SSA COMMITTEE REPORT ON SYMONS XBG-12A ACCIDENT

(Editor's note: this is a condensation of the full report submitted to the SSA Board of Directors on January 31, 1959. Copies of the complete report are available from the office of the Executive Secretary for 25¢ each.)

Briegleb aircraft XBG-12A (N68-784) suffered structural failure in the air during or just after an aero tow at 1400 feet over El Mirage Dry Lake on April 19, 1958, resulting in fatal injuries to the pilot.

The XBG-12A was properly designed, built, and maintained. The 50 foot span, aspect ratio 17.9 all wood wing was designed to an ultimate load factor of 8. The fundamental wing bending frequency was reported by Briegleb to be 134 cycles per minute. Recent wing tip modification could not have contributed to the accident in an aerodynamic sense. However, the 6 pounds of lead added to the left wing just outboard of the aileron end undoubtedly reduced the wing bending frequency. The inertial effect of this mass was perhaps responsible for the failure of the left wing tip.

The right wing broke off just outboard of the fuselage attach strap. The break gave every evidence of having occured under very high load and there is every reason to believe that the design load factor was exceeded. No evidence of progressive glue failure was found. All control systems and the easily accessible release system were operating freely on the flight just preceeding the fatal one.

It should he noted here that the production BG-12A wing is both stronger and stiffer than that of the XBG-12A. The ultimate load factor had been increased to 12 and the fundamental wing bending frequency has been measured by several people to be 190 cycles per minute.

The sailplane pilot, Robert Symons, was an experienced power, pilot. He had made three aero tows in the week prior to the accident but had not flown the XBG-12A previously. He was wearing a parachute and the canopy was NOT taped shut. It is difficult to see how such an able pilot could have permitted such a load to be applied to the sailplane or why he would not have made some attempt to bail out after the wing failure. Numerous reports reached the committee to the effect that Symons had given indication of having suffered mild heart attack in the weeks just preceeding the accident. This could not be verified. A recent physical exam did not include an electrocardiograph. An autopsy was not performed. Mrs. Symons said the difficulty he was having with his arm was due to muscular strain which occured when he was throwing packages overboard on a mountain rescue flight.

The tow pilot, Charles Seybert, had a Commercial airplane pilot certificate, a Private glider pilot certificate, and had made 20 aero tows in the preceeding 30 days, three of them with the Tri-Pacer, towing Symons. The 1958 Piper Tri-Pacer was equipped with a Schweizer tow release and was properly certified. The airspeed indicator was substantially correct while that in the sailplane was reading about 10 mph high. A 325 foot nylon tow line was used on the fatal flight.

The weather was clear, visibility 50 miles, temperature 80 degrees F, wind variable, and strong thermals were present. Rates of climb in thermals were reported to vary from 12 to 20 feet per second.

Symons was given a careful cockpit check by Gus Briegleb. Gus mentioned that the tow he had just received from the Tri-Pacer was too fast and that the yellow line range started at 80 mph on the XBG-12A indicator corresponding to 70 mph corrected airspeed. Symons mentioned that the Tri-Pacer climbed best at 85 mph and instructed Seybert to tow between 80 and 85 mph. Symons experienced some difficulty with the treadle type rudder pedals due to his artificial leg but soon adjusted to it.

The take-off was smooth as was the initial portion of the climb. All observers commented on the tow speed appearing higher than normal. After flying through a thermal a turn was initiated to return to the thermal. Two severe jerks were then felt by the tow pilot some few seconds apart. The second jerk placed the tow plane in a nose down attitude from which it was necessary to throttle back to prevent overspeeding. Not feeling the drag of the sailplane, Seybert then started a descending turn toward the field at which time he saw the wing fluttering down.

There were five witnesses all located at least 2 miles from the accident which occured at 1400 feet above the dry lake. The tow line was not visible to them. Most of the witnesses said the sailplane appeared to be well above the tow plane at the time the wing failed. The tow plane appeared to start down before the wing failure. Only one witness saw a series of longitudinal porpoises of increasing violence leading to the structural failure.

ANALYSIS OF THE SSA COMMITTEE

1. It is impossible to determine whether the pilot was conscious at the time of wing failure.

2. It is impossible to determine whether the tow rope was still attached at time of wing failure. It is highly likely that the rope and wing failed almost simultaneously.

3. It appears highly unlikely that simply towing into a gust could have caused the failure. Gust velocities of 46 and 31 feet per second would be required to exceed the ultimate load factor at speeds of 80 and 120 mph respectively.

4. Accidental rotation to maximum lift coefficient could have produced wing failure at about 100 mph without any tow rope load or dynamic effects.

5. The effect of the tow rope load is dependent on the angle of the towline. Wing failure would have occured at 94 mph at a towline angle of 15°, 88 mph at 30°, and 83 mph at 45°.

6. The observed porpoising and failude of the left wing tip sugges. the possibility of dynamic instability in pitch perhaps coupling with the natural frequency of the wing. I such coupling could exist the tin to double amplitude would be so short as to make it impossible t the pilot to take any corrective a tion before wing failure occured. Due to the many factors involved in the dynamic response of the sailplane, the sailplane wing, the towline, the towplane, it was impossible for the committee to make an analysis with the information and facilities available. Although pitch-

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