

## FIELD NOTES

### HISTORY OF FLIGHT

On August 19, 2017, about 1352 Pacific daylight time, a Rich Wheeler Express CT, N246TM, impacted the wall of a canyon while on approach to land at the Madras Municipal Airport, Madras, Oregon. The pilot/owner was operating the airplane under the provisions of 14 Code of Federal Regulations Part 91. The private pilot, the sole occupant, sustained fatal injuries; the airplane was destroyed. The cross-country personal flight originated from San Carlos, California with a final destination of Madras. Visual meteorological conditions prevailed and no flight plan had been filed.

The pilot submitted a reservation request and payment to the Madras airport operations on July 22, 2017 indicating that he intended to arrive on August 19, at 1400 and depart on August 21. The pilot was planning to camp at the airport and participate in the Oregon Solarfest, where activities were being held for the viewing of the solar eclipse.

| Arrival/Departure Information             |      |                      |                |      |
|-------------------------------------------|------|----------------------|----------------|------|
| August 19, 2PM, 2PAX                      |      |                      | August 21, 4PM |      |
| Date                                      | Time | # In Party           | Date           | Time |
| Aircraft Information / Parking & Tie Down |      |                      |                |      |
| Aircraft Make:                            | EXPR | Aircraft Model:      | Express        |      |
| Aircraft Year:                            | 2002 | Aircraft Tail Number | N246TM         |      |

Figure 01: Pilot's Reservation

### NOTICE TO AIRMEN (NOTAM)

A Notice to Airmen (NOTAM) was in effect at the time of the accident, which gave instructions to pilots as to the procedures they must follow to land at the Madras airport. A Non-Federal Contract Tower (NFCT) provided air traffic control services at the airport to help facilitate the increased traffic.

The NOTAM instructed pilots that all arrivals into Madras must be conducted at the time of their assigned reservation and via the routes depicted in the NOTAM unless otherwise instructed by the controllers. When arriving from the south, the NOTAM stated that the pilot should perform the "Cove Entry," which consisted of reporting over the Cove Palisades State Park (COVE) and fly north to Lake Simtustus Resort (RESORT), then to continue inbound toward the airport (east) and enter a left downwind for runway 34 (south).

According to the controller working at the tower at the time of the accident, the pilot checked in at COVE and was instructed to report his position when he was over RESORT. Several minutes later, after other traffic departed, the controller modified the pilot's instructions and told him to proceed to a 3-mile final to runway 34. After a few minutes, the controller requested that the pilot report his position to which he responded that he was on a 3-mile left base to runway 34. The controller cleared him to land and observed a plume of smoke shortly thereafter.

#### NOTAM:

The purpose of this Notice is to inform pilots of special air traffic procedures that will be implemented during the Oregon Solarfest, August 18, 2017–August 21, 2017 in the vicinity of Madras Municipal Airport (S33), Madras, OR. During this event a temporary Non-Federal Contract Tower (NFCT) will provide air traffic control services at the airport to enhance safety due to an expected increase in local air traffic operations. Pilots should review and utilize the procedures contained in this Notice during the effective times.

Air traffic control services at Madras NFCT are provided by Aegis ATC. The tower will operate from a modified trailer outfitted with two-way radio communications and 180 windows. Because the tower does not have a clear 360 view, it is important for pilots to fly inbound via the standard routes and be vigilant in searching for other aircraft.

**Cove entry:** From The Cove Palisades State Park, fly single file direct to Lake Simtustus Resort then turn inbound to Madras Airport and enter a left downwind for Runway 34

**General Planning:**

30NM from S33 turn on landing lights and squawk beacon code 0300 or as assigned by ATC.

Monitor Madras NFCT 15-20 miles from the airport for landing information.

Report in to the tower over or nearing published reporting points.

VFR sequencing inbound to Madras Airport begins over The Cove Palisades State Park, 8.5 NM SW of Madras Airport and the intersection of HWY 97 and Old HWY 97, 10.4 NM NW of the Madras Airport.

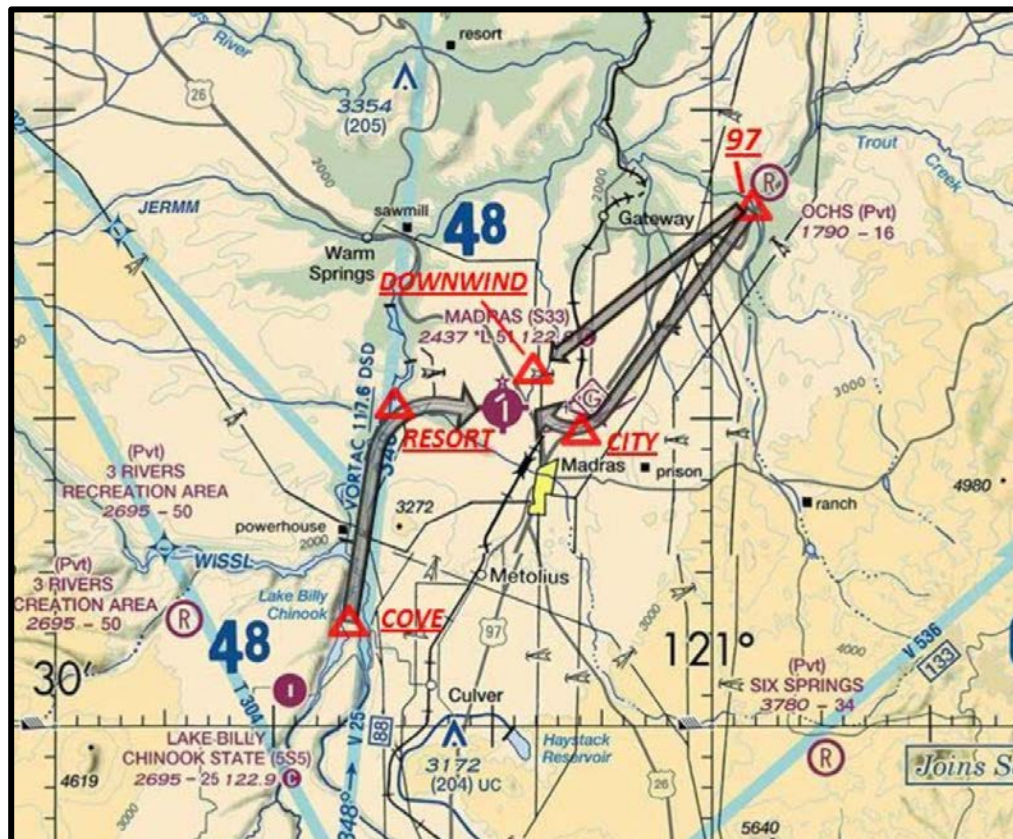


Figure 02: NOTAM Directions

Prior permission is required to land at Madras Airport August 18–21, 2017. You must have a reservation on file with the airport before you are allowed to land. Due to runway configuration and parking areas, arrival times are metered to ensure efficiency and safety of flight.

All arrivals must fly inbound to Madras via the routes depicted in the following pages for the runway in use unless instructed otherwise by ATC. If VFR holding becomes necessary due to traffic volume or an unanticipated runway closure, ATC will provide holding instructions over reporting points. Be vigilant of heavy traffic in the vicinity and look for another aircraft to follow.

Reporting Points: Watch for and sequence your aircraft with other observed traffic. Maintain single file. Aircraft maintain 90 KTS and 3700 MSL over reporting points COVE and 97. If unable, maintain 130 KTS and 4200 MSL over reporting points COVE and 97. Descent from these altitudes to pattern altitude may begin after being told to proceed to the next reporting point.

Airport pattern altitude for aircraft at 90 KTS is 3200. Airport pattern altitude for aircraft at 130 KTS is 3700. Monitor Madras NFCT as you approach COVE or 97 to obtain runway direction and inbound clearance. Announce yourself to Madras NFCT at COVE or 97. Inbound report RESORT, CITY or entering downwind RWY 16 or 34. All Aircraft

Report to Tower with 1 Minute Weather Madras will have downwinds on both sides of the airport; prepare to be sequenced in the pattern by Madras NFCT. Notify ATC if you are unable to maintain at least 90 KTS.



Figure 03: NOTAM Map

#### WRECKAGE AND IMPACT

The accident site was located on the north-facing slope of a canyon comprised of soft dirt and trees. The wreckage was about 1.1 nautical miles from the approach end of runway 34 on a bearing of 025°. The GPS coordinates for the crash site were 44.643112 north latitude and -121.164459 west longitude at an altitude of about 2,280 feet mean seal level (msl)

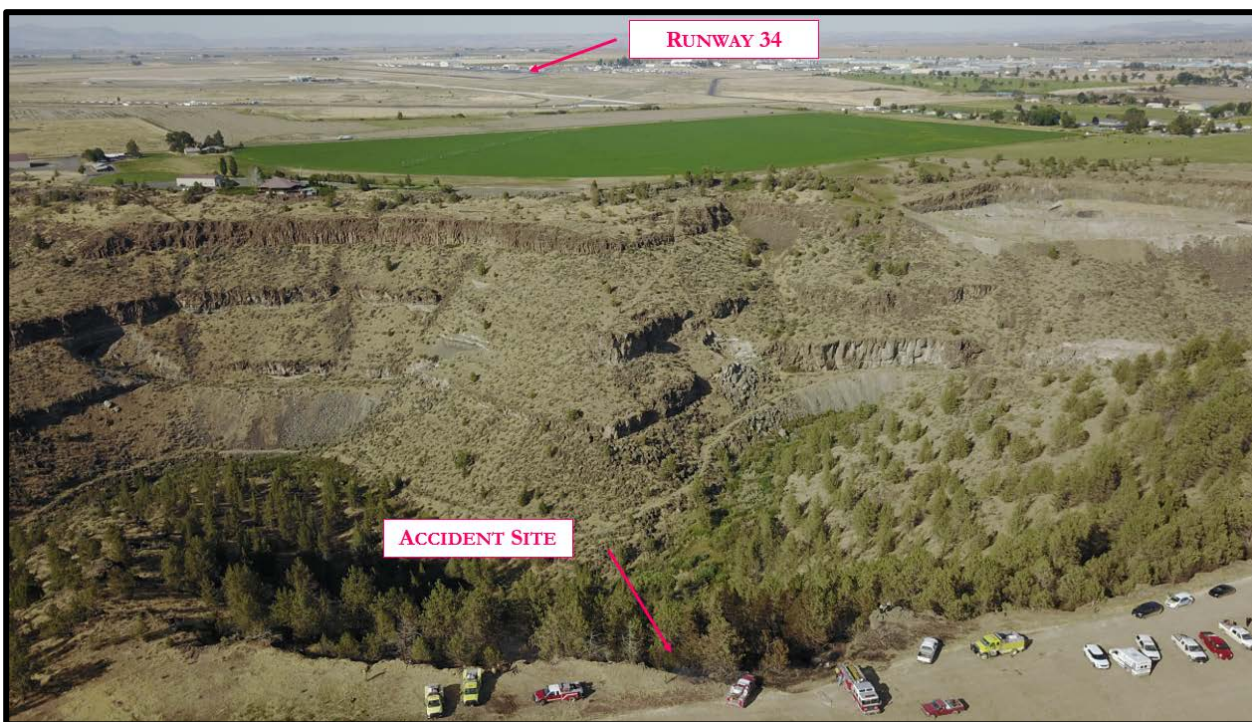


Figure 04: Accident Site Referencing Runway 34

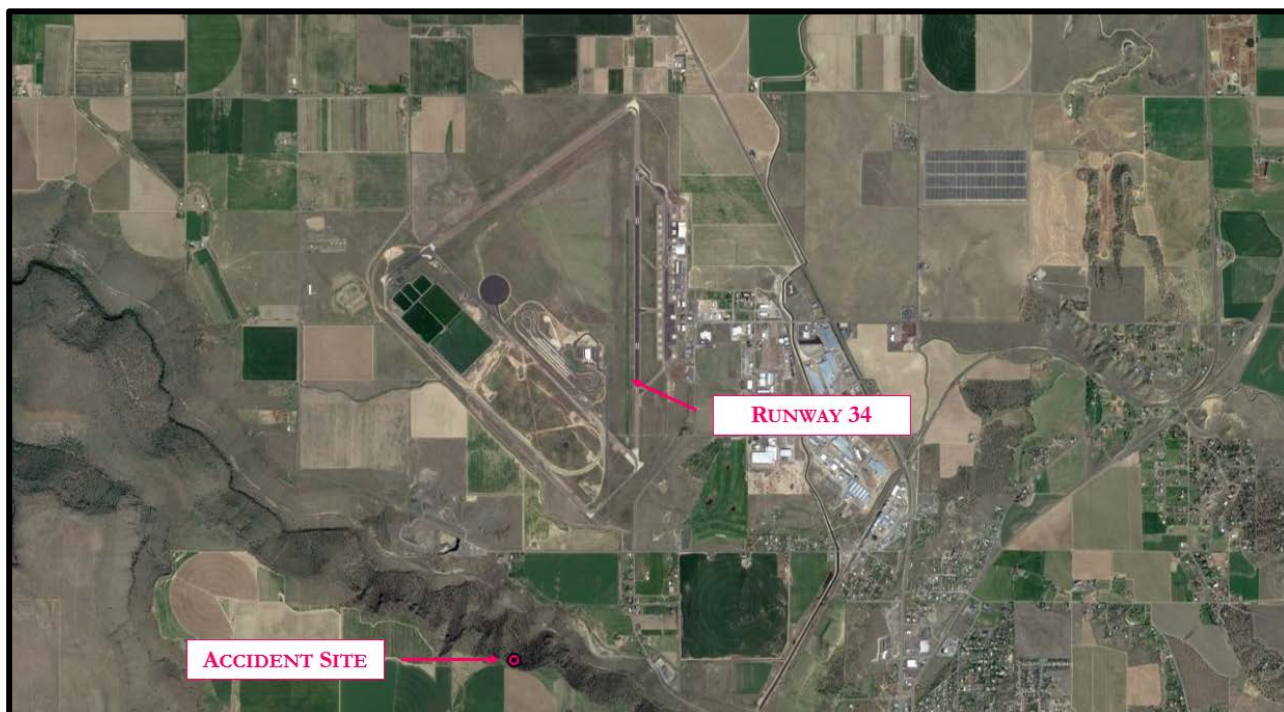


Figure 05: Accident Site Overhead Showing Airport



Figure 06: Accident Site Showing the Runway

The first identified points of contact consisted of freshly severed tree limbs adjacent to the main wreckage. The debris field was primarily contained in the area of the main wreckage on a 60-70° slope comprised of loose dirt. The tree was located in a slight ravine in the ebb of the canyon wall.



*Figure 07: Accident Site Referencing the Main Wreckage*

The main wreckage had been subjected to severe thermal damage and consisted of the outboard right wing, empennage, engine, and the mostly ashen remains of the fuselage. The cabin was completely consumed by fire.

The inboard right wing was located upslope of the engine and was identifiable by the shape of the wingtip and a small blue/green chard of material embedded in the navigation light area. The left wing was down slope of the engine toward the ravine. Under the wing were parts of the cockpit area and instrument panel, identifiable by the seat frames, rudders pedals, and burned remains of the radios.

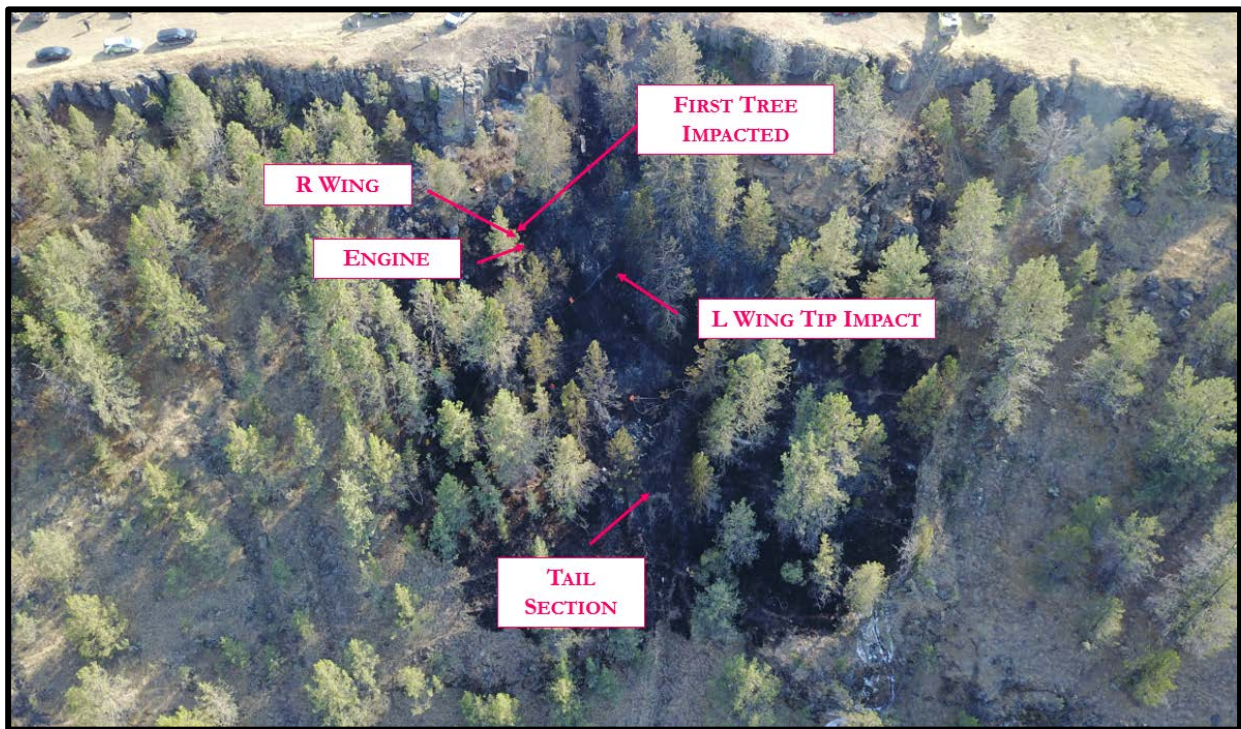


Figure 08: Main Wreckage

The engine came to rest on its left side, with the cylinders nos 2, 4, 6 completely imbedded in the dirt. A portion of one propeller blade was visible and the tip had melted. After unburying the engine and propeller, it was revealed that the propeller remained attached to the engine at the crankshaft flange. The spinner was bent around the hub and the bottom blade was broken free from the hub. All the blades were relatively straight aside from slight aft bends.

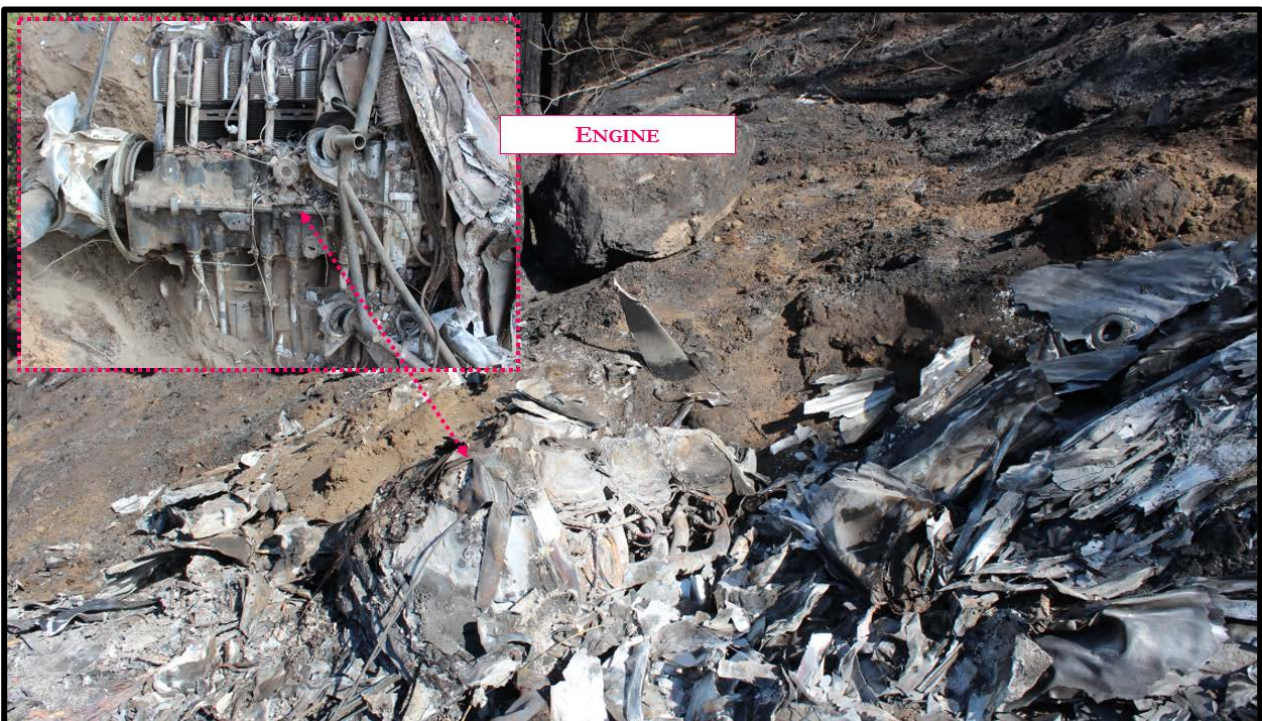


Figure 09: Engine

The empennage was thermally destroyed and only portions of the flight controls were identifiable. The tail section was located in the at the bottom of the debris field (about 15 feet from the engine). The farthest item down the debris field included a portion of the upper cabin and window, Garmin 750 GPS, several other cockpit items.

## EXAMINATIONS

The airplane was recovered to Airtech Services LLC.2143 E ST NE Hangar 3. The airplane components were arranged as close as possible to their original position in the airplane prior to the accident.

Fuselage. The fuselage was constructed of composite material and consumed by fire.

Door. The single right-side entry door was constructed of composite material and mostly consumed by fire. The door latch was in the locked position

Seats. The seats were constructed of composite material and consumed by fire.

Wings, flaps, ailerons, empennage, and trim tabs. These flight control surfaces were constructed of composite material and consumed by fire.

Flight Controls. The airplane had dual flight controls consisting of various materials. Items made of steel were thermally damaged but generally intact. All items made of composite material or aluminum were consumed by fire.

Pitch. Pitch control was accomplished by one of two control sticks connecting to a mixing assembly, then via a series of two steel rods and two steel tubes running centerline to the elevators. This assembly used six rod end bearings to complete the connection. All but two rod end bearings demonstrated signs of damage from overload. Two rod end bearings, both of which connected to the same a steel bell crank, demonstrated no signs of overload, no signs of elongation, and were lacking attaching hardware. This bell crank was not recovered for inspection.

Roll axis. Roll was controlled by one of two control sticks connected to the mixing assembly, then to a series of aluminum tubes and bell cranks to the ailerons. The aluminum control tubes were consumed by fire. The ends of these control tubes were attached to rod end bearings and indicate they were connected to their respective steel bell cranks.

Yaw. Yaw was controlled by a pair of rudder pedals connecting to two steel cables running through pulleys to the rudder. The dual rudder pedal assemblies were made of steel and were thermally damaged. The two rudder control cables were found thermally damaged but generally intact to the connecting brackets that would have attached to the rudder.

Flaps. This airplane used an electric motor to manipulate the flaps. The electric motor was thermally damaged. The steel tubes used to manipulate the flaps were thermally damaged.

Landing Gear. The tricycle landing gear was thermally damaged. The nose wheel and hub were consumed by fire. The nose wheel strut was thermal damage. The main landing gear was a two-piece design constructed from aluminum and was thermally damaged. The main landing gear wheels were thermally damaged. The main landing gear wheels were consumed by fire.



*Figure 10: Flight Control System*

Engine. Model: IO-540, Data plate missing; Serial Number: L-17422-48A; Case Match Number: 514  
Rotation of the engine was not possible due to binding of various components, which was a result of impact damage; investigators were not able to obtain compression. The cylinders' combustion chambers were examined upon removal

of 1, 3, and 5 cylinders and a borescope examination of the remaining cylinders. The combustion chambers remained mechanically undamaged, and there was no evidence of foreign object ingestion or detonation. The valves were intact and undamaged. There was no evidence of valve to piston face contact. The gas path and combustion signatures observed at the spark plugs, combustion chambers, and exhaust system components displayed coloration that the Continental representative said was consistent with normal operation.

Spark Plug Manufacturer: Autolite: UREM38S Spark plug condition: normal

Borescope Inspection: No Anomalies, All cylinder had rust from sitting after fire.

Left Magneto: Slick 6351 S/N: 03120032: Comments: Mostly consumed by fire.

Right Magneto: Slick: Consumed by fire

Oil pickup screen condition: Found separated from sump, Contaminated with dirt Oil sump consumed by fire

Lower accessory case consumed by fire. All accessories consumed by fire Exhaust and intake crush upward

Propeller. The three-bladed propeller was damaged by impact forces. Propeller Manufacturer McCauley

Propeller Model: B3D32C417-C Propeller S/N: 900150

Blade 1: broken free with leading edge polishing, cord wise scratches and twisting

Blade 2: loose in hub with tip melted away

Blade 3: blade bent aft at tip

| Date     | Tail Number | Sales_Description                                                                                                             | Quantity |
|----------|-------------|-------------------------------------------------------------------------------------------------------------------------------|----------|
| 08/19/17 | 246TM       | AvGas 100LL Date: 08/19/2017 10:03:46 Docket #: 15474 Operator: Equip: AvGas6 Meter: AvGas6-1 (End=100114.8 Start=100055.9)   | 58.9     |
| 04/04/17 | 246TM       | AvGas 100LL Date: 04/04/2017 12:28:13 Docket #: 12097 Operator: Equip: AvGas6 Meter: AvGas6-1 (End=35460.6 Start=35438)       | 22.6     |
| 10/19/16 | 246TM       | AvGas 100LL Date: 10/19/2016 10:44:59 Docket #: 14129 Operator: Equip: AvGas2 Meter: AvGas2-1 (End=75953.5 Start=75919.5)     | 34       |
| 10/06/16 | 246TM       | AvGas 100LL Date: 10/06/2016 11:02:47 Docket #: 13277 Operator: Equip: AvGas6 Meter: AvGas6-1 (End=1927015.5 Start=1926984.4) | 31.1     |
| 08/27/16 | 246TM       | AvGas 100LL Date: 08/27/2016 16:07:41 Docket #: 12455 Operator: Equip: AvGas6 Meter: AvGas6-1 (End=1910858.8 Start=1910819.5) | 39.2     |
|          |             | TOTAL                                                                                                                         | 185.8    |