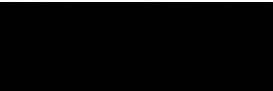


 **Federal Ministry**
Republic of Austria
Climate Action, Environment,
Energy, Mobility,
Innovation and Technology

Mr Stephen Stein
Aviation Accident Investigator
32125 32nd Ave South
Federal Way, WA 98001


bmk.gv.at

Federal Safety Investigation Authority
Bernhard Kobylík
Senior Investigator


Radetzkystraße 2, 1030 Vienna, Austria

Please send e-mail answers quoting our reference
number to 

Ref.No.: Accredited representative for N423EB

Your ref.: N423EB

Dear Mr Stein,

On June 16th 2020, the Federal Safety Investigation Authority of Austria offered assistance to perform functional test of following items out of N423EB:

1. MAP sensor
2. MAT sensor
3. Engine main wiring harness
4. Fuel system leak-proof check
5. Fuel pump test
6. ECU Test

1.1 Fuel Pumps, Check Valves, Fuel Lines, ECU

On October 7th 2020, the FSIA conducted following tests of the main and auxiliary fuel pumps at the engine manufacturer site (BRP Rotax, Rotaxstraße 1, A-4623 Gunskirchen, Austria):

- Leak check
 - Functional check
 - Pressure check
- 

1.1.1 Fuel pumps

Both fuel pumps found within the nominal operational ranges. There were no fuel leaks observed – neither internal nor external. The electrical load of both pumps found within the specification of the engine manufacturer BRP Rotax.

1.1.2 Check valves

The check valves found working properly, without any leak or damage.

1.1.3 Fuel lines

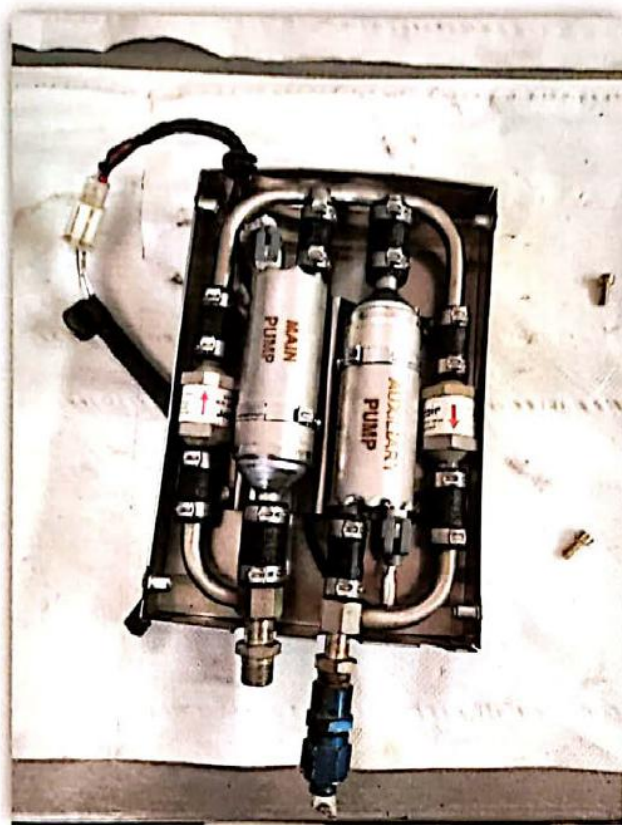
The fuel lines were found tight, sealed and without any anomalies.

1.1.4 Electrical wiring

The electrical wiring found satisfactory and undamaged.

1.1.5 ECU

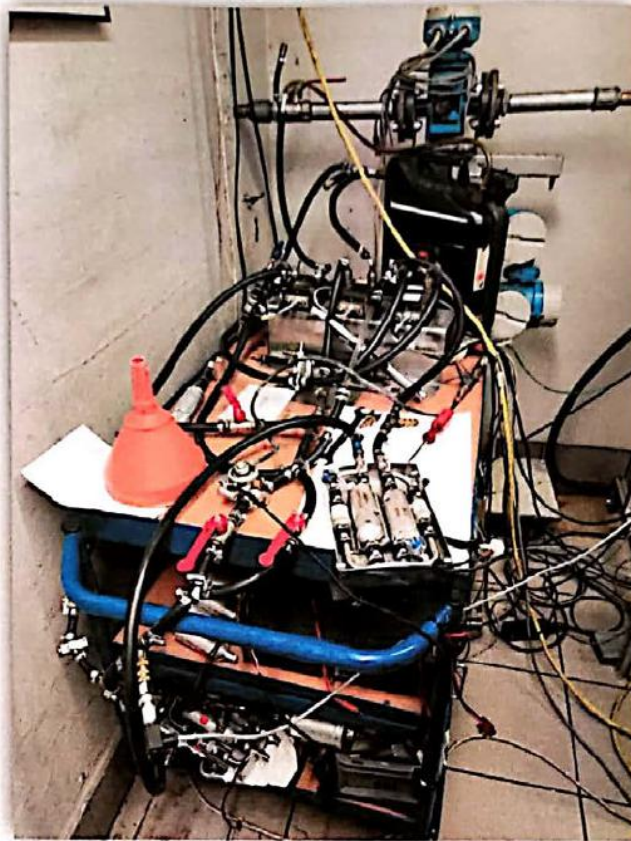
The Electronic Control Unit has been tested and downloaded. There were no anomalies or damages found.



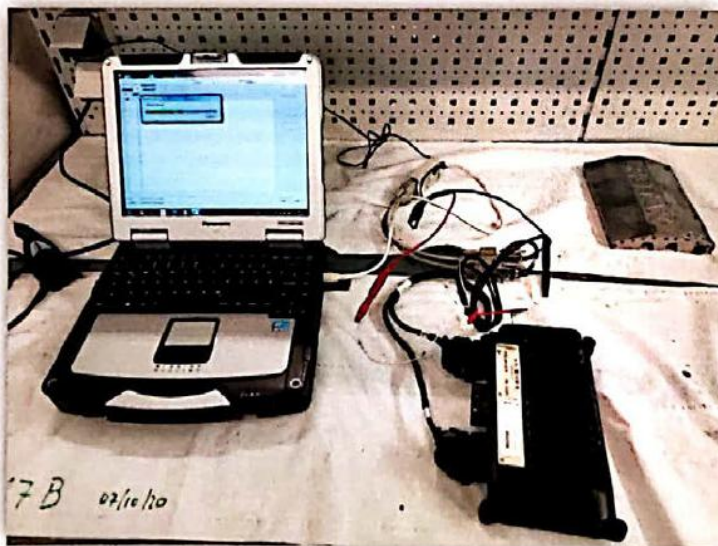
Picture #1: Fuel pump assembly with main and auxiliary fuel pumps, check valves, fuel lines, and electrical wiring



Picture #2: Fuel pump operational testing at BRP Rotax facility



Picture #3: Fuel pump test bench at BRP Rotax facility



Picture #4: ECU testing at BRP Rotax facility



1.2 Main harness

On 23rd November 2020, the FSIA conducted the functional test of the certified engine main harness at the manufacturer site (GPV, Bahnhofstraße 50/1, A-8786 Rottenmann, Austria).

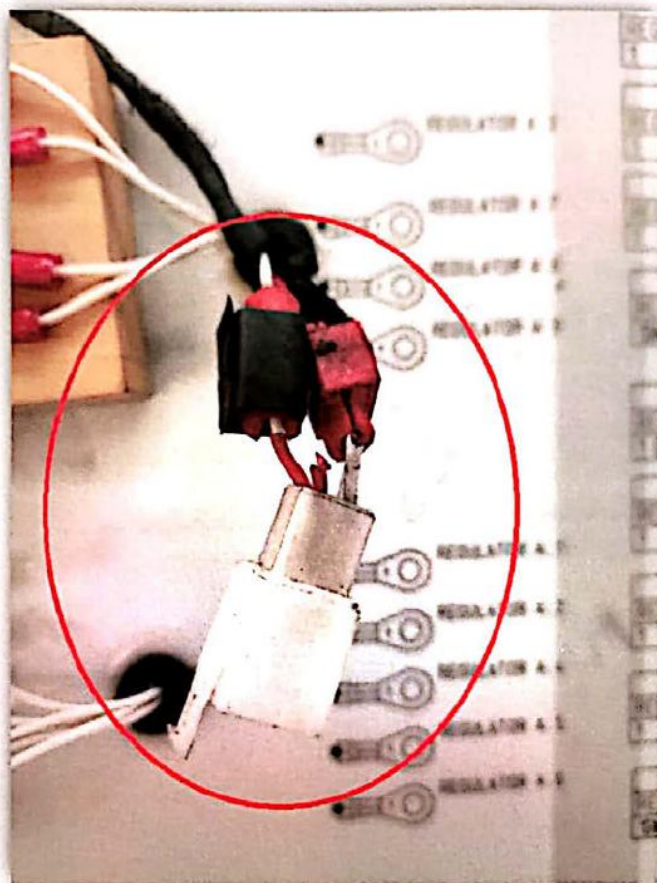
The test of the main harness has been conducted on the manufacturer test bench for this type of harness. The cables for the electrical fuel pumps found modified by someone, most likely to ensure that the length of the cables to the fuel pumps are sufficient. BRP Rotax offers extension kits for the aircraft manufacturers in order to create the correct length of the fuel pump cables. As the fuel pumps are mounted in different locations of the many different aircraft types, it is necessary to give the aircraft manufacturers the possibility to adjust their fuel pump wiring accordingly. However, the cable extension of this particular main wiring is not in common with the requirements of BRP Rotax. The red connector is not aviation standard, the cables were cutted and not sealed. It is the responsibility of the aircraft manufacturer to ensure that the requirements of the engine manufacturer complied with.

The main harness manufacturer GPV mounted the harness on the test bench, repaired the fuel cables of the fuel pumps and performed a system and resistance check three times. Each of the three tests were carried out without any problems. There were, except the cables for the fuel pumps, had no signs of e.g. anomalies, a broken/damaged cable; defective connector, etc.

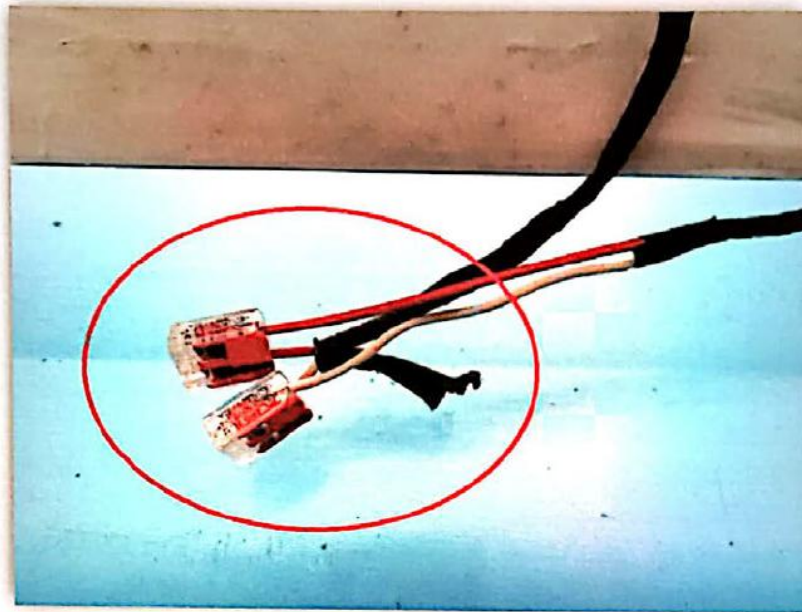
1.2.1 MAT and MAP sensors

Additionally, due to Covid19, it was not possible to travel to the manufacturer for the MAT and MAP sensor. Together with the main harness, the FSIA conducted a functional / resistance check of the MAP and MAT sensors. Both sensors found satisfactory.

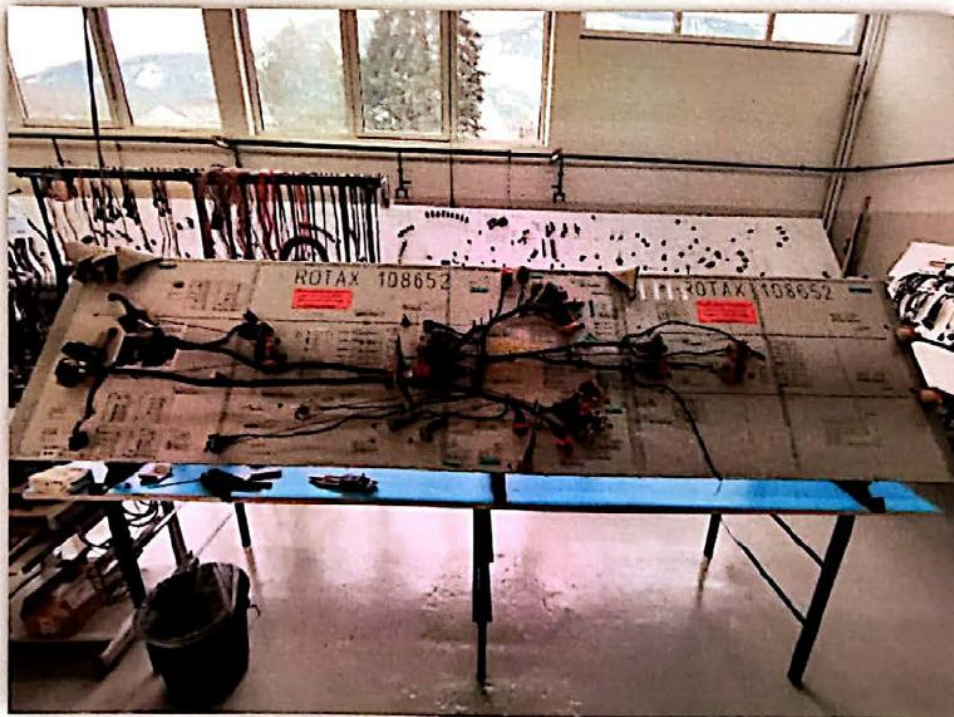




Picture #5: Engine main harness cable for Fuel Pump. This connector is not the required connector as per BRP Rotax requirement.

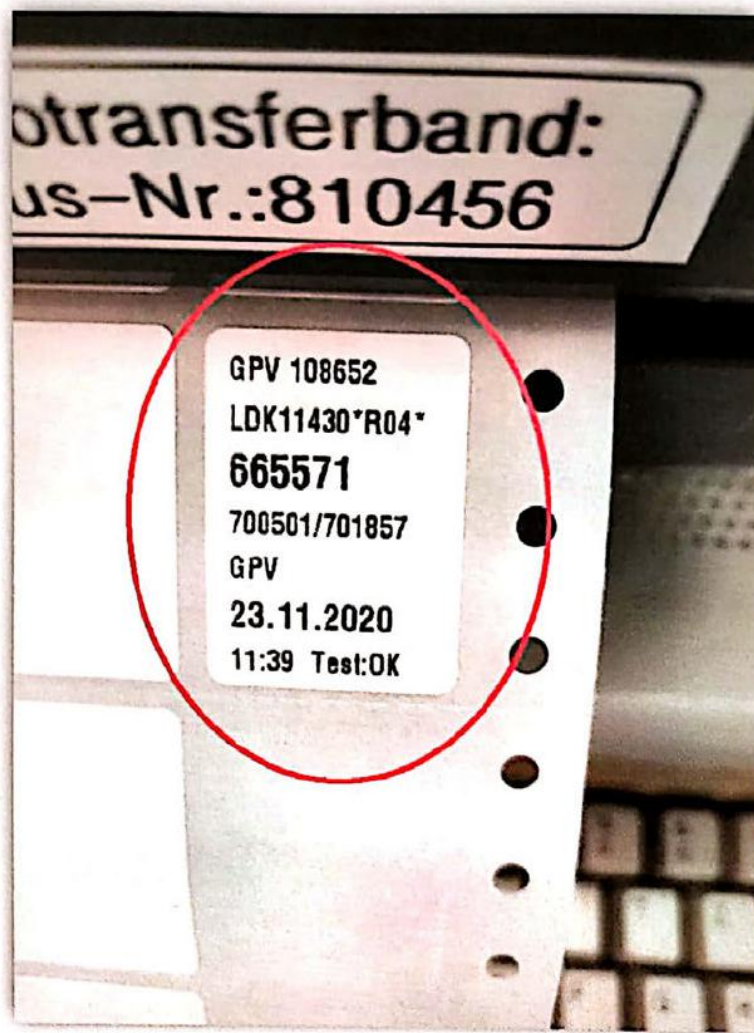


Picture #6: For test purposes, it was necessary to remove the red cable connector (picture #5) and extended the cable length



Picture #7: Bench test at GPV facility





Picture #8: Bench test result for the engine main harness

1.3 Conclusion

The above listed parts have been tested satisfactory. Besides, of the fuel cables extension made by unknown person, all parts found within the nominal operation limitations and functioning properly.



Bernhard Kobylik
Senior Aviation Safety Inspector
Federal Safety Investigation Authority of Austria