DOCKET NO. **SA-510**

NATIONAL TRANSPORTATION SAFETY BOARD

WASHINGTON, D.C.

Air France FDR/QAR Yaw Indicents

Boeing Commercial Airplane Group
P.O. Box 3707
Seattle, WA 98124-2207

February 10, 1995
B-U01B-15119-ASI

Mr. Thomas Haueter, AS-10
National Transportation Safety Board
490 L'Enfant Plaza East SW
Washington DC 20594-2000

BOEING

Subject: USAir 737-300 Accident, N513AU/PP033 Near Pittsburgh, September 8, 1994 - AFA Rudder Related Events

Reference: a) Public Hearing Action Item List distributed January 27, 1995 in Pittsburgh.
b) Letter B-U01B-15088-ASI to Greg Phillips, January 12, 1995

Dear Mr. Haueter:

The following is in response to the reference (a) item:

> Plots of FDR data/QAR data for any/all Air France incidents or yaw damper occurrences.

We assumed that "incidents" in this item refers to rudder related events. From a manual search of our Customer Service records back through January, 1993, we have found rudder related events reported to Boeing by Air France (AFA) in three distinct time frames. These time frames correspond with events provided to the NTSB in enclosure (A) of reference (b) beginning with "Date", 930709, 940413 and 940916. We have enclosed a summary and copies of the correspondence and plots associated with each event that we received or sent out.

Information being forwarded to the NTSB by or with this correspondence is for the exclusive purpose of supporting investigative activities, is considered proprietary to The Boeing Company, and is being provided on a confidential basis. We do not authorize dissemination of this material to the public. Any release of data by the NTSB, that was supplied to Boeing from Air France, should have their consent before release.

If you have questions, please contact Rick Howes, ([redacted] or me.

Very truly yours,

FLIGHT TEST

[redacted]

BOEING

John W. Purvis
Director, Air Safety Investigation
Org. B-U01B, M/S 14-HM
Telex 32-9430, STA DIR PURVIS
[redacted]

Enclosures: Relevant in-service correspondence

AFA RUDDER KICK REPORTS

NTSB REQUESTED DATA

AFA YAW DAMPER ANOMALY REPORT SUMMARY
2/8/95

The following is a summary of rudder / yaw damper related events reported by AFA since January 1993. These reports were received from two Boeing field service bases (CDG and ORY) in three distinct time frames, and involve at least four separate airplanes. Considerable confusion has been associated this series of reports including event sequencing, association of events and airplanes with flight data, and accuracy of provided data. This summary provides Boeing's best interpretation of the reported information. However, it should be noted that Boeing has received and is currently planning to evaluate additional flight data provided by AFA.

On 09 Jul 93, AFA–CDG reported that airplane PP911 (F–GHVM) experienced a rudder kick during descent when airspeed was reduced to 290 knots. Sudden yaw to the right was reported, and the autopilot was disengaged. Two passengers were reported slightly injured. The yaw damper coupler and the DADC were replaced. AFA supplied DFDR data (graphical form) for our review and advised that shop findings would be provided at a later date. No assistance was requested.

On 27 Jul 93, AFA–CDG advised that the yaw damper electro–hydraulic servo valve (transfer valve) was found "faulty" due to "bad" electrical wire insulation. AFA also reported evidence of skydrol on the electrical wires, and concluded this servo valve was the cause of the rudder kick. Boeing assumes that AFA is referring to airplane PP911 in this telex, however it was not clearly identified. Further, AFA did not previously advise Boeing that, or when, the transfer valve from airplane PP911 had been removed. No mention was made of the previously discussed yaw damper coupler or DADC which AFA advised that they had removed from airplane PP911. AFA provided this report as information only, and did not request assistance at that time.

On 03 Aug 93, AFA–ORY provided a translation of the original French language report. The nature of this report (recipient and originator) was not specified. In this report, AFA now identified the event as a "sudden violent movement of yaw". The report also stated that the control wheel was simultaneously rotated to a vertical position, and that the rudder pedals did not move. It was not specified whether the control wheel rotated due to pilot or autopilot input. However, when AFA noted that the yaw damper indicator was full right, the yaw damper was disengaged. AFA advised the yaw damper indicator returned to neutral and the "control column went back to the horizontal position", indicating the control wheel rotation was autopilot induced. (It should be noted that the autopilot does not have the authority to command close to the reported 90 degree rotation. Also, AFA advised in a previous report that the autopilot was disengaged, but made no mention of yaw damper disengagement.) AFA advised in this report that the yaw damper transfer valve was replaced on 27 Jun. (NOTE: Original report to Boeing was on 09 Jul.)

AFA YAW DAMPER ANOMALY REPORT SUMMARY
2/8/95

AFA reported that no faults were found in the removed yaw damper coupler or DADC. Further, AFA advised that no faults were found in the rudder PCU except for the transfer valve. AFA reported "pressurizing the yaw damper actuator always resulted in a right rudder movement". AFA also noted that the transfer valve cap was found to be "full of hydraulic fluid" when it was removed. AFA further advised that the Teflon liner was missing from the ball joint where the rudder PCU attaches to the vertical stabilizer aft spar. AFA offered the transfer valve and the ball joint for Boeing examination,

On 04 Aug 93, AFA–CDG advised of a series of three rudder "kicks" on airplane PP902 (F–GFUA). The first of these events reportedly occurred on 24 Jul 93, with subsequent events on 29 Jul and 04 Aug. AFA advised that the planned to replace the yaw damper transfer valve based on experience with airplane PP911, and that they would advise Boeing of their findings.

On 06 Aug 93, AFA–CDG sent further data regarding the 09 Jul reported rudder kick on airplane PP911. In this telex, AFA advised that both the yaw damper and the autopilot were disengaged in response to this anomaly. This is somewhat inconsistent with previous reports. AFA posed questions regarding operations and crew response to the anomaly.

Also on 06 Aug 93, Boeing requested that AFA provide the removed transfer valve and ball joint from airplane PP911, and the transfer valve removed from airplane PP902. Boeing also requested that AFA provide any available flight data recorder information for the rudder kick events on both airplanes PP911 and PP902, and requested the date of the event on airplane PP911.

On 10 Aug 93, AFA–ORY advised that the transfer valve and the ball joint from airplane PP911 had been forwarded to Boeing. The transfer valve from airplane PP902 was not yet available since the person responsible for it was on vacation. Flight data recorder information had not yet been released from security. The date of the rudder kick on airplane PP911 was not provided.

On 11 Aug 93, AFA–ORY advised that the flight data recorder data from airplane PP911 was being mailed to our office. This was subsequently received in graphical and tabular, but not raw (magnetic) form. Flight data information for airplane PP902 was not received.

On 13 Aug 93, Boeing responded to AFA questions and advised AFA that the flight crew reactions to the 09 Jul reported anomaly on airplane PP911 were correct. Boeing also advised that the operations manual was being reviewed in regard to this type of event.

AFA YAW DAMPER ANOMALY REPORT SUMMARY
2/8/95

A number of subsequent telexes between Boeing and AFA were sent which primarily contained exchanges of questions and answers, and technical information. One issue discussed was the reported "vertical" control wheel deflection. Boeing advised AFA that the flight data recorder data indicates that the ailerons displaced approximately seven degrees during the yaw damper anomaly on airplane PP911 (this does not agree with the previously reported vertical control wheel position). Boeing requested that AFA check the function of the aileron force limiter since this device should have limited the autopilot aileron deflection to five degrees. AFA subsequently advised Boeing that the aileron force limiter had been checked and found within limits. AFA further advised that the flight crew was not responsible for control wheel inputs, and that the only flight crew response was to switch off the yaw damper. In response to a Boeing question about flight data recorder data, AFA advised that ailerons and aileron position sensors were correctly rigged on airplane PP911, and that an apparent discrepancy in the aileron position data was due to ground equipment used to read the flight data.

On 02 Sep 93, AFA–CDG reported two rudder kicks during takeoff roll on airplane F–GHUM. (It was later revealed during a telecon that these events actually occurred on airplane PP911.) The first reportedly occurred on 15 Jun 93. (A review of available data disclosed no previous report of this occurrence from AFA). The second event occurred on 20 Aug 93. QAR information for the second event was provided for our review. AFA posed several questions regarding these events, mostly pertaining to yaw damper system operation. Boeing responded to AFA's questions on 02 Sep both by telecon and by telex. In this response, Boeing explained yaw damper system operation and how the yaw damper authority is limited, and also advised that the QAR data indicates the 20 Aug event was manually input and not yaw damper related. Boeing also posed a number of clarification questions to AFA regarding the 20 Aug event, and provided AFA with a number of items to check if future rudder kicks are reported.

AFA–CDG provided responses to the Boeing questions in a telex on 29 Sep 93. Included in this response, AFA acknowledged disagreement between pilot reports and QAR data for the 20 Aug event. AFA was unable explain or determine the cause of this condition, and suspected difficulties in interpreting the QAR data.

On 13 Oct 93, Boeing advised AFA of the examination / testing results for the yaw damper transfer valve from airplane PP911. The report was mostly factual in nature, detailing the findings of the examination. Although evidence of hydraulic fluid was found within the torque motor cavity, operational discrepancies in this valve could not be duplicated during testing. Further, Boeing was unable to detect any conditions which might have resulted in the anomalies discussed in the 09 Jul AFA report. In a later telex on 21 Oct 93, Boeing

advised AFA that the transfer valve from airplane PP902 had been totally disassembled prior to Boeing receipt, and we were unable to test it. Examination of this valve revealed nothing of significance.

On 20 Oct 93, AFA–CDG sent a telex which included some clarification information and some questions. AFA advised that the date of the 09 Jul reported event on airplane PP911 was 24 Jun 93. AFA also advised that some previous faxed FDR data (graphical and tabular) was not associated with the airplane (PP911) discussed in the telex which accompanied that fax, but rather that FDR data was applicable to an event on airplane PP902 which occurred on 24 Aug 93. AFA requested that Boeing review this data and provide our comments. Boeing review of the supplied data did not provide evidence of rudder control anomalies.

On 13 Apr 94, AFA–CDG advised of a rudder kick / oscillation on airplane PS606. FDR data (graphical) was forwarded for Boeing review. AFA advised that no known maintenance action occurred due to the relatively small rudder displacement. Boeing review of the available FDR data revealed no notable anomalies in rudder system operation.

On 30 Sep 94, AFA–CDG reported rudder kicks on airplane PT510 (F–GJNJ) during descent on 16 Sep. AFA noted a rudder displacement of 1 Hz with no rudder pedal displacement. AFA believed this frequency is a characteristic of yaw damper input. Graphical QAR data was forwarded, and Boeing was requested to review this data. Boeing review of this data indicates that the rudder did displace to the yaw damper limit for approximately 3 seconds. However, Boeing advised AFA that the information provided in the forwarded QAR data was not sufficient to determine the cause of the rudder deflection, and that AFA should provide FDR data in raw form for a more complete analyses.

On 12 Oct 94, AFA–CDG forwarded additional tabular QAR data regarding airplane PT510 for Boeing analysis. Boeing again advised AFA that the forwarded data was insufficient to perform a complete analysis and resolve apparent inconsistencies of the reported event. Boeing again requested that AFA provide raw DFDR data and Boeing advised AFA of preferred data formats. No subsequent response from AFA.

AFA YAW DAMPER ANOMALY REPORT SUMMARY

DATE	ORIGIN	APLN	REPORTED INFORMATION
7/9/93	CDG	F–GHVM (PP911)	AFA report of rudder kick at 290 kts during descent Replaced YD coupler, DADC DFDR data sent (1page fax, graphical data)
7/27/93	CDG	?	AFA reported YD transfer valve found "faulty". Skydrol found in coil AFA concluded this valve cause of rudder kick
8/3/93	ORY	PP911	Translation of French report. Previous findings. Teflon bearing liner found missing (RPCU attach brg) Offered parts for Boeing exam.
8/4/93	CDG	F–GFUA (PP902)	AFA report of series of rudder/yaw damper events on this airplane – AFA plans to replace transfer valve
8/6/93	CDG	PP911	AFA flight ops / crew response questions
8/6/93	BOE	PP911 PP902	Boeing requests parts for evaluation from AFA
8/11/93	ORY	PP911	AFA provides further FDR data (graphical and tabular)
8/13/93	BOE	PP911	Boeing response to AFA flight ops questions
8/13/93	CDG	F–GFUA	AFA shop findings on removed parts AFA technical questions
8/16/93	BOE	F–GFUA	Boeing response to AFA technical questions
8/17/93	ORY	PP911	AFA sends parts for examination
8/17/93	BOE	PP911	Boeing analysis of AFA provided FDR data Boeing questions to AFA based on FDR data
8/19/93	CDG	PP911	AFA technical questions for Boeing
8/24/93	BOE	PP911	Boeing response to AFA technical questions.
8/25/93	ORY	PP911	AFA response to some Boeing questions based on FDR data.
9/2/93	CDG	F–GHUM?	AFA report of two rudder kicks, 15 June and 20 Aug QAR data provided (graphical) AFA questions to Boeing
9/2/93	BOE	PP911	Boeing analysis of AFA QAR data Boeing response to AFA questions. Boeing poses several questions to AFA based on FDR data and telecon information.
9/27/93	BOE	PP911	Boeing technical questions to AFA
9/28/93	ORY	PP911	AFA response to Boeing technical questions.

AFA YAW DAMPER ANOMALY REPORT SUMMARY
(CONTINUED)

DATE	ORIGIN	APLN	REPORTED INFORMATION
9/29/93	CDG	PP911	AFA response to Boeing technical and operations questions.
10/6/93	BOE	PP911	Boeing technical questions to AFA
10/13/93	BOE	PP911	Boeing examination results of AFA supplied parts to AFA
10/18/93	ORY	PP911	AFA response to Boeing question regarding transfer valve removal and testing
10/20/93	CDG	PP911 PP902	AFA response/clarification to Boeing questions regarding rudder kicks on these airplanes AFA provides FDR data for 24 Aug 93 report (graphical and tabular)
10/21/93	BOE	PP911 PP902	Result of Boeing examination of AFA transfer valve.
10/26/93	BOE	PP902 PP911	Boeing response to AFA questions. Boeing analysis of AFA provided FDR data
4/13/94	CDG	PS606	AFA reports rudder kicks/oscillation FDR data (graphical) provided for evaluation
5/11/94	BOE	PS606	Boeing response / analysis of FDR data
9/30/94	CDG	F-GJNJ (PT510)	AFA reports rudder oscillations, they believe lateral oscillations resulted Provided QAR data for our review (graphical)
10/7/94	BOE	PT510	Boeing advised AFA of evaluation of QAR data Advise AFA that data is insufficient for complete analysis, Requested raw data from FDR as well as additional data for future reference
10/12/94	CDG	PT510	AFA provides more QAR data (tabular)
10/19/94	BOE	PT510	Boeing advises AFA that latest QAR data is still insufficient to resolve apparent inconsistencies Boeing again requests that AFA provide raw DFDR data Boeing provides preferred data formats.

View Message

Message Number:	Action File Name:	Status:
AFA-CDG-93-0190TR	AFA-CDG-93-0190TR	Closed

Model: 737-300 ATA: 2221-20

Subject: RUDDER KICK DURING DESCENT
GRANDJEAN/LEMAIRE - DMQP

11E0 3318 /dev/sio2 vopems 07/09/93 02:18
DIR 617BOE

/ATTN (617) G. B. CROSS
/7/7/7/7 AIRLINE SUPPORT MANAGER M-72B3 2H-95
/CC (BFSORY) E. FESSLER BOEING CUSTOMER SERVICES - ORY

AFA-CDG-93-0190TR 9 JUL 93
ATA 2221-20 MODEL 737-300 20 JUL 93 F
RUDDER KICK DURING DESCENT
GRANDJEAN/LEMAIRE - DMQP
REF /A/ FAX ATTACHMENT - 1 PAGE

AIRPLANE	HOURS/CYCLES
F-GHVM/ PP911	8998/6487

THE FOLLOWING MESSAGE SENT TO B. CROSS WITH COPY TO E. FESSLER.

AIR FRANCE REPORTED THAT THE DATA AIRPLANE EXPERIENCED A RUDDER KICK DURING DESCENT. THIS OCCURRED WHEN THE AIRSPEED WAS REDUCED TO 290 KNOTS. THERE WERE NO TURBULENCES. THE AIRPLANE HAD A SUDDEN YAW TO THE RIGHT. CONSEQUENLTY, THE AUTOPILOT WAS DISENGAGED. AS A RESULT OF THIS CONDITION, TWO PASSENGERS WERE REPORTED SLIGHTLY INJURED.

AIR FRANCE REPLACED THE YAW DAMPER COUPLER, S/N OUT 88092861. FURTHERMORE, THE DADC WAS ALSO REPLACED, S/N OUT 1095.

AIR FRANCE ENGINEERING AND MAINTENANCE ARE INVESTIGATING THIS CONDITION. REFERENCE /A/ PRESENTS THE DATA RECORDER IN THE DFDR FOR YOUR INFORMATION.

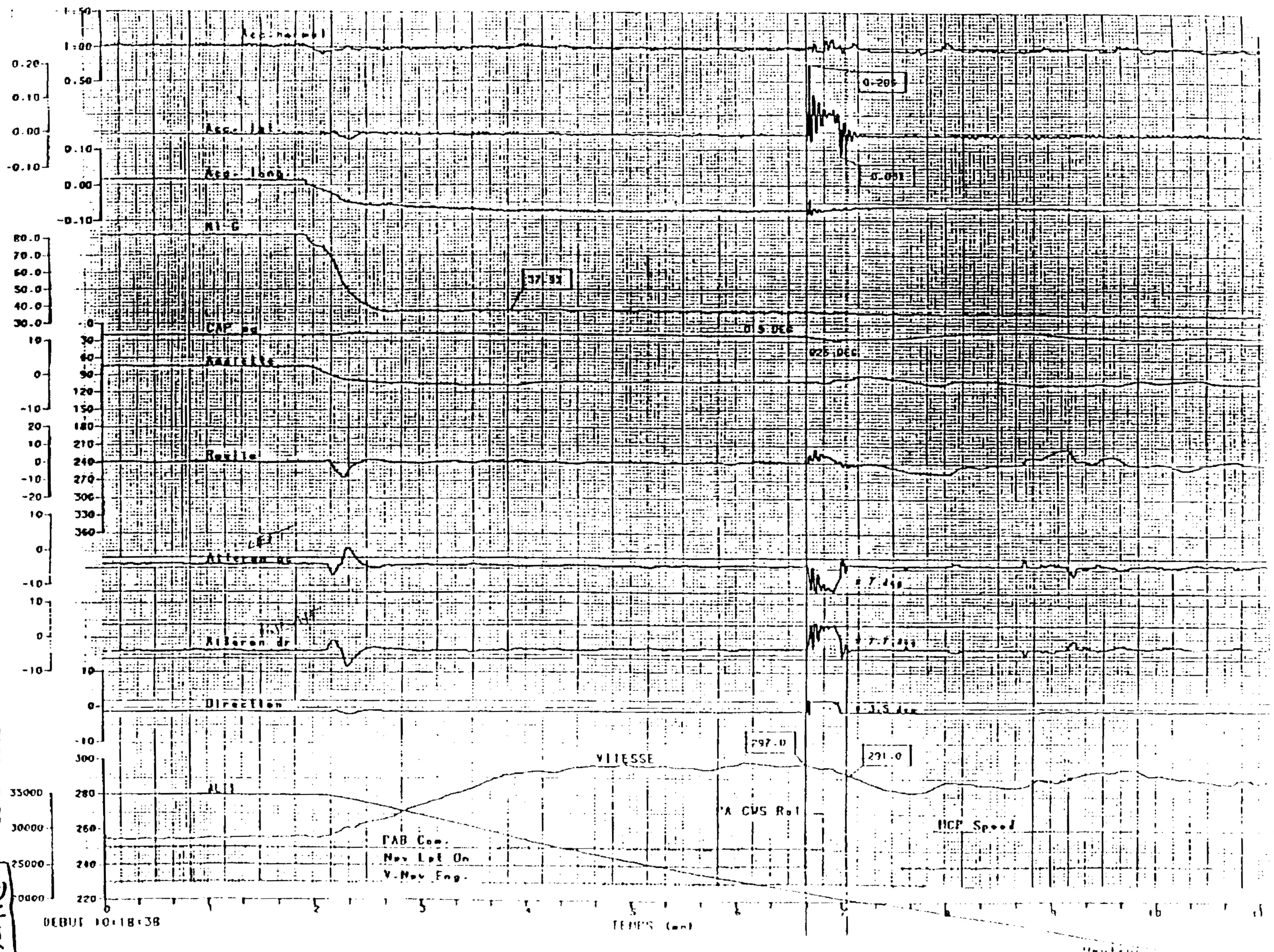
ACTION
AIR FRANCE WILL PROVIDE SHOP FINDINGS OF THE REMOVED UNITS AT A LATER DATE.

RAHIMANE BOEING CUSTOMER SERVICES BFS CDG-PARIS

FSE-BOECOM FRI 07/09/93 11:25:07

BOESEA-DDSO24-00029-07/09/93-0920Z

31 FG 1 AF - - ROOB 20 s/cm FHVM230(4798/ 4993



TOTAL P.03

RECEIVED FROM 33 1 48621312 7. 9.1993 2:17 P. 2

Number: 95-[illegible]

To: Airworthiness Manager

Subject: In-Service Events or Discrepancies
To Be Reported To The FAA

Reference: Boeing Operating Procedure-Agreement B-7000-090 "Reporting Airplane Failures, Malfunctions and Defects to the FAA"

The following is submitted in accordance with the referenced procedure.

Airplane Identity					
Model-series	Line Nbr.	Reg. (tail) Nbr.	Serial Nbr.	Date occurred	Location
737-300	1595	F-GHVM	24026	unknown - reported 9 Jul	Orly, France

Product or part causing or involved with event or discrepancy:

Part Nbr.: Moog P/N A71882-1

Part Name: Rudder PCU Electrohydraulic Servo Valve

Appropriate DER (s): Tom Heineman Phone: [redacted]

Nature of failure, malfunction or defect:
During descent into Orly, at 290 knots, a sudden yaw movement was noted. The pilots noted full right yaw damper input on the yaw damper indicator. The yaw damper was disconnected and the problem went away.

Event or discrepancy on delivered airplanes based on information from:

- Airlines (s)
- Engineering Liaison
- Quality Control
- Manufacturing
- Materiel
- Spares

Prepared by: John Hamilton [redacted]

Telephone Nbr. [redacted]

Approved by: [redacted]
C. E. Finnegan

View Message

Message Number:	Action File Name:	Status:
AFA-CDG-93-0199TR	AFA-CDG-93-0190TR	Closed

Model: 737-300 ATA: 2221-20

Subject: RUDDER KICK DURING DESCENT
GRANDJEAN/LEMAIRE DMQP

11E0 4684 /dev/sio2 vopems 07/19/93 01:10
DIR 617BOE

/ATTN (617) G. B. CROSS
/7/7/7/7 AIRLINE SUPPORT MANAGER M-72B3 2H-95
/CC (BFSORY) E. FESSLER BOEING CUSTOMER SERVICES - ORY

AFA-CDG-93-0199TR 19 JUL 93
ATA 2221-20 MODEL 737-300 27 JUL 93 F
RUDDER KICK DURING DESCENT
GRANDJEAN/LEMAIRE DMQP
REF /A/ AFA-CDG-93-0190TR DTD 09 JUL 93 /C/

AIRPLANE	HOURS/CYCLES
F-GHVM/	8998/6487
PP911	

THE FOLLOWING MESSAGE SENT TO B. CROSS WITH COPY TO E. FESSLER.

AIR FRANCE ENGINNERING ADVISES THAT SHOP FINDINGS OF THE REMOVED UNITS WHICH WERE THE YAW DAMPER COUPLER AND THE DADC, ARE NOT AVAILABLE AT THIS TIME.

ACTION
AIR FRANCE WILL PROVIDE THE ABOVE INFORMATION AT A LATER DATE

RAHIMANE BOEING CUSTOMER SERVICES BFS CDG-PARIS

FSE-BOECOM MON 07/19/93 10:16:01

BOESEA-DDSO27-00004-07/19/93-0813Z

View Message

Message Number:	Action File Name:	Status:
AFA-CDG-93-0215TR	AFA-CDG-93-0190TR	Closed

Model: 737-300 ATA: 2720-06

Subject: RUDDER KICK DURING DESCENT
GRANDJEAN/LEMAIRE - DMQP

11E0 6058 /dev/sio2 vopems 07/27/93 10:08
DIR 617BOE

/ATTN (617) G. B. CROSS
/7/7/7/7 AIRLINE SUPPORT MANAGER M-72B3 2H-95
/CC (BFSORY) E. FESSLER BOEING CUSTOMER SERVICES - ORY

AFA-CDG-93-0215TR 27 JUL 93
ATA 2221-20 MODEL 737-300
RUDDER KICK DURING DESCENT
GRANDJEAN/LEMAIRE - DMQP
REF /A/ AFA-CDG-93-0190TR DTD 09 JUL 93 /C/
/B/ AFA-CDG-93-0199TR DTD 19 JUL 93 /C/

THE FOLLOWING MESSAGE SENT TO B. CROSS WITH COPY TO E. FESSLER.

THE REFERENCE /A/ MESSAGE REPORTED THAT THE DATA AIRCRAFT EXPERIENCED A RUDDER KICK DURING DESCENT.

AIR FRANCE PROVIDES THE FOLLOWING SHOP FINDINGS OF THE REMOVED UNITS AS REPORTED IN THE REFERENCE /A/ MESSAGE. INSPECTION REVEALED THAT THE SERVO VALVE, P/N A71882, S/N 1728, WAS FOUND TO BE FAULTY. ACCORDING TO AIR FRANCE, THIS WAS DUE TO BAD INSULATION. AIR FRANCE ALSO ADVISED THAT THERE WAS EVIDENCE OF SKYDROL IN THE SYSTEM WHICH RESULTED CONTAMINATION OF THE ELECTRICAL WIRES. THUS, AIR FRANCE CONCLUDED THAT THE SUBJECT SERVO VALVE WAS THE CAUSE OF THE RUDDER KICK DURING DESCENT.

ACTION
THE ABOVE MESSAGE IS FOR YOUR INFORMATION.

RAHIMANE BOEING CUSTOMER SERVICES BFS CDG-PARIS

FSE-BOECOM TUE 07/27/93 19:17:12

BOESEA-DDSO04-00056-07/27/93-1712Z

View Message

Message Number:	Action File Name:	Status:
AFA-ORY-93-0181TR	AFA-CDG-93-0190TR	Closed

Model: 737-300 ATA: 2725-10

Subject: RUDDER KICK DURING DESCENT
GRANDJEAN/LEMAIRE - DMQP JEZEQUEL DMUR

11E0 6981 /dev/sio2 vopems 08/03/93 06:54
DIR 617BOE

/ATTN (617) G. B. CROSS M7272 2H-95
/CC (BFSCDG) L. RAHIMANE CUSTOMER SERVICES REP

AFA-ORY-93-0181TR 3 AUG 93
ATA 2221-20 MODEL 737-300 5 AUG 93 H
RUDDER KICK DURING DESCENT
GRANDJEAN/LEMAIRE - DMQP JEZEQUEL DMUR
REF /A/ AFA-CDG-93-0215TR
/B/ AFA-CDG-93-0190TR
/C/ 737 IPC 27-21-00-40 FIG 40 PAGES 0/1
/D/ 737 MM 27-21-00 PAGE 13 FIG 6

AIRPLANE	HOURS/CYCLES
PP911	8998/6487

THE FOLLOWING SENT TO CROSS WITH COPY TO RAHIMANE

DESCRIPTION:

FURTHER TO THE REFERENCE /A/ TELEX, AFA HAVE PROVIDED THE FOLLOWING REPORT WHICH WAS TRANSLATED FROM THE ORIGINAL FRENCH LANGUAGE VERSION.

QUOTE

NATURE OF THE INCIDENT

VIOLENT MOVEMENT OF YAW DURING DECENT

DURING DECENT AT ORLY, THE SKY WAS CLEAR AND THE ATMOSPHERE WAS CALM, THE AUTOPILOT WAS ENGAGED, THE ENGINE POWERS WERE REDUCED, THE SPEED WAS AT 290 KNOTS WHEN A SUDDEN VIOLENT MOVEMENT OF YAW WAS NOTED. SIMULTANIOUSLY, THE CONTROL WHEEL WAS ROTATED TO A VERTICAL POSITION.

THERE WAS NO INSTRUMENT WARNING AND THE RUDDER PEDALS DID NOT MOVE. AFTER VERIFICATION OF THE ENGINES AND THE REVERSERS, THE ANOMALY WAS IDENTIFIED BY THE INDICATION OF THE YAW DAMPER WHICH INDICATED THE RUDDER IN THE FULL RIGHT DIRECTION.

THE FLIGHT CREW DISENGAGED THE YAW DAMPER, THE INDICATOR NEEDLE THEN RETURNED TO THE NORMAL POSITION AND THE CONTROL COLUMN WENT BACK TO THE HORIZONTAL POSITION.

A DOCTOR WAS ASKED TO MEET THE SLIGHTLY INJURED PASSENGERS; TWO OF THEM WERE TRANSFERED TO A MEDICAL FACILITY AT ORLY SOUTH.

THE YAW DAMPER COUPLER AND THE DIGITAL AIR DATA COMPUTER WERE REPLACED DURING TRANSIT, THEN ON THE 27 JUNE THE TRANSFER VALVE ON THE PCU WAS ALSO REPLACED.

UNQUOTE

AFA SUBSEQUENTLY DETERMINED THAT THE YAW DAMPER COUPLER AND THE DADC REMOVED AS STATED IN REF /B/ TELEX, WERE FOUND TO HAVE NO FAULTS. THE POWER CONTROL UNIT WAS ALSO FOUND TO HAVE NO FAULTS EXCEPT FOR THE TRANSFER VALVE. REFERING TO REFERENCE /D/, AFA DETERMINED THAT AT NO TIME WAS THERE ANY PRESSURE ON ONE SIDE OF THE YAW DAMPER ACTUATOR. THERE WAS, HOWEVER, PRESSURE ON THE OPPOSITE SIDE. THE PRESSUREIZED YAW DAMPER ACTUATOR ALWAYS RESULTED IN A RIGHT RUDDER MOVEMENT. ALSO IT SHOULD BE NOTED THAT THE CAP AT THE TOP OF THE REFERENCE /D/ DIAGRAM, WAS REMOVED AND FOUND TO BE FULL OF HYDRAULIC FLUID.

IN ADDITION TO THESE FINDINGS, AFA ALSO REPORT THAT THE BALL JOINT, REFERENCE /C/ CIRCLE D, CIRCLE J, ITEM 445 (P/N BLFR-16-086), WAS FOUND WITH THE TEFLON LINER MISSING. THIS ALLOWED A GREAT DEAL OF PLAY, BOTH AXIALLY AND RADIALLY, AT THIS LOCATION. AFA BELIEVE THAT IT IS THIS THAT CAUSED THE TRANSFER VALVE TO FAIL.

AFA ADVISE THAT THE TRANSFER VALVE AND THE BALL JOINT ARE AVAILABLE FOR BOEING INVESTIGATION IF DESIRED.

ACTION:

PLEASE ADVISE IF BOEING WISHES TO HAVE THE TRANSFER VALVE AND THE BALL JOINT FOR EXAMINATION.

REGARDS,

A GARDNER / E. FESSLER - BOEING CUSTOMER SERVICES - PARIS/ORLY

FSE-BOECOM TUE 08/03/93 15:50:33

BOESEA-DDSO24-00036-08/03/93-1358Z

View Message

Message Number:	Action File Name:	Status:
AFA-CDG-93-0222TR	AFA-CDG-93-0190TR	Closed

Model: 737-300 ATA: 2720-06

Subject: RUDDER KICK DURING CRUISE
GRANDJEAN/LEMAIRE - DMQP JEZEQUEL - DMUR BONNIO - DONT

11E0 7297 /dev/sio2 vopems 08/04/93 10:30
DIR 617BOE

/ATTN (617) G. B. CROSS
/7/7/7/7 AIRLINE SUPPORT MANAGER M-72B3 2H-95
/CC (BFSORY) E. FESSLER BOEING CUSTOMER SERVICES - ORY

AFA-CDG-93-0222TR 4 AUG 93
ATA 2221-20 MODEL 737-300 12 AUG 93 F
RUDDER KICK DURING CRUISE
GRANDJEAN/LEMAIRE - DMQP JEZEQUEL - DMUR BONNIO - DONT
REF /A/ AFA-CDG-93-0190TR DTD 09 JUL 93 /C/
/B/ AFA-CDG-93-0215TR DTD 27 JUL 93 /C/
/C/ AFA-ORY-93-0181TR DTD 03 AUG 93 /H/
AIRPLANE HOURS/CYCLES
F-GFUA

THE FOLLOWING MESSAGE SENT TO B. CROSS WITH COPY TO E. FESSLER.

THE REFERENCE /A/ MESSAGE REPORTED RUDDER KICK DURING DESCENT ON AIRPLANE F-GHVM. AIR FRANCE ADVISES THAT RECENTLY, THE DATA AIRPLANE, F-GFUA, EXPERIENCED A SERIE OF LIGHT RUDDER KICK DURING CRUISE. THE EVENTS WERE AS FOLLOWS:

24 JUL 93

THE FLIGHT CREW REPORTED THAT LIGHT RUDDER KICKS WERE NOTED DURING CRUISE. THE AIRPLANE YAWED TO LEFT AND THEN TO THE RIGHT. AT THAT TIME, THE CREW BELIEVED THAT THE CONDITION WAS DUE TO THE YAW DAMPER ITSELF. NO CORRECTIVE ACTION WAS TAKEN.

29 JUL 93

SIMILAR CONDITION OCCURRED DURING CRUISE. AS A CORRECTIVE ACTION, THE YAW DAMPER WAS RE-RACKED. THEN, THE COUPLER WAS CHECKED PER MM 22-12-31. NO ANOMALIES WERE NOTED.

30 JUL 93

AIR FRANCE REPLACED THE YAW DAMPER CALCULATOR. THE REMOVED S/N WAS 87042566. THE P/N WAS NOT AVAILABLE.

01 AUG 93

THE FLIGHT CREW REPORTED THAT THE YAW DAMPER PERFORMED PROPERLY. THE FLIGHT WAS UNEVENTFUL.

04 AUG 93

LIGHT RUDDER KICKS WERE NOTED AGAIN DURING CRUISE. AGAIN, THE AIRPLANE YAWED TO THE LEFT, THEN TO THE RIGHT. AT THIS TIME, AIR FRANCE PLANS TO REPLACE THE SERVO VALVE SINCE THE SERVO VALVE ON AIRPLANE F-GHVM WAS THE CAUSE OF THE RUDDER KICK CONDITION.

ACTION
AIR FRANCE WILL PROVIDE THE SHOP FINDINGS OF THE SERVO VALVE WHEN IT WILL BE REMOVED AND CHECKED. HOWEVER, IF THE SERVO VALVE IS THE CAUSE OF THE REPORTED CONDITION, AIR FRANCE INDICATES THAT BOEING SHOULD TAKE AN IMMEDIATE ACTION PERTAINING TO THE RUDDER KICK CONDITION.

PLEASE BE ADVISED THAT THIS CONDITION HAS HIGH VISIBILITY WITHIN AIR FRANCE FLIGHT OPERATIONS, MAINTENANCE AND ENGINEERING.

RAHIMANE BOEING CUSTOMER SERVICES BFS CDG-PARIS

FSE-BOECOM WED 08/04/93 19:38:35

BOESEA-DDSO01-00053-08/04/93-1735Z

View Message

Message Number:	Action File Name:	Status:
AFA-CDG-93-0221TR	AFA-CDG-93-0190TR	Closed

Model: 737-300 ATA: 2221-20

Subject: RUDDER KICK DURING DESCENT - OPERATIONAL PROCEDURES GRANDJEAN
/LEMAIRE - DMQP JEZEQUEL DMUR, BONIAU-DONT

11E0 7615 /dev/sio2 vopems 08/06/93 04:16
DIR 617BOE

/ATTN (617) G. B. CROSS
/7/7/7/7 AIRLINE SUPPORT MANAGER M-72B3 2H-95
/CC (BFSORY) E. FESSLER BOEING CUSTOMER SERVICES - ORY

/////RESEND TO ADD TEXT AND QUESTION - ORIG SENT 4 AUG /////

AFA-CDG-93-0221TR 6 AUG 93
ATA 2221-20 MODEL 737-300 9 AUG 93 H
RUDDER KICK DURING DESCENT - OPERATIONAL PROCEDURES
GRANDJEAN/LEMAIRE - DMQP JEZEQUEL DMUR, BONIAU-DONT
REF /A/ AFA-ORY-93-0181TR
/B/ AFA-CDG-93-0215TR
/C/ OM 03.10.09
/D/ AVIATION WEEK AND SPACE TECHNOLOGY JUL 26 93 ISSUE, UAL FLIGHT 585
/E/ D6-8735-528 AFM SECTION 3.2 , P.7, NON-NORMAL PROCEDURES
AIRPLANE HOURS/CYCLES
PP911

FOLLOWING MESSAGE SENT TO B. CROSS WITH COPY TO E. FESSLER

SUBSEQUENT TO THE REF /A/ MESSAGE, AFA WISHES TO CONFIRM CERTAIN OPERATIONAL ASPECTS OF THE SUBJECT EVENT. AS STATED IN REF /A/, THERE WAS NO ALARM OR YAW DAMPER ANNUNCIATION TO THE CREW OTHER THAN THE YAW DAMPER INDICATOR SHOWING HARD RIGHT AND THE CONTROL WHEEL HARD LEFT /PRESUMABLY DUE TO AUTOPILOT REACTION/. IN RESPONSE TO THIS CONDITION, THE CREW TURNED OFF THE YAW DAMPER, THE INDICATOR RETURNED TO THE NORMAL POSITION AND THE CONTROL WHEEL RETURNED TO NEUTRAL. AT SOME LATER POINT, THE A/P WAS DISCONNECTED.

LACKING AN EXPLICIT NON-NORMAL PROCEDURE IN REF /C/, AFA WOULD LIKE CONFIRMATION THAT THE CREW RESPONSE WAS OPTIMUM. CREWS HAVE READ REF /D/ AND OTHER ASSOCIATED ARTICLES AND HAVE EXPRESSED CONCERN THAT THE ABOVE EVENT MIGHT BE RELATED.

----RESEND ADDITIONS---
SUBSEQUENT TO ORIG MESSAGE WE HAVE LOCATED A REFERENCE IN THE NON-NORMAL PROCEDURES OF THE REF /E/ /AFM/ WHICH ADVISES CREW TO TURN THE YAW DAMPER OFF //IF DIRECTIONAL HUNTING OR RUDDER OSCILLATIONS OCCUR//. AFA HAS REQUESTED THAT A SIMILAR INSTRUCTION BE PLACED IN THE QRH/OM FOR ALL 737 MODELS

ACTION:
1. DID THE AFA CREWS RESPOND IN THE BEST WAY TO THE EVENT /Q/ ARE THERE ANY PROCEDURES WHICH BOEING CAN RECOMMEND IN THE EVENT OF FUTURE OCCURRENCES /Q/

2. IF THE AUTOPILOT HAD NOT BEEN ENGAGED, WHAT WOULD HAVE BEEN THE PROBABLE RESULT. PLEASE COMMENT ON ANY SIMILARITIES OR SIGNIFICANT DIFFERENCES WITH THE UAL FLIGHT 585 EVENT.

----RESEND ADDITION---
3. PLEASE EVALUATE THE REF /E/ PROCEDURES FOR INCLUSION IN QRH/OM FOR 737 MODELS, AND ADVISE.

WALKER/RAHIMANE BOEING CUSTOMER SERVICES BFSCDG - PARIS

BOESEA-X2RI01-00188-08/04/93-1619Z

FSE-BOECOM FRI 08/06/93 13:25:25

BOESEA-DDSO07-00048-08/06/93-1121Z

View Message

Message Number:	Action File Name:	Status:
AFA-ORY-93-0195RR	AFA-CDG-93-0190TR	Closed

Model: 737-300 ATA: 2725-10

Subject: RUDDER KICK DURING DESCENT

AFA-ORY-93-0195RR 06 AUG 93
ATA 2725-10 MODEL 737-300
RUDDER KICK DURING DESCENT
REF /A/ AFA-ORY-93-0181TR DATED 3 AUG 93 /SENT ATA 2221-20/
/C/
/B/ AFA-CDG-93-0190TR DATED 9 JUL 93 /SENT ATA 2221-20/
/C/ AFA-CDG-93-0222TR DATED 4 AUG 93 /SENT ATA 2221-20/
/D/ OHM 27-20-01
AIRPLANE HOURS/CYCLES
PP911

THE FOLLOWING MESSAGE SENT TO E.FESSLER /BCSR/ WITH A CC TO L.RAHIMANE /BCSR/.

THE REFERENCE /A/ AND /B/ TELEXES DISCUSS A RUDDER DISCREPANCY ON AFA AIRPLANE PP911/F-GHVM. REPORTEDLY, ON DESCENT TO ORLY, A SUDDEN YAW WAS NOTED AND THE YAW DAMPER INDICATOR SHOWED FULL RIGHT DEFLECTION. THE FLIGHT CREW TURNED OFF THE YAW DAMPER SYSTEM AND THE YAW DAMPER INDICATOR RETURNED TO NEUTRAL. THE YAW DAMPER COUPLER AND DIGITAL AIR DATA COMPUTER /DADC/ AND THE REFERENCE /D/ FIGURE 1101, ITEM 45, RUDDER PCU ELECTROHYDRAULIC SERVO VALVE /EHSV/, MOOG P/N A71882-1, SERIAL NUMBER 1728 WERE REMOVED DURING TROUBLESHOOTING. FURTHER INVESTIGATION REVEALED NO FAULTS WITH THE DADC OR THE YAW DAMPER COUPLER. HOWEVER, THE EHSV WAS DETERMINED BY AFA TO BE DISCREPANT. AFA ALSO REPORTED THAT THE P/N BLFR-16-086 BALL JOINT WAS FOUND WITH THE TEFLON LINER MISSING, REPORTEDLY ALLOWING SIGNIFICANT FREEPLAY. AFA ADVISED THAT THE BALL JOINT AND EHSV ARE AVAILABLE FOR OUR EXAMINATION.

THE REFERENCE /C/ TELEX REPORTED A SIMILAR RUDDER DISCREPANCY ON AFA AIRPLANE F-GFUA/PP902. REPORTEDLY, REPLACEMENT OF THE RUDDER PCU EHSV CORRECTED THE DISCREPANCY.

WE ARE INTERESTED IN EXAMINING THE REMOVED EHSV AND THE BALL JOINT FROM AIRPLANE F-GHVM. ADDITIONALLY, WE ARE INTERESTED IN THE EHSV REMOVED FROM AIRPLANE F-GFUA. IF THESE PARTS ARE AVAILABLE, PLEASE FORWARD THEM TO THE FOLLOWING ADDRESS:

BOEING COMMERCIAL AIRPLANE GROUP
ATTENTION BRUCE CROSS
CUSTOMER SERVICE CENTER
BLDG. 11-14-1.3 COLUMN E8, MAIL STOP 2H-80
2925 S. 112TH STREET
SEATTLE, WASHINGTON 98168

UPON RECEIPT OF THE PARTS, WE WILL PROVIDE YOU WITH A SCHEDULE FOR OUR EXAMINATION. PLEASE PROVIDE SHIPPING INFORMATION BY RETURN TELEX. ADDITIONALLY, OUR COPY OF THE IPC DOES NOT INCLUDE THE IPC REFERENCE NOTED IN THE REFERENCE /A/ TELEX. PLEASE PROVIDE FURTHER CLARIFICATION OR FAX US A COPY OF YOUR IPC.

ALSO, WE ARE INTERESTED IN ANY AVAILABLE FLIGHT DATA RECORDER

DATA FOR THE REFERENCE /A/ AND /C/ EVENTS, AND THE DATE THAT THE REFERENCE /A/ EVENT OCCURRED.

NOTE ATA CHANGE.

BOEINGAIR JAH/KLH/BRUCE CROSS M-7272 2H-95
CUSTOMER SERVICES DIVISION
/VLM 08/06/93 1345

View Message

Message Number:	Action File Name:	Status:
AFA-CDG-93-0208RR	AFA-CDG-93-0190TR	Closed

Model: 737-300 ATA: 2221-20

Subject: RUDDER KICK DURING DESCENT - OPERATIONAL PROCEDURES GRANDJEAN
/LEMAIRE - DMQP JEZEQUEL DMUR, BONIAU-DONT

AFA-CDG-93-0208RR 09 AUG 93
ATA 2221-20 MODEL 737-300 16 AUG 93 H
RUDDER KICK DURING DESCENT - OPERATIONAL PROCEDURES
GRANDJEAN/LEMAIRE - DMQP JEZEQUEL DMUR, BONIAU-DONT
REF /A/ AFA-CDG-93-0221TR /H/
/B/ AFA-ORY-93-0181TR
/C/ AFA-CDG-93-0215TR
AIRPLANE HOURS/CYCLES
PP911

THE FOLLOWING MESSAGE SENT TO L.RAHIMANE /BCSR/ WITH A CC TO
E.FESSLER /BCSR/.

REFERENCE /A/ REQUESTS OPERATIONAL INFORMATION IN CONNECTION WITH
SUBJECT AFA RUDDER KICK DURING DESCENT.

WE ARE CURRENTLY INVESTIGATING THE REFERENCE /A/ INQUIRIES AND
WILL RESPOND WITH ADDITIONAL INFORMATION BY 16 AUGUST.

BOEINGAIR MM/KLH/BRUCE CROSS M-7272 2H-95
CUSTOMER SERVICES DIVISION

/VNB 08/09/93 1654

View Message

Message Number:	Action File Name:	Status:
AFA-ORY-93-0187TR	AFA-CDG-93-0190TR	Closed

Model: 737-300 ATA: 2725-10

Subject: RUDDER KICK DURING DESCENT
JEZEQUEL DMUR LEBLANC DMUR

11E0 8034 /dev/sio2 vopems 08/10/93 05:14
DIR 617BOE

/ATTN (617) G. B. CROSS M7272 2H-95
/CC (BFSCDG) L. RAHIMANE CUSTOMER SERVICES REP

AFA-ORY-93-0187TR 10 AUG 93
ATA 2725-10 MODEL 737-300 17 AUG 93 H
RUDDER KICK DURING DESCENT
JEZEQUEL DMUR LEBLANC DMUR
REF /A/ AFA-ORY-93-0195RR
AIRPLANE HOURS/CYCLES
PP911

THE FOLLOWING SENT TO CROSS WITH COPY TO RAHIMANE

DESCRIPTION:

THE EHSV AND THE BALL JOINT FROM THE DATA AIRPLANE HAVE BEEN FORWARDED TODAY VIA AIRMAIL TO YOUR OFFICE AS REQUESTED. WE HAVE INCLUDED IN THE PACKAGE THE IPC REFERENCES REQUESTED. INCLUDED ALSO IS AN AFA WARRANTY CLAIM FORM THAT AFA IS USING TO REQUEST AN INVESTIGATION OF THE EHSV. AFA HAVE REQUESTED THAT WE SEND THIS FORM IN WITH THE EHSV ALTHOUGH WE ARE NOT SURE OF THE PROCEDURAL IMPLICATIONS OF THIS.

WE ARE NOT YET ABLE TO OBTAIN THE EHSV FROM THE SECOND AIRPLANE SINCE THE PERSON RESPONSIBLE FOR IT IS ON VACATION. WE ANTICIPATE GETTING IN A WEEK OR TWO.

WE ARE WAITING FOR THE PRINT OUT FROM THE FLIGHT DATA RECORDER AND ANTICIPATE THIS IN A COUPLE OF DAYS. WE HAVE TO OBTAIN APPROVAL FROM AFA SECURITY BEFORE THIS CAN BE RELEASED TO US.

ACTION:

PLEASE ADVISE BOEING SCHEDULE FOR EXAMINATION OF THE RETURNED EHSV AND BALL JOINT.

REGARDS,

A GARDNER / E. FESSLER - BOEING CUSTOMER SERVICES - PARIS/ORLY

FSE-BOECOM TUE 08/10/93 13:47:38

BOESEA-DDSO21-00138-08/10/93-1219Z

View Message

Message Number:	Action File Name:	Status:
AFA-ORY-93-0190TR	AFA-CDG-93-0190TR	Closed

Model: 737-300 ATA: 2725-10

Subject: RUDDER KICK DURING DESCENT
JEZEQUEL DMUR LEBLANC DMUR

11E0 8208 /dev/sio2 vopems 08/11/93 02:21
DIR 617BOE

/ATTN (617) G. B. CROSS M7272 2H-95
/CC (BFSCDG) L. RAHIMANE CUSTOMER SERVICES REP

AFA-ORY-93-0190TR 11 AUG 93
ATA 2725-10 MODEL 737-300
RUDDER KICK DURING DESCENT
JEZEQUEL DMUR LEBLANC DMUR
REF /A/ AFA-ORY-93-0187TR
AIRPLANE HOURS/CYCLES
PP911/
F-GHVM

THE FOLLOWING SENT TO CROSS WITH COPY TO RAHIMANE

DESCRIPTION:

FURTHER TO THE REFERENCE /A/ TELEX, THIS IS TO INFORM YOU THAT WE NOW HAVE THE FLIGHT DATA RECORDER PRINT OUT FOR THE DATA AIRPLANE. WE WILL AIRMAIL THIS TO YOUR OFFICE TODAY.

ACTION:

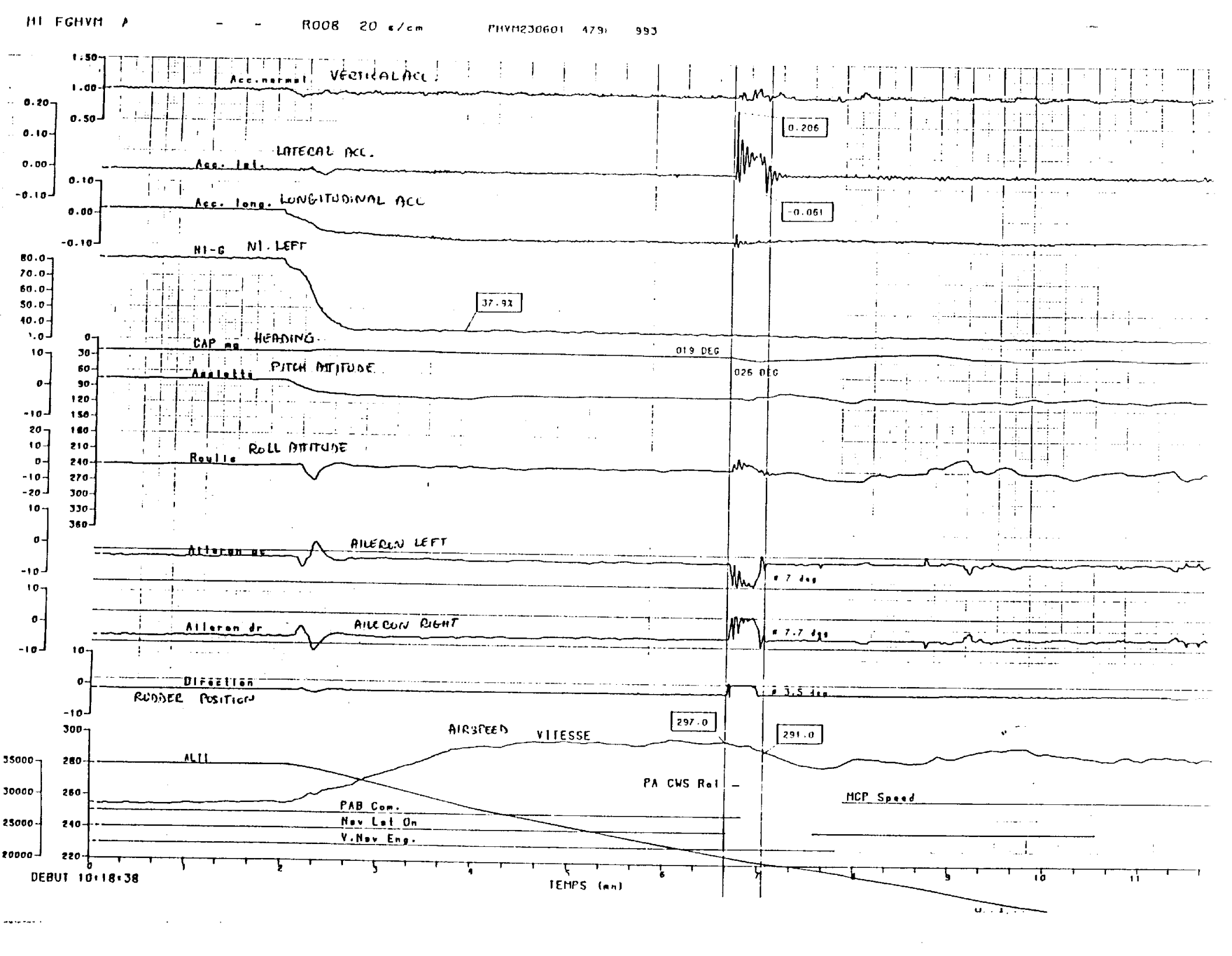
NONE - FOR YOUR INFORMATION

REGARDS,

A GARDNER / E. FESSLER - BOEING CUSTOMER SERVICES - PARIS/ORLY

FSE-BOECOM WED 08/11/93 10:54:22

BOESEA-DDSO22-00018-08/11/93-0926Z


M1 FGHVM A - - ROOB 20 c/cm PHVM230601 479 993
Acc.normal VERTICAL ACC.
0.206
LATECAL ACC.
Acc. lat.
Acc. long. LONGITUDINAL ACC
-0.061
N1-G N1 LEFT
37.9%
CAP ma HEADING
019 DEG
Assiette PITCH ATTITUDE
026 DEG
Roulis ROLL ATTITUDE
Aileron ag AILERON LEFT
Aileron dr AILERON RIGHT
Direction
RUDDER POSITION
297.0
291.0
AIRSPEED VITESSE
ALTI
PA CWS Rol
PAB Com.
Nav Lat On
V.Nav Eng.
MCP Speed
DEBUT 10:18:38
TEMPS (mn)

973

DO.NY ~~074~~ A FGHVM - ETAT de PARAMETRES 0 Pas 1/4 s PHVM2306 01-07-93/14:22 page 1

Cycle	Heure TU	ALTI	CAP (HEADING)	CAS	ASSI (P.ATTITUDE)	ATTA (AOA)	ROULI (R.ATTITUDE)	TRIM (PITCH)	DIR (RUDDER)	GAUCG (AILERON L)	GAUCD (AILERON R)	ACCZ	ACCY	ACCX	HYAMG	MYBMD	REVGG	REVGD	PABC	CWSP	CWSR	NAVLA
	(h:mn:s)	ft	deg	kt	deg	deg	deg	deg	deg	deg	deg	g	g	g								
	PHASE 8 DESCENTE																					
4896	10:25:10	21613	19.7	297.0	-1.6	0.4	0.3	4.16	-1.4	-4.6	-3.5	1.01	-0.006	-0.074			1	1	1			1
												1.00	-0.005	-0.069								
									-1.4			0.99	-0.006	-0.070								
												0.99	-0.004	-0.074								
	11	21568	19.7	297.0	-1.6	0.4	0.4		-1.4	-4.6	-3.5	1.00	-0.003	-0.072					1			
												0.98	-0.005	-0.071								
									-1.4			0.99	-0.005	-0.071								
												0.99	-0.007	-0.071								
	12	21523	19.7	297.0	-1.6	0.4	0.4	4.16	-1.1	-4.6	-3.5	0.99	-0.006	-0.070			1	1	1			1
												0.98	-0.005	-0.070								
									-1.4			0.98	-0.004	-0.070								
												0.97	-0.003	-0.071								
	13	21485	19.7	297.0	-1.6	0.4	0.4		-1.1	-4.6	-3.5	0.96	-0.006	-0.071					1			
												0.98	-0.006	-0.071								
									-1.4			0.99	-0.008	-0.071								
												0.99	-0.007	-0.070								
4897	10:25:14	21440	19.7	297.0	-1.6	0.4	0.3	4.16	-1.1	-4.6	-3.5	0.98	-0.006	-0.070			1	1	1			1
												0.98	-0.007	-0.070								
									-1.4			0.99	-0.005	-0.074								
												0.97	-0.004	-0.071								
	15	21395	19.7	297.0	-1.6	0.4	0.2		-1.4	-4.6	-3.5	0.98	-0.007	-0.071					1			
												0.98	-0.007	-0.071								
									-1.4			0.98	-0.008	-0.071								
												0.99	-0.006	-0.070								
	16	21357	19.7	297.0	-1.6	0.4	0.2	4.16	-1.4	-4.2	-3.5	1.01	-0.005	-0.074			1	1	1			1
												0.98	-0.005	-0.070								
									-1.4			0.97	-0.006	-0.071								
												0.98	-0.007	-0.072								
	17	21312	19.9	297.0	-1.5	0.4	0.2		-1.4	-4.2	-3.5	0.99	-0.003	-0.071					1			
												0.99	-0.008	-0.071								
									-1.4			0.97	-0.006	-0.070								
												0.99	-0.006	-0.070								
4898	10:25:18	21261	19.9	297.0	-1.6	0.4	0.2	4.16	-1.4	-4.6	-3.5	0.99	-0.004	-0.071			1	1	1			1
												0.98	-0.005	-0.071								
									2.1			0.99	-0.022	-0.065								
												0.99	-0.002	-0.079								
	19	21222	20.6	297.0	-1.5	0.2	-0.1		2.1	-7.4	0.0	0.97	0.043	-0.073					1			
												0.97	0.082	-0.066								
									-2.1			0.99	0.206	-0.051								
												1.00	0.113	-0.042								
	20	21171	22.1	296.0	-1.6	0.2	5.0	4.16	1.6	-11.2	3.9	1.03	-0.004	-0.074			1	1	1			
												1.01	-0.018	-0.081								
									1.4			1.01	-0.023	-0.082								
												1.04	-0.028	-0.086								
	21	21120	20.9	296.5	-1.6	0.5	1.8		1.8	-4.6	-3.5	1.04	-0.008	-0.082					1			
												1.01	0.032	-0.072								
									1.6			0.96	0.073	-0.068								
												0.93	0.100	-0.065								
4899	10:25:22	21062	22.9	296.0	-1.6	0.2	1.4	4.16	1.8	-11.2	4.2	0.99	0.113	-0.062			1	1	1		1	
												1.05	0.106	-0.063								

YAW.

NIL CNR.

hh:mm:ss	ft	deg	kt	deg	deg		deg	deg	deg	deg	g	g	g	YAMG	YBMD	F\GG	GD	LBC	WSP	WSR	AVLA
								1.3			1.09	0.093	-0.065								
											1.07	0.063	-0.070								
23	21043	22.9	295.5	-1.6	0.5	6.1		1.6	-11.6	3.9	1.06	0.032	-0.074					1			
											1.03	0.006	-0.073								
								1.8			1.01	-0.002	-0.075								
											0.99	0.003	-0.076								
24	20998	22.5	295.5	-1.8	0.4	3.1	4.16	1.3	-6.3	-1.4	0.96	0.017	-0.075			1	1	1			
											0.94	0.038	-0.074								
								1.8			0.93	0.062	-0.072								
											0.94	0.082	-0.069								
25	20960	23.7	295.0	-1.9	-0.2	1.5		1.3	-9.8	2.5	0.95	0.091	-0.063					1			
											0.93	0.088	-0.068								
								1.5			0.97	0.073	-0.071								
											0.95	0.059	-0.069								
4900 10:25:26	20922	23.9	295.0	-1.7	0.0	6.0	4.16	1.8	-11.2	3.9	0.95	0.041	-0.071			1	1	1		1	
											0.96	0.028	-0.075								
								1.8			0.98	0.020	-0.073								
											0.94	0.023	-0.074								
27	20970	23.7	295.0	-2.1	0.2	4.6		1.8	-9.1	1.8	0.94	0.030	-0.073					1			
											0.94	0.039	-0.073								
								1.8			0.94	0.055	-0.070								
											0.97	0.067	-0.073								
28	20826	24.8	295.5	-2.1	0.0	3.1	4.16	1.3	-10.9	3.5	0.96	0.070	-0.071			1	1				
											0.94	0.072	-0.067								
								1.3			0.98	0.071	-0.071								
											1.00	0.063	-0.071								
29	20774	25.1	295.5	-1.6	0.5	4.7		1.8	-11.2	3.5	1.05	0.053	-0.072								
											1.09	0.047	-0.071								
								1.8			1.12	0.044	-0.070								
											1.13	0.043	-0.070								
4901 10:25:30	20730	25.3	295.5	-1.9	0.5	3.6	4.16	1.8	-10.2	2.5	1.07	0.048	-0.068			1	1				
											1.04	0.051	-0.068								
								1.6			0.98	0.057	-0.069								
											0.97	0.060	-0.069								
31	20685	25.8	295.5	-1.5	0.4	3.9		1.8	-11.2	3.5	0.97	0.061	-0.070								
											1.03	0.059	-0.071								
								1.6			1.05	0.056	-0.071								
											1.07	0.054	-0.069								
32	20640	26.2	295.5	-1.2	0.5	2.8	4.16	1.5	-10.9	3.2	1.07	0.052	-0.066			1	1				
											1.10	0.052	-0.070								
								1.8			1.09	0.054	-0.066								
											1.08	0.055	-0.063								
33	20602	26.5	295.0	-0.9	0.9	2.1		1.8	-11.6	3.9	1.14	0.057	-0.068								
											1.12	0.060	-0.065								
								1.4			1.15	0.069	-0.068								
											1.11	0.067	-0.060								
4902 10:25:34	20563	26.7	294.0	-1.1	0.7	2.0	4.16	1.1	-10.5	2.8	1.06	0.054	-0.065			1	1				
											1.04	0.042	-0.065								
								1.1			1.01	0.033	-0.067								
											1.00	0.030	-0.068								
35	20531	26.4	293.5	-0.9	0.5	0.7		1.1	-9.1	1.4	0.99	0.028	-0.069								
											1.00	0.031	-0.070								

Cycle	Heure TU (h:mn:s)	ALTI ft	CAP deg	CAS kt	ASSI deg	ATTA deg	ROULI deg	TRIM deg	DIR deg	GAUCG deg	GAUCD deg	ACCZ g	ACCY g	ACCX g	HYAMG	HTBMD	REVGG	REVGD	PAGC	PWSP	CWSR	NAVLA
									1.4			1.00	0.037	-0.068								
												0.99	0.049	-0.067								
	36	20499	26.5	293.0	-1.1	0.5	-0.4	4.16	0.4	-6.4	0.7	1.01	0.059	-0.066			1	1				
												1.02	0.055	-0.066								
									0.0			1.02	0.046	-0.067								
												1.00	0.033	-0.064								
	37	20474	26.2	292.5	-0.9	0.5	1.3		-1.4	-7.0	-1.1	1.02	0.015	-0.070								
												1.05	-0.007	-0.067								
									-1.8			1.03	-0.035	-0.067								
												1.03	-0.054	-0.070								
4903	10:25:38	20435	24.8	292.5	-0.9	0.7	0.4	4.16	-1.4	-1.8	-6.0	1.03	-0.061	-0.071			1	1				
												1.01	-0.054	-0.071								
									-1.4			0.97	-0.036	-0.070								
												0.95	-0.011	-0.068								
	39	20410	25.1	292.5	-1.1	0.4	-2.4		-1.4	-3.5	-4.2	0.92	0.010	-0.067								
												0.93	0.023	-0.065								
									-1.4			0.94	0.030	-0.062								
												0.98	0.027	-0.061								
	40	20371	25.5	292.0	-0.9	0.5	-0.3	4.16	-1.4	-0.3	-1.8	1.00	0.012	-0.061			1	1				
												1.01	-0.003	-0.063								
									-1.4			1.02	-0.017	-0.065								
												1.01	-0.027	-0.067								
	41	20333	24.6	291.5	-0.9	0.7	0.1		-1.4	-4.2	-3.9	1.01	-0.033	-0.068								
												1.01	-0.032	-0.069								
									-1.4			0.99	-0.025	-0.068								
												0.99	-0.015	-0.067								
4904	10:25:42	20294	24.8	291.0	-0.7	0.7	-2.2	4.31	-1.4	-3.9	-4.2	0.99	-0.002	-0.065			1	1				
												0.99	0.008	-0.063								
									-1.4			1.01	0.012	-0.067								
												1.02	0.013	-0.066								
	43	20262	25.0	290.5	-0.5	0.7	-1.4		-1.4	-4.2	-3.5	1.03	0.006	-0.067								
												1.04	-0.002	-0.067								
									-1.4			1.02	-0.011	-0.064								
												1.04	-0.019	-0.065								
	44	20224	24.4	290.5	-0.5	0.9	-0.5	4.31	-1.4	-4.2	-3.5	1.03	-0.022	-0.065			1	1				
												1.04	-0.021	-0.063								
									-1.4			1.03	-0.017	-0.062								
												1.04	-0.010	-0.063								
	45	20198	24.4	290.0	-0.2	1.1	-1.5		-1.4	-4.2	-3.9	1.04	-0.003	-0.062								
												1.09	0.003	-0.066								
									-1.4			1.08	0.006	-0.062								
												1.06	0.006	-0.060								
4905	10:25:46	20173	24.6	289.5	0.0	1.1	-1.6	4.31	-1.4	-4.2	-3.5	1.06	0.003	-0.060			1	1				
												1.06	-0.002	-0.061								
									-1.4			1.05	-0.003	-0.060								
												1.05	-0.005	-0.060								
	47	20147	24.3	289.5	0.2	0.9	-0.9		-1.4	-4.2	-3.5	1.05	-0.009	-0.062								
												1.04	-0.011	-0.062								
									-1.4			1.02	-0.011	-0.063								
												1.01	-0.010	-0.065								
	48	20122	24.1	289.0	0.0	0.9	-1.1	4.31	-1.4	-4.2	-3.5	1.00	-0.008	-0.063			1	1				
												1.00	-0.005	-0.064								

View Message

Message Number:	Action File Name:	Status:
AFA-CDG-93-0214RR	AFA-CDG-93-0190TR	Closed

Model: 737-300 ATA: 2221-20

Subject: RUDDER KICK DURING DESCENT - OPERATIONAL PROCEDURES /LEMAIRE - DMQP JEZEQUEL DMUR, BONIAU-DONT GRANDJEAN

AFA-CDG-93-0214RR 13 AUG 93
ATA 2221-20 MODEL 737-300
RUDDER KICK DURING DESCENT - OPERATIONAL PROCEDURES
GRANDJEAN/LEMAIRE - DMQP JEZEQUEL DMUR, BONIAU-DONT
REF /A/ AFA-CDG-93-0221TR /C/
/B/ AFA-ORY-93-0181TR
/C/ AFA-CDG-93-0215TR
/D/ OPERATIONS MANUAL 03.10.09
/E/ AW&ST 7/26/93 ISSUE, UAL FLT 585
/F/ D6-8735-528 AFM SECT 3.2, PG 7
/G/ AFA-ORY-93-0187TR
AIRPLANE HOURS/CYCLES
PP911

THE FOLLOWING MESSAGE SENT TO L.RAHIMANE /BCSR/ WITH A CC TO E.FESSLER /BCSR/.

THE REFERENCE /A/ MESSAGE DESCRIBES A RUDDER KICK DURING DESCENT. THE REPORT INDICATES HARD LEFT WHEEL POSITION. REFERENCE /G/ INDICATES THAT AFA WILL ATTEMPT TO OBTAIN FDR DATA. WE WOULD APPRECIATE OBTAINING FDR DATA WHEN AVAILABLE CMA AS WE WOULD NOT EXPECT FULL WHEEL TRAVEL IN THE EVENT OF A YAW DAMPER EVENT.

REFERENCE /A/ REQUESTS INFORMATION REGARDING OPERATIONAL PROCEDURES IN CONNECTION WITH THE SUBJECT AFA RUDDER KICK. THE FOLLOWING RESPONSES ARE PROVIDED.

1/ DID THE AFA CREWS RESPOND IN THE BEST WAY TO THE EVENT /Q/ ARE THERE ANY PROCEDURES WHICH BOEING CAN RECOMMEND IN THE EVENT OF FUTURE OCCURRENCES /Q/

AFTER DISCUSSION WITH BOEING PILOTS AND ENGINEERS CMA BOEING CONCURS THAT THE AFA PILOTS RESPONDED APPROPRIATELY FOR THIS YAW DAMPER ANOMALY. WE BELIEVE THAT THE FLIGHT CREW ACTIONS FOR THIS OCCURRENCE WERE CORRECT.

2/ IF THE AUTOPILOT HAD NOT BEEN ENGAGED CMA WHAT WOULD HAVE BEEN THE PROBABLE RESULT /Q/ PLEASE COMMENT ON ANY SIMILARITIES OR SIGNIFICANT DIFFERENCES WITH THE UAL FLIGHT 585 EVENT /Q/.

THE YAW DAMPER ON THE 737-300 HAS A LIMITED AUTHORITY OF 3 DEG RUDDER. THE PILOT HAS THE CAPABILITY AT ALL TIMES TO OVERCOME ANY ERRONEOUS YAW DAMPER INPUT BY USING WHEEL AND/OR PEDAL INPUTS. IF THE AUTOPILOT IS NOT ENGAGED CMA THE PILOT RESPONSE TO THIS TYPE OF OCCURRENCE WOULD BE TO MAINTAIN CONTROL OF THE AIRPLANE. THE PILOT RESPONSE WOULD THEREFORE BE SIMILAR TO THE AUTOPILOT RESPONSE AND THE AIRPLANE RESPONSE WOULD ALSO BE SIMILAR. YAW DAMPER FULL DEFLECTION MALFUNCTIONS WERE DEMONSTRATED IN FLIGHT TEST ON BOTH THE 737-300 AND 737-400 AIRPLANES AND WERE SHOWN TO BE SAFELY CONTROLLABLE CMA INCLUDING DURING APPROACH

CONDITIONS. THE POSSIBILITY OF THIS TYPE OF MALFUNCTION WAS CONSIDERED IN THE UAL585 ACCIDENT INVESTIGATION AND WAS DETERMINED NOT TO BE A FACTOR IN THE ACCIDENT. THE 737-200 AIRPLANE HAS A 2 DEGREE AUTHORITY YAW DAMPER AND ANY YAW DAMPER ERRONEOUS INPUT IS EASILY CONTROLLED.

3/ PLEASE EVALUATE THE REFERENCE /F/ PROCEDURES FOR INCLUSION IN THE QRH/OM FOR 737 MODELS AND ADVISE.

WE ARE CURRENTLY REVIEWING THE OPERATIONS MANUAL IN REGARD TO THIS TYPE OF EVENT. WE WILL ADVISE AFA OF ANY REVISION MADE RELATED TO YAW DAMPER MALFUNCTIONS.

BOEINGAIR MM/KLH/BRUCE CROSS M-7272 2H-95
CUSTOMER SERVICES DIVISION
/VNB 08/13/93 1736

View Message

Message Number:	Action File Name:	Status:
AFA-CDG-93-0233TR	AFA-CDG-93-0190TR	Closed

Model: 737-300 ATA: 2725-10

Subject: RUDDER KICK DURING CRUISE LEMAIRE
/DMQP - JEZEQUEL/DMUR - BONIAU/DONT

11E0 8640 /dev/sio2 vopems 08/13/93 01:40
DIR 617BOE

/ATTN (617) G. B. CROSS
/7/7/7/7 AIRLINE SUPPORT MANAGER M-72B3 2H-95
/CC (BFSORY) E. FESSLER BOEING CUSTOMER SERVICES - ORY

AFA-CDG-93-0233TR 13 AUG 93
ATA 2221-20 MODEL 737-300 16 AUG 93 H
RUDDER KICK DURING CRUISE
LEMAIRE/DMQP - JEZEQUEL/DMUR - BONIAU/DONT
REF /A/ AFA-CDG-93-0222TR DTD 04 AUG 93 /C/
/B/ SERVICE BULLETIN 737-27-1185 DTD 15 APR 93
AIRPLANE HOURS/CYCLES
F-GFUA

/// CORRECTED COPY - PARAGRAPH 2/ HAS BEEN CHANGED ///

THE FOLLOWING MESSAGE SENT TO B. CROSS WITH COPY TO E. FESSLER.

THE REFERENCE /A/ MESSAGE REPORTED LIGHT RUDDER KICKS ON THE DATA AIRCRAFT DURING CRUISE ON SEVERAL OCCASIONS. CONSEQUENTLY, AIR FRANCE HAS REMOVED THE SERVO VALVE FOR INSPECTIONS. FURTHERMORE, THE REFERENCE /A/ MESSAGE DID NOT PROVIDE THE P/N AND S/N OF THE SUBJECT SERVO VALVE. AIR FRANCE ADVISES THAT THE P/N AND S/N WERE 75130 AND 33761A RESPECTIVELY.

SHOP FINDINGS OF THE SERVO VALVE REVEALED THE FOLLOWING.

1/ THERE WERE NO ANOMALIES NOTED ON THE EXTERIOR PARTS OF OF THE SERVO VALVE, INCLUDING THE OPENING OF THE ELECTRICAL SYSTEM.

2/ DURING THE ELECTRICAL TEST, IT WAS NOTED THERE WERE NO ANOMALIES. HOWEVER, WHEN THE SERVO VALVE WAS ON THE BENCH WITHOUT ANY ELECTRICAL EXCITATION, INSTABILITY WITHIN THE THE ELECTRICAL SYSTEM WAS NOTED.

3/ THE TORQUE MOTOR WAS CHECKED THROUGH A MISCROSCOPE. HOWEVER, AIR FRANCE INDICATES THAT IT IS DIFFICULT TO DETERMINE ANY ANOMALIES. CONSEQUENTLY, AIR FRANCE ELECTED TO REPLACE THE TORQUE MOTOR. AIR FRANCE BELIEVES THAT THIS WOULD CORRECT THIS CONDITION.

ACTION
1/ THE REFERENCE /B/ SERVICE BULLETIN GIVES INSTRUCTION TO REPLACE THE DUAL SERVO VALVE ON THE RUDDER POWER CONTROL UNIT (PCU). BOEING RECOMMENDS THAT EACH OPERATOR EXAMINE THIS SERVICE BULLETIN AT THE SOONEST. HOWEVER, THE DATA AIRPLANE IS NOT AFFECTED

AIR FRANCE PLANS TO EXERCISE THE REFERENCE /B/ SERVICE BULLETIN PER PRECAUTION. DOES BOEING RECOMMEND AIR FRANCE TO PERFORM THE REFERENCE /B/ SERVICE BULLETIN /Q/.

2/ AIR FRANCE WOULD LIKE TO INQUIRE WHETHER BOEING BELIEVES THAT THE SUBJECT CONDITION IS RELATED TO THE REFERENCE /B/ SERVICE BULLETIN.

3/ THE REFERENCE /B/ SERVICE BULLETIN PROVIDES THE FOLLOWING DUAL SERVO VALVE ASSEMBLY P/N: 68010-5005 OR 68010-5007. ARE THESE P/N THE SAME AS P/N 75130 /Q/.

4/ AIR FRANCE WOULD LIKE BOEING TO PROVIDE ANY SUGGESTIONS AND RECOMMENDATIONS TO WHAT ACTION SHOULD BE TAKEN AT THIS TIME TO RESOLVE THE RUDDER KICK CONDITION.

NOTE: BECAUSE OF HIGH VISIBILITY, AIR FRANCE ENGINEERING WOULD GREATLY APPRECIATE AN ANSWER BY 16 AUG 93.

RAHIMANE BOEING CUSTOMER SERVICES BFS CDG-PARIS

FSE-BOECOM FRI 08/13/93 10:50:16

BOESEA-DDSO21-00024-08/13/93-0845Z

View Message

Message Number:	Action File Name:	Status:
AFA-CDG-93-0215RR	AFA-CDG-93-0190TR	Closed

Model: 737-300 ATA: 2725-10

Subject: RUDDER KICK DURING CRUISE LEMAIRE
/DMQP - JEZEQUEL/DMUR - BONIAU/DONT

AFA-CDG-93-0215RR 16 AUG 93
ATA 2725-10 MODEL 737-300
RUDDER KICK DURING CRUISE
LEMAIRE/DMQP - JEZEQUEL/DMUR - BONIAU/DONT
REF /A/ AFA-CDG-93-0233TR DTD 13 AUG 93 /C/
/B/ AFA-CDG-93-0222TR DTD 04 AUG 93
/C/ SB 737-27-1185 DTD 15 APR 93
/D/ OHM 27-20-01
AIRPLANE HOURS/CYCLES
F-GFUA

THE FOLLOWING INFORMATION IS PROVIDED IN RESPONSE TO THE REF /A/ TELEX REGARDING RUDDER ANOMALIES DURING FLIGHT ON THE DATA AIRPLANE. AFA DESCRIBED THESE ANOMALIES IN THE REF /B/ TELEX. AFA POSED SEVERAL QUESTIONS REGARDING THESE ANOMALIES. THESE QUESTIONS ARE ADDRESSED SEQUENTIALLY BELOW.

1/ AFA COMMENTED THAT THE DATA AIRPLANE /PP902/ IS NOT AFFECTED BY THE REF /C/ SERVICE BULLETIN, AND QUERIED WHETHER BOEING RECOMMENDED THIS BULLETIN BE PERFORMED ON THIS AIRPLANE.

PLEASE NOTE THAT AIRPLANE PP902 IS INCLUDED IN THE AFA EFFECTIVITY BLOCK ON PAGE 2 OF THE REF /C/ SERVICE BULLETIN. ACCORDINGLY, WE RECOMMEND THAT AFA ACCOMPLISH THIS BULLETIN ON THE DATA AIRPLANE, AND ON ALL THEIR MODEL 737 AIRPLANES.

2/ AFA QUERIED WHETHER THE REF /A/ AND REF /B/ DESCRIBED ANOMALIES WERE RELATED TO THE REF /C/ SERVICE BULLETIN.

THE REF /C/ SERVICE BULLETIN PERTAINS TO THE P/N 68010-5003 DUAL SERVO VALVE. THIS IS A MECHANICAL SERVO VALVE WHICH DIRECTLY CONTROLS HYDRAULIC FLOW/PRESSURE TO THE RUDDER PCU ACTUATOR. THE P/N 75130 VALVE DISCUSSED IN THE REF /A/ TELEX IS AN ELECTRO-HYDRAULIC SERVO VALVE. THIS VALVE IS RECEIVES COMMAND SIGNALS FROM THE YAW DAMPER COUPLER AND CONTROLS THE YAW DAMPER MOD PISTON WITHIN THE RUDDER PCU. SINCE THESE TWO VALVES ARE PHYSICALLY AND FUNCTIONALLY INDEPENDENT, WE DO NOT BELIEVE THE REF /A/ ANOMALIES ARE RELATED TO THE REF /C/ SERVICE BULLETIN.

3/ SEE ITEM 2/.

4/ WE SUGGEST THAT AFA REPLACE THE P/N 75130 YAW DAMPER ELECTRO-HYDRAULIC SERVO VALVE AND TEST THE UNIT PER THE REF /D/ OHM.

BOEINGAIR BDJ/KLH/BRUCE CROSS M-7272 2H-95
CUSTOMER SERVICES DIVISION

View Message

Message Number:	Action File Name:	Status:
AFA-ORY-93-0194TR	AFA-CDG-93-0190TR	Closed

Model: 737-300 ATA: 2725-10

Subject: RUDDER KICK DURING DESCENT
JEZEQUEL DMUR LEBLANC DMUR

11E0 9097 /dev/sio2 vopems 08/17/93 02:38
DIR 617BOE

/ATTN (617) G. B. CROSS M7272 2H-95
/CC (BFSCDG) L. RAHIMANE CUSTOMER SERVICES REP

AFA-ORY-93-0194TR 17 AUG 93
ATA 2725-10 MODEL 737-300 24 AUG 93 H
RUDDER KICK DURING DESCENT
JEZEQUEL DMUR LEBLANC DMUR
REF /A/ AFA-ORY-93-0187TR
AIRPLANE HOURS/CYCLES
PP911

THE FOLLOWING SENT TO CROSS WITH COPY TO RAHIMANE

DESCRIPTION:

FURTHER TO THE REF /A/ TELEX WE HAVE TODAY FORWARDED THE SECOND EHSV VIA AIR MAIL. INCLUDED IN THE PACKAGE IS A WARRANTY CLAIM FORM SIMILAR TO THAT FORWARDED WITH THE FIRST EHSV.

ACTION:

1. PLEASE ADVISE BOEING FINDINGS ASAP ON BOTH THE EHSV'S AND THE BALL JOINT.

2. AFA NEED TO HAVE BOTH THE EHSV'S BACK AS SOON AS POSSIBLE SINCE THEY ARE SHORT OF SPARE UNITS. PLEASE ARRANGE TO HAVE THEM RETURNED AS SOON AS POSSIBLE.

3. AFA HAVE THE CAPABILITY TO REPAIR THESE VALVES, THEREFORE IT IS NOT NECESSARY FOR BOEING TO ARRANGE FOR REPAIR UNLESS, OF COURSE, THE REPAIR IS "NO CHARGE".

4. PLEASE ADVISE IF THE FIRST VALVE AND BALL JOINT HAVE ARRIVED SAFELY

REGARDS,

A GARDNER / E. FESSLER - BOEING CUSTOMER SERVICES - PARIS/ORLY

FSE-BOECOM TUE 08/17/93 11:42:00

BOESEA-DDSO07-00023-08/17/93-0943Z

View Message

Message Number:	Action File Name:	Status:
AFA-ORY-93-0206RR	AFA-CDG-93-0190TR	Closed

Model: 737-300 ATA: 2725-10

Subject: RUDDER KICK DURING DESCENT
JEZEQUEL DMUR LEBLANC DMUR

AFA-ORY-93-0206RR 17 AUG 93
ATA 2725-10 MODEL 737-300 24 AUG 93 H 25 AUG 93 F
RUDDER KICK DURING DESCENT9
JEZEQUEL DMUR LEBLANC DMUR
REF /A/ AFA-ORY-93-0187TR DTD 10 AUG 93 /H/
/B/ AFA-ORY-93-0181TR DTD 03 AUG 93
/C/ AFA-ORY-93-0195RR DTD 06 AUG 93
/D/ AFA-CDG-93-0190TR DTD 09 JUL 93
AIRPLANE HOURS/CYCLES
PP911

THE FOLLOWING MESSAGE SENT TO E.FESSLER /BCSR/ WITH A CC TO L.RAHIMANE /BCSR/.

THE FOLLOWING INFORMATION IS PROVIDED IN RESPONSE TO THE REF /A/ TELEX REGARDING RUDDER CONTROL ANOMALIES ON THE DATA AIRPLANE. THESE ANOMALIES WERE DESCRIBED IN THE REF /B/ TELEX. IN THE REF /C/ TELEX, WE REQUESTED THE MOOG P/N A71882-1, S/N 1728 RUDDER PCU ELECTROHYDRAULIC SERVO VALVE /EHSV/ AND THE BALL JOINT WHICH WERE REMOVED FROM THIS AIRPLANE DURING TROUBLESHOOTING. WE ALSO REQUESTED THE SAME EHSV WHICH WAS REMOVED FROM AIRPLANE PP902/F-GFUA DURING TROUBLESHOOTING OF RUDDER CONTROL ANOMALIES.

IN THE REF /A/ TELEX, AFA ADVISED THAT THEY WERE SENDING THE REQUESTED PARTS FROM THE DATA AIRPLANE, AND THAT THE EHSV FROM AIRPLANE PP902 WAS NOT YET AVAILABLE. WE HAVE NOT YET RECEIVED ANY OF THESE PARTS. WE WILL ADVISE AFA OF THE RECEIPT OF THESE PARTS AND/OR STATUS OF OUR INVESTIGATION BY 24 AUG 93.

ADDITIONALLY, FURTHER REVIEW OF THE FLIGHT DATA PROVIDED IN THE FAXED ATTACHMENT TO THE REF /D/ TELEX HAS RESULTED IN THE FOLLOWING QUESTIONS:

1/ THE DATA INDICATES APPROXIMATELY SEVEN DEGREES OF AILERON DISPLACEMENT DURING THE YAW DAMPER ANOMALY. THE DATA ALSO INDICATES THE AIRSPEED WAS APPROXIMATELY 290 KTS. ACCORDINGLY, WE ASSUME THAT FLAPS WERE IN THE //UP// POSITION AT THIS TIME.

PLEASE NOTE THAT THE AILERON FORCE LIMITER LIMITS LATERAL AUTOPILOT AUTHORITY TO APPROXIMATELY FIVE DEGREES AILERON DISPLACEMENT WHEN FLAPS ARE IN THE UP POSITION. THE SEVEN DEGREES AILERON DISPLACEMENT INDICATES THAT EITHER THE AILERON FORCE LIMITER IS NOT FUNCTIONING PROPERLY OR THERE WAS ADDITIONAL FLIGHT CREW INPUT BEYOND THE AUTOPILOT INPUT DURING THE YAW DAMPER ANOMALY. PLEASE ADVISE US IF THE AILERON FORCE LIMITER HAS BEEN CHECKED ON THE DATA AIRPLANE, AND/OR WHETHER FLIGHT CREW INPUT WAS RESPONSIBLE FOR THIS AILERON DEFLECTION.

2/ THE DATA ALSO INDICATES THAT BOTH THE LEFT AND RIGHT AILERONS WERE IN THE MINUS FOUR DEGREES POSITION DURING NORMAL FLIGHT. HAS THE AILERON RIGGING AND/OR THE AILERON POSITION TRANSMITTERS BEEN CHECKED ON THIS AIRPLANE/Q/ IS IT POSSIBLE THAT THE ZERO

POSITION ON THESE TWO TRACES IS NOT CORRECT/Q/

IF POSSIBLE, PLEASE PROVIDE THIS INFORMATION BY 25 AUGUST 93.

BOEINGAIR BDJ/KLH/BRUCE CROSS M-7272 2H-95
CUSTOMER SERVICES DIVISION
/VNB 08/17/93 1611

View Message

Message Number:	Action File Name:	Status:
AFA-CDG-93-0244TR	AFA-CDG-93-0190TR	Closed

Model: 737-300 ATA: 2200-00

Subject: RUDDER KICK DURING DESCENT

11E0 9633 /dev/sio2 vopems 08/19/93 09:32
DIR 617BOE

/ATTN (617) G. B. CROSS
/7/7/7/7 AIRLINE SUPPORT MANAGER M-72B3 2H-95
/CC (BFSORY) E. FESSLER BOEING CUSTOMER SERVICES - ORY

AFA-CDG-93-0244TR 19 AUG 93
ATA 2725-10 MODEL 737-300 25 AUG 93 H
RUDDER KICK DURING DESCENT
FINEL-DONT,LEMAIRE-DMQP
REF /A/ AFA-ORY-93-0206RR
/B/ AFA-CDG-93-0221TR
/C/ AFA-CDG-93-0214RR
/D/ FAX, FLIGHT RECORDER DATA
/E/ OM 07.20.03
/F/ OM 07.20.06A ,07.20.02
AIRPLANE HOURS/CYCLES
PP911

FOLLOWING MESSAGE SENT TO B. CROSS WITH COPY TO E. FESSLER

SUBSEQUENT TO REFS, AIR FRANCE OPERATIONS REQUESTS CONFIRMATION OF CERTAIN OPERATIONAL ASPECTS OF THE AUTOPILOT. AS NOTED ON THE REF /D/ FLIGHT DATA, JUST AFTER THE SUBJECT EVENT, LNAV DISENGAGED. THERE APPEARS TO BE A SHORT TIME INTERVAL AND THEN CWS BECOMES ACTIVE, AND FINALLY IT REVERTS TO MANUAL.

IT APPEARS TO AIR FRANCE THAT LNAV DISENGAGED PRIOR TO ANY ACTION BY THE CREW. THE A/P APPARENTLY REVERTED TO CWS, BUT NOT UNTIL SOME TIME AFTER LNAV DROPPED OFF.

AFA REQUESTS EXPLANATION FOR POSSIBLE CAUSES OF LNAV DISENGAGE /ASSUMING NO CREW INPUT AT THAT POINT/, AS WELL AS WHY THE SYSTEM REVERTED TO CWS AND WHY THERE WAS APPARENTLY AN INTERVAL INBETWEEN THE TWO.

ACTION:
1. BESIDES CREW INPUT TO A/P CONTROLS OR CONTROL WHEEL, WHAT COULD HAVE CAUSED LNAV TO DISENGAGE DURING THE EVENT /Q/

2. WHY DID THE SYSTEM APPARENTLY REVERT TO CWS FOR ABOUT 8 SECONDS BEFORE DISENGAGING ALTOGETHER /Q/

3. WHY IS THERE APPARENTLY AN INTERVAL BETWEEN LNAV AND CWS AS REFLECTED ON THE REF /D/ DATA /Q/

THIS TELEX RELATES TO REF /A/, BUT IS NOT INTENDED TO PROVIDE ANSWERS TO THE QUESTIONS OF REF /A/.

WALKER/RAHIMANE BOEING CUSTOMER SERVICES BFSCDG - PARIS

FSE-BOECOM THU 08/19/93 18:42:11

View Message

Message Number:	Action File Name:	Status:
AFA-ORY-93-0215RR	AFA-CDG-93-0190TR	Closed

Model: 737-300 ATA: 2725-10

Subject: RUDDER KICK DURING DESCENT
JEZEQUEL DMUR LEBLANC DMUR

AFA-ORY-93-0215RR 24 AUG 93
ATA 2725-10 MODEL 737-300 02 SEP 93 H
RUDDER KICK DURING DESCENT-
JEZEQUEL DMUR LEBLANC DMUR
REF /A/ AFA-ORY-93-0187TR DTD 10 AUG 93 /H/
/B/ AFA-ORY-93-0194TR DTD 17 AUG 93 /C/
/C/ AFA-ORY-93-0206RR DTD 17 AUG 93
/D/ AFA-ORY-93-0181TR DTD 03 AUG 93
AIRPLANE HOURS/CYCLES
PP911

THE FOLLOWING MESSAGE SENT TO E.FESSLER /BCSR/ WITH A CC TO L.RAHIMANE /BCSR/.

THE FOLLOWING INFORMATION IS PROVIDED IN RESPONSE TO THE REF /B/ TELEX AND IS FURTHER INFORMATION TO THE REF /C/ TELEX REGARDING RUDDER CONTROL ANOMALIES. THESE ANOMALIES WERE DESCRIBED IN THE REF /D/ TELEX. WE REQUESTED THE MOOG P/N A71882-1, S/N 1728 RUDDER PCU ELECTROHYDRAULIC SERVO VALVE /EHSV/ AND THE BALL JOINT WHICH WERE REMOVED FROM THE DATA AIRPLANE DURING TROUBLESHOOTING. WE ALSO REQUESTED THE SAME PART NUMBER EHSV WHICH WAS REMOVED FROM AIRPLANE PP902/F-GFUA DURING TROUBLESHOOTING OF RUDDER CONTROL ANOMALIES. IN THE REF /B/ TELEX, AFA REQUESTED CONFIRMATION OF RECEIPT OF THE PARTS FROM AIRPLANE PP911, AND ADVISED THAT THE EHSV FROM AIRPLANE PP902 HAD BEEN SENT.

WE HAVE RECEIVED THE FORWARDED PARTS FROM AIRPLANE PP911. PER THE REF /B/ REQUEST, WE PLAN TO TEST AND EXAMINE THE EHSV FROM THIS AIRPLANE, AND RETURN IT TO AFA AS QUICKLY AS POSSIBLE IN ORDER TO MAINTAIN ADEQUATE SPARES. WE HAVE NOT YET RECEIVED THE EHSV FROM AIRPLANE PP902. HOWEVER, SIMILAR TO THE S/N 1728 EHSV, WE PLAN TO EXPEDITE THE EXAMINATION AND RETURN OF THIS EHSV UPON ITS RECEIPT. WE WILL ADVISE AFA OF THE STATUS OF THESE PARTS AND OUR EXAMINATION/TESTING BY 02 SEP 93.

BOEINGAIR BDJ/KLH/BRUCE CROSS M-7272 2H-95
CUSTOMER SERVICES DIVISION
/VNB 08/24/93 1614

View Message

Message Number:	Action File Name:	Status:
AFA-CDG-93-0228RR	AFA-CDG-93-0190TR	Closed

Model: 737-300 ATA: 2211-00

Subject: RUDDER KICK DURING DESCENT - AUTOPILOT OPERATION

AFA-CDG-93-0228RR 25 AUG 93
ATA 2211-00 MODEL 737-300
RUDDER KICK DURING DESCENT - AUTOPILOT OPERATION
REF /A/ AFA-CDG-93-0244TR DTD 19 AUG 93 /C/
/B/ AFA-CDG-93-0190TR DTD 09 JUL 93

THE FOLLOWING MESSAGE SENT TO L.RAHIMANE /BCSR/ WITH A CC TO E.FESSLER /BCSR/.

IN THE REFERENCE (A) TELEX, AFA ASKED SEVERAL QUESTIONS RELATED TO AUTOPILOT OPERATION WITH THE RUDDER KICK EVENT REPORTED IN THE REF (B) MESSAGE. THE FOLLOWING PROVIDES A RESPONSE TO THE THREE QUESTIONS IN THE REF (A) TELEX.

Q1. BESIDES CREW INPUT TO A/P CONTROLS OR CONTROL WHEEL, WHAT COULD HAVE CAUSED LNAV TO DISENGAGE DURING THE REPORTED EVENT?

ANS. WE REVIEWED THE DATA PROVIDED BY AFA FOR THE REPORTED EVENT AND, BASED ON THIS DATA, WE ARE NOT ABLE TO EXPLAIN WHAT CAUSED LNAV TO DISCONNECT DURING THIS EVENT.

Q2. WHY DID THE SYSTEM APPARENTLY REVERT TO CWS FOR ABOUT 8 SECONDS BEFORE DISENGAGING ALTOGETHER?

ANS. THE REFERENCE (B) TELEX REPORTED THAT THE AUTOPILOT WAS DISENGAGED AFTER THE RUDDER KICK EVENT OCCURRED. THIS SEEMS TO INDICATE A MANUAL DISENGAGEMENT. WE ARE NOT ABLE TO DETERMINE WHY THE AUTOPILOT SYSTEM WOULD HAVE DISENGAGED AUTOMATICALLY, OR REVERTED TO THE CWS MODE, BASED ON THE DATA PROVIDED.

Q3. WHY IS THERE APPARENTLY AN INTERVAL BETWEEN LNAV AND CWS AS REFLECTED IN THE DATA THAT WAS FAXED WITH THE REF (A) TELEX?

ANS. THE DATA PROVIDED BY AFA INDICATES THAT THERE WAS NO DELAY BETWEEN THE TIME WHEN LNAV WAS ENGAGED AND WHEN THE CWS MODE WAS SUBSEQUENTLY ENGAGED. THE RECORDED DATA INDICATES THAT BIT ASSOCIATED WITH LNAV ENGAGE IS RECORED EVERY TWO SECONDS, AND THE BIT ASSOCIATED WITH CWS ENGAGE IS SET EVERY FOUR SECONDS, AS FOLLOWS:

TIME REFERENCE	LNAV BIT	CWS BIT
T = 0	1	
1		
2	1	
3		
4	1	
5		
6		
7		

8	1
9	
10	
11	
12	1

THE CWS BIT WAS RECORDED AT THE FIRST OPPORTUNITY AFTER THE LNAV BIT WAS SET TO "NOT TRUE".

PLEASE ADVISE IF AFA HAS FURTHER QUESTIONS REGARDING THE RECORDED DATA FOR THE SUBJECT EVENT.

BOEINGAIR JSR/KLH/BRUCE CROSS M-7272 2H-95
CUSTOMER SERVICES DIVISION
/VNB 08/25/93 1850

View Message

Message Number:	Action File Name:	Status:
AFA-ORY-93-0202TR	AFA-CDG-93-0190TR	Closed

Model: 737-300 ATA: 2725-10

Subject: RUDDER KICK DURING DESCENT JEZEQUEL DMUR LEBLANC DMUR

11E0 0514 /dev/sio2 vopems 08/25/93 06:58
DIR 617BOE

/ATTN (617) G. B. CROSS M7272 2H-95
/CC (BFSCDG) L. RAHIMANE CUSTOMER SERVICES REP

AFA-ORY-93-0202TR 25 AUG 93
ATA 2725-10 MODEL 737-300 1 SEP 93 F
RUDDER KICK DURING DESCENT JEZEQUEL DMUR LEBLANC DMUR
REF /A/ AFA-ORY-93-0206RR
AIRPLANE HOURS/CYCLES
PP911

FOLLOWING MESSAGE SENT TO CROSS WITH COPY TO RAHIMANE

QUESTION 1.

BOEING ASKED IF THE AILERON FORCE LIMITER HAS BEEN CHECKED AND/OR IF FLIGHT CREW INPUT WAS RESPONSIBLE FOR THE AILERON DEFLECTION.

RESPONSE;

AFA ADVISE THAT FLIGHT CREW INPUT WAS NOT RESPONSIBLE FOR THE AILERON DEFLECTION. THE ONLY CREW ACTION WAS TO SWITCH OFF THE YAW DAMPER. AFA ALSO ADVISE THAT THE AIRPLANE WILL BE IN CDG WITHIN THE NEXT TWO OR THREE DAYS AND THE AILERON FORCE LIMITER WILL BE CHECKED THEN, TIME PERMITTING. WE WILL PROVIDE AN UPDATE BY 01 SEP 93.

QUESTION 2.

BOEING ASKED IF THE AILERON RIGGING AND AILERON POSITION TRANSMITTERS AHD BEEN CHECKED.

RESPONSE

AFA ADVISE THAT THEY HAVE CHECKED THE AIRPLANE AILERON RIGGING AND THE POSITION TRANSMITTERS AND THEY ARE CORRECTLY RIGGED. THE MINUS FOUR DEGREES IS A RESULT OF THE GROUND EQUIPMENT USED TO READ THIS DATA. THE LINE AT MINUS FOUR DEGREES IS THE TRUE ZERO.

ACTION

NONE - FOR YOUR INFORMATION.

REGARDS

A GARDNER/E. FESSLER - BOEING CUSTOMER SERVICES - PARIS/ORLY

FSE-BOECOM WED 08/25/93 16:01:06

BOESEA-DDSO22-00033-08/25/93-1404Z

View Message

Message Number:	Action File Name:	Status:
AFA-ORY-93-0203TR	AFA-CDG-93-0190TR	Closed

Model: 737-300 ATA: 2725-10

Subject: RUDDER KICK DURING DESCENT JEZEQUEL DMUR LEBLANC DMUR

11E0 0712 /dev/sio2 vopems 08/26/93 06:22
DIR 617BOE

/ATTN (617) G. B. CROSS M7272 2H-95
/CC (BFSCDG) L. RAHIMANE CUSTOMER SERVICES REP

AFA-ORY-93-0203TR 26 AUG 93
ATA 2725-10 MODEL 737-300
RUDDER KICK DURING DESCENT JEZEQUEL DMUR LEBLANC DMUR
REF /A/ AFA-ORY-93-0202TR
AIRPLANE HOURS/CYCLES
PP911

FOLLOWING MESSAGE SENT TO CROSS WITH COPY TO RAHIMANE

FURTHER TO THE REF /A/ TELEX, AFA HAVE NOW CHECKED THE DATA AIRPLANE AILERON FORCE LIMITER AND FOUND IT TO BE WITHIN CORRECT LIMITS.

ACTION

NONE - FOR YOUR INFORMATION.

REGARDS

A GARDNER/E. FESSLER - BOEING CUSTOMER SERVICES - PARIS/ORLY

FSE-BOECOM THU 08/26/93 15:24:17

BOESEA-DDSO08-00019-08/26/93-1329Z

View Message

Message Number:	Action File Name:	Status:
AFA-CDG-93-0266TR	AFA-CDG-93-0190TR	Closed

Model: 737-300 ATA: 2725-10

Subject: RUDDER KICK THEVENET
-DMQP/SATP GRANDJEAN/SAKSIK-DMQP/TE FINEL-DONT

11E0 1851 /dev/sio2 vopems 09/02/93 06:23
DIR 617BOE

/ATTN (617) G. B. CROSS
/7/7/7/7 AIRLINE SUPPORT MANAGER M-72B3 2H-95
/CC (BFSORY) E. FESSLER BOEING CUSTOMER SERVICES - ORY

// RUSH // RUSH // RUSH // RUSH // RUSH // RUSH // RUSH // RUSH

AFA-CDG-93-0266TR 2 SEP 93
ATA 2725-10 MODEL 737-300 2 SEP 93 H
RUDDER KICK
THEVENET-DMQP/SATP GRANDJEAN/SAKSIK-DMQP/TE FINEL-DONT
REF /A/ TELECON RAHIMANE/DIDONATO DATED 02-SEP-93
/B/ AFA-ORY-93-0203TR ATA /2725-10/ DATED 26 AUG 93 /C/
/C/ AFA-ORY-93-0202TR ATA /2725-10/ DATED 25 AUG 93 /C/
/D/ AFA-ORY-93-0215RR ATA /2725-10/ DATED 24 AUG 93 /C/
/E/ AFA-CDG-93-0244TR ATA /2725-10/ DATED 19 AUG 93 /C/
/F/ AFA-ORY-93-0206RR ATA /2725-10/ DATED 17 AUG 93 /C/
/G/ AFA-ORY-93-0194TR ATA /2725-10/ DATED 17 AUG 93 /C/
/H/ AFA-CDG-93-0215RR ATA /2725-10/ DATED 16 AUG 93 /C/
/I/ AFA-CDG-93-0233TR ATA /2221-20/ DATED 13 AUG 93 /C/
/J/ AFA-ORY-93-0195RR ATA /2725-10/ DATED 06 AUG 93 /C/
/K/ AFA-CDG-93-0222TR ATA /2221-20/ DATED 04 AUG 93 /C/
/L/ AFA-ORY-93-0181TR ATA /2221-20/ DATED 03 AUG 93 /C/
/M/ AFA-CDG-93-0215TR ATA /2221-20/ DATED 27 JUL 93 /C/
/N/ AFA-CDG-93-0199TR ATA /2221-20/ DATED 19 JUL 93 /C/
/O/ AFA-CDG-93-0190TR ATA /2221-20/ DATED 19 JUL 93 /C/
/P/ FAXED ATTACHMENT - 8 PAGES

THE FOLLOWING MESSAGE SENT TO B. CROSS WITH COPY TO E. FESSLER.

INTRODUCTION

THE RUDDER KICK EVENT WAS FIRST REPORTED IN THE REFERENCE /O/ MESSAGE. THIS CONDITION OCCURRED DURING DESCENT WHICH TWO (2) PASSENGERS WERE SLIGHTLY INJURED. THE CAUSES OF THIS CONDITION WERE REPORTED IN THE REFERENCES /L/ AND /M/ MESSAGES. LATER, RUDDER KICK DURING CRUISE ON A DIFFERENT AIRPLANE WAS REPORTED ON SEVERAL OCCASIONS PER THE REFERENCE /K/ MESSAGE. CONSEQUENTLY, THE EHSV WAS SHIPPED TO BOEING FOR INVESTIGATION.

DESCRIPTION

AIR FRANCE ADVISES TODAY THAT AIRPLANE F-GHUM EXPERIENCED TWO (2) VIOLENT RUDDER KICKS DURING TAKEOFF ROLL. THE FIRST CONDITION OCCURRED ON 15 JUN 93. THE TAKEOFF SPEED WAS 100 KNOTS AND THE AIRPLANE YAWED TO THE RIGHT. CONSEQUENTLY, AIR FRANCE MAINTENANCE HAS INSPECTED THE NOSE WHEEL STEERING, AND NOSE GEAR WITHOUT ANY ANOMALIES NOTED.

THE SECOND CONDITION OCCURRED ON 20 AUG 93. THE TAKEOFF SPEED WAS 120 KNOTS AND THE YAWED TO THE RIGHT AT APPROXIMATELY TWO (2)

METERS OFF THE RUNWAY CENTERLINE. THE FLIGHT CREW INDICATED THAT THERE WERE NO CONTROL WHEEL NOR RUDDER INPUTS AT THAT TIME, AND NO MOVEMENTS OF THE PEDALS NOR THE CONTROL WHEEL DURING RUDDER DISPLACEMENT.

FURTHERMORE, THE CREW FELT THAT THERE WAS A DROP TO THE LEFT HAND SIDE OR BRAKE APLLICATION ON THE RIGHT HAND SIDE. CONSEQUENTLY, AIR FRANCE MAINTENANCE REPLACED THE YAW DAMPER COMPUTER AND THE IFC ACCESSORY UNIT. FURTHERMORE, THE ELECTRICAL SYSTEM WAS CHECKED WITHOUT ANOMALIES NOTED. ALSO, AIR FRANCE INDICATES THAT THE RUDDER POWER UNIT, M175, WAS REPLACED DURING MAINTENANCE CHECK IN JULY 93.

DATA FROM THE QAR TAPE INDICATED A 12.3 DEGREES OF RUDDER MOVEMENT AT A SPEED OF 125 KNOTS. THE LATERAL ACCELERATION WAS 0.211 G AND THE ELAPSE TIME OF THE RUDDER MOVEMENT WAS 2 SECONDS. THE REFERENCE /P/ PRESENTS THE QAR DATA.

CONCLUSION

AIR FRANCE HAS NOT BEEN ABLE TO RESOLVE THE RUDDER KICK EVENTS DURING DIFFERENT PHASES (DESCENT, CRUISE, TAKEOFF ROLL). HOWEVER, AIR FRANCE BELIEVES THAT ALL THE EVENTS MAY NOT BE RELATED TO THE SAME CAUSES.

ACTION
IN ORDER TO ASSIST AIR FRANCE IN RESOLVING THE RUDDER KICK EVENTS, AIR FRANCE WOULD LIKE TO INQUIRE THE FOLLOWING.

1/ IS IT POSSIBLE THAT THE YAW DAMPER WOULD CAUSE THE RUDDER MOVEMENT AT 12.3 DEGREES /Q/.

NOTE: THERE WERE NO CONTROL WHEEL NOR RUDDER PEDALS INPUTS.

2/ WHETHER OR NOT THE YAW DAMPER IS THE CAUSE, AIR FRANCE WOULD LIKE BOEING TO PROVIDE EXPLANATION.

3/ TO BETTER UNDERSTAND THE YAW DAMPER SYSTEM, AIR FRANCE WOULD LIKE TO INQUIRE THE FUNCTION OF THE YAW DAMPER WHEN THE AIRPLANE IS TAXIING, TAKING OFF, LANDING AND ROLLING OUT.

4/ THE OPERATING LIMITS OF THE YAW DAMPER ARE +/- 3 DEGREES. ARE THESE LIMITS PROVIDED BY THE YAW DAMPER COMPUTER, OR THE MECHANICAL STOPS OR OTHER SYSTEM /Q/.

5/ AIR FRANCE WOULD ALSO TO INQUIRE WHETHER ANY OTHER OPERATORS EXPERIENCED SIMILAR CONDITIONS.

6/ PLEASE PROVIDE ANY RECOMMENDATIONS DEEMED NECESSARY TO RESOLVE THE RUDDER KICK EVENTS.

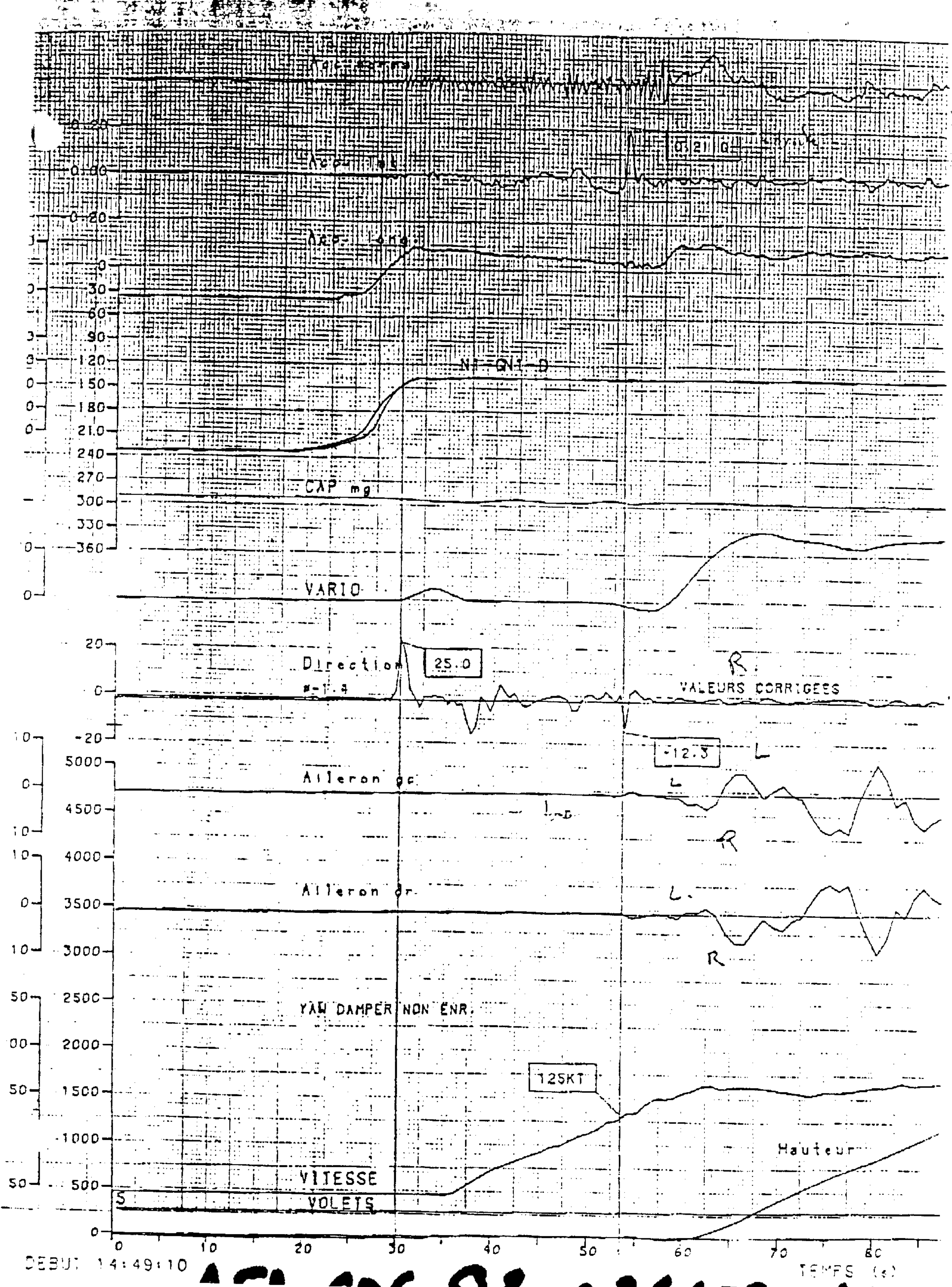
7/ DURING THE REFERENCE /A/ TELECON, IT WAS AGREED THAT BFS-CDG WILL INITIATE A TELECON AT 08:30 A.M (SEATTLE TIME) TO DISCUSS FURTHER THIS CONDITION. THE FOLLOWING AIR FRANCE MEMBERS WILL BE PRESENT DURING THE TELECON.

PIERRE LAMBERT	MANAGER	DMQP/SATP
GERARD THEVENET		DMQP/STAP
ALAIN GRANDJEAN		DMQP/TE
JEAN-MARC LEMAIRE		DMQP/TE
FINEL		DONT
BONIAU		DONT
LATIF RAHIMANE		BOEING CUSTOMER SERVICES
JAMES WALKER		COEING CUSTOMER SERVICES

RAHIMANE BOEING CUSTOMER SERVICES BFS CDG-PARIS

FSE-BOECOM THU 09/02/93 15:34:45

BOESEA-DDSO25-00041-09/02/93-1329Z


N1 GN1 D
CAP mg
VARIO
Direction
25.0
VALEURS CORRIGEES
-12.3
Aileron gc
Aileron dr
YAW DAMPER NON ENR.
125KT
Hauteur
VITESSE
VOLETS
DEBUT 14:49:10
TEMPS (s)

View Message

Message Number:	Action File Name:	Status:
AFA-CDG-93-0237RR	AFA-CDG-93-0190TR	Closed

Model: 737-300 ATA: 2725-10

Subject: RUDDER KICK

AFA-CDG-93-0237RR 02 SEP 93
ATA 2725-10 MODEL 737-300 14 SEP 93 F
RUDDER KICK
REF /A/ AFA-CDG-93-0266TR DTD 02 SEP 93 /C/
/B/ TELECON BOEING/AFA ON 02 SEP 93
/C/ 737-300 MM 27-21-00
/D/ AFA-CDG-93-0190TR DTD 09 JUL 93
/E/ AFA-ORY-93-0181TR DTD 03 AUG 93
/F/ 737-SL-27-82-B DTD 13 JUL 93
AIRPLANE HOURS/CYCLES
PP911

THE FOLLOWING MESSAGE SENT TO L. RAHIMANE /BCSR/ WITH A COPY TO E. FESSLER /BCSR/.

THE FOLLOWING INFORMATION IS PROVIDED IN RESPONSE TO THE REF /A/ TELEX REGARDING RUDDER CONTROL ANOMALIES ON THE DATA AIRPLANE. AFA ADVISED OF TWO SEPARATE REPORTS OF //UNCOMMANDED// RUDDER MOVEMENT ON THIS AIRPLANE. THE FIRST OCCURRED ON 15 JUN 93 DURING TAKEOFF ROLL AT 100 KNOTS. AFA ADVISED AIRPLANE YAW KICKS TO THE RIGHT. THE SECOND OCCURRED ON 20 AUG 93 ALSO DURING TAKEOFF ROLL AT 120 KNOTS. FLIGHT RECORDER DATA INDICATES A RUDDER DISPLACEMENT OF 12.3 DEGREES TO THE LEFT FOR THIS REPORT. AFA POSED SEVERAL QUESTIONS REGARDING THESE ANOMALIES. THESE QUESTIONS WERE ADDRESSED IN THE REF /B/ TELECON. OUR RESPONSES TO THESE QUESTIONS ARE REPEATED FOR YOUR CONVENIENCE.

1. IT IS NOT POSSIBLE FOR THE YAW DAMPER ALONE TO CAUSE RUDDER MOVEMENT OF 12.3 DEGREES. IN ORDER TO MORE EASILY UNDERSTAND THE YAW DAMPER OPERATION, WE SUGGEST THAT AFA REFER TO THE REF /C/ MAINTENANCE MANUAL FIGURE 1, SHEET 2 /RUDDER CONTROL SYSTEM COMPONENT LOCATION/ AND FIGURE 6 /RUDDER POWER CONTROL SYSTEM SCHEMATIC/.

THE YAW DAMPER COUPLER COMMANDS MOVEMENT OF THE RUDDER BY SENDING ELECTRICAL SIGNALS TO THE RUDDER PCU TRANSFER VALVE. THIS RESULTS IN PORTING OF HYDRAULIC PRESSURE TO THE YAW DAMPER ACTUATOR WHICH TRANSLATES AXIALLY. THIS MOVES THE PRIMARY SUMMING LEVER WHICH, IN TURN MOVES THE PRIMARY VALVE RESULTING IN MOVEMENT OF THE ACTUATOR PISTON AND RUDDER.

PLEASE NOTE THAT THERE IS NO FEEDBACK INTO THE MANUAL RUDDER CONTROL SYSTEM DURING YAW DAMPER OPERATION. ACCORDINGLY, THERE IS NO MOVEMENT OF THE MAIN RUDDER PCU INPUT ROD OR RUDDER PEDALS WHEN THE RUDDER MOVES DUE TO YAW DAMPER COMMANDS. THIS MEANS THE RUDDER PCU EXTERNAL SUMMING LINKAGE IS ESSENTIALLY GROUNDED AT THE ATTACHMENT POINT TO THIS INPUT ROD. THEREFORE, AS THE RUDDER MOVES PER THE YAW DAMPER COMMAND, THE EXTERNAL SUMMING LINKAGE MOVES THE PCU INPUT SHAFT AND PHYSICALLY SUMS OUT THE MECHANICAL COMMAND TO THE PCU PRIMARY VALVE. THE RUDDER PCU CEASES TO MOVE WHEN THE YAW DAMPER INPUT IS COMPLETELY SUMMED OUT AT THE YAW DAMPER AUTHORITY LIMIT /3 DEGREES FOR P/N 65-44861-9 RUDDER PCU/.

2. SEE ITEM 1.

3. AS DISCUSSED IN THE REF /B/ TELECON, THE YAW DAMPER SYSTEM IS EITHER ON OR OFF. THERE IS NO DISTINCTION BETWEEN GROUND AND AIR MODES. THE YAW DAMPER SYSTEM WILL REACT TO AIRPLANE YAW ON THE GROUND THE SAME WAY IT REACTS IN THE AIR.

4. THE YAW DAMPER AUTHORITY IS PHYSICALLY LIMITED BY THE STROKE OF THE YAW DAMPER ACTUATOR AND THE MECHANICAL SUMMING DISCUSSED IN ITEM 1. YAW DAMPER ACTUATOR STROKE IS DEPENDENT UPON RUDDER PCU CONFIGURATION.

5. WE HAVE HAD A NUMBER OF PREVIOUS REPORTS OF RUDDER KICKS. MOST OF THESE REPORTS HAVE BEEN ATTRIBUTED TO YAW DAMPER ANOMALIES.

6. OUR REVIEW OF PREVIOUS AFA CORRESPONDENCE INDICATES THERE HAVE BEEN A TOTAL OF THREE RECENT REPORTS OF RUDDER CONTROL ANOMALIES ON THE DATA AIRPLANE, THE TWO REPORTS DISCUSSED ABOVE AND THE REF /D/ REPORT. THE REF /E/ TELEX INCLUDED MORE DETAILS ABOUT THE THIRD REPORT WHICH OCCURRED IN CRUISE/DESCENT AT 290 KNOTS. AFA ALSO ADVISED IN THIS TELEX THAT THEIR INVESTIGATION OF THE RUDDER PCU REVEALED DISCREPANT OPERATION OF THE ELECTROHYDRAULIC SERVO VALVE /TRANSFER VALVE/, AND THAT THE CAP WHICH HOUSES THE ELECTRICAL PORTION OF THIS VALVE CONTAINED HYDRAULIC FLUID. THIS VALVE WAS SENT TO US FOR OUR EXAMINATION.

WE HAVE NOT YET EXAMINED THIS VALVE. HOWEVER, THE INFORMATION PROVIDED BY AFA INDICATES THAT THE RUDDER ANOMALY IN CRUISE AND THE FIRST RUDDER ANOMALY DURING TAKEOFF ROLL ARE BOTH LIKELY DUE TO DISCREPANT OPERATION OF THE TRANSFER VALVE.

WE HAVE REVIEWED THE REF /A/ DETAILS AND THE FAXED FDR DATA FOR THE SECOND /AUG 20/ RUDDER ANOMALY REPORT DURING TAKEOFF ROLL. WE DO NOT BELIEVE THIS REPORT IS RELATED TO THE OTHER TWO REPORTS DUE TO THE MAGNITUDE OF THE RUDDER DISPLACEMENT /12.3 DEGREES/. WE BELIEVE THERE WAS A MANUAL INPUT TO THE RUDDER PCU FROM SOME SOURCE WHICH CAUSED THIS RUDDER DEFLECTION. IN ORDER TO FURTHER EVALUATE THIS REPORT, WE WOULD APPRECIATE IT IF AFA COULD PROVIDE THE FOLLOWING INFORMATION.

A/ PLEASE ADVISE WEATHER CONDITIONS AT THE AIRPORT WHERE THIS ANOMALY WAS REPORTED ON THE DAY OF THE REPORT. WERE THERE GUSTING WINDS /Q/ FROM WHAT DIRECTION RELATIVE TO THE TAKEOFF DIRECTION /Q/

B/ WAS THE RUDDER TRIM ON THIS AIRPLANE CONFIRMED TO BE AT NEUTRAL PRIOR TO TAKEOFF ROLL /Q/ WAS RUDDER TRIM REQUIRED FOLLOWING TAKEOFF DURING CLIMB OUT /Q/ WHAT DIRECTION AND HOW MUCH /Q/ WAS THERE A JUMP SEAT PASSENGER ON THIS FLIGHT /Q/ WERE THERE ANY FOREIGN OBJECT PLACED ON THE AFT AISLE STAND /Q/

C/ IN THE REF /B/ TELECON, AFA ADVISED THAT FLIGHT CREW MEMBERS DID NOT HAVE THEIR FEET ON THE RUDDER PEDALS DURING TAKEOFF ROLL. PLEASE CONFIRM THIS STATEMENT. IS THIS NORMAL OPERATING PROCEDURE /Q/ IF YES, HOW IS THE AIRPLANE STEERED DURING TAKEOFF ROLL /Q/ IS TILLER STEERING USED AT SPEEDS ABOVE TAXI SPEED /Q/ COULD ONE OF THE FLIGHT CREW MEMBERS HAVE INADVERTENTLY BUMPED OR KICKED THE RUDDER PEDALS AT THE TIME OF THE RUDDER DISPLACEMENT.

D/ AFA COMMENTED THAT THE CREW FELT THERE WAS A DROP IN THE LEFT WING OR BRAKE APPLICATION TO THE RIGHT SIDE OF THE AIRPLANE. HOWEVER, THE FDR DATA FOR THIS EVENT INDICATES THAT THE RUDDER DISPLACEMENT WAS TO THE LEFT, WHICH WOULD PRODUCE A LEFT YAW.

BRAKE APPLICATION TO THE RIGHT SIDE WOULD PRODUCE RIGHT YAW. PLEASE CONFIRM THE STATEMENT IN REF /A/ TELEX AND THE RUDDER DISPLACEMENT DIRECTION IN THE FDR DATA. THIS INFORMATION IS OF PARTICULAR SIGNIFICANCE BECAUSE IF THE TOP OF EITHER THE CAPTAINS OR FIRST OFFICERS LEFT RUDDER PEDAL WAS ACCIDENTALLY BUMPED, A LEFT RUDDER COMMAND AND LEFT MLG BRAKING WOULD RESULT.

IF POSSIBLE, PLEASE PROVIDE THIS INFORMATION BY 14 SEP 93.

FURTHER INFORMATION

IN THE REF /B/ TELECON, AFA ADVISED THAT OPERATION OF THE DATA AIRPLANE IS CONTINUING WITH THE YAW DAMPER SYSTEM OFF. AS DISCUSSED ABOVE, WE DO NOT THINK THE MOST RECENT RUDDER ANOMALY ON THIS AIRPLANE WAS YAW DAMPER RELATED. FURTHER, WE BELIEVE THE PREVIOUS TWO REPORTS WERE LIKELY RESOLVED BY REMOVAL OF THE DISCREPANT RUDDER PCU TRANSFER VALVE. ACCORDINGLY, WE BELIEVE THAT YAW DAMPER OPERATION SHOULD BE RESUMED ON THIS AIRPLANE.

AFA ALSO QUERIED REGARDING THE POSSIBLE ASSOCIATION OF THE RUDDER ANOMALIES ON THIS AIRPLANE AND THE CONDITION DISCUSSED IN THE REF /F/ SERVICE LETTER. AS NOTED IN THIS TELECON, THE REF /F/ SERVICE LETTER PERTAINS TO ANOMALIES IN THE MAIN RUDDER PCU DUAL SERVO VALVE. THE ANOMALIES REPORTED BY AFA DO NOT INCLUDE THE SYMPTOMS OF THE REF /F/ DISCUSSED CONDITION. ACCORDINGLY, WE DO NOT BELIEVE THESE REPORTS ARE RELATED TO THE REF /F/ SERVICE LETTER.

IF AFA EXPERIENCES FURTHER RUDDER KICK ANOMALIES, WE SUGGEST THAT THE FOLLOWING ITEMS BE CONSIDERED.

- IS THERE ANY FEEDBACK THROUGH THE RUDDER PEDALS. IF YES, CHECK THE STANDBY RUDDER PCU INPUT CRANK FOR BINDING PER THE REF /C/ MAINTENANCE MANUAL TROUBLESHOOTING SECTION. IF NO, YAW DAMPER SYSTEM IS SUSPECT.

- WHEN CHECKING FOR YAW DAMPER ANOMALIES, CONSIDER THE FOLLOWING ITEMS:
  - YAW DAMPER COUPLER / RATE GYRO
  - YAW DAMPER SYSTEM WIRING AND CONNECTIONS, ESPECIALLY TO THE RUDDER PCU
  - RUDDER PCU TRANSFER VALVE
  - RUDDER PCU SOLENOID VALVE

- RUDDER TRIM
  - WAS TRIM INADVERTENTLY APPLIED TO THE RUDDER SYSTEM
  - RUDDER TRIM SWITCH STICKING

- WEATHER CONDITIONS, GUSTY WINDS, ETC

- FOREIGN OBJECTS OR OBSTRUCTIONS IN THE RUDDER PEDAL AREA

- ASYMMETRIC ENGINE THRUST

FOLLOWING RECEIPT OF THE PREVIOUSLY REQUESTED INFORMATION, WE WILL RESPOND ACCORDINGLY. PLEASE ADVISE US IF FURTHER ASSISTANCE IS REQUIRED.

BOEINGAIR BDJ/KLH/BRUCE CROSS M-7272 2H-95
CUSTOMER SERVICES DIVISION
/GRD 09/02/93 1931

View Message

Message Number:	Action File Name:	Status:
AFA-ORY-93-0220RR	AFA-CDG-93-0190TR	Closed

Model: 737-300 ATA: 2725-10

Subject: RUDDER KICK DURING DESCENT

AFA-ORY-93-0220RR 02 SEP 93
ATA 2725-10 MODEL 737-300 15 SEP 93 H
RUDDER KICK DURING DESCENT
REF /A/ AFA-ORY-93-0187TR DTD 10 AUG 93 /H/
/B/ AFA-ORY-93-0215RR DTD 24 AUG 93
/C/ AFA-ORY-93-0181TR DTD 03 AUG 93
AIRPLANE HOURS/CYCLES
PP902
PP911

THE FOLLOWING MESSAGE SENT TO E. FESSLER /BCSR/ WITH A CC TO L. RAHIMANE /BCSR/.

THE FOLLOWING IS FURTHER INFORMATION TO THE REF /B/ TELEX REGARDING RUDDER CONTROL ANOMALIES. THESE ANOMALIES WERE DESCRIBED IN THE REF /C/ TELEX. WE REQUESTED THE MOOG P/N A71882-1, S/N 1728 RUDDER PCU ELECTROHYDRAULIC SERVO VALVE /EHSV/ AND THE BALL JOINT WHICH WERE REMOVED FROM THE DATA AIRPLANE DURING TROUBLESHOOTING. WE ALSO REQUESTED THE SAME PART NUMBER EHSV WHICH WAS REMOVED FROM AIRPLANE PP902/F-GFUA DURING TROUBLESHOOTING OF RUDDER CONTROL ANOMALIES. IN THE REF /B/ TELEX, AFA REQUESTED CONFIRMATION OF RECEIPT OF THE PARTS FROM AIRPLANE PP911, AND ADVISED THAT THE EHSV FROM AIRPLANE PP902 HAD BEEN SENT.

AS DISCUSSED IN THE REF /B/ TELEX, WE HAVE RECEIVED THE PARTS FROM AIRPLANE PP911. WE HAVE NOW RECEIVED THE EHSV FROM AIRPLANE PP902. WE INTEND TO EXAMINE THESE UNITS AS SOON AS SCHEDULING PERMITS. WE WILL ADVISE AFA OF THE STATUS OF THIS EXAMINATION BY 15 SEP 93.

BOEINGAIR BDJ/KLH/BRUCE CROSS M-7272 2H-95
CUSTOMER SERVICES DIVISION
/GRD 09/02/93 1932

View Message

Message Number:	Action File Name:	Status:
AFA-CDG-93-0280TR	AFA-CDG-93-0190TR	Closed

Model: 737-300 ATA: 2725-10

Subject: RUDDER KICK
GRANDJEAN - DMQP/TE

11E0 3414 /dev/sio2 vopems 09/13/93 08:51
DIR 617BOE

/ATTN (617) G. B. CROSS
/7/7/7/7 AIRLINE SUPPORT MANAGER M-72B3 2H-95

AFA-CDG-93-0280TR 13 SEP 93
ATA 2725-10 MODEL 737-300 20 SEP 93 F
RUDDER KICK
GRANDJEAN - DMQP/TE
REF /A/ AFA-CDG-93-0237RR DATED 02 SEP 93 /C/
/B/ AFA-CDG-93-0266TR DATED 02 SEP 93 /C/
AIRPLANE HOURS/CYCLES
PP911

THE FOLLOWING MESSAGE SENT TO B. CROSS WITH TO E. FESSLER.

THE REFERENCE /A/ MESSAGE INDICATED THAT IN ORDER TO FURTHER EVALUATE THE REFERENCE /B/ REPORT, BOEING WOULD APPRECIATE IT IF AIR FRANCE COULD PROVIDE THE INFORMATION REQUESTED IN THE REFERENCE /A/ MESSAGE.

ACTION
AIR FRANCE IS STILL GATHERING THE INFORMATION AS REQUESTED BY BOEING AND WILL PROVIDE IT AT A LATER DATE.

RAHIMANE BOEING CUSTOMER SERVICES BFS CDG-PARIS

FSE-BOECOM MON 09/13/93 18:01:50

BOESEA-DDSO25-00042-09/13/93-1557Z

View Message

Message Number:	Action File Name:	Status:
AFA-ORY-93-0231RR	AFA-CDG-93-0190TR	Closed

Model: 737-300 ATA: 2725-10

Subject: RUDDER KICK DURING DESCENT

AFA-ORY-93-0231RR 15 SEP 93
ATA 2725-10 MODEL 737-300 06 OCT 93 H
RUDDER KICK DURING DESCENT
REF /A/ AFA-ORY-93-0187TR DATED 10 AUG 93 /H/
/B/ AFA-ORY-93-0220RR DATED 2 SEP 93
/C/ AFA-ORY-93-0181TR DATED 3 AUG 93
AIRPLANE HOURS/CYCLES
PP911

THE FOLLOWING MESSAGE SENT TO E.FESSLER /BCSR/ WITH A CC TO L.RAHIMANE /BCSR/.

THE REFERENCE /B/ TELEX ADVISED OUR RECEIPT OF THE EHSV REMOVED FROM THE RUDDER PCU ON AFA AIRPLANE PP902 AND THE RUDDER PCU EHSV AND PCU FORWARD SUPPORT BEARING WHICH WERE REMOVED FROM AFA AIRPLANE PP911. WE ARE CURRENTLY ACCOMPLISHING PRELIMINARY TESTING OF THE REMOVED EHSV/S. UPON COMPLETION OF THIS TESTING, WE WILL SCHEDULE OUR DISASSEMBLY AND EXAMINATION OF THE REMOVED PARTS. WE WILL PROVIDE YOU FURTHER STATUS OF OUR TESTING AND EXAMINATION ON OR BEFORE 6 OCTOBER 1993.

BOEINGAIR JAH/KLH/BRUCE CROSS M-7272 2H-95
CUSTOMER SERVICES DIVISION
/VNB 09/15/93 1720

View Message

Message Number:	Action File Name:	Status:
AFA-CDG-93-0297TR	AFA-CDG-93-0190TR	Closed

Model: 737-300 ATA: 2725-10

Subject: RUDDER KICK
GRANDJEAN - DMQP/TE BONIAU - DONT

11E0 4487 /dev/sio2 vopems 09/20/93 01:49
DIR 617BOE

/ATTN (617) G. B. CROSS
/7/7/7/7 AIRLINE SUPPORT MANAGER M-72B3 2H-95
/CC (BFSORY) E. FESSLER BOEING CUSTOMER SERVICES - ORY

AFA-CDG-93-0297TR 20 SEP 93
ATA 2725-10 MODEL 737-300 27 SEP 93 F
RUDDER KICK
GRANDJEAN - DMQP/TE BONIAU - DONT
REF /A/ AFA-CDG-93-0280TR DATED 13 SEP 93 /C/
/B/ AFA-CDG-93-0237RR DATED 02 SEP 93 /C/
/C/ AFA-CDG-93-0266TR DATED 02 SEP 93 /C/
AIRPLANE HOURS/CYCLES
PP911

THE FOLLOWING MESSAGE SENT TO B. CROSS WITH TO E. FESSLER.

THE REFERENCE /B/ MESSAGE INDICATED THAT IN ORDER TO FURTHER EVALUATE THE REFERENCE /C/ REPORT, BOEING WOULD APPRECIATE IT IF AIR FRANCE COULD PROVIDE THE INFORMATION REQUESTED IN THE REFERENCE /B/ MESSAGE.

ACTION
AIR FRANCE IS STILL GATHERING THE INFORMATION AS REQUESTED BY BOEING AND WILL PROVIDE A STATUS UPDATE AT A LATER DATE.

RAHIMANE BOEING CUSTOMER SERVICES BFS CDG-PARIS

FSE-BOECOM MON 09/20/93 11:02:06

BOESEA-DDSO25-00020-09/20/93-0856Z

View Message

Message Number:	Action File Name:	Status:
AFA-ORY-93-0238RR	AFA-CDG-93-0190TR	Closed

Model: 737-300 ATA: 2725-10

Subject: RUDDER KICK DURING DESCENT

AFA-ORY-93-0238RR 27 SEP 93
ATA 2725-10 MODEL 737-300 06 OCT 93 H 30 SEP 93 F
RUDDER KICK DURING DESCENT
REF /A/ AFA-ORY-93-0231RR DTD 15 SEP 93
/B/ AFA-ORY-93-0181TR DTD 03 AUG 93
/C/ AFA-ORY-93-0187TR DATED 10 AUG 93 /H/
AIRPLANE HOURS/CYCLES
PP911

THE FOLLOWING MESSAGE SENT TO E. FESSLER /BCSR/ WITH COPY TO L. RAHIMANE /BCSR/.

THE FOLLOWING IS FURTHER INFORMATION TO THE REF /A/ TELEX REGARDING OUR EXAMINATION OF THE ELECTROHYDRAULIC SERVO VALVES REMOVED FROM AIRPLANES PP902 AND PP911. IN THE REF /B/ TELEX, AFA STATED THE FOLLOWING OF THE EHSV REMOVED FROM AIRPLANE PP911:

//...AFA DETERMINED THAT AT NO TIME WAS THERE ANY PRESSURE ON ONE SIDE OF THE YAW DAMPER ACTUATOR. THERE WAS, HOWEVER, PRESSURE ON THE OPPOSITE SIDE. THE PRESSURIZED YAW DAMPER ACTUATOR ALWAYS RESULTED IN A RIGHT RUDDER MOVEMENT.//

IN ORDER TO ASSIST US IN OUR INVESTIGATION, WE WOULD APPRECIATE IT IF AFA WOULD PROVIDE FURTHER DETAILS REGARDING THIS INFORMATION. PLEASE INCLUDE THE FOLLOWING INFORMATION:

1/ HOW DID AFA DETERMINE THAT THE YAW DAMPER ACTUATOR /MOD PISTON/ WAS ONLY RECEIVING HYDRAULIC PRESSURE ON ONE SIDE /Q/

2/ DID AFA CONFIRM THAT THE YAW DAMPER MOD PISTON WAS MOVING TO ONE SIDE WHEN HYDRAULIC POWER WAS APPLIED, OR COULD THE MOD PISTON HAVE BEEN //STUCK// IN THAT POSITION /Q/

3/ WAS THE ELECTROHYDRAULIC SERVO VALVE //STUCK// IN ONE POSITION, THUS COMMANDING THE MOD PISTON MOVEMENT TO ONE SIDE. HOW DID AFA DETERMINE THIS /Q/

4/ IF YES TO 3/, DID AFA DETERMINE WHETHER THE EHSV POSITION RESULTED FROM AN ELECTRICAL OR A MECHANICAL MALFUNCTION. IF YES, HOW WAS THIS DETERMINATION MADE /Q/

IF POSSIBLE, PLEASE PROVIDE THIS INFORMATION BY 30 SEP 93. WE WILL ADVISE AFA OF THE STATUS OF OUR INVESTIGATION BY 06 OCT 93.

BOEINGAIR BDJ/KLH/BRUCE CROSS M-7272 2H-95
CUSTOMER SERVICES DIVISION
/CLA 09/27/93 1454

View Message

Message Number:	Action File Name:	Status:
AFA-ORY-93-0227TR	AFA-CDG-93-0190TR	Closed

Model: 737-300 ATA: 2725-10

Subject: RUDDER KICK DURING DESCENT
JEZEQUEL DMUR

11E0 5869 /dev/sio2 vopems 09/28/93 07:45
DIR 617BOE

/ATTN (617) G. B. CROSS M7272 2H-95
/CC (BFSCDG) L. RAHIMANE CUSTOMER SERVICES REP

AFA-ORY-93-0227TR 28 SEP 93
ATA 2725-10 MODEL 737-300 6 OCT 93 H
RUDDER KICK DURING DESCENT
JEZEQUEL DMUR
REF /A/ AFA-ORY-93-0238RR
/B/ AFA-ORY-93-0231RR
/C/ AFA-ORY-93-0181TR
/D/ AFA-ORY-93-0187TR
AIRPLANE HOURS/CYCLES
PP911

THE FOLLOWING SENT TO CROSS WITH COPY TO RAHIMANE

DESCRIPTION:
AFA PROVIDES THE FOLLOWING IN RESPONSE TO LIKE NUMBERED QUESTIONS IN REF/A/:

1. DURING BENCH TEST OF THE SERVO VALVE, AN ELECTRICAL SIGNAL WAS PROVIDED TO DRIVE THE VALVE IN BOTH DIRECTIONS. THE PRESSURE, HOWEVER, REMAINED HIGH ON ONE SIDE AND LOW ON THE OTHER SIDE AT ALL TIMES.
2. AFA INSTALLED THE SERVO VALVE ON A PCU. THE RESULT WAS THE SAME AS THE BENCH TEST, THE YAW DAMPER MOD PISTON STAYED IN THE SAME POSITION AT ALL TIMES REGARDLESS OF ELECTRICAL SIGNAL TO THE SERVO VALVE.
3. AND 4. AFA DOES NOT HAVE THE ANSWERS TO THESE QUESTIONS. AFA ADVISES THAT THE REASON THE SERVO VALVE WAS SENT TO BOEING WAS TO OBTAIN THE ANSWERS TO THESE QUESTIONS.

ACTION:
PLEASE ADVISE STATUS OF INVESTIGATION.

REGARDS,

EARL FESSLER - CUSTOMER SERVICES MANAGER - PARIS/ORLY

FSE-BOECOM TUE 09/28/93 16:51:18

BOESEA-DDSO03-00054-09/28/93-1454Z

View Message

Message Number:	Action File Name:	Status:
AFA-CDG-93-0307TR	AFA-CDG-93-0190TR	Closed

Model: 737-300 ATA: 2725-10

Subject: RUDDER KICK FINEL -
DONT THEVENET/GRANDJEAN - DMQP

11E0 6001 /dev/sio2 vopems 09/29/93 00:03
DIR 617BOE

/ATTN (617) G. B. CROSS
/7/7/7/7 AIRLINE SUPPORT MANAGER M-72B3 2H-95
/CC (BFSORY) E. FESSLER BOEING CUSTOMER SERVICES - ORY

AFA-CDG-93-0307TR 29 SEP 93
ATA 2725-10 MODEL 737-300
RUDDER KICK
FINEL - DONT THEVENET/GRANDJEAN - DMQP
REF /A/ AFA-CDG-93-0237RR DATED 02 SEP 93 /C/
/B/ AFA-CDG-93-0266TR DATED 02 SEP 93 /C/
/C/ TELECON BOEING/AFA DATED 02 SEP 93
AIRPLANE HOURS/CYCLES
PP911

THE FOLLOWING MESSAGE SENT TO B. CROSS WITH COPY TO E. FESSLER.

IN ORDER TO FURTHER EVALUATE THE REFERENCE /B/ REPORT, BOEING WOULD APPRECIATE IF AIR FRANCE COULD PROVIDE FURTHER INFORMATION. THUS, AIR FRANCE PROVIDES THE FOLLOWING RESPONSES.

QUESTION A

PLEASE ADVISE WHEATHER CONDITIONS AT THE AIRPORT WHERE THIS ANOMALY WAS REPORTED ON THE DAY OF THE REPORT. WERE THERE GUSTING WINDS /Q/ FROM WHAT DIRECTION RELATIVE TO THE TAKEOFF DIRECTION /Q/.

RESPONSE A

AIR FRANCE INDICATED THAT WHEATHER CONDITIONS AT THE AIRPORT WHICH IS LOCATED AT CAVOK, WAS AS FOLLOWS:

. HEADWIND WAS LESS THAN 10 KNOTS.
. THERE WERE NO GUSTING WINDS.

QUESTION B

WAS THE RUDDER TRIM ON THIS AIRPLANE CONFIRMED TO BE AT NEUTRAL PRIOR TO TAKEOFF ROLL /Q/ WAS RUDDER TRIM REQUIRED FOLLOWING TAKEOFF DURING CLIMB OUT /Q/ WHAT DIRECTION AND HOW MUCH /Q/ WAS THERE A JUMP SEAT PASSENGER ON THIS FLIGHT /Q/ WERE THERE ANY FOREIGN OBJECT PLACED ON THE AFT AISLE STAND /Q/.

RESPONSE B

AIR FRANCE ADVISED THAT THE RUDDER TRIM ON THIS AIRPLANE WAS TO BE AT NEUTRAL PRIOR TO TAKEOFF ROLL AS SPECIFIED IN THE CHECKLIST; THE RUDDER TRIM WAS NOT REQUIRED FOLLOWING TAKEOFF DURING CLIMB OUT; THE DIRECTION OF THE WHEEL WAS NO MORE THAN 0.2 UNIT AT NEUTRAL; THERE WAS NO JUMP SEAT PASSENGER ON THIS

FLIGHT; THERE WERE NO FOREIGN OBJECT PLACED ON THE AFT AISLE STAND.

QUESTION C

IN THE REFERENCE /C/ TELECON, AIR FRANCE ADVISED THAT FLIGHT CREW MEMBERS DID NOT HAVE THEIR FEET ON THE RUDDER PEDALS DURING TAKEOFF ROLL. PLEASE CONFIRM THIS STATEMENT. IS THIS NORMAL OPERATING PROCEDURE /Q/ IF YES, HOW IS THE AIRPLANE STEERED DURING TAKEOFF ROLL /Q/ IS TILLER STEERING USED AT SPEEDS ABOVE TAXI SPEED /Q/ COULD ONE OF THE FLIGHT CREW MEMBERS HAVE INADVERTENTLY BUMPED OR KICKED THE RUDDER PEDALS AT THE TIME OF THE RUDDER DISPLACEMENT.

RESPONSE C

AIR FRANCE ADVISED THAT THE PILOT HAD HIS FEET ON THE RUDDER PEDALS DURING TAKEOFF ROLL, IN ORDER TO STEER THE AIRCRAFT. TILLER STEERING IS NOT USED FOR SPEED ABOVE 15 KNOTS. FURTHERMORE, FOR FLIGHT CREW MEMBERS (I.E FIRST OFFICER IN THIS CASE) NOT FLYING THE AIRPLANE, THEIR FEET WERE ON THE FLOOR. ALSO, NONE OF THE FLIGHT CREW MEMBERS HAD INADVERTENTLY BUMPED OR KICKED THE RUDDER PEDALS AT THE TIME OF THE RUDDER DISPLACEMENT. AIR FRANCE ALSO INDICATED THAT THE PILOT WHO FLEW THE AIRPLANE DID NOT USE RUDDER OR BRAKE TO CORRECT THE RUDDER DISPLACEMENT.

QUESTION D

AIR FRANCE COMMENTED THAT THE CREW FELT THERE WAS A DROP IN THE LEFT WING OR BRAKE APPLICATION TO THE RIGHT SIDE OF THE AIRPLANE. HOWEVER, THE FDR DATA FOR THIS EVENT INDICATES THAT THE RUDDER DISPLACEMENT WAS TO THE LEFT, WHICH WOULD PRODUCE A LEFT YAW. BRAKE APPLICATION TO THE RIGHT SIDE WOULD PRODUCE RIGHT YAW. PLEASE CONFIRM THE STATEMENT IN REFERENCE /B/ TELEX AND THE RUDDER DISPLACEMENT DIRECTION IN THE FDR DATA. THIS INFORMATION IS OF PARTICULAR SIGNIFICANCE BECAUSE IF THE TOP OF EITHER THE CAPTAINS OR FIRST OFFICERS LEFT RUDDER PEDAL WAS ACCIDENTALLY BUMPED, A LEFT RUDDER COMMAND AND LEFT MLG BRAKING WOULD RESULT.

RESPONSE D

AIR FRANCE CONFIRMED AGAIN THAT THE FLIGHT CREW FELT THERE WAS A DROP IN THE LEFT WING OR BRAKE APPLICATION TO THE RIGHT SIDE OF THE AIRPLANE. AIR FRANCE EMPHASIZED AGAIN THAT THE FLIGHT CREW MEMBERS FELT THESE MOTIONS. HOWEVER, THE FDR DATA FOR THIS EVENT INDICATES THE FOLLOWING:

. HEADING: +0.2 DEGREES RIGHT
. LATERAL ACCELERATION: 0.211G RIGHT

AIR FRANCE INDICATES THAT THIS CONFIRMED A DISPLACEMENT TO THE RIGHT SIDE. THEREFORE, AIR FRANCE FLIGHT OPERATIONS ENGINEERING SUSPECTED THAT THERE WAS A MISTAKE IN THE SIGN CONVENTION OF THE RUDDER DATA FROM THE QUICK ACCESS RECORDER. THUS, AIR FRANCE WAS NOT ABLE TO EXPLAIN OR DETERMINE THE CAUSE OF THIS FAULT.

ACTION
THE ABOVE MESSAGE IS FOR YOUR INFORMATION.

RAHIMANE BOEING CUSTOMER SERVICES BFS CDG-PARIS

FSE-BOECOM WED 09/29/93 08:12:16

BOESEA-DDSO22-00012-09/29/93-0711Z

View Message

Message Number:	Action File Name:	Status:
AFA-ORY-93-0243RR	AFA-CDG-93-0190TR	Closed

Model: 737-300 ATA: 2725-10

Subject: RUDDER KICK DURING DESCENT

AFA-ORY-93-0243RR 06 OCT 93
ATA 2725-10 MODEL 737-300 13 OCT 93 H 12 OCT 93 F
RUDDER KICK DURING DESCENT
REF /A/ AFA-ORY-93-0187TR DTD 10 AUG 93 /B/
/B/ AFA-ORY-93-0231RR DTD 15 SEP 93
/C/ AFA-ORY-93-0227TR DATED 28 SEP 93 /C/
AIRPLANE HOURS/CYCLES
PP911

THE FOLLOWING MESSAGE SENT TO E.FESSLER /BCSR/ WITH A CC TO L.RAHIMANE /BCSR/.

THE FOLLOWING IS FURTHER INFORMATION TO THE REF /B/ TELEX REGARDING OUR EXAMINATION OF THE EHSV/S REMOVED FROM AFA AIRPLANES PP902 AND PP911. THESE EHSV/S WERE REMOVED FOLLOWING RUDDER CONTROL ANOMALIES ON THESE AIRPLANES.

OUR EXAMINATION OF THESE ELECTROHYDRAULIC SERVO VALVES IS CURRENTLY ONGOING. WE WILL ADVISE AFA OF THE STATUS OF THIS INVESTIGATION BY 13 OCT 93.

IN THE MEANTIME, WE ARE INTERESTED IN LEARNING ADDITIONAL INFORMATION REGARDING AFA/S EXAMINATION OF THE EHSV. IF POSSIBLE, PLEASE PROVIDE THE FOLLOWING INFORMATION BY 12 OCTOBER 1993.

1/ AFA ADVISED THAT THE CAP ON THE EHSV WAS FULL OF FLUID. PLEASE ADVISE WHETHER THE FLUID WAS RELEASED FROM THE CAP DURING THIS EXAMINATION, OR WHETHER THE FLUID WAS TRAPPED IN THE CAP AND EHSV.

2/ WAS THE CAP REMOVED FOLLOWING ALL FUNCTIONAL TESTING, OR WAS FURTHER TESTING ACCOMPLISHED AFTER THE CAP WAS REMOVED.

BOEINGAIR BDJ/KLH/BRUCE CROSS M-7272 2H-95
CUSTOMER SERVICES DIVISION
/VNB 10/06/93 1814

View Message

Message Number:	Action File Name:	Status:
AFA-ORY-93-0247RR	AFA-CDG-93-0190TR	Closed

Model: 737-300 ATA: 2725-10

Subject: EXAMINATION OF RUDDER PCU EHSV/S

AFA-ORY-93-0247RR 13 OCT 93
ATA 2725-10 MODEL 737-300 21 OCT 93 H
EXAMINATION OF RUDDER PCU EHSV/S
REF /A/ AFA-ORY-93-0187TR DTD 10 AUG 93 /H/
/B/ AFA-ORY-93-0243RR DTD 06 OCT 93
/C/ AFA-ORY-93-0227TR DTD 28 SEP 93
AIRPLANE HOURS/CYCLES
PP902
PP911

THE FOLLOWING MESSAGE SENT TO E.FESSLER /BCSR/ WITH A CC TO J.DEC /BCSR/.

THE FOLLOWING IS FURTHER INFORMATION TO THE REF /B/ TELEX REGARDING OUR EXAMINATION OF THE ELECTROHYDRAULIC SERVO VALVES /EHSV/ REMOVED FROM AFA AIRPLANES PP902 AND PP911. THESE EHSV/S WERE REMOVED FROM THE RUDDER PCU/S FOLLOWING RUDDER CONTROL ANOMALIES ON THESE AIRPLANES.

WE HAVE COMPLETED OUR EXAMINATION OF THE P/N S252T001-5, S/N 1728 EHSV. THIS VALVE WAS REMOVED FROM THE RUDDER PCU ON AIRPLANE PP911. THE FOLLOWING ARE THE FINDINGS FROM THIS EXAMINATION.

- PRELIMINARY TESTING CONFIRMED LOW INSULATION RESISTANCE. PERFORMANCE OF THE VALVE DID NOT SEEM TO BE AFFECTED BY THIS CONDITION.

- NULL BIAS CURRENT REQUIRED TO MAINTAIN THE VALVE IN THE NEUTRAL POSITION WAS MEASURED AT 0.42MA. THIS SHOULD BE 0.36MA MAXIMUM.

- INSTALLATION AND TESTING OF THIS UNIT ON A RUDDER PCU REVEALED NO ANOMALIES. THE UNIT WAS CYCLED AT VARIOUS FREQUENCIES. OPERATION WAS SMOOTH AND CONTINUOUS. WE WERE UNABLE TO DUPLICATE THE VALVE HARDOVER CONDITION DESCRIBED IN THE REF /C/ TELEX.

- REMOVAL OF THE TORQUE MOTOR CAP REVEALED HYDRAULIC FLUID WITHIN THE TORQUE MOTOR CAVITY. THE CAP WAS NOT FULL, BUT THERE WAS A SMALL POOL OF FLUID IN THE CAP AND ALL PARTS WITHIN THE CAP WERE COATED WITH HYDRAULIC FLUID.

- SMALL PARTICLE CONTAMINATES WERE NOTED SUSPENDED WITHIN THE FLUID AND ON SOME INNER COMPONENTS. WE BELIEVE THAT NONE OF THE OBSERVED PARTICLE WERE LARGE ENOUGH TO CAUSE A TORQUE MOTOR JAM OR SIGNIFICANTLY AFFECT ITS OPERATION.

- THE UNIT WAS PRESSURIZED WITH THE TORQUE MOTOR CAP REMOVED TO INVESTIGATE HYDRAULIC LEAKAGE CONDITION. NO LEAKAGE WAS NOTED DURING THE DURATION OF THIS PRESSURIZATION.

- FURTHER DISASSEMBLY OF THE UNIT REVEALED A SMALL FLOW LINE IMPRESSION ON AN INTERNAL O-RING. ON THIS SAME O-RING, IT WAS

NOTED THAT THE COLOR CODING PAINT WAS VERY THICK AND THE CORNER OF THE PAINT WAS SEPARATING FROM THE O-RING MATERIAL. WE BELIEVE BOTH OF THESE CONDITIONS COULD ALLOW SLOW HYDRAULIC LEAKAGE AND COULD ACCOUNT FOR THE HYDRAULIC FLUID FOUND WITHIN THE MOTOR CAVITY.

IN SUMMARY, WE WERE UNABLE TO DUPLICATE ANY OPERATIONAL DISCREPANCIES IN THIS VALVE. FURTHER, WE WERE UNABLE TO DETECT ANY CONDITIONS WHICH MIGHT HAVE RESULTED IN THE ANOMALIES REPORTED BY AFA. WE INTEND TO RETURN THIS /DISASSEMBLED/ VALVE TO AFA PER THEIR PREVIOUS REQUEST UNLESS AFA ADVISES US OTHERWISE.

WE HAVE NOT YET EXAMINED THE EHSV FROM AIRPLANE PP902. SINCE THIS VALVE WAS RECEIVE IN A PARTIALLY DISASSEMBLED STATE, WE WILL BE UNABLE TO PERFORM FUNCTIONAL TESTING OF THIS UNIT. WE WILL ADVISE AFA OF THE STATUS OF THIS EHSV BY 21 OCT 93.

PLEASE NOTE SUBJECT CHANGE.

JOHNSON/KLH/BRUCE CROSS
CUSTOMER SERVICES DIVISION
BOEINGAIR M-7272 2H-95
/VNB 10/13/93 1555

View Message

Message Number:	Action File Name:	Status:
AFA-ORY-93-0240TR/2	AFA-CDG-93-0190TR	Closed

Model: 737-300 ATA: 2725-10

Subject: RUDDER KICK DURING DESCENT LE
BLANC DMUR JEZEQUEL DMUR

11E0 9045 /dev/sio2 vopems 10/18/93 08:03
DIR 617BOE

/ATTN (617) G. B. CROSS - AIRLINE SUPPORT MGR - M7272 2H-95
/CC (BFSCDG) J. DEC - CUSTOMER SERVICE MGR - PARIS/CDG

AFA-ORY-93-0240TR 18 OCT 93
ATA 2725-10 MODEL 737-300 21 OCT 93 H
RUDDER KICK DURING DESCENT
LE BLANC DMUR JEZEQUEL DMUR
REF /A/ AFA-ORY-93-0243RR
/B/ AFA-ORY-93-0238TR
AIRPLANE HOURS/CYCLES
PP911

THE FOLLOWING SENT TO CROSS WITH COPY TO RAHIMANE

DESCRIPTION:
AFA PROVIDES THE FOLLOWING IN RESPONSE TO QUESTIONS /1/ AND /2/
IN REF/A/.

BEFORE THE VALVE WAS TESTED THE CAP WAS REMOVED AND FLUID WAS
FOUND UNDER THE CAP. THE SUBSEQUENT TESTING WAS DONE WITH THE CAP
REMOVED.

ACTION:
PLEASE ADVISE EXAMINATION RESULTS.

REGARDS,

EARL FESSLER - CUSTOMER SERVICES MANAGER - PARIS/ORLY

FSE-BOECOM MON 10/18/93 16:46:21

BOESEA-DDSO28-00047-10/18/93-1513Z

View Message

Message Number:	Action File Name:	Status:
AFA-CDG-93-0334TR	AFA-CDG-93-0190TR	Closed

Model: 737-300 ATA: 2725-10

Subject: RUDDER KICK
DONT

BONIAU

11E0 9490 /dev/sio2 vopems 10/20/93 04:11
DIR 617BOE

/ATTN (617) G. B. CROSS
/7/7/7/7 AIRLINE SUPPORT MANAGER M-72B3 2H-95
/CC (BFSORY) E. FESSLER CUSTOMER SERVICES MANAGER - ORY

AFA-CDG-93-0334TR 20 OCT 93
ATA 2725-10 MODEL 737-300 26 OCT 93 H
RUDDER KICK
BONIAU DONT
REF /A/ AFA-CDG-93-0190TR
/B/ AFA-CDG-93-0266TR
/C/ AFA-CDG-93-0222TR
/D/ FAX AFA-CDG-93-(SAME AS TELEX) 8 PAGES
/E/ AFA-CDG-93-0214RR
/F/ AFA-CDG-93-0237RR
/G/ AFA-CDG-93-0307TR
AIRPLANE HOURS/CYCLES
PP911
PP902

FOLLOWING MESSAGE SENT TO CROSS WITH COPY TO FESSLER

A REVIEW OF THE VARIOUS TELEXES RELATING TO THE SUBJECT RUDDER KICKS HAS INDICATED A NEED FOR SOME CLARIFICATION. IT IS APPARENT THAT THERE IS SOME CONFUSION ABOUT THE EVENTS BEING REPORTED.

/A/ REF /A/ FIRST REPORTED A RUDDER KICK DURING "DESCENT" ON PP911. THE DATE OF THIS OCCURENCE WAS 24 JUN 93.

/B/ REF /B/ FIRST REPORTED RUDDER KICKS DURING "TAKE OFF" ON THE SAME AIRPLANE, PP911. THE DATES OF THESE EVENTS WERE 15 JUNE 93 AND 20 AUG 93.

/C/ REF /C/ FIRST REPORTED A SERIES OF RUDDER KICKS DURING "CRUISE" ON PP902. THIS CULMINATED IN AN OCCURENCE ON 24 AUG 93. REF /D/ PROVIDES FDR OUTPUT FOR THIS LATTER EVENT. PLEASE NOTE THAT THIS DATA WAS ORIGINALLY INADVERTENTLY FAXED WITH REF /B/ TELEX. THE DATA ON THESE (REF /D/) EIGHT PAGES RELATES TO PP902 NOT PP911.

THE ABOVE EVENTS, ITEMS /A/, /B/ AND /C/ ARE THE ONLY ONES TO HAVE BEEN REPORTED.

AFA OPERATIONS HAVE ASKED A NUMBER OF QUESTIONS RELATIVE TO THESE EVENTS.

ACTION:

1. DOES BOEING HAVE ANYTHING FURTHER TO ADVISE RELATIVE TO REF /E/ ITEM 3 :

"PLEASE EVALUATE THE REFERENCE /F/ PROCEDURES FOR INCLUSION IN THE QRH/OM FOR 737 MODELS AND ADVISE.

WE ARE CURRENTLY REVIEWING THE OPERATIONS MANUAL IN REGARD TO THIS TYPE OF EVENT. WE WILL ADVISE AFA OF ANY REVISION MADE RELATED TO YAW DAMPER MALFUNCTIONS."

2. REF /B/ ASKED IF OTHER OPERATORS HAD EXPERIENCED SIMILAR RUDDER KICK ANOMOLIES. REF /F/ RESPONDED "WE HAVE HAD A NUMBER OF PREVIOUS REPORTS OF RUDDER KICKS. MOST OF THESE REPORTS HAVE BEEN ATTRIBUTED TO YAW DAMPER ANOMALIES". AFA HAVE ASKED IF BOEING COULD DESCRIBE THE PREVIOUS "OTHER OPERATOR" REPORTS. WERE THEY DURING TAKE OFF, CLIMB CRUISE OR DESCENT. HAVE OTHER OPERATORS EXPERIENCED ANY DIRECTIONAL ANOMOLIES FOR ANY OTHER REASON ON THE 737 FLEET.

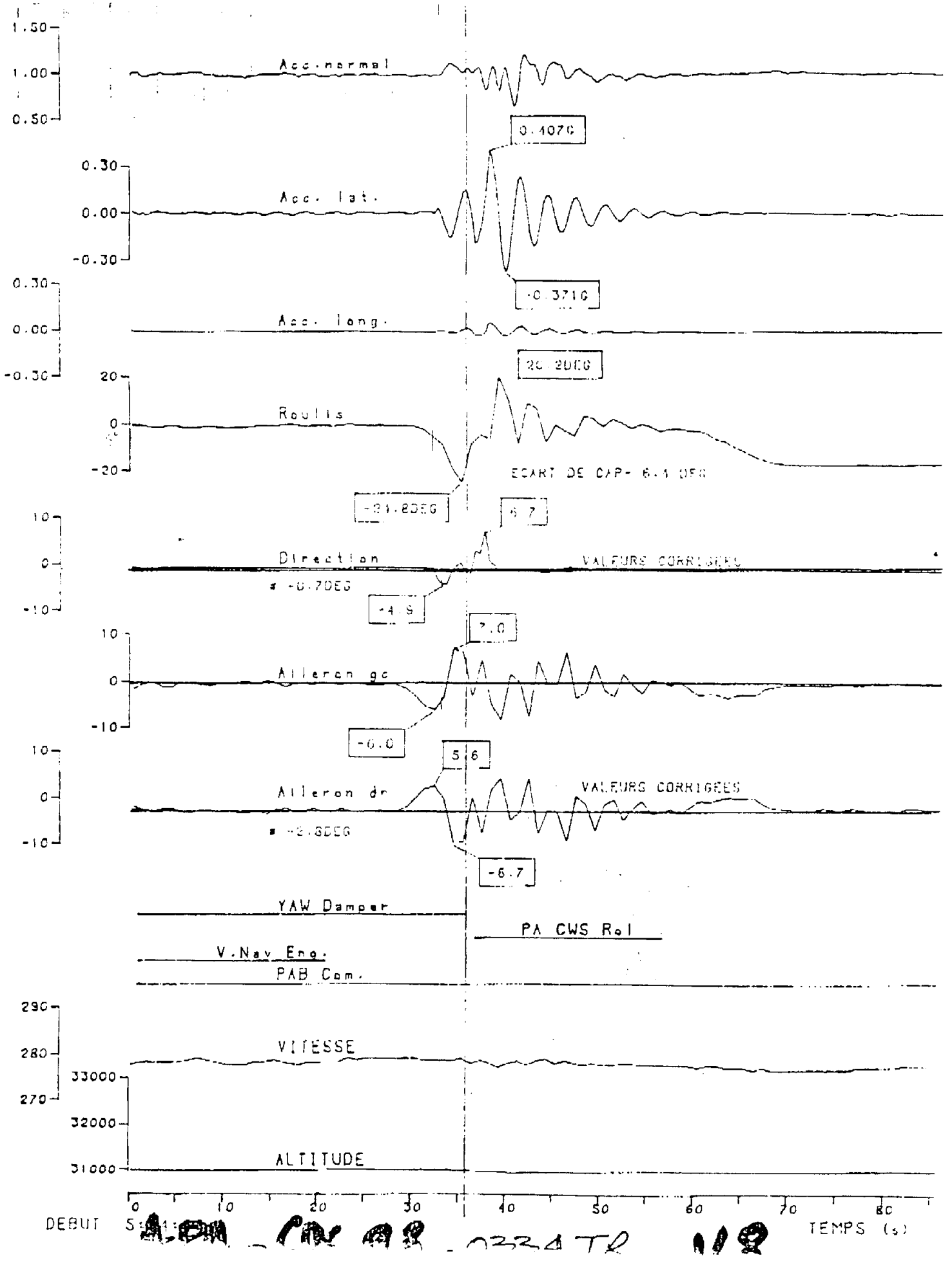
3. PLEASE COMMENT ON THE REF /D/ FAXED FDR PRINT OUT FOR THE RUDDER KICK IN CRUISE EVENT ON PP902 (SEE ITEM /C/ ABOVE)

4. DOES BOEING HAVE FURTHER COMMENTS FOLLOWING THE REF /G/ TELEX WHICH PROVIDED CLARIFICATION FROM AFA ON WEATHER CONDITIONS ETC AT THE TIME OF THE RUDDER KICK EVENT DESCRIBED IN REF /B/.

A. GARDNER/DEC BOEING CUSTOMER SERVICES PARIS/CDG

FSE-BOECOM WED 10/20/93 12:27:13

BOESEA-DDSO22-00028-10/20/93-1121Z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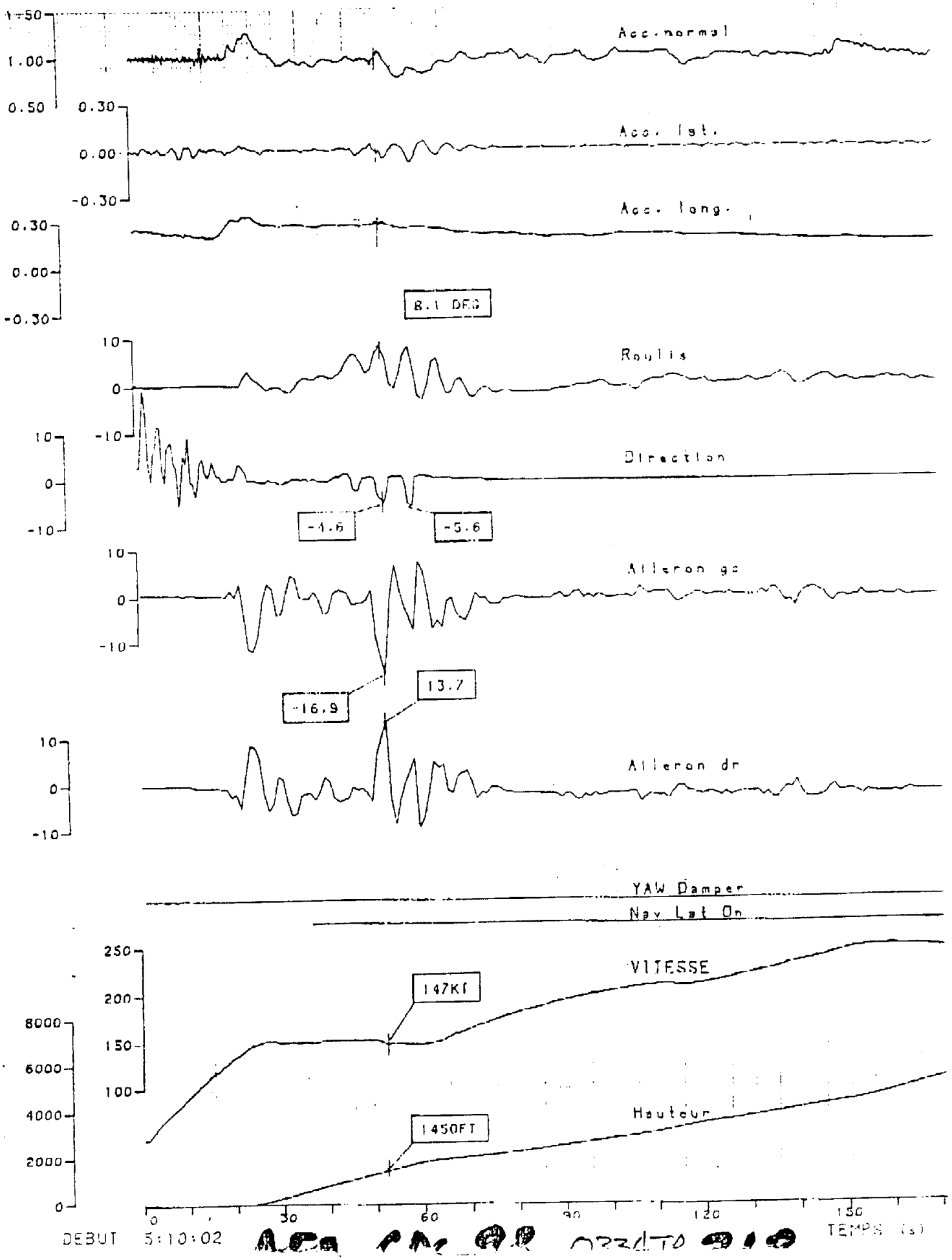
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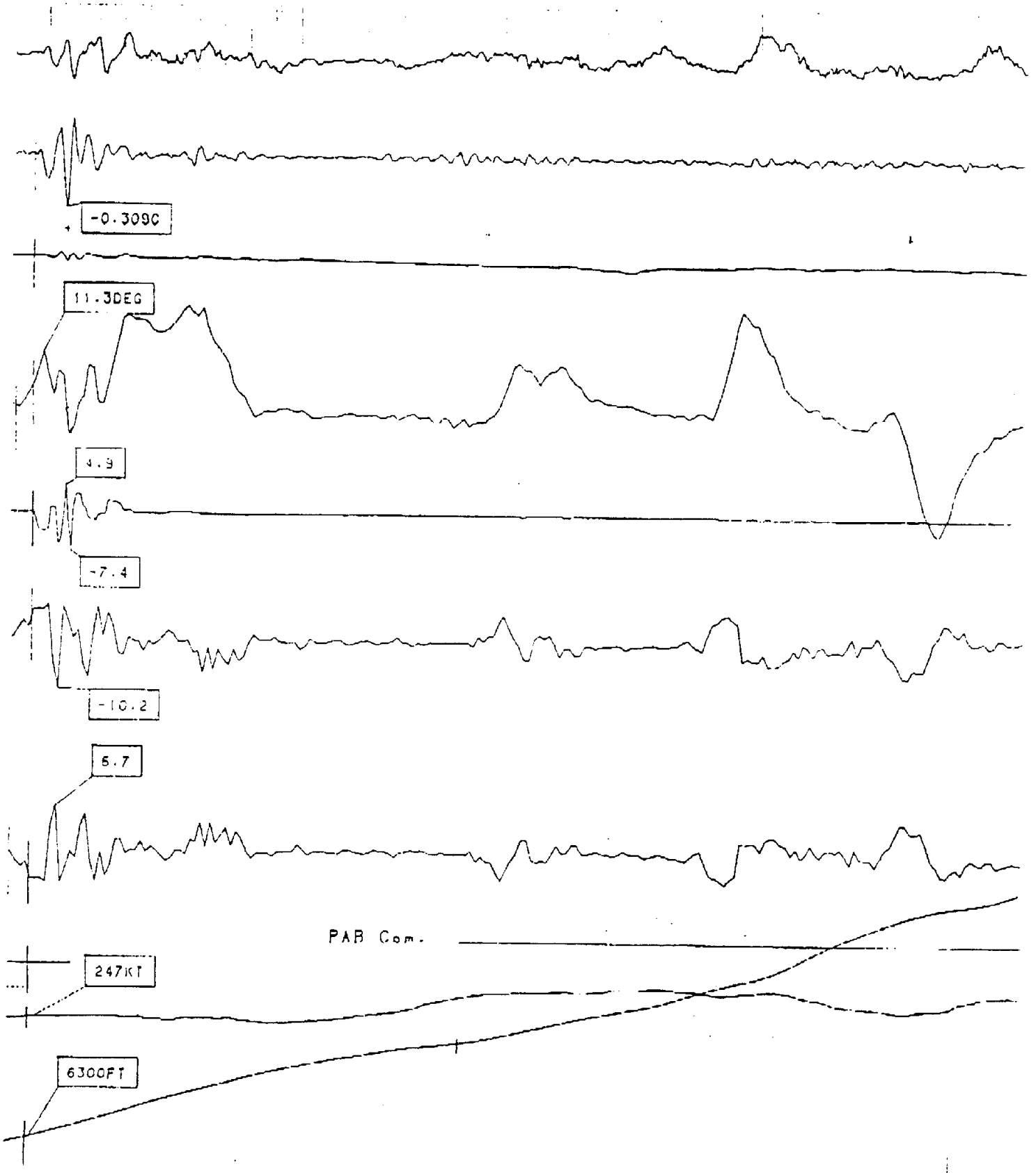
Acc. lat.
Acc. long.
0.30
0.00
-0.30
8.1 DEG
10
0
-10
Roulis
Direction
-4.5
-5.6
Aileron gc
-16.9
13.7
Aileron dr
YAW Damper
Nav Lat On
250
200
150
100
VITESSE
147KT
8000
6000
4000
2000
0
1450FT
Hauteur
0
30
60
90
120
150
TEMPS (s)
DEBUT 5:10:02


-0.309G
11.3DEG
4.9
-7.4
-10.2
5.7
PAB Com.
247KT
6300FT
210
330
360

Cycle	Heure ID (hh:mm:ss)	HAUTD ft	CAP deg	CAS kt	ASSI deg	ATTA deg	ROULI deg	DIR deg	GAUCG deg	GAUCD deg	ACCZ g	ACCY g	ACCX g	PPPPCCNVVY	N1G %	N1D %
	12	6474	335.9	248.5	9.0	2.1	-5.0	-2.8	3.2	-5.6	0.83	0.043	0.159	1	84.6	84.5
	13	6532	342.8	247.5	9.0	1.2	-3.5	1.1	-3.4	-2.5	0.28	0.053	0.154	1	33.9	85.1
9297	5:13:14	6583	340.9	247.5	9.3	2.6	1.3	3.5	1.4	-3.9	1.02	-0.051	0.138		84.7	84.4
	15	6634	342.8	248.5	9.4	2.5	2.7	0.7	-5.6	-2.5	1.04	0.113	0.168		34.5	85.3
	16	6692	343.8	248.0	10.4	2.5	6.5	-1.4	-3.1	4.9	1.13	0.058	0.165		84.9	84.6
	17	6750	341.2	248.0	11.8	3.2	8.2	-1.4	0.7	-6.2	1.14	-0.101	0.154		34.7	84.7
9298	5:13:16	6807	343.8	246.0	10.4	3.2	1.2	-0.7	6.0	-8.4	1.10	-0.043	0.150		35.0	86.7
	19	6871	343.0	248.0	9.3	0.9	1.4	-0.7	0.0	-2.5	0.80	0.061	0.142		84.9	84.1
	20	6935	343.4	247.5	10.0	1.6	5.3	2.1	-.9	-7.6	0.76	-0.002	0.143		35.2	84.5
	21	6995	344.0	247.5	10.0	2.1	9.7	1.8	2.1	-4.9	1.00	0.022	0.150		35.0	84.9
9299	5:13:22	7050	345.9	247.5	10.5	2.5	13.7	1.4	-3.2	0.0	1.08	0.051	0.156		34.6	85.1
	23	7116	347.5	247.0	11.4	3.3	15.4	0.0	-3.5	0.0	1.22	0.038	0.170		84.7	85.7
	24	7178	347.7	247.5	11.6	3.2	16.9	0.4	0.0	-2.8	1.18	-0.035	0.158		35.1	85.6
	25	7242	348.8	247.5	11.3	2.3	17.9	-0.4	-0.7	-2.1	0.99	0.004	0.152		85.3	84.5
9300	5:13:26	7313	350.2	247.5	10.9	2.3	17.6	-0.4	-0.7	-2.1	0.98	-0.008	0.152		35.0	84.2
	27	7383	351.0	248.0	11.1	1.9	17.2	-0.4	-2.8	-0.4	0.96	0.003	0.152		84.6	85.2
	28	7447	351.9	246.0	11.2	2.5	17.1	-0.4	-3.7	-2.5	1.05	-0.014	0.153		35.4	84.7
	29	7511	353.1	246.0	11.1	2.5	15.6	-0.4	-1.4	-1.4	0.98	-0.006	0.152		34.6	86.0
9301	5:13:30	7575	354.4	246.0	10.4	2.1	15.3	-0.4	-0.7	-2.1	0.95	0.012	0.150		35.4	85.1
	31	7633	355.3	246.0	10.2	1.8	15.6	-0.4	0.4	-3.2	0.95	0.013	0.147		35.2	85.0
	32	7690	358.0	244.5	10.0	2.1	16.1	0.0	1.4	-4.2	0.93	-0.018	0.150		84.7	85.0
	33	7748	357.0	244.5	9.5	2.1	17.2	0.0	0.7	-3.5	1.02	0.002	0.156		85.2	85.8
9302	5:13:34	7799	358.4	245.0	9.5	1.9	18.3	0.0	-0.7	-2.1	0.92	0.018	0.152		35.6	85.4
	35	7850	359.6	247.0	9.7	2.3	20.0	0.0	-0.7	-2.1	0.99	0.006	0.155		85.6	85.6
	36	7908	0.5	242.5	9.5	3.0	20.7	0.0	-0.4	-2.8	1.06	-0.019	0.151		35.4	85.8
	37	7959	1.9	247.0	9.0	1.9	19.3	-0.4	-2.8	0.0	0.96	-0.015	0.148		35.4	86.0
9303	5:13:38	8010	4.0	246.5	9.3	2.6	18.7	-0.4	-2.5	-0.4	1.07	0.063	0.166		85.1	86.1
	39	8068	5.4	248.5	10.0	2.6	20.4	-0.4	-7.0	3.5	1.09	-0.025	0.155		35.6	85.8
	40	8119	6.0	247.0	10.0	3.0	16.4	-0.4	-1.8	-1.4	1.09	-0.013	0.157		35.8	85.2
	41	8170	7.7	248.5	9.3	2.5	13.8	-0.4	-6.3	3.5	0.99	0.029	0.153		85.8	85.8
304	5:13:42	8228	8.4	246.5	9.8	2.1	12.6	-0.4	-2.1	-0.7	0.97	0.002	0.155		85.8	85.4
	43	8286	9.0	247.0	9.8	2.3	11.0	-0.4	-4.2	1.1	0.99	-0.005	0.153		85.3	86.0
	44	8337	9.1	248.0	9.7	2.1	7.4	-0.4	-5.3	2.5	1.00	-0.010	0.150		86.0	85.6
	45	8394	9.7	247.5	9.7	2.1	5.1	-0.4	-2.1	-1.1	0.99	0.000	0.149		85.3	86.4
305	5:13:46	8452	10.4	246.5	9.8	2.1	3.5	-0.4	-4.9	1.8	1.00	0.033	0.154		86.1	86.1
	47	8510	10.2	245.5	10.0	2.5	2.9	-0.4	-3.5	0.4	1.01	-0.002	0.151		85.8	86.5
	48	8561	9.8	245.0	9.5	2.3	0.5	-0.4	-0.7	-2.1	0.98	-0.009	0.149		86.6	85.9
	49	8618	10.0	245.0	9.3	1.6	-1.2	-0.4	0.7	-3.5	0.88	0.014	0.147		86.1	85.8
306	5:13:50	8676	13.2	244.5	9.5	2.1	-0.8	-0.4	-0.4	-2.5	0.97	0.013	0.153		85.9	86.3
	51	8727	9.8	243.5	9.0	1.9	0.1	-0.4	-0.4	-2.5	0.92	0.001	0.148		85.7	86.7
	52	8778	9.7	243.5	8.6	1.8	-0.1	-0.4	-0.4	-2.5	0.93	0.002	0.148		86.5	86.1
	53	8830	9.3	243.0	8.1	1.4	0.1	-0.4	0.4	-3.2	0.84	0.010	0.147		86.3	86.6
07	5:13:54	8874	9.2	243.0	8.3	1.8	0.6	-0.4	-0.7	-2.1	0.91	0.005	0.149		86.3	86.3
	55	8919	9.5	243.5	8.1	2.1	0.6	-0.4	-0.7	-2.1	0.96	-0.006	0.150		86.7	86.1
	56	8964	9.5	244.0	7.7	1.9	0.1	-0.4	-3.7	-2.1	0.93	0.000	0.149		86.6	85.9
	57	9002	9.2	244.5	7.9	1.9	-0.2	-0.4	-0.7	-2.1	0.94	0.010	0.150		86.6	86.7
08	5:13:58	9041	9.8	245.0	7.9	2.3	0.3	-0.4	-2.1	-0.7	0.99	0.003	0.152		86.0	87.0
	59	9079	9.7	245.0	7.9	2.3	-0.4	-0.4	-1.4	-1.8	0.98	0.008	0.150		86.6	87.0
	60	9118	9.2	245.5	7.7	2.1	-1.3	-0.4	0.0	-2.8	0.99	0.004	0.150		86.6	86.7
	61	9156	9.5	245.0	7.6	1.9	-1.3	-0.4	-0.7	-2.1	0.93	0.010	0.149		86.0	87.0
10	5:14:2	9194	9.3	245.5	7.6	2.1	-1.1	-0.4	-0.7	-2.1	0.97	0.002	0.150		87.1	86.4
	3	9233	9.3	246.0	7.4	2.1	-1.1	-0.4	-0.7	-2.1	0.92	0.005	0.149		86.4	87.2

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AAI-CD6-93-0334TR 8/8

Cycle	Heure TU	HALTD	CAP	CAS	ASSL	ATTA	ROULI	DIR	GAUCG	GAUCD	ACCZ	ACCY	ACCX	P A A C	P A B C	P A A M	P A B M	C U S P	C U S R	N A V L	V N A O A	V S O N N	Y A W	N1G	N1D
	(h:mn:s)	ft	dg	kt	deg	deg	deg	deg	deg	deg	g	g	g											%	%
	20	4055	333.4	232.2	7.9	3.0	1.7	-0.4	-1.4	-1.4	1.00	0.002	0.167							1			1	83.3	83.4
	21	4087	333.4	233.2	7.7	2.6	0.9	-0.4	-2.8	0.4	0.99	0.003	0.166										1	83.3	83.2
9284	5:12:22	4119	333.6	234.5	7.7	2.6	-0.4	-0.4	-0.4	-2.1	0.97	0.008	0.163							1			1	82.7	83.4
	23	4151	333.4	235.5	7.7	2.6	-0.2	-0.4	-0.2	-3.5	0.97	0.010	0.162										1	83.2	83.3
	24	4183	333.0	236.5	7.4	2.6	-0.3	-0.4	1.1	-3.5	0.98	-0.001	0.161							1			1	83.1	83.0
	25	4215	333.0	237.5	7.2	2.6	0.1	-0.4	1.1	-3.5	0.96	0.003	0.159										1	82.7	83.6
9285	5:12:26	4247	334.2	238.5	7.0	2.5	0.7	-0.4	0.4	-3.2	0.96	0.007	0.159							1			1	83.3	82.7
	27	4279	334.4	239.3	6.9	2.3	1.1	-0.4	0.0	-2.8	0.94	0.003	0.157										1	83.2	83.0
	28	4305	333.6	241.5	6.9	2.5	1.4	-0.4	-1.4	-1.2	0.97	0.008	0.155							1			1	83.0	83.7
	29	4330	333.6	242.0	6.9	2.3	1.5	-0.4	-2.1	-0.7	0.96	0.003	0.154										1	83.4	83.2
9286	5:12:30	4356	333.7	244.0	6.7	2.3	0.5	-0.4	-0.7	-2.1	1.01	0.003	0.153							1			1	83.0	83.5
	31	4382	333.9	245.0	7.0	2.3	0.0	-0.4	-0.7	-2.1	0.99	0.012	0.157										1	83.3	83.7
	32	4407	333.9	246.1	7.7	2.8	0.6	-0.4	-1.1	-1.8	1.11	0.004	0.161							1			1	83.3	83.7
	33	4439	334.7	247.0	8.1	2.8	0.5	-0.4	-0.7	-2.1	1.11	0.007	0.160										1	83.4	83.2
9287	5:12:34	4478	333.7	247.5	9.4	2.6	0.0	-0.4	-0.7	-2.5	1.10	0.008	0.158							1			1	83.4	83.2
	35	4516	333.7	248.0	8.6	2.6	-0.2	-0.4	-0.4	-3.2	1.09	0.011	0.156										1	82.5	83.3
	36	4561	333.7	248.5	9.0	2.5	0.3	-0.4	-0.7	-2.1	1.07	0.007	0.155							1			1	83.2	83.8
	37	4606	333.5	248.5	9.1	2.6	0.1	-0.4	-0.7	-2.5	1.07	0.008	0.154										1	83.9	83.0
9288	5:12:38	4657	333.6	248.5	9.5	2.6	0.2	-0.4	-0.7	-2.5	1.06	0.010	0.154							1			1	83.0	84.1
	39	4702	333.6	249.0	9.7	2.5	0.3	-0.4	-0.4	-2.5	1.05	0.013	0.153										1	83.6	83.1
	40	4753	333.6	249.0	9.8	2.3	0.6	-0.4	-0.7	-2.5	1.04	0.009	0.151							1			1	83.1	84.0
	41	4804	333.4	249.0	9.8	2.1	0.9	-0.4	-0.2	-2.5	1.01	0.000	0.149										1	83.7	82.7
9289	5:12:42	4855	333.2	248.5	10.0	2.3	0.5	-0.4	-0.7	-2.1	1.01	0.002	0.150							1			1	83.0	84.1
	43	4906	333.4	248.0	10.0	2.1	0.4	-0.4	0.0	-2.8	0.99	0.006	0.143										1	83.8	83.4
	44	4964	333.6	248.3	10.2	2.3	0.5	-0.4	-0.7	-2.1	1.01	0.016	0.151							1			1	83.4	83.9
	45	5022	333.6	248.0	10.2	2.1	0.8	-0.4	-1.1	-1.8	1.00	0.004	0.149										1	83.3	84.1
9290	5:12:46	5073	333.6	248.0	10.2	2.3	0.3	-0.4	-0.7	-2.1	1.01	-0.005	0.150							1			1	83.8	83.0
	47	5130	333.7	248.0	10.4	2.1	-0.3	-0.4	-0.7	-2.1	0.99	0.011	0.151										1	83.2	84.3
	48	5188	333.4	248.0	10.2	2.1	0.2	-0.4	-0.7	-2.1	1.00	0.012	0.150							1			1	83.9	83.3
	49	5246	333.7	247.5	10.0	2.1	0.4	-0.4	-0.7	-2.1	0.97	0.000	0.150										1	83.7	83.9
9291	5:12:50	5297	333.6	247.0	10.0	1.8	0.1	-0.4	-0.7	-2.1	0.94	0.005	0.150							1			1	83.3	84.3
	51	5354	333.7	248.0	10.0	1.6	-0.2	-0.4	-0.7	-2.1	0.95	0.004	0.148										1	83.8	83.3
	52	5412	333.1	248.5	10.2	2.1	0.1	-0.4	-0.7	-2.1	1.00	0.016	0.151							1			1	83.9	83.2
	53	5470	333.2	248.0	10.2	2.1	0.7	-0.4	-0.7	-2.1	1.00	0.007	0.151										1	83.2	84.4
9292	5:12:54	5521	333.7	248.0	10.2	2.1	0.9	-0.4	-0.7	-2.1	0.95	-0.002	0.150							1			1	84.1	83.7
	55	5578	333.7	245.5	10.0	2.3	0.2	-0.4	-0.7	-2.1	0.98	0.009	0.152										1	83.7	83.8
	56	5636	333.7	245.5	9.8	2.1	0.6	-0.4	-0.7	-2.1	1.00	0.012	0.152							1			1	83.8	84.3
	57	5687	336.5	245.5	9.7	2.1	1.2	-0.4	-0.7	-2.1	0.95	-0.002	0.151										1	84.3	83.3
9293	5:12:58	5738	336.5	245.5	9.7	2.1	0.9	-0.4	-0.6	-2.1	0.96	0.001	0.150							1			1	83.4	84.4
	59	5796	333.6	245.5	9.7	1.6	0.5	-0.4	-0.4	-2.1	0.92	0.013	0.152										1	84.4	84.6
	60	5847	333.6	245.0	9.4	2.3	0.8	-0.4	-0.4	-2.5	0.99	-0.008	0.151							1			1	84.5	83.4
	61	5898	333.5	245.5	9.6	2.3	-0.7	-0.4	0.0	-2.8	1.03	0.001	0.153										1	84.0	84.7
9294	5:13:2	5950	333.7	246.0	9.6	2.3	0.4	-0.4	1.6	-4.6	0.99	0.014	0.152							1			1	84.3	84.7
	3	6001	333.9	246.0	9.8	2.1	1.8	-0.4	3.2	-5.6	0.99	-0.008	0.154										1	84.1	84.5
	4	6052	337.1	246.5	9.8	2.3	3.3	-0.4	4.8	-6.6	1.03	0.007	0.153							1			1	84.5	84.4
	5	6103	339.4	247.0	9.5	2.3	5.1	-0.4	5.3	-6.1	1.01	-0.003	0.152										1	84.3	84.6
9295	5:13:6	6154	332.3	247.0	10.4	2.1	8.1	-3.9	5.3	-8.1	1.00	0.016	0.160										1	84.7	84.1
	7	6212	333.0	247.0	10.4	3.0	11.3	-4.2	5.3	-8.1	1.08	-0.130	0.153										1	83.8	84.0
	8	6263	337.5	247.5	9.7	2.5	5.7	-3.5	6.3	-8.8	0.93	-0.092	0.149										1	84.4	84.3
	9	6316	343.5	247.5	9.3	1.6	2.8	0.7	-5.3	2.8	0.85	0.066	0.151										1	84.5	84.7
9296	5:13:10	6372	345.8	246.5	10.0	2.1	2.6	-0.2	-10.2	6.7	1.00	0.158	0.179										1	84.4	84.4
	11	6423	332.1	246.5	9.4	3.3	6.5	-1.1	6.0	-8.8	1.15	-0.241	0.147										1	84.9	83.3

DO.NY B747-UTA FGPUA ETAT de PARAMETRES 0 Pas 1/4 s PFUA2208 25-08-93/16:32 page 3

Cycle	Heure TU	ALTI	CAP	CAS	ASSI	ATTA	ROULI	DIR	GAUCG	GAUCD	ACCZ	ACCY	ACCX	P	P	P	P	C	C	N	V	V	Y	N16	N1D
	(hh:mn:s)	ft	deg	kt	deg	deg	deg	deg	deg	deg	g	g	g											%	%
								-3.2			0.99	0.034	0.001												
											0.96	0.020	0.005												
38		31034	9.0	279.0	1.5	0.5	-8.5	-4.2	-3.2	0.0	0.99	-0.023	0.000		1								1	80.2	80.4
											1.03	-0.069	-0.004												
								-4.2			1.07	-0.107	-0.006												
											1.11	-0.151	-0.011												
39		31027	6.0	223.0	1.9	1.4	-18.2	-1.4	7.0	-9.5	1.13	-0.149	-0.014		1								1	79.3	80.9
											1.10	-0.102	-0.014												
								0.0			1.08	-0.041	-0.004												
											1.07	-0.033	-0.001												
40		31027	7.4	279.5	3.0	0.9	-24.8	0.4	6.3	-9.1	1.06	0.096	0.003		1								1	79.2	80.5
											1.01	0.150	0.011												
								-1.8			1.02	0.149	0.021												
											1.07	0.113	0.019												
9469	5:24:42	31008	3.5	276.5	1.9	0.4	-8.1	-1.8	-3.2	0.4	1.08	0.031	0.006		1				1					79.9	79.8
											1.02	-0.052	-0.002												
								3.2			1.02	-0.190	-0.027												
											1.06	-0.171	-0.033												
43		30995	4.9	279.0	2.3	0.9	-4.4	2.5	4.9	-2.4	1.09	-0.111	-0.026		1									80.2	80.9
											1.04	-0.052	-0.025												
								2.4			0.93	0.085	-0.017												
											0.82	0.229	0.004												
44		30995	11.3	277.5	1.2	-0.2	-0.3	0.7	-4.9	2.1	0.65	0.407	0.051		1									79.8	80.9
											1.02	0.357	0.056												
								0.0			1.10	0.259	0.033												
											1.05	0.137	0.024												
45		30989	7.6	277.5	2.6	-0.2	20.2	-1.4	-3.1	4.6	0.90	-0.029	0.006		1									79.5	81.0
											0.81	-0.216	-0.014												
								-0.7			0.94	-0.337	-0.033												
											1.08	-0.371	-0.034												
9470	5:24:46	30976	3.7	276.5	0.9	1.2	10.1	-0.7	1.8	-4.6	1.04	-0.312	-0.026		1				1					79.6	81.0
											0.87	-0.168	-0.016												
								-0.7			0.75	-0.004	-0.003												
											0.64	0.136	0.011												
47		30989	9.3	279.0	1.9	-0.4	-7.9	-1.4	0.0	-2.8	0.69	0.226	0.026		1									80.2	80.3
											0.89	0.242	0.032												
								-1.1			1.12	0.188	0.031												
											1.22	0.102	0.019												
48		30989	9.7	278.0	2.1	0.9	-9.1	-1.1	-7.4	4.6	1.20	-0.011	0.005		1									79.2	80.5
											1.13	-0.114	-0.010												
								-1.1			1.10	-0.135	-0.021												
											1.11	-0.210	-0.025												
49		30982	5.4	279.0	1.8	1.2	6.9	-1.1	4.6	-7.4	1.10	-0.136	-0.022		1									79.2	80.4
											1.04	-0.104	-0.012												
								-1.8			0.95	-0.003	-0.002												
											0.87	0.077	0.003												
9471	5:24:49	30989	3.3	279.5	2.3	0.5	-7.6	-1.8	-0.6	-2.5	0.92	0.117	0.010		1				1					79.6	80.4
											1.05	0.120	0.014												
								-1.4			1.11	0.098	0.013												
											1.16	0.060	0.006												
50		30989	8.4	276.5	2.3	0.9	-0.1	-1.4	-0.6	-2.8	1.14	-0.029	-0.002		1									79.6	80.3
											1.11	-0.031	-0.010												

AAIA-CD6-93-0334TR

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AFA-06-93-0334R 7/8

Cycle	Heure TU	ALTI	CAP	CAS	ASSI	ATTA	ROULI	DIR	GAUCG	GAUCD	ACCZ	ACCY	ACCX	P A s C	P A 8 C	P A A M	P A B M	C U S P	C U S R	N R V 1 A	V R A O N	V S O N	Y A W	NIG	NID
	(h:mn:s)	ft	deg	kt	deg	deg	deg	deg	deg	deg	g	g	g											%	%
	PHASE 7 CROISIERE																								
9460	5:24:6	31006	10.4	276.0	1.9	0.5	-0.1	-0.7	-1.4	-1.8	0.99	0.012	-0.003		1						1		1	79.6	79.9
	7	31006	10.2	276.5	1.9	0.5	-0.2	-0.7	-0.4	-2.5	0.98	0.001	-0.003		1								1	79.6	80.4
	8	31006	10.2	276.5	2.1	0.5	-1.1	-0.7	0.0	-2.8	0.99	0.004	-0.005		1								1	79.6	80.5
	9	31008	10.4	276.5	1.9	0.5	-0.6	-0.7	-1.1	-2.1	1.01	0.008	-0.004		1								1	80.0	80.2
9461	5:24:10	31008	10.2	276.5	1.9	0.5	-0.4	-0.7	-1.1	-2.1	0.99	-0.003	-0.003		1						1		1	80.3	79.5
	11	31008	10.2	276.5	1.9	0.5	-0.9	-0.7	0.0	-2.8	1.01	-0.003	-0.006		1								1	80.2	79.8
	12	31008	10.2	279.0	2.1	0.5	-1.1	-0.7	0.0	-3.2	1.01	0.009	-0.006		1								1	79.3	80.6
	13	31008	10.4	276.5	2.1	0.5	-0.7	-0.7	-0.7	-2.5	1.03	0.006	-0.006		1								1	79.8	80.4
9462	5:24:14	31008	10.2	275.0	2.1	0.6	-0.5	-0.7	-0.7	-2.5	0.99	0.000	-0.006		1						1		1	80.4	79.9
	15	31008	10.2	276.5	2.1	0.4	-1.0	-0.7	-0.4	-2.8	0.99	0.003	-0.005		1								1	80.2	79.6
	16	31008	10.2	276.0	2.1	0.4	-1.1	-0.7	-0.4	-2.5	0.96	0.008	-0.005		1								1	79.9	80.0
	17	31008	10.3	275.0	2.1	0.5	-0.8	-0.7	0.0	-3.2	0.97	-0.001	-0.006		1								1	80.0	79.7
9463	5:24:17	31008	10.0	276.0	1.9	0.4	-0.6	-0.7	0.0	-3.2	0.97	0.006	-0.005		1						1		1	79.5	80.8
	18	31008	10.0	276.5	1.9	0.5	-0.4	-0.7	-0.4	-2.5	1.00	0.007	-0.006		1								1	79.6	80.3
	19	31006	9.5	276.5	1.9	0.5	-0.3	-0.7	0.4	-3.5	1.01	-0.005	-0.009		1								1	79.6	80.8
	20	31008	10.2	279.0	2.1	0.5	-0.6	-0.7	-0.6	-2.5	1.00	0.007	-0.004		1								1	80.4	79.5
9464	5:24:22	31008	10.2	276.5	2.1	0.5	0.3	-0.7	-1.1	-2.1	1.02	0.001	-0.006		1						1		1	80.4	79.8
	23	31008	10.1	276.5	2.1	0.5	0.1	-0.7	-0.6	-2.8	1.00	-0.005	-0.009		1								1	80.2	80.0
	24	31014	10.0	276.0	2.1	0.5	-0.6	-0.7	-0.6	-2.8	0.98	0.007	-0.006		1								1	79.6	80.6
	25	31021	10.2	275.5	2.1	0.5	-0.2	-0.7	-0.7	-2.1	0.99	0.003	-0.006		1								1	79.6	80.6
9465	5:24:25	31027	10.0	276.5	1.9	0.5	-0.2	-0.7	0.0	-2.8	0.96	-0.006	-0.006		1						1		1	80.4	80.0
	26	31034	10.0	275.5	1.9	0.5	-0.5	-0.7	-0.4	-2.8	0.97	0.005	-0.005		1								1	80.0	79.7
	27	31040	10.2	276.5	1.9	0.4	-0.1	-0.7	-0.7	-2.1	0.98	0.012	-0.006		1								1	79.9	80.0
	28	31040	10.0	279.5	1.9	0.5	0.2	-0.7	0.0	-2.8	1.00	-0.002	-0.007		1								1	79.9	80.3
9466	5:24:29	31040	10.0	279.0	1.9	0.4	-0.4	-0.7	-0.4	-2.6	0.96	0.007	-0.004		1								1	79.5	80.6
	30	31040	10.2	279.5	1.9	0.4	-0.3	-0.7	-0.7	-2.5	1.00	0.007	-0.004		1								1	79.2	80.6
	31	31040	10.3	276.5	1.9	0.4	-0.1	-0.7	-0.7	-2.5	1.00	-0.001	-0.009		1								1	79.9	80.5
	32	31040	10.0	279.5	1.9	0.4	-0.4	-0.7	-0.4	-2.8	0.99	0.000	-0.006		1								1	80.4	79.5
9467	5:24:34	31040	10.2	276.5	1.9	0.4	-0.4	-0.7	-0.7	-2.5	0.99	0.007	-0.006		1								1	80.3	79.8
	35	31040	10.3	276.5	1.8	0.4	-0.2	-0.7	-1.3	-1.6	0.99	-0.002	-0.009		1								1	80.5	79.7
	36	31040	10.0	276.5	1.8	0.4	-0.8	-0.7	-5.2	0.4	0.97	0.003	-0.006		1								1	80.2	79.9
	37	31040	10.0	277.0	1.6	0.4	-2.1	-0.7	-5.3	2.5	0.99	0.008	-0.007		1								1	79.5	81.0
9468	5:24:37	31040	9.3	276.5	1.6	0.4	-5.6	-0.7	-6.0	2.8	0.98	0.005	-0.007		1								1	79.8	80.6
	38	31034	9.0	279.0	1.6	0.5	-8.5	-4.2	-3.2	0.0	0.99	-0.023	0.000		1								1	80.2	80.4
	39	31027	5.3	275.5	1.9	1.4	-15.2	-1.6	7.0	-9.5	1.13	-0.149	-0.014		1								1	79.3	80.9
	40	31027	7.4	275.5	3.0	0.9	-24.5	0.4	6.3	-9.1	1.04	0.096	0.003		1								1	79.2	80.6
9469	5:24:42	31008	2.5	275.5	1.4	0.4	-8.1	-1.8	-3.2	0.4	1.06	0.031	0.008		1					1				79.9	79.8
	43	30995	4.9	275.0	2.3	0.9	-4.4	2.5	4.9	-7.4	1.09	-0.111	-0.026		1									80.2	80.9
	44	30995	11.3	276.5	1.2	-0.2	-6.3	0.7	-4.9	2.1	0.85	0.407	0.051		1									79.8	80.9
	45	30989	9.6	277.5	2.6	-0.2	20.2	-1.2	-6.1	4.6	0.90	-0.029	0.004		1									79.5	81.0
9470	5:24:46	30976	3.7	276.5	0.9	1.2	10.1	-0.7	1.8	-4.6	1.04	-0.312	-0.026		1					1				79.8	81.0
	47	30939	9.5	275.0	1.9	-0.4	-7.9	-1.6	0.0	-2.8	0.69	0.226	0.026		1									80.2	80.8
	48	30969	9.7	276.0	2.1	0.9	-9.1	-1.1	-7.4	4.6	1.20	-0.011	0.005		1									79.2	80.5
	49	30932	5.0	277.0	1.8	1.2	6.9	-1.1	4.5	-7.4	1.10	-0.188	-0.022		1									79.7	80.4
9471	5:24:49	30942	3.6	275.5	2.3	0.5	-7.0	-1.8	-0.4	-2.5	0.92	0.117	0.010		1					1				79.8	80.6
	50	30989	8.4	276.5	2.3	0.9	0.1	-1.2	-0.6	2.8	1.14	-0.029	-0.002		1									79.6	80.3
	51	30939	4.3	279.0	2.3	0.9	-2.7	-0.7	6.3	-9.1	1.05	-0.089	-0.016		1									79.5	80.4
	52	30995	3.4	276.5	2.6	0.5	-4.6	-0.7	-3.5	0.7	1.02	0.105	0.007		1									80.0	79.7
9472	5:24:54	31002	6.6	276.0	2.3	0.5	-3.7	-0.7	-2.1	-1.1	1.04	-0.011	-0.004		1					1				79.7	80.3
	55	31002	7.0	276.5	2.1	0.5	2.6	-1.1	3.9	-6.7	0.97	-0.064	-0.011		1									79.6	80.5

DO.NT 0747-UTA FGFUA - ETAT de PARAMETRES 0 Pas 1/4 s PFUA2208 25-08-93/15:15 page 2

Cycle	Heure TU	HAUTD	CAP	CAS	ASSI	ATTA	ROUL1	DIR	GAUCG	GAUCD	ACCZ	ACCY	ACCX	P P P P C C N V Y	N1G	N1D
	(h:mn:s)	ft	deg	kt	deg	deg	deg	deg	deg	deg	g	g	g		%	%
PHASE 6 MONTEE																
9295	5:13:6	6154	339.8	247.0	10.4	2.1	8.1	-3.9	5.3	-6.1	1.00	0.016	0.160	1	84.7	84.1
											1.06	-0.021	0.160			
								-3.9			1.04	-0.062	0.157			
											1.05	-0.100	0.154			
	7	6212	33[illegible]	247.0	10.4	3.0	11.5	-4.2	5.3	-6.1	1.08	-0.130	0.153	1	83.8	84.9
											1.07	-0.143	0.151			
								-3.9			1.05	-0.137	0.149			
											0.99	-0.120	0.149			
	8	6263	337.5	247.[illegible]	9.7	2.5	6.7	-3.5	6.3	-6.8	0.93	-0.092	0.149	1	84.4	84.3
											0.91	-0.100	0.137			
								0.2			0.83	-0.044	0.139			
											0.88	0.016	0.145			
	9	6312	340.5	247.5	9.3	1.6	2.8	0.7	-5.3	2.8	0.85	0.056	0.151	1	84.5	84.7
											0.89	0.103	0.152			
								0.4			0.95	0.125	0.159			
											0.98	0.131	0.165			
9296	5:13:10	6372	343.[illegible]	246.5	13.0	2.1	7.6	-6.7	-10.2	6.7	1.00	0.136	0.172	1	84.4	84.4
											1.01	0.079	0.173			
								-5.6			1.06	0.031	0.172			
											1.14	-0.140	0.155			
	11	6423	339.3	246.5	9.8	3.3	6.5	-1.1	6.0	-8.8	1.15	-0.251	0.147	1	84.9	85.3
											1.15	-0.309	0.135			
								4.9			1.07	-0.265	0.123			
											0.95	-0.136	0.129			
	12	6474	333.9	246.5	9.0	2.1	-5.0	-2.8	3.2	-5.6	0.83	0.043	0.159	1	84.6	84.5
											0.78	0.155	0.157			
								-7.4			0.74	0.214	0.172			
											0.76	0.158	0.171			
	13	6532	342.[illegible]	247.5	9.0	1.2	-3.5	1.1	-0.4	-2.5	0.88	0.053	0.154	1	83.9	85.1
											0.96	0.002	0.147			
								3.2			1.00	-0.046	0.136			
											1.01	-0.058	0.136			
9297	5:13:14	6583	343.5	247.5	9.3	2.6	1.3	3.5	1.4	-3.9	1.02	-0.051	0.138		84.7	84.4
											1.05	-0.011	0.139			
								2.8			1.00	0.039	0.149			
											1.03	0.074	0.154			
	15	6634	342.6	246.5	9.8	2.5	2.2	0.7	-5.6	2.5	1.04	0.113	0.160		84.5	85.3
											1.11	0.120	0.170			
								0.4			1.13	0.117	0.176			
											1.14	0.090	0.171			
	16	6692	343.[illegible]	246.0	10.[illegible]	2.5	5.6	-1.6	-8.1	4.9	1.13	0.058	0.165		84.9	84.6
											1.09	0.037	0.159			
								-1.8			1.09	-0.036	0.155			
											1.11	-0.072	0.153			
	17	6750	341.2	246.0	11.6	3.2	8.2	-1.4	0.7	-5.2	1.14	-0.101	0.156		84.7	84.7
											1.18	-0.096	0.154			
								-2.1			1.19	-0.078	0.157			
											1.17	-0.059	0.158			
9298	5:13:18	6807	343.8	245.0	10.4	3.2	1.2	-0.7	6.0	-8.4	1.10	-0.043	0.150		85.0	84.7
											0.97	-0.012	0.147			

View Message

Message Number:	Action File Name:	Status:
AFA-ORY-93-0251RR	AFA-CDG-93-0190TR	Closed

Model: 737-300 ATA: 2725-10

Subject: RUDDER KICK DURING DESCENT

AFA-ORY-93-0251RR 21 OCT 93
ATA 2725-10 MODEL 737-300
RUDDER KICK DURING DESCENT
REF /A/ AFA-ORY-93-0187TR DTD 10 AUG 93 /C/
/B/ AFA-ORY-93-0240TR/2 DTD 18 OCT 93
/C/ AFA-ORY-93-0247RR DTD 13 OCT 93
/D/ AFA-CDG-93-0334TR DTD 20 OCT 93
AIRPLANE HOURS/CYCLES
PP911

THE FOLLOWING MESSAGE SENT TO E. FESSLER /BCSR/ WITH A COPY TO J. DEC /BCSR/.

THE FOLLOWING IS FURTHER INFORMATION TO THE REF /C/ TELEX REGARDING OUR EXAMINATION OF THE ELECTROHYDRAULIC SERVO VALVE /EHSV/ REMOVED FROM AFA AIRPLANES PP902 AND PP911. THESE EHSV/S WERE REMOVED AND FORWARDED FROM THE RUDDER PCU/S FOLLOWING RUDDER CONTROL ANOMALIES ON THESE AIRPLANE.

THE FINDINGS OF OUR EXAMINATION OF THE EHSV FROM AIRPLANE PP911 WERE PROVIDED IN THE REF /C/ TELEX. WE HAVE ALSO COMPLETED OUR EXAMINATION OF THE EHSV REMOVED FROM AIRPLANE PP902. AS NOTED IN THE REF /C/ TELEX, THIS VALVE APPEARS TO HAVE BEEN TOTALLY DISASSEMBLED PRIOR TO OUR RECEIPT OF IT. ACCORDINGLY, WE WERE UNABLE TO TEST THIS VALVE.

THE VALVE WAS DISASSEMBLED AND VISUALLY INSPECTED. SLIGHT EVIDENCE OF CORROSION DISCOLORATION WAS NOTED IN THE SLEEVE. THE VALVE SLIDE APPEARED NORMAL. NO FURTHER ANOMALIES WERE NOTED.

WE PLAN TO RETURN THIS EHSV TO AFA SIMILAR TO THE EHSV REMOVED FROM AIRPLANE PP911 AS DISCUSSED IN THE REF /C/ TELEX. WE WILL RESPOND TO THE REF /D/ TELEX BY 26 OCT 93.

JOHNSON/KLH/BRUCE CROSS
CUSTOMER SERVICES DIVISION
BOEINGAIR M-7272 2H-95
/GRD 10/21/93 1649

View Message

Message Number:	Action File Name:	Status:
AFA-CDG-93-0305RR	AFA-CDG-93-0190TR	Closed

Model: 737-300 ATA: 2725-10

Subject: RUDDER KICK

AFA-CDG-93-0305RR 26 OCT 93
ATA 2725-10 MODEL 737-300
RUDDER KICK
REF /A/ AFA-CDG-93-0334TR DTD 20 OCT 93 /C/
/B/ AFA-CDG-93-0214RR DTD 13 AUG 93
/C/ AFA-CDG-93-0237RR DTD 02 SEP 93
/D/ AFA-CDG-93-0307TR DTD 29 SEP 93
AIRPLANE HOURS/CYCLES
PP902
PP911

THE FOLLOWING MESSAGE SENT TO J. DEC WITH A COPY TO E. FESSLER.

THE FOLLOWING INFORMATION IS PROVIDED IN RESPONSE TO THE REF /A/ TELEX REGARDING RUDDER CONTROL ANOMALIES ON THE DATA AIRPLANES. AFA POSED FOUR QUESTIONS ON THIS TOPIC. THESE QUESTIONS ARE ADDRESSED SEQUENTIALLY BELOW.

1/ IN THE REF /B/ TELEX, WE ADVISED AFA THAT WE WERE REVIEWING THE OPERATIONS MANUAL WITH REGARD TO THE RUDDER CONTROL ANOMALIES REPORTED ON AIRPLANE PP911. WE HAVE COMPLETED THIS REVIEW AND HAVE DETERMINED THAT NO CHANGES TO THE OPERATIONS MANUAL ARE REQUIRED AT THIS TIME.

2/ AFA QUERIED REGARDING PREVIOUS REPORTS OF RUDDER //KICKS// DURING FLIGHT INCLUDING FLIGHT PHASE.

AS DISCUSSED IN THE REF /C/ TELEX, WE HAVE HAD A NUMBER OF REPORTS OF RUDDER //KICKS// AND OSCILLATIONS. THESE HAVE BEEN REPORTED IN ALL PHASES OF FLIGHT INCLUDING CLIMB, CRUISE, DESCENT, AND ON THE GROUND. OUR REVIEW OF AVAILABLE DATA INDICATES THAT ALL RESOLVED REPORTS OF RUDDER KICKS HAVE BEEN ASSOCIATED WITH VARIOUS YAW DAMPER SYSTEM ANOMALIES. THESE ANOMALIES INCLUDE YAW DAMPER RATE GYRO MALFUNCTIONS, COMMAND AND FEEDBACK WIRING AND CONNECTION DISCREPANCIES, AND RUDDER PCU YAW DAMPER SYSTEM ANOMALIES.

OUR REVIEW ALSO DISCLOSED TWO REPORTS OF UNCOMMANDED RUDDER MOTION WITH THE YAW DAMPER SYSTEM DISENGAGED. HOWEVER, BOTH OF THESE REPORTS WERE OF RUDDER OSCILLATIONS, NOT RUDDER KICKS, AND OCCURRED ON THE GROUND. IN ONE CASE, THE CAUSE WAS NOT SPECIFICALLY DETERMINED. IN THE OTHER CASE, THE OSCILLATION WAS ATTRIBUTED TO A COMBINATION OF LOOSE/WORN CONTROL AND STRUCTURAL LINKAGES AND WORN RUDDER HINGE BEARINGS.

3/ WE HAVE REVIEWED THE FAXED FLIGHT DATA RECORDER DATA FOR THE //RUDDER KICKS// ON AIRPLANE PP902. THIS DATA INDICATES THAT THE FLIGHT CONTROLS UPSETS SHOWN IN THIS DATA DO NOT APPEAR TO HAVE RESULTED FROM YAW DAMPER SYSTEM ANOMALIES. THIS IS BECAUSE:

A. RUDDER DEFLECTIONS SHOWN ON THE FDR DATA ARE PRECEDED BY AILERON DEFLECTIONS. THIS INDICATES RUDDER MOVEMENT AS A REACTION TO AILERON INDUCED ROLL RATHER THAN AILERON REACTION

TO RUDDER INDUCED YAW.

B. IN SOME CASES, THE RUDDER MOVEMENT OCCURS WITH THE YAW DAMPER SYSTEM SHUT OFF. THIS RUDDER MOTION COULD NOT BE YAW DAMPER INDUCED.

C. THE FDR DATA INDICATES RUDDER DISPLACEMENT OF WELL BEYOND THE YAW DAMPER AUTHORITY LIMIT OF 3 DEGREES. AS DISCUSSED IN THE REF /C/ TELEX, THE RUDDER CANNOT MOVE SIGNIFICANTLY BEYOND THE YAW DAMPER AUTHORITY LIMIT WITHOUT ADDITIONAL EXTERNAL CONTROL INPUT.

THE AFOREMENTIONED CONDITIONS, ESPECIALLY B. AND C., INDICATE THAT THERE WERE MECHANICAL INPUTS TO THE RUDDER CONTROL SYSTEM THROUGH THE RUDDER PEDALS DURING THE FLIGHT CONTROL DISPLACEMENTS SHOWN ON THE FAXED FDR DATA.

4/ WE HAVE NO FURTHER COMMENT FOLLOWING REVIEW OF THE REF /D/ TELEX.

JOHNSON/KLH/BRUCE CROSS
CUSTOMER SERVICES DIVISION
BOEINGAIR M-7272 2H-95
/CAR 10/26/93 1909

View Message

Message Number:	Action File Name:	Status:
AFA-CDG-94-0118TR	AFA-CDG-94-0118TR	Closed

Model: 737-300 ATA: 2725-10

Subject: RUDDER KICK/OSCILLATION - JY.FINEL/DONT

11E0 6684 /dev/sio2 vopems 04/13/94 06:56
DIR 617BOE

/ATTN (617) G. B. CROSS
/7/7/7/7 AIRLINE SUPPORT MANAGER M-72B3 2H-95
/CC (BFSORY) E. FESSLER CUSTOMER SERVICES MANAGER - ORY

AFA-CDG-94-0118TR 13 APR 94
ATA 2725-10 MODEL 737-300 18 APR 94 H
RUDDER KICK/OSCILLATION - JY.FINEL/DONT
REF /A/ AFA-CDG-93-0190TR DTD 9 JUL 93
/B/ AFA-ORY-93-0181TR DTD 3 AUG 93
/C/ AFA-CDG-93-0222TR DTD 4 AUG 93
AIRPLANE HOURS/CYCLES
PS606

FOLLOWING MESSAGE SENT TO B. CROSS WITH COPY TO E. FESSLER

REFS /A/ THRU /C/ WERE THE START OF A LENGHTY COMMUNICATION WITH BOEING ON AIR FRANCE REPORTS OF RUDDER KICKS ON APLS PP911 AND PP902, RECENTLY AFA REPORTED ANOTHER CASE OF RUDDER KICK/ OSCILLATION ON A THIRD APL: PS606.

AFA FLIGHT OPS ENGINEERING MADE AVAILABLE THE FLIGHT DATA RECORDER GRAPHS SHOWING THE EVENT. THE INFORMATION WILL BE MAILED THIS DATA TO YOU FOR YOUR INFORMATION/ANALYSIS.

AFA MAINTENANCE ENGINEERING REPORTS THAT THERE WAS NO KNOWN MAINTENANCE ACTION DUE TO THE RELATIVELY SMALL RUDDER DISPLACEMENT.

ACTION

AFA FLIGHT OPS ENGINEERING WOULD LIKE YOUR COMMENTS ON THIS EVENT.

J. DEC BOEING CUSTOMER SERVICES PARIS/CDG

FSE-BOECOM WED 04/13/94 16:07:16

BOESEA-DDSO02-00037-04/13/94-1407Z

View Message

Message Number:	Action File Name:	Status:
AFA-CDG-94-0110RR	AFA-CDG-94-0118TR	Closed

Model: 737-300 ATA: 2725-10

Subject: RUDDER KICK/OSCILLATION

AFA-CDG-94-0110RR 18 APR 94
ATA 2725-10 MODEL 737-300 12 MAY 94 H
RUDDER KICK/OSCILLATION
REF AFA-CDG-94-0118TR DTD 13 APR 94 /H/
AIRPLANE HOURS/CYCLES
PS606

THE FOLLOWING MESSAGE SENT TO J. DEC WITH A COPY TO E. FESSLER.

THE FOLLOWING INFORMATION IS PROVIDED IN RESPONSE TO THE REF TELEX REGARDING A RUDDER CONTROL ANOMALY ON AFA AIRPLANE PS606. AFA ADVISED THEY WERE MAILING A COPY OF FLIGHT DATA RECORDER GRAPHS FOR THE REPORTED ANOMALY, AND REQUESTED OUR COMMENTS.

WE HAVE NOT YET RECEIVED THESE GRAPHS FROM AFA. WE WILL ADVISE AFA REGARDING THE STATUS OF THIS REPORT BY 12 MAY 94.

JOHNSON/KLH/BRUCE CROSS
CUSTOMER SERVICES DIVISION
BOEINGAIR M-7272 2H-95
/CAR 04/18/94 1511

View Message

Message Number:	Action File Name:	Status:
AFA-CDG-94-0140RR	AFA-CDG-94-0118TR	Closed

Model: 737-300 ATA: 2725-10

Subject: RUDDER KICK/OSCILLATION

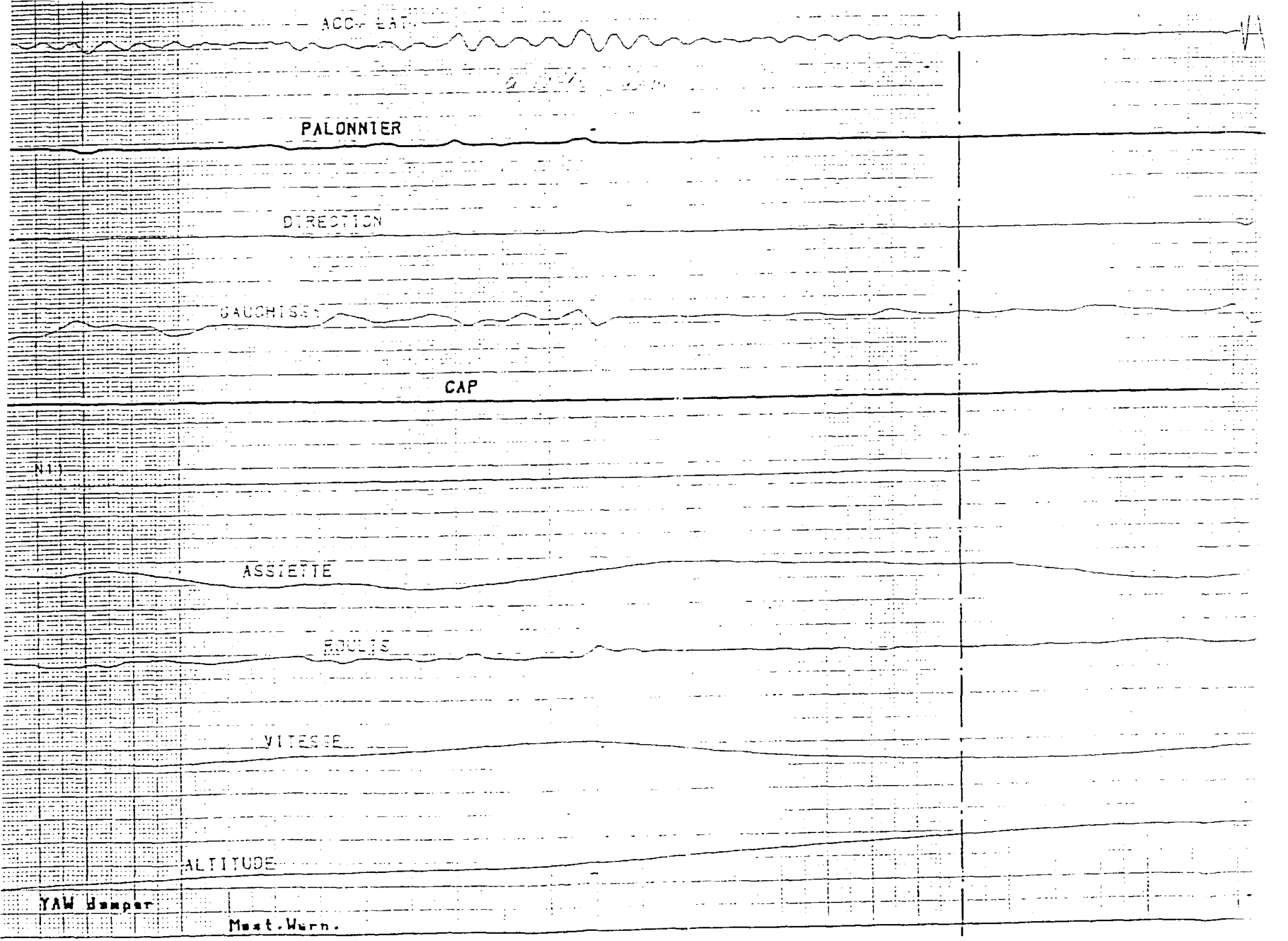
AFA-CDG-94-0140RR 11 MAY 94
ATA 2725-10 MODEL 737-300
RUDDER KICK/OSCILLATION
REF /A/ AFA-CDG-94-0118TR DTD 13 APR 94 /C/
/B/ AFA-CDG-94-0110RR DTD 18 APR 94
AIRPLANE HOURS/CYCLES
PS606

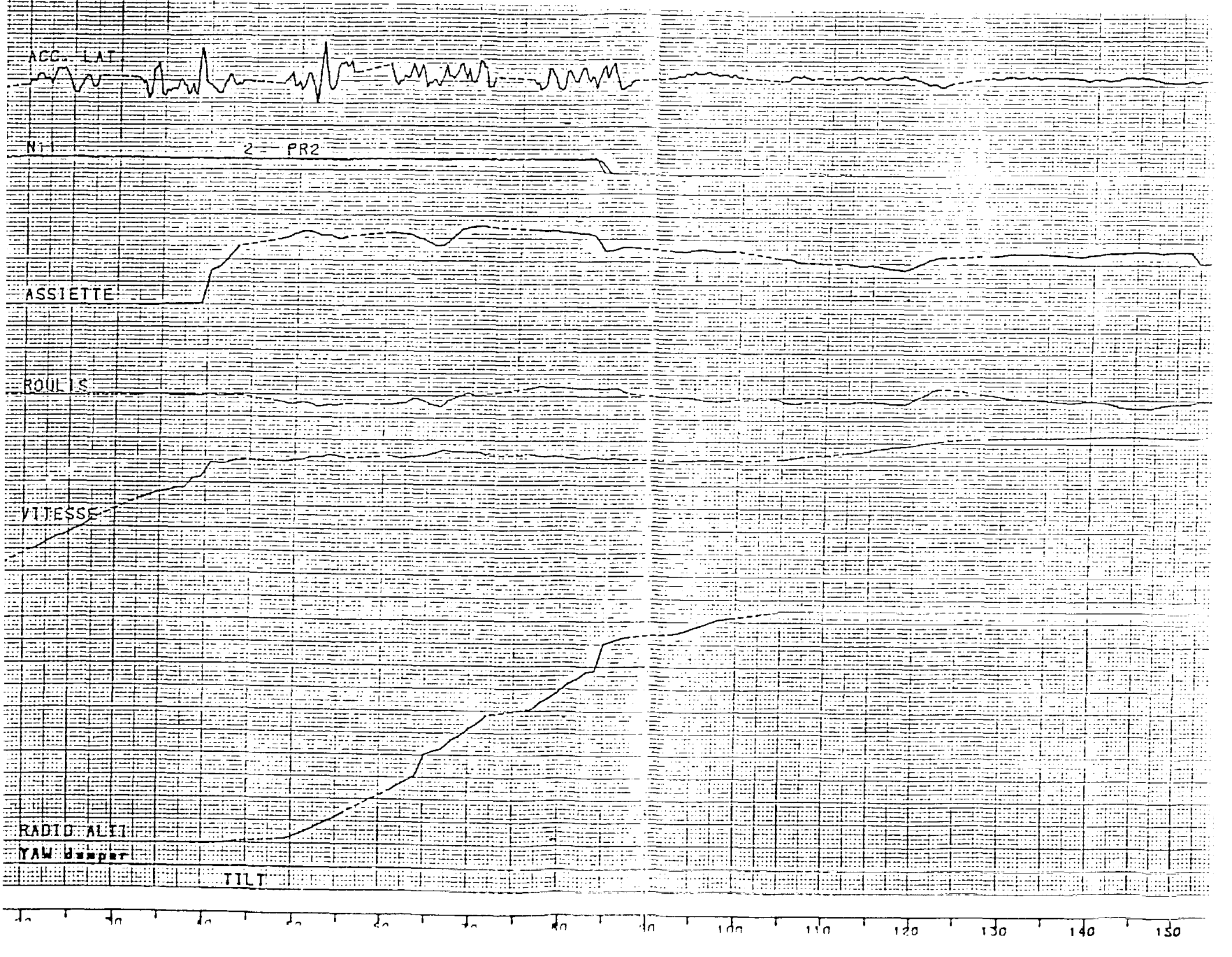
FLWG MSG SENT TO J. DEC /BCSR/ WITH COPY TO E. FESSLER /BCSR/

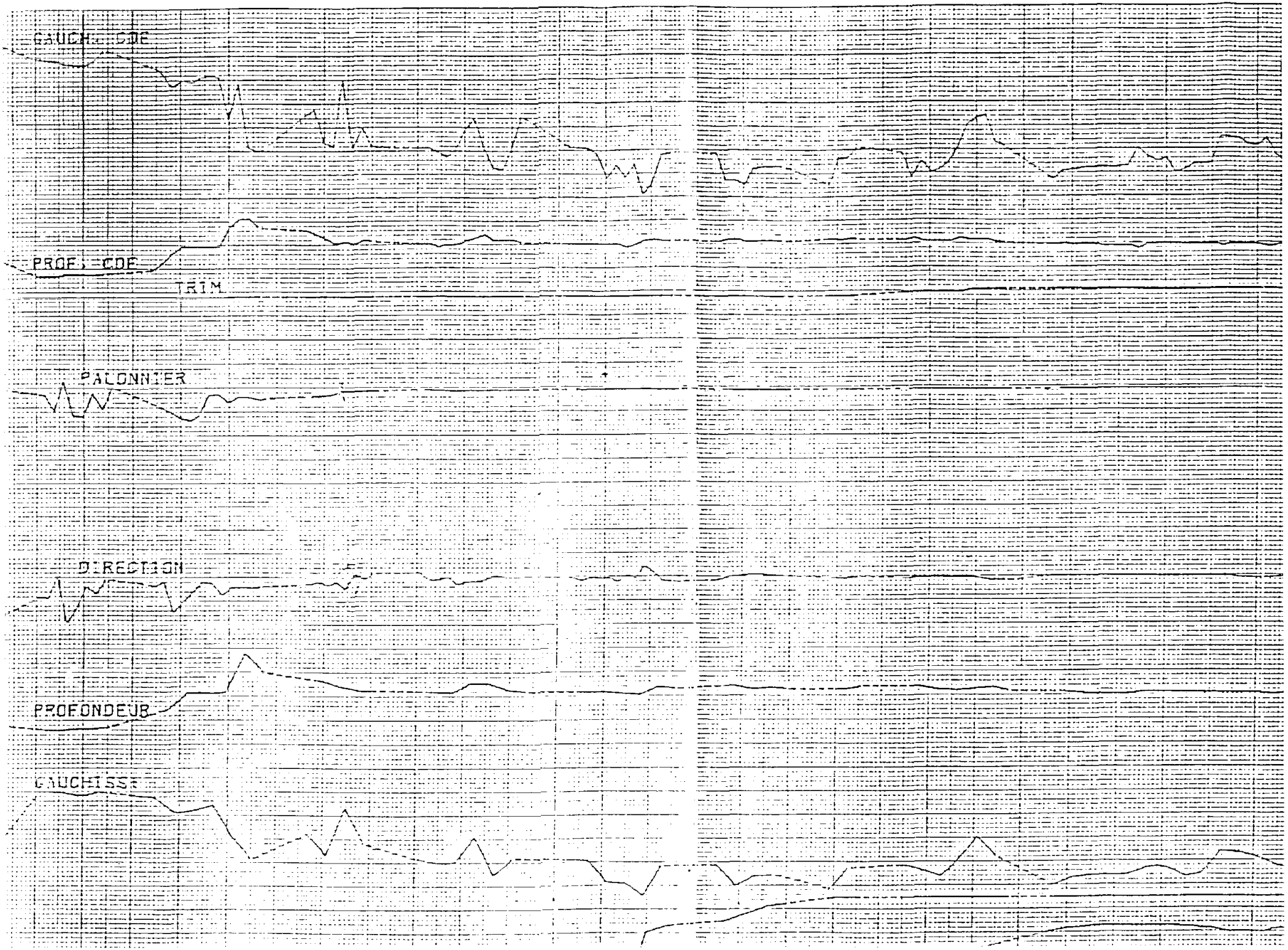
THE FOLLOWING IS FURTHER INFORMATION TO THE REF /B/ TELEX REGARDING THE REF /A/ REPORTED RUDDER CONTROL ANOMALY ON THE DATA AIRPLANE. AFA ADVISED THEY WERE MAILING A COPY OF FLIGHT DATA RECORDER GRAPHS FOR THE REPORTED ANOMALY, AND REQUESTED OUR COMMENTS.

OUR REVIEW OF THESE FLIGHT DATA RECORDER GRAPHS HAS REVEALED NO APPARENT RUDDER CONTROL OR YAW DAMPER ANOMALIES. THE DATA INDICATES THAT RUDDER POSITION WAS WITHIN REASONABLE AGREEMENT WITH RUDDER PEDAL POSITION AND/OR YAW DAMPER COMMAND AUTHORITY. THE DATA ALSO INDICATES THAT YAW DAMPER COMMANDED RUDDER DISPLACEMENTS WERE REACTIONS TO EXTERNAL CONDITIONS SUCH AS LATERAL ACCELERATIONS OR AILERON COMMANDS. IT APPEARS FROM THE FLIGHT DATA RECORDER GRAPHS THAT THE RUDDER CONTROL SYSTEM WAS FUNCTIONING CORRECTLY ON THE DATA AIRPLANE. ACCORDINGLY, WE DO NOT SUGGEST ANY FURTHER ACTION REGARDING THIS MATTER AT THIS TIME.

JOHNSON/KLH/BRUCE CROSS
CUSTOMER SERVICES DIVISION
BOEINGAIR M-7272 2H-95
/GJB 05/11/94 1420


ACC. LAT.
PALONNIER
DIRECTION
GAUCHISSE
CAP
N1
ASSIETTE
ROULIS
VITESSE
ALTITUDE
YAW damper
Mast.Warn.


ACC. LAT
N1
2
PR2
ASSIETTE
ROULIS
VITESSE
RADIO ALTI
YAW damper
TILT
100
110
120
130
140
150


GAUCH. CDE
PROF. CDE
TRIM
PALONNIER
DIRECTION
PROFONDEUR
GAUCHISSE

View Message

Message Number:	Action File Name:	Status:
AFA-CDG-94-0368RR	AFA-CDG-94-0118TR	Closed

Model: 737-500 ATA: 2725-10

Subject: RUDDER KICK/OSCILLATION DURING DESCENT - FINEL-DONT

AFA-CDG-94-0368RR 19 OCT 94
ATA 2725-10 MODEL 737-500
RUDDER KICK/OSCILLATION DURING DESCENT - FINEL-DONT
REF /A/ AFA-CDG-94-0355TR DTD 12 OCT 94 /C/
/B/ AFA-CDG-94-0344RR
/C/ AFA-CDG-94-0334TR
AIRPLANE HOURS/CYCLES
F-GUNC
PT51C

THE FOLLOWING MESSAGE SENT TO E. FESSLER WITH A COPY TO J. DEC.

THE FOLLOWING INFORMATION IS PROVIDED IN RESPONSE TO THE REF /A/ TELEX REGARDING THE REF /C/ REPORTED RUDDER KICK DURING DESCENT. IN THE REF /B/ TELEX, WE ADVISED AFA THAT WE WERE UNABLE TO CONCLUSIVELY DETERMINE THE CAUSE OF THE RUDDER DISPLACEMENT FROM THE PROVIDED DATA, AND THAT RAW DATA FROM THE FLIGHT DATA RECORDER WOULD BE MORE USEFUL FOR FUTURE REFERENCE. INCLUDED WITH THE REF /A/ TELEX WAS FAXED TABULAR DATA ADDITIONAL TO THAT PROVIDED WITH THE REF /C/ TELEX. AFA REQUESTED THAT WE EVALUATE AND COMMENT ON THIS ADDITIONAL DATA.

A CURSORY REVIEW OF THE INFORMATION PROVIDED WITH THE REF /A/ TELEX HAS DISCLOSED SOME APPARENT INCONSISTENCIES. HOWEVER, WE ARE STILL UNABLE TO DETERMINE THE SOURCE OF THESE APPARENT ANOMALIES WITH THE REF /A/ AND REF /C/ DATA IN PRINTED FORMAT.

FOR FUTURE REFERENCE, WHEN AFA REQUESTS OUR REVIEW OR ANALYSIS OF DFDR DATA, PLEASE NOTE:

TRANSMISSION OF DFDR DATA IN ONE OF THE FOLLOWING FORMATS AND MEDIUMS WILL GREATLY FACILITATE OUR ANALYSIS. IF AT ALL POSSIBLE, IT IS HIGHLY DESIRABLE TO RECEIVE THE DFDR DATA FROM THE ENTIRE FLIGHT /ENGINE START TO ENGINE SHUTDOWN/.

IN ADDITION TO THE RECORDED DATA, IF WEIGHT AND BALANCE DATA ARE NO AVAILABLE ON THE DFDR, PLEASE PROVIDE THE AIRCRAFT GROSS WEIGHT AND CENTER OF GRAVITY FOR THE FLIGHT AND/OR TIME IN QUESTION.

DATA FORMAT INFORMATION

ALL DFDR DATA SHOULD BE TRANSFERRED IN RAW BINARY FORMAT. /COMPRESSED DATA FROM A SOLID STATE DFDR SHOULD BE UNCOMPRESSED PRIOR TO TRANSMISSION/.

THE FOLLOWING INFORMATION WILL FACILITATE THE CONVERSION INTO THE ENGINEERING SCIENTIFIC BINARY /ESB/ FORMAT REQUIRED FOR ENGINEERING ANALYSIS:

- AIRCRAFT MODEL
- TAIL OR LINE NUMBER

- DFDR MANUFACTURER
- DIGITAL FLIGHT DATA ACQUISITION UNIT /DFDAU/ TYPE
- DFDAU DATA FRAME LAYOUT /IF NON BOEING D6-55333 STANDARD FRAME 1 OR 2 FORMAT/

PLEASE PROVIDE AS MUCH OF THIS INFORMATION AS POSSIBLE WITH THE DFDR DATA.

TRANSMISSION MEDIUMS

DATA MAY BE TRANSMITTED ON ONE OF THE FOLLOWING MEDIUMS:

1/ DATA /PACKED OR UNPACKED/ MAY BE COPIED OR BACKED-UP ONTO 3.5 INCH DISKETTE/S/. /DATA ON A 5.25 INCH DISKETTE IS ALSO ACCEPTABLE./

   - DATA COMPRESSION PROGRAMS /PKZIP, LHARC OR ARJ/ MAY BE UTILIZED TO DECREASE THE AMOUNT OF DISK SPACE REQUIRED. PLEASE SPECIFY IF A DATA COMPRESSION UTILITY HAS BEEN UTILIZED.

2/ A COPY OF THE DFDR DATA ON REEL TO REEL TAPE /COPY TAPE/ IN RAW BINARY FORMAT OF THE DFDR MANUFACTURE IS ALSO ACCEPTABLE.

RECEIPT OF DFDR DATA IN THE ABOVE DESCRIBED FORM WOULD SIGNIFICANTLY ASSIST US IF AFA REQUESTS ANY FURTHER ANALYSIS OF OF THE REF /C/ REPORTED ANOMALY.

JOHNSON/DUYUNGAN/MIKE DIDONATO
CUSTOMER SERVICE ENGINEERING
BOEINGAIR M-7272 2H-95
/CAR

19 OCT 94 2109

View Message

Message Number:	Action File Name:	Status:
AFA-CDG-94-0334TR	AFA-CDG-94-0118TR	Closed

Model: 737-500 ATA: 2725-10

Subject: RUDDER KICK/OSCILLATION DURING DESCENT - FINEL-DONT

DIR 617BOE

/ATTN (617) M. DIDONATO
/7/7/7/7 AIRLINE SUPPORT MANAGER M-72B3 2H-95
/CC (BFSORY) J. DEC CUSTOMER SERVICES MANAGER - ORY

AFA-CDG-94-0334TR 30 SEP 94
ATA 2725-10 MODEL 737-500 7 OCT 94 H
RUDDER KICK/OSCILLATION DURING DESCENT -
FINEL-DONT
REF /A/ AFA-CDG-94-0118TR /C/
/B/ AFA-CDG-93-0305RR /C/
/C/ AFA-CDG-94-0214RR
/D/ FAX, 1 PG QAR READ-OUT SHOWING RUDDE R KICK
AIRPLANE HOURS/CYCLES
F-GUNC
PT510

FOLLOWING MESSAGE SENT TO M. DIDONATO WITH COPY TO J. DEC

AIR FRANCE CONTINUES TO EXPERIENCE RUDDER /KICKS/ ON 737 AIRCRAFT OF ALL MODELS. THE LATEST EVENT OCCURED ON THE DATA 737-500 AIRCRAFT WHILE DESCENDING FROM FL060 ON A FLIGHT FROM MUNICH TO PARIS CDG ON 16 SEPT. THE REF /D/ DATA SHOWS THAT JUST AFTER SELECTING A LOWER ALTITUDE, THE RUDDER DISPLACED AT A RATE OF 1 CYCLE PER SEC AND THIS APPARENTLY INDUCED A 4 HZ LATERAL OSCILLATON. NOTE PER THE DATA THAT THE RUDDER PEDALS DO NOT REGISTER A DISPLACEMENT.

AIR FRANCE BELIEVES THIS FREQUENCY IS CHARACTERSITIC OF A YAW DAMPER INPUT. AFA REQUESTS BOEING EXAMINATION OF THE EVENT AND COMMENT. THERE HAVE BEEN 2 OTHER SIMILAR EVENTS FOR WHICH WE ARE ATTEMPTING TO OBTAIN DATA.

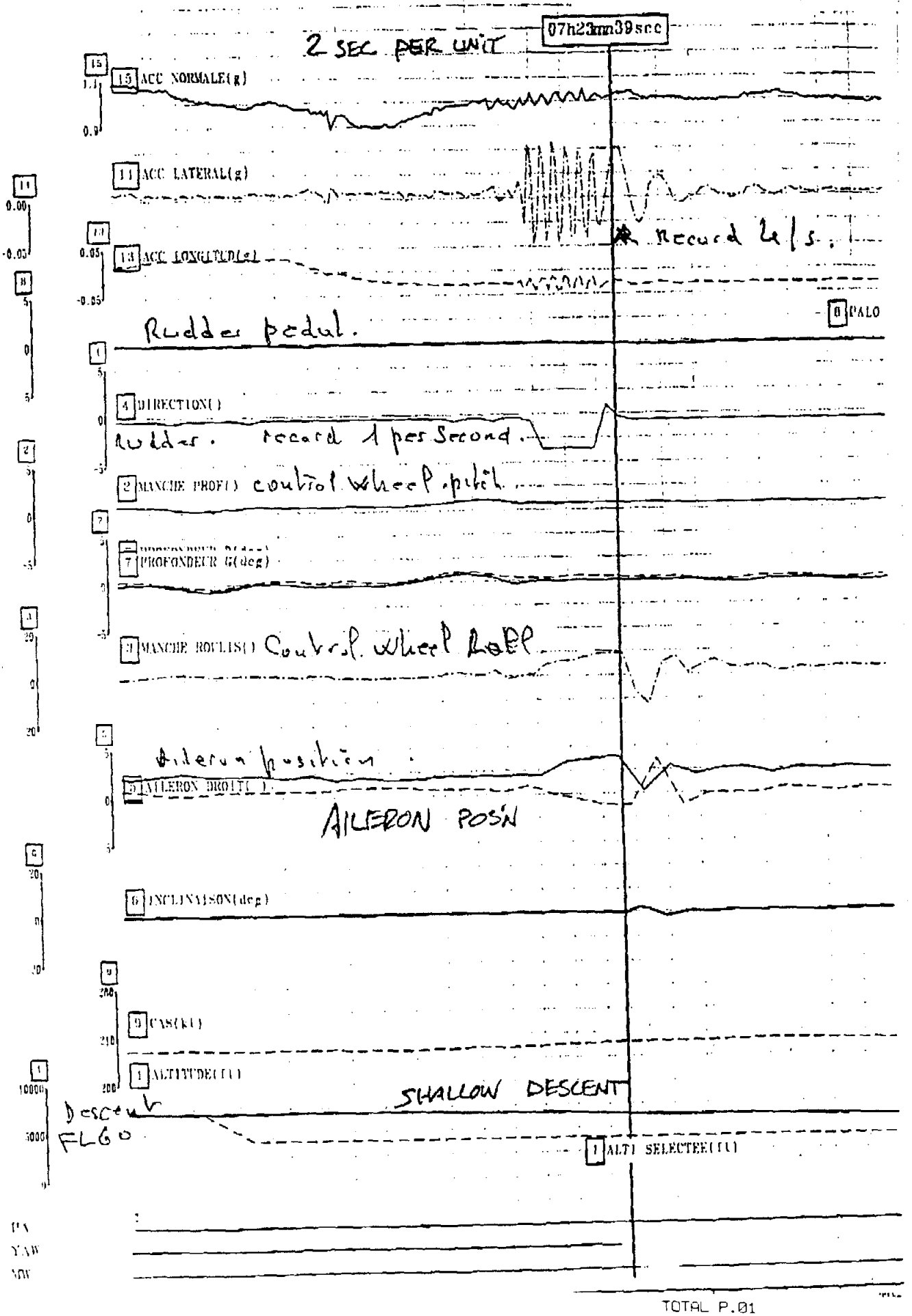
ACTION:
PLEASE REVIEW THIS LATEST EVENT AND COMMENT. IS AIR FRANCE CORRECT THAT THIS APPEARS TO BE A YAW DAMPER ANOMALY /Q/

WALKER/FESSLER BOEING CUSTOMER SERVICES BFSCDG - PARIS

FSE-BOECOM FRI 09/30/94 15:49:46
BOESEA-X2SO05-00017-09/30/94-1450Z

FGJNJ B.737/500 AF1551 16/09/9410 PH?LII 0 MUC -

AFA-CDG-94-0334 TR



View Message

Message Number:	Action File Name:	Status:
AFA-CDG-94-0344RR	AFA-CDG-94-0118TR	Closed

Model: 737-500 ATA: 2725-10

Subject: RUDDER KICK/OSCILLATION DURING DESCENT - FINEL-DONT

AFA-CDG-94-0344RR 07 OCT 94
ATA 2725-10 MODEL 737-500
RUDDER KICK/OSCILLATION DURING DESCENT - FINEL-DONT
REF /A/ AFA-CDG-94-0334TR DTD 30 SEP 94 /C/
/B/ AFA-CDG-94-0118TR
/C/ AFA-CDG-93-0305RR
/D/ AFA-CDG-94-0214RR
/E/ FAX, 1 PG QAR READ-OUT SHOWING RUDDE R KICK
AIRPLANE HOURS/CYCLES
F-GCNC
PTS10

THE FOLLOWING MESSAGE SENT TO E. FESSLER WITH A COPY TO J. DEC.

THE FOLLOWING INFORMATION IS PROVIDED IN RESPONSE TO THE REF /A/ TELEX REGARDING RUDDER //KICKS// DURING FLIGHT. AFA REQUESTED WE REVIEW AND COMMENT ON FAXED FDR DATA FROM THE DATA AIRPLANE. REPORTEDLY, WHILE DESCENDING FROM FL060, THE RUDDER //DISPLACED AT A RATE OF 1 CYCLE PER SEC AND THIS APPARENTLY INDUCED A 4 HZ LATERAL OSCILLATION//. AFA NOTED THAT THE RUDDER PEDALS DID NOT MOVE AT THAT TIME.

WE HAVE REVIEWED THE AFOREMENTIONED FAXED DATA AND WE AGREE THAT THE RUDDER APPEARS TO HAVE DISPLACED TO THE YAW DAMPER AUTHORITY LIMIT /3 DEGREES/ FOR APPROXIMATELY 3 SECONDS. HOWEVER, THE DATA PROVIDED DID NOT INCLUDE SEVERAL SIGNIFICANT PARAMETERS INCLUDING HEADING AND ROLL ANGLE DATA WHICH ARE NECESSARY FOR MORE COMPLETE ANALYSIS. ACCORDINGLY, WE ARE UNABLE TO DETERMINE WHETHER THE INDICATED RUDDER DISPLACEMENT RESULTED FROM A YAW DAMPER SYSTEM ANOMALY OR IF IT WAS A REACTION TO ANOTHER FLIGHT ANOMALY /I.E. GUST LOAD, SUDDEN HEADING CHANGE, ETC/.

FOR FUTURE REFERENCE, IF AFA WISHES MORE DETAILED ANALYSIS, WE SUGGEST THAT THEY PROVIDE US WITH RAW DATA FROM THE FLIGHT DATA RECORDER. IT WOULD ALSO BE HELPFUL IF AFA COULD PROVIDE THE RESULTS OF YAW DAMPER COUPLER BITE TESTING ACCOMPLISHED FOLLOWING A REPORT OF A RUDDER KICK OR UNCOMMANDED RUDDER MOVEMENT.

JOHNSON/DUYUNGAN/MIKE DIDONATO
CUSTOMER SERVICE ENGINEERING
BOEINGAIR M-7272 2H-95
/CAR

07 OCT 94 2108

View Message

Message Number:	Action File Name:	Status:
AFA-CDG-94-0355TR	AFA-CDG-94-0118TR	Closed

Model: 737-500 ATA: 2725-10

Subject: RUDDER KICK/OSCILLATION DURING DESCENT - FINEL-DONT

DIR 617BOE

/ATTN (617) M. DIDONATO
/7/7/7/7 AIRLINE SUPPORT MANAGER M-72B3 2H-95
/CC (BFSORY) J. DEC CUSTOMER SERVICES MANAGER - ORY

AFA-CDG-94-0355TR 12 OCT 94
ATA 2725-10 MODEL 737-500 19 OCT 94 H
RUDDER KICK/OSCILLATION DURING DESCENT - FINEL-DONT
REF /A/ AFA-CDG-94-0344RR /C/
/B/ AFA-CDG-94-0334TR
/C/ FAX, 8 PAGES DFDR DATA, SENT 12 OCT 94
AIRPLANE HOURS/CYCLES
F-GUNC
PT510

FOLLOWING MESSAGE SENT TO M. DIDONATO WITH COPY TO J. DEC

AIR FRANCE RECOGNIZES THAT DATA WAS LIMITED IN THE REF /B/ ENQUIRY. ADDITIONAL DATA HAS BECOME AVAILABLE AND IS FORWARDED PER REF /C/. THIS INCLUDES HEADING AND ACCELERATION IN ALL AXES BUT DOES NOT INCLUDE ROLL ANGLE DATA.

AIR FRANCE WILL CONTINUE TO SEEK ADDITIONAL DATA ON THIS EVENT /AND FUTURE EVENTS/ AND FORWARD THIS AS IT BECOMES AVAILABLE. THE RUDDER KICK PHENOMENON HAS HIGH VISIBILITY, PARTICULARLY WITH RECENT 737 EVENTS.

ACTION:
PLEASE REVIEW THE ADDITIONAL DATA AND ADVISE IF FURTHER CONCLUSIONS CAN BE DRAWN.

WALKER/PESSLER BOEING CUSTOMER SERVICES BFSCDG - PARIS

FSE-BOECOM WED 10/12/94 16:10:19
BOESEA-X2SO12-00018-10/12/94-1511Z

F.GSNF . B 737.528 - Flight AF 2107 - 22 SEPT. 1994

Rudder Kick's during descent Flight level 60

118

Radio Altitude →

ALTI	Altitude	ft	
HAUT	Synthese hauteur	ft	
CAS	Computed airspeed	kt	
ASSI	Pitch angle	deg	+up
STIB	Control column position		+up
PROL	Left elevator position	deg	+up
PROR	Right elevator position	deg	+up
STIR	Control wheel position		+right
AILR	Right aileron position	°	
DIR	Rudder position		+right
PALON	Rudder pedal position		+right
MW	Master warning		no warn
YAW	Yaw damper disengaged		not disengaged
CAP	Magnetic heading	deg	
ACCY	Lateral acceleration	g	+right
ACCX	Longitudinal acceleration	g	+forward
ACCZ	Normal acceleration	g	+up

7 Roulis

Cycle	Heure TU (H:mn:s)	ALTI ft	HAUT ft	CAS kt	ASSI deg	STIP	PROL deg	PROR deg	STER	AILR	DIR	PALON	M W	Y A W	CAP deg	ACCY g	ACCX g	ACCZ g
PHASE 8 DESCENTE																		
40794	7:23: 0	6992	6516	229.0	3.0	0.7		0.0	0.3	2.0	-0.4	-0.1	1	1	329.4	0.007	0.013	1.084
																0.006	0.015	1.084
	1	6986	6510	228.5	3.4	0.7	0.3		0.7		-0.4	-0.1	1	1	329.4	0.007	0.014	1.084
																0.009	0.018	1.084
	2	6980	6504	229.0	3.7	0.6		0.0	1.1	2.3	-0.4	-0.1	1	1	329.4	0.007	0.015	1.084
																0.009	0.019	1.084
	3	6978	6502	229.0	3.9	0.6	0.0		1.8		-0.4	-0.1	1	1	329.4	0.009	0.018	1.074
																0.006	0.020	1.084
40795	7:23: 4	6976	6500	229.5	4.2	0.5		-0.3	2.2	2.6	-0.7	-0.1	1	1	329.4	0.005	0.021	1.074
																0.002	0.022	1.065
	5	6976	6500	229.0	4.2	0.3	-0.3		2.2		-0.4	-0.1	1	1	329.4	0.005	0.023	1.065
																0.007	0.024	1.065
	6	6978	6502	229.0	4.2	0.2		-0.8	1.8	2.3	-0.4	-0.1	1	1	329.4	0.005	0.026	1.065
																0.005	0.026	1.056
	7	6978	6502	228.5	4.2	0.3	-0.5		1.4		-0.4	-0.1	1	1	329.4	0.005	0.026	1.056
																0.006	0.026	1.065
40796	7:23: 8	6978	6502	228.5	4.2	0.4		-0.5	1.4	2.3	-0.4	-0.1	1	1	329.4	0.005	0.025	1.056
																0.005	0.026	1.065
	9	6980	6504	228.0	4.2	0.4	0.0		1.4		-0.4	-0.1	1	1	329.4	0.004	0.026	1.047
																0.003	0.024	1.038
																0.003	0.026	1.029
																0.006	0.026	1.029
																0.006	0.026	1.019
																0.004	0.026	1.029
																0.003	0.027	1.019
																0.005	0.026	1.019
																0.006	0.026	1.010
																0.007	0.027	1.010
																0.005	0.026	1.010
																0.004	0.026	1.010
																0.005	0.027	1.010
																0.005	0.026	1.001
																0.005	0.025	1.001
																0.005	0.026	1.001
																0.005	0.026	1.001
																0.004	0.025	1.001
																0.005	0.026	0.992

AFA-LDG-94.0355.TR

3/8

Cycle	Heure TU (H:mm:ss)	ALTI ft	HAUT ft	CAS kt	ASSI deg	STIP	PROL deg	PROR deg	STIR	AILR °	DIR °	PALON	MW	YAW	CAP deg	ACCY g	ACCX g	ACCZ g
																0.005	0.025	0.992
																0.003	0.026	0.992
																0.004	0.026	0.983
	10	6980	6504	228.0	4.1	0.6		0.0	1.4	2.3	-0.7	-0.1	1	1	329.4	0.003	0.026	0.983
																0.006	0.025	0.983
																0.006	0.026	0.983
																0.006	0.025	0.983
	11	6980	6504	228.5	4.2	0.6	0.3		1.4		-0.4	-0.1	1	1	329.4	0.007	0.024	0.992
																0.004	0.026	1.001
																0.005	0.027	1.001
																0.006	0.027	1.001
40797	7:23:12	6980	6504	228.5	4.2	0.5		0.0	1.4	2.0	-0.4	-0.1	1	1	329.4	0.005	0.026	1.001
																0.004	0.030	1.010
																0.005	0.026	1.001
																0.004	0.026	1.001
	13	6980	6504	228.5	4.1	0.5	0.3		0.7		-0.4	-0.1	1	1	329.4	0.003	0.026	0.992
																0.003	0.026	0.992
																0.005	0.025	0.992
																0.003	0.022	0.983
	14	6980	6504	228.5	3.9	0.5		-0.3	0.7	2.3	-0.4	-0.2	1	1	329.4	0.005	0.020	0.974
																0.005	0.019	0.974
																0.007	0.016	0.974
																0.008	0.015	0.974
	15	6978	6502	228.5	3.9	0.5	0.0		1.4		-0.4	-0.1	1	1	329.4	0.009	0.011	0.974
																0.011	0.008	0.974
																0.007	0.008	0.955
																0.008	0.006	0.965
40798	7:23:16	6976	6500	229.0	3.5	0.5		-0.3	1.1	1.7	-0.4	-0.1	1	1	329.4	0.005	0.003	0.955
																0.004	-0.001	0.965
																-0.003	-0.005	0.946
																-0.003	-0.002	0.965
	17	6974	6498	227.5	3.4	0.5	0.3		-0.1		-0.4	-0.1	1	1	329.4	0.013	-0.004	0.891
																0.008	-0.004	0.919
																0.003	-0.005	0.946
																0.005	0.004	0.946
	18	6968	6492	227.5	3.2	0.6		-0.3	0.3	2.0	-0.4	-0.1	1	1	329.4	0.007	-0.007	0.946
																0.005	-0.010	0.937
																0.006	-0.012	0.919
																0.005	-0.013	0.910
	19	6960	6484	228.0	2.7	0.5	0.0		-0.5		-0.4	-0.1	1	1	329.4	0.005	-0.014	0.900
																0.006	-0.016	0.891
																0.006	-0.016	0.900

AFA-CDG-94-0355 TR 418

Cycle	Heure TU (H:mn:s)	ALTI ft	HAUT ft	CAS kt	ASSI deg	STIP	PROL deg	PROR deg	STIR	AILR	DIR	PALON	MW	YAW	CAP deg	ACCY g	ACCX g	ACCZ g
																0.006	-0.018	0.900
40799	7:23:20	6948	6472	227.5	2.3	0.5		-0.3	-0.1	1.7	-0.4	-0.1	1	1	329.4	0.007	-0.019	0.900
																0.003	-0.019	0.891
																0.007	-0.019	0.891
																0.007	-0.021	0.891
	21	6934	6458	227.0	1.8	0.5	0.0		-0.1		-0.4	-0.1	1	1	329.4	0.007	-0.022	0.900
																0.006	-0.022	0.910
																0.007	-0.024	0.900
																0.005	-0.025	0.900
	22	6916	6440	227.5	1.4	0.5		0.0	-0.1	1.7	-0.4	-0.1	1	1	329.4	0.005	-0.025	0.900
																0.007	-0.025	0.910
																0.004	-0.024	0.919
																0.002	-0.025	0.919
	23	6896	6420	227.5	1.1	0.6	0.5		-0.1		-0.4	-0.1	1	1	329.4	0.005	-0.026	0.928
																0.005	-0.025	0.928
																0.003	-0.026	0.937
																0.004	-0.028	0.937
40800	7:23:24	6874	6398	228.0	0.9	0.7		0.5	-0.1	2.0	-0.4	-0.1	1	0	329.4	0.003	-0.027	0.946
																0.004	-0.027	0.955
																0.001	-0.028	0.955
																0.002	-0.029	0.946
	25	6848	6372	228.0	0.7	0.8	1.0		-1.1		-0.4	-0.1	1	1	329.4	0.007	-0.028	0.974
																0.007	-0.029	0.974
																0.007	-0.028	0.965
																0.005	-0.028	0.974
	26	6822	6346	228.5	0.8	1.0		0.8	1.8	2.0	-0.7	-0.1	1	1	329.4	0.005	-0.029	0.983
																0.004	-0.028	0.983
																0.007	-0.029	0.983
																0.006	-0.030	0.983
	27	6796	6320	229.0	0.6	1.0	1.0		1.1		-0.4	-0.1	1	1	329.4	0.005	-0.028	0.983
																0.002	-0.029	0.983
																0.000	-0.029	0.983
																0.005	-0.026	0.992
40801	7:23:28	6770	6294	228.5	0.8	1.1		0.5	0.7	2.0	-0.4	-0.1	1	1	329.4	0.003	-0.027	1.001
																0.004	-0.026	1.001
																0.004	-0.025	0.992
																0.007	-0.025	1.001
	29	6744	6268	228.0	0.8	1.0	0.5		2.2		-0.7	-0.1	1	1	329.8	0.007	-0.026	1.010
																0.010	-0.026	0.965
																0.012	-0.027	0.974
																0.001	-0.028	0.992
	30	6716	6240	228.5	0.7	0.9		-0.3	-1.3	2.0	-0.4	-0.1	1	1	329.4	-0.003	-0.027	1.010

AFA-CDG-94-0355 TR 5/8

Cycle	Heure TU (H:mn:s)	ALTI ft	HAUT ft	CAS kt	ASSI deg	STIP	PROL deg	PROR deg	STIR	AILR °	DIR °	PALON	MW	YAW	CAP deg	ACCY g	ACCX g	ACCZ g
																-0.002	-0.026	0.992
																0.005	-0.026	0.983
																0.007	-0.027	0.992
	31	6688	6212	229.0	0.6	0.7	0.3		0.3		-0.4	-0.1	1		329.8	0.001	-0.028	0.974
																0.004	-0.027	0.965
																0.016	-0.022	0.983
																0.005	-0.038	1.010
40802	7:23:32	6660	6184	229.5	0.6	0.7		0.0	0.7	2.0	-0.7	-0.1	1	1	329.8	-0.027	-0.032	0.983
																0.055	-0.016	0.992
																0.040	-0.028	1.029
																-0.046	-0.042	1.001
	33	6632	6156	230.0	0.6	0.7	0.3		4.5		-3.6	-0.1	1		329.8	-0.032	-0.026	0.983
																0.053	-0.016	1.001
																0.039	-0.016	1.029
																-0.043	-0.041	1.010
	34	6606	6130	230.5	0.7	0.6		0.0	6.0	3.4	-3.6	-0.2	1	1	329.8	-0.027	-0.014	0.983
																0.057	-0.015	1.001
																0.041	-0.043	1.029
																-0.046	-0.041	1.038
	35	6578	6102	230.5	0.7	0.7	0.5		6.0		-3.6	-0.2	1	1	329.8	-0.032	-0.014	1.010
																0.052	-0.016	0.992
																0.040	-0.041	1.019
																-0.041	-0.041	1.038
40803	7:23:36	6550	6074	231.0	0.7	0.7		0.0	7.6	3.7	-3.6	-0.2	1	1	329.8	-0.040	-0.014	1.029
																0.047	-0.016	1.001
																0.042	-0.039	1.010
																-0.032	-0.042	1.047
	37	6524	6048	231.5	0.9	0.7	0.5		8.7		-3.6	-0.2	1	1	329.8	-0.042	-0.017	1.001
																0.036	-0.016	1.001
																0.046	-0.038	1.019
																-0.026	-0.039	1.029
	38	6496	6020	232.0	0.9	0.7		0.0	9.1	4.0	0.9	-0.2	1	1	329.8	-0.029	-0.034	1.019
																-0.011	-0.028	1.010
																0.010	-0.024	1.010
																0.033	-0.021	1.019
	39	6470	5994	232.0	0.9	0.7	0.3		9.1		-0.4	-0.2	1		329.4	0.046	-0.022	1.019
																0.052	-0.022	1.029
																0.051	-0.025	1.029
																0.036	-0.026	1.029
40804	7:23:40	6446	5970	232.0	1.1	0.7		0.0	-7.0	0.3	-0.7	-0.3			330.5	0.019	-0.029	1.029
																0.003	-0.032	1.038
																-0.012	-0.032	1.038

AFA-CDG-94-0355 TR 6/18

Cycle	Heure TU (H:mn:s)	ALTI ft	HAUT ft	CAS kt	ASSI deg	STIP	PROL deg	PROR deg	STIR	AILR	DIR	PALON	MW	YAW	CAP deg	ACCY g	ACCX g	ACCZ g
																-0.022	-0.032	1.019
		41	6424	5948	232.5	1.1	0.7	0.3	-12.2		-0.7	-0.3			329.8	-0.027	-0.032	1.019
																-0.022	-0.030	1.010
																-0.014	-0.030	1.010
																0.010	-0.029	1.001
		42	6398	5922	232.5	1.2	0.7		0.0	4.9	2.9	-0.7	-0.3	1	329.1	0.015	-0.027	1.010
																0.020	-0.026	1.010
																0.021	-0.026	1.010
																0.030	-0.028	1.010
		43	6374	5898	232.0	1.1	0.6	0.3		7.6		-0.7	-0.3	1	329.4	0.015	-0.027	1.010
																0.009	-0.032	1.010
																0.000	-0.030	1.010
																-0.005	-0.032	1.010
40805	7:23:44		6352	5876	232.0	1.2	0.6		0.0	0.7	2.0	-0.7	-0.3	1	329.4	-0.007	-0.032	1.010
																-0.007	-0.032	1.010
																-0.005	-0.030	1.001
																-0.002	-0.029	0.992
		45	6328	5852	232.0	1.2	0.6	0.0		3.8		-0.7	-0.3	1	329.1	-0.001	-0.029	1.001
																0.001	-0.029	0.992
																0.003	-0.029	1.001
																0.007	-0.029	0.992
		46	6304	5828	232.5	1.1	0.6		-0.3	6.0	2.6	-0.7	-0.2	1	329.4	0.007	-0.029	1.001
																0.009	-0.029	0.992
																0.005	-0.032	1.001
																0.004	-0.030	1.001
		47	6282	5806	232.5	1.1	0.6	0.0		3.4		-0.7	-0.2	1	329.4	0.001	-0.032	0.992
																0.002	-0.032	1.001
																0.000	-0.032	1.001
																0.001	-0.030	1.001
40806	7:23:48		6258	5782	233.0	1.1	0.6		-0.3	2.2	2.6	-0.7	-0.2	1	329.4	-0.003	-0.030	1.001
																-0.002	-0.030	1.001
																0.000	-0.032	1.001
																0.001	-0.030	1.001
		49	6234	5758	233.5	1.1	0.6	0.3		3.4		-0.7	-0.2	1	329.4	0.001	-0.029	1.010
																0.007	-0.029	1.019
																0.007	-0.028	1.010
																0.008	-0.029	1.019
		50	6210	5734	233.5	1.1	0.6		0.0	3.0	2.0	-0.7	-0.2	1	329.4	0.009	-0.029	1.019
																0.007	-0.030	1.019
																0.004	-0.029	1.019
																0.003	-0.028	1.019
		51	6188	5712	233.5	1.2	0.7	0.3		0.7		-0.7	-0.2	1	329.4	0.001	-0.029	1.029

AFA-CDG-94-0355 T2
4/8

Cycle	Heure TU (H:mn:s)	ALTI ft	HAUT ft	CAS kt	ASSI deg	STIP	PROL deg	PROR deg	STIR	AILER °	DIR °	PALON	MW	YAW	CAP deg	ACCY g	ACCX g	ACCZ g
																0.000	-0.030	1.019
40807	7:23:52	6166	5690	233.0	1.2	0.7		0.0	1.4	2.6	-0.7	-0.2	1		329.4	-0.001	-0.030	1.029
																0.001	-0.029	1.029
	53	6144	5668	233.0	1.4	0.6	0.3		2.6		-0.7	-0.2	1		329.4	0.001	-0.028	1.029
																0.004	-0.032	1.019
	54	6124	5648	233.0	1.4	0.6		0.0	1.8	2.3	-0.7	-0.2	1		329.4	0.006	-0.028	1.019
																0.007	-0.028	1.019
	55	6102	5626	232.5	1.4	0.6	0.0		2.2		-0.7	-0.2	1		329.4	0.005	-0.030	1.019
																0.003	-0.029	1.010
40808	7:23:56	6082	5606	232.5	1.4	0.5		-0.3	2.6	2.6	-0.7	-0.2	1		329.4	0.006	-0.029	1.010
																0.004	-0.029	1.001
	57	6060	5584	232.0	1.4	0.5	0.0		2.6		-0.7	-0.2	1		329.4	0.003	-0.030	1.001
																0.002	-0.030	1.001
	58	6040	5564	232.0	1.5	0.5		-0.3	2.2	2.3	-0.7	-0.2	1		329.4	0.001	-0.030	1.001
																0.002	-0.030	1.001
	59	6018	5542	231.5	1.2	0.6	0.3		2.2		-0.7	-0.2	1		329.4	0.003	-0.029	1.001
																0.004	-0.029	1.001
40809	7:24: 0	5998	5522	231.5	1.2	0.7		0.0	2.2	2.3	-0.7	-0.2	1		329.4	0.004	-0.029	1.001
																0.003	-0.030	0.992
	1	5974	5498	231.5	1.2	0.7	0.3		1.8		-0.7	-0.2	1		329.4	0.003	-0.029	0.992
																0.003	-0.029	0.992
																0.003	-0.032	0.992
																0.003	-0.029	0.992
																0.003	-0.030	0.992
																0.002	-0.029	0.992
																0.003	-0.030	0.983
																0.003	-0.029	0.983
																0.005	-0.029	0.992
																0.003	-0.029	1.001
																0.004	-0.029	0.992
																0.005	-0.032	0.992
																0.004	-0.029	1.001
																0.003	-0.029	0.983
																0.002	-0.029	0.992
																0.001	-0.032	0.992
																0.005	-0.029	0.992
																0.002	-0.030	1.001

AFA-CDG 94-0355TR

818

Cycle	Heure TU (H:mn:s)	ALTI ft	HAUT ft	CAS kt	ASSI deg	STIP	PROL deg	PROR deg	STIR	AILR	DIR	PALON	MW	VAW	CAP deg	ACCY g	ACCX g	ACCZ g
	3	5952	5476	231.5	1.2	0.7	0.3	0.0	1.8	2.3	-0.7	-0.2			329.4	0.000	-0.029	1.001
		5930	5454	231.0	1.2	0.7	0.3		1.8		-0.7	-0.2			329.4	0.003	-0.029	1.001
																0.005	-0.029	0.992
																0.003	-0.029	0.992
																0.004	-0.028	1.001
																0.005	-0.028	0.992
																0.004	-0.029	1.001
																0.007	-0.027	1.001
																-0.007	-0.027	1.001

View Message

Message Number:	Action File Name:	Status:
AFA-CDG-94-0368RR	AFA-CDG-94-0118TR	Closed

Model: 737-500 ATA: 2725-10

Subject: RUDDER KICK/OSCILLATION DURING DESCENT - FINEL-DONT

AFA-CDG-94-0368RR 19 OCT 94
ATA 2725-10 MODEL 737-500
RUDDER KICK/OSCILLATION DURING DESCENT - FINEL-DONT
REF /A/ AFA-CDG-94-0355TR DTD 12 OCT 94 /C/
/B/ AFA-CDG-94-0344RR
/C/ AFA-CDG-94-0334TR

AIRPLANE	HOURS/CYCLES
F-GJNJ	
PT510	

THE FOLLOWING MESSAGE SENT TO E. FESSLER WITH A COPY TO J. DEC.

THE FOLLOWING INFORMATION IS PROVIDED IN RESPONSE TO THE REF /A/ TELEX REGARDING THE REF /C/ REPORTED RUDDER KICK DURING DESCENT. IN THE REF /B/ TELEX, WE ADVISED AFA THAT WE WERE UNABLE TO CONCLUSIVELY DETERMINE THE CAUSE OF THE RUDDER DISPLACEMENT FROM THE PROVIDED DATA, AND THAT RAW DATA FROM THE FLIGHT DATA RECORDER WOULD BE MORE USEFUL FOR FUTURE REFERENCE. INCLUDED WITH THE REF /A/ TELEX WAS FAXED TABULAR DATA ADDITIONAL TO THAT PROVIDED WITH THE REF /C/ TELEX. AFA REQUESTED THAT WE EVALUATE AND COMMENT ON THIS ADDITIONAL DATA.

A CURSORY REVIEW OF THE INFORMATION PROVIDED WITH THE REF /A/ TELEX HAS DISCLOSED SOME APPARENT INCONSISTENCIES. HOWEVER, WE ARE STILL UNABLE TO DETERMINE THE SOURCE OF THESE APPARENT ANOMALIES WITH THE REF /A/ AND REF /C/ DATA IN PRINTED FORMAT.

FOR FUTURE REFERENCE, WHEN AFA REQUESTS OUR REVIEW OR ANALYSIS OF DFDR DATA, PLEASE NOTE:

TRANSMISSION OF DFDR DATA IN ONE OF THE FOLLOWING FORMATS AND MEDIUMS WILL GREATLY FACILITATE OUR ANALYSIS. IF AT ALL POSSIBLE, IT IS HIGHLY DESIRABLE TO RECEIVE THE DFDR DATA FROM THE ENTIRE FLIGHT /ENGINE START TO ENGINE SHUTDOWN/.

IN ADDITION TO THE RECORDED DATA, IF WEIGHT AND BALANCE DATA ARE NO AVAILABLE ON THE DFDR, PLEASE PROVIDE THE AIRCRAFT GROSS WEIGHT AND CENTER OF GRAVITY FOR THE FLIGHT AND/OR TIME IN QUESTION.

DATA FORMAT INFORMATION

ALL DFDR DATA SHOULD BE TRANSFERRED IN RAW BINARY FORMAT. /COMPRESSED DATA FROM A SOLID STATE DFDR SHOULD BE UNCOMPRESSED PRIOR TO TRANSMISSION/.

THE FOLLOWING INFORMATION WILL FACILITATE THE CONVERSION INTO THE ENGINEERING SCIENTIFIC BINARY /ESB/ FORMAT REQUIRED FOR ENGINEERING ANALYSIS:

- AIRCRAFT MODEL
- TAIL OR LINE NUMBER

- DFDR MANUFACTURER
- DIGITAL FLIGHT DATA ACQUISITION UNIT /DFDAU/ TYPE
- DFDAU DATA FRAME LAYOUT /IF NON BOEING D6-55333 STANDARD FRAME 1 OR 2 FORMAT/

PLEASE PROVIDE AS MUCH OF THIS INFORMATION AS POSSIBLE WITH THE DFDR DATA.

TRANSMISSION MEDIUMS

DATA MAY BE TRANSMITTED ON ONE OF THE FOLLOWING MEDIUMS:

1/ DATA /PACKED OR UNPACKED/ MAY BE COPIED OR BACKED-UP ONTO 3.5 INCH DISKETTE/S/. /DATA ON A 5.25 INCH DISKETTE IS ALSO ACCEPTABLE./

   - DATA COMPRESSION PROGRAMS /PKZIP, LHARC OR ARJ/ MAY BE UTILIZED TO DECREASE THE AMOUNT OF DISK SPACE REQUIRED. PLEASE SPECIFY IF A DATA COMPRESSION UTILITY HAS BEEN UTILIZED.

2/ A COPY OF THE DFDR DATA ON REEL TO REEL TAPE /COPY TAPE/ IN RAW BINARY FORMAT OF THE DFDR MANUFACTURE IS ALSO ACCEPTABLE.

RECEIPT OF DFDR DATA IN THE ABOVE DESCRIBED FORM WOULD SIGNIFICANTLY ASSIST US IF AFA REQUESTS ANY FURTHER ANALYSIS OF OF THE REF /C/ REPORTED ANOMALY.

JOHNSON/DUYUNGAN/MIKE DIDONATO
CUSTOMER SERVICE ENGINEERING
BOEINGAIR M-7272 2H-95
/CAR

19 OCT 94 2109