

NATIONAL TRANSPORTATION SAFETY BOARD

Vehicle Recorder Division
Washington, D.C. 20594

January 10, 2020

Engine Gauges

Specialist's Factual Report By Sean Payne

1. EVENT SUMMARY

Location: Galliano, LA
Date: March 10, 2019
Aircraft: Bell 407
Registration: N577AL
Operator: Bristow Inc.
NTSB Number: CEN19FA095

2. GROUP

A group was not convened.

3. DETAILS OF INVESTIGATION

The National Transportation Safety Board (NTSB) Vehicle Recorder Division received the following device:

Device Manufacturer/Model: Type:	Moog Engine Gauge Torque Gauge
Device Manufacturer/Model: Type:	Moog Engine Gauge Ng (Compressor) RPM Percent Gauge
Device Manufacturer/Model: Type:	Moog Engine Gauge Oil Temperature Gauge

3.1. Device Description

Moog produces a number of different gauges for aerospace applications. The accident helicopter was equipped with three Moog gauges. One gauge displayed torque values, another gauge displayed compressor RPM readings (Ng) and the last gauge displayed oil temperature. According to Moog, not all gauges are capable of recording data. Furthermore, some Moog gauges only record the magnitude of an exceedance event, the duration of the event and the time the event occurred. In order to determine which gauges are capable of recording data, the manufacturer must be provided the part number and

serial number of the gauge. Gauges that record data contain an internal watch style battery which supplies power to an internal clock. If the battery is dead, the lack of timing information could corrupt or compromise any recorded data.

3.2. Device Condition

Upon arrival at the Vehicle Recorder Laboratory, an examination revealed the unit had sustained both impact and water damage. Figure 1 shows the condition of the gauges after they have been removed from their outer casing and rinsed with clean water. The three gauges were then dried in a vacuum drying oven.

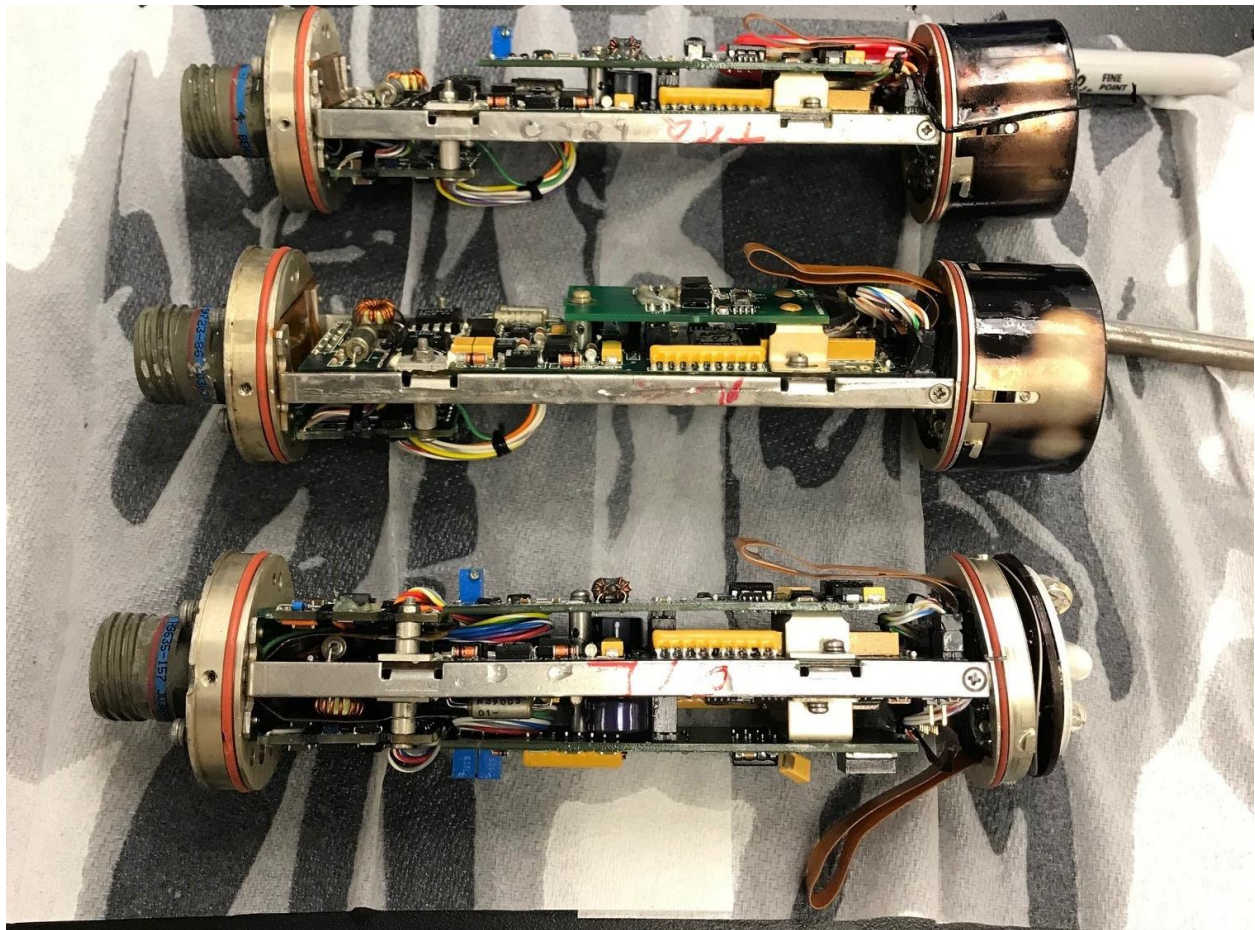


Figure 1. Photo of damaged unit

3.3. Data Description

Torque Gauge

The manufacturer determined the gauge would likely record a value related to the magnitude of an over-torque event, the duration of the event and the time the event occurred. The unit's internal watch battery's voltage was measured at 0.4 volts, however, visible damage showed that power may not be able to be supplied from the battery to the unit's main board. The manufacturer stated that without battery power, the data was likely

corrupted or compromised. In consultation with the Investigator-In-Charge, it was determined that data retrieval would not be pursued.

Ng (Compressor) RPM Percent Gauge

A measure of the internal battery's voltage revealed the battery was no longer supplying voltage. In consultation with the Investigator-In-Charge, it was determined that data retrieval would not be pursued.

Oil Temperature Gauge

The manufacturer determined that the device does contain a memory chip, however, this particular device does not have a battery and does not record any data.