ERA15LA062
Airframe and Engine Examination
Cirrus SR22T, N227RR
Hampton, South Carolina

Participants:

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The participants convened at the facilities of Atlanta Air Recovery, [redacted] Griffin, GA on December 11, 2014 at 0900. The following items were requested by the NTSB investigator-in-charge, and the notes below each item reflect the condition and work actually performed during the examination.

1. *Remove and inspect the recording devices for damage. If none, download the data*
   Notes: The airplane was equipped with a Garmin G1000 flight management system and a Secure Digital (SD) card was installed in the data recording slot of the MFD. The data was of good quality and included the entire accident flight until power off. All participants were provided a copy of the G1000 data. The SD card was retained by ASI Hicks and was placed in a static-resistant bag. The Recoverable Data Module (RDM) was located in the severed empennage and was undamaged. ASI Miller downloaded the approximately 3 last hours of flight data and that data was shared with all participants. The data was of excellent quality and closely correlated with the G1000 data. ASI Hicks retained the RDM and it was placed in a static-resistant bag.

2. *Analyze data*
   Notes: A very preliminary look at the data indicated that a sharp drop in oil pressure (to zero) occurred in cruise flight about 9,000 feet msl. This was coincident with the engine rpm remaining high, up to about 2,500 in the descent. The descent varied in airspeed but approached 160 knots at times. Oil pressure never recovered. The other engine parameters were consistent with a shutdown.

3. *Inspect airframe and document damage to structure*
   Notes: Photographs were taken of all airframe components except for the wings. AAR provided a CD of their recovery process. In general, the empennage was severed (broken off completely)

just forward of the horizontal stabilizer, at the aft end of the oxygen bottle. The CAPS system straps and parachute and lines were present and appeared to indicate a normal deployment. The right wing broke free at the wing root during the impact sequence. The left wing remained attached and was cut off by AAR personnel. The right cockpit door could not be opened normally due to impact damage; the left door opened normally. The occupiable space inside the cabin was not compromised. The seats were secure on their tracks. The shoulder harness-mounted air bags were deployed at both front seat positions. Flight control continuity was confirmed from the cockpit controls to the flight controls surfaces, with exception of cables cut by recovery personnel. The Hobbs meter indicated 62.7 hours and the Flight meter indicated 51.7 hours. All cockpit circuit breakers were "in." The ELT was in the "ARM" position. The three-bladed composite Hartzell propeller had impact damage. One blade was broken free at the shank and not recovered. The other two blades remained attached to the hub. No rotational damage observed. All impact damage was non-rotational. Both engine turbochargers were normal in appearance, no impact damage noted. Both units spun freely. No blade damage or deformation noted.

4. *Photograph and note document the cockpit for position of engine controls*
   Notes: The throttle was in the "Full Forward" position; the fuel mixture lever was at mid-range between Full Rich and Idle Cut-off. There was no propeller control (I assume it is automatic).

5. *Document position of the fuel selector*
   The fuel selector was secured in the four o'clock (OFF) position. There are two off positions (4 and 8 o'clock).

6. *Document position of the engine controls at the engine*
   The engine controls on the engine corresponded directly to the cockpit controls. Once documented, full, unrestricted stop-to-stop movement was observed.

7. *Verify movement of control in cockpit matches movement at the engine*
   See #6, above.

8. *Remove all top spark plugs from each cylinder and inspect for color, wear, against Champion Aviation Check-A-Plug chart*
   The bottom spark plugs were removed for inspection. All six plugs exhibited very light wear (near new condition) and light gray color with no deposits or soot
   observed.

9. Borescope cylinders from removed plugs
   All six cylinders were borescoped. All piston heads showed very light wear and no significant deposits. Normal combustion signatures. The cylinder domes were normal in appearance. The valves were normal in appearance with very light wear and no deposits noted.

10. *Crack fuel lines at engine-driven fuel pump, fuel metering unit, auxiliary fuel pump to document fuel*
    Fuel line between the fuel gascolator and the engine-driven pump was removed and was empty of any fuel. The fuel line between engine-driven pump and the fuel metering unit was removed and was full of clean 100LL fuel (approx. 1 oz) with no water noted.

11. *Determine amount of fuel in fuel strainer*
    The firewall-mounted fuel gascolator was drained and contained about 3 oz. of clean, water-free, 100LL fuel.

12. *Verify amount of oil in engine*
    Approx. 8 quarts of oil registered on the oil dipstick. The oil was “like new” in appearance. There were no signs of oil leaks anywhere on the exterior of the engine.

13. *Check the oil pressure sender for operation*
    Removed the oil sender and retained by ASI Hicks for further study. The wiring connection remained on the harness with the engine. One of three wires from the sender to the G1000 did not pass a continuity test with a meter. ASI Miller will research further for possible examination at CMI.

14. *Check the oil suction screen*
    Did not remove oil sump.

15. *Remove the oil filter and cut open looking for metal*
    Did not remove; anticipate examination at CMI.

16. *Remove oil pump to inspect for condition*
    Disassembled, found to be fully operational, “like new” condition.

17. *Remove engine-driven fuel pump and document engine drive condition*
    Removed unit. Did not disassemble in anticipation of engine run. Drive coupling intact. Manual rotation indicated no internal binding and smooth, normal movement. Residual fuel expelled when rotated.

18. *Rotate engine and verify valve train continuity*
    Removed propeller and rotated engine with a breaker bar. Continuity established throughout engine to accessory case. Valve movement was normal. Consistent compression/suction observed on all cylinders.