

NATIONAL TRANSPORTATION SAFETY BOARD
WASHINGTON, D.C.

ISSUED: August 8, 1974

Forwarded to:

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

SAFETY RECOMMENDATION(S)

A-74-59 & 60

On July 8, 1974, the No. 1 engine's core cowl separated in flight on a McDonnell-Douglas DC-10, N60NA, while it was en route from Miami, Florida, to Los Angeles, California. The National Transportation Safety Board's investigation of the accident indicates that corrective action should be taken to reduce the possibility of similar accidents.

N60NA departed Miami International Airport at 0914, July 8. During the climb and at approximately 25,000 feet altitude, an explosion, accompanied by severe vibrations, was experienced. The flight engineer's panel indicated loss of hydraulic and engine oil and AC bus for No. 2 engine. The No. 2 engine was deactivated. During emergency descent, the No. 2 engine's fire warning lights illuminated. Fire extinguishers were discharged, and the fire warning lights went out. The No. 2 AC bus system was reactivated by the bus lockout switch. The severe vibrations continued during the descent until power was reduced for the approach and landing. The aircraft was landed at Tampa International Airport without further incident.

Inspection of the aircraft revealed structural damage to the left wing leading edge outboard of the No. 1 engine, a small puncture, approximately 6" x 6", in the upper wing surface, and severe damage to the No. 2 engine from ingestion of foreign objects.

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Further investigation revealed the absence of the No. 1 engine left and right core cowl panels. Because there was no damage to the inboard brackets, it was obvious that the right half of the core cowl had separated from its mounting brackets first, and the resultant air loads on the separated portion tore the left hand panel from its mounting brackets. The complete core cowl passed over the left wing and damaged the wing and the No. 2 engine.

The background data indicated that N60NA was routed into maintenance on July 6, 1974, with a pilot's complaint that No. 1 reverse unlock light had been on after landing at Miami. Line maintenance personnel removed the right side core cowl and the fan reverser during troubleshooting procedures.

The aircraft had been under the supervision of line maintenance for about five work shifts during the repair to the No. 1 engine. After completion of the troubleshooting and repair effort, the discrepancy was not cleared, and the aircraft was dispatched on July 8, 1974, with the complaint listed as an open item.

Information obtained from depositions of maintenance personnel indicated that a mechanic set the inboard core cowl in position, and secured the cowl by placing one bolt, without nut, in the center bracket for the core cowl. The next work shift assumed that all three bolts were installed properly with nuts, and proceeded to close and secure the core cowl. There was no paperwork or mechanic writeup to indicate that the core cowl was, in fact, unsecured.

Depositions further indicated a lack of documentation and a breakdown in communication in the indirect transfer of critical instruction during the shift changes. Although 14 CFR 121.369(b)(9) states, that certificate holder's manuals must include "Procedures to ensure that required inspections, other maintenance, preventive maintenance, and alteration that are not completed as a result of shift changes or similar work interruptions are properly completed before the aircraft is released to service," the personnel deposed indicated an unfamiliarity with this portion of the regulations. Further, the National Airlines Maintenance Administration Manual, section 0-11-8, clearly delineates areas of responsibility in the maintenance intershift turnover. Further, the National Airlines Base Check descriptive information, under section A(3) states, "The instructions are intended as a guide. Personnel should always be on the alert for discrepancies not specifically spelled out. Such discrepancies must be investigated to the extent necessary to evaluate the effect on the continued airworthiness of the aircraft and normal operation of its systems. If necessary, plates and panels not ordinarily opened may be opened to insure a thorough evaluation. An item must be entered on the standard Maintenance Supplement (885-121)

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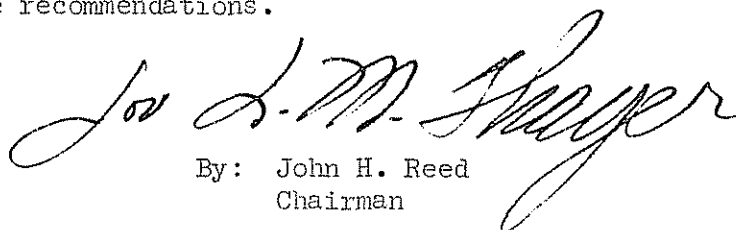
for any plate or panel so removed." Although the manual clearly states that plates and panels removed should be listed, no such entry was made.

Therefore, to eliminate the recurrence of such maintenance oversights as enumerated above, the National Transportation Safety Board recommends that the Federal Aviation Administration:

1. Review National Airline's implementation of their Maintenance Procedures and require changes as necessary to the maintenance and inspection procedures relative to maintenance shift changes or other similar work interruptions in order to ensure that all required inspections are performed.
2. Issue a Maintenance Bulletin to alert all air carrier inspectors of the shift changeover problems, and to insure their awareness of the difficulties that can be experienced when procedures are not followed explicitly.

Members of our Bureau of Aviation Safety will be available for consultation in the above matter if desired.

REED, Chairman, McADAMS, THAYER, BURGESS, and HALLEY, Members, concurred in the above recommendations.



By: John H. Reed
Chairman

THESE RECOMMENDATIONS WILL BE RELEASED TO THE PUBLIC ON THE ISSUE DATE SHOWN ABOVE. NO PUBLIC DISSEMINATION OF THE CONTENTS OF THIS DOCUMENT SHOULD BE MADE PRIOR TO THAT DATE.