

National Transportation Safety Board

Office of Aviation Safety

Washington, DC 20594



WPR24LA296

FOLLOW-UP EXAMINATION SUMMARY

October 24, 2024

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A. ACCIDENT

Location: Vernal, Utah
Date: May 22, 2024
Time: 1030 MDT
Airplane: N8580T Cessna 182C

B. FOLLOW-UP EXAMINATION SUMMARY ATTENDEE

IIC Eleazar Nepomuceno
National Transportation Safety Board
Federal Way, Washington

C. SUMMARY

On May 22, 2024, about 1030 mountain daylight time, a Cessna 182C, N8580T, was substantially damaged when it was involved in an accident near Vernal, Utah. The pilot and 2 passengers were not injured. The airplane was operated as a Title 14 Code of Federal Regulations Part 91 personal flight.

The pilot reported that while on 5-mile final for runway 17 at the Vernal Regional Airport (VEL), Vernal, Utah, he performed a slip briefly to lose altitude. As the airplane was about 3 miles from the runway, he reduced engine power and extended the flaps to 40°. Shortly after, the engine “stumbled” and lost total power. Despite his attempts, the pilot was unable to restart the engine and initiated a landing to an open field. During the off-airport landing, the airplane landed hard, which resulted in substantial damage to the fuselage.

The airplane was recovered to a field on airport property (see figure 1). The insurance company decided to not recover the aircraft to a salvage facility. The examination took place on October 24-25, 2024, on airport property.

No mechanical or preimpact anomalies were annotated during the examination.



Figure 1. View of the recovered accident airplane

D. DETAILS OF THE EXAMINATION

1.0 Airframe Examination

1.1 Fuselage

The lower fuselage, below the left and right side rudder control pedals were compressed, consistent with impact damage.

1.2 Empennage

The empennage was found unremarkable.

1.3 Wings

The right wing was found unremarkable. The leading edge of the outboard section of the left wing, about 2 feet, was bent up, consistent with impact damage. The left and right lift-struts remained secured to its respective attachment points on the wing and fuselage.

1.4 Landing Gear

The nose landing gear was damaged and collapsed into the engine compartment. The left and right landing gears remained attached to the fuselage.

1.5 Cockpit

The floor boards had compression damage consistent with a hard landing.

1.6 Fuel/Fuel System

The fuel selector lever was found in the OFF position. The lever was moved to each position (LEFT, BOTH, RIGHT) and moved without binding and remained in the detent for each position. The pilot reported that the lever was in the LEFT position during the accident sequence. The left and right fuel tanks were not compromised. The left tank was devoid of fuel during the examination. ON the day of the accident, the LEO on scene reported that they could not recover any fuel from the left and right tank, possibly due to the orientation of the wing when the airplane came to rest.

2.0 Engine Examination

Examination of the recovered engine revealed that the engine remained attached to the airframe via the engine mounts. All six cylinders and all engine accessories remained attached. All accessible fuel and oil lines were secure to its corresponding attachment point. No evidence of any mechanical damage was observed to the engine crankcase or cylinders.

The rocker box covers were removed. The intake and exhaust rocker arms were intact, and oil coated residue was seen in all cylinders. All intake and exhaust valve springs were in place and visually appeared to be undamaged. The upper spark plugs were removed, and all six cylinders were examined internally using a lighted borescope. A normal amount of combustion deposits was observed within the combustion dome of each cylinder and piston face. All the intake and exhaust valves were unremarkable. The crankshaft was rotated by hand using the propeller to access the cylinder chamber but rotational continuity was not established throughout the engine and valve train due to the position of the airplane that prevented full rotation of the propeller.

The top engine spark plugs were removed from the engine, and they were the massive electrode type. The sparkplugs exhibited black deposits within the electrode area. All spark plugs exhibited signatures consistent with NORMAL when compared to the Champion Check-A-Plug comparison chart.

The carburetor remained attached to the engine and was unremarkable. The throttle and mixture control cable remained attached to the servo and unremarkable. The throttle and mixture control moved the available length.

The air induction body remained attached and was impact damaged. The air induction conduit was clear of obstructions and debris.

The magnetos remained secure to the engine. The terminals and contact points in each magneto were found unremarkable.

3.0 Propeller Examination

The fuel servo remained attached to the engine and was unremarkable. Both propeller blades remained secured to the propeller hub. One blade was found unremarkable; the other blade had aft bending about midspan.

4.0 Fuel Calculations

The pilot reported that he switched the fuel selector lever every 30 minutes during his flight to balance the fuel load. The pilot reported that about 71 miles from his destination, he calculated that the right tank gauge was about 1/3 and that the left tank was less than 1/2 and added that he needed about 7 gallons of fuel or 30 minutes of flight. The pilot further reported that he was in a steep slip descent and that the engine was still configured to be lean.

Notes		
Weight	2,385	
Fuel capacity	55 usable	gal
Cruise power setting	2,300	rpm
Fuel at depart	55	gal

Fuel Calculations using POH with fuel selector lever position to BOTH at takeoff

Phase	Time	Altitude ft	Fuel remaining	Fuel consumed (gal)	Tank
Depart and climb (incl. 3 gal for start, taxi, and takeoff per chart)	7:07:45	(4473) ft MSL	55 Total, 27.5 L, 27.5 R	6	BOTH
level to cruise	7:18:06	9,900	49 T, 24.5 L, 24.5 R	(using 5.5 per 30 min per POH)	
Descent to	7:18:32	9700		1	BOTH
Climb to	7:22:58	9,800	48 T, 24.0 L, 24.0 R		Switch to right
Descent to	7:24:16	9,600			
Climb to	7:34:34	9,700			
Descent to	7:36:17	9,600			

Climb to	7:38:50	9,700			
Descent to	7:39:34	9,600			
Climb to	7:40:11	9,800			
Descent to	7:44:10	9,600		5.5	
Climb to	7:50:30	9,700	42.5 T, 24.0 L, 18.5 R		Switch to left
Descent to	7:52:46	9,500			
Climb to	7:56:52	9,800			
Descent to	7:59:54	9,600			
Climb to	8:01:21	9,800			
Descent to	8:03:54	9,500			
Climb to	8:05:43	9,700			
Descent	8:06:54	9,500			
Climb to	8:08:44	9,800			
Descent to	8:14:39	9,500			
Climb to	8:16:01	9,600			
Descent to	8:16:40	9,500		5.5	
Climb to	8:18:53	9,800	37 T, 18.5 L, 18.5 R		Switch to right
Descent to	8:25:17	9,700			
Climb to	8:28:14	9,800			
Descent to	8:31:13	9,600			
Climb to	8:34:23	9,800			
Descent to	8:37:04	9,600			
Climb to	8:40:04	9,700			
Descent to	8:41:57	9,600			
Climb to	8:42:14	9,700			
Descent to	8:45:25	9,500		5.5	
Climb to	8:48:59	10,600	31.5 T, 18.5 L, 13.0 R		Switch to left
Descent to	8:59:15	10,500			
Climb to	9:01:05	10,700			
Descent to	9:08:46	10,500			
Climb to	9:11:32	10,900			
Descent to	9:16:09	10,500			
Climb to	9:18:15	10,800		5.5	
Descent to	9:22:43	10,500	26.0 T, 13.0 L, 13.0 R		Switched to Right
Climb to	9:28:46	10,800			
Descent to	9:42:38	10,600		5.5	
Climb to	9:52:11	11,700	20.5 T, 13.0 L, 7.5 R		Switched to left
Descent to	10:11:08	11,500			
Climb to	10:17:59	11,600			

Descent to	10:19:07	11,200		5.5	
	10:20:08	11,000	15 T, 7.5 L, 7.5 R		Still Left
	10:21:11	10,600			
	10:22:17	10,100			
	10:23:29	9,400			
	10:24:44	8,700			
	10:25:24	7,600			
	10:26:25	6,700			
	10:27:25	5,700		1	
	10:28:31		14 T, 6.5 L, 7.5 R		

Fuel Calculations using POH with fuel selector lever position to LEFT at takeoff

Phase	Time	Altitude ft	Fuel remaining	Fuel consumed (gal)	Tank
Depart and climb (incl. 3 gal for start, taxi, and takeoff per chart)	7:07:45	(4473) ft MSL	55 Total, 27.5 L, 27.5 R	6	Left
level to cruise	7:18:06	9,900	49 T, 21.5 L, 27.5 R	(using 5.5 per 30 min per POH)	Switch to right
Descent to	7:18:32	9700		1	
Climb to	7:22:58	9,800	48 T, 21.5 L, 26.5 R		Stay Right
Descent to	7:24:16	9,600			
Climb to	7:34:34	9,700			
Descent to	7:36:17	9,600			
Climb to	7:38:50	9,700			
Descent to	7:39:34	9,600			
Climb to	7:40:11	9,800			
Descent to	7:44:10	9,600		5.5	
Climb to	7:50:30	9,700	42.5 T, 21.5 L, 21.0 R		Switch to left
Descent to	7:52:46	9,500			
Climb to	7:56:52	9,800			
Descent to	7:59:54	9,600			
Climb to	8:01:21	9,800			
Descent to	8:03:54	9,500			
Climb to	8:05:43	9,700			
Descent to	8:06:54	9,500			
Climb to	8:08:44	9,800			
Descent to	8:14:39	9,500			
Climb to	8:16:01	9,600			
Descent to	8:16:40	9,500		5.5	
Climb to	8:18:53	9,800	37 T, 16.0 L, 21.0 R		Switch to right
Descent to	8:25:17	9,700			
Climb to	8:28:14	9,800			
Descent to	8:31:13	9,600			
Climb to	8:34:23	9,800			
Descent to	8:37:04	9,600			
Climb to	8:40:04	9,700			
Descent to	8:41:57	9,600			

Climb to	8:42:14	9,700			
Descent to	8:45:25	9,500		5.5	
Climb to	8:48:59	10,600	31.5 T, 16.0 L, 15.5 R		Switch to left
Descent to	8:59:15	10,500			
Climb to	9:01:05	10,700			
Descent to	9:08:46	10,500			
Climb to	9:11:32	10,900			
Descent to	9:16:09	10,500			
Climb to	9:18:15	10,800		5.5	
Descent to	9:22:43	10,500	26 T, 10.5 L, 15.5 R		Switched to Right
Climb to	9:28:46	10,800			
Descent to	9:42:38	10,600		5.5	
Climb to	9:52:11	11,700	20.5 T, 10.5 L, 10.0 R		Switched to left
Descent to	10:11:08	11,500			
Climb to	10:17:59	11,600			
Descent to	10:19:07	11,200			
	10:20:08	11,000		5.5	
	10:21:11	10,600	15 T, 5.0 L, 10.0 R		Stay left
	10:22:17	10,100			
	10:23:29	9,400			
	10:24:44	8,700			
	10:25:24	7,600			
	10:26:25	6,700			
	10:27:25	5,700		1	
	10:28:31		14 T, 4.0 L, 11.0 R		

Fuel Calculations using POH with fuel selector lever position to RIGHT at takeoff

Phase	Time	Altitude ft	Fuel remaining	Fuel consumed (gal)	Tank Setting
Depart and climb (incl. 3 gal for start, taxi, and takeoff per chart)	7:07:45	(4473) ft MSL	55 Total, 27.5 L, 27.5 R	6	RIGHT
level to cruise	7:18:06	9,900	49 T, 27.5 L, 21.5 R	(using 5.5 per 30 min per POH)	
descent	7:18:32	9700		1	
climb	7:22:58	9,800	48 T, 27.5 L, 20.5 R		Stay on right
descent	7:24:16	9,600			
climb	7:34:34	9,700			
descent	7:36:17	9,600			
climb	7:38:50	9,700			
descent	7:39:34	9,600			
climb	7:40:11	9,800			
descent	7:44:10	9,600		5.5	
climb	7:50:30	9,700	42.5 T, 27.5 L, 15.0 R		Switch to left
descent	7:52:46	9,500			
climb	7:56:52	9,800			
descent	7:59:54	9,600			
climb	8:01:21	9,800			
descent	8:03:54	9,500			
climb	8:05:43	9,700			
descent	8:06:54	9,500			
climb	8:08:44	9,800			
descent	8:14:39	9,500			
climb	8:16:01	9,600			
descent	8:16:40	9,500		5.5	
climb	8:18:53	9,800	37 T, 22.0 L, 15.0 R		Switch to right
descent	8:25:17	9,700			
climb	8:28:14	9,800			
descent	8:31:13	9,600			
climb	8:34:23	9,800			
descent	8:37:04	9,600			
climb	8:40:04	9,700			
descent	8:41:57	9,600			

climb	8:42:14	9,700			
descent	8:45:25	9,500		5.5	
climb	8:48:59	10,600	31.5 T, 22.0 L, 9.5 R		Switch to left
descent	8:59:15	10,500			
climb	9:01:05	10,700			
descent	9:08:46	10,500			
climb	9:11:32	10,900			
descent	9:16:09	10,500			
climb	9:18:15	10,800		5.5	
descent	9:22:43	10,500	26 T, 16.5 L, 9.5 R		Switched to right
climb	9:28:46	10,800			
descent	9:42:38	10,600		5.5	
Climb	9:52:11	11,700	20.5 T, 16.5 L, 4.0 R		Switched to left
descent	10:11:08	11,500			
climb	10:17:59	11,600			
descent	10:19:07	11,200			
	10:20:08	11,000		5.5	
	10:21:11	10,600	15 T, 11.0 L, 4.0 R		Still Left
	10:22:17	10,100			
	10:23:29	9,400			
	10:24:44	8,700			
	10:25:24	7,600			
	10:26:25	6,700			
	10:27:25	5,700		1	
	10:28:31		14 T, 10.0 L, 4.0 R		

Fuel Calculations using ADS-B ground speed with fuel selector lever position to BOTH at takeoff

Phase – ADSB w knots	Time	Altitude ft	Fuel remaining	Fuel consumed (gal)	Tank
Depart and climb (incl. 3 gal for start, taxi, and takeoff per chart)	7:07:45	(4473) ft MSL	55 Total, 27.5 L, 27.5 R	6	BOTH
level to cruise	7:18:06	9,900@127 kts	49 T, 24.5 L, 24.5 R	(using ground speed)	
Descent to	7:18:32	9700		2	BOTH
Climb to	7:22:58	9,800@148 kts	47 T, 23.5 L, 23.5 R		Switch to right
Descent to	7:24:16	9,600			
Climb to	7:34:34	9,700			
Descent to	7:36:17	9,600			
Climb to	7:38:50	9,700			
Descent to	7:39:34	9,600			
Climb to	7:40:11	9,800			
Descent to	7:44:10	9,600		5	
Climb to	7:50:30	9,700@130 kts	42 T, 23.5 L, 18.5 R		Switch to left
Descent to	7:52:46	9,500			
Climb to	7:56:52	9,800			
Descent to	7:59:54	9,600			
Climb to	8:01:21	9,800			
Descent to	8:03:54	9,500			
Climb to	8:05:43	9,700			
Descent	8:06:54	9,500			
Climb to	8:08:44	9,800			
Descent to	8:14:39	9,500			
Climb to	8:16:01	9,600			
Descent to	8:16:40	9,500		5	
Climb to	8:18:53	9,800@127 kts	37 T, 18.5 L, 18.5 R		Switch to right
Descent to	8:25:17	9,700			
Climb to	8:28:14	9,800			
Descent to	8:31:13	9,600			
Climb to	8:34:23	9,800			

Descent to	8:37:04	9,600			
Climb to	8:40:04	9,700			
Descent to	8:41:57	9,600			
Climb to	8:42:14	9,700			
Descent to	8:45:25	9,500		6	
Climb to	8:48:59	10,600@108 kts	31 T, 18.5 L, 12.5 R		Switch to left
Descent to	8:59:15	10,500			
Climb to	9:01:05	10,700			
Descent to	9:08:46	10,500			
Climb to	9:11:32	10,900			
Descent to	9:16:09	10,500			
Climb to	9:18:15	10,800		7	
Descent to	9:22:43	10,500@96 kts	24 T, 11.5 L, 12.5 R		Switched to Right
Climb to	9:28:46	10,800			
Descent to	9:42:38	10,600		7	
Climb to	9:52:11	11,700@114 kts	17 T, 11.5 L, 5.5 R		Switched to left
Descent to	10:11:08	11,500			
Climb to	10:17:59	11,600			
Descent to	10:19:07	11,200		6	
	10:20:08	11,000@121 kts	11 T, 5.5 L, 5.5 R		Still Left
	10:21:11	10,600			
	10:22:17	10,100			
	10:23:29	9,400			
	10:24:44	8,700			
	10:25:24	7,600			
	10:26:25	6,700			
	10:27:25	5,700		2	
	10:28:31		9 T, 3.5 L, 5.5 R		

Fuel Calculations using ADS-B ground speed with fuel selector lever position to LEFT at takeoff

Phase – ADSB w knots	Time	Altitude ft	Fuel remaining	Fuel consumed (gal)	Tank
Depart and climb (incl. 3 gal for start, taxi, and takeoff per chart)	7:07:45	(4473) ft MSL	55 Total, 27.5 L, 27.5 R	6	LEFT
level to cruise	7:18:06	9,900@127 kts	49 T, 21.5 L, 27.5 R	(using ground speed)	
Descent to	7:18:32	9700		2	
Climb to	7:22:58	9,800@148 kts	47 T, 19.5 L, 27.5 R		Switch to right
Descent to	7:24:16	9,600			
Climb to	7:34:34	9,700			
Descent to	7:36:17	9,600			
Climb to	7:38:50	9,700			
Descent to	7:39:34	9,600			
Climb to	7:40:11	9,800			
Descent to	7:44:10	9,600		5	
Climb to	7:50:30	9,700@130 kts	42 T, 19.5 L, 22.5 R		Switch to left
Descent to	7:52:46	9,500			
Climb to	7:56:52	9,800			
Descent to	7:59:54	9,600			
Climb to	8:01:21	9,800			
Descent to	8:03:54	9,500			
Climb to	8:05:43	9,700			
Descent	8:06:54	9,500			
Climb to	8:08:44	9,800			
Descent to	8:14:39	9,500			
Climb to	8:16:01	9,600			
Descent to	8:16:40	9,500		5	
Climb to	8:18:53	9,800@127 kts	37 T, 14.5 L, 22.5 R		Switch to right
Descent to	8:25:17	9,700			
Climb to	8:28:14	9,800			
Descent to	8:31:13	9,600			
Climb to	8:34:23	9,800			
Descent to	8:37:04	9,600			

Climb to	8:40:04	9,700			
Descent to	8:41:57	9,600			
Climb to	8:42:14	9,700			
Descent to	8:45:25	9,500		6	
Climb to	8:48:59	10,600@108 kts	31 T, 14.5 L, 16.5 R		Switch to left
Descent to	8:59:15	10,500			
Climb to	9:01:05	10,700			
Descent to	9:08:46	10,500			
Climb to	9:11:32	10,900			
Descent to	9:16:09	10,500			
Climb to	9:18:15	10,800		7	
Descent to	9:22:43	10,500@96 kts	24 T, 7.5 L, 16.5 R		Switched to right
Climb to	9:28:46	10,800			
Descent to	9:42:38	10,600		7	
Climb to	9:52:11	11,700@114 kts	17 T, 7.5 L, 9.5 R		Switched to left
Descent to	10:11:08	11,500			
Climb to	10:17:59	11,600			
Descent to	10:19:07	11,200		6	
	10:20:08	11,000@121 kts	11 T, 1.5 L, 9.5 R		Stay Left
	10:21:11	10,600			
	10:22:17	10,100			
	10:23:29	9,400			
	10:24:44	8,700			
	10:25:24	7,600			
	10:26:25	6,700			
	10:27:25	5,700		2	
	10:28:31		9.5 T, 0 L, 9.5 R		

Fuel Calculations using ADS-B ground speed with fuel selector lever position to RIGHT at takeoff

Phase – ADSB w knots	Time	Altitude ft	Fuel remaining	Fuel consumed (gal)	Tank
Depart and climb (incl. 3 gal for start, taxi, and takeoff per chart)	7:07:45	(4473) ft MSL	55 Total, 27.5 L, 27.5 R	6	RIGHT
level to cruise	7:18:06	9,900@127 kts	49 T, 27.5 L, 21.5 R	(using ground speed)	
Descent to	7:18:32	9700		2	
Climb to	7:22:58	9,800@148 kts	47 T, 27.5 L, 19.5 R		Stay right
Descent to	7:24:16	9,600			
Climb to	7:34:34	9,700			
Descent to	7:36:17	9,600			
Climb to	7:38:50	9,700			
Descent to	7:39:34	9,600			
Climb to	7:40:11	9,800			
Descent to	7:44:10	9,600		5	
Climb to	7:50:30	9,700@130 kts	42 T, 27.5 L, 14.5 R		Switch to Left
Descent to	7:52:46	9,500			
Climb to	7:56:52	9,800			
Descent to	7:59:54	9,600			
Climb to	8:01:21	9,800			
Descent to	8:03:54	9,500			
Climb to	8:05:43	9,700			
Descent	8:06:54	9,500			
Climb to	8:08:44	9,800			
Descent to	8:14:39	9,500			
Climb to	8:16:01	9,600			
Descent to	8:16:40	9,500		5	
Climb to	8:18:53	9,800@127 kts	37 T, 22.5 L, 14.5 R		Switch to right
Descent to	8:25:17	9,700			
Climb to	8:28:14	9,800			
Descent to	8:31:13	9,600			
Climb to	8:34:23	9,800			

Descent to	8:37:04	9,600			
Climb to	8:40:04	9,700			
Descent to	8:41:57	9,600			
Climb to	8:42:14	9,700			
Descent to	8:45:25	9,500		6	
Climb to	8:48:59	10,600@108 kts	31 T, 22.5 L, 8.5 R		Switch to left
Descent to	8:59:15	10,500			
Climb to	9:01:05	10,700			
Descent to	9:08:46	10,500			
Climb to	9:11:32	10,900			
Descent to	9:16:09	10,500			
Climb to	9:18:15	10,800		7	
Descent to	9:22:43	10,500@96 kts	24 T, 15.5 L, 8.5 R		Switched to right
Climb to	9:28:46	10,800			
Descent to	9:42:38	10,600		7	
Climb to	9:52:11	11,700@114 kts	17 T, 15.5 L, 1.5 R		Switched to left
Descent to	10:11:08	11,500			
Climb to	10:17:59	11,600			
Descent to	10:19:07	11,200		6	
	10:20:08	11,000@121 kts	11 T, 9.5 L, 1.5 R		Still Left
	10:21:11	10,600			
	10:22:17	10,100			
	10:23:29	9,400			
	10:24:44	8,700			
	10:25:24	7,600			
	10:26:25	6,700			
	10:27:25	5,700		2	
	10:28:31		9 T, 7.5 L, 1.5 R		

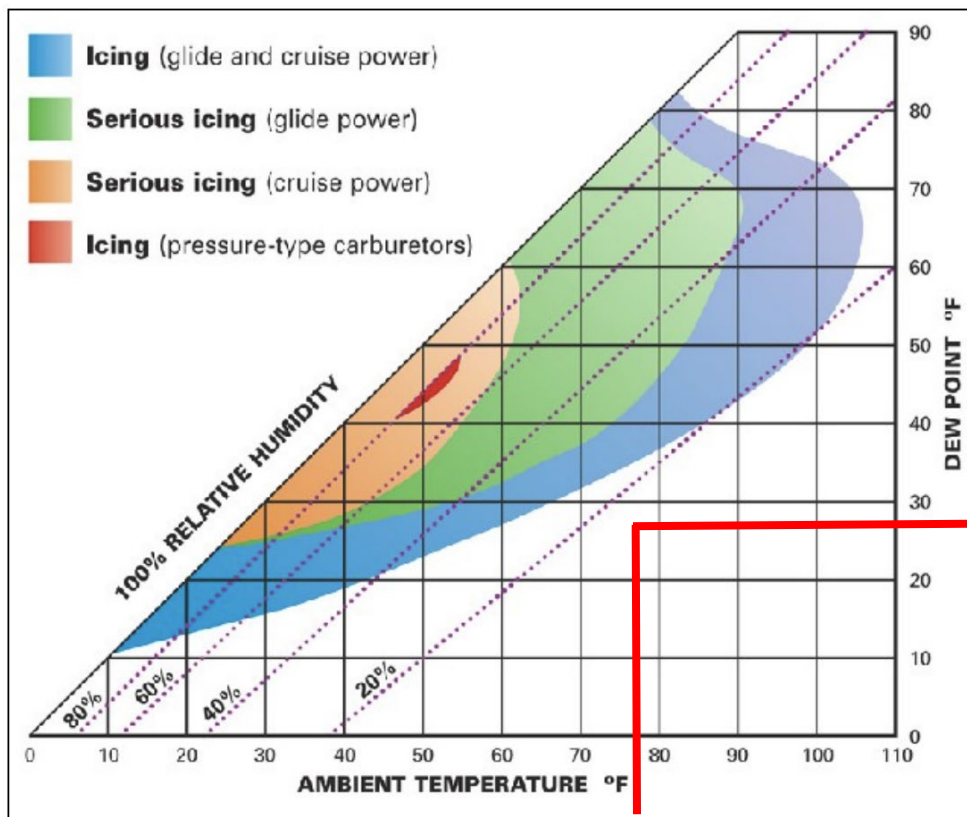
Fuel Flow Instrument Installed

The airplane was equipped with a Shadin Microflo-L Fuel Flow Computer. However, there was no GPS installed and without it, the manufacturer states that the computer then acts as a fuel flow indicator and totalizer and loses all navigation-dependent calculations, to include NM per gallon, fuel-to-destination, and fuel reserve at destination. However, the unit may track real-time fuel flow, fuel used, fuel left, and endurance, if the fuel burn rate stays constant, utilizing direct data from the fuel flow transducer and manual pilot entries. The device must be manually updated each time fuel is added since it lacks GPS data input, which prevents it from automatically detecting fuel changes or flight tracking.

5.0 Meteorological Information

The automated weather observation station located at the accident airport reported that, about the time of the accident, the wind was from 220° at 4 knots, visibility of 10 statute miles, clear clouds above aerodrome level, temperature at 77°F, and dew point at 28°F.

Review of the Federal Aviation Administration Carburetor Icing Chart for the given temperature and dew point revealed that the conditions were not conducive to icing (For more information, see Special Airworthiness Information Bulletin CE-09-35 in the public docket.)



Submitted by:

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