



MEMORANDUM FOR RECORD

Stephen Stein
Aviation Accident Investigator
National Transportation Safety Board
Office of Aviation Safety – Western Pacific Region

NTSB Accident Number: WPR19LA141
Aircraft Registration & Make/Model: N423EB; Flight Design CTLS
Accident Location: Boulder City, Nevada
Accident Date: May 7, 2019

Note: The following interview was documented by the Investigator –In-Charge (IIC), Stephen Stein.

Interview #1 Summary

Jason Crow
Eyewitness

E-mail correspondence Date; May 7, 2019

The NTSB IIC received Mr. Crow's witness statement through a third party, an airport employee, the contents of which are capture below.

This is an email of my observations in regards to the GA crash at Boulder this afternoon May 7, 2019 at approximately 1620 local time. This accident happened only shortly after I had myself landed on Runway 15. The winds were a little gusty but were favoring 15 at the time of the accident. The nature of his approach is what caught my attention and caused me to stop and observe. I witnessed what appeared to be a Diamond 40 Series aircraft making an approach to Runway 15, the plane appeared to be carrying excessive speed and was a little high on its final approach. This seemed to cause the plane to float from the 1000 ft markers past the Delta intersection and toward the intersection of runway 9-27, and during this time the pilot appeared to be trying to save the landing. At the point of approaching the intersection of 9-27 the pilot appeared to start an attempt at a go around, however it did not initially sound like he applied full go around power. The aircraft failed to climb out, only seeming to make it about 200ft AGL,

when crossing the end of the runway it looked like the pilot tried to force it to climb by pulling up harder but upon doing this the plane entered into a stall and descended down and to the left. Shortly after that the aircraft impacted the ground a little ways out side the airport grounds and to the left of the departure end of Runway 15.

Jason Crow

Interview #1 Summary

Jason Crow

Eyewitness

Interview Date; May 9, 2019

Mr. Crow was asked multiple follow-up questions in regards to his initial written observations about the accident flight. During this interview, he stated that the pilot's approach was initially high, appeared shaky and bouncy, and looked like he build up too much airspeed during his rapid descent. The airplane floated about 2/3 down the runway and descended as low as 10 ft above ground level before the pilot initiated a go-around. Mr. Crow heard the engine power increase rapidly during this time, but sounded like the engine reached partial power. The airplane immediately pitched up and began a climb. He further added that the airplane's pitch change was "drastic" as the nose pitched up significantly in a short amount of time. Immediately after, the airspeed decreased, followed by a nose low attitude and a left turn. The event looked similar to a power ON stall.



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Interview #1 Summary

Miguel Giacaman
Accident Pilot

Interview Date & Time; August 13, 2019; 0830 PT

Mr. Giacaman reported that he started flying in the United States in 1999 and subsequently obtained a private pilot certificate in 2004. Most of his flying has been on the West Coast and has included cities such as: San Francisco, California; Portland, Oregon; Tucson, Arizona; and Catalina Island, California. He added that he had never experienced any issues with the accident airplane since he purchased it in 2016. At the time of the accident, he had been flying a few hours each month included two flights to San Francisco, California that recurred monthly.

On the day of the accident, he had planned to take his brother-in-law for a recreational flight. They departed about 1530 from runway 15 and flew over the Hoover Dam. As soon as he entered the east side of Lake Mead, which he did on Autopilot at 4,000 ft, the engine suddenly accelerated and both occupants observed a loud noise that sounded like the engine had reached full power. The pilot looked at his airspeed indicator and noticed that it had reached 134 kts. He later stated that he only inferred the power increase after observing the increase in his airspeed. His altitude remained about 4,000 ft mean sea level at this time. He further remarked that he

could have been looking at true airspeed, not indicated airspeed, but could not recall. At the time the throttle setting was at 70% power. The pilot then retarded the throttle to IDLE; however he did not observe a noticeable power response until 5-8 seconds later. He added that he was waiting to hear a “noise” from the engine and a reduction in airspeed. The pilot did not look at rpm or manifold pressure. The LANE B warning light illuminated after this event, which was accompanied by a caption in the lower right corner of the primary flight display that read “Rotax: Land Airplane.”

The pilot immediately changed his course and returned to the airport. The LANE B indicator was still illuminated for the remainder of the flight, but the airplane flew normally during the approach. He further remarked that to initiate his descent from his cruise flight altitude he attempted to decrease power to IDLE, but the airplane would not descend. The pilot then performed the “emergency descent procedure” to descend promptly by forcing the nose low, power to IDLE, no flaps, and using a sideslip maneuver. However, when he reached the runway the airplane was too fast, about 90 kts. The airplane would not slow to his surprise, so about the remaining third of the runway, he applied full power to perform a go-around maneuver. Immediately after, he looked out the window and observed that “he’s going up”, so he put the nose down and the airplane crashed about three seconds later.

He subsequently added that the airplane had slowed down by the remaining third of the runway, but not enough to perform a full stop landing. The pilot further remarked that the stall speed in the airplane was 42 kts indicated with 15° of flaps and 45 kts indicated with 0° of flaps.



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Interview #1 Summary

Jordan Paskevich
Rotax Flight Safety

E-mail correspondence Date; August 2, 2019

The NTSB IIC documented the following e-mail correspondence from Rotax Flight Safety.

Hi Stephen

I hope the below will help with the questions you have and to address some of the pilots statements.

- *The ECU contains two independent computers (Lane **A** and Lane **B**)*
- *The engine is normally in ECO mode: running LEAN of peak. The ECO mode is mostly based on the throttle position: from idle to around 97%. At throttle position over 98% the ECU switches to POWER mode and the mixture goes RICH for maximum performance. When Lane **A** or **B** warning light is "ON" (not flashing) the engine will default to run in "RICH" mode. This will reduce aircrafts fuel range. The redundant ECU runs on the principle of "injection and ignition as a top priority".*

- *If a warning lamp lights up / flashes then there is a fault. The system automatically switches (one time) to the Lane that is healthier and thus you are running the engine on a single lane.*

Lane A and Lane B have different sensor inputs. During Lane and Ignition check, some sensor values are not displayed, depending on the activation of the Lanes:

- ***Not available sensor values if Lane A = OFF and Lane B = ON:*** • Coolant temperature • Exhaust gas temperatures from cyl. 1-4 • Ambient temperature • Throttle lever position
- ***Not available sensor values if Lane B = OFF and Lane A = ON:*** • Oil temperature • Oil pressure

Engine not responding to throttle inputs •

- *Possible breakage/blockage of throttle valve actuation/ linkage.*
- *Possible problem/influence of alternate air system.*
- *Limited flight operation with available power possible.*
- *A maintenance inspection should be carried out.*

Generators

The engine has two 3-phase, internal, oil cooled, permanent magnet generators. They require no external excitation; whenever they rotate they produce electricity. The magneto flywheel assembly rotates with the crankshaft, and the stationary Stator contains the two separate generator winding systems.

- *The generator A (16A) supplies the engine control unit (ECU) and the fuel pump module with power.*
- *The generator B (30A) supplies the airframe.*

The ECU decides which Gen is to be used (turning Lane A off does not automatically turn off Gen A, unless the ECU decides this is best). The generators are brushless and have no contacting or wearing parts. In case of failure of the Gen A, Gen B takes over the engine electrical requirements, but the battery will stop charging at the same time. Normally both generators run together.

Failure of the EMS power supply

- *If the EMS power supplies (alternator A) fails then the ECU automatically switches one-time over to the second EMS power supply (alternator B)*
- *While alternator B runs, no power drop is recognizable •*
- *Failure of both EMS power supplies (alternator A/B) result in engine stoppage. Remedy: Switch "ON" the Battery Backup Switch (In this case the power supply is provided by the aircraft battery). Restart engine.*
- *Land the aircraft at the next available opportunity*
- *A maintenance inspection should be carried out*

Interview #2 Summary

Jordan Paskevich
Rotax Flight Safety

E-mail correspondence Date; August 12, 2019

The NTSB IIC documented the following e-mail correspondence from Rotax Flight Safety.

Here is a list of the systems each Lane in the ECU controls and monitors.

Lane A 10Hz

- Engine Speed
- EGT Cylinder 1
- EGT Cylinder 2
- EGT Cylinder 3
- EGT Cylinder 4
- ECU Bus Voltage
- Generator Select Voltage
- Manifold Air Pressure
- Metered Air/Fuel Ratio Target
- Linearized Throttle Position
- Calculated Ignition Dwell Time
- Ignition Timing
- Transient Enrichment
- EGT Lambda Target
- EGT Operating State
- Knock Ratio 1
- Knock Ratio 2
- Calculated Mass Air Flow
- Calculated Fuel Flow
- EFT Steady Stat Word
- Fuel Injection Mass for Cylinder 1
- Fuel Injection Mass for Cylinder 2
- Fuel Injection Mass for Cylinder 3
- Fuel Injection Mass for Cylinder 4
- EGT Multiplicative Fuel Correction for Cylinder 1
- EGT Multiplicative Fuel Correction for Cylinder 2
- EGT Multiplicative Fuel Correction for Cylinder 3
- EGT Multiplicative Fuel Correction for Cylinder 4
- System Status Work
- SSW: Advanced Built In Test State
- SSW: Knock Stated
- SSW: Opposite Lane Alive State
- SSW: Generator Select Manager State

- SSW: This Lane In Control State
- SSW: Turn Down Mode State
- SSW: Feed Forward Lane State
- SSW: Bus Voltage State
- SSW: Warning Lamp State
- SSW: Fuel Injection Synchronization Status
- SSW: System State
- Time Stamp
- Time Stamp of Land B

Lane B 10hz

- Engine Speed
- ECU Bus Voltage
- Generator Select Voltage
- Manifold Air Pressure
- Ignition Timing
- Oil Pressure
- Metered Air/Fuel Target Ratio
- Calculated Fuel Flow
- Calculated Mass Air Flow
- Calculated Ignition Dwell Time
- Fuel Injection Mass for Cylinder 1
- Fuel Injection Mass for Cylinder 2
- Fuel Injection Mass for Cylinder 3
- Fuel Injection Mass for Cylinder 4
- System Status Word
- SSW: Advanced Built In Test State
- SSW: Knock State
- SSW: Opposite Lane Alive State
- SSW: Generator Select Manager State
- SSW: This Lane in Control State
- SSW: Turn Down Mode State
- SSW: Feed Forward Lane State
- SSW: Bus Voltage State
- SSW: Fuel Injection Synchronization Status
- SSW: System State
- Time Stamp
- Time Stamp of Lane A

Additional Monitoring

- Lane A/B Errors/Events
- Sensor Fault Status of Lane A
- Sensor Fault Status of Lane B
- Device Fault Status of Lane A

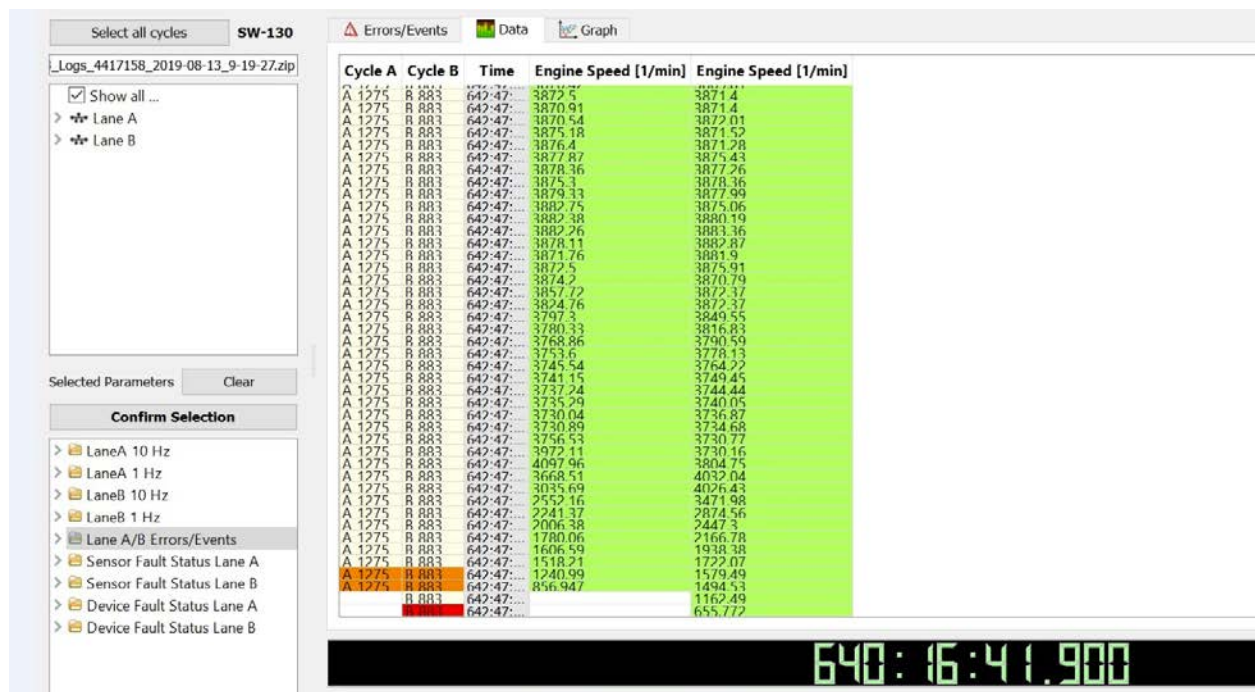
- Device Fault Status of Lane B

Interview #3 Summary

Jordan Paskevich
Rotax Flight Safety

E-mail correspondence Date; August 12, 2019

The NTSB IIC documented the following e-mail correspondence from Rotax Flight Safety.



Select all cycles

SW-130

Logs_4417158_2019-08-13_9-19-27.zip

Show all ...

Lane A

Lane B

Selected Parameters

Clear

Confirm Selection

LaneA 10 Hz

LaneA 1 Hz

LaneB 10 Hz

LaneB 1 Hz

Lane A/B Errors/Events

Sensor Fault Status Lane A

Sensor Fault Status Lane B

Device Fault Status Lane A

Device Fault Status Lane B

Errors/Events

Data

Graph

Filter Settings

Clear Filter

Clear All

Select All

Deselect All

Error/Event Category

Failures

Occurrences

Category

Class

Type

Test

Error

Lane

Both AB

1

Failure

1: Sensor

11: Crank ...

2: Failure ...

1: Below Range

Class

All

1

Failure

2: Actuator

5: Ignitio...

1: TPU Test

1: Nominal Current Not Reached

Type

All

1

Failure

2: Actuator

7: Genera...

3: Test W...

5: Generator Select In Failsafe

Test

All

5

Failure

3: Compo...

5: ETPU

0: ETPU T...

1: Synchronization Lost

Error

All

Cycle	Time	Category	FC_Class	FC_Type	FC_Test	FC_Error	Fault Reading
R 372	301:42:19	Failure	3: Component	5: ETPU	0: ETPU Test	1: Synchronization Lost	2
A 621	374:28:28	Failure	3: Component	5: ETPU	0: ETPU Test	1: Synchronization Lost	2
R 581	411:51:22	Failure	1: Sensor	11: Crank Bias Negative Voltage	2: Failure Test	1: Below Range	1.19741
R 672	462:15:37	Failure	3: Component	5: ETPU	0: ETPU Test	1: Synchronization Lost	2
R 796	582:57:36	Failure	3: Component	5: ETPU	0: ETPU Test	1: Synchronization Lost	2
B 883	642:40:11	Failure	2: Actuator	5: Ignition 1 (Cyl 1 and 2)	1: TPU Test	1: Nominal Current Not Reached	30
B 883	642:47:43	Failure	2: Actuator	7: Generator Select	3: Test While Not Commanding Gen	5: Generator Select In Failsafe	6.91866

640:16:41.900

Interview #4 Summary

Jordan Paskevich

Rotax Flight Safety

E-mail correspondence Date; May 14, 2020

The NTSB IIC documented the following e-mail correspondence from Rotax Flight Safety.

Rotax changed the operator's manual in January 2019 and removed the “Land the aircraft” warning. This is why you haven’t seen it in the references I previously provided and probably why you had trouble finding it. The accident aircraft was configured as per the old operator’s manual, where it does state when to land the aircraft based on the lane lights (see below).

4.1) Fault indicated by the EMS lamps

EMS lamps

NOTICE

Reduce engine power setting to the minimum necessary and carry out precautionary landing.

The aircraft should be flown to the nearest available landing site (Airfield, Airstrip, Airport) if any of the following combinations of the EMS lamps arise:

- One lamp permanently on, one off.
- One lamp permanently on, one flashing.
- Both lamps permanently on.
- Both lamps flashing.

EMS lamps operating states

If one of the lamps is flashing while the other is off then limited flight operation are permitted up to a maximum of 10 hours.

LANE A	LANE B	Action
OFF	Flashing	Limited flight operation
Flashing	OFF	Limited flight operation
OFF	ON	Land the aircraft
Flashing	Flashing	Land the aircraft
Flashing	ON	Land the aircraft
ON	OFF	Land the aircraft
ON	Flashing	Land the aircraft
ON	ON	Land the aircraft

ON = permanently on

Interview #5 Summary

Jordan Paskevich

Rotax Flight Safety

E-mail correspondence Date; May 14, 2020

The NTSB IIC documented the following e-mail correspondence from Rotax Flight Safety.

Only one fault appears as the “second one” shows up right at the time of engine shut down and this would be considered normal due to circumstances - The failure “Nominal current not reached” Code has a solid lane light. The ECU systems monitors the current level when changing an ignition coil. If the current does not meet a nominal level (6A), the system reports and records the event with a status flag. If the status flag is set in separate engine revolutions this fault is recorded for the ignition coil of Cylinder 1 or 2.