

NATIONAL TRANSPORTATION SAFETY BOARD
WASHINGTON, D.C.

ISSUED: November 6, 1974

Forwarded to:
Honorable Alexander P. Butterfield
Administrator
Federal Aviation Administration
Washington, D. C. 20591

SAFETY RECOMMENDATION(S)

A-74-95

On March 5, 1974, a Nihon YS-11A-200, N208PA, airplane was being used for a training flight under provisions of 14 CFR 91 when it became involved in an accident about 8 miles east of Borrego Springs, California. The National Transportation Safety Board's investigation of the accident revealed a maintenance problem which we believe warrants your attention.

When engine power was applied to recover from a simulated landing stall, the engines did not respond, and the aircraft was landed in the desert. The instructor and three trainees were not injured.

Our investigation of the accident revealed that both engines had been subjected to extremely high, destructive in-flight temperatures, which concentrated in the turbine section of each engine. In addition to the turbine damage, the No. 1 engine nacelle (Zone 3) was extensively burned rearward of the aircraft firewall bulkhead.

The excessive temperatures in the turbines of the engines were attributed to a high-(cruise pitch) stop hangup of both propellers while the aircraft was at low airspeed and entering a stall maneuver. The airplane was equipped with two, 40-root-size Dowty Rotol R209/4-40-5/2 propellers. Two conditions permitted the high-stop hangup to occur:

- (1) The cockpit high pressure fuel cock lever was in the "open" detent, instead of the "lockout" detent. (The latter is prescribed for low speed operation in flight and training manuals.)

- (2) Worn contact faces of two propeller high-stop hub contact switches.

With the high pressure fuel cock lever in the "open" position, the propeller high-stop can only be withdrawn electrically, and the electrical failure of the high-stop hub contact switches prohibited operation of the system.

The No. 2 propeller hub contact switches functioned normally; however, the switches must be operable on both propellers for the propeller stop system to function. Maintenance records indicated that the No. 1 propeller and its two high-stop hub contact switches had accumulated about 2,345 operational hours since overhaul.

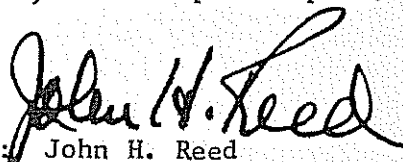
According to the manufacturer's maintenance instructions, replacement of these switches is predicated upon their reaching a specified maximum wear limit. The wear rate should be monitored by periodic inspection of the switches. If higher-than-usual wear rates are detected, the operator is alerted to replace the switches before the wear exceeds maximum specified limits. These types of switches are also installed in 20- and 30-root size propellers.

We recognize that the crew's nonadherence to prescribed procedures was involved in the accident sequence. However, we believe that the excessive wear of the contact switches was the underlying hazard that initiated the chain of events which led to the accident.

Therefore, the National Transportation Safety Board recommends that the Federal Aviation Administration:

Issue a maintenance bulletin which (1) emphasizes the importance of establishing appropriate inspection periods for hub contact switch brushes on Dowty Rotol Nos. 20, 30, and 40 root size propellers (Dart) and (2) advises of the availability of pertinent service instructions in Dowty Rotol Service Bulletin 61-839, dated April 11, 1974.

REED, Chairman, THAYER, BURGESS, and HALEY, Members, concurred in the above recommendation. McADAMS, Member, did not participate.


By: John H. Reed
Chairman