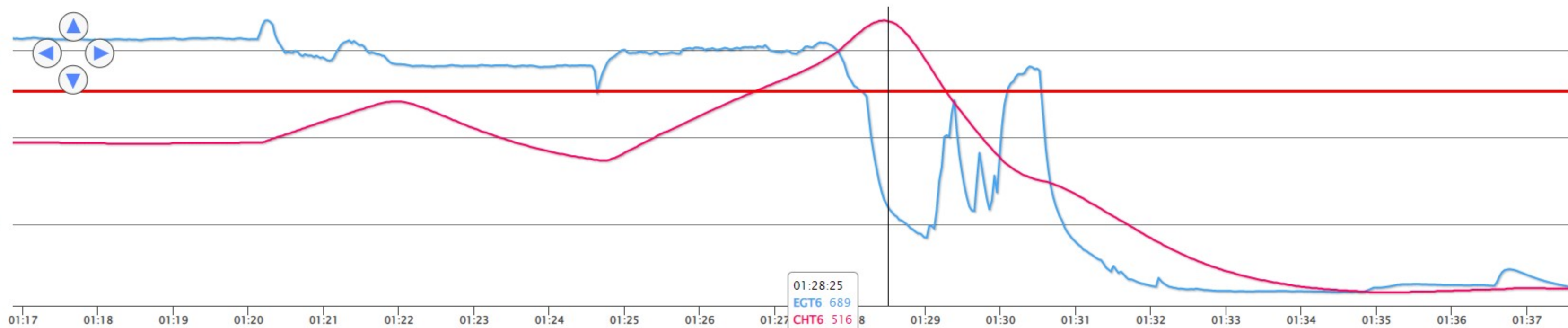
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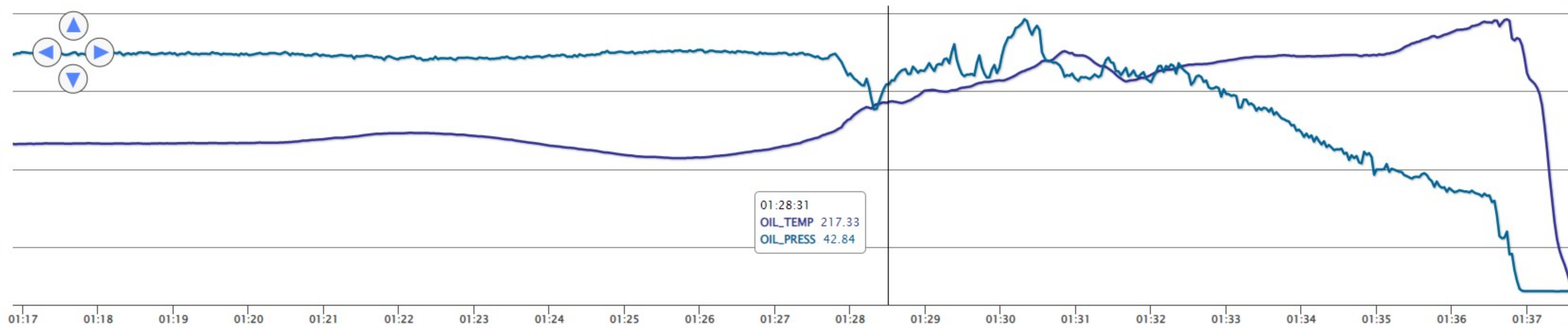
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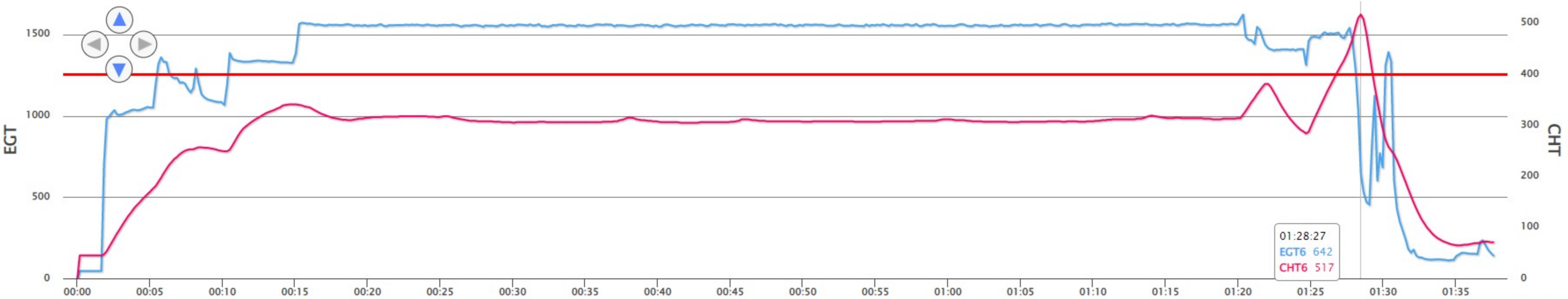
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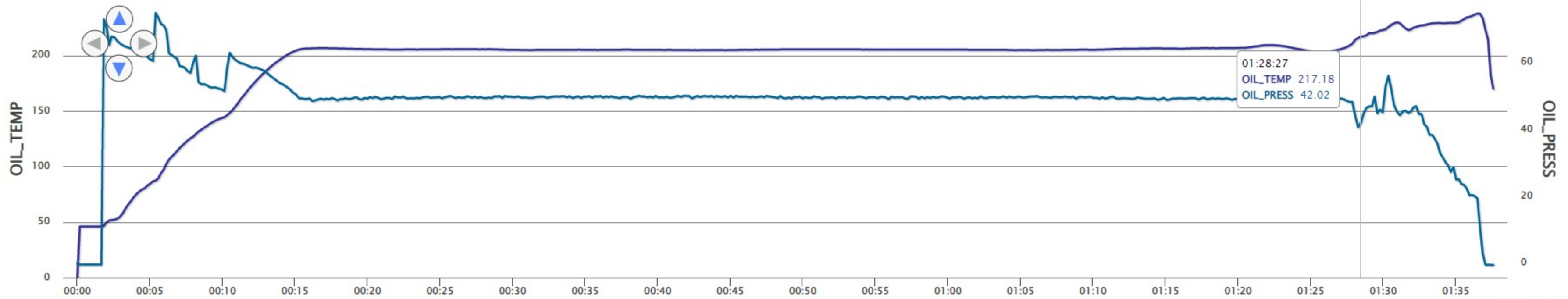
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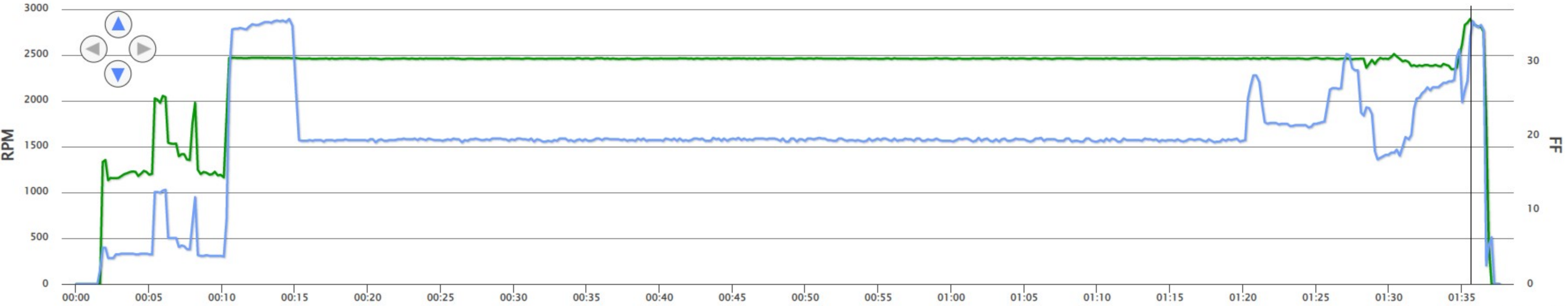
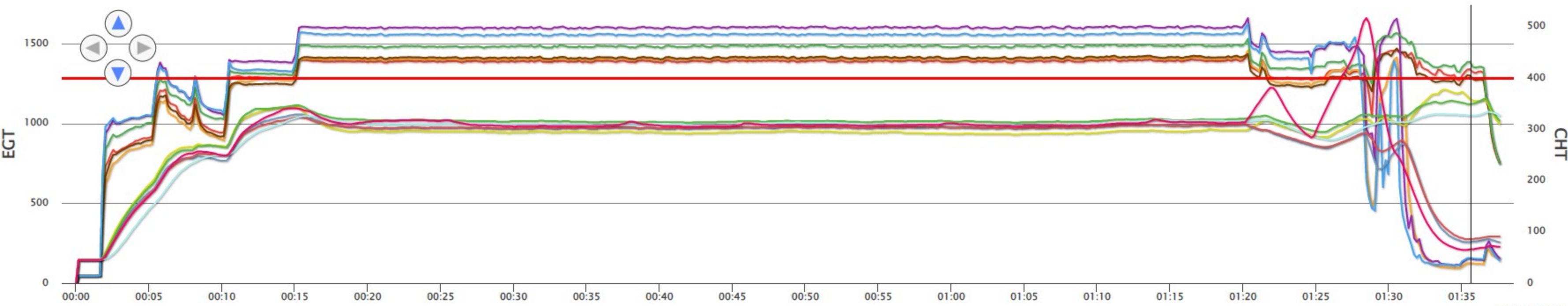
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