



NATIONAL TRANSPORTATION SAFETY BOARD

Office of Aviation Safety
Western Pacific Region

October 29, 2020

AIRFRAME AND ENGINE EXAMINATION SUMMARY

WPR20FA005

This document contains 10 embedded photos.

A. ACCIDENT

Location: Camarillo, California
Date: October 8, 2019
Aircraft: Bede N501BD, BD-5

Preliminary Report:

On October 8, 2019, about 1229 Pacific daylight time, an amateur built experimental Bede BD-5, airplane, N501BD, was substantially damaged when it impacted terrain about 3/4 mile south of the Camarillo Airport (CMA) Camarillo, California. The airline transport pilot was fatally injured. The airplane was registered to the pilot who was operating it as a Title 14 Code of Federal Regulations Part 91 personal flight. Visual meteorological conditions prevailed, and no flight plan had been filed for the local flight that departed CMA about 1223.

According to preliminary data, the Air Traffic Control tower radioed the pilot, who was flying on downwind in the traffic pattern, that he was a little low. The pilot responded that he was having issues climbing and would need to stay at his current altitude. He also responded that he would need to make a full stop landing.

Several witnesses located near the accident site reported that the airplane was low, then made a right turn, and was rapidly descending towards the ground. One witness stated that the propeller was not moving.

A postaccident examination of the accident site by the National Transportation Safety Board investigator-in-charge, revealed that all major structural components and primary flight controls of the airplane, were located at the accident site. The airplane came to rest inverted in an open field of produce. There was a post-crash fire, that was primarily contained, to the middle portion of the airplane's bottom. No damage to a nearby power line was noted.

The wreckage was recovered to a secure location for further examination.

B. PARTICIPANTS

Albert Nixon-NTSB IIC (Not present during the examination)
Andrew Swick-NTSB

C. SUMMARY

Examination of the wreckage was conducted at the facilities of Southwest Aircraft Transportation and Recovery Incorporated, Chino, California. The postaccident examination of the airframe and engine revealed the separation of the no. 4 connecting rod bearing and separated connecting rod end cap.

DETAILS OF THE INVESTIGATION

1.0 Airframe Examination

The airframe revealed thermal and impact damage to the cabin area. The cabin was separated near the aft cabin bulkhead to facilitate the relocation of the wreckage to a secured facility. Impact damage was evident to both wings and forward fuselage area. The engine and propeller assembly remained attached to the main wreckage.



Figure 1-Wreckage Layout, Forward Left Side View

Flight control cable continuity was established from the stabilator, rudder, ailerons and flaps to the aft cabin bulkhead. The ailerons and flaps moved freely on their wing attachments and were disconnected from the torque tube connections at the wing root area. The stabilator and rudder cables were pulled from the aft cabin bulkhead area and movement of the flight controls was established.



Figure 2-Wreckage layout, aft rear side view.

The right wing tip fairing had impact damage. About 1 ft of the leading edge near the wing tip was bent down and the aileron outboard edge was damaged. The left wing had impact damage at the wing tip and the midsection of the leading edge. The wing fuel tank caps were removed and undamaged. The cap seals were intact and undamaged.

The rudder was undamaged and the stabilizer buckled on the left side.

The cabin area was separated from the main wreckage and had thermal and impact damage.

2.0 Engine Examination

The engine remained attached to the fuselage engine mount assembly and was undamaged. The carburetor was removed from the engine and disassembled. No anomalies were noted during the examination of the carburetor and associated fuel lines. The carburetor fuel screen was removed and clear of debris. The turbocharger was removed from the engine and was undamaged. The turbine spun freely by hand and no anomalies were noted. The oil filter was removed from the engine and disassembled. Brass colored sediment was visible in the residual oil and the filter element folds.



Figure 3-Engine, right side.

The spark plugs were removed and the electrode areas were undamaged and showed little wear. The plug electrode areas were wet with water. The cylinders were boroscoped and the combustion chambers showed normal operating signatures. The valve heads were undamaged. The crankshaft was rotated through the propeller assembly and engine and driveshaft and accessory drive continuity was established. The propeller drive shaft drive belt had thermal damage but remained intact. The alternator drive belt on the accessory section was undamaged. Thumb compression was attained on no. 1, 2 and 3 cylinders. The no. 4 piston would not move during the crankshaft rotation. The crankcase had impact damage near the no. 4 connecting rod area.



Figure 4-Engine, aft left side.

The engine was removed from the airframe and about 2 quarts of oil was drained from the oil sump. The oil sump had internal impact marks near the no. 4 cylinder area. The oil sump was removed and revealed metal bearing debris, two sections of the no. 4 connecting rod end cap and bolt sections in the residual oil. The bearing debris was small and thermally discolored and deformed.



Figure 5-Crankshaft, connecting rod end caps, connecting rod bearings and bolts.

The connecting rod end caps were removed on the no. 1, 2 and 3 connecting rods. The lower crankshaft support assembly was removed and the crankshaft was removed from the engine. The support was damaged near the no. 4 connecting rod area. The crankshaft support through bolts and connecting rod bolts had high torque when removed. The crankshaft and connecting rod bearings (8 bearings), showed normal wear conditions.

The engine and crankshaft oil galleys were unobstructed. The crankshaft and remaining connecting rod bearing showed normal wear conditions.

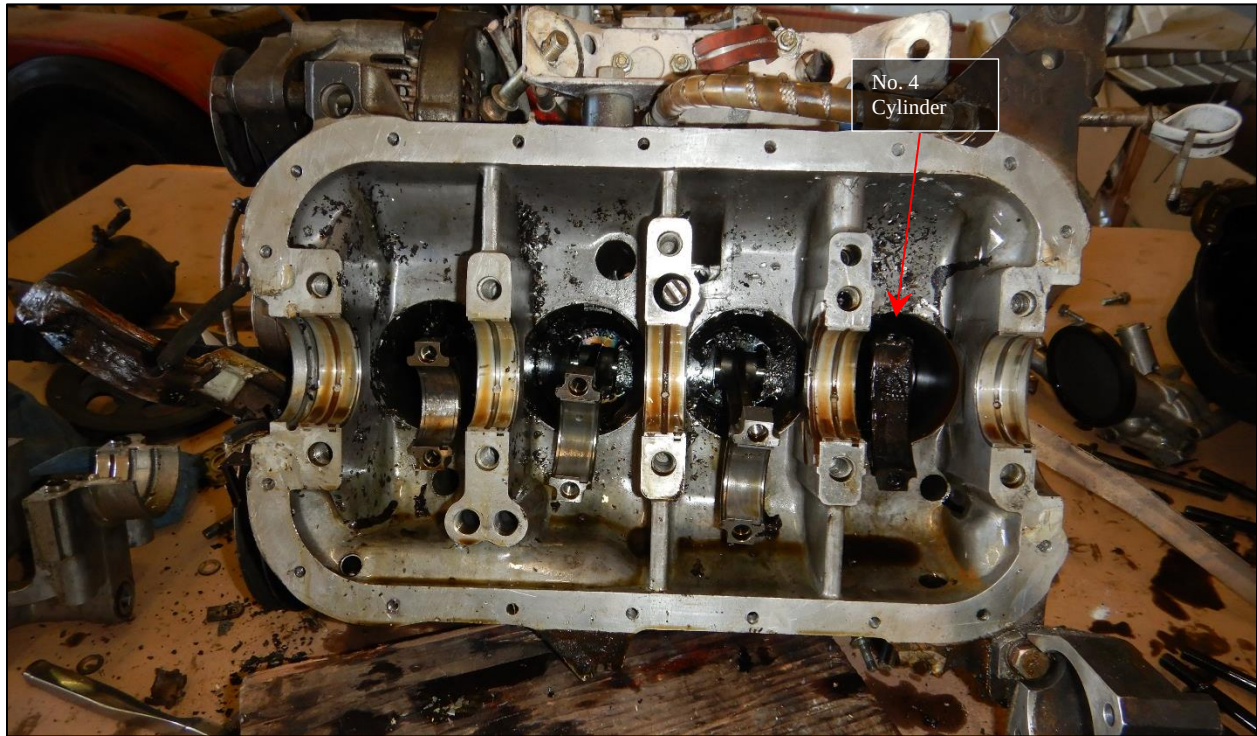


Figure 6-Upper crankcase and crankshaft bearings and support.



Figure 7-Lower crankshaft support and bearings.

The no. 4 connecting rod bearing contact area on the crankshaft was thermally discolored and had mechanical deformation. The no. 4 connecting rod journal and the no. 5 main journal shared oil galley was unobstructed.



Figure 8-Crankshaft no. 4 connecting rod journal.

The no. 4 connecting rod end cap sections had thermal discoloration and mechanical damage. The section of the connecting rod end cap with the bearing tang insert, had mechanical damage consistent with bearing shift.



Figure 9-No. 4 connecting rod end cap section and bearing tang insert.

The no. 4 connecting rod bolts were bent, and the separated surface areas were consistent with overload failure.



Figure 10-No. 4 connecting rod bolts.

Submitted by: Andrew Swick