

N559JC Engine / Propeller Examination 1/19/2018

On January 19, 2018, FAA Inspectors Gregory Horrell and Brian Lord traveled to Meridian, Idaho to examine civil aircraft N559JC. Initial examination of the engine revealed:

- There was engine oil showing on the oil dipstick located adjacent to the oil filler.
- The engine oil appeared dark brown and did not smell burnt.
- There was no coolant in the radiator (Mazda automotive engine).
- There was significant crush damage to the lower firewall making complete examination of the radiator difficult.
- The intake air filter assembly showed signs of fire damage and the filter element and plastic filter element support basket (which prevents the foam filter element from collapsing into the intake during operation) was melted.
- There was evidence of ingested debris (likely the molten foam air filter element and plastic support basket) inside the throats of both intake openings and on the forward face of the alternator (directly behind the air filter assembly).
- There was molten debris on the #1 and #3 electronic ignition coils beneath the intake air filter assembly and fire damage to the #1 and #3 ignition coil wiring harness.
- There was evidence of molten debris beneath and aft of the intake assembly but none forward of the intake assembly.
- The 2 engine intake air sensors mounted directly above and between the intake openings (inside the air filter assembly) showed evidence of fire damage.
- The oil filter bracket was broken but the oil filter was intact.
- All oil, coolant and fuel hoses appeared intact.
- The fuel system components at the injectors (on the opposite side of the engine from the intake air filter assembly) appeared intact and showed no sign of fire damage.
- Examination of the oil filter element showed no metal contamination.
- Examination of the oil in the filter showed no metal contamination.
- The propeller spinner was broken open but still attached.
- One propeller blade was missing.
- One propeller blade was fractured chord-wise approximately mid-span but the outboard section was still attached.
- There was no evidence of chord-wise propeller blade tip damage or leading edge damage.
- The propeller could be turned by hand with internal continuity established by observation of the alternator belt turning at the rear of the engine.

The presence of molten foreign matter inside the throats of the intake manifolds would indicate an intake air filter fire occurred and the debris was ingested while the engine was operating.

The presence of molten debris beneath and behind (but not forward) of the intake air filter assembly would indicate the fire occurred with cooling air flowing through the cowl interior (in-flight).

The lack of chord-wise propeller blade damage (and no damage to one blade) would indicate the engine was not producing power and the propeller was not turning at impact.

The presence of engine oil, lack of metal or other contamination in the oil or oil filter, and the ability to rotate the propeller by hand, would indicate the engine did not fail or sustain damage due to oil starvation.