Memorandum For Record

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Examination of the airframe fuel system revealed extensive crushing of fuel lines from each tank between the root and the fuel selector. The auxiliary fuel pump was impact damaged which precluded operational testing; the associated fuel lines at the pump were also extensively impact damaged. Drops of fuel were noted at the left inlet of the fuel selector valve, while no fuel was noted at the right inlet of the fuel selector valve. The fuel line from the selector valve to the auxiliary fuel pump was disconnected and no fuel was present. The fuel selector was on the right tank position and it was internally free of obstructions. With the exception of crushed fuel lines, no obstructions were noted from the selector valve through the auxiliary fuel pump to the firewall.

Examination of the cockpit revealed the instrument panel was extensively impact damaged. There was no evidence of fire but the smell of burning insulation was noted. The retractable handle assembly was nearly vertical and was not in its down and locked socket. The cabin roof was displaced aft. No shoulder harnesses were noted.

The following readings were noted:

Master Switch – Separated from Panel not located/observed
Ignition Switch – Both; key broken
Airspeed Indicator – Separated from panel, needle missing. No obvious slap mark
Electronics Int'l Carb Temp/OAT – Digital
Attitude Indicator – Instrument partially separated. 5° nose up left bank about 20°
Altimeter – Hundred Foot needle separated. 2,800 feet. 30.00 inches of Mercury.
No. 1 Omni-Head – Heading 040
No. 2 Omni-Head – Heading 360, partial nav flag, CDI needle displaced
VSI – Needle Missing. No obvious slap mark
Directional Gyro - 285°
Turn Coordinator – Left bank, ball full left
Pilot's headset and microphone – plugged in

Fuel Pump – On
Strobe – Off
Turn and Bank – On
Pitot Heat – Neutral
Beacon – On
Nav Light Switch – Broken
Landing Light Switch – Detached
Pilot's Yoke Horns – Intact
Parking Brake – Broken unknown position
Cabin Heat – In/off
Cabin Vent – In/off
Carb Air – Cold
Throttle – Extended ½ inch, bent down
Mixture – Full Rich
Propeller Control – Full Forward/Low Pitch
Autopilot Mode Controller –

- Avionics Master – On
- Autopilot – Off
- Autopilot Select – Unknown
- The following circuit breakers were tripped:
    - Nav Comm 2
    - GPS
    - AutoPilot

Audio Select Panel – Unknown Positions
Garmin GNS 430 – Installed
No. 2 Communication Transceiver – Narco MK12D, Digital
Tachometer – Separated from panel. Needle Missing. 0099.0
Manifold Pressure/Fuel Flow – Manifold Pressure off scale high. Fuel pressure >red line 6.5
Oil Pressure – 40 (yellow arc)
Left Fuel Quantity – Between 41 and 82
Right Fuel Quantity - <0
Ammeter – 0
Oil Temperature -<0
CHT - <0
Co-Pilot's Circuit Breaker Panel. The following circuit breakers below were tripped. The remainder were broken:

- Auxiliary Bus Bar
- Generator
- OAT

EDM 700 – Installed and retained
Digital Fuel Flow – Impact damaged. Loose circuit boards found in wreckage. Components retained for investigation
Transponder – Installed
Remote ELT – Armed
C02 Detector – Installed

Elevator trim - Neutral. Jackscrew below floor extended 7 threads on aft side, which correlated to the take-off trim setting position[1]. The jackscrew was impact damaged and displaced from its normal position.
Pilot's Restraint – Male and Female unlatched. No obvious stretching of the webbing was noted. The outboard portion of the lapbelt was crushed under the left forward portion of the seat, between the seat and floor. Latches and releases OK.
Pilot's Seat – The inboard seat track was on the seat rail, while the outboard seat track was separated at the forward attach but connected at the rear attach. Both seat rails were deformed.
Gear Down Bulb – Not Located
Gear Up Bulb – Filament was broken and exhibited slight stretching

Engine Examination Factual Observations –

The carburetor was fractured across the throttle bore and separated from the engine. The carburetor fuel inlet fitting was impact separated from the carburetor. The fuel inlet screen was exposed to the elements and was unobstructed. The throttle cable remained attached to the carburetor throttle control arm and the arm remained attached to the carburetor. The idle adjust screw was separated from the carburetor and the position of the throttle arm undetermined. The mixture cabled remained attached to the carburetor mixture control arm. The arm was separated from the carburetor and its position undetermined. The carburetor air box was crushed and the position of the carburetor heat door undetermined. The carburetor heat cable remained attached to the carburetor heat control arm and the arm was separated from the carburetor heat valve shaft.

The carburetor was partially disassembled and no damage was noted to the composite floats or other internal components. No fuel was observed in the carburetor float bowl.

The engine-driven fuel pump remained attached to the engine and no damage was noted. Liquid and odor consistent with aviation gasoline drained from the pump when it was removed for examination. When hand actuated, air pressure was felt at the pump outlet and suction was felt at the pump inlet fittings, respectively. The pump was partially disassembled and no damage was noted to the diaphragms, check valves or other internal components.

Examination of the ignition system revealed both magnetos remained attached to the engine and no external damage other than impact damage to the ignition harness wires was noted. Both magnetos produced spark from all ignition towers when rotated by hand. The No. 2 lower spark plug was impact damaged. All of the spark plug electrodes exhibited light gray combustion deposits and undamaged, worn normal condition.

Examination of the engine revealed oil was observed coating the engine interior surfaces. The oil sump was fragmented, and the oil suction screen which was found among the recovered wreckage; the screen was unobstructed. No debris was observed between the folds of the oil filter element. The oil cooler was impact damaged. The oil cooler hoses were secure.

[1] According to e-mail from Robert Collier, Director of Quality, Mooney International Corporation dated October 29, 2018, at 1043 EDT.

Examination of the exhaust system components revealed extensive crushing damage.