



## **NATIONAL TRANSPORTATION SAFETY BOARD**

Office of Aviation Safety  
Western Pacific Region

July 20, 2020

# **ENGINE EXAMINATION**

**WPR19LA240**

## **A. ACCIDENT**

Location: Lancaster, CA  
Date: August 25, 2019  
Aircraft: Super Petrel, Registration Number: N632MM  
NTSB IIC: Albert Nixon

## **B. EXAMINATION PARTICIPANTS:**

Michael Hicks  
Air Safety Investigator  
National Transportation Safety Board  
Federal Way, WA

Jordan Paskevich  
Chief Accident Investigator  
Rotech Flight Safety Inc.  
Rotax Aircraft Engines  
Vernon B.C., Canada

## **C. SUMMARY**

Examination of the airplane's engine was conducted on July 20, 2020, at the facilities of Southwest Aircraft Transportation and Recovery, located at the Chino Airport, (CNO), Chino, California. Both carburetor's seals were observed not seating properly and leaking, which caused the engine to lose power. Additionally, contamination was observed in each carburetor float bowl. No other anomalies or evidence of preimpact mechanical failure or malfunction were noted during the examination of the engine.

## **D. DETAILS OF THE INVESTIGATION**

### **1.0 Engine Examination**

Examination of the Rotax 914 UL2 engine, serial number 9576264, revealed that it was still attached to the fuselage and sustained no damage. All the spark plugs were removed and exhibited normal wear conditions and no anomalies were noted. The crankshaft was rotated by hand, utilizing the propeller, and rotational continuity was established throughout the engine, accessory section, and the valve train.

The two carburetor float bowls were removed and examined. The cylinder Nos. 1 and 3 carburetor float bowl had contamination located beneath one float. The cylinder Nos. 2 and 4 carburetor float bowl had contamination located below the main jet. The contamination was consistent with grease that was used on the float bowl's gaskets. The fuel pumps tested good. Additionally, the lubrication system, engine cylinders and internal engine components, cooling system, ignition, and exhaust system, were examined with no anomalies noted. The examination of the engine determined that it could be safely run.



**Figure 1: Contamination carburetor float bowl for cylinder nos, 1 and 3.**



**Figure 2: Contamination in carburetor float bowl for cylinder nos. 2 and 4.**

About ½ liter of oil was added and further, fuel was added to the header tank. Several engine runs were accomplished.

One first engine run, the engine was started with both the auxiliary and main fuel pumps on. All engine parameters were normal. After several minutes, the throttle was advanced from 2,000 rpm to 3,500 rpm. The engine began to run rough and loose power. The throttle was then advanced further, to 4,000 rpm, and then the engine began to shake and run very rough. The auxiliary pump was shut off and the engine began to run slightly better, but it did not fix the rough running issue.

On the second engine run the engine was started with the auxiliary and main fuel pumps on. All engine parameters were normal. After several minutes, the throttle was advanced from 2,000 rpm to 3,250 rpm and the engine began to run rough and lose power. The engine was run a 3,200 rpm several times and the power loss issue persisted. One fuel pump was shut off and the engine ran better. With both fuel pumps selected on, the engine tended to run worse.

On the third engine run, the carburetor floats were removed from the float bowl and replaced with known new functional ones. Additionally, the float bowls were resealed. The engine was

started with the use of both fuel pumps and ran at 2,000 rpm for several seconds. When the rpm was advanced to 3,200 the engine ran fine with no issues.

On the fourth engine run, the new functional floats remained installed, and the engine was started with both fuel pumps on and the starter. The engine was run at 2,000 rpm for several seconds and then the throttle was advanced 4,770 rpm and the engine ran fine with no anomalies noted and was shut down.

On the fifth engine run, the new functional floats remained installed, and the engine was started and run with the use of both fuel pumps. The engine was run at 2,000 rpm and then the throttle advanced to 4,280 rpm and the engine ran fine with no anomalies noted.

On the sixth engine run, the original floats were reinstalled into the float bowls and the engine was started and run with the use of both fuel pumps and the starter. The engine was run at 2,000 rpm with no issues and then the throttle was advanced to 4,219 rpm with no anomalies noted. It was determined that the original floats were not the issue.

On the seventh and final engine run, the original floats remained installed. Since the original floats were determined not to be the issue, the float the bowls were intentionally loosened, and the engine run again to check for leaks. The engine was started and run with the use of both fuel pumps. The engine was run at 2,000 and 3,500 rpm with no issues and then the throttle was advanced to 4,090 rpm and the engine ran rough, shook, and lost power.

Therefore, when the carburetor bowls were resealed, the subsequent engine runs showed no anomalies. When the carburetor float bowl seal issue was reintroduced in the seventh and last engine run, the issue with the engine running rough and losing power also reoccurred.

Submitted by: Albert Nixon