

**DOCKET NO.: SA-517**  
**EXHIBIT NO. 10D**

**NATIONAL TRANSPORTATION SAFETY BOARD**  
**WASHINGTON, D.C.**

**HG-7468 FDR PARAMETER RETROFIT DOCUMENTATION**

**By: Tom Jacky**  
**(5 pages)**

**NOTE:** The contents of this exhibit are identical to the contents of **Addendum to Group Chairman’s Factual Report - Flight Data Recorder, Attachment 1, “HG-7468 FDR Parameter Retrofit Documentation”**. The text portion of the **Addendum to Group Chairman’s Factual Report - Flight Data Recorder** is included in Exhibit 10B.

# HL7468 DFDR PARAMETER

## 입력현황

P/N : 981-6009-010

S/N : 2663

장착 일자 : 96. 10. 13

| NO | PARAMTER NAME                              | S.F     | WORD        | BIT    |
|----|--|---------|-------------|--------|
| 1  | ACCELERATION - LATERAL                     | 1,2,3,4 | 15,31,47,63 | 3 - 12 |
| 2  | ACCELERATION - LONGITUDINAL                | 1,2,3,4 | 13,29,45,61 | 3 - 12 |
| 3  | ACCELERATION - VERTICAL                    | 1,2,3,4 | 2,18,34,50  | 1 - 12 |
| 4  | ALTITUDE - COARSE                          | 1       | 23          | 1 - 12 |
| 5  | ALTITUDE - FINE                            | 1,2,3,4 | 5           | 1 - 12 |
| 6  | COMPUTED AIR SPEED                         | 1,2,3,4 | 19          | 1 - 12 |
| 7  | CONTROL COLUMN POSITION - PITCH            | 1,2,3,4 | 41          | 3 - 12 |
| 8  | CONTROL COLUMN POSITION - ROLL             | 1,2,3,4 | 9           | 3 - 12 |
| 9  | DOCUMENTARY DATA                           |         |             |        |
| 10 | ENG PRESSURE RATIO - ENG 1                 | 1       | 33          | 1 - 12 |
| 11 | ENG PRESSURE RATIO - ENG 2                 | 2       | 33          | 1 - 12 |
| 12 | ENG PRESSURE RATIO - ENG 3                 | 3       | 33          | 1 - 12 |
| 13 | ENG PRESSURE RATIO - ENG 4                 | 4       | 33          | 1 - 12 |
| 14 | EVENT MARKER                               |         |             |        |
| 15 | FLAP POSITION - L.E EXTENDED - LEFT SET 1  | 1,3     | 39          | 1      |
| 16 | FLAP POSITION - L.E EXTENDED - LEFT SET 2  | 2,4     | 39          | 1      |
| 17 | FLAP POSITION - L.E EXTENDED - LEFT SET 3  | 1,3     | 39          | 2      |
| 18 | FLAP POSITION - L.E EXTENDED - LEFT SET 4  | 2,4     | 39          | 2      |
| 19 | FLAP POSITION - L.E EXTENDED - RIGHT SET 1 | 1,3     | 4           | 1      |
| 20 | FLAP POSITION - L.E EXTENDED - RIGHT SET 2 | 2,4     | 4           | 1      |
| 21 | FLAP POSITION - L.E EXTENDED - RIGHT SET 3 | 1,3     | 4           | 2      |
| 22 | FLAP POSITION - L.E EXTENDED - RIGHT SET 4 | 2,4     | 4           | 3      |
| 23 | FLAP POSITION - T.E RIGHT IN BOARD         | 1,3     | 39          | 3 - 12 |
| 24 | HF - 1 KEYING                              | 1,2,3,4 | 61          | 1      |
| 25 | HF - 2 KEYING                              | 1,2,3,4 | 61          | 2      |

|        |                                    |         |       |        |
|--------|------------------------------------|---------|-------|--------|
| 26     | L.E MASTER IN TRANSIT              | 1,2,3,4 | 13    | 2      |
| 27     | MAGNETIC HEADING                   | 1,2,3,4 | 3     | 3 - 12 |
| 28     | PITCH ATTITUDE                     | 1,2,3,4 | 51    | 3 - 12 |
| 29     | ROLL ATTITUDE                      | 1,2,3,4 | 17    | 3 - 12 |
| 30     | RUDDER PEDAL POSITION              | 1,2,3,4 | 27,59 | 3 - 12 |
| 31     | STABILIZER POSITION                | 1,3     | 55    | 1 - 12 |
| 32     | THRUST REVERSER IN TRANSIT - ENG 1 | 1       | 7     | 1      |
| 33     | THRUST REVERSER IN TRANSIT - ENG 2 | 2       | 7     | 1      |
| 34     | THRUST REVERSER IN TRANSIT - ENG 3 | 3       | 7     | 1      |
| 35     | THRUST REVERSER IN TRANSIT - ENG 4 | 4       | 7     | 1      |
| 36     | THRUST REVERSER OPERATING - ENG 1  | 1       | 30    | 1      |
| 37     | THRUST REVERSER OPERATING - ENG 2  | 2       | 30    | 1      |
| 38     | THRUST REVERSER OPERATING - ENG 3  | 3       | 30    | 1      |
| 39     | THRUST REVERSER OPERATING - ENG 4  | 4       | 30    | 1      |
| 40     | VHF 1 KEYING                       | 1,2,3,4 | 9     | 1      |
| 41     | VHF 2 KEYING                       | 1,2,3,4 | 9     | 2      |
| 42     | VHF 3 KEYING                       | 1,2,3,4 | 15    | 1      |
| ① { 43 | EGT - ENG 1                        | 1       | 16    | 1 - 12 |
| 44     | EGT - ENG 2                        | 2       | 16    | 1 - 12 |
| 45     | EGT - ENG 3                        | 3       | 16    | 1 - 12 |
| 46     | EGT - ENG 4                        | 4       | 16    | 1 - 12 |
| ② { 55 | OIL QUANTITY - ENG 1               | 1,3     | 62    | 1 - 12 |
| 56     | OIL QUANTITY - ENG 2               | 2,4     | 35    | 1 - 12 |
| 57     | OIL QUANTITY - ENG 3               | 3       | 28    | 1 - 12 |
| 58     | OIL QUANTITY - ENG 4               | 4       | 44    | 1 - 12 |
| ③ < 59 | STATIC AIR TEMPERATURE             | 2,4     | 55    | 1 - 12 |
| ④ < 60 | SPOILER POSITION - LEFT #4         | 1,2,3,4 | 32    | 1 - 12 |
| 61     | SPOILER POSITION - RIGHT #12       | 1,2,3,4 | 48    | 1 - 12 |

\* spoiler pos (4), WARD: 32, Subframe 1, 2, 3, 4  
 " (12), " (48)  
 " " " " " " " "

**KOREAN AIR SAT Word # 4455 " 2,4 ENGINEERING ORDER**

ENGINEERING DEPARTMENT

|   |        |       |      |               |        |       |     |  |    |    |    |                                  |
|---|--------|-------|------|---------------|--------|-------|-----|--|----|----|----|----------------------------------|
| EAO No  |        | Rev   | Step | Date          |        |       |     | ATA  | 담당 | 담당 | 팀장 | 부장                               |
| A 9 5 7 6 4 0 0 0 1 3 1 1 0 9 5 9 1   |        |       |      |               |        |       |     |  |    |    |    |                                  |
| Original Reference Document :   |        |       |      |               |        |       |     |  |    |    |    |                                  |
| KEB   |        |       |      |               |        |       |     |  |    |    |    |                                  |
| AD No. : N/A  |        |       |      |               |        |       |     |  |    |    |    |                                  |
| Approval : N/A  |        |       |      |               |        |       |     |  |    |    |    |                                  |
| refer :   |        |       |      |               |        |       |     |  |    |    |    |                                  |
| Subject :   |        |       |      |               |        |       |     | Effectivity : 8747-200/300/SP<br>HL7463/64/70/56/57/43/54/58/59/51/52/59<br>/75/76/71/74/41/01 HL7448                            |    |    |    |                                  |
| FDR PARAMETER 추가(SAT) SPOILER)  |        |       |      |               |        |       |     | Compliance : AD <input type="checkbox"/> Limited <input type="checkbox"/> Routine <input checked="" type="checkbox"/>            |    |    |    |                                  |
| I. Planning & Information<br>Reason & Description :   |        |       |      |               |        |       |     | 1996. 12. 31 이전  |    |    |    |                                  |
| 이유 : FDR(FLIGHT DATA RECORDER)에 SAT(STATIC AIR TEMP) 및 SPOILER POSITION SIGNAL을 추가하기 위하여            |        |       |      |               |        |       |     | Removed Parts Disposition :  |    |    |    |                                  |
| 개요 : FDAU (-FLIGHT DATA ACQUISITION UNIT)에 관련 WIRING을 연결해줌.   |        |       |      |               |        |       |     | Reference :<br>WDM 31-31-xx/27-68-11/34-12-12,22<br>MM 31-31-xx/29-11-00   |    |    |    |                                  |
| - NO.2 CADCR로부터 FDAU까지 WIRE 연결  |        |       |      |               |        |       |     | Distribution :   |    |    |    |                                  |
| - NO.4, NO.12 SPOILER TRANSMITTER로부터 FDAU까지 WIRE 연결   |        |       |      |               |        |       |     | 품질보증팀(QA), 검사실(MC), 생산관리팀(MC), 생산계획팀(MD), 생산기술팀(MC), 생산기술팀(MH), 생산관리1팀(MH), CONTROL TOWER(MH), AVIONICS1팀(MC), AVIONICS 점검팀(MF). |    |    |    |                                  |
| II. Attachment  |        |       |      |               |        |       |     | Remarks  |    |    |    |                                  |
| - Part List 1 page(s)   |        |       |      |               |        |       |     | FDR TESTER는 AVIONICS 점검팀에 있음.  |    |    |    |                                  |
| - Special Tool List page(s)   |        |       |      |               |        |       |     |  |    |    |    |                                  |
| - Accomplishment Instruction 2 page(s)  |        |       |      |               |        |       |     |  |    |    |    |                                  |
| - Drawing 4 부   |        |       |      |               |        |       |     |  |    |    |    |                                  |
| - Accomplishment/inspection Report page(s)  |        |       |      |               |        |       |     |  |    |    |    |                                  |
| Man Power & Information(예상)   |        |       |      |               |        |       |     | Attachment Revision  |    |    |    |                                  |
| Skill   | Man    | Hours | M/H  | Skill         | Man    | Hours | M/H | 01   | 96 |    |    | 작업권자 7호 및 첨부 DRAWING에            |
| REI   | 2      | 10    | 20   |               |        |       |     | 2.23   |    |    |    | PROGRAM PIN DB591C 83.100 GRD 4점 |
| APG   | 1      | 2     | 2    |               |        |       |     | 02   | 96 |    |    | WIRE MARKING, P1 및 첨부            |
| TTL M/H :   | 22 M/H |       |      | Elapsed Hrs : | 10 HRS |       |     | 03   | 96 |    |    | HL7474 DRAWING Rev. 및            |
| Remarks   |        |       |      |               |        |       |     | Rev  | 날짜 | 담당 | 팀장 | 개정 이유                            |
| W & B : Change <input type="checkbox"/> No Change <input checked="" type="checkbox"/>               |        |       |      |               |        |       |     |  |    |    |    |                                  |
| Δ WT : + lb   |        |       |      |               |        |       |     |  |    |    |    |                                  |
| Δ Moment : + in-lb  |        |       |      |               |        |       |     |  |    |    |    |                                  |
| Technical Implication   |        |       |      |               |        |       |     |  |    |    |    |                                  |
| Defueling <input type="checkbox"/> Jack-up <input type="checkbox"/> Weight <input type="checkbox"/> |        |       |      |               |        |       |     |  |    |    |    |                                  |
| Engine Test <input type="checkbox"/> Flight Test <input type="checkbox"/>                           |        |       |      |               |        |       |     |  |    |    |    |                                  |

기 술 개 발 부 장

\* EGT : WORD 16. subframe 1, 2, 3, 4.  
 oil qty : 12, 13, 35, 36, 38 (ALL), 44 (ALL)

**KGREAN AIR**  
 ENGINEERING DEPARTMENT

**ENGINEERING ORDER**

|   |      |       |                |       |  |                     |     |  |
|---|------|-------|----------------|-------|--|---------------------|-----|--|
| ENG No.   | Rev. | Step  | Date           | ATA   | 담당   | 담당                  | 팀장  | 부장   |
| A190490   | 01   | 01    | 220124         | 311   |  |                     |     |  |
| Original Reference Document<br>KEB KE   |      |       |                |       |  |                     |     |  |
| AD No.<br>N/A   |      |       |                |       | Effectivity  |                     |     |  |
| Approval<br>N/A   |      |       |                |       | HL 7441/43/51/52/54/56/57/<br>58/59/66/69/70/71/74/75/76<br><u>HL 7443</u>   |                     |     |  |
| Refer   |      |       |                |       | Compliance : AD <input type="checkbox"/> Limited <input type="checkbox"/> Routine <input checked="" type="checkbox"/>  |                     |     |  |
| Subject<br>B747 - EXPANDED DFDR PARAMETER 추가  |      |       |                |       | 1995. 12. 31 이전  |                     |     |  |
| I. Planning & Information<br>Reason & Description   |      |       |                |       | Removed Parts Disposition  |                     |     |  |
| 이유 : DFDR에 ENGINE 관련 PARAMETERS<br>(EGT, NI, N2, OIL QTY, OIL PRESSURE)<br>를 추가하여 정비 자원에 참고하고자 함.     |      |       |                |       | Reference<br>컴부 WDM 31-35-81, 31-35-82<br>31-35-83, 31-35-84<br>M.M 31-31-00   |                     |     |  |
| 개요 : 해당 ENGINE 관련 INDICATOR에서<br>WIRE를 DFDAU 까지 ROUTING하고,<br>DFDAU에 PIN-PROGRAMMING을<br>수행함.         |      |       |                |       | Distribution<br>수신 : 품질보증팀, 생산 계획팀, 운항정비 검사팀, 공장 검사팀,<br>생산관리팀(2), 생산기술팀(MC), 생산기술팀(MH)<br>AVIONICS 점검팀(MF), 생산관리팀(MH)<br>참고수신 : 품질 검사팀, AVIONICS 정비팀, 운항정비 2팀, 3팀 |                     |     |  |
| Man Power & Elapsed Hours   |      |       |                |       | II. Attachment   |                     |     |  |
| Skill   | Man  | Hours | M/H            | Skill | Man  | Hours               | M/H | - Part List ..... 2 pages<br>- WIRE LIST ..... 10 pages<br>- Accomplishment Instruction ..... 5 pages<br>- Drawing ..... 4 pages<br>- Accomplishment/Inspection Report ..... 1 pages |
| R   | 3    | 30    | 90             |       |  |                     |     | Remarks<br>- NI, N2 및 OIL PRESSURE PARAMETERS는<br>WIRING PROVISION 작업만 수행함.  |
| I   | 2    | 3     | 6              |       |  |                     |     |  |
| TTL M/H 96  |      |       | Elapsed Hrs 33 |       |  | Attachment Revision |     |  |
| Remarks   |      |       |                |       |  |                     |     |  |
| W & B : Change <input checked="" type="checkbox"/> No Change <input type="checkbox"/>                 |      |       |                |       |  |                     |     |  |
| ΔVT ..... NEGLIGIBLE  |      |       |                |       |  |                     |     |  |
| ΔMoment   |      |       |                |       |  |                     |     |  |
| Technical Implication   |      |       |                |       |  |                     |     |  |
| Defueling <input type="checkbox"/> Jack-up <input type="checkbox"/> Weighing <input type="checkbox"/> |      |       |                |       |  |                     |     |  |
| Engine Test <input type="checkbox"/> Flight Test <input type="checkbox"/>                             |      |       |                |       | 이 94년 9/23일 신검사 제호 타항관련 검사.<br>REV. 일자 담당 팀장 임직<br>개정 이유   |                     |     |  |
| 기 술 부 장   |      |       |                |       |  |                     |     |  |