Ultra Electronics
SERVICE BULLETIN

This Service Bulletin complies with British Civil Airworthiness Requirements, Sect. A, Chapter A5-3.

Signed . . . . . .

CAA Approval No. DAI/1501/39
November 1, 1997

SERVICE BULLETIN No. C8E38-75-001

ENGINE AIR - COMPRESSOR CONTROL - BLEED VALVE CONTROL

BLEED VALVE CONTROL UNIT

INTRODUCTION OF BVCU TYPE NUMBER C8E38-12

(Ultra Mod. No. RD409 : R-R Mod. No. RB211-75-C267)

1. Planning Information

A. Effectivity

(1) Boeing 757 aircraft

RB211-535E4-37, -37/10, -37/11, -37/12, -37/14, -37/16, -37/17, -37/19, -37/20, -37/23, -37/24, -B-37, -B-37/15, -B-37/20 and -B-37/21 engines, prior to Serial No. 31534.

(2) Tupolev TU204 aircraft

RB211-535E4-B-75 engines prior to Serial No. 31534.

(3) Bleed Valve Control Unit

Type Numbers C8E38-9 and C8E38-11, all Serial Numbers.

B. Reason

(1) Problem

There are two schedules for the engine handling bleed valves, steady state and transient. The latter is intended for engine acceleration and deceleration. The rate of power lever angle movement (PLA) is used by the engine bleed valve control unit (BVCU) to determine which schedule should be used.

The auto-throttle movement at the top of aircraft descent can be sufficiently slow for engine deceleration to be undertaken with the bleed valves remaining on the steady state schedule. This reduces the engine surge margin.

(2) Evidence

There have been six engine run-downs and over fifteen events of surge and recovery during engine deceleration for aircraft descent attributed to this problem.

(3) Substantiation

The changes introduced by this Service Bulletin (Modification) have been shown by satisfactory unit, rig and flight testing to stop the problem.

(4) Objective

Incorporation of this Service Bulletin (Modification) is designed to maintain the engine surge margin.

(5) Effect of Bulletin on :

Operation	Affected
Maintenance	Affected
Overhaul	Affected
Repair Schemes	Not affected
Interchangeability of unit on/with engine	Not affected
Interchangeability of parts within the unit	Affected (see NOTE overleaf)

NOTE: It is essential that parts are installed in the BVCU as a set.

(6) Supplemental Information

For all other information refer to R-R Service Bulletin RB211-75-C267.

C. Description

This Service Bulletin introduces a BVCU Type No. C8E38-12 which has increased sensitivity to the rate of power lever angle movement.

(1) C8E38-9 and C8E38-11 BVCUs

For values of $N2/\sqrt{T2}$ greater than 211 units, the PLA rate threshold is $>2.5°$/sec and the displacement threshold is $>6.5°$.

For values of $N2/\sqrt{T2}$ less than 211 units, the PLA rate threshold is $>2.5°$/sec and the displacement threshold is $>1.0°$.

(2) C8E38-12 BVCUs

For values of $N2/\sqrt{T2}$ greater than 212 units, the PLA rate threshold is decreased to $>1.0°$/sec and the displacement threshold is decreased to $>3.0°$.

For values of $N2/\sqrt{T2}$ less than 212 units, the PLA rate threshold is decreased to $>1.0°$/sec and the displacement threshold remains at $>1.0°$.

The above sensitivity changes are effected by changing the values of four resistors located on the R & S 1 PCB.

The changes to the PLA transient detection logic have necessitated software changes in the FM2 PCB. The following routines have been updated :

B5 PLA high steady state detection
D9 PLA high monitor check
B9 PLA low steady state detection
E0 PLA low monitor check

This Service Bulletin also introduces Bleed Valve Schedule 19. This increases the nominal closing switch points by one $N2/\sqrt{T2}$ unit with an increased tolerance of ± 3 units. These changes are implemented during setting up.

D. Compliance

RECOMMENDED (1B)

Rolls-Royce recommends that this Service Bulletin (Modification) be accomplished on an expedited basis.

E. Approval

R-R Modification 75-C267 was approved by a representative of the United Kingdom Civil Aviation Authority (CAA) on August 1, 1997.

Ultra Electronics Service Bulletin C8E38-75-001 was approved by Rolls-Royce on Xxxx Y, 1997.

F. Manpower

Not applicable - Operators are to return BVCUs to the manufacturer (Ultra Electronics Controls Division) for accomplishment.

G. Material Cost and Availability

The manufacturer will incorporate Mod. No. RD409 on BVCUs returned for investigation/repair.

H. Tooling - Price and Availability

Not applicable.

J. Weight and Balance

Weight and balance are not changed by this modification.

K. Electrical Load Data

Accomplishment of this Service Bulletin does not change the aircraft electrical load.

L. References

Ultra Electronics Component Maintenance Manual Ref. 75-32-02.

Rolls-Royce Service Bulletin No. RB211-75-C267.

2. Accomplishment Instructions - Type C8E38-9 BVCUs

WARNING: ALL CRINKLE WASHERS USED IN THIS UNIT ARE MADE OF CADMIUM PLATED BERYLLIUM COPPER. ALL BERYLLIUM PRODUCTS, WHEN FRACTURED, ARE A TOXIC HAZARD. UNDER NO CIRCUMSTANCES MUST ABRASIVE MATERIALS BE USED ON BERYLLIUM PRODUCTS

CAUTION: WORK ON THE UNIT MUST BE CARRIED OUT IN A CLEAN ROOM WITH A CONTROLLED AND FILTERED ATMOSPHERE. DO ALL WORK AT AN APPROVED METAL-OXIDE SEMICONDUCTOR (MOS) WORKSTATION. USE APPROVED ANTI-STATIC PROCEDURES TO PREVENT STATIC DISCHARGE DAMAGE.

NOTE: If you are working on a BVCU which has not had MCP 14141 incorporated, it will be necessary to completely remove the motherboard and flexi-rigid assembly in order to add some wire links to the underside of the motherboard. This work is covered in paragraphs B., C., D. and E. below.

A. Remove the Lid Assembly and Labels

(1) Refer to CMM 75-32-02, Disassembly, and carry out the work detailed in para. 2.A.

(2) Discard the lid but retain the lid gasket for future re-assembly.

(3) Remove and discard the identification and modification labels.

B. Remove all the PCBs (units without MCP 14141 only)

(1) Refer to CMM 75-32-02, Disassembly, and carry out the work detailed in para. 2.B.

(2) Discard the R & S 2 PCB.

(3) Pack the FM 1 and FM 2 PCBs for subsequent despatch to the manufacturer in exchange for re-programmed FM 1 and FM 2 PCBs.

C. Remove the Motherboard and Flexi-rigid Assembly (units without MCP 14141 only)

(1) Refer to CMM 75-32-02, Disassembly, and carry out the work detailed in paras. 2.C., 2.D. and 2.E.

(2) Retain all the disassembled items for future re-assembly.

(3) Taking care to avoid straining the flexi-rigid sub-assembly, place the motherboard on a flat work-surface, with the solder side uppermost.

D. Fit Wire Links to the Motherboard (units without MCP 14141only)

(1) Refer to Fig. 1 in this Service Bulletin. On the motherboard, locate and identify the pin connections listed in the table in Fig. 1.

(2) Refer to CMM 75-32-02, Repair page 601 and up, and familiarise yourself with the procedures for soldering work on conformally coated boards.

(3) After removing the conformal coating locally around each pin connection, make up a set of links using Raychem Type 44, 7/0.0063 wire, Part No. 44A702926 (or its equivalent). Form the stripped ends of each link into tinned hooks of a size to fit over the protruding connector pins.

(4) Solder the links to the connector pins, ensuring that a good fillet of solder is formed around each hook.

(5) Using Dow Corning adhesive RTV 3145 (or its equivalent), tack each link to the motherboard surface at frequent intervals.

(6) Repair the conformal coating as detailed in CMM 75-32-02, Repair page 605.

E. Refit the Motherboard and PCBs (units without MCP 14141 only)

(1) Refer to CMM 75-32-02, Assembly, and carry out the work detailed in paras. 3.A., 3.C. and 3.D.

(2) Fit the new, exchanged, FM 1 and FM 2 boards and the new R & S 2 PCB.

(3) Fit the original Power Supply 1 and 2 PCBs, the original Solenoid Driver, Signal Processing and DDU PCBs.

(4) All PCBs, except the R & S 1 PCB should now be in position.

F. Modify the R & S 1 PCB

(1) Refer to CMM 75-32-02, Repair, pages 601 and up, and familiarise yourself with the procedures for soldering work on conformally coated PCBs.

(2) Refer to IPL Fig. 6 in CMM 75-32-02; locate and identify resistors R139, R144, R155 and R156.

(3) From the Mod. Kit, obtain and check the new resistors :-

R139 - 1K3 ohms
R144 - 1K24 ohms
R155 - 5K76 ohms
R156 - 5K6 ohms

(4) Remove the conformal coating locally around each of the resistors which has to be replaced.

(5) Use a solder-sucker to remove all excess solder from within the plated-through holes.

(6) Form the leads of the new resistors as necessary, fit the new resistors and solder in place.

(7) Crop the excess leads from the non-component side of the PCB.

(8) Remove the original labels from the PCB and fit new labels from the Mod. Kit. Endorse the S/N label with the original serial number.

(9) Repair the conformal coating as detailed in CMM 75-32-02, Repair page 605.

(10) Refit the R & S 1 PCB into the unit.

G. Fit the New Unit Labels

(1) Obtain new identification and modification labels from the Mod. Kit.

(2) Using isopropyl alcohol (or an equivalent), ensure that the unit case is clean in the vicinity of the labels.

(3) Using Loctite Multi-Bond 330 (or an equivalent), bond the new labels to the case in the positions occupied by the original labels.

(4) Ensure that all air is expelled from beneath the new labels.

H. Fit the New Lid

(1) Obtain the new lid from the Mod. Kit. Ensure that the mating surfaces on the lid and on the unit case are clean and dry.

(2) Inspect the original lid gasket for signs of damage; renew if necessary.

(3) Refer to CMM 75-32-02, Assembly, page 707 and fit the new lid to the case.

J. Pressure Test

Refer to CMM 75-32-02, Check, pages 502 and 503/504. Carry out the case pressure tests detailed in para. 4.

K. Electrical Test

Refer to CMM 75-32-02, Testing and Fault Isolation, and carry out the full test procedure.

L. Record of Accomplishment

After accomplishment of this Service Bulletin, the Operator must inform the manufacturer of the following :

- Service Bulletin number.
- Serial Numbers of the BVCU(s) modified.
- Serial Numbers of the R & S 1 and motherboards modified.
- Date of the modifications.

Send this data to :

North America	**Rest of the World**
Support Manager North America, Ultra Electronics, 10640 Main Street, Suite 200, Fairfax, VA, 22030, United States of America	Product Support Manager, Ultra Electronics Controls Division, Bridport Road, Greenford, Middlesex UB6 8UA United Kingdom

In addition the Operator must enter the relevant data into the Aircraft/Equipment Technical Logs in accordance with normal procedure.

3. Accomplishment Instructions - Type C8E38-11 BVCUs

WARNING: ALL CRINKLE WASHERS USED IN THIS UNIT ARE MADE OF CADMIUM PLATED BERYLLIUM COPPER. ALL BERYLLIUM PRODUCTS, WHEN FRACTURED, ARE A TOXIC HAZARD. UNDER NO CIRCUMSTANCES MUST ABRASIVE MATERIALS BE USED ON BERYLLIUM PRODUCTS

CAUTION: WORK ON THE UNIT MUST BE CARRIED OUT IN A CLEAN ROOM WITH A CONTROLLED AND FILTERED ATMOSPHERE. DO ALL WORK AT AN APPROVED METAL-OXIDE SEMICONDUCTOR (MOS) WORKSTATION. USE APPROVED ANTI-STATIC PROCEDURES TO PREVENT STATIC DISCHARGE DAMAGE.

A. Remove the Lid Assembly and Labels

(1) Refer to CMM 75-32-02, Disassembly, and carry out the work detailed in para. 2.A.

(2) Retain the lid and its gasket for future re-assembly.

(3) Remove and discard the identification and modification labels.

B. Remove the R & S 1, FM 1 and FM 2 PCBs

(1) Refer to CMM 75-32-02, Disassembly, and carry out the work detailed in para. 2.B.

(2) Pack the FM 1 and FM 2 PCBs for subsequent despatch to the manufacturer in exchange for re-programmed FM 1 and FM 2 PCBs.

C. Modify the R & S 1 PCB

(1) Refer to CMM 75-32-02, Repair, pages 601 and up, and familiarise yourself with the procedures for soldering work on conformally coated PCBs.

(2) Refer to IPL Fig. 6 in CMM 75-32-02; locate and identify resistors R139, R144, R155 and R156.

(3) From the Mod. Kit, obtain and check the new resistors :-

R139 - 1K3 ohms
R144 - 1K24 ohms
R155 - 5K76 ohms
R156 - 5K6 ohms

(4) Remove the conformal coating locally around each of the resistors which has to be replaced.

(5) Use a solder-sucker to remove all excess solder from within the plated-through holes.

(6) Form the leads of the new resistors as necessary, fit the new resistors and solder in place.

(7) Crop the excess leads from the non-component side of the PCB.

(8) Remove the original labels from the PCB and fit new labels from the Mod. Kit. Endorse the S/N label with the original serial number.

(9) Repair the conformal coating as detailed in CMM 75-32-02, Repair page 605.

(10) Refit the R & S 1 PCB into the unit, followed by the re-programmed FM 1 and FM 2 PCBs.

D. Fit the New Unit Labels

(1) Obtain new identification and modification labels from the Mod. Kit.

(2) Using isopropyl alcohol (or an equivalent), ensure that the unit case is clean in the vicinity of the labels.

(3) Using Loctite Multi-Bond 330 (or an equivalent), bond the new labels to the case in the positions occupied by the original labels.

(4) Ensure that all air is expelled from beneath the new labels.

E. Refit the Lid

(1) Ensure that the mating surfaces on the lid and on the unit case are clean and dry.

(2) Inspect the original lid gasket for signs of damage; renew if necessary.

(3) Refer to CMM 75-32-02, Assembly, page 707 and fit the lid to the case.

F. Pressure Test

Refer to CMM 75-32-02, Check, pages 502 and 503/504. Carry out the case pressure tests detailed in para. 4.

G. Electrical Test

Refer to CMM 75-32-02, Testing and Fault Isolation, and carry out the full test procedure.

H. Record of Accomplishment

After accomplishment of this Service Bulletin, the Operator must inform the manufacturer of the following :

- Service Bulletin number.
- Serial Numbers of the BVCU(s) modified.
- Serial Numbers of the R & S 1 PCBs modified.
- Date of the modifications.

Send this data to :

North America

Support Manager North America,
Ultra Electronics,
10640 Main Street, Suite 200,
Fairfax, VA, 22030,
United States of America

Rest of the World

Product Support Manager,
Ultra Electronics Controls Division,
Bridport Road, Greenford, Middlesex
UB6 8UA
United Kingdom

In addition the Operator must enter the relevant data into the Aircraft/Equipment Technical Logs in accordance with normal procedure.

4. Material Information

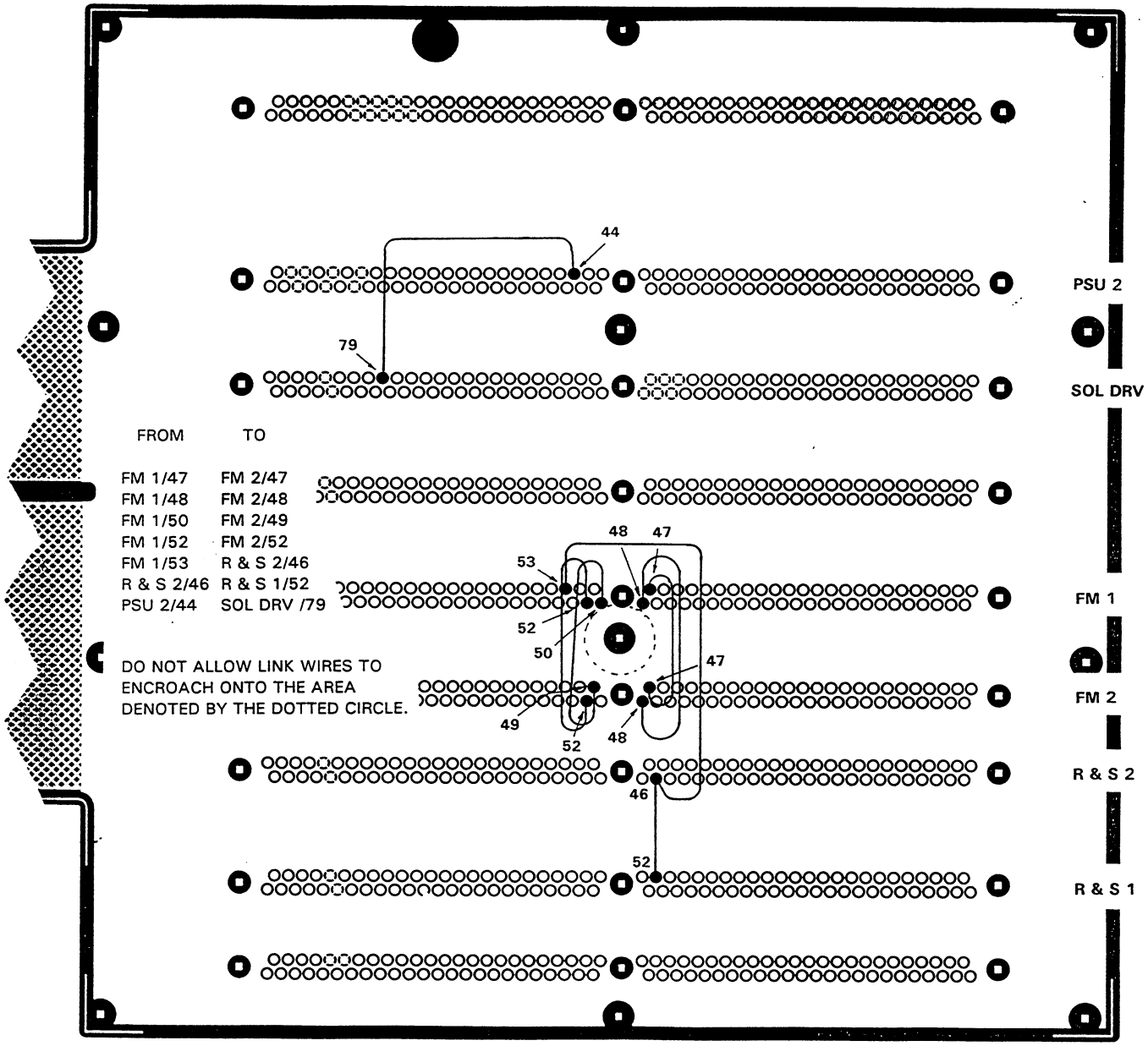
A. Conversion of C8E38-9 BVCU to C8E38-12

New Pt. No.	Qty	Keyword	Old Pt. No.	Instr. Disp.
012CE00-0130	1	PCB, R & S 1	007CE00-0090	Old part modified to produce new part.
24626-724-0-1	1	Resistor, R139	24628-339-0-1	Discard
24628-289-0-1	1	Resistor, R144	24628-338-0-1	Discard
24628-366-0-1	1	Resistor, R155	24628-422-0-1	Discard
24628-364-0-1	1	Resistor, R156	24628-421-0-1	Discard
012CE-00-0040	1	PCB, R & S 2	007CE00-0370	Discard
014CE00-0050	1	PCBs FM1 & FM2 matched pair	007CE00-0060 OR 007CE00-0430	Return to manfr. in exchange for new part
012CE00-0110	1	Lid	007CE00-0330	Discard
014CE00-0012	1	Label, ident.	007CE00-0174	Discard
014CE00-0013	1	Label, ident.	n/a	n/a
32436-127-0	1	Label, mod.	007CE00-0173	Discard

B. Conversion of C8E38-11 BVCU to C8E38-12

New Pt. No.	Qty	Keyword	Old Pt. No.	Instr. Disp.
012CE00-0130	1	PCB, R & S 1	007CE00-0090	Old part modified to produce new part.

New Pt. No.	Qty	Keyword	Old Pt. No.	Instr. Disp.
24626-724-0-1	1	Resistor, R139	24628-339-0-1	Discard
24628-289-0-1	1	Resistor, R144	24628-338-0-1	Discard
24628-366-0-1	1	Resistor, R155	24628-422-0-1	Discard
24628-364-0-1	1	Resistor, R156	24628-421-0-1	Discard
014CE00-0050	1	PCBs FM1 & FM2 matched pair	012CE00-0120	Return to manfr. in exchange for new part
	1	Lid	012CE00-0110	Discard
014CE00-0012	1	Label, ident.	012CE00-0092	Discard
014CE00-0013	1	Label, ident.	n/a	n/a
32436-127-0	1	Label, mod.	007CE00-0173	Discard



Location of Motherboard Links
Figure 1