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WAR DEPARTMENT
AIR CORPS

Mat'l Div.

Serial No. _____

UNSATISFACTORY REPORT

45-39 (See A. C. Cr. 15-54)

Station Serial No. 45-201

Date 9 JULY 1945

Station 369

Organization 360TH FIGHTER SQUADRON

Name, type and ser. no. of equipment P-51D-15 AIRCRAFT, SERIAL # 44-15164

Name and part no. of defective part LANDING GEAR UPLOCK SYSTEM, N. AMERICAN, CLASS 01-N

DESCRIPTION OF TROUBLE:

1. DESCRIPTION OF MALFUNCTION

A. THIS AIRCRAFT MADE A ROUTINE FLIGHT ON 30 JUNE 1945. INVESTIGATION REVEALED THE FOLLOWING FACTS:

- (1) THE LEFT WING WAS FOUND SEVERAL MILES FROM THE AIRCRAFT, TORN OFF BETWEEN STATIONS 0 AND 17.5, WITH THE MAIN WHEEL STRUT FULLY EXTENDED AND LOCKED DOWN.
- (2) THE REMAINDER OF THE AIRPLANE WAS FOUND INTACT WITH NO INDICATION OF PILOT ERROR. THE RIGHT LANDING GEAR WAS UP AND LOCKED.
- (3) THE LEFT LANDING GEAR WAS FOUND SHEARED OFF AT THE TOP OF THE OUTER CYLINDER PISTON TUBE PROBABLY CAUSED ON IMPACT OF CRASH. ALSO THE LANDING GEAR RETRACTING STRUT CONNECTING ROD (PART #73-33578-3) WAS FOUND BROKEN DUE TO COMPRESSION BECAUSE THE ACTUATING CYLINDER WAS STILL IN THE RETRACTED POSITION.
- (4) THE LEFT HAND LANDING GEAR RETRACTED HOOK ASSEMBLY (PART #109-33558) WAS BURRED AND MARKED ON THE OUTBOARD SIDE INDICATING THE UPLOCK ROLLER AND STUD ON THE STRUT ASSEMBLY SLIPPED OFF DURING THE HIGH VELOCITY DIVE AND PULL OUT. THE ROLLER AND STUD HAD AN ELONGATED MARK ON IT LEADING TO THE ASSUMPTION THAT WING ENDURED SEVERE STRAINS AND CAUSED IT TO FLEX BEYOND THE LIMIT OF THE ROLLER.
- (5) THE LEFT WING HAD SEVERE SKIN STRAINS INDICATING A SEVERE PULL OUT BEFORE THE WING TORE OFF. A 1/2" HIGH WRINKLE ALONG STATION 75. A 1/4" HIGH WRINKLE PARALLEL TO THE SPAR BETWEEN STATIONS 117.125 AND 125.5. OUTBOARD OF THE AMMUNITION BAYS NUMEROUS 1/4" HIGH WRINKLES LOCATED DIAGONALLY FROM THE AILERON INBOARD END TO THE LEADING EDGE OF THE WING TIP. ALL THE AFOREMENTIONED BUCKLES AND WRINKLES ARE TYPICAL OF HIGH "G" PULL OUTS AND IT IS UNLIKELY THAT THEY WERE ALL CAUSED BY THE CRASH.

B. THE FOLLOWING IS THE PROBABLE SERIES OF EVENTS LEADING TO THE CRASH. THE AIRCRAFT WENT INTO A SPIN OR DIVE (THE MARK ON THE UPLOCK ROLLER SHOWED THAT THE WING FLEXED DOWNWARDS AS WELL AS UPWARDS). DURING PULL OUT THE DEFLECTION OF THE WING WAS SO GREAT THAT THE UPLOCK ROLLER WAS PULLED TO THE EDGE OF THE HOOK ASSEMBLY AND CENTRIFUGAL FORCE ON THE STRUT AND WHEEL DID THE

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REST. THE HYDRAULIC PRESSURE IN THE ACTUATING CYLINDER RESISTED THE RETRACTION OF THE STRUT BUT THE COMPRESSION ON THE CONNECTING ROD OVERCAME ITS STRENGTH AND CAUSED IT TO FRACTURE ALTHOUGH THE ACTUATING PISTON REMAINED IN THE RETRACTED POSITION. THE CENTRIFUGAL FORCE ON THE STRUT FORCED THE FAIRING DOOR LOCKS OPEN AND THE STRUT RETRACTED. THE AIR PRESSURE IN THE WHEEL WELL AND THE DRAG ON THE EXTENDED WHEEL ASSEMBLY TORE THE LEFT WING FROM THE FUSELAGE. THE AIR PRESSURE WAS SO SEVERE IN THE WHEEL WELL IT BUCKLED THE CROSS SECTION RIB ASSEMBLIES AND TORE LOOSE THE RIVETS.


2. RECOMMENDATIONS

- A. IT IS APPARENT THAT A SAFER UPLOCK INSTALLATION IS NECESSARY. AN IMPROVEMENT CAN BE ACCOMPLISHED BY SIMPLY LENGTHENING THE STUD AND ROLLER (RESPECTIVE PART NUMBERS 65684 AND 64646). THIS WOULD ALLOW FOR A GREATER DEFLECTION OF THE WING WITHOUT THE STRUT RETRACTING, CAUSING A SIMILAR OCCURRENCE.
- B. A STRONGER LANDING GEAR RETRACTING STRUT CONNECTING ROD ASSEMBLY (PART #73-33578-3) SHOULD BE MANUFACTURED TO ASSIST THE FAIRING DOOR UP-LOCKS IF THE STRUT UPLOCK FAILS. A CONNECTING ROD ASSEMBLY HAS BROKEN PREVIOUSLY IN THIS ORGANIZATION. (SEE UR 44-384, DATED 9-12-44).

3. DISPOSITION

- A. THE AIRCRAFT WAS CLASSIFIED CATEGORY "E" AND TRANSFERRED TO STATION 470.

FOR THE COMMANDING OFFICER.


HAROLD A. RAGNELL,
CAPT, AIR CORPS,
ENGINEERING OFFICER.

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