DOCKET NO. **SA-510**

NATIONAL TRANSPORTATION SAFETY BOARD

WASHINGTON, D.C.

B737 Input Rod Summary

737 Rudder PCU Input Rod Summary

On 26 Jan 95, UAL advised us of an anomaly which occurred during bench testing of a 737 rudder PCU. The NTSB was notified, and UAL requested on-site assistance from Boeing at SFO. Two engineers from Boeing went to UAL-SFO in response to this request. During the ensuing investigation, an area near the aft end of the rudder PCU input control rod (P/N 69-37290-11) was discovered where the paint had been apparently scrapped off. This area was adjacent to a structural web mounted inside the aft surface of the vertical stabilizer. Examination of other 737 airplanes available at that time revealed similar wear areas on this input rod.

On 27 Jan 95, we received a report from DAL of similar wear on this control rod. Additionally, a dent approximately 1/4 inch deep was noted in the wear region of this rod. UAL has advised that they have a rudder PCU input rod that was similarly dented.

No reports of rudder control system binding or rudder control anomalies have been associated with either of the above reports.

The cause(s) of these reports has not yet been conclusively determined, and is currently being actively investigated.

A review of available data has revealed six previous report of similar wear and/or dents. We believe that in each of these cases the anomaly is attributable to either rudder or rudder PCU removal / installation.

All of the above reports were discovered during routine maintenance inspections. None of these anomalies were associated with any reported flight anomalies.

ATA 2725-30 MODEL 737 3 MAR 93 H
RUDDER PCU INPUT CONTROL ROD - DAMAGE
REF /A/ TWO PAGE FAX SENT ON 24 FEB 93
/B/ 737-200 DLH MM 27-21-12 REV 93 DATED 20 OCT 92
/C/ 737-200 DLH MM 27-21-11 REV 93 DATED 20 OCT 92
/D/ 737-300 DLH MM 27-21-11 REV 20 DATED 15 NOV 92

THE FOLLOWING MESSAGE IS SENT TO BRUCE CROSS WITH A COPY TO KARL TAHT.

DAMGE DESCRIPTION

DLH FOUND TWO P/N 69-37290-11 RUDDER PCU INPUT CONTROL RODS IN THEIR SPARES STOCK WITH DAMAGE TO THE OUTER SURFACE OF THE TUBE PORTION OF THE RODS. DLH REQUESTS THAT BOEING EVALUATE THE DAMAGE AND ADVISE DLH IF THE CONTROL RODS ARE ACCEPTABLE FOR CONTINUED USE.

ADDITIONALLY, DLH WANTS TO ADVISE BOEING OF THE PROBABLE CAUSE OF THE DAMAGE TO THE RODS SO THAT BOEING CAN POSSIBLY IMPROVE THE MAINTENANCE PROCEDURES IN THE EXISTING BOEING MAINTENANCE MANUAL.

BOTH OF THE -11 RODS WERE DAMAGED IN THE SAME MANNER. DLH HAS PROVIDED US WITH TWO SKETCHES WHICH SHOW THE DAMAGE LOCATION AND ITS EXTENT. IT APPEARSE THAT THERE WAS A SHARP EDGE RIDING ON THE CONTROL ROD THAT CAUSED SOME CHAFFING DAMAGE IN THE AREA, WHICH IS IDENTIFIED AS THE "CHAFFED AREA" ON THE SKETCHES.

ADJACENT TO THE CHAFFED AREA THERE IS A DAMGED AREA, WHICH IS IDENTIFIED AS A "DENT" ON THE SKETCHES. THERE SEEMS TO BE NO MATERIAL REMOVED IN THIS AREA. SO, THE COMPLETE DENT IN THE OUTER SURFACE CARRIES THROUGH TO THE INNER DIAMETER'S SURFACE OF THE RODS (YOU CAN SEE THE DENT ON THE ROD'S INNER DIAMETER). WE WILL PROVIDE YOU WITH A COPY OF THE DLH SKETCHES VIA THE REF /A/ FAX.

DLH WOULD LIKE TO BE ABLE TO CONTINUE TO USE THE TWO CONTROL RODS AFTER SMOOTHING AND REFINISHING THE DAMAGED LOCATIONS.

SOURCE OF CONDITION

DLH BELIEVES THAT THE CHAFFING AND DENT OCCURRED WHEN THE RUDDER PCU WAS DETACHED FROM THE RUDDER. WHEN THE PCU IS DETACHED FROM

THE RUDDER, THE PCU IS NO LONGER SUPPORTED AT ITS AFT END. SO, WHEN THE PCU IS DETACHED, THE PCU INSTALLATION IS ALLOWED TO MOVE DOWN AND ROTATE SLIGHTLY ABOUT ITS FORWARD ATTACHEMENTS UNTIL IT COMES TO REST ON THE HORIZONTAL STABILIZER STRUCTURE THAT IS BELOW THE AFT END OF THE PCU.

DLH BELEIVES THAT AS THE PCU MOVES TO ITS NEW RESTING POSITION THE PCU INSTALLATION TENDS TO ROTATE IN A WAY THAT THE INPUT ROD COMES TO A RESTING POINT ON THE STRUCTURE FIRST. THE DAMGED LOCATION ON THE INPUT ROD, SHOWN IN THE REF /A/ FAX, IS THE POINT THAT THE ROD HITS THE STRUCTURE.

DLH'S ASSUMTION ABOUT THE SOURCE OF THE DAMAGE IS SUPPORTED BY THE INFORMATION THAT IS PROVIDED IN PARAGRAPH 3.B. ON PAGE 401 OF THE REF /B/ MM SECTION. THIS MM SECTION STATES TO REMOVE THE RUDDER PCU INPUT CONTROL ROD WHEN THE PCU IS DISCONNECTED FROM THE RUDDER TO AVOID DAMAGE TO THE INPUT ROD.

FURTHER REVIEW OF THE REF /C/ AND /D/ MM SECTIONS REVEALS THAT THE ROD REMOVAL INFORMATION PROVIDED IN THE REF /B/ MM SECTION IS NOT PROVIDED IN THESE TWO MM SECTIONS.

THE DIFFERENCE IN CONTEXT BETWEEN THE REF /C/ MM SECTION WHEN COMPAIRED TO THE REF /B/ AND /D/ MM SECTIONS IS THAT THE LATER ADDRESS THE REMOVAL OF A RUDDER MADE OF COMPOSITE MATERIAL, AND THE REF /C/ MM SECTION ADDRESSES THE REMOVAL OF AN ALUMINUM RUDDER ASSEMBLY.

DLH IS NOT SURE WHAT TYPE OF AIRPLANE THE TWO RODS WERE REMOVED FROM SINCE THE RODS WERE FOUND IN THEIR SPARES STOCK.

ACTION:

1/ PLEASE REVIEW THE INFORMATION ABOVE AND IN THE REF /A/ FAX, AND PROVIDE US WITH A NO TECHNICAL OBJECTION FOR DLH TO CONTINUE USING THE TWO P/N 69-37290-11 RUDDER PCU INPUT CONTROL RODS.

2/ PLEASE REVIEW THE INFORMATION PROVIDED IN THE REF /B/, /C/, AND /D/ MM SECTIONS AND ADVISE US IF AIRPLANE MAINTENANCE ENGINEERING PLANS TO REVISE THE REF /C/ AND /D/ MM SECTIONS TO REQUIRE THAT THE RUDDER PCU INPUT CONTROL ROD BE REMOVED WHEN THE RUDDER PCU IS DISCONNECTED FROM THE RUDDER.

PLEASE PROVIDE A RESPONSE BY 04 MARCH 93.

HAZZARD/NOVA BOEING CUSTOMER SERVICES HAMBURG

FSE-BOECOM WED 02/24/93 13:38:02

BOESEA-DDS006-00035-02/24/93-1244Z

DLH-HAM-93-0142KR 03 MAR 93
ATA 2725-30 MODEL 737
RUDDER PCU INPUT CONTROL ROD - DAMAGE
REF /A/ DLH-HAM-93-0134TR DTD 24 FEB 93 /C/
/B/ TWO PAGE FAX SENT ON 24 FEB 93
/C/ 737-200 MM 27-21-12 REV 93 DTD 20 OCT 92
/D/ 737-200 MM 27-21-11 REV 93 DTD 20 OCT 92
/E/ 737-300 MM 27-21-11 REF 20 DTD 15 OCT 92

THE FOLLOWING MESSAGE SENT TO R.NOVA /BCSR/ WITH A CC TO K.TAHT /BCSR/.

THE FOLLOWING INFORMATION IS PROVIDED IN RESPONSE TO THE REF /A/ TELEX REGARDING RUDDER PCU INPUT CONTROL ROD DAMAGE. DLH ADVISED OF TWO P/N 69-37290-11 RUDDER PCU INPUT RODS IN THEIR SPARES STOCK WITH DAMAGE TO THE OUTER SURFACE OF THE TUBE. THIS CONDITION IS SHOWN ON THE REF /B/ FAXED SKETCH. DLH ADVISED THAT THEY BELIEVE THIS CONDITION RESULTED FROM REMOVAL OF THE RUDDER PCU FROM THE RUDDER PRIOR TO REMOVAL OF THE CONTROL ROD FROM THE RUDDER PCU. DLH QUERIED WHETHER THESE CONTROL RODS ARE ACCEPTABLE FOR CONTINUED USE, AND WHETHER MAINTENANCE MANUAL REVISIONS SHOULD BE CONSIDERED TO PREVENT FUTURE SIMILAR DAMAGE.

1/ WE HAVE REVIEWED THE INFORMATION IN THE REF /A/ TELEX AND THE REF /B/ FAX. UNFORTUNATELY, WE KNOW OF NO FEASIBLE WAY TO DETERMINE WHETHER CRACKS HAVE FORMED ON EITHER THE INNER DIAMETER OF THE OUTER TUBE OR THE OUTER DIAMETER OF THE INNER TUBE. THIS, IN TURN, MEANS WE ARE UNABLE TO CONFIRM THE STRUCTURAL INTEGRITY OF THIS PART. ACCORDINGLY, WE SUGGEST THESE TWO CONTROL RODS BE SCRAPPED.

2. DLH NOTED THAT THE REF /C/ MM ADVISES THE THE CONTROL ROD SHOULD BE REMOVED FROM THE RUDDER PCU WHEN THE RUDDER PCU IS DISCONNECTED FROM THE RUDDER TO AVOID DAMAGE TO THE CONTROL ROD. HOWEVER, THE REF /D/ AND REF /E/ MAINTENANCE MANUAL SECTIONS DO NOT INCLUDE THIS INFORMATION. DLH SUGGESTED THAT THE CONTROL ROD IS SUSCEPTIBLE TO DAMAGE IF IT IS NOT REMOVED AND THE RUDDER PCU IS DISCONNECTED FROM THE RUDDER.

WE AGREE THAT A POTENTIAL FOR DAMAGE TO THIS CONTROL ROD EXISTS IF IT HAS NOT BEEN REMOVED AND THE AFT END OF THE RUDDER PCU IS NOT CONNECTED TO AND SUPPORTED BY THE RUDDER. ACCORDINGLY, WE HAVE REQUESTED THAT THE MAINTENANCE MANUAL BE REVISED SO THAT THE INPUT CONTROL ROD IS REMOVED ANY TIME THE RUDDER PCU IS DISCONNECTED FROM THE RUDDER.

BOEINGAIR BDJ/DEP/BRUCE CROSS M-7272 2H-95
CUSTOMER SERVICES DIVISION
/VNB 03/03/93 1603

ATA 2724-00 MODEL 737-400 14 APR 92 H
RUDDER CONTROL TORQUE TUBE LOWER BEARING INSPECTION
REF /A/ 737-SL-27-70-B
AIRPLANE HOURS/CYCLES
EI-BXD 4276/4277

DURING INSPECTION PER REF /A/, RUDDER INPUT VERNIER CONTROL ROD, P/N 69-37290-11 WAS FOUND TO HAVE CONTACTED THE CENTER CRANK OF THE RUDDER CONTROL TORQUE TUBE. THIS RESULTED IN THE FOLLOWING DAMAGE BEING SUSTAINED BY THE INPUT ROD:

SCORING FOR 1-1/2 INCH IN LENGTH TAPERING FROM 1/16 INCH TO MAX WIDTH OF 1/2 INCH, INDENTATION AT END OF SCORE MARK 1/2 INCH LONG AND 1/16 INCH DEEP. THIS INDENTATION WAS ALSO VISIBLE ON THE INNER WALL OF THE TORQUE TUBE (DUAL LOAD PATH CONSTRUCTION). THIS NECESSITATED THE REMOVAL AND REPLACEMENT OF THE TORQUE TUBE. ARL BELIEVE THIS DAMAGE TO THE INPUT ROD WAS CAUSED AS A RESULT OF MIGRATION OF THE BEARING IN THE TORQUE TUBE LOWER HOUSING WHICH HAD BEEN INSTALLED UPSIDE DOWN. AS A RESULT OF THE ABOVE FINDINGS ARL ARE INSPECTING REMAINDER OF FLEET AT NEXT A-CHECK.

ACTION
PLEASE ADVISE IF ANY SIMILAR REPORTS HAVE BEEN RECEIVED FROM OTHER OPERATORS. ALSO, SUGGEST REF /A/ BE REVIEWED FOR INCLUSION OF THIS ADDITIONAL INSPECTION REQUIREMENT.

V. RABBETTS CUST SUPPT REP DUBLIN

FSE-BOECOM WED 04/08/92 16:48:14

BOESEA-DDSO01-00133-04/08/92-1552Z

ARL-DUB-92-0192TR 10 APR 92
ATA 2724-00 MODEL 737-400
RUDDER CONTROL TORQUE TUBE LOWER BEARING INSPECTION
REF /A/ ARL-DUB-92-0182TR /C/
AIRPLANE HOURS/CYCLES
EI-BXD 4276/4277

FURTHER TO REF /A/ THE FOLLOWING INFORMATION MAY BE RELEVANT. THE RUDDER WAS REMOVED FROM THIS AIRCRAFT IN NOVEMBER 1991 DUE LIGHTENING STRIKE DAMAGE. IT IS CONCEIVABLE THAT THE DAMAGE SUSTAINED WAS CAUSED DURING REMOVAL/INSTALLATION OF THE RUDDER.

ACTION
AT YOUR DISCRETION. PLEASE CONSIDER REF /A/ CLOSED.

V. RABBETTS CUST SUPPT REP DUBLIN

FSE-BOECOM FRI 04/10/92 15:30:55

BOESEA-DDSO04-00065-04/10/92-1436Z

ARL-DUB-92-0232RR 14 APR 92
ATA 2724-00 MODEL 737-400
RUDDER CONTROL TORQUE TUBE LOWER BEARING INSPECTION
REF /A/ ARL-DUB-92-0182TR DTD 08 APR 92 /C/
/B/ ARL-DUB-92-0192TR DTD 10 APR 92
/C/ 737-SL-27-70-B DTD 17 MAR 92
AIRPLANE HOURS/CYCLES
EI-BXD

IN THE REF /A/ TELEX, ARL ADVISED THAT DURING THE REF /C/ CHECK, DAMAGE TO THE RUDDER INPUT VERNIER CONTROL ROD, P/N 69-37290-11, WAS DISCOVERED. THIS DAMAGE APPEARED TO HAVE RESULTED FROM CONTACT BETWEEN THE CONTROL ROD AND THE CENTER CRANK OF THE RUDDER CONTROL TORQUE TUBE. ARL BELIEVED THIS CONTACT WAS CAUSED BY MIGRATION OF THE BEARING IN THE LOWER RUDDER CONTROL TORQUE TUBE BEARING HOUSING, AND QUERIED WHETHER SIMILAR REPORTS FROM OTHER OPERATORS HAD BEEN RECEIVED.

HOWEVER, IN THE REF /B/ TELEX, ARL ADVISED THAT THE RUDDER WAS REPLACED ON THIS AIRPLANE IN NOVEMBER 91, AND THAT THE AFOREMENTIONED DAMAGE COULD HAVE OCCURRED THEN.

A REVIEW OF AVAILABLE DATA HAS DISCLOSED NO PREVIOUS REPORTS OF SIMILAR DAMAGE DUE TO RUDDER CONTROL TORQUE TUBE LOWER BEARING MIGRATION. ADDITIONALLY, OUR REVIEW OF THIS CONDITION REVEALED THAT THE WORST CASE BEARING MIGRATION OF THIS LOWER BEARING WOULD STILL LEAVE A MINIMUM OF 0.1 INCH CLEARANCE IN THE AREA OF REPORTED INTERFERENCE. ACCORDINGLY, WE CONCUR WITH ARL THAT THE REF /A/ REPORTED DAMAGE MOST LIKELY OCCURRED DURING THE REF /B/ MENTIONED RUDDER REPLACEMENT PROCESS.

BOEINGAIR BDJ/JHB/BRUCE CROSS M-7272 2H-95
CUSTOMER SERVICES DIVISION
/GRD 04/14/92 1630

AMW-PHX-92-040/TR 17 DEC 92
ATA 2725-30 MODEL 737-300 8 JAN 93 H
RUDDER DUAL PATH VERNIER CONTROL ROD GOUGE
REF /A/ P/N 69-37290-11
/B/ FAX ONE PAGE
/C/ OHM 27-37-09

AIRPLANE	HOURS/CYCLES
N154AW	18167/14615

REF /A/ ROD IS A BONDED ASSEMBLY OF INNER TUBE, P/N 69-37291-1, AND OUTER TUBE, P/N 69-37291-2. ONE GOUGE WAS FOUND ABOUT /1/ INCH FROM THE THROAT OF THE FORK END OF THE ROD ON THE OUTER TUBE. THE AREA IS ABOUT 0.13 IN. CIRCUMFERENTIAL AND 0.5 IN. AXIALLY. THE DEEPEST PART WAS REPORTED TO BE 0.005 IN. AND IS 1.13 IN. FROM THE THROAT OF THE FORK END. AMW WAS NOT ABLE TO DETERMINE THE REMAINING THICKNESS OF THE TUBE WALLS IN THE DAMAGE AREA. REF /B/ ILLUSTRATES THE DAMAGE.

AMW MANUALLY POLISHED THE DAMAGE AREA TO 63 MICROINCHES. APPLIED ALODINE AND BMS 10-11 TYPE I PRIMER. AND RETURNED THE ROD TO SERVICE.

ACTION:

/1/ THE BOLT ASSEMBLY AT EACH END OF THE ROD IS COMPOSED OF A HOLLOW BOLT AND A SOLID BOLT. IS THE PURPOSE OF THE DOUBLE TUBE AND DOUBLE BOLT FOR REDUNDANCY?

/2/ THERE IS NO DAMAGE ALLOWABLE IN REF /C/. IS THE ACTION TAKEN BY AMW ACCETABLE?

REGARDS,
A. NOON/ED DAY/D. MOORE
BOEING CUSTOMER SUPPORT
PHOENIX

FSE-BOECOM THU 12/17/92 02:59:19

BOESEA-DDSO22-00049-12/17/92-2206Z

AMW-PHX-93-0010RR 08 DEC 93
ATA 2725-30 MODEL 737-300
RUDDER DUAL PATH VERNIER CONTROL ROD GOUGE
REF AMW-PHX-92-0407TR DATED 17 DEC 92 /C/
AIRPLANE HOURS/CYCLES
PP183

THE REFERENCE TELEX REPORTED A GOUGE IN A P/N 69-37290-11 RUDDER DUAL PATH VERNIER CONTROL ROD ASSEMBLY. THE GOUGE WAS LOCATED APPROXIMATELY 1 INCH FROM THE THROAT OF THE CONTROL ROD ASSEMBLY FORK END. THE GOUGE DEPTH WAS APPROXIMATELY 0.005 INCH. REPORTEDLY, AMW REWORKED THE ROD ASSEMBLY BY POLISHING THE REWORKED AREA AND APPLYING ALODINE AND PRIMER. AMW QUESTIONED WHETHER THIS REWORK IS ACCEPTABLE.

WE HAVE REVIEWED THE PROPOSED REWORK AND HAVE DETERMINED THAT IT IS STRUCTURALLY SATISFACTORY.

THE DUAL PATH CONTROL ROD ASSEMBLY AND ATTACHMENT BOLT ASSEMBLY IS FOR REDUNDANCY TO ENSURE THAT A DISCREPANCY /CRACK, ETC./ IN ONE PART WILL NOT AFFECT OPERATION OF THE RUDDER CONTROL SYSTEM.

BOEINGAIR JAH/JCK/BRUCE CROSS M-7272 2H-95
CUSTOMER SERVICES DIVISION

ATA 2725-30 MODEL 737-405 9 JAN 95 H
RUDDER PCU - VERNIER DUAL PATH ROD CHAFING WITH VERTICAL STAB
REF /A/ 69-37290-11 VERNIER ROD
/B/ IPC 27-21-91-01 ITEM 25
/C/ FAX - 1 PG SAME NBR THIS TELEX
/D/ SB 737-55-1052 23 SEP 93

AIRPLANE	HOURS/CYCLES
PW571	13378/11351
LN-BRA	

PW571 IS CURRENTLY UNDERGOING ITS FIRST "4C" CHECK. DURING THIS MAINTENANCE PERIOD, BRAATHENS FOUND THE SUBJECT ROD WITH A DENT AND CHAFING. INSPECTION SHOWED THAT CONTACT HAD BEEN MADE DURING NORMAL OPERATION WITH THE VERTICAL STABILIZER STRUCTURE.

THE DENT IS APPROXIMATELY 0.027 INCH DEEP AND IS LOCATED 2.728 INCHFROM THE CENTER OF THE MOUNTING BORE. THE CHAFED AREA IS APPROXIMATELY 1.025 INCH LONG AND 0.120 INCH WIDE, THE DEPTH IS MINOR. PLEASE SEE THE REF (C) FAX (NOTE THAT THE FAX DEPICTS THE ROD WITH THE DENT AND CHAFING ON THE INBOARD SIDE OF THE ROD - IN FACT, THE DENT AND CHAFING ARE LOCATED ON THE OUTBOARD SIDE OF THE ROD).

BRAATHENS PLANS TO LOCALLY BLEND AND POLISH THE DENT AND CHAFING, EDDY CURRENT INSPECT, TREAT WITH ALODINE, AND PRIME WITH BMS 10-11.

WHEN THE PCU IS REINSTALLED, THE CLEARANCE BETWEEN THE ROD AND THE STRUCTURE WILL BE EXAMINED. THIS IS THE FOURTH C-CHECK, AND THIS IS THE FIRST REPORT OF ANY CONTACT; APPARENTLY, THE DAMAGE HAS OCCURED AFTER THE 3C-CHECK. THERE ARE NO KNOWN COMPLAINTS BY FLIGHT CREW OR MAINTENANCE CREW THAT SEEM TO BE RELATED TO THIS CONTACT.

THE REF (D) SERVICE BULLETIN, "STABILIZERS - VERTICAL STABILIZER (FIN) - TRAILING EDGE BEAM INSPECTION AND REWORK," DISCUSSES CLEARANCE ON THE RIGHTHAND SIDE OF THE STRUCTURE. FOR THIS SUBJECT CASE, THE CONTACT HAS BEEN MADE WITH THE STRUCTURE ON THE LEFTHAND SIDE OF THE FIN. AND, FOR PW571, THE INTENT OF THIS SB HAS ALREADY BEEN ACCOMPLISHED (I.E., STRUCTURE ON THE RIGHTHAND SIDE HAS THE CUTOUT).

AFTER INSTALLATION OF THE PCU, IF CLEARANCE BETWEEN THE SUBJECT VERNIER ROD AND THE FIN STRUCTURE SEEMS INADEQUATE, BRAATHENS HAS SUGGESTED ACCOMPLISHING THE REWORK DESCRIBED IN THE SB ON THE LEFTHAND SIDE OF THE FIN.

ACTION:

1. PLEASE PROVIDE A "NO TECHNICAL OBJECTION (NTO)" STATEMENT FOR THE BRAATHENS' PROPOSAL TO REWORK THE SUBJECT ROD AND RETURN TO SERVICE.

2. PLEASE COMMENT ON KNOWN REPORTS BY OTHER OPERATORS WITH SIMILAR EXPERIENCE.

3. PLEASE COMMENT ON THE BRAATHENS' PROPOSAL TO ACCOMPLISH A CUTOUT, SIMILAR TO THAT DESCRIBED IN THE REF (D) SB, ON THE LEFTHAND SIDE OF THE FIN.

4. IN ORDER TO SUPPORT THE MAINTENANCE SCHEDULE, PLEASE MAKE BEST ATTEMPT TO RESPOND BY 9 JAN 95.

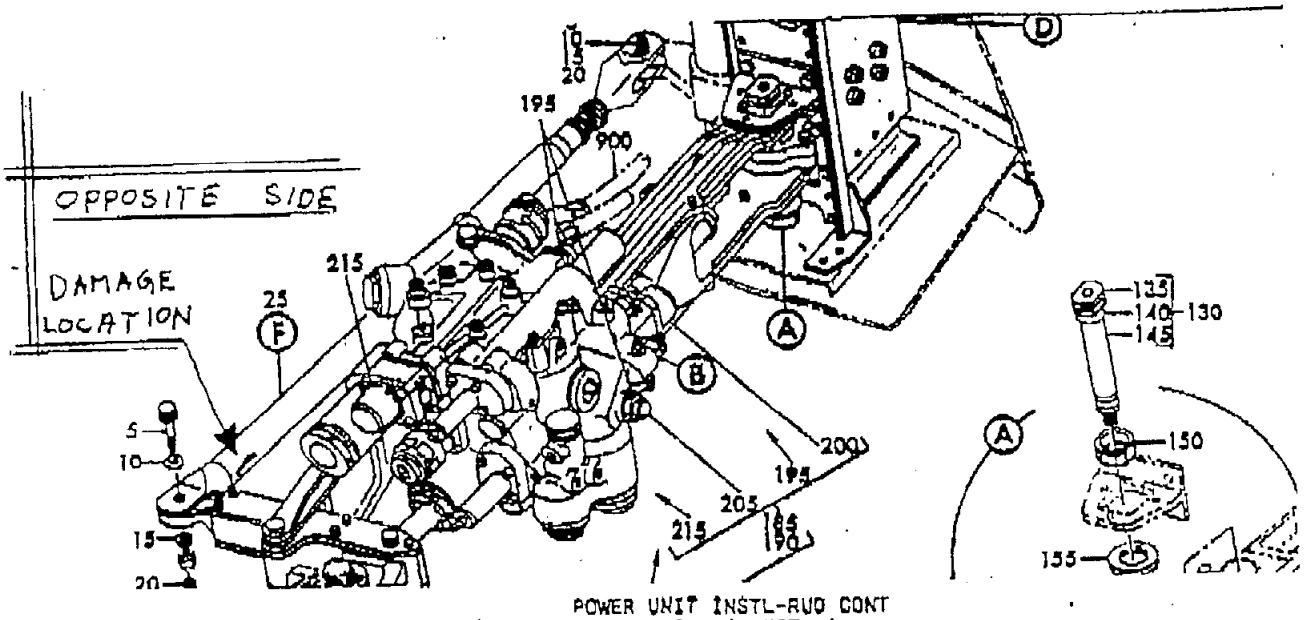
Thank you,
PJ Kizer
Boeing Customer Services
Stavanger, Norway

S. BRYNE-TIN/A

FSE-BOECOM THU 01/05/95 07:23:04
BOESEA-X2SO12-00014-01/05/95-1438Z

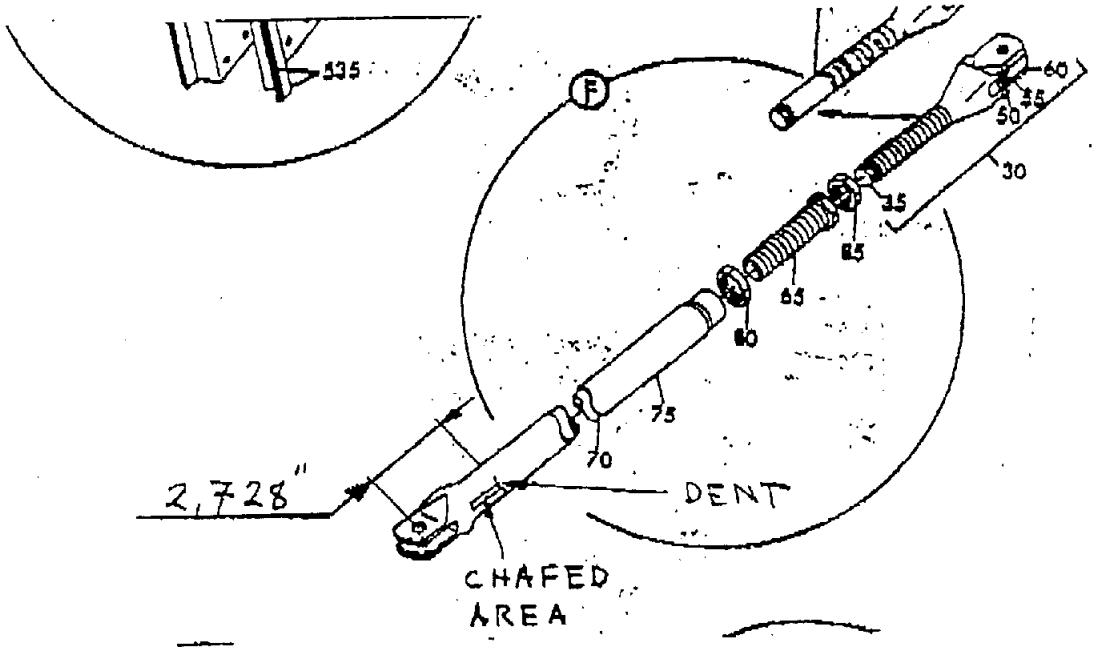
BRT - SVG - 95 - 0013 TR

1/1



POWER UNIT INSTL-RUD CONT
FIGURE 1 (SHEET 1)

MAY 12/93 27-21-91-01 27-21-91 PAG



POWER UNIT INSTL-RUD CONT
FIGURE 1 (SHEET 2)

MAY 12/93 27-21-91-01 27-21-91-(PAGE

ATA 2725-30 MODEL 737-405
RUDDER PCU - VERNIER DUAL PATH ROD CHAFING WITH VERTICAL STAB
REF /A/ BRT-SVG-95-0013TR DTD 05 JAN 95 /C/
/B/ 69-37290-11 VERNIER ROD
/C/ IPC 27-21-91-01 ITEM 25
/D/ FAX - 1 PG SAME NBR THIS TELEX
/E/ SB 737-55-1052 23 SEP 93
AIRPLANE HOURS/CYCLES
LN-BRA
PW571

THE FOLLOWING INFORMATION IS PROVIDED IN RESPONSE TO THE REF /A/ TELEX REGARDING CHAFING AND A DENT DISCOVERED ON THE MAIN RUDDER PCU INPUT ROD. BRT ADVISED THAT THEIR INSPECTION INDICATED CONTACT BETWEEN THE INPUT ROD AND THE VERTICAL STABILIZER STRUCTURE. THIS CONDITION WAS DISCOVERED DURING A //4C// CHECK ON THE DATA AIRPLANE. BRT NOTED THIS CONDITION WAS NOT REPORTED DURING THE //3C// CHECK, AND DEDUCED THAT THE CONTACT OCCURRED SINCE THAT CHECK. BRT POSED SEVERAL QUESTIONS REGARDING THIS CONDITION AND CORRECTIVE ACTION. THESE QUESTIONS ARE ADDRESSED BELOW.

1. OUR REVIEW OF THE REF /A/ AND REF /D/ INFORMATION INDICATES THAT IT IS STRUCTURALLY UNACCEPTABLE TO CONTINUE USE OF THE DAMAGED INPUT ROD DUE TO POTENTIAL COMPRISE OF THE DUAL LOAD PATH FUNCTION OF THIS ROD. ACCORDINGLY, WE SUGGEST THAT THE DAMAGED INPUT ROD BE REPLACED.

2. WE HAVE RECEIVED REPORTS FROM OTHER OPERATORS OF SIMILAR RUDDER PCU INPUT ROD DAMAGE. HOWEVER, IN EACH OF THESE REPORTS, THIS DAMAGE WAS ATTRIBUTED TO TESTING OR REMOVAL ANOMALIES. ONE OF THESE REPORTS STATED THAT THE DAMAGE OCCURRED WHEN THE RUDDER PCU WAS DISCONNECTED FROM THE RUDDER WITHOUT FIRST REMOVING THE RUDDER PCU INPUT ROD AS SPECIFIED IN MM 27-21-11. OUR REVIEW OF AVAILABLE DATA DID NOT REVEAL ANY PREVIOUS SIMILAR REPORTS WHICH WERE ATTRIBUTED TO INTERFERENCE DURING NORMAL OPERATION.

3. MODIFICATION OF THE LEFT SIDE VERTICAL FIN STRUCTURE SIMILAR TO THAT DISCUSSED IN THE REF /E/ SERVICE BULLETIN WOULD REQUIRE FURTHER EVALUATION BEFORE APPROVAL. WE SUGGEST THAT BRT REINSTALL THE RUDDER PCU AND INPUT ROD, AND CHECK THE MINIMUM CLEARANCE BETWEEN THE ROD AND ADJACENT STRUCTURE THROUGH FULL RUDDER PEDAL TRAVEL. THIS SHOULD BE DONE WITH THE RUDDER PCU FULLY POWERED. IF A POTENTIAL INTERFERENCE CONDITION EXISTS, PLEASE ADVISE US THE MINIMUM CLEARANCE OR DEGREE OF INTERFERENCE. WE WILL EVALUATE STRUCTURAL MODIFICATIONS FOLLOWING RECEIPT OF THIS INFORMATION.

JOHNSON/FRUGE/DIDONATO
CUSTOMER SERVICE ENGINEERING
BOEINGAIR M-7272 2H-95
/CLA

///RUSH AOG///SAME DAY RESPONSE REQUIRED////AOG////RUSH///

XIH-TSN-93-0069TR 6 OCT 93
ATA 2725-30 MODEL 737-300 6 OCT 93 H
RUDDER POWER UNIT INPUT ROD RIDING STRUCTURE
REF /A/ INPUT ROD P/N 69-37290-11
AIRPLANE HOURS/CYCLES
PQ264

XIH REPORT THAT REF /A/ ROD SHOWS EVIDENCE OF RIDING STRUCTURE.

REF /A/ ROD EXHIBITS DAMAGE TO THE AFT OUTBOARD SURFACE APPROX 2.5 INCHES LONG .20 INCHES WIDE WITH A CREASE BEING PRESENT AT THE FORWARD TERMINATING POINT OF THE DAMAGED AREA. THE ADJACENT STRUCTURE (ANGLE) EXHIBITS SLIGHT ABRASION ON THE AFT EDGE OF THE MOST INBOARD FLANGE.

THERE APPEARS TO BE CONSIDERABLE CLEARANCE BETWEEN THE REF /A/ ROD AND ADJACENT STRUCTURE WHEN THE RUDDER IS MOVE THROUGH IT'S ENTIRE RANGE OF TRAVEL WITH HYDRAULIC POWER BEING SUPPLIED BY ELECTRIC PUMPS.

THE REF /A/ ATTACH BOLTS EXHIBIT TAMPER PROOF PUTTY (PINK IN COLOR) ON LOCKING HARDWARE.

DESIRED ACTION:

PLEASE PROVIDE INSTRUCTIONS WITH REFERENCES FOR REPAIRING / REPLACING REF /A/ ROD.

IF POSSIBLE PLEASE PROVIDE ADDITIONAL CHECKS TO VERIFY ACTUAL RIDING OF THE REF /A/ ROD ON ADJACENT STRUCTURE.

HAVE SIMILAR REPORTS OF REF /A/ ROD RIDING STRUCTURE BEEN REPORTED./Q/

PLEASE PROVIDE AN EXPLANATION OF HOW THIS CONDITION CAN OCCUR. AND ANY ADDITIONAL CHECKS NECESSARY TO RETURN DATA AIRPLANE TO SERVICE.

REGARDS,

FLINT /BCSM/ TIANJIN

FSE-BOECOM WED 10/06/93 02:58:57

BOESEA-DDSC07-00034-10/06/93-0955Z

XIH-TSN-93-0070TR 6 OCT 93
ATA 2725-30 MODEL 737-300 7 NOV 93 H
RUDDER POWER UNIT INPUT ROD RIDING STRUCTURE
REF /A/ XIH-TSN-93-0050RR
/B/ TELECON F. CARLSON TO J. FLINT DATED 6 OCT 93
/C/ 737-300 MM 27-21-11
/D/ 69-37290-11 CONTROL ROD
/E/ XIH-TSN-93-0069TR
AIRPLANE HOURS/CYCLES
PQ264

THIS MESSAGE SENT TO CLARIFY INFORMATION EXCHANGED IN REF /B/.

REF /A/ ITEM 5 ADDITIONAL INFORMATION, STATED THAT DATA AIRPLANE HAD BEEN REPAINTED TWICE SINCE DELIVERY.

CLARIFICATION: IT IS BELIEVED, THAT DATA AIRPLANE WAS REPAINTED TWICE DURING THE MANUFACTURING CYCLE PRIOR TO SALE AND DELIVERY TO XIH.

FIRST REPAINT WOULD HAVE BEEN IN THE GUADELOUPE AIRLINE COLOR CONFIGURATION.

SECOND REPAINT WOULD HAVE BEEN IN THE XINHUA AIRLINE COLOR CONFIGURATION.

IT IS BELIEVED THAT DURING REPAINTING IT MAY BE NECESSARY TO POSITION THE RUDDER TO ACCOMPLISH THE PAINTING OF THE RUDDER LEADING EDGE.

REF /A/ STATED THAT REF /C/ REQUIRED THE REMOVAL OF REF /D/ ROD IF THE RUDDER PCU WAS DISCONNECTED FROM THE RUDDER.

XIH HAVE NOT PERFORMED ANY MAINTENANCE IN THIS AREA AND XIH INTEND TO FILE A WARRANTY CLAIM REGARDING THIS SUBJECT.

DESIRED ACTION.

PLEASE INITIATE A QUALITY INVESTIGATION TO DETERMINE IF THE RUDDER PCU WAS DISCONNECTED FROM THE RUDDER DURING THE MANUFACTURING CYCLE.(INCLUDING REPAINTING PROCESSES)

PLEASE DETERMINE IF CRITICAL COMPONENTS WERE ISOLATED PER APPLICABLE PROCEDURES IF DISCONNECTING THE RUDDER FROM THE PCU WAS REQUIRED DURING THE MANUFACTURING CYCLE.

THANK YOU FOR THE EXPEDITIOUS RESPONSE TO REF /E/. XIH WERE ABLE

TO MAINTAIN REVENUE SCHEDULE WHICH IS VERY CRITICAL TO THE OPERATIONAL INTEGRITY OF A NEW OPERATOR IN THE PRC.

REGARDS,

FLINT /BCSM/ TIANJIN

XIH-TSN-93-0050RR 07 OCT 93
ATA 2725-30 MODEL 737-300
RUDDER POWER UNIT INPUT ROD RIDING STRUCTURE
REF /A/ XIH-TSN-93-0069TR DTD 06 OCT 1993 /C/
/B/ P/N 69-37290-11 RUDDER CONTROL INPUT ROD ASSEMBLY
/C/ TELECON - F. CARLSON TO J. FLINT DTD 06 OCT 1993
AIRPLANE HOURS/CYCLES
PQ264

R E S E N D TO CORRECT TEXT - MM 27-21-11
REVISED TO MM 27-21-91
VNB 10/07/93 2223 MSG ORG DTD 06 OCT 93

///RUSH AOG///SAME DAY RESPONSE REQUIRED////AOG////RUSH///

THE REFERENCE /A/ TELEX REPORTS FINDING DAMAGE TO THE P/N 69-37290-11 DUAL LOAD PATH RUDDER VERNIER CONTROL ROD ASSEMBLY. IT WAS REPORTED THAT THE DAMAGE TO THE AFT OUTBOARD SURFACE IS APPROXIMATELY 2.5 INCHES LONG BY 0.20 INCH WIDE WITH A CREASE BEING PRESENT AT THE FORWARD TERMINATING POINT OF THE DAMAGED AREA. THE ADJACENT STRUCTURE (ANGLE) EXHIBITS SLIGHT ABRASION ON THE AFT EDGE OF THE MOST INBOARD FLANGE.

THE FOLLOWING ADDITIONAL INFORMATION WAS PROVIDED IN THE REFERENCE /C/ TELECON -

1. THE DAMAGE TO THE CONTROL ROD IS SUFFICIENTLY MINOR THAT A PERSON CAN SEE THE SCUFFED PAINT BUT CANNOT REALLY SEE THE //CREASE//. THE MOST EFFECTIVE WAY TO ASSESS THE DAMAGE IS TO RUN YOUR FINGER OVER THE DEPRESSED AREA OF THE CONTROL ROD.

2. A REPLACEMENT CONTROL ROD IS NOT AVAILABLE. IT REQUIRES AT LEAST A WEEK TO OBTAIN A REPLACEMENT.

3. IT WAS REQUESTED THAT WE PROVIDE GUIDANCE TO ALLOW DISPATCH UNTIL A REPLACEMENT CONTROL ROD CAN BE OBTAINED AND INSTALLED.

4. IT WAS STATED THAT ACCOMPLISHING NON-DESTRUCTIVE TESTING WILL MOST LIKELY REQUIRE TIME TO OBTAIN THE NECESSARY PERSONNEL AND MATERIALS TO ACCOMPLISH THE TEST.

5. THIS AIRPLANE HAS BEEN REPAINTED TWICE SINCE DELIVERY.

WE HAVE RECEIVED PRIOR REPORTS OF SIMILAR DAMAGE TO THE CONTROL ROD. ONE OF THE REPORTS STATED THAT THE DAMAGE OCCURRED WHEN THE RUDDER PCU WAS DISCONNECTED FROM THE RUDDER WITHOUT FIRST REMOVING THE P/N 69-37290-11 CONTROL ROD, AS CALLED FOR IN 737-300 MM 27-21-91. THIS SCENARIO IS CONSISTENT WITH THE STATEMENT IN REFERENCE /A/ THAT THERE IS ADEQUATE CLEARANCE BETWEEN THE CONTROL ROD AND ADJACENT STRUCTURE WHEN THE RUDDER IS

MOVED THROUGH ITS FULL RANGE OF TRAVEL.

WE RECOMMEND THAT THE CONTROL ROD BE REPLACED AS SOON AS PRACTICAL. IN THE INTERIM, WE HAVE NO TECHNICAL OBJECTION TO CONTINUED OPERATION OF THE AIRCRAFT PROVIDED A ONE-TIME NON-DESTRUCTIVE TEST IS ACCOMPLISHED TO ASSURE THAT THE CONTROL ROD IS NOT CRACKED. IT IS RECOMMENDED THAT A DYE PENETRANT TEST BE ACCOMPLISHED. IF A CRACK IS FOUND THEN THE CONTROL ROD SHOULD BE REMOVED FROM SERVICE. IF NO CRACK IS FOUND IN THE AREA OF THE DAMAGE THEN THE ROD SHOULD RECEIVE BRUSH ALODINE AND A COAT OF PRIMER. AN ACCEPTABLE ALTERNATE TO THE DYE PENETRANT INSPECTION IS AN EDDY CURRENT INSPECTION OF THE DAMAGED AREA.

WE UNDERSTAND THAT IT IS NOT POSSIBLE TO ACCOMPLISH THE NON-DESTRUCTIVE TESTING IMMEDIATELY. WE HAVE NO TECHNICAL OBJECTION TO DELAYING THIS TESTING FOR TWO DAYS TO ALLOW TIME TO OBTAIN THE NECESSARY PERSONNEL AND EQUIPMENT, AND TO SUPPORT SCHEDULED OPERATIONS OF THE AIRCRAFT.

THE REPLACEMENT CONTROL ROD SHOULD BE INSTALLED IN ACCORDANCE WITH MM 27-21-91 PAGE BLOCKS 400 AND 500.

///MESSAGE RESENT TO CORRECT MEASUREMENTS ITEM 4\\\

XIH-PEK-93-0002TR 14 OCT 93
ATA 2725-30 MODEL 737-300 15 OCT 93 H
RUDDER POWER UNIT INPUT ROD DAMAGE
REF /A/ XIH-TSN-93-0050RR

XIH REPLACED SUBJECT CONTROL ROD AND THEIR REVIEW INDICATED...
1. THE ROD REMOVED HAD A CROSSWISE CREASE/VERTICAL/ AT POSITION 3.6 INCHES FORWARD OF THE AFT END AT THE OUTBD/LH TUBE LOCATION.

2. CREASE WAS DETERMINED TO BE APROX 0.030 INCH IN DEPTH AND WAS EVIDENT INTERNAL TO TUBE. THE EXACT DEPTH WAS DIFFICULT TO MEASURE DUE TO THE PROXIMITY WITH THE END FITTING TAPER.

3. THE REPLACEMENT ROD HAD A SMALL SCUFF IN THE PAINT AT A SIMILAR POSITION AFTER ONE FLIGHT, BUT REMAINED WITHOUT FURTHER MARKS OR CHANGE DURING THE FOLLOWING SERVICES. IT IS UNKNOWN WHETHER THE MARK IN THE PAINT WAS EVIDENT UPON INSTALLATION PRIOR TO THE FIRST FLIGHT.

4. INSPECTION OF APL ROD POSITION RELATIVE TO STRUCTURE /THE LH AFT FAIRING ATTACH ANGLE ADJACENT TO THE ROD AFT FITTING/ REVEALED... THE NEAREST POINT BETWEEN THE ROD AND THE FAIRING ATTACH ANGLE IS 0.60 INCH AND IN A POSITION WHERE CREASE FOUND THE GAP MEASURED 0.70 INCH.

AS WOULD APPEAR THE AFT FIN AUX STRUCTURE IS TIED TO THE PCU PIVOT THRU CROSSMEMBERS, WE ARE UNABLE TO DETERMINE HOW ROD CHAFE CAN OCCUR DURING OPERATION WITHOUT BREAKAGE.

XIH ARE AT PRESENT REPAIRING THE SMALL MARK ON THE ROD /NO DAMAGE IS NOTED ONLY PAINT/ AND ARE CONTINUING TO OBSERVE.

ACTION
1. PLS ADVISE FURTHER TO REF /A/ DESCRIPTION, IF THE FIN AFT FAIRING ATTACH AUX STRUCTURE CAN MOVE RELATIVE TO THE CONTROL ROD SUFFICIENT TO CAUSE CHAFE.

2. PLS ADVISE ANY ADDITIONAL AREAS OF INSPECTION WHICH MIGHT BE REQUIRED TO ENSURE SERVICABILITY.

J HARP BCSR BEJ JIANG XINYING/ENGR/XIH

BOESEA-X2RI02-00024-10/13/93-0946Z

FSE-BOECOM THU 10/14/93 12:41:36

BOESEA-DDSO24-00006-10/14/93-0440Z

XIH-TSN-93-0052RR 13 OCT 93
ATA 2725-30 MODEL 737-300
RUDDER POWER UNIT INPUT ROD RIDING STRUCTURE
REF /A/ XIH-TSN-93-0070TR DATED 6 OCTOBER 1993 /C/
/B/ XIH-TSN-93-0069TR DATED 6 OCTOBER 1993
/C/ XIH-TSN-93-0050RR DATED 6 OCTOBER 1993
/D/ XIH-PEK-93-0002TR DATED 13 OCTOBER 1993
AIRPLANE HOURS/CYCLES
PQ264

THE REFERENCE /A/ TELEX PROVIDES FURTHER INFORMATION TO THE REFERENCE /B/ AND /C/ TELEXES CONCERNING DAMAGE FOUND ON THE P/N 69-37290-11 RUDDER CONTROL ROD. IT WAS REQUESTED THAT WE INVESTIGATE THE POSSIBILITY OF THIS DAMAGE OCCURRING DURING MANUFACTURE OR WHEN THE AIRPLANE WAS REPAINTED TWO TIMES PRIOR TO DELIVERY.

WE HAVE COMPLETED A QUALITY INVESTIGATION TO DETERMINE IF THE RUDDER PCU WAS DISCONNECTED DURING MANUFACTURE, OR TO FACILITATE REPAINTING OF THE AIRCRAFT. WE HAVE BEEN UNABLE TO IDENTIFY ANY ACTIVITIES WHERE THE RUDDER PCU MIGHT BE DISCONNECTED FROM THE RUDDER DURING THE NORMAL MANUFACTURING CYCLE. WE HAVE ALSO CHECKED THE PROCEDURES UTILIZED WHEN THE AIRCRAFT WAS REPAINTED. WE WERE INFORMED THAT THE RUDDER PCU IS NOT DISCONNECTED DURING THE REPAINTING PROCESS SINCE ADEQUATE ACCESS IS AVAILABLE FOR PAINTING WITH THE PCU INSTALLED AND ATTACHED IN A NORMAL FASHION.

WE ARE CONTINUING THIS INVESTIGATION AS PART OF OUR RESPONSE TO THE QUESTIONS RAISED IN THE REFERENCE /D/ TELEX.

CARLSON/JSM/BRUCE CROSS
CUSTOMER SERVICES DIVISION
BOEINGAIR M-7272 2H-95
/GRD 10/13/93 1619

XIH-PEK-93-0003RR 15 OCT 93
ATA 2725-30 MODEL 737-300
RUDDER POWER UNIT INPUT ROD DAMAGE
REF /A/ XIH-PEK-93-0002TR DATED 13 OCTOBER 1993 /C/
/B/ XIH-TSN-93-0050RR DATED 6 OCTOBER 1993
AIRPLANE HOURS/CYCLES
PQ264

THE FOLLOWING MESSAGE SENT TO J. HARP /BCSR/ WITH A COPY TO J. FLINT /BCSR/.

THE REFERENCE /A/ TELEX PROVIDES FURTHER INFORMATION CONCERNING DAMAGE FOUND ON THE P/N 69-37290-11 RUDDER VERNIER CONTROL INPUT ROD ASSEMBLY. WE APPRECIATE YOUR FORWARDING THIS ADDITIONAL INFORMATION.

OUR DISCUSSIONS WITH JERRY FLINT HERE IN SEATTLE ON 14 OCTOBER 1993 CONFIRMED THAT THE STRUCTURE IN QUESTION IS THAT TO WHICH THE RUDDER LEADING EDGE AERODYNAMIC SEALS ARE ATTACHED.

OUR RESPONSE TO THE REQUESTS IN THE REFERENCE /A/ TELEX FOLLOWS -

REQUEST 1

PLEASE ADVISE FURTHER TO REFERENCE /B/ DESCRIPTION, IF THE FIN AFT FAIRING ATTACH AUXILIARY STRUCTURE CAN MOVE RELATIVE TO THE CONTROL ROD SUFFICIENT TO CAUSE CHAFE.

RESPONSE
OUR ANALYSIS OF THIS CONDITION INDICATES THAT EVEN UNDER EXTREME CONDITIONS, THE STRUCTURE WILL NOT DEFLECT ENOUGH TO RESULT IN AN INTERFERENCE CONDITION BETWEEN THE FAIRING ATTACH ANGLE AND THE RUDDER CONTROL ROD. WE HAVE MEASURED THE CLEARANCE BETWEEN THE CONTROL ROD AND FAIRING ATTACH ANGLE STRUCTURE ON TWO PRODUCTION AIRPLANES. WE FOUND THE MINIMUM CLEARANCE TO BE ABOUT 0.70 INCH WHICH IS IN AGREEMENT WITH THE RESULTS REPORTED IN THE REFERENCE /A/ TELEX.

REQUEST 2

PLEASE ADVISE ANY ADDITIONAL AREAS OF INSPECTION WHICH MIGHT BE REQUIRED TO ENSURE SERVICEABILITY.

RESPONSE
WE CONCUR WITH THE ACTIONS TAKEN BY XIH. WE HAVE NO FURTHER SUGGESTIONS AT THIS TIME. WE BELIEVE THAT THE REPORTED DAMAGE MOST LIKELY OCCURRED WHILE THE AIRPLANE WAS ON THE GROUND.

PLEASE ADVISE OF ANY FUTURE OBSERVATIONS OF DAMAGE TO THE RUDDER CONTROL ROD.

CARLSON/JSM/BRUCE CROSS
CUSTOMER SERVICES DIVISION
BOEINGAIR M-7272 2H-95
/GRD 10/15/93 1716

PEMCO AEROPLEX INC.
A Precision Standard Company

TO: Bruce Cross – Airline Support Manager Fax – (206) 544-9696 Action: _____

PEM-DTH-94- 0065 IR DATE 8-4-94

ATA- 2725-30 MODEL B737-300 DUE DATE 8-9-94 H/C/F

SUBJECT: RUDDER ROD DAMAGE

AP Var No./Line No./Serial No. S/N 23788 Hours _____ Cycles _____

REF/A/ IPC 27-20-00-40

B- FIG 1

Background:

THE OUTER ROD P/N 69-37291-2 WAS DENTED WHEN THE RUDDER ACTUATOR WAS ACCIDENTALY OPERATED WHILE THE RUDDER WAS REMOVED FOR BALANCING. THE ROD WAS FORCED AGAINST AN ADJACENT STRUCTURE WHICH CAUSED A SMALL DENT AND A GAUGE (Ref FIG 1

Request:

1- CAN THE DAMAGED AREA BE REPAIRED? OR IS IT RECOMMENDED TO CHANGE THE ROD?

Name: JACK ARL HARIS Signed: _____ Total pages: ___

REF. PEM-DHN-940065TR

SHT 2 OF 3

OUT B.D

AFT

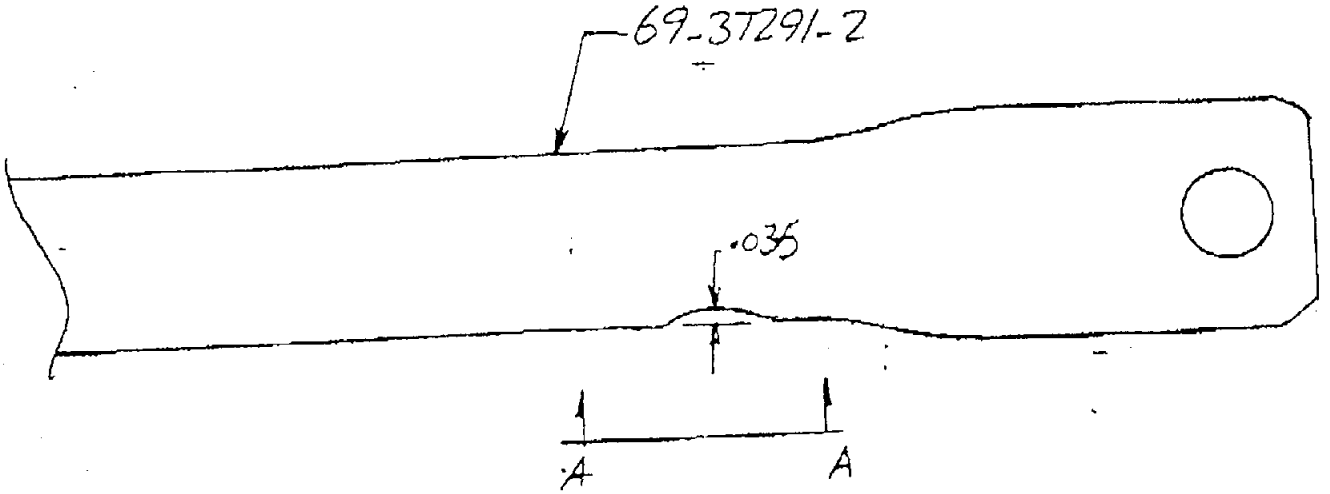
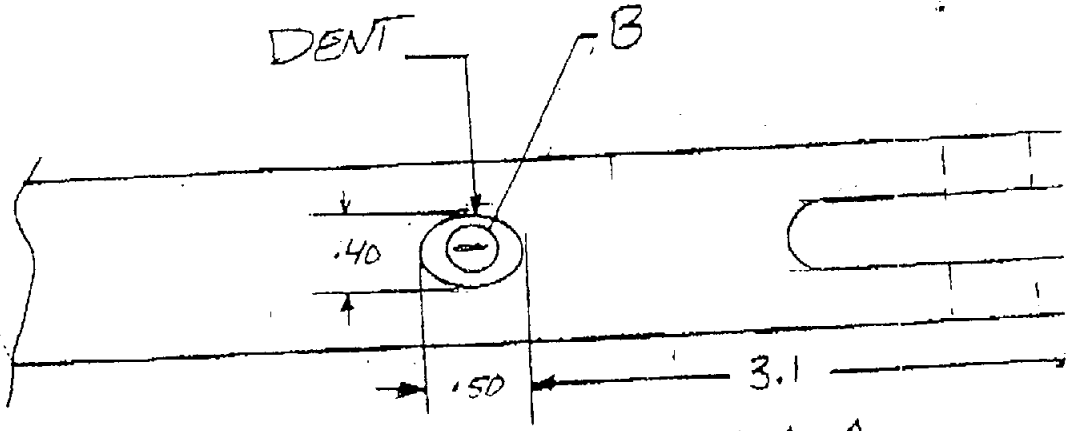
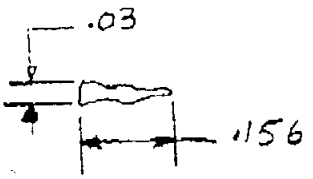


FIG 1
TOP VIEW



VIEW A-A

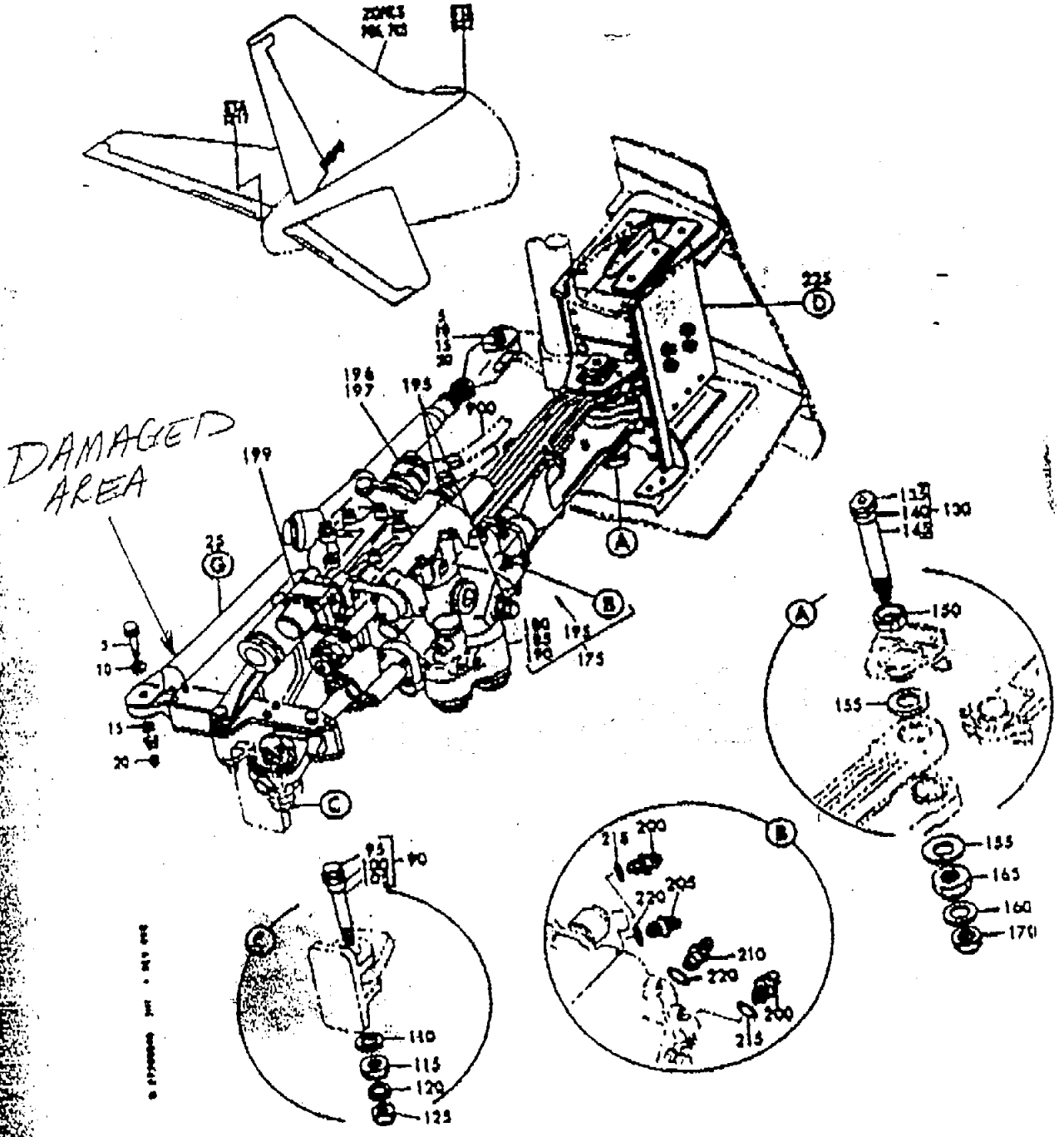


DETAIL B

GAUGE IS MAX .015 DEEP.

BOEING 737-300/-400/-500

Ref PEM. DHN. 94065TR
SHT 3 OF 3



POWER UNIT INSTL-RUD CONT
FIGURE 40 (SHEET 1)

27-20-00-40

Model: 737-300 ATA: 2725-30

Subject: RUDDER PCU INPUT ROD DAMAGE

PEM-DTH-94-0037RR 09 AUG 94
ATA 2725-30 MODEL 737-300
RUDDER PCU INPUT ROD DAMAGE
REF PEM-DTH-94-0065TR DATED 04-AUG-94 /C/

IN THE REF /A/ FAX PEMCO REPORTED THE THAT OUTER RUDDER PCU INPUT ROD P/N 69-37291-2 BECAME DENTED WHEN THE RUDDER PCU WAS INADVERTENTLY OPERATED WHILE THE RUDDER WAS REMOVED FOR BALANCING. THE ROD WAS FORCED AGAINST AN ADJACENT STRUCTURE WHICH CAUSED A SMALL DENT. PEMCO ASKED WHETHER THE DAMAGED AREA IS REPAIRABLE OR THE ROD MUST BE REPLACED.

THE ROD IS STRUCTURALLY ACCEPTABLE IF REPAIRED PER THE FOLLOWING INSTRUCTIONS.

1/ BLEND-OUT THE DAMAGED AREA. THE MAXIMUM ALLOWABLE DEPTH OF MATERIAL REMOVAL IS 0.018 INCHES. MINIMUM RADIUS OF BLEND-OUT IS 0.25 INCHES.

2/ RADIUS THE EDGES OF THE DENT TO A MINIMUM OF 0.15 INCHES.

3/ SURFACE ROUGHNESS OF MACHINED SURFACES SHALL BE 63 MICROINCHES OR BETTER.

4/ AFTER MACHINING, PENETRANT INSPECT PER OHM 20-20-02.

5/ ALODINE PER OHM 20-43-03.

6/ FINISH WITH ONE COAT BMS 10-11, TYPE I WET PRIMER.

TRIGS/HENSHAW/MIKE DIDONATO
CUSTOMER SERVICES DIVISION
BOEINGAIR M-7272 2H-95
/VNB 08/09/94 1835

DIR 617 M7420

/ATTN (617) M. DIDONATO AIRLINE SUPPORT MANAGER

DAL-ATL-95-0114TR 27 JAN 95
ATA 2725-30 MODEL 737-300 1 FEB 95 H
DAMAGED INPUT ROD TO RUDER POWER UNIT
REF /A/ PICTURES PP237 AIRBORNE EXPRESS AIRBILL 8770295332
/B/ SKETCH (1 PAGE FAX)

AIRPLANE	HOURS/CYCLES
N307WA	29060/27000
PP237	

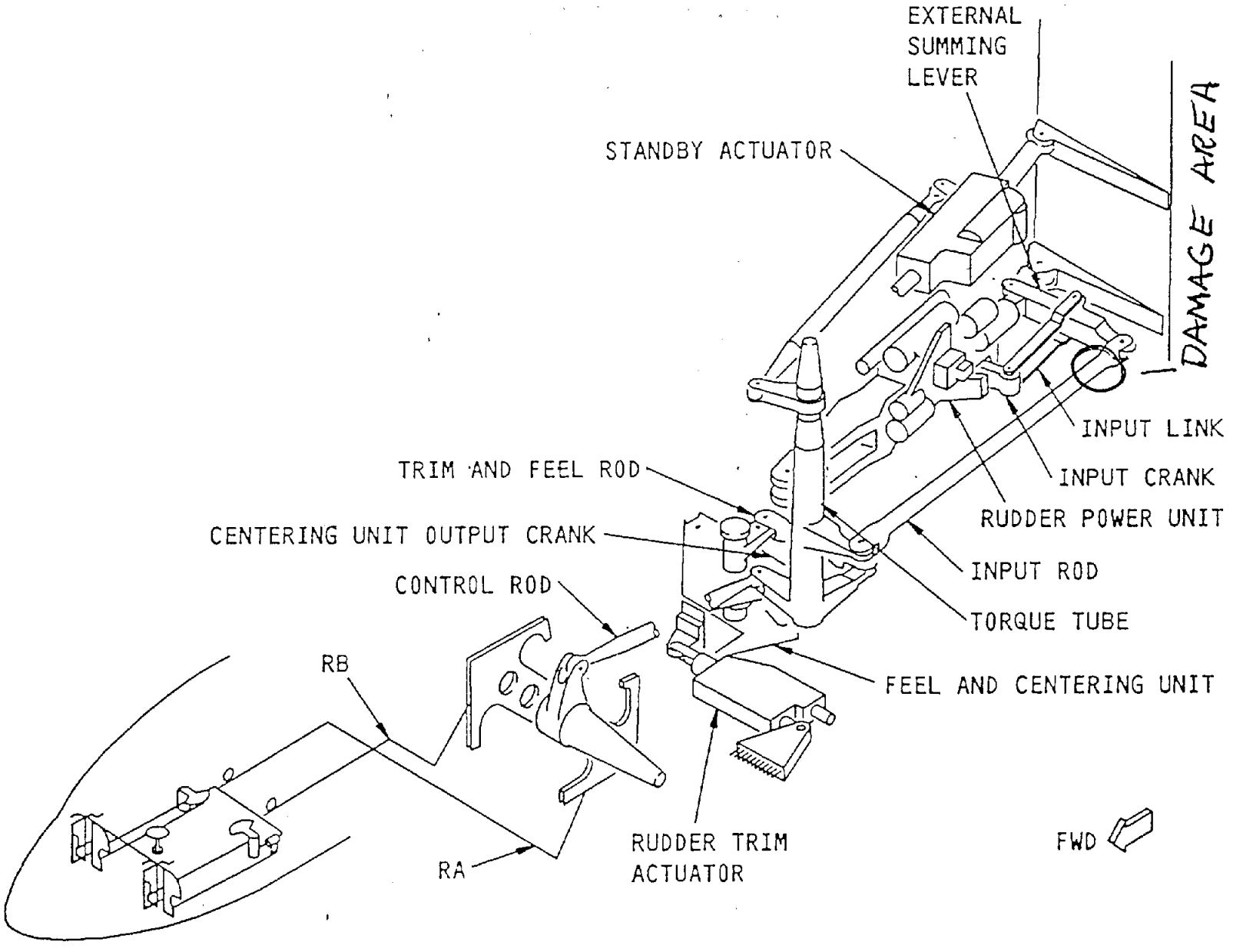
DURING THE PRESENT HMV OF THE DATA AIRPLANE, A DAMAGED INPUT ROD TO THE RUDDER PCU WAS DISCOVERED. DAMAGE HAS OCCURRED AT THE AFT END OF THE ROD WHERE THE ROD HAS BEEN STIKING THE LEFT AFT VERTICAL FRAME STRUCTURE OF THE STABILIZER. UPON NOTIFICATION, PICTURES WERE TAKE WITH ALL COMPONENTS IN PLACE. THE PICTURES HAVE BEEN SENT BY AIRBORNE EXPRESS AIRBILL 8770295332. THIS OFFICE HAS ASKED FOR THE INPUT ROD AND THAT THE RUDDER PCU BE MADE AVAILABLE IF BOEING REQUESTS. THE REF /B/ SKETCH SHOWS DAMAGE LOCATION. THE DENT IN THE INPUT ROD IS APPROXIMATELY 1/4 INCH DEEP AND IS SCRAPED REARWARD ABOUT 1 INCH. THERE IS A MINOR INDICATION OF SCRAPING ON THE VERTICAL RUDDER STRUCTURAL ELEMENT.

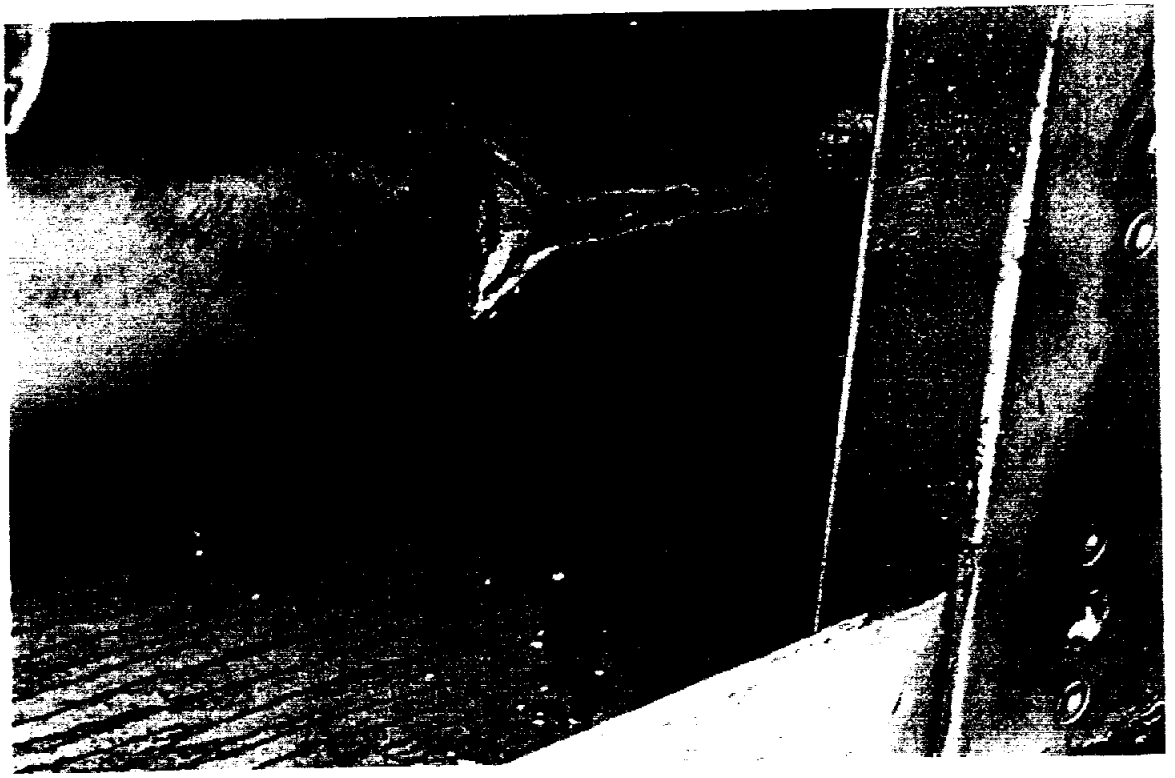
ACTION: PLEASE ADVISE IF BOEING WOULD LIKE TO EXAMINE THE RUDDER PCU OR THE INPUT ROD.

ZABRISKIE/DOERN CUSTOMER SERVICES ATLANTA

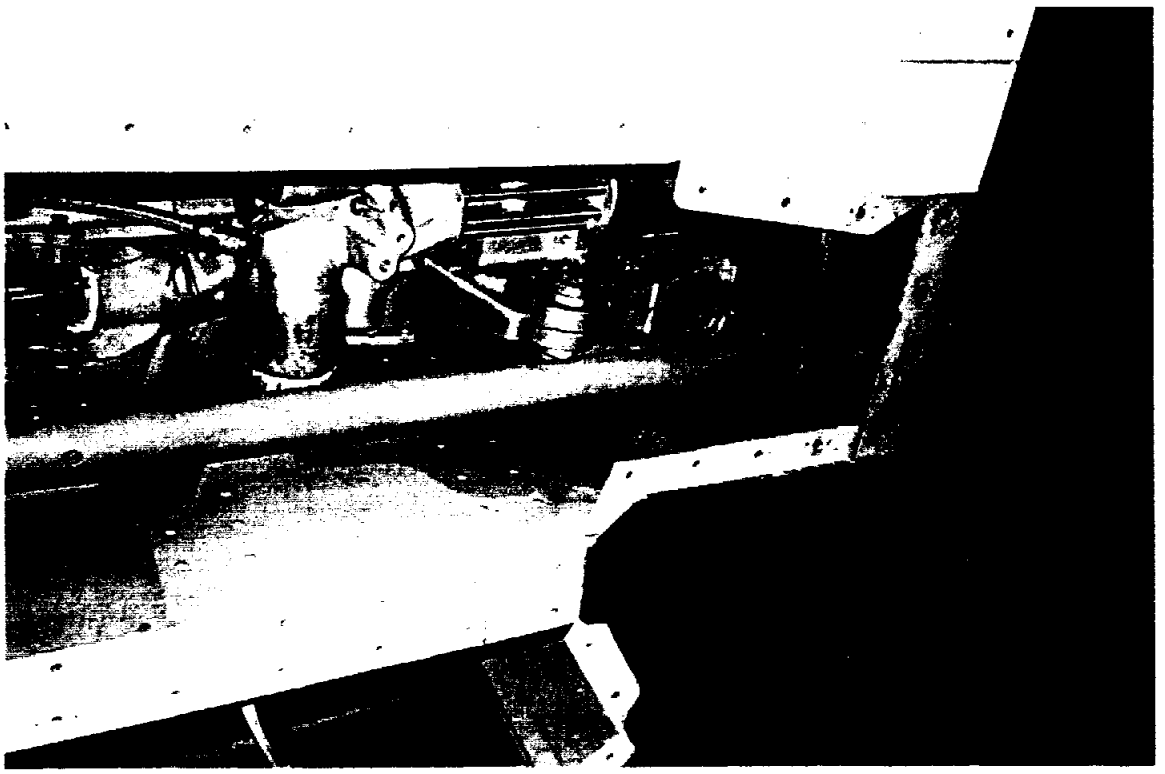
BOESEA-DDRI01-00021-01/27/95-1411Z

DAL-ATL-95-0114 TR PG 4 14
REF 18





DELTA (DAL) REPORT (DAL-ATL-95-0114TR)



DELTA (DAL) REPORT (DAL-ATL-95-0114TR)