

CALLBACK

From NASA's Aviation Safety Reporting System



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OVERWEIGHT and out of Balance



Feeling a bit heavy? Got weight in the wrong places? If it's a personal problem, you can blame the holidays. But, if it's an aircraft issue, the culprit is likely to be a weight and balance error. At best, overloaded or improperly balanced aircraft experience degraded performance and handling. Large errors can result in the loss of stability and control.

Running the Numbers

This B737-300 flight crew did not follow up on the first clue that the load numbers were off. As the Captain reported, it took five more clues and a firm landing to confirm their suspicions.

■ *The load sheet was given to us for an on-time pushback and the First Officer loaded the numbers in the Performance Computer and Control Display Unit (CDU) per normal operations. No discrepancies were noted at this time. However, I thought that the V-speeds seemed lower than what they should have been (clue #1). The passenger count on the load sheet and the flight attendant passenger count matched.... The takeoff...was normal. We initially set the throttles at 90% and left them there. This helped our takeoff performance but also probably helped hide the weight discrepancy.... The First Officer informed me that the aircraft seemed to fly as though it was heavier than we had calculated, but he thought that the trim setting might have been a little off (clue #2).... The descent was a little behind the profile required to make the crossing altitudes (clue #3). We were having trouble slowing the aircraft and getting it down on the approach with flaps 30-degrees as briefed (clue #4). We elected to use flaps 40-degrees, but still could not meet the stabilized approach criteria, so we asked for Runway 4. Tower was unable to give us Runway 4, so we elected to go around. This probably helped our performance since the fuel used on the go-around lowered our gross weight for the subsequent approach and landing.... On the second approach we both noticed that the aircraft was unusually nose high for flaps 30-degrees and that more power than normal was required to maintain our calculated approach speed (clue #5). We actually flew ten knots faster than our calculated approach speed in order to have better control over our pitch attitude. At one point during the approach I noticed the stall indicator appear at the top of the Heads Up Display (HUD) and then go away (clue #6). At this point we knew that something was wrong, but even with all the clues we did not know what it was. The approach ended with a hard landing. It finally dawned on me that perhaps our weights were wrong on the load sheet.... When we checked the load sheet we realized that the agent had not added the passenger and cargo weight to the OEW (Operational Empty Weight) and had used the OEW as the Zero Fuel Weight (ZFW). This resulted in a 22,000 lb. error in our performance calculations.*

Heavy Baggage

Failure to account for the additional weight of passenger's "heavy" bags can have a significant effect on the performance and control of smaller aircraft. In the first of two ASRS reports that address this matter, a Jetstream 41 crew wisely delayed their departure because of suspicious indications.

■ *The baggage loading and count was delayed and the baggage form got to the crew late. Wanting to make an on-time takeoff, we completed our calculations as quickly as possible.... While taxiing out to the runway, the stall lights on the CAP (Central Annunciator Panel) momentarily flashed on and off. This occurred twice during taxi. We referred to the QRH (Quick Reference Handbook) and rechecked circuit breakers. No other indications occurred at this time so I assumed it was a malfunctioning stall system. We decided to return to the gate to investigate. While taxiing back, I noticed that the nosewheel steering was becoming intermittent.... When maintenance arrived, they indicated that the nosewheel was considerably extended. I asked the flight attendant to move two passengers to empty seats in the forward portion of the cabin. Maintenance indicated that the strut had compressed some, so I decided to taxi back to the gate. The nosewheel steering worked fine. At the gate...the First Officer indicated that there was a 350 lb. error in his calculations of the baggage.... Also, the ramp inspectors informed me that the baggage count was correct, but some heavy bags were indeed "very heavy" and were loaded in the aft end of the compartment.*

This ERJ 145 Captain's report on a heavy baggage incident was the subject of a recent ASRS Alert Bulletin.

■ *The baggage slip indicated that we had 2,204 lbs. of bags. At rotation I noted that the trim setting was clearly incorrect and I had to push the elevator to the forward limit to recover from the nose up pitch. The aircraft seemed to be much heavier aft than calculated. After arriving at [destination] the ramp personnel indicated that the baggage seemed excessively heavy. The bags were weighed and the recalculated figure put the cargo weight approximately 1,095 lbs. over the maximum limit.*

An Alarming Takeoff

After making mistakes that almost led to an accident, this C172 pilot generously shared the experience through ASRS. It would be a mistake not to heed the lesson.

■ *[I] proceeded with the departure on a grass strip approximately 2,200 feet long. At 60 kts. I rotated and started to climb. I had packed the plane and messed up because I had an aft center of gravity. Without enough runway left to put down, I climbed (with the stall warning screaming) to avoid trees at the end of the runway. [I] just cleared the trees. The contributing factors were too much baggage, not knowing the density altitude, and complacency. Thank God I am still around to share this lesson.*

ASRS Recently Issued Alerts On...

B737-800 In-flight fuel leak
Foreign airport ILS identifier chart error
A320 released with disconnected brakes
Portable Breathing Equipment canister fire
ERJ 135 cockpit seat movement on takeoff

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November 2003 Report Intake

Air Carrier / Air Taxi Pilots	1999
General Aviation Pilots	663
Controllers	27
Cabin/Mechanics/Military/Other	83
TOTAL	2772

Holiday Hints



Holiday pressures can affect concentration and judgement. Three ASRS reports offer some valuable lessons about this seasonal syndrome.

Just after an airport “turnaround” (from south to north oriented runway operations), this A310 flight crew was given clearance to cross an active runway enroute to the assigned runway. The Captain picks up the story as they approached the hold short line of the intermediate runway.

■ *I immediately saw a DC10 on short final for Runway 27 and slammed on the brakes.... We did encroach slightly on the Taxiway B to Runway 27 hold short line.... The DC10 did not appear to take any evasive action.... I strongly suspect that there were considerable distractions for the controllers associated with turning the field around from southerly to northerly operations. “Habit patterns for survival” saved the day. That is: 1. There were no distractions (e.g. no Flight Management Computer programming) prior to crossing the active runways, and 2. Good aircraft alignment and lookout facilitated properly clearing both left and right before crossing active runways and taxiways.*

This was quite a jolt, even for an experienced and proficient Captain and reinforces why we do things the way we do. A piece of wisdom (from a 40-year airline veteran) came to mind as I reviewed these issues, “It’s the holidays, and people don’t concentrate like they do at other times.” ▲

Several reports in the November 2003 Callback (#290) addressed the problem of unplanned flight into Instrument Meteorological Conditions (IMC). Another report on this dangerous practice offers a timely lesson: Don’t let the pressure to get home for the holidays cloud your judgement.

■ *I departed in VFR conditions with a weather briefing from the Flight Service Station (FSS) forecasting VFR to Marginal VFR along my route of flight. After climbing through scattered clouds, I leveled at 8,500 feet MSL. Near my destination, the layer below closed and I found myself on top of an overcast. By that time, ASOS at my departure point was also reporting overcast (the flight distance was only 80 NM). Weather was clearly building in all directions. I proceeded to a point above terrain well known to me and descended through clouds to approximately 1,000 feet AGL, where I broke out [and landed] at a nearby airfield.*

The weather was forecast to worsen in the direction of flight. When it became clear that I would be unable to

proceed VFR under the clouds with sufficient altitude above the ground, the appropriate decision would have been to return to my departure point immediately. I felt pressed to get my errands done and get home for the holidays, and this affected my judgement when I decided to climb above and continue the flight. I have instrument training, but have not yet been rated. ▲

Holiday fatigue and haste contributed to this private pilot’s runway incursion.

■ *After landing on Runway 36, I was instructed by Tower to make a right turn on the next taxiway and hold short of Runway 6.... My attention was not where it should have been. I was concentrating on the distant taxiway and ramp lighting and on my desire to finish this flight and return to my home base. As a result of my lack of attention, I proceeded to cross Runway 6 without clearance and with an aircraft on final for Runway 6. I was immediately advised and admonished for my error.... I was tired due to the holidays and my personal workload.... As the saying goes, haste makes waste....* ▲

From the Maintenance Desk

ASRS continues to receive reports concerning B767 wheel spacers. (see Callback #282, March 2003). The following two reports shed some light on possible causes for spacer problems on the nose gear .

■ *Even with the proper manuals and paperwork on hand, the spacer on the B767 nose wheels seems to be a trap. It continually sticks to the wheel bearing when the assembly is removed from the aircraft. The 767 has the only nose wheel spacer of [my airline’s] fleet types. This and the fact that B767 tires are rarely changed at this station contribute to the spacer being missed.*

■ *I was notified by my supervisor that an axle spacer was found to be missing on the right side nose tire during the walk-around inspection.... On the B767-300 there are two different axle configurations. One is internally threaded and the other is externally threaded. I did not think the externally threaded axle required a spacer.*

According to the air carrier’s maintenance manual, wheel spacers are required on both the internally and the externally threaded B767 nose gear axles.