

NATIONAL TRANSPORTATION SAFETY BOARD

Vehicle Recorder Division
Washington, D.C. 20594

March 14, 2016

Flight Data Recorder

Specialist's Factual Report
By Cassandra Johnson

1. EVENT SUMMARY

Location: Miami, Florida
Date: February 11, 2015
Aircraft: Beech 1900C
Registration: YV1674
Operator: Aeropanamericano CA
NTSB Number: ERA15FA129

On February 11, 2015, at 1439 eastern standard time (EST), a Beech 1900C, Venezuelan registration VY1674, registered to and operated by Aeropanamericano, C.A., was destroyed during collision with terrain, following a loss of engine thrust during initial climb from Kendall-Tamiami Executive Airport (KTMB), Miami, Florida. The two foreign certificated pilots and two passengers were fatally injured. The repositioning flight was conducted under the provisions of Title 14 *Code of Federal Regulations* (CFR) Part 91. Visual meteorological conditions prevailed and an instrument flight rules flight plan was filed for the planned flight to Providenciales International Airport (MBPV), Providenciales, Turks and Caicos.

2. FLIGHT DATA RECORDER GROUP

A flight data recorder (FDR) group was not convened.

3. FDR Carriage Requirements

The event aircraft, YV1674, was manufactured in 1988, and per 14 CFR Part 91.609 was operating such that it was not required to be equipped with an FDR. The aircraft was not originally delivered with an FDR recording system but had one installed per Supplemental Type Certificate (STC) SA106CH.

4. DETAILS OF FDR INVESTIGATION

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

Recorder Manufacturer/Model: **Loral/Fairchild F1000**
Recorder Serial Number: **01307**

4.1. Loral/Fairchild F1000 Description

This model FDR records airplane flight information in a digital format using solid-state flash memory as the recording medium. The F1000 can receive data in the ARINC

573/717/747/542a configurations and can record a minimum of 25 hours of flight data. It is configured to record 64 12-bit words of digital information every second. Each grouping of 64 words (each second) is called a subframe. Each subframe has a unique 12-bit synchronization (sync) word identifying it as subframe 1, 2, 3, or 4. The sync word is the first word in each subframe. The data stream is "in sync" when successive sync words appear at proper 64-word intervals. Each data parameter (e.g. altitude, heading, airspeed) has a specifically assigned word number within the subframe. The F1000 is designed to meet the crash-survivability requirements of TSO-C124.

4.1.1. Recorder Condition

The recorder was in good condition and the data were extracted normally from the recorder.

4.1.2. Recording Description

The FDR recording contained about 87 hours of data. Timing of the FDR data is measured in subframe reference number (SRN), where each SRN equals one elapsed second. The event flight was the last flight of the recording.

4.1.3. Engineering Units Conversions

The engineering units conversions used for the data contained in this report are based on documentation from Flight Data Systems and NTSB archived FDR documentation. Flight Data Systems Company performed an FDR readout on this aircraft on May 9, 2014 using information for a similar installation by another operator because they were not provided FDR documentation from the operator.

Where applicable, the conversions have been changed to ensure that the parameters conform to the NTSB's standard sign convention that climbing right turns are positive (CRT=+).¹ Table A-1 of appendix A lists the FDR parameters verified and provided in this report. Additionally, table A-2 of appendix A describes the unit abbreviations used in this report.

4.1.4. Inoperative Parameters

Flight Data Systems Company noted in their May 9, 2014 Flight Data Recorder Readout Service Specialist Report from this aircraft that the following parameters were not working: pitch attitude, roll attitude, pitch control, and flap position. The same parameters were not working for this readout.

4.2. Time Correlation

Correlation of the FDR data from SRN to the event local time, EST, was established with an offset provided by the Cockpit Voice Recorder (CVR) Group Chairman in the Factual Report, Cockpit Voice Recorder.

¹ CRT=+ means that for any parameter recorded that indicates a climb or a right turn, the sign for that value is positive. Also, for any parameter recorded that indicates an action or deflection, if it induces a climb or right turn, the value is positive. Examples: Right Roll = +, Pitch Up = +, Elevator Trailing Edge Up = +, Right Rudder = +.

Accordingly, the time offset for the event flight data from SRN to local EST is the following: $EST = SRN - 259,937.7$. Therefore, for the rest of this report, all times are referenced as EST, not SRN. However, the times in the prior flight are referenced as SRN, not local time.

4.3. FDR Plots and Corresponding Tabular Data

Figures 1 and 3 contain FDR data recorded during the February 11, 2015 event. Figures 2 and 4 contain the FDR data recorded during the prior flight. All the parameters listed in table A-1 are plotted. These figures are configured such that right turns are indicated by the trace moving toward the bottom of the page, left turns towards the top of the page, and nose up attitudes towards the top of the page.

Figure 1 covers the entire event from 14:28:10 EST to the end of the FDR data at 14:39:19 EST (the x-axis ends at 14:39:40 EST). Figure 2 covers the entire prior flight from 300,715 SRN to 310,615 SRN.

Figure 3 has an expanded scale from 14:36:00 EST to the end of the FDR data at 14:39:19 EST (the x-axis ends at 14:39:20 EST) focusing on the event takeoff. Figure 4 has an expanded scale from 300,960 SRN to 301,160 SRN focusing on the prior flight's takeoff.

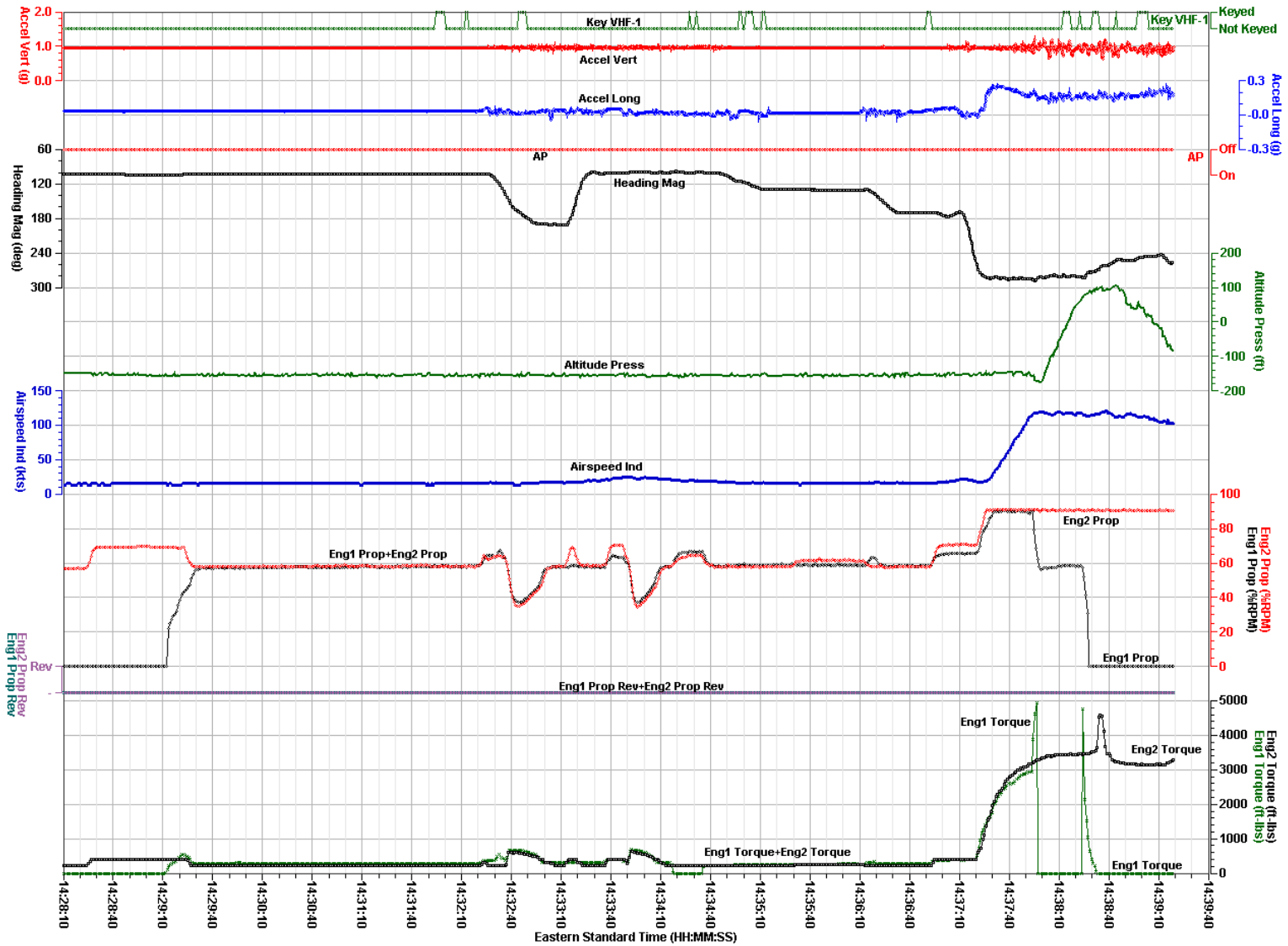
In brief for the February 11, 2015 event, the FDR data indicated during the initial climb at 14:37:59 EST the engine 1 propeller speed decreased from about 90% revolutions per minute (RPM) to about 56% RPM, while at an indicated airspeed of about 120 knots (kts). At this time, the engine 2 propeller speed was at about 91% RPM and remained at 91% RPM until the end of the FDR recording. About 26 seconds later at 14:38:28 EST, the engine 1 propeller speed reduced further to 0% RPM, the indicated airspeed decreased to 114 kts and the pressure altitude² had increased to about 82 feet (ft). Approximately 51 seconds later at 14:39:19 EST, the FDR data ended with indicated airspeed at about 104 kts and the pressure altitude at -84 ft.

In the prior flight after the initial climb, the indicated airspeed increased to about 190 kts while both engine propeller speeds were at about 90 %RPM.

The corresponding tabular data used to create figures 1 and 3 were provided in electronic comma separated value (*.csv) format as attachment 1 to this report. Additionally, the corresponding tabular data used to create figures 2 and 4 were provided in electronic comma separated value (*.csv) format as attachment 2 to this report.

² This FDR records pressure altitude, which is based on a standard altimeter setting of 29.92 inches of mercury (in Hg) and has not been corrected for the local altimeter setting at the time of the event.

Figure 1. Plot of parameters during event flight – entire recording.

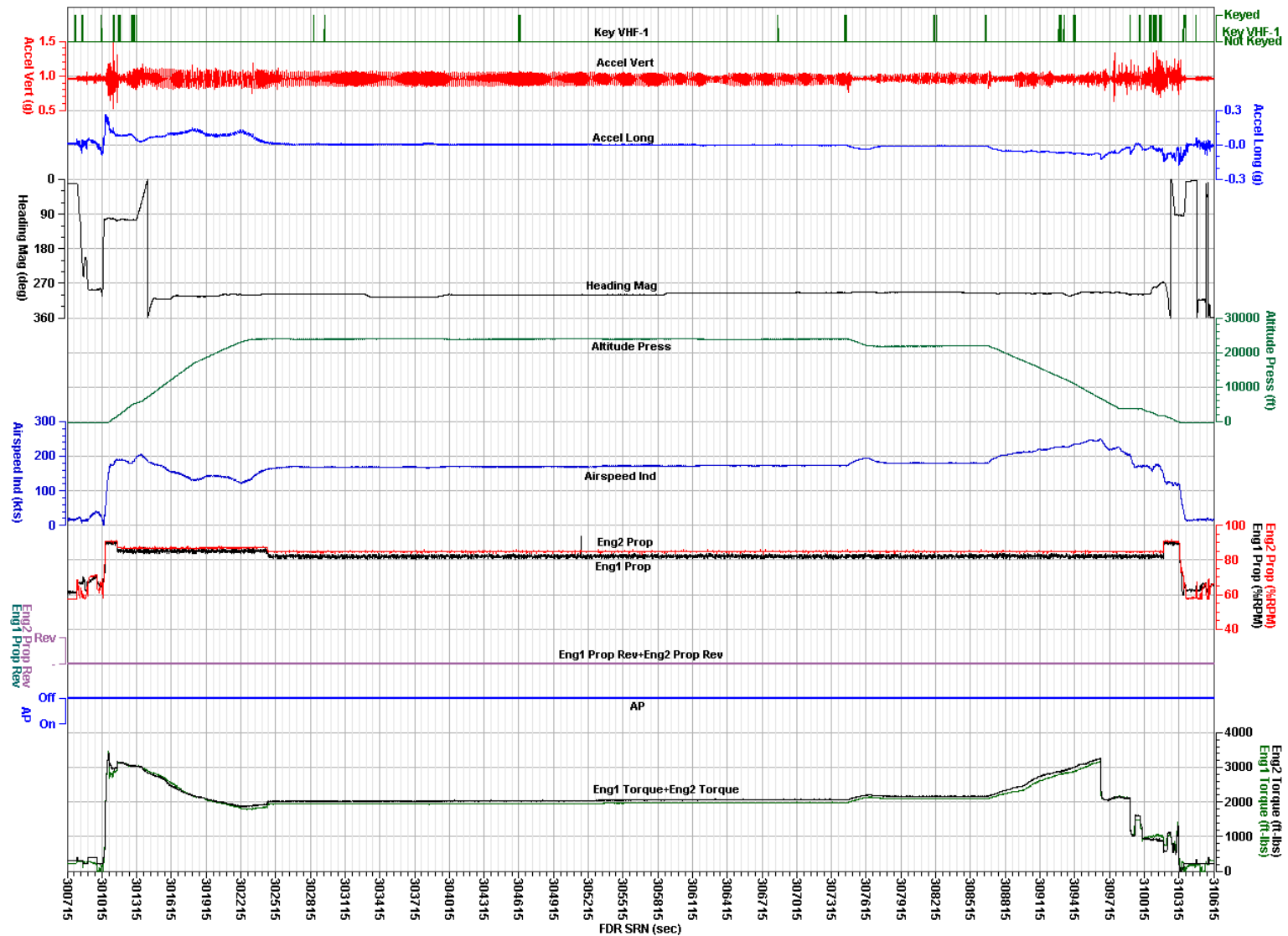


Revised: 26 February 2016

Event

National Transportation Safety Board

Figure 2. Plot of parameters during prior flight.

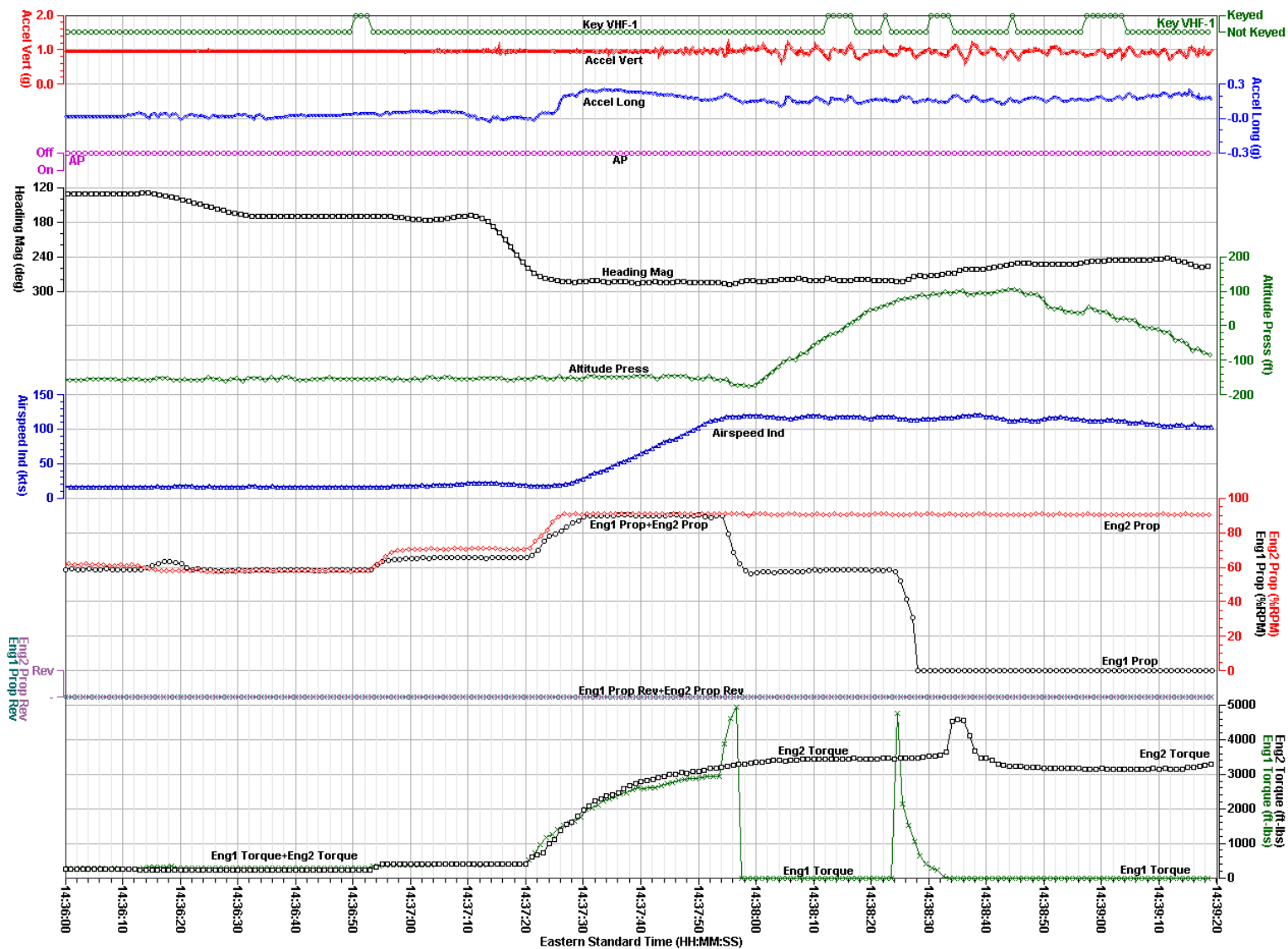


Revised: 26 February 2016

Prior Flight - Entire

National Transportation Safety Board

Figure 3. Plot of parameters during event flight - expanded scale at takeoff.

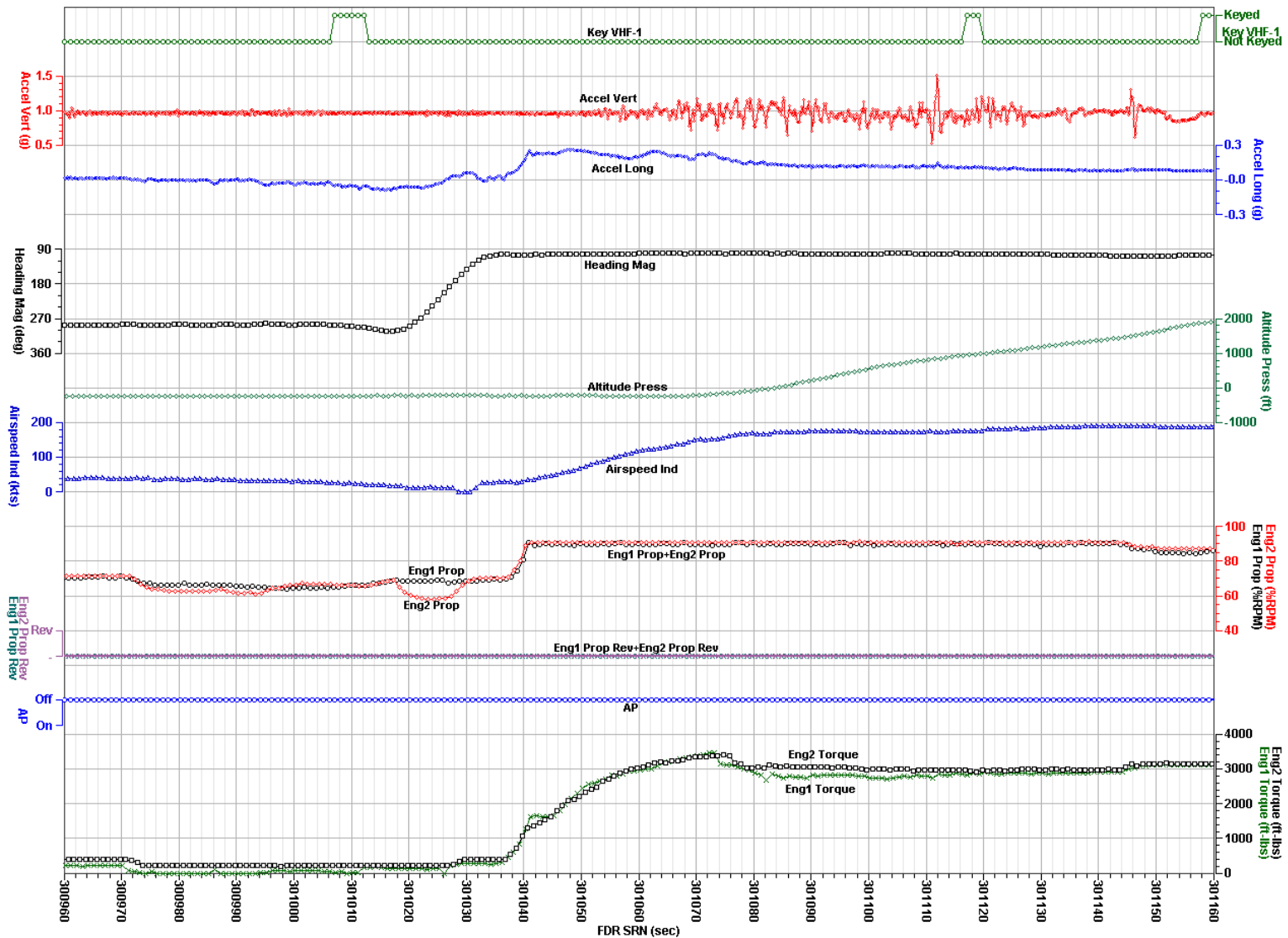


Revised: 14 March 2016

Event - Expand at Takeoff

National Transportation Safety Board

Figure 4. Plot of parameters during prior flight - expanded scale at takeoff.



Revised: 26 February 2016

Prior Flight - Expand at Takeoff

National Transportation Safety Board

APPENDIX A

This appendix describes the parameters provided and verified in this report. Table A-1 lists the parameters and table A-2 describes the unit abbreviations used in this report.

Table A-1. Verified and provided FDR parameters.

Parameter Name	Plot/Table Label	Unit
1. Autopilot Engaged	AP	
2. Engine 1 Propeller Reverse	Eng1 Prop Rev	
3. Engine 1 Propeller Speed	Eng1 Prop	%RPM
4. Engine 1 Torque	Eng1 Torque	ft-lbs
5. Engine 2 Propeller Reverse	Eng2 Prop Rev	
6. Engine 2 Propeller Speed	Eng2 Prop	%RPM
7. Engine 2 Torque	Eng2 Torque	ft-lbs
8. Indicated Airspeed	Airspeed Ind	kts
9. Longitudinal Acceleration	Accel Long	g
10. Magnetic Heading	Heading Mag	deg
11. Microphone 1 Keying	Key VHF-1	
12. Pressure Altitude	Altitude Press	ft
13. Vertical Acceleration	Accel Vert	g

NOTE: This FDR records pressure altitude, which is based on a standard altimeter setting of 29.92 inches of mercury (in Hg). The pressure altitude information presented in the FDR plots and in the electronic data has not been corrected for the local altimeter setting at the time of the event.

NOTE: Parameters with a blank unit description in table A-1 are discretes. A discrete is typically a 1-bit parameter that is either a 0 state or a 1 state where each state is uniquely defined for each parameter.

Table A-2. Unit abbreviations.

Units Abbreviation	Description
%RPM	percent revolutions per minute
deg	degrees
ft	feet
ft-lbs	foot pounds
g	g
kts	knots