

National Transportation Safety Board

Office of Aviation Safety

Washington, DC 20594



WPR22FA148

FOLLOW-UP EXAMINATION NOTES

July 12, 2022

TABLE OF CONTENTS

A. ACCIDENT.....	3
B. FOLLOW-UP EXAMINATION NOTES	3
C. SUMMARY	3
D. DETAILS OF THE EXAMINATION.....	3
1.0 AIRFRAME EXAMINATION.....	3
1.1 Fuselage.....	4
1.2 Empennage	4
1.3 Wings	5
1.4 Landing Gear.....	7
1.5 Cockpit.....	7
1.6 Survivability.....	8
1.7 Fuel/Fuel System.....	8
2.0 ENGINE EXAMINATION	8
3.0 PROPELLER EXAMINATION	9
4.0 CROSS-COUNTRY FLIGHT PATH.....	10
5.0 PERFORMANCE CALCULATIONS	11
6.0 METEOROLOGY	14
7.0 INSURANCE INFORMATION.....	16

flight were recovered. Flight control continuity was established from the cockpit to its respective flight control surface.

1.1 Fuselage

The fuselage (figure 1) remained intact with compression damage to its steel frame adjacent the upper fuselage and cabin. The windscreen sustained consistent with impact.



Figure 1. View of fuselage

1.2 Empennage

The left horizontal stabilizer, left & right elevators, and rudder were removed for transport and was found unremarkable (figure 2).



Figure 2. View of removed rudder, elevators and left horizontal stabilizer.

1.3 Wings

The left (figure 3) and right (figure 4) wing were separated from the fuselage for recovery. The left wing sustained compression damage consistent with impact on its outboard leading edge. The left aileron remained secured to its mounting points. The right wing sustained minor damage. The right lift-struts sustained compression damage consistent with impact.



Figure 3. View of left wing.



Figure 4. View of right wing.

1.4 Landing Gear

The left landing gear remained attached to the fuselage. The right gear remained attached to its anchor point but was folded underneath the lower fuselage. The tail wheel remained attached less the 2 retaining springs that were displaced from its anchor point.

1.5 Cockpit

The lower fuselage (figure 5) sustained damage consistent with impact. External mounts for an iPad were found secured in the cockpit.



Figure 5. View of lower fuselage.

The following avionics, switches and gauges were on cockpit panel:

- Magento switch - placed in the BOTH position
- Brake handle pushed in
- A handheld radio was attached behind the left steering yoke and was OFF
- The left side steering yoke remained attached with impact damage and was free to rotate and moved forward and aft when manipulated by hand

- The airspeed indicator glass was impact damage; the needle was at 0 knots
- The fuel handle was about midspan
- The carburetor heat handle was fully advanced
- The mixture control knob was in the full forward position
- The throttle control knob was in the full forward position
- The RPM gauge was damaged with the glass and needle displaced.
- The cabin heat handle was in the full forward position
- The altimeter was intact and read 7,350 ft msl, the Kohlmann's window was set to 29.48 inches Hg
- Oil pressure was gauge intact; needle at 0 psi

1.6 Survivability

All 4-point harnesses were found secured at its anchor point.

1.7 Fuel/Fuel System

The 13-gallon main tank was mounted forward of the cockpit and behind the engine; the main tank was found intact. Fuel continuity was established from the main tank to the engine. The fuel lines that had not been damaged from impact or removed to transport the airplane were secure. No fuel was recovered during the examination.

2.0 Engine Examination

The engine (figure 6), a Lycoming O-145-B2, serial number 5496-2, remained attached to its engine mounts, which were connected to the engine firewall. The engine truss sustained substantial damage consistent from impact. Both propeller blades remained attached to the propeller hub and flange, which was connected to the crankshaft. The carburetor was displaced from its mating flange and pressed onto the bottom of the oil sump. The mixture lever and throttle lever on the carburetor were damaged. The right exhaust tubes were displaced from their corresponding cylinders.



Figure 6. View of damaged engine and propeller.

Examination of the cylinders combustion chamber interior components using a lighted borescope revealed normal piston face and valve signatures, and no indications of catastrophic engine failure.

Mechanical continuity was established throughout the rotating group, valve train and accessory section as the crankshaft was manually rotated by hand utilizing the propeller. Thumb compression was achieved in the proper firing order at all four cylinders.

The ignition harness was attached to each of its corresponding spark plug. The spark plugs were securely attached at each spark plug port. The spark plugs were all massive electrode plugs and displayed coloration consistent with normal wear. The electrodes coloration was symmetrical and free of mechanical damage.

3.0 Propeller Examination

The wood propeller and hub assembly remained attached to the engine. One blade was fractured at the blade root while the second blade was fractured and splintered midspan.

4.0 Cross-Country Flight Path

The pilot and CFI-rated passenger departed Afton Municipal Airport Field (KAFO) Afton, Wyoming about 0930 central standard time for a cross country ferry flight, with an intended destination of Kerrville Municipal Airport, (KERV), Kerrville, Texas. Six flight legs were completed prior to the accident; the accident leg had a destination of Double Eagle II Airport, Albuquerque, New Mexico.

Leg 1

- The owner and CFI rated passenger departed Alton Municipal Airport (AFO), Afton, Wyoming, on Friday, April 8, 2022, about 1000 MDT, according to the fixed based operator (FBO) owner.
- The airplane landed in Kemmerer Municipal Airport (EMM), Kemmerer, Wyoming on April 8, 2022, about 1100, about 56 nm southeast of KAFO. A fuel receipt transaction at 1120 showed that the airplane was fueled with 7.98 gallons of 100 LL.

Leg 2

- They departed EMM on April 8, 2022, about 1115. The surviving passenger could not recall what time they departed EMM.
- The previous owner reported that the passenger texted him while they were at EMM, that the airplane had a hard time becoming departing the airport due to density altitude performance but was able to depart EMM without further issues.
- The airplane landed in Southwest Wyoming Regional Airport (RKS), Rock Springs, Wyoming about 1230 MDT, about 68 nm east from KEMM.

Leg 3

- According to a receipt, the airplane was fueled with 4.6 gallons of 100LL at 1248 and the airplane departed shortly thereafter.
- The airplane landed in Rangely Airport (AV0), Rangely, Colorado, on April 8, 2022, about 1330 MDT, 91 nm south of RKS, according to the AV0 airport manager.

Leg 4

- About 1515 MDT, prior to their departure, a local flight instructor spoke to the pilot and discussed his flight plan for a fuel stop destination in Double Eagle II Airport (AEG), Albuquerque, New Mexico. A local flight instructor at Rangely Airport reported that the pilot told him that the airplane was struggling to clear 8,000 ft msl during their previous flight legs from Alton, Wyoming. The pilot then asked the instructor for obstacles to avoid when the pilot and owner fly through New Mexico. The instructor stated that if he was planning the flight to AEG, he would fly directly to Canyonlands Regional Airport (CNY), Moab, Utah, then to Cortez Municipal Airport (CEZ), Cortez, Colorado and/or Four Corners Regional Airport (FMN), Farmington, New Mexico, and then continue to Double Eagle II Airport (AEG) in Albuquerque, New Mexico by using Highway 505 as a landmark guide. He added that once the airplane reached Nageezi, NM, he should navigate to the southeast and follow V187 directly to KAEG.
- According to the airport manager, they fueled the airplane and then departed about 1530 MDT on April 8, 2022.
- They subsequently landed at Canyonlands Regional Airport, CNY, Moab, UT on April 8, 2022, at an unknown time, about 92 nm southwest of AV0. The surviving passenger could not recall what time they landed.

Leg 5

- They then departed CNY on April 8, 2022, at an unknown time. The surviving passenger could not recall what time they departed.
- The airplane landed in Cortez Municipal Airport, CEZ, Cortez, Colorado, on the evening of April 8, 2022, about 100 nm southeast of CNY, for an overnight stop. The surviving passenger could not recall what time they landed.

Leg 6

- According to the CEZ airport manager, the airplane departed on April 9, 2022, about 1020 MDT. The manager reported that a mechanic assisted them in starting the engine by heating the spark plugs.
- The airplane landed in For Corners Regional Airport, FMN, Farmington, New Mexico on Saturday, April 9, 2022, about 38 nm southeast of CEZ, about 1101MDT. The airplane departed about 1111 local, according to FMN General Manager.

Leg 7

- They departed FMN on April 9, 2022, at 1114 MDT for Double Eagle II Airport (AEG) Albuquerque, New Mexico.
- The airplane impacted terrain 53 nm southeast of FMN about 1200 local MDT. [36.131543, -107.445307]

5.0 Performance Calculations

FMN has a listed elevation of 5,507 ft and had an Automated Surface Observation System which was augmented. Prior to departure, the ASOS reported the wind was 160° at 6 knots, visibility of 10 statute miles (sm), clear of clouds, a temperature of 19°C, a dewpoint temperature of -11°C, and an altimeter setting of 29.95 inches of mercury (Hg); its calculated density altitude (figure 7) was 7,226 ft.

Density Altitude Calculator			
Elevation	<input type="text" value="5507"/>	<input checked="" type="radio"/> feet	<input type="radio"/> m
Air Temperature	<input type="text" value="19"/>	<input type="radio"/> deg F	<input checked="" type="radio"/> deg C
Altimeter Setting	<input type="text" value="29.95"/>	<input checked="" type="radio"/> in Hg	<input type="radio"/> hPa
Dew Point	<input type="text" value="-11"/>	<input type="radio"/> deg F	<input checked="" type="radio"/> deg C
<input type="button" value="Calculate"/> <input type="button" value="Reset"/>			
Density Altitude	<input type="text" value="7226"/>	feet	<input type="text" value="2203"/> m
Absolute Pressure	<input type="text" value="24.45"/>	in Hg	<input type="text" value="828.1"/> hPa
Air Density	<input type="text" value="0.0616"/>	lb/ft ³	<input type="text" value="0.986"/> kg/m ³
Relative Density	<input type="text" value="80.51"/>	%	<input type="text" value="80.51"/> %
Estimated AWOS	<input type="text" value="7200"/>	feet	<input type="text" value="2195"/> m
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Figure 7. Density altitude calculation at FMN around time of departure.

At the time of the accident, the FMN ASOS reported the wind was 310° at 7 knots, visibility of 10 sm, clear of clouds, a temperature of 22°C, a dewpoint temperature of -11°C, and an altimeter setting of 29.90 Hg; its calculated density altitude was 7,726 ft (figure 8).

Density Altitude Calculator			
Elevation	<input type="text" value="5507"/>	<input checked="" type="radio"/> feet	<input type="radio"/> m
Air Temperature	<input type="text" value="22"/>	<input type="radio"/> deg F	<input checked="" type="radio"/> deg C
Altimeter Setting	<input type="text" value="29.90"/>	<input checked="" type="radio"/> in Hg	<input type="radio"/> hPa
Dew Point	<input type="text" value="-11"/>	<input type="radio"/> deg F	<input checked="" type="radio"/> deg C
<input type="button" value="Calculate"/> <input type="button" value="Reset"/>			
Density Altitude	<input type="text" value="7614"/>	feet	<input type="text" value="2321"/> m
Absolute Pressure	<input type="text" value="24.41"/>	in Hg	<input type="text" value="826.6"/> hPa
Air Density	<input type="text" value="0.0608"/>	lb/ft ³	<input type="text" value="0.975"/> kg/m ³
Relative Density	<input type="text" value="79.55"/>	%	<input type="text" value="79.55"/> %
Estimated AWOS	<input type="text" value="7600"/>	feet	<input type="text" value="2316"/> m
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Figure 8. Density altitude calculation at FMN around time of accident.

The accident site has a listed elevation of about 7,100 ft. At the time of the accident, the reported wind in Counselor, NM was about 158° at 6 knots, a temperature of 20°C, and a dewpoint of -11°C. The accident airplane had an altimeter setting of 29.38 (reflecting 7,360 ft msl) and the calculated density altitude at the accident site was 9,897 ft (figure 9). A witness reported that winds were gusting at the time of the accident and that the airplane was maneuvering at a low level.

Density Altitude Calculator			
Elevation	<input type="text" value="7100"/>	<input checked="" type="radio"/> feet	<input type="radio"/> m
Air Temperature	<input type="text" value="20"/>	<input type="radio"/> deg F	<input checked="" type="radio"/> deg C
Altimeter Setting	<input type="text" value="29.38"/>	<input checked="" type="radio"/> in Hg	<input type="radio"/> hPa
Dew Point	<input type="text" value="-11"/>	<input checked="" type="radio"/> deg F	<input type="radio"/> deg C
<input type="button" value="Calculate"/> <input type="button" value="Reset"/>			
Density Altitude	<input type="text" value="9897"/> feet	<input type="text" value="3017"/> m	
Absolute Pressure	<input type="text" value="22.57"/> in Hg	<input type="text" value="764.2"/> hPa	
Air Density	<input type="text" value="0.0567"/> lb/ft ³	<input type="text" value="0.908"/> kg/m ³	
Relative Density	<input type="text" value="74.1"/> %	<input type="text" value="74.1"/> %	
Estimated AWOS	<input type="text" value="9900"/> feet	<input type="text" value="3018"/> m	
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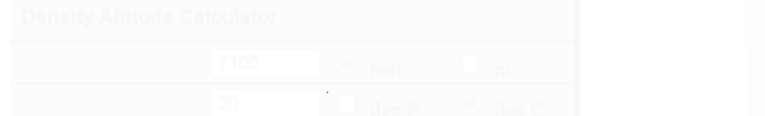
Figure 9. Density altitude calculation at the accident site around time of accident.

The Operator’s Manual for a Lycoming Model O-145-B2 Aviation Engine depicts the full throttle horsepower at different altitudes (Table 1). At an altitude of 7,000 ft and at full throttle, of sea level horsepower is about 78.9%; at an altitude of 9,500 ft, the sea level horsepower is about 72.5%. The owner and CFI rated passenger added 4 gallons of fuel at FMN for their next leg to AEG.

Table 1. Lycoming Full Throttle HP at Altitude Chart (reference only)
 Historic Version, for Reference Only

FULL THROTTLE HP AT ALTITUDE

Altitude Ft.	% S.L. HP.	Altitude Ft.	% S.L. HP.	Altitude Ft.	% S.L. HP.
0	100	8,500	74.8	17,000	54.3
500	98.5	9,000	73.5	17,500	53.1
1,000	96.8	9,500	72.5	18,000	52.1
1,500	95.3	10,000	70.8	18,500	51.4
2,000	93.6	10,500	69.5	19,000	50.0
2,500	92.0	11,000	68.3	19,500	49.1
3,000	90.5	11,500	67.2	20,000	48.0
3,500	89.3	12,000	65.8	20,500	47.6
4,000	87.5	12,500	64.7	21,000	46.0
4,500	85.9	13,000	63.4	21,500	45.2
5,000	84.6	13,500	62.3	22,000	44.0
5,500	83.2	14,000	61.0	22,500	43.3
6,000	81.7	14,500	59.8	23,000	42.2
6,500	80.2	15,000	58.7	23,500	41.4
7,000	78.9	15,500	57.6	24,000	40.3
7,500	77.5	16,000	56.5	24,500	39.5
8,000	76.2	16,500	55.4	25,000	38.5



6.0 Meteorology

A witness reported that he saw the airplane at a low altitude maneuver towards a ridgeline to the southwest. Shortly after, the airplane made a 180° left turn away from the ridgeline, towards a nearby dirt road that ran northwest to southeast, lined with a powerline. The witness then saw the airplane impact terrain and nose over, short of the road and powerlines. The witness further reported that during the time of the accident, the winds were gusting from the southwest and over the ridgeline and that the engine was running.

Plymouth State Weather Center

Surface Wind streamlines [m/s]

WXP analysis for 18Z 9 APR 22

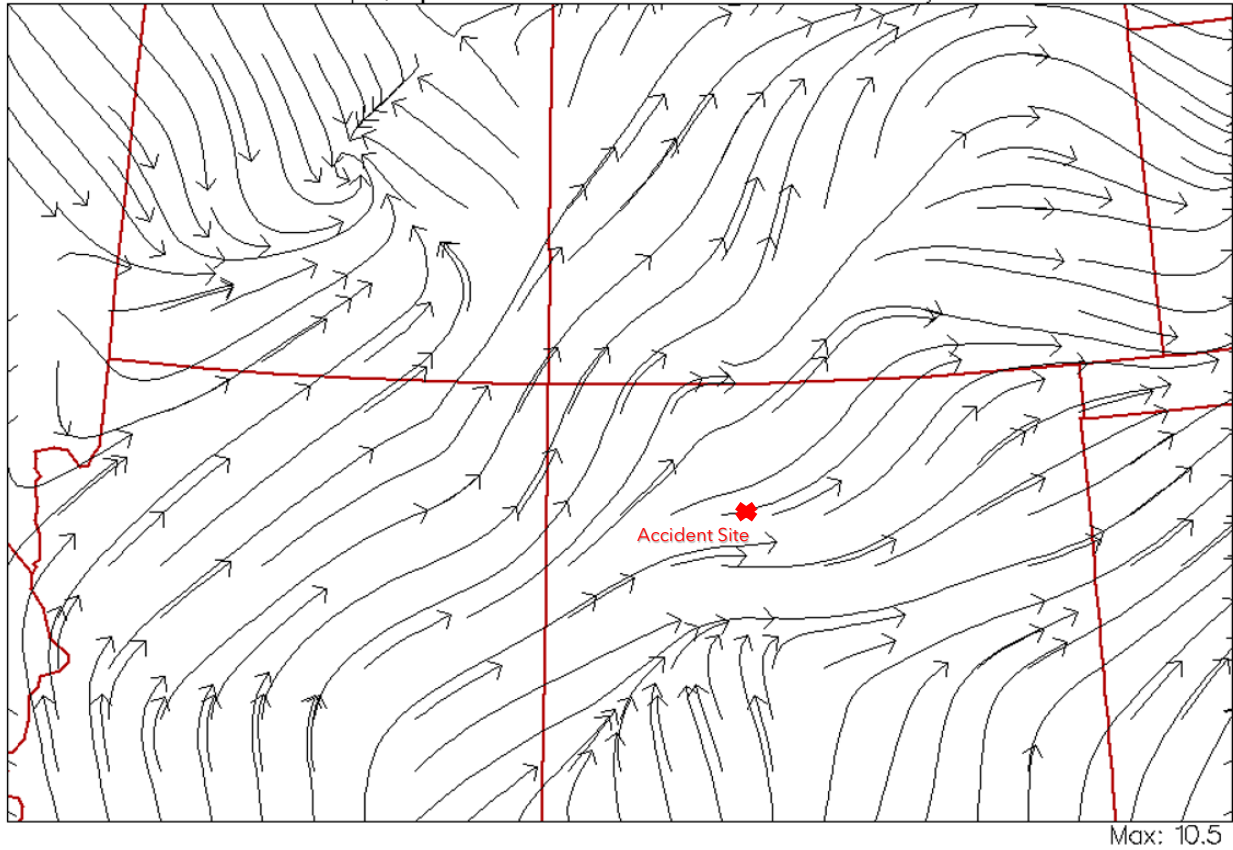


Figure 10. Surface Wind WXP Analysis for time of accident.

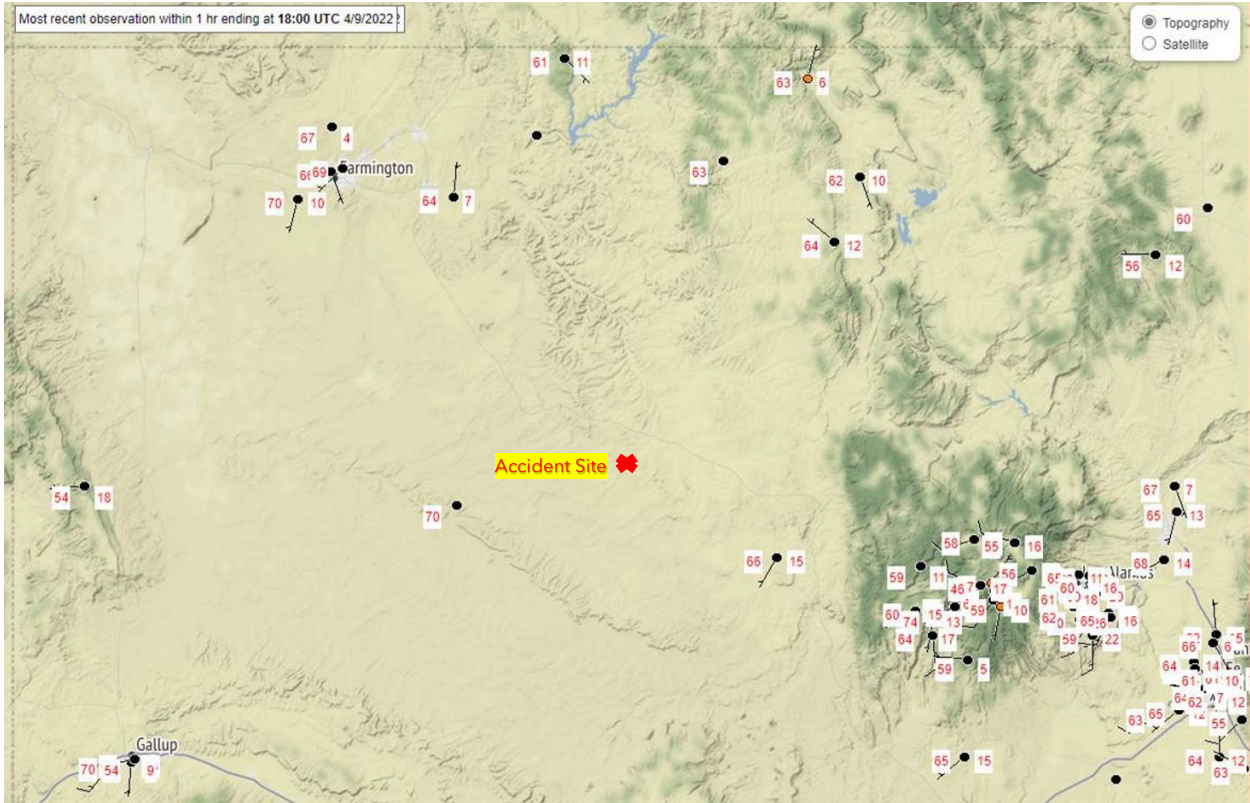


Figure 11. A Mesowest image of wind with temperature (°F) and peak wind gusts for 1800Z (winds in mph).

7.0 Insurance Information

The policy writer reported that the policy produced included both the new owner and the flight instructor. The policy stated that both the new owner and the flight instructor had to meet specific requirements for whomever was flying the airplane to include a current and valid medical certificate. The policy writer was not aware that the new owner did not have a current medical when she wrote the policy.

According to the policy, the new owner could not claim PIC.

THIS ENDORSEMENT CHANGES YOUR POLICY. PLEASE READ IT CAREFULLY

Requirements for the Pilot Flying the Aircraft

This endorsement applies only to the following **aircraft**:

*If no entry is made this endorsement applies to all **aircraft** covered by **your** policy.*

This endorsement completes or changes Item 9. **REQUIREMENTS FOR THE PILOT FLYING THE AIRCRAFT** of **your** Coverage Identification Page to read as follows:

The **aircraft** must be operated **in flight** only by a pilot named below having the minimum qualifications shown. The pilot must have a current and valid (1) medical certificate, (2) flight review and (3) pilot certificate with necessary ratings, each as required by the **FAA** for each flight. There is no coverage if the pilot does not meet the qualifications or requirements specified below for each designated use of the **aircraft**:

MINIMUM REQUIREMENTS FOR PILOT, PILOT CERTIFICATE, RATINGS AND LOGGED FLYING HOURS:

New Owner

1. As Respects N24345, 1940 TAYLORCRAFT BC12 65 for **Pleasure & Business Use** *
DALTON LOFTON must receive a flight checkout from a properly certificated and rated flight instructor having the minimum flight experience required by the Open Pilot Clause below, in the same make and model **aircraft** if he/she has not logged a minimum of 5 hours as pilot in command of the same make & model **aircraft** within the preceding 90 days prior to acting as sole pilot in command.

Dalton Lofton must complete a Flight Review, as defined by FAR 61.56, in the same make & model **aircraft** being operated from a properly certificated and rated flight instructor having the minimum flight experience required by the Open Pilot Clause below, 12 months or less prior to operation of the **aircraft** as sole pilot in command.

CFI-rated Passenger

1. As Respects N24345, 1940 TAYLORCRAFT BC12 65 for **Pleasure & Business Use** *

OPEN PILOT CLAUSE **CFI-rated Passenger**

1. As Respects N24345, 1940 TAYLORCRAFT BC12 65 for **Pleasure & Business Use** *
Any other person approved by **you** provided he/she holds a private or more advanced pilot certificate with airplane single engine land rating(s) and has a minimum of 500 total logged hours, including not less than 100 hours in tailwheel aircraft and 10 hours in the same make & model **aircraft**.

* The pilot(s) mentioned above while operating the **aircraft in flight** as pilot in command must also have a logged tailwheel endorsement unless exempt from such requirement under applicable **FAA** regulations.

* Any person operating the **aircraft in flight** as pilot in command must also have a logged tailwheel endorsement unless exempt from such requirement under applicable **FAA** regulations.

The following information is required only when the effective date of this endorsement is subsequent to the Policy effective date.

This endorsement is Endorsement No. _____
This endorsement is effective on 04/08/2022
Attached to and forming a part of Policy No. _____
Issued to (First Named Insured): _____
Additional Premium: INCLUDED

(01/10)

Submitted by:

Eleazar Nepomuceno
Aviation Accident Investigator