



## RECORD OF COMMUNICATION

**Michael Huhn**  
**Air Safety Investigator**  
**Western Pacific Region**

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**Date: September 12, 2018**  
**Person Contacted: Mr. Ray Lawrence (ULPower Engines Representative)**  
**NTSB Accident Number: WPR18TA223**

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**Narrative:** The following information was provided in an email sent by Mr. Lawrence on this date:

I have inspected this engine this week and found that the probable cause of failure was detonation, probably caused by the use of fuel with a lower than recommended octane rating.

The manufacturer specifies 93 octane and in the location where the engine was being operated, 91 is the highest rated auto fuel available. I suspect that the fuel being used was actually 87 octane, either intentional or more likely by mistake.

The lower octane rating of the fuel, accompanied by higher cylinder head temperatures due to the extended period of slow flight, the pilot reported, requiring a high power setting to maintain altitude at low airspeed with reduced cooling airflow, combined to create the condition.

I am including pictures of the affected piston, showing severe erosion.

This would have allowed the crankcase to become pressurized, forcing the engine oil out through the crankcase vent and exhaust valve. The erosion is present in #1 piston and an excessive amount of oil was present in #1 exhaust pipe, to support this opinion.



**Figure 1 - Damaged Piston**



**Figure 2 - Damaged Piston**



**Figure 3 - Damaged Piston**



**Figure 4 - Damaged Piston**



**Figure 5 - Piston Face**