Pre-Purchase Inspection Report

AIRCRAFT INFORMATION			
Date of inspection:	04 / 21 / 2020		
Location of Inspection	Owner's Hanger Mabel Lake BC, Canada		
AIRCRAFT INFORMATION			
Aircraft Make:	Kitfox	**Aircraft registration:**	C-FXCE
Aircraft Model:	Outback 5	**Aircraft S/N**	98080160
Aircraft Manufactured Date:	06 / 01 / 2001		
Propeller make, model & S/N	Air master AP332 Constant Speed Feathering Propeller		
ENGINE INFORMATION			
Engine Type:	Rotax 912 ULS	**Engine TTSN**	Analog Hobbs: 384.3 Digital Hobbs: 482.9
Engine Serial Number:	4425336	**Engine TTSOH**	N/A
Engine Manufacture date:	03 / 24 / 1999	**Engine position:**	Tractor

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04 / 21 / 2020	Rotax 912 ULS	4425336	C-FXCE

Initial Inspection

The Pre-purchase inspection took place on April 21, 2020. The aircraft was located in the pilot/owner hangar/garage in Mable Lake, BC Canada (1 hr. drive from Vernon, BC Canada).

The aircraft was stored out of the elements and in the owner's hangar/garage on an aircraft lift, with its wings folded and the top engine cowl removed. A maintainer was connected to the battery.

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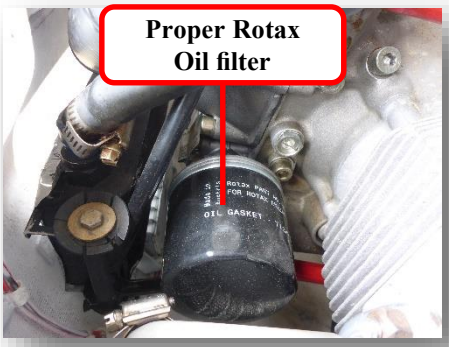
Detailed Inspection

Lubrication System: The oil was found to be clean and in the middle of the flat portion of the dipstick (within limits). An aftermarket oil thermostat was incorporated into the oil system. The oil cooler was correctly installed and partially blocked with tape.
Some operators who fly in colder climates often place tape over a portion of radiators to maintain operating temperatures. The inlet fitting of the oil cooler was not an optimal design or recommended due to its restrictive nature.

It's recommended to have the restrictive fitting changed to a more free-flowing type. The oil lines appeared to be in good overall condition with no leaks however, it's recommended to change the oil lines due to age.



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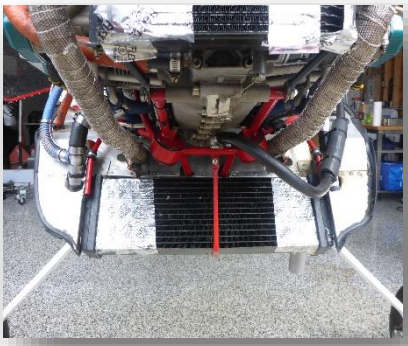
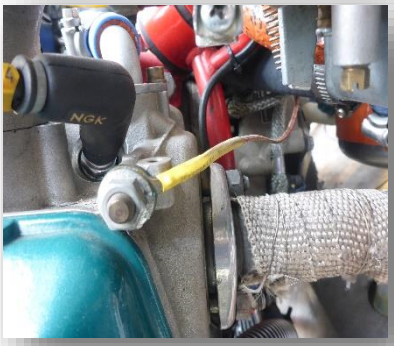
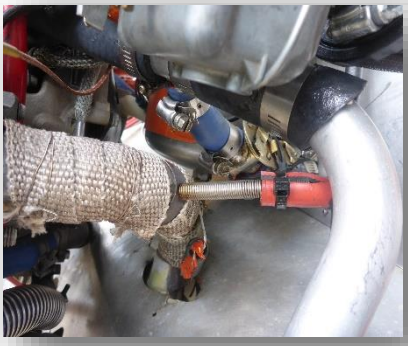
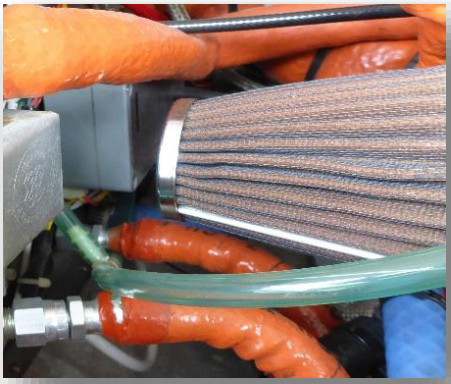
Exhaust system: The exhaust system was examined for condition, modifications, and conformity. The 4 exhaust pipes were mostly covered with a heat wrap and could not be fully inspected. The exhaust muffler appeared to be in good overall condition and properly secured.





Air Filters: The air filters were examined for condition and proper type. Both air filters were K&N and appeared to be cleaned and properly oiled. No anomalies were seen with the air cleaners.

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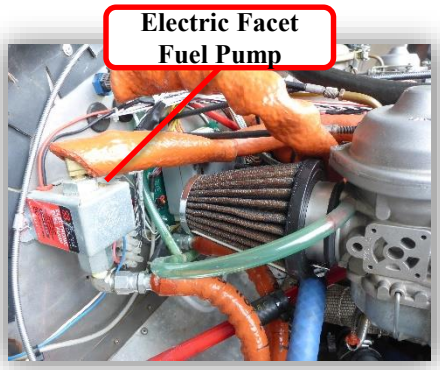
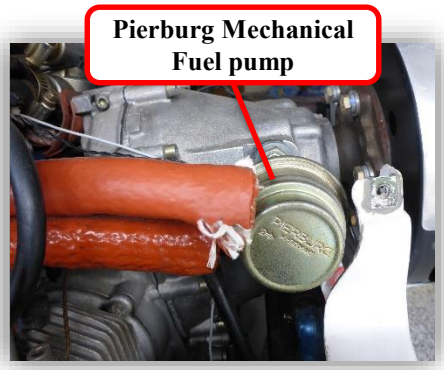
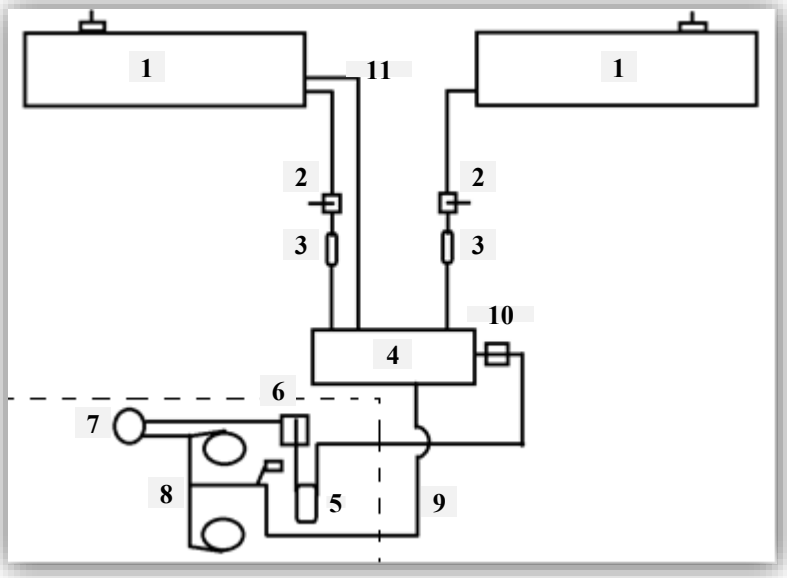
Fuel System: The fuel system was examined. Most of the fuel lines positioned forward of the firewall were covered in a protective fire sleeve and could not be fully examined. The portions of the fuel lines that were examined beyond the firewall were stiff and not pliable. When the fuel lines become hardened, they should be replaced.
Rotax sets a 5-year replacement limitation on all rubber components, including the mechanical fuel pump. The mechanical fuel pump installed on the engine was an “old Pierburg type" and well beyond 5 years old. The fuel system included a gascolator that appeared to be in good condition with easy an access pull cable drain. A Facet electrical fuel pump was installed between the gascolator and the mechanical fuel pump. No anomalies were found with the electric fuel pump.





The fuel system design diagram:
- 1 Wing Tank
- 2 Fuel Shut off valves
- 3 Fuel Filters
- 4 Header Tank
- 5 Gascolator
- 6 Electric Fuel Pump
- 7 Mechanical Fuel Pump
- 8 Carburetors
- 9 Fuel Return Line
- 10 Checkvalve
- 11 Vent line



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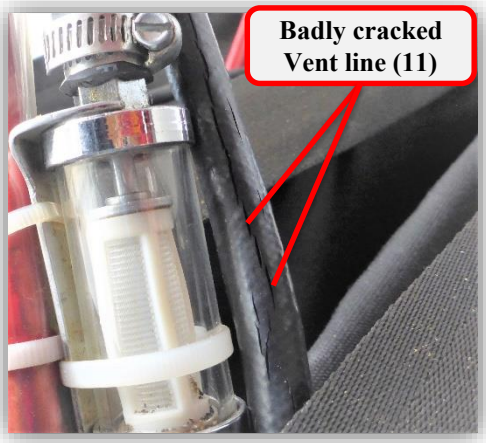
Fuel System (Continued) : The fuel vent line (11) from the header tank (4) to the wing tank (1) was badly cracked and when the fuel shut off valve (2) was turned on, fuel flowed from the wing tank to the header tank and back up the vent line. A substantial amount of fuel leaked out of the cracked header tank vent line.



During the inspection, the owner did replace the cracked vent line with a new fuel line, however, it is recommended that all fuel lines aft of the firewall are replaced with good quality fuel lines. Both fuel filters were examined and only a small amount of debris was found contained inside the fuel filters. Both fuel filters were mounted in a location that allowed for easy access and inspection. No anomalies found with the fuel filters.

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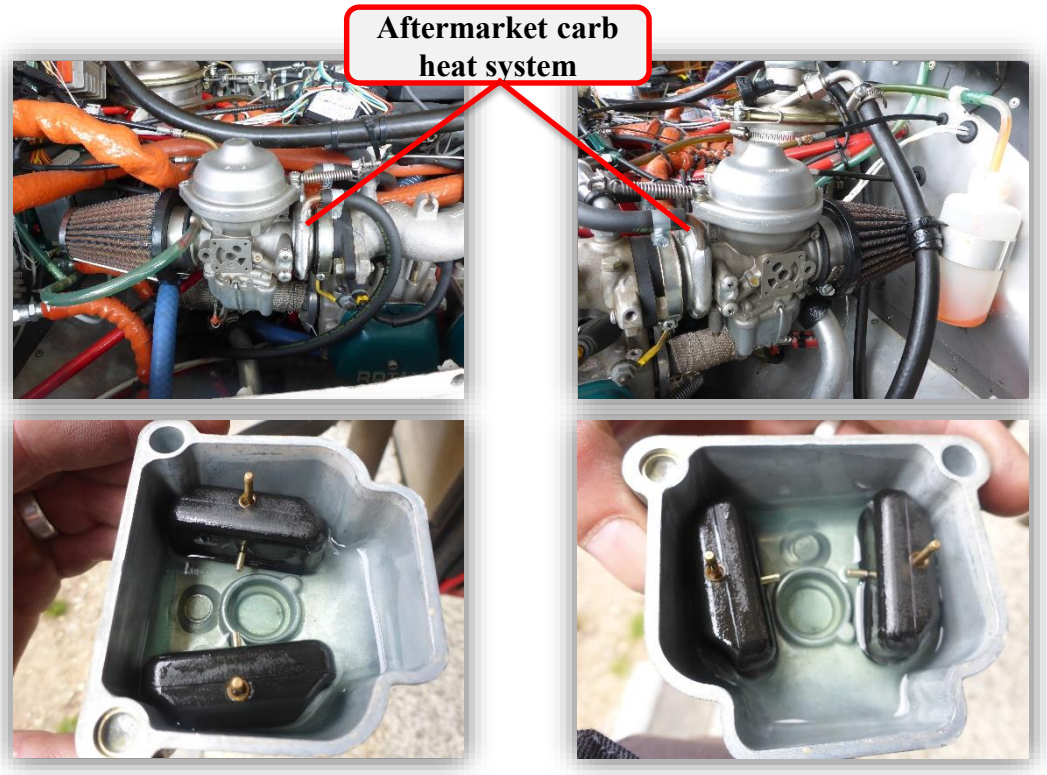
Carburetors: Both the 1/3 and 2/4 Carburetors were examined. Both carburetors had an aftermarket carb heat system installed that utilizes warm coolant from the coolant system. It is unknown how well this system works in carburetor icing conditions.
The 1/3 Carburetor float bowl was removed and examined for any fuel contamination and float check. No anomalies were found with the 1/3 float bowls and the floats appeared to be in good overall condition. The floats were not weighed, however, the floats were placed in fuel and they appeared to be buoyant. A proper weight check should still be done on the floats to determine if they have absorbed fuel. The main jet was clear of any blockage and debris and the throttle linkage and choke operated normally and within there full travel range. No anomalies were seen with the 1/3 Carburetor.

The 2/4 Carburetor float bowl was removed and examined for any fuel contamination and float check. No anomalies were found with the 1/3 float bowls and the floats appeared to be in good overall condition. The floats were not weighed, however, the floats were placed in fuel and they appeared to be buoyant. A proper weight check should still be done on the floats to determine if they have absorbed fuel. The main jet was clear of any blockage and debris and the throttle linkage and choke operated normally and within there full travel range. No anomalies were seen with the 2/4 Carburetor.



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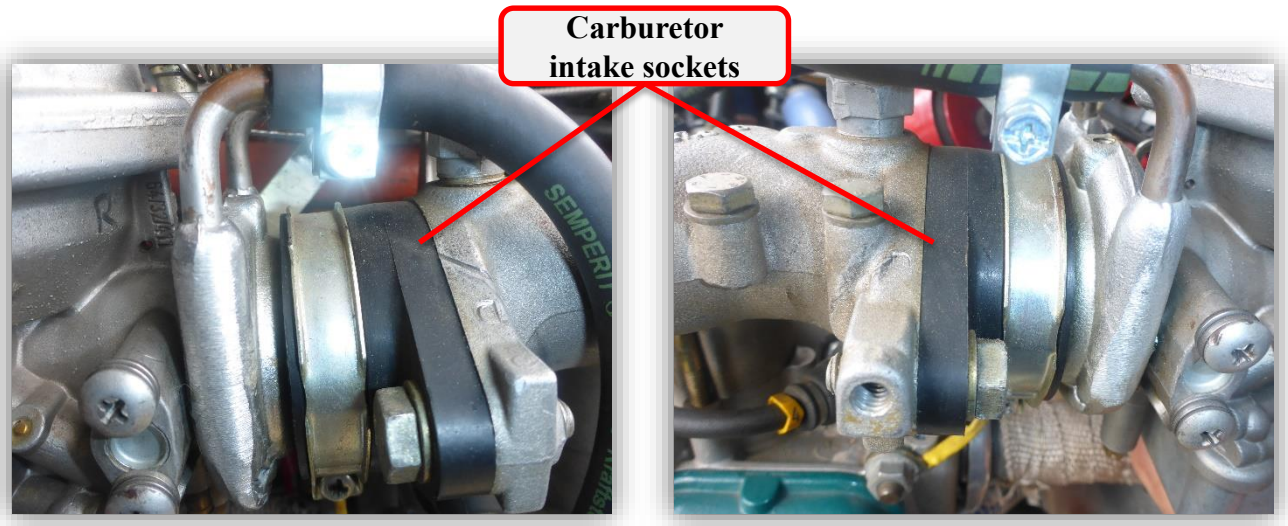
Carburetors (Continued): Both the 1/3 and 2/4 Carburetors intake sockets were examined for condition. It is unknown the age of the carburetor intake sockets however, they appeared to be in good overall condition with no evidence of cracking. The carburetor intake sockets have a life limit of 5 years as set out by Rotax and depending on when they were last changed, they may need to be replaced due to the age restriction. Due to the Kitfox engine mount design, the intake manifolds are swapped from one side to another for clearance. This places the carburetors further outboard than stock configuration and may cause more stress on the carburetor sockets. This can result in premature wear and issues when synchronizing the carburetors.



Reduction Gearbox: The reduction gearbox was inspected. the friction torque was checked on the reduction gearbox to determine its internal condition. The friction torque came to 413.4 in-lbs which is well within the limitations set out by Rotax. No issues were noted with the reduction gearbox.

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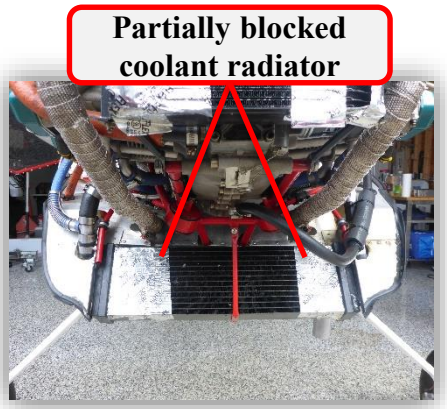
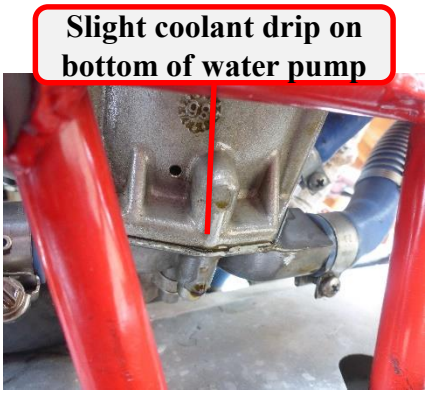
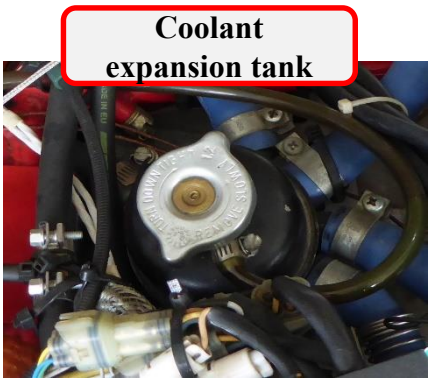
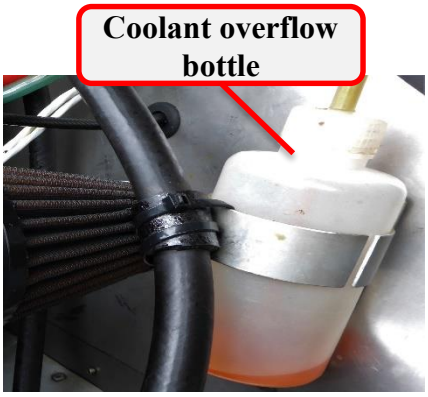
Coolant System: The coolant system was examined. The coolant radiator was correctly installed and partially blocked with tape (same as oil cooler) no anomalies were found with the coolant radiator. Some of the coolant lines were slightly swollen and should be replaced. The coolant lines that run from the cylinder heads to the water pump were upgraded to silicone and do not fall under the 5-year rubber replacement as set out by Rotax. All silicone lines appeared to be in good overall condition with no evidence of leakage.
A small amount of coolant was found on the base of the water pump, however, it could not be determined if the water pump was leaking as there was no evidence of coolant on the bottom of the engine cowling. This coolant could have come from the service of the coolant system. The coolant expansion tank was full of what appeared to be the correct type of coolant and the overflow bottle was mounted correctly.









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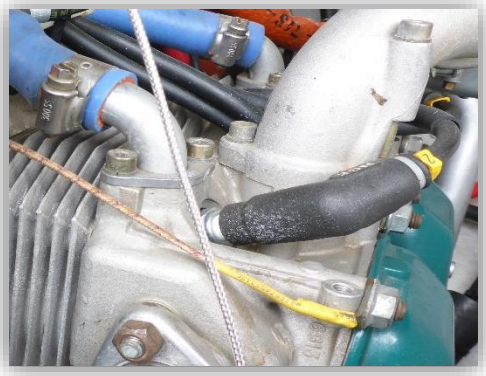
Cylinder Leak Down: A cylinder leak down check was done on all 4 cylinders. All the parameters of the cylinder leak down check were within the limits as set out by Rotax.

Cylinder # 1	78/80	Cylinder # 3	78/80
Cylinder # 2	79/80	Cylinder # 4	78/80

Ignition System: An aftermarket "Bully Hawk" soft start ignition module was installed on the engine. Some cracking of the protective shielding was seen on the ignition modules. This type of cracking is fairly superficial and may not affect the overall performance of the ignition system.

The ignition leads, spark plug boots and spark plugs were all examined for condition and proper type. No anomalies were seen with these items.



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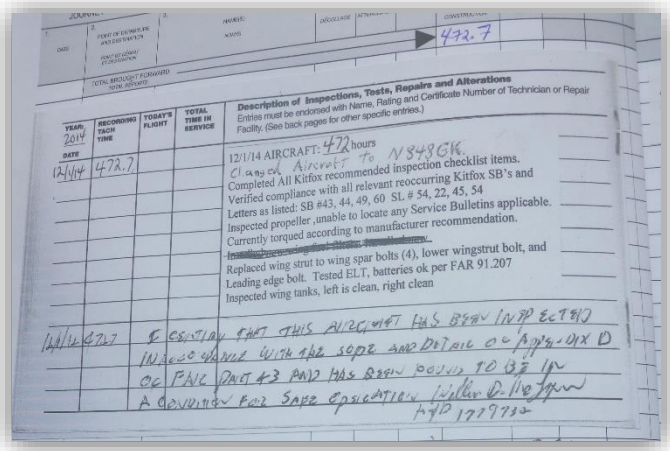
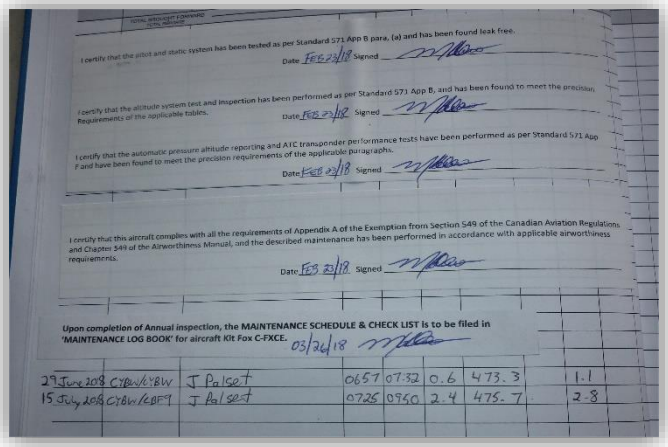
Engine Maintenance Records: The owner of the aircraft provided limited records of maintenance. A copy of the maintenance entries was recorded and the most recent entry was done on March 26, 2018, with a statement “Upon completion of Annual inspection, the maintenance schedule & checklist is to be filled in the maintenance logbook for aircraft kit fox C-FXCE. No actual maintenance logbook was provided for review. The oldest records of maintenance were done when the aircraft was registered in the US on November 23, 2015. A copy of the logbooks has been obtained for the purchaser's review. Based on the engine S/N the following Service bulletins should have been complied with. Without a detailed examination of the engine, it is unknown if these bulletins were ever complied with.

SB-912-067-UL Exchange of floats on ROTAX Engine Type 912 and 914 (Series)
SB-912-065 UL Periodic inspection of the float buoyancy for ROTAX Engine Type 912 and 914 (Series)
SB-912-063-replacement of Fuel Pumps for Rotax Engine Type 912 (Series)
SB-912-029-UL Checking of the crankcase on ROTAX engine type 912 and 914 (Series)
SB-912-042-UL Checking of the engine in case of excessive propeller backlash for Rotax engine type 912 SSB-912-030-UL cracks, wear and distortion on the carburetor flange on Rotax engine type 912 and 914 (series)
SB-912-037-UL Installation of an electric starter with enhanced power for Rotax Motor Type 912 und 914 (Series)
SB-912-022-UL Replacement of valve spring retainer on single valve spring configuration of ROTAX engine type 912 and 914 (Series)
SB-912-073ULReplacement of circlip (carburetor) for ROTAX Engine Type 912 and 914 (Series)
SB-912-071ULReplacement of oil filter for ROTAX Engine Type 912 i, 912 and 914 (Series)





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Engine Test Run

The engine was started and idled smoothly at 2000 RPM. Engine oil and fuel pressures were within the normal operating range. After the CHT and oil temperatures were in the green, the RPM was advanced to 3000, 3500, and then 4000 RPM. The engine ran smooth, however, engine oil pressure indication became erratic and would jump beyond pressure limitations and then back to normal. This was deemed an indication error of the sensor and not an actual issue with the engine oil pressures. An ignition check was done with the engine running at 4000 RPM. Ignition circuit A experienced a 100 RPM drop (Normal) and ignition circuit B experienced a 200 RPM drop and the engine ran a little rough (Normal for an aftermarket bully hawk soft-start).

The electronic constant speed propeller was engaged and it operated normally. After several minutes of a ground test run, the engine was then brought back to idled and shut down. Other then the rough running B ignition circuit, the erratic oil pressure indication, no anomalies were noticed during the engine run.

Conclusion

The aircraft and engine was in good overall condition with some minor issues that should be addressed.

Issues that should be addressed before flight	Issues that should be addressed during next maintenance interval
Mechanical Fuel Pump should be changed to the new BDC Corona mechanical fuel pump All fuel and vent lines should be changed to good quality fuel lines	Investigate if all service bulletins have been complied with 5 year rubber replacement should be done Swollen coolant hose should be replaced Oil pressure sensor should be changed Aftermarket bully hawk soft start system should be tested Carburetor floats should be weighed Oil cooler inlet fitting should be changed to a more free flowing fitting type Possible coolant leak should be investigated to determine if the water pump is leaking.