National Transportation Safety Board
Office of Research and Engineering
Washington, D.C. 20594

Airplane Performance

Wreckage Site Factual Report

A. ACCIDENT

Location:	Denver, CO
Date:	December 23, 2008
Time:	0018 GMT (6:18 pm MST)
Airplane:	Boeing B-737-500, N18611
NTSB Number:	DCA09MA021

B. GROUP

Chairman: Timothy Burtch
National Transportation Safety Board
Washington, DC

Member: Joseph Bracken
Senior Staff Engineer
Air Line Pilots Association

Member: Steve O'Neal
Senior Flight Test Engineer
FAA

Member: Doug Wood
Manager of Technical Flight Data
Continental Airlines

C. SUMMARY

On December 20, 2008, at 1818 mountain standard time (MST), Continental flight 1404, a Boeing 737-500 (registration N18611), equipped with CFM56-3B1 engines, departed the left side of runway 34R during takeoff from Denver International Airport (DEN). The scheduled, domestic passenger flight, operated under the provisions of Title 14 CFR Part 121, was enroute to George Bush Intercontinental Airport (IAH), Houston, Texas. There were 37 injuries among the passengers and crew, and no fatalities. The airplane was substantially damaged and experienced a post-crash fire. The weather observation in effect at the time of the accident was reported to be winds at 290 and 24 knots with gusts to 32 knots, visibility of 10 miles, a few clouds at 4000 feet and scattered clouds at 10,000 feet. The temperature was reported as -4 degrees Celsius.

D. DETAILS OF FIELD INVESTIGATION

Wreckage

The NTSB team arrived at the accident site on Sunday afternoon. After the Organizational Meeting, there was little daylight remaining. As a result, the Airplane Performance group did not begin surveying the accident site until the following morning.

Upon arriving at the accident scene the next morning, the group noted that there were visible tire marks from the main and nose gear on runway 34R that veered off approximately 2500 ft down the runway. See Figure 1.

Figure 1: The Airplane Departed Approximately 2500 ft from 34R Threshold

The main gear tire marks continued through a grassy area at approximately 10° to the left of the runway centerline, with no nose gear mark visible. The tracks then crossed taxiway (WC) where they were momentarily lost just beyond the taxiway. All three gear tracks then reappeared. In addition, this area showed what appeared to be heavy scrapping from the engine nacelles on the ground. There was a black fluid deposit in the nose gear track shortly beyond where the nose gear tracks reappeared. The main gear tracks disappeared just prior to the engine nacelle scrapes. See Figure 2.

Figure 2: All Gear Tracks Reappear Beyond Taxiway Along with Engine Nacelles

Engine nacelle and fuselage scraping proceeded over a service road and continued to the final resting place of the airplane. See Figure 3

Figure 3: Final Resting Location of Airplane

Site Documentation

The Airplane Performance Group surveyed the complete ground path of the accident airplane and identified significant witness marks with survey paint. Three primary areas of concentration emerged from the survey: the areas surrounding the airplane, the impact point beyond the taxiway, and the runway. There were 34 points of interest tagged for further documentation. See Table 1.

After identifying the interesting points, the group went back and took GPS measurements using two independent systems: a hand-held GPS unit and Denver International Airport's (DIA) surveying system. Pictures were also taken.

NTSB	DIA	Description	Latitude		Longitude	
1	2001	Aircraft (Right Wing Root)	39	52.634	104	41.377
2	2002	Left Main Landing Gear	39	52.639	104	41.365
3	2003	Right Main Landing Gear	39	52.585	104	41.344
4	2004	Aircraft Entry Service Road	39	52.559	104	41.345
5	2005	NLG Hydraulic Splatter	39	52.545	104	41.337
6	2006	NLG "part"	39	52.545	104	41.337
7	2007	NLG "O-ring"	39	52.546	104	41.338
8	2008	NLG Touchdown (field)	39	52.540	104	41.333
9	2009	Right Eng Touchdown (Field)	39	52.541	104	41.329
10	2010	Left Eng Touchdown (Field)	39	52.538	104	41.336
11	2011	End MLG Impact (Field)	39	52.538	104	41.331
12	2012	Begin MLG Impact (Field)	39	52.535	104	41.330
13	2013	Aircraft Exit Taxiway	39	52.512	104	41.316
14	2014	Centerline RMLG on Taxiway	39	52.499	104	41.307
15	2015	Centerline LMLG on Taxiway	39	52.500	104	41.310
16	2016	Unknown Plastic Piece (grass)	39	52.460	104	41.290
17	2017	Centerline Gear Track (grass)	39	52.443	104	41.282
18	2018	Rubber Deposit on Clay (grass)	39	52.440	104	41.283
19	2019	Centerline Gear Track (grass)	39	52.398	104	41.266
20	2020	Centerline Gear Track (grass - FDM9))	39	52.341	104	41.255
21	2021	Centerline LMLG (rwy - 2620' from threshold)	39	52.278	104	41.244
22	2022	Centerline RMLG (rwy - 2620' from threshold)	39	52.279	104	41.238
23	2023	Centerline LMLG (rwy - 2300' from threshold)	39	52.226	104	41.234
24	2024	Centerline RMLG (rwy - 2300' from threshold)	39	52.225	104	41.230
25	2025	Outer RMLG Tire Cross Centerline (rwy)	39	52.199	104	41.226
26	2026	Centerline LMLG (rwy - 2040' from threshold)	39	52.182	104	41.230
27	2027	Centerline RMLG (rwy - 2040' from threshold)	39	52.182	104	41.227
28	2028	NLG Initial Tire Mark	39	52.177	104	41.229
29	2029	Centerline LMLG Initial Tire Mark	39	52.160	104	41.230
30	2030	Centerline RMLG Initial Tire Mark	39	52.161	104	41.228
31	2031	Left Wing Tip	39	52.629	104	41.389
32	2032	Tail	39	52.627	104	41.372
33	2033	Right Wing Tip	39	52.637	104	41.368
34	2034	Nose	39	52.642	104	41.386

Table 1: 34 Points of Interest

The GPS data were processed and over-layed on a satellite image of DEN Runway 34R. These data are depicted in Figures 4 and 5. The numbers in the figures correspond to the NTSB numbers in Table 1. The red placemarks in the figures indicate the four corners of the airplane. A compass measurement indicated that the airplane came to rest on a magnetic heading of approximately 315°.

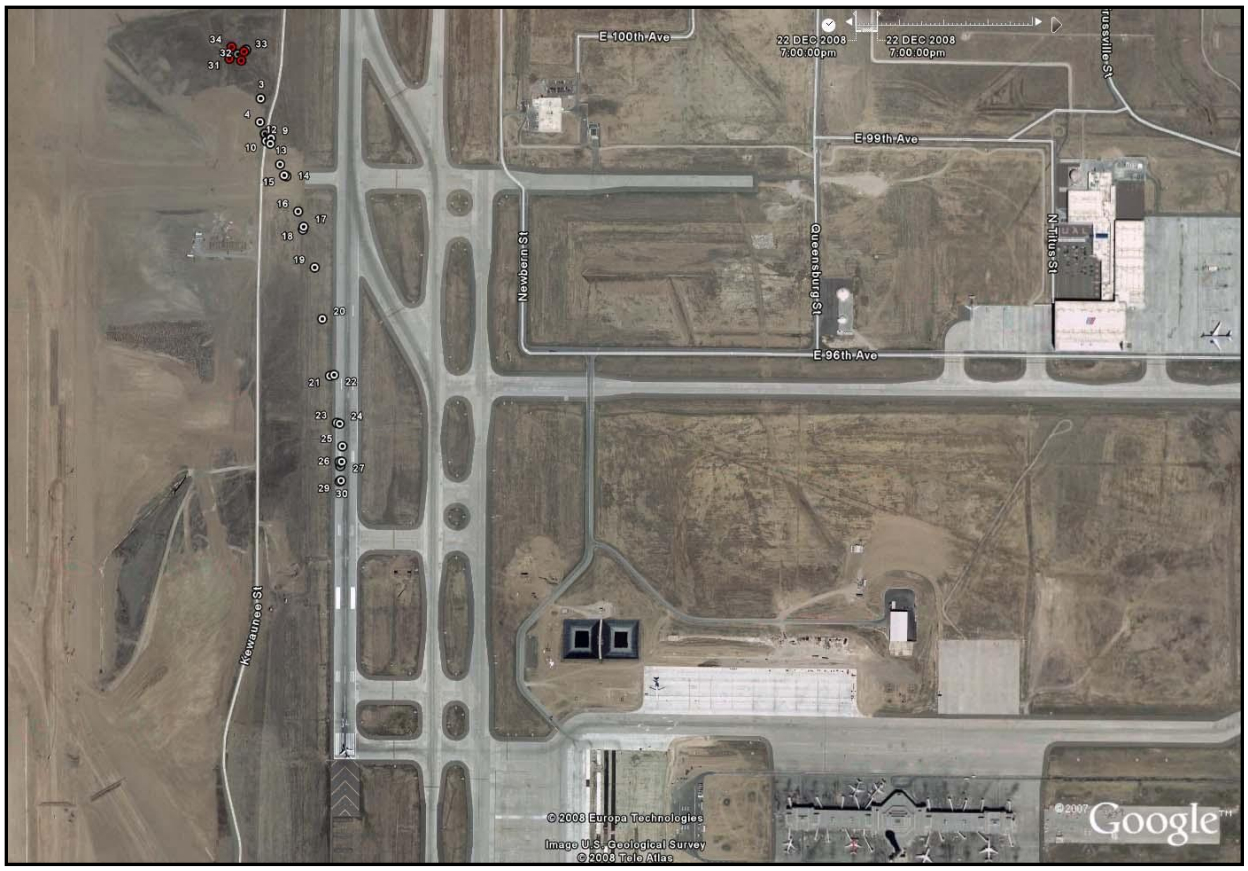


Figure 4: GPS Placemark Overlay

Figure 5: GPS Placemark Overlay, Zoomed

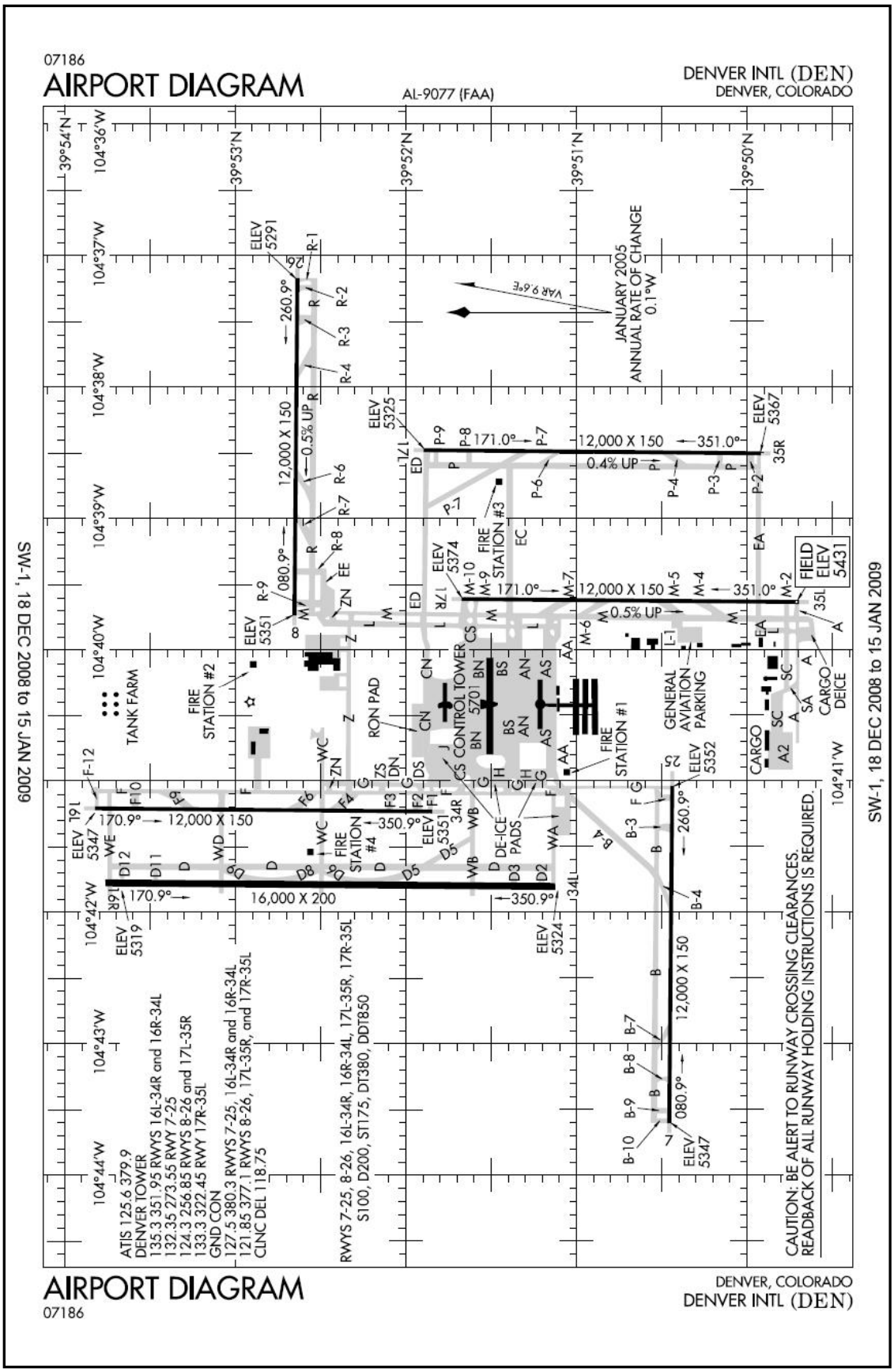
Aircraft Configuration (see Operations Factual for more details)

The aircraft was properly configured for take-off, and there were no obvious system malfunctions. The engines appeared to be producing the commanded take-off power.

Weather (see Meteorogical Factual for more details)

A Special weather report was taken at 1834 MST and indicated winds 290˚/24 kts, gusts 32, visibility 10 statute miles, a few clouds at 4,000, scattered clouds at 10,000, temperature -4˚C, dew point -18˚C, altimeter setting 29.98 in Hg. The tower reported winds of 270˚/27 kts with the take-off clearance.

Timothy Burtch
Senior Aerospace Engineer



Attachment 1: NOS/NACO Airport Diagram for DEN