NATIONAL TRANSPORTATION SAFETY BOARD

Office of Aviation Safety

Western Pacific Region

11 February, 2013

AIRFRAME AND ENGINE EXAMINATION

WPR13FA116

N328SP – Cessna 172S

Field Examination Report

11 February, 2013

Exam Location:

On-scene	8 February, 2013
Plain Parts Pleasant Grove, CA	11 February, 2013

Participants:

Van McKenny	NTSB
Andrew Hall	Cessna Aircraft Company
Mark Platt	Lycoming Engines

Accident Location:

City:	Minden, NV
Latitude/Longitude:	N38 58.887, W119 29.561
Elevation:	6,764 feet msl
Terrain:	Mountainous

Circumstances/Terrain:

Airplane wreckage was located on an 8 degree slope about 1.5 miles below and west of Rice Peak, 14 miles east of Minden, Nevada. The terrain was populated with 20 foot tall pinion pines and juniper trees. The ground was snow covered. The initial point of impact with terrain was identified by fiberglass fragments, a wing tip position light with red lens fragments, and freshly broken tree branches. Trees on either side of the initial impact point appeared undisturbed with no broken branches or evidence of being topped. The main wreckage was located on a bearing of 088 degrees magnetic 63 feet from the initial impact point. About halfway between the initial impact point and the main wreckage was the propeller hub and one propeller blade imbedded into the ground with

disturbed earth surrounding it. The main wreckage consisted of the engine, airplane cabin, left and right wings, empennage and tail. The tail was elevated in the air and bent over the cabin in scorpion fashion.

Examination:

On-scene examination of wreckage revealed control system continuity from all control surfaces to the cockpit through multiple control cable overload separations.

Fuselage

- Model: 172S, SN: 172S8256
- Firewall and engine mount separated from fuselage.
- Fuel strainer contained a few drops of blue fluid. Fuel screen clear of debris
- Nose gear separated from fire wall
- Fuselage buckled behind aft door frame
- ELT – Pointer Model 3000-11, SN: 328125

Cockpit:

- Instrument panel destroyed.
- Front seats separated from cabin deck
- Rear seats remained attached to cabin deck
- Instruments and controls
    - Mixture – in
    - Flap switch – up
    - Carb Heat – in
    - Throttle – in
    - Tach – 1800 rpm, 3234.2 hrs
    - Direction Gyro – 280
- Directional gyro, interior of gyro case shows evidence of circumfral scoring
- The fuel selector handle was observed separated from the shaft. The imprint in the position placard indicated the handle was between the both and left position
- The fuel selector valve was observed not in a detent and was between the both and left position.
- Firewall shutoff valve observe in the open position
- Aileron cable chains on control sprockets. Cables attached to chains on each end.
- Elevator cable attached to elevator bell crank
- Rudder cables were attached to the rudder torque tubes

Tail:

- Horizontal stabilizer present. Leading edge crushing along the entire right stabilizer, leading edge crushing along the outboard 24 inches of the left stabilizer.
- Elevator present on both left and right horizontal stablizers, elevator balance weights present on both.
- Elevator trim actuator measured 1.35 in extension (corresponding to 5° tab up)
- Vertical stabilizer attached to tail, rudder attached at hinges, balance weight present.

Left Wing:

- Entire wing present on-scene
- Outboard 10 feet of wing exhibited leading edge crushing back to main spar.
- Wing tip not present.
- Aileron present on wing hinge, with balance weight.
- Fuel cap secure on filler port. Hydraulic deformation of fuel tank
- Aileron control cables attached to bell crank, cable ends broomstawed consistent with overload.
- Flap present on wing. Flap in retracted position.

Right Wing:

- Entire wing present on-scene
- 4 foot section of wing tip deformed aft 45°
- Leading edge crushing along the remaining wing span.
- Flap on hinge. Flap deformed in place.
- Flap actuator in the fully retracted (up) position. Flap cable ends attached to flap bell crank.
- Fuel cap present on filler port. Hydraulic deformation of fuel tank.
- Aileron separated from wing trailing edge. Balance weight present.
- Aileron control cables attached to aileron bell crank

Propeller:

- McCauley fixed pitch prop
- Model: 1A170EJHA7660

- SN:TF023
- Blade A
    - Leading edge polishing
    - Chordwise scratches
    - Leading edge gouge at the tip
- Blade B
    - Blade separated from hub at shank. Fracture surface granular in texture and grey in color.
    - Tip curled aft
    - Deformed in a single S-bend with evidence of slight twist. Outboard 3rd of blade bent slightly forward.
    - Chordwise scratches across entire face of blade outboard 8 inches from the fracture line.

Engine:

- IO-360-L2A, SN: L-30896-51A
- 160 hp (continuous)/180 hp (takeoff)
- Propeller and crankshaft hub separated from crankshaft, fracture granular surface, 45° shear angles.
- All 4 cylinder jugs attached to engine case.
- Push rods present.
- All valves present and coated with oil
- Magnetos – Slick Model 4371. Both mags detached from mounting pads
- Left side induction tubes crushed.
- Left side exhaust manifold exhibited plastic deformation and crushing.
- Right side induction tubes present
- Right side exhaust manifold present.
- Fuel distribution valve removed. Diaphragm flexible and undamaged
- Top spark plugs removed. REM38E. No's 1&3 oil soaked, No's 2&4 gray in color. No mechanical damage evident.
- Engine rotated by hand through the vacuum pump drive gear. Thumb compression achieved on all cylinders. Valves moved in sequence.
- Fuel pump removed and disassembled. Diaphragm present, pliable, and undamaged.