



## **NATIONAL TRANSPORTATION SAFETY BOARD**

Office of Aviation Safety  
Western Pacific Region

June 2, 2022

# **WEIGHT AND BALANCE AND PERFORMANCE SUMMARY**

**WPR22FA164**

This document contains 0 embedded photos.

## A. ACCIDENT

Location: Cedar City, Utah  
Date: April 23, 2022  
Aircraft: Diamon Aircraft Ind Inc, DA 40, N321PF  
NTSB Investigator-in-Charge: Eric M. Gutierrez

## B. Weight and Balance information

An estimated weight and balance of the airplane prior to flight was calculated using the following:

- Most recent weight and balance, dated January 18, 2022
- Reported or measured weights of the occupants
- No baggage
- Full fuel levels and -5 gallons
- Front seat positions at common range
- Rear seat passengers at common range

Fuel - Full			
Item	Weight	Arm	Moment
Airplane	1754	97.05	170227.5
Front (Pilot)	215	90.6	19479
Front (Pass)	195	90.6	17667
Rear (Pass)	200	128	25600
Rear (Pass)	170	128	21760
Baggage	0	120	0
Fuel (40 gal)	240	103.5	24840
Totals	2774	100.7835256	279573.5

Figure 1: View of airplane weight and balance with full fuel.

Fuel - -5 Gallons			
Item	Weight	Arm	Moment
Airplane	1754	97.05	170227.5
Front (Pilot)	215	90.6	19479
Front (Pilot)	195	90.6	17667
Rear (Pass)	200	128	25600
Rear (Pass)	170	128	21760
Baggage	0	120	0
Fuel (35 gal)	210	103.5	21735
<b>Totals</b>	<b>2744</b>	<b>100.7538265</b>	<b>276468.5</b>

Figure 2: View of airplane weight and balance with 35 gal of fuel.

Utilizing full fuel levels (40 gallons), reported or measured occupant weight, no baggage, the weight of the airplane was estimated to be about 128 lbs over the maximum gross weight. The center of gravity (CG) was calculated using the passenger and seat locations in the most favorable position and was found to be outside the published CG envelope.

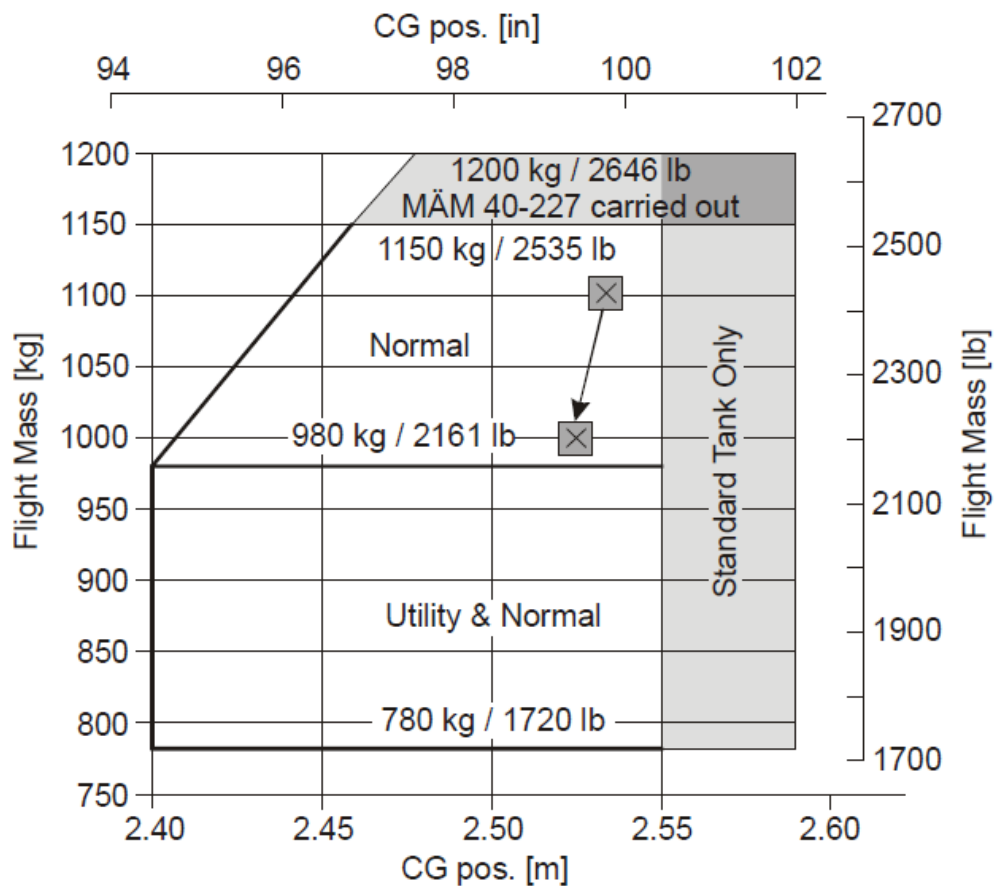


Figure 3: View of center of gravity range from airplane flight manual.

### C. Performance

The automated weather observation station located on the airport reported that, about the time of the accident, the temperature was 9° C, dew point was -8° C and the barometric pressure was 30.10.

The calculated density altitude from the Cedar City Regional Airport, Cedar City, Utah, at the time of departure was about 6,022 ft and a pressure altitude of 5,457 ft.

The calculated density altitude at the accident location and time of the accident was about 7,203 ft and a pressure altitude of 6,418 ft.

Utilizing the performance instructions noted within the airplane flight manual, the assumed altitude and air density conditions, the calculated climb performance would have been about 300 ft per minute (fpm).

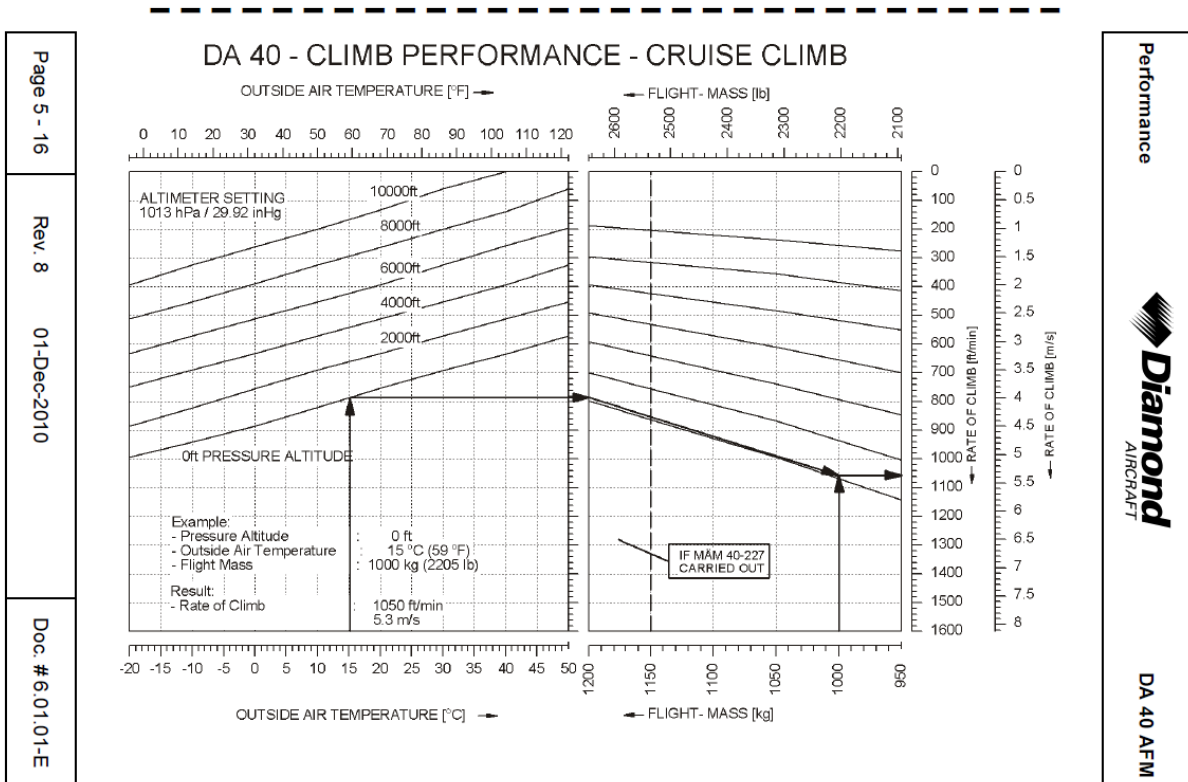


Figure 4: View of climb performance chart from airplane flight manual.

Submitted by: Eric M. Gutierrez