

Air Safety Investigations Aircraft Incident/Accident Technical Report

Aircraft Incident/ Accident Information	Year: 1980	Make: Cessna	Model: 172P
	Serial number: 17274520		Registration: N52436
Location: Goodyear, AZ		Date: 02-10-24	Time: 0745 MST
Aircraft Owner		Aircraft Operator	
Angel Aviation Inc. [REDACTED]		Same as Aircraft Owner	
Report Information			
Senior Air Safety Investigator: Jennifer D. Barclay		Report #: ASI-24-AN-T	Report date: 07-16-24

Airframe

Impact Sequence and Airframe Structure

There was no evidence of fire. The wings and struts were removed by recovery personnel to facilitate transport to the storage facility. Slight buckling was observed on the right side of the fuselage forward of the cabin door and aft near the baggage area. The right main landing gear was inverted which prevented opening of the right cabin door. The left wing exhibited leading edge damage from midspan to the wingtip and downward buckling to the outer 1/3 of the wing. The right wingtip was forced upward, and the wing exhibited downward buckling from midspan to the wingtip. The leading edge exhibited tearing midspan.



Online photograph obtained from azcentral.com

Airframe Systems

Flight Control System Information		
Control lock: Found loose in aircraft		
Flight Control Cable Continuity		
Ailerons: See below	Elevators: Established	Rudder: Established
Aileron tab: Not applicable	Elevator tab: Established	Rudder tab: Not applicable
Flap and Trim Positions		
Flap indicator: 0°	Flap handle: 10°	Flap actuator: 3.7" = ~20°
Elevator trim:	Indicator: Between neutral and full nose up	Actuator: 1.2" = Neutral

Remarks:

Control cable continuity was established from the cockpit controls to the rudder, elevator and elevator trim tab. Aileron cable continuity was established from the cockpit control to the ailerons through cuts by recovery personnel.

Airframe Fuel System Condition, Controls, and Read Outs		
Fuel strainer screen: Clean	Fuel strainer bowl: Clean	
Main fuel tank gauge:	Left: Digital	Right: Digital
Fuel selector handle: Off	Fuel selector valve: Undetermined	

Remarks:

Approximately 17 gallons of fuel was drained from the left wing by recovery personnel. According to news reports, an undetermined amount of fuel drained from the aircraft at the accident site. Both fuel caps were installed and secure. The fuel selector operated normally, and positive detents were identified in each position.

Landing Gear System Condition and Controls			
Gear position:	Nose: Fixed	Left: Fixed	Right: Fixed
Actuator position:	Nose: Not applicable	Left: Not applicable	Right: Not applicable
Landing gear selector: Not applicable			
Environmental System Controls and Read Outs			
Cabin heater: Off	Cabin vent: Off	Defrost: Off	
Air conditioner: Not applicable	Oxygen system: Not applicable	Oxygen quantity: Not applicable	
Icing System Information and Switches			
Certified into known icing? No		De-icing boots installed? No	
Pitot heat: Off		Stall heat: Not applicable	
Anti-ice:	Surface: Not applicable	Propeller: Not applicable	Windshield: Not applicable
ELT Information			
Installed? Yes	Manufacturer: ACK Technologies	Model: E-04	Type: AF
Serial number: 030653	Battery due date: 12-16-24	Armed: Yes	Activated: Undetermined

Remarks:

None.

Cabin and Equipment/Furnishings

Restraint System Information						
Seat	Occupied	Restraint type	Restraint used	Condition	Manufacturer	2nd seat stop
1	Yes	3-Point	See below	Intact	Non-OEM	Yes
2	Yes	3-Point	See below	Intact	Non-OEM	No
3	No	2-Point	N/A	Intact	Non-OEM	Not applicable
4	No	2-Point	N/A	Intact	Non-OEM	Not applicable

Seat Condition Information					
Seat	Orientation	Feet intact	Back intact	Base intact	Rail intact
1	Forward facing	Yes	Yes	Yes	No
2	Forward facing	No	Yes	Yes	Yes
3	Forward facing	Yes	Yes	Yes	Not applicable
4	Forward facing	Yes	Yes	Yes	Not applicable

Remarks:

Both occupants were utilizing the lap-belt portion only of the available three-point restraints. All four seat rails exceeded the seat rail hole dimensions listed in AD 2011-10-09.



Pilot seat rails, ASI-24-AN-023

Instrument Panel

Navigation Instruments							
Analog primary instruments				Autopilot type: None			
Suction gage: Not applicable		Magnetic compass: Undt			Clock: Digital		
	Left side				Left side		
Airspeed:	0		Turn coordinator (airplane):	Level			
Attitude (pitch):	Digital		Turn coordinator (ball):	Centered			
Attitude (roll):	Digital		Heading indicator:	Digital			
Altimeter:	1,010'		Heading "bug":	Digital			
Altimeter setting:	29.91		Vertical speed indicator:	50' Down			
Communication and Navigation Radios							
Radio	Control	Active frequency	Stand-by frequency	Radio	Control	Active frequency	Stand-by frequency
Com 1:	S/B	S/B	S/B	Com 2:	S/B	S/B	S/B
Nav 1:	S/B	S/B	S/B	Nav 2:	S/B	S/B	S/B
Obs 1:	050°			Obs 2:	Not applicable		
Transponder:	Mode: S/B		Active code: S/B		Stand-by code: S/B		
Electrical Switch Positions							
Master battery: Off		Master alternator: Off			Avionics 1: On		
Lighting Switch Positions							
Navigation: On		Rotating Beacon: On			Landing: Off		
Taxi: Not applicable		Strobe: On			Instrument: Undetermined		
Ignition Switch Position							
Key: Off							

Remarks:

The navigation and communication units were removed from the aircraft prior to examination of the wreckage.

Powerplant Description

Engine Instruments					
Hour meter:	1,842.1	Tach RPM:	0	Tach hours:	3,741.3
Manifold press:	N/A	Oil press:	0	Oil temp:	0
EGT:	N/A	EGT:	N/A	CHT:	N/A
Fuel press:	Undt	Fuel flow:	Undt	Ammeter:	Undt
Voltmeter:	Digital				
Engine Control Positions					
	Cockpit	Engine		Cockpit	Engine
Throttle:	Idle	Idle	Cowl flaps:	N/A	N/A
Mixture:	Lean	Lean	Carburetor heat:	1" out	Undt
Propeller:	N/A	N/A	Primer:	In & locked	
Engine Condition					
Engine attached to airframe:	Yes	Propeller attached to engine:	Yes		
Engine compression:	See below	Valve train continuity:	Yes		
Vacuum pump drive shaft:	Not applicable				
Engine Fuel System Condition					
Fuel pump drive shaft:	Not applicable	Carburetor inlet screen:	Undetermined		
Magnetos Condition					
Left magneto attached:	Yes	Right magneto attached:	Yes		
Left magneto spark:	See below	Right magneto spark:	See below		
Spark Plug Condition (per Champion Check-A-Plug Card)					
	1	2	3	4	
Top	Worn	Carbon fouled	Worn	Normal	
Bottom	Carbon fouled	Carbon fouled	Normal	Worn	

Remarks:

The engine could only be partially rotated with the propeller due to an internal engine malfunction. Thumb compression/suction could not be obtained. The oil dipstick indicated approximately four quarts of oil in the sump. The oil filter was cut open, and metal contamination consistent with bearing material was observed in the pleats. The oil suction screen was about half full of metal consistent with bearing material.



Oil suction screen, ASI-24-AN-050



Metal removed from suction screen, ASI-24-AN-052

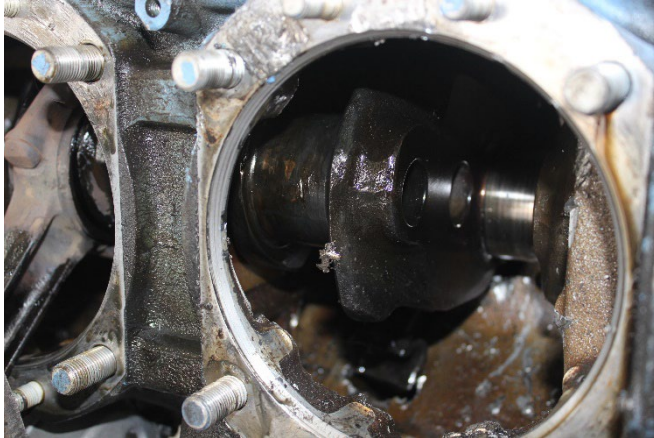
Cylinders #1, #2 and #4 were removed to facilitate examination; cylinder #3 could not be removed due to a damaged cylinder barrel. The #4 connecting rod separated from the crankshaft and had mechanical damage to the yoke end. The lower yoke portion separated from the connecting rod. The #4 connecting rod journal surface showed normal operating signatures. The #3 connecting rod separated from the journal and had mechanical damage to the yoke end. Both yoke end portions separated from the connecting rod. The #3 journal surface exhibited thermal distress. The separated connecting rod parts were found in the lower area of cylinders #3 and #4. The #4 bearing was found with deformation and no thermal distress. Four connecting rod cap bolt ends separated about mid-length and all 4 nuts remained attached. The #2 connecting rod was loose on the crankshaft. The connecting rod exhibited thermal distress at the yoke and cap end. Most of the bearing separated from the connecting rod. The #2 connecting rod journal exhibited thermal distress. The #1 connecting rod journal exhibited normal operating signatures. The connecting rod nuts were found tightly secured on the #1 & #2 rod caps prior to removal. The oil sump was removed from the crankcase and contained metal contamination and mechanically damaged parts.



Cylinder #4, ASI-24-AN-057



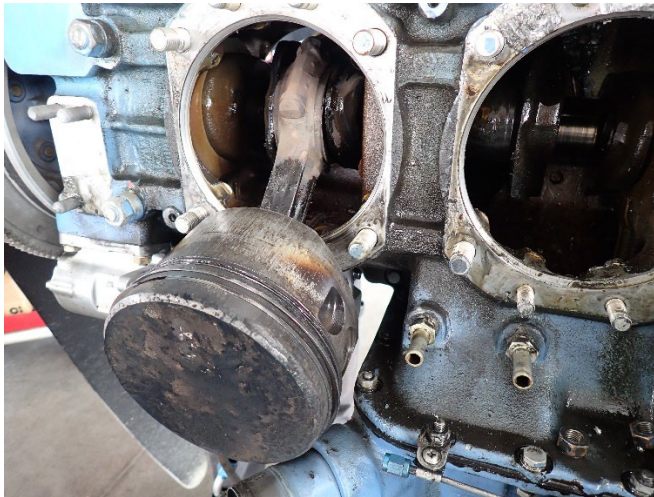
#4 journal surface, ASI-24-AN-060



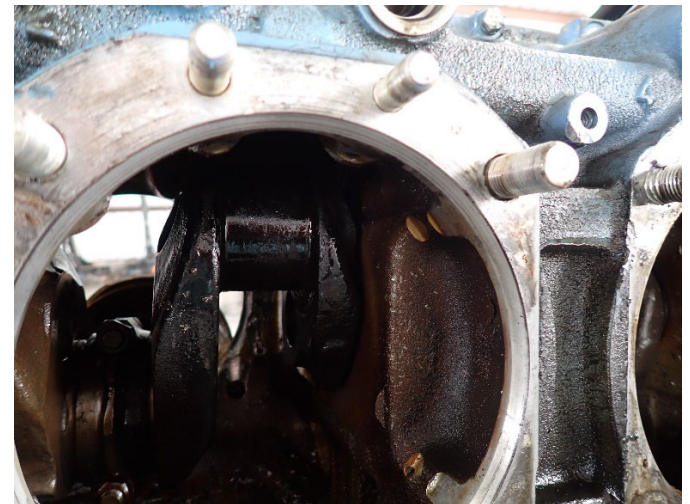
#3 journal surface, Lycoming photograph



#3 yoke end, Lycoming photograph



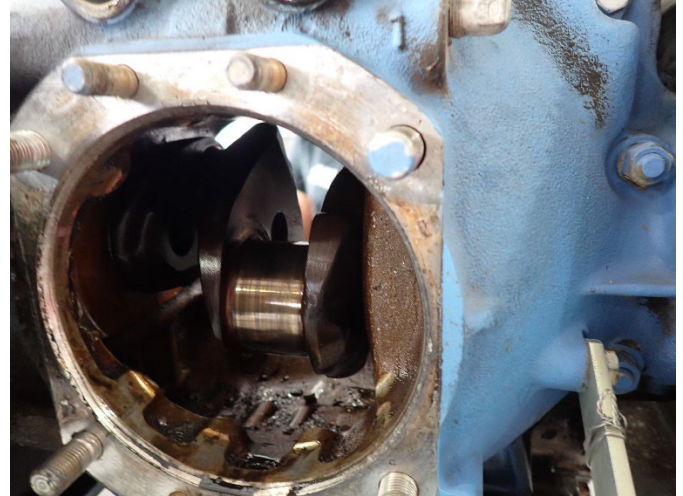
#2 connecting rod, ASI-24-AN- 067



#2 journal surface, ASI-24-AN-075



#1 connecting rod, ASI-24-AN-079



#1 journal surface, ASI-24-AN-078

Propeller

The propeller remained attached to the engine, both blades were straight and unremarkable. One blade exhibited leading edge damage to the outer 1/3 of the blade consistent with contact with a paved surface. The spinner did not exhibit any rotational signatures.

Research & Testing

The following components were retained by the NTSB for metallurgical analysis: the #3 connecting rod yoke, four connecting rod bolt ends with nuts attached, and the #4 connecting rod. The examination had not been conducted at the time this report was completed.