

Piper Exam Notes

N4139A, PA-28-181, SN 2843115

On 08/29/2018 at about 1740 AZ, a 1998 Piper PA-28-181 *Archer III* was substantially damaged during a forced landing on a road about 18 miles southwest of Casa Grande, AZ. There was no fire. The Private Pilot occupying the front left seat and the Student Pilot/owner occupying the front right seat reported no injuries.

Fuselage

Accident damage appeared to be limited to some buckling of the aft wing carry through on the right side of the aft cabin floor area. The cabin interior, including the seats, seat lap belts and buckles, insulation, and side panels were removed during recovery. The seats, seat belts, and buckles showed no obvious damage.

The yokes appeared undamaged. Aileron control cable continuity was established from the yoke chains to the turnbuckles aft of the main wing spar; the forward aileron cables had been disconnected from the wing aileron control cables at the turnbuckles to allow for disassembly of the aircraft. Rudder cable continuity was established from the rudder pedals to the rudder. The stabilator cables remained attached to the control tee bar and continuity was established through the fuselage to the aft clevises, which had been removed from the stabilator balance weight during recovery. The flap lever was in the flaps up position. The pitch trim indicator pointed to aircraft nose down, and rudder trim indicated approximately neutral.



The engine control levers were located mid-travel at the time of examination; they exhibited no binding when moved. The carb heat was off.

The fuel selector remained installed in the left lower cabin. The decal plate, handle, and surrounding carpet panel had been removed during recovery. The position of the valve shaft correlated to a setting of off. The selector valve showed no apparent damage or defects, and each position displayed a tactile, clear detent. The selector was removed and examined; the valve functioned as expected when light air pressure was applied, and the internal components showed no defects during disassembly. The fuel gascolator and electric fuel pump were disassembled and examined; clear, uncontaminated fluid consistent with 100LL was found, and the screens were free of contamination.

The main cabin and baggage doors remained attached to the fuselage and showed no apparent defects. The windows and windscreens were intact. Some oil spatter was noted on the windscreen and center trim strip.

The instrument panel and all mounted instruments remained in place and intact. The tachometer recording time was 1588.0, and the flight hobbs read 4642.2. All circuit breakers were in (closed.) The overhead panel switches were all off, except for the strobe light switch, which was set to fin strobe on. The heater controls were off, and the vent fan was set to HI. The ELT remote switch was set to ARM.

The belly of the aircraft was blackened with accumulated dirt, oil, and grime. A thin, sticky film of dirt and oily residue could be wiped off with a light touch. Areas of adhered dirt and grime could not be removed with finger pressure. The underside of the empennage was covered in dry dirt film.

Left Wing

The left wing was removed from the fuselage. No impact damage was noted during examination. The left main gear remained attached to the wing and no defects were observed. The landing gear fairing had been removed.

The aileron cables remained in place in the wing and were disconnected at the wing root. The aileron control bellcrank and stops remained in place and were apparently undamaged. The aileron and flap remained attached to the wing and showed no apparent damage. The flap was positioned up.

The fuel tank had been defueled and showed no damage. The fuel cap remained in place in the filler. The vent was observed in place in the tank and no blockage was noted. No leakage of fuel was seen from the tank drain valve.

Right Wing

The right wing was removed from the fuselage. The leading edge between wing stations (WS) 172 and WS 128 (approx.) was crushed aft about 4-6 inches. The right main gear remained attached to the wing and no defects were observed. The landing gear fairing had been removed.

The aileron cables remained in place in the wing and were disconnected at the wing root. The aileron control bellcrank and stops remained in place and were apparently undamaged. The aileron and flap remained attached to the wing. The aileron showed no obvious damage. The flap lower skin was punctured and scraped at approximately WS 60-64.



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Empennage

The empennage showed no obvious impact damage. The stabilator had been removed during recovery.

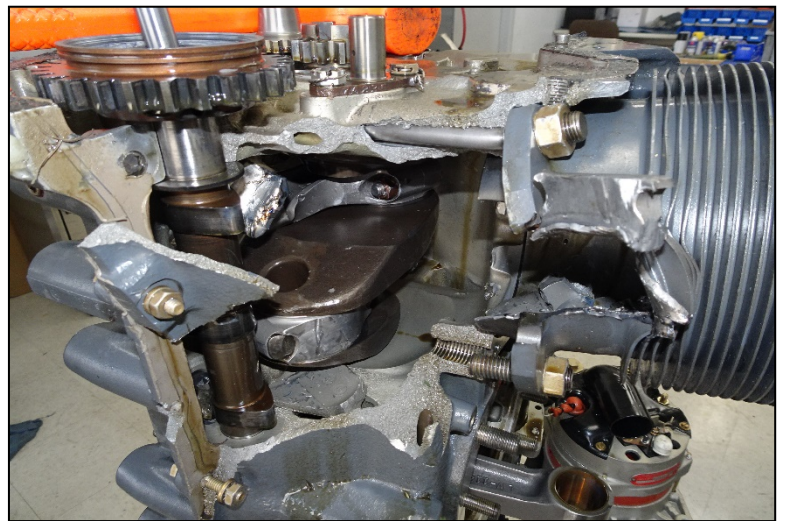
The vertical stabilizer was apparently undamaged, and the rudder remained attached. The rudder control cables remained attached to the rudder control horn, and cable continuity could be established to the rudder pedals.

The removed stabilator appeared free from defects. The trim tab, also apparently undamaged, remained attached. The pitch trim barrel showed 3 exposed threads (about .6"), corresponding to a neutral to nose down trim.

The ELT inspection panel remained installed and the TSO C91a ELT remained in its mounting tray. The ELT antenna cable and the Molex connector were installed on the ELT. The ELT was switched to off. The ELT was labeled with a battery expiration date of 09/2020.

Engine

The engine cowlings remained installed. The upper engine cowl, though intact, was cracked in the center, and oil had oozed and streaked aft. When the engine top cowl was removed, it revealed extensive damage to the engine crank case between the base of the #4 cylinder and the upper case flange. The crank case was fragmented, pieces were apparently missing, and the camshaft and crankshaft were exposed. The engine was seized, and the propeller could not be rotated.



The engine accessories remained installed on the accessory case. Oil bathed the accessories, the exterior of the sump, the carburetor, air box, and hoses. The engine controls remained attached to the carburetor. None of the fuel and oil hose B-nuts were found to be loose during the removal of the engine.

The engine was removed, and teardown examination was performed. No damage was noted to the accessories. The magnetos produced spark at all posts when mounted in a test harness. The oil filter contained copious metal shavings, many of which reacted to a magnet. The oil sump contained little oil and was packed with metal chunks.

Cylinders #1, #2, and #3 showed some damage to the skirts, but otherwise were unremarkable. The pistons from those cylinders appeared undamaged and showed normal exhaust deposits.

The crank case was broken apart from the split line down to the #4 cylinder. The #4 connecting rod remained attached to the crankshaft; it was bent, and the piston end was damaged. The #4 piston wrist pin lay within the crank case; it was scratched, but otherwise undamaged. The #4 cylinder mounting flange was broken apart. All the #4 cylinder base nuts were missing or finger loose. The #4 piston skirt was missing, and the top of the piston remained at the top of the cylinder. There were no signs of heat distress found within the engine, and none of the oil galleries were found blocked.

Propeller

The propeller remained attached to the engine crankshaft flange. Both propeller blades appeared unbent and free of gouges to the leading edges. One blade displayed many scrapes and scratches to the paint on the back; the scrapes were irregular in shape and direction. The other blade was not scraped.

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