

23 August 2023

N405WB Accident Investigation Statement

Conducted by Inspectors Cardullo and Larivee

Prepared by Philippe Larivee

Inspectors Cardullo and Larivee arrived at the New England Airlines maintenance hangar at approximately 1000. N405WB was located outside the hangar and partially covered in a tarp. The wings and horizontal stabilizer were removed.

Airframe Inspection:

- Wing Spars and Flight control cables cut during removal. (See photos N409WB_013 through N405WB_018)
- Actuated cut cables and found free movement of ailerons and flaps.
- Actuated elevator cable and found free movement to elevator bell crank.
- Actuated rudder and found free movement.
- Actuated throttle, prop and mixture controls and found free movement of cables and associated linkages on engine.
- Fuel selector was found in “OFF” position.
- Moved fuel selector handle through all detents. Found it difficult to move selector from “LH Tip Tank” to “OFF.” Tab was bent, possible result of accident damage. (See photo N405WB_047)
- Left wing root first rib cracked, unclear if this is impact damage or induced damage from wing removal (See photo N405WB_017)
- Found RH MLG had been torn from aircraft during landing. (See photos N405WB_006 through N405WB_008)
- Found NLG folded back into fuselage. (See photos N405WB_022 through N405WB_024)
 - Engine mount tubing broken in several locations, associated with NLG mounting. (See photos N405WB_060 through N405WB_070)
- Damage found to LH wing tip, Aileron, and flap. (See photos N405WB_026 through N405WB_034)
- Damage found to RH flap.
- Damage found on left elevator. (See photo N405WB_010 through N405WB_012 and N405WB_074)
- Buckling damage noted to forward fuselage left side. (See photos N405WB_026 through N405WB_028, N405WB_058, N405WB_059 and N405WB_066)
- Firewall creased lower right side. (See photos N405WB_071 through N405WB_073)

Propeller Inspection:

- Prop damage consistent with a non-powered strike, all three blades bent, no tip curling. (See photos N405WB_002 through N405WB_005, N405WB_022, and N405WB_035 through N405WB_038)

Engine Inspection:

- Overall condition of engine appears good. No large fuel stains or oil leaks noted.
- Engine had approximately 9 quarts of oil.
- Removed ignition leads and rocker covers.
- Pulled through engine:
 - Engine turned freely.
 - Felt compression on all six cylinders.
 - All 12 valves operated.
 - Left magneto impulse coupling was heard functioning.
- Removed spark plugs: (See photos N405WB_076 through N405WB_083)
 - Found all 12 plugs to be in good visual condition.
 - No ovaling of electrode noted.
 - Visual inspection of gapping, no discrepancies noted.
 - No evidence of fouling noted.
- Pulled through engine with plugs removed, engine turned smoothly:
 - Visual inspection of all 6 pistons through spark plug holes showed no damage or discoloration.
- Magnetos found to be in good visible condition:
 - Removed left magneto:
 - Removed impulse coupling.
 - Spun magneto and found good spark on left bottom and right top ignition leads.
 - Removed right magneto.
 - Spun magneto and found good spark on left top and right bottom ignition leads.
- Removed air filter, found to be clean. (See photo N405WB_091)
- Removed fuel flow manifold and found fuel present in bowl. Visual inspection of diaphragm revealed no discrepancies. Fuel smell was normal for 100LL
- Visual inspection of induction system revealed no obstructions.
- Removed all 6 fuel injectors, visual inspection revealed no obstructions.
- Removed oil filter and inspected. No excessive debris noted, just normal wear. (See photos N405WB_084 through N405WB_086)
- Removed fuel selector valve and disassembled: (See photos N405WB_087 through N405WB_090)
 - No leaks noted.
 - No debris found inside valve.
 - Detent found to function properly.
 - Stop pin found to be installed and functioning properly.
- Visual inspection up all 3 exhaust pipes found exhaust baffles to be in place and intact.
- Removed engine driven fuel pump
 - pump spline drive rotated freely, no binding or roughness noted
 - pump drive cavity was covered in reddish brown powder, signs of metal wear and chaffing
 - pump spline showed evidence of wear on spline gear teeth; teeth were rounded on the edges, and worn indentations the length of the teeth (See photos Eng Fuel pump IMG 161-167
 - engine accessory drive splines showed signs of wear and chaffing
 - engine fuel pump was installed at engine overhaul 3/22/2018, TSMOH 1137.1

Conclusion:

Aircraft damage is consistent with unpowered landing in rough terrain. No mechanical irregularities noted with engine. No blockages noted within induction system. No discrepancies noted in ignition system. No mechanical discrepancies noted in fuel system.