International Aero Engines

SERVICE BULLETIN

# AIR - HP COMPRESSOR VARIABLE STATOR VANE ACTUATOR - INTRODUCTION OF A LINEAR VARIABLE DIFFERENTIAL TRANSFORMER WITH REVISED ADHESIVE TAPE - CATEGORY CODE 7 - MOD.ENG-75-0078



## 1. Planning Information

### A. Effectivity

(1) Aircraft:
(a) Airbus A319.
(b) Airbus A320.
(c) Airbus A321.
(d) Boeing-Douglas MD-90.

(2) Engines:
(a) V2500-A1 Engines prior to Serial No. V0362.
(b) V2522-A5 Engines prior to Serial No. V10550.
(c) V2524-A5 Engines prior to Serial No. V10550.
(d) V2527-A5 Engines prior to Serial No. V10550.
(e) V2527E-A5 Engines prior to Serial No. V10550.
(f) V2530-A5 engines prior to Serial No. V10550.
(g) V2533-A5 Engines prior to Serial No. V10550.
(h) V2525-D5 Engines prior to Serial No. V20275.
(i) V2528-D5 Engines prior to Serial No V20275.

### B. Concurrent Requirements

None.

### C. Reason

(1) Problem

As a result of reports of degradation of the LVDT soldered joints, IAE V2500 Service Bulletin 75-0068 introduced a modification to the Linear Variable Differential Transformer (LVDT) of the LP Compressor Bleed Valve Master Actuator (LPCBVMA).

To date, there have been no in-service reports of this problem on the Variable Stator Vane Actuator (VSVA) LVDT. However because the soldered joints of the VSVA LVDT are similar to those of the LPCBVMA LVDT, it has been decided that a similar modification should be incorporated.

(2) Evidence

Refer to (1) Problem.

(3) Objective

The purpose of this Service Bulletin is to maintain unit reliability.

(4) Substantiation

A satisfactory engineering analysis, gas chromatography analysis, mass spectrometry analysis and a laboratory fuel vapour test have been carried out on the changes introduced by this Service Bulletin.

(5) Effect of Bulletin on:

(a) Operation

Not affected.

(b) Maintenance

Not affected.

(c) Overhaul

Not affected.

(d) Repair Schemes

Not affected.

(e) Interchangeability

Not affected.

(f) Fits and Clearances

Not affected.

D. Description

(1) This Service Bulletin contains the installation of a VSVA which has the Lucas Aerospace Modification DTV-058 incorporated.

(2) The LVDT of the VSVA as changed as follows:

(a) The acrylic adhesive tape for the LVDT has been changed to a similar polyimide tape with silicone adhesive.

(3) DTV-058 will be put on the modification plate of the units that have had this modification incorporated.

E. Compliance

Category Code 7

Accomplish when there are no superceded parts remaining.

F. Approval

The part number changes and/or modification are given in Section 2 and 3 of this Service Bulletin. They comply with the applicable Federal Aviation Regulations and are FAA-APPROVED for the engine models listed.

G. Manpower

Estimate of man-hours necessary to embody this Service Bulletin in full:

| | | |
|---|---|---|
| (1) | In Service | Not applicable |
| (2) | At Overhaul | No additional time is necessary to embody this Service Bulletin. |

NOTE: It is possible to get access to the parts affected by this Service Bulletin at overhaul.

H. Material - Price and Availability

Refer to the vendor Service Bulletin given at L.(2).

I. Tooling - Price and Availability

Special tools are not necessary.

J. Weight and Balance

(1) Weight Change

Not affected.

(2) Moment Arm

Not affected.

(3) Datum

Engine front mount centreline (Power Plant Station (PPS) 100).

K. Electrical Load Data

This Service Bulletin does not affect the aircraft electrical load.

L. References

(1) Internal Reference No.

EC97VI006A

(2) Other References

IAE V2500 Service Bulletin:

| | |
|---|---|
| 75-0068 | AIR-LP COMPRESSOR BLEED, MASTER ACTUATOR - INTRODUCTION OF A LINEAR VARIABLE DIFFERENTIAL TRANSFORMER WITH REVISED ADHESIVE TAPE |

Lucas Service Bulletins:

| | |
|---|---|
| 1685-75-008 | ENGINE - COMPRESSOR CONTROL - VSVA - INTRODUCTION OF NEW LINEAR DIFFERENTIAL TRANSFORMER (LVDT) WITH REVISED MATERIALS TO PREVENT DEGRADATION. |
| 2607-75-002 | ENGINE - COMPRESSOR CONTROL - VSVA - INTRODUCTION OF NEW LINEAR DIFFERENTIAL TRANSFORMER (LVDT) WITH REVISED MATERIALS TO PREVENT DEGRADATION. |

A319/A320/A321 Aircraft Maintenance Manual (AMM), Chapter/Section 75-32-41, Removal/Installation.

MD90 Aircraft Maintenance Manual (AMM), Chapter/Section 75-33-41, Removal/Installation.

A1/A5/D5 Engine Manual (EM), Chapter/Section 72-00-40, Removal/Installation-11

This SB is subject of AIRBUS Aircraft Modification Number 29820

M. Other Publications Affected

None.

2. Material Information

A. Kits necessary for this Service Bulletin:

Refer to the vendor Service Bulletin at 1.L.(1).

B. Units affected by this Service Bulletin:

| NEW PART No. (ATA No.) | QTY | EST'D UNIT PRICE ($) | PART TITLE | OLD PART No. (IPC No.) | INSTR DISP |
|---|---|---|---|---|---|
| A1 Engines | | | | | |
| 1685MK7 (75-32-41) | 1 | | Actuator - Variable Stator Vane (VU4271) | 1685MK7 (01-100) | (A)(B)(S1) |
| A5 and D5 Engines | | | | | |
| 2607MK2 (75-32-41) | 1 | | Actuator - Variable Stator Vane (VU4271) | 2607MK2 (01-100) | (A)(B)(S1) |

NOTE: The unit prices, if shown, are an estimate and they are given for the purpose of planning only. For actual prices, refer to the IAE Price Catalog or IAE's spare part sales department.

C. Instruction Disposition Codes:

(1) (A) New unit will be available from October 1998.

(2) (B) Old unit will be discontinued.

(3) (S1) Old and new units are freely and fully interchangeable.

3. Accomplishment Instructions

A. Rework Instructions

None.

B. Assembly Instructions

(1) For the correct Removal/Installation procedures, refer to one of the manuals that follow:

(a) A319/A320/A321 Aircraft Maintenance Manual (AMM), Chapter/Section 75-32-41, Removal/Installation.

(b) MD90 Aircraft Maintenance Manual (AMM), Chapter/Section 75-33-41, Removal/Installation.

(c) A1/A5/D5 Engine Manual (EM), Chapter/Section 72-00-40, Removal/Installation-11

(2) Refer to the vendor Service Bulletin at 1.L.(2).

C. Recording Instructions

(1) A record of accomplishment is necessary. Refer to vendor service bulletin at 1.L.

# Lucas Aerospace

# SERVICE BULLETIN

## PUBLICATION TRANSMITTAL

LUCAS AEROSPACE
SHAFTMOOR LANE, BIRMINGHAM, B28 8SW
ENGLAND.

TELEPHONE: 0121-707-7111
FACSIMILE: 0121-707-8826

Date: Mar 2/99

VARIABLE STATOR VANE ACTUATOR
TYPE 2607

THIS DOCUMENT TRANSMITS SERVICE BULLETIN 2607-75-002.

| Remove | Insert | Reason |
|---|---|---|
| - | Service Bulletin 2607-75-002, Pages 1 thru 14 dated Mar 2/99 and Supplement, Pages 1 and 2 dated Mar 2/99. | Part Numbers 2607-4000 and 2607-40001 (SB 2607-75-001) are superseded by 2607-4002. |



*CHECK THAT ANY PREVIOUS REVISIONS HAVE BEEN INCORPORATED*

If any have not been received please advise Technical Publications Department, Lucas Aerospace,

Birmingham B28 8SW, ENGLAND Telephone: 0121-707-7111

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# Lucas Aerospace

# SERVICE BULLETIN

## ENGINE COMPRESSOR CONTROL - VARIABLE STATOR VANE ACTUATOR, INTRODUCTION OF NEW LINEAR VARIABLE DIFFERENTIAL TRANSFORMER (LVDT), REVISED MATERIALS TO PREVENT JOINT DEGRADATION

(LUCAS AEROSPACE MOD. D.TV.058)

1. Planning Information

A. Effectivity

(1) Aircraft

(a) Airbus - A319, A320 and A321.

(b) Boeing-Douglas - MD90.

(2) Engine

(a) V2500. A5/D5 Engines.

(3) Equipment

(a) Variable Stator Vane Actuator (VSVA) - Type 2607 Mk 2 Units.

B. Reason

(1) Condition

The current standard of Linear Variable Differential Transformer (LVDT), in the Variable Stator Vane Actuator (VSVA) Unit, could fail open circuit due to the release of hexa-decanoic acid from the acrylic adhesive coated polyimide insulation tape. The result is a corrosive degradation of the high temperature solder which leads to the LVDT going open circuit on the affected channel.

(2) Background

The condition was identified during the investigation of an LPC Bleed Master Actuator LVDT failing open circuit due to chemical degradation of the soldered joints.

(3) Objective

Incorporation of the changes introduced by this Service Bulletin (Modification), are designed to remove the possibility of chemical degradation of the soldered joints.

(4) Substantiation

The changes introduced by this Service Bulletin (Modification), have been shown by testing, to alleviate the condition.



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*EDL 206146 IH*

C. Description

(1) This Service Bulletin (Modification) introduces the silicon adhesive coated polyimide tape used in the LVDT.

(2) This Service Bulletin has three parts:

Part 1 is to do this Service Bulletin at the operator's facility.

Part 2 is to do this Service Bulletin by unit replacement.

Part 3 is to do this Service Bulletin at an overhaul facility.

D. Compliance

Category Code 6.

Accomplish when the sub-assembly (i.e. Modules, Accessories, Components or Build Groups) is disassembled sufficiently to afford access to the affected part and to all affected spare parts.

E. Approval

Service Bulletin No. 2607-75-002 (Mod. D.TV.058), (IAE SB V2500-ENG-75-0078) was technically approved by IAE on 25 Nov/98. The part number changes and/or part modifications described in this Service Bulletin have been shown to comply with the appropriate Federal Aviation (FAA) Regulations and are FAA approved for those units listed in this Bulletin.

F. Manpower

(1) 2.25 man hours are necessary to accomplish this Service Bulletin (Modification) at Engine Maintenance Level (Part 1). 1.73 man hours are necessary to accomplish this Service Bulletin (Modification), by unit replacement (Part 2). 2.25 man hours are necessary to accomplish this Service Bulletin (Modification), by overhaul facility (Part 3).

G. Material - Price and Availability

See the supplement to this Bulletin.

H. Tooling - Price and Availability

(1) Additional tools

See the supplement to this Bulletin.

(2) Tools made redundant

None.

I. Weight and Balance

(1) Weight change ..... Nil.

(2) Moment arm ..... No effect.

(3) Datum ..... Engine front mount centerline (Power(PPS)100).



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J. References

(1) Lucas Aerospace, Mod. D.TV.058.

(2) Lucas Aerospace, Component Maintenance Manual (CMM) 75-32-61.

(3) IAE Service Bulletin V2500-ENG-75-0078.

K. Other Publications Affected

Nil.

2. Accomplishment Instructions (Figures 1 and 2)

CAUTION: KEEP THE UNIT AND COMPONENTS CLEAN. DO THE WORK IN AN AREA WHICH HAS NO DIRT AND OTHER UNWANTED MATERIAL OR CONTAMINATION.

Paragraph 2.A. are the engine maintenance accomplishment instructions (Part 1).

Paragraph 2.B. are the unit replacement instructions (Part 2).

Paragraph 2.C. are the overhaul facility accomplishment instructions (Part 3).

A. Replace the LVDT (Part 1, Engine Maintenance Accomplishment Instructions)

(1) Remove the Variable Stator Vane Actuator Unit (VSVA), as instructed by IAE Service Bulletin V2500-ENG-75-xxxx.

(2) Let the fuel drain from the actuator and, where possible, install the transport blanks called up in 75-32-61.

(3) Remove the label retaining strap (1-20) and the identification plate (1-30). Discard the label retaining strap (1-20) but keep the identification plate (1-30) until the service bulletin is completed.

(4) Check the mains supply voltage (120v or 240v). Connect the indicator unit (LVDT indicator unit EL4049 or EL6023) to the mains supply.

(5) Set the voltage selector switch on the LVDT indicator unit EL4049, to equal the mains supply voltage.

NOTE: The EL 6023 LVDT indicator unit automatically sets the supply voltage to 85-264V AC

(6) On indicator unit EL4049 set the mains switch to ON.

(7) Set the winding selector switch to the PRIMARY position and adjust the energising voltage to 6.000 ± 0.005v by means of the 6v adjustment potentiometer

NOTE: The Prim position on the LVDT indicator unit EL6023 has the same function as the PRIMARY position on the LVDT indicator unit EL4049.

NOTE: Keep the indicator unit switched on while the LVDT is replaced, this will keep the energising voltage stabilised.



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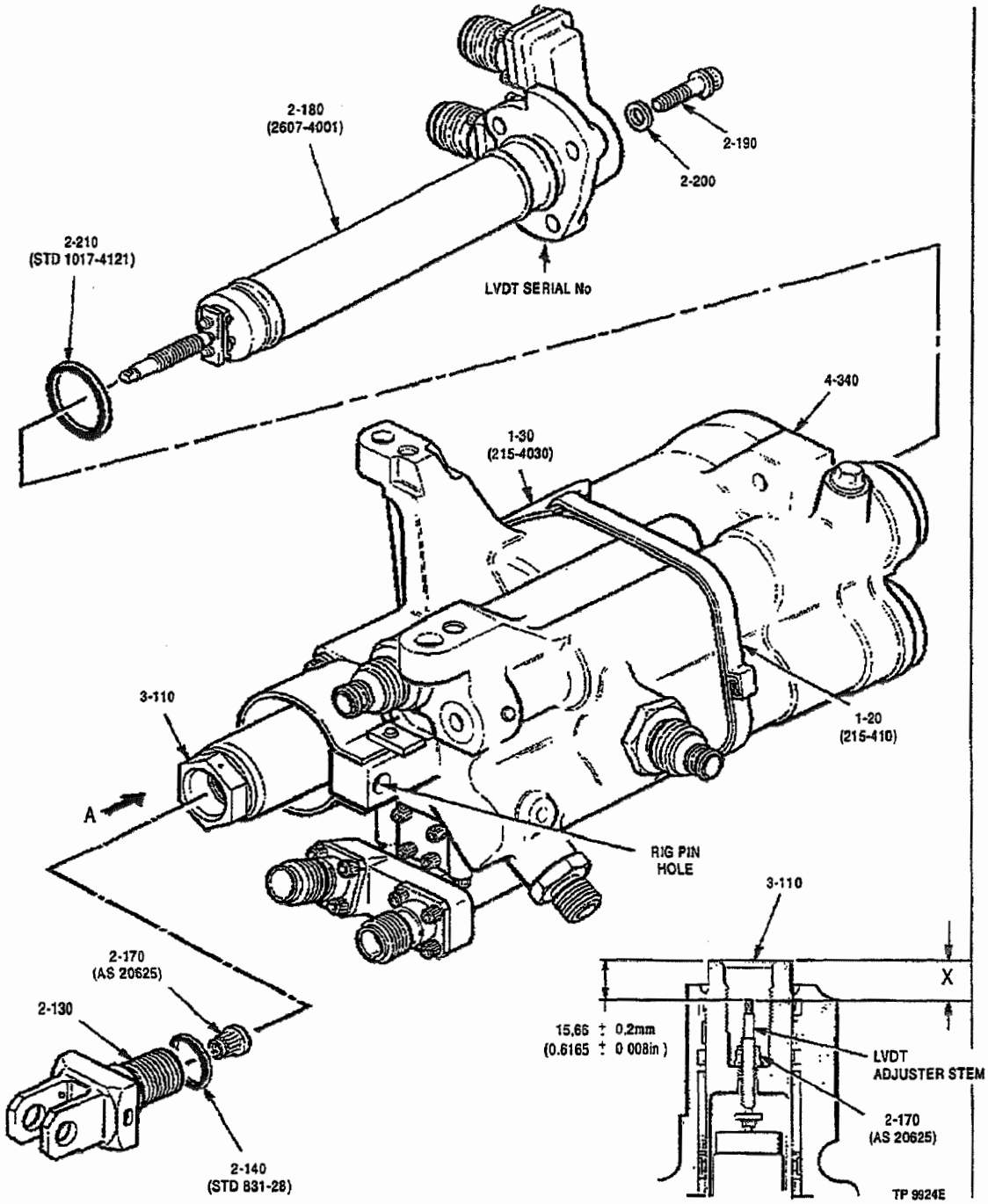


Removal and Installation of the LVDT
Figure 1



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(8) Remove the LVDT, Figure 1

(a) Install the VSVA on the workholder A.043236 and attach the workholder to a hydraclamp or hold it in a vice.

(b) Extend the ram piston (piston assembly) (3-110) by hand to the fully extended position. Use the reaction tool A.043321) to hold the ram piston and unscrew the fork end with the torque adapter.

(c) Remove the fork end (2-130) together with the toroidal sealing ring (2-140) from the ram piston (3-110). Remove the toroidal sealing ring (2-140) from the fork end (2-130), discard the toroidal sealing ring.

(d) Unscrew and remove the self-locking nut (2-170) from the adjuster stem of the LVDT (2-180). Use the adjusting tool A.043222 to hold the LVDT adjuster stem while the self-locking nut (2-170) is unscrewed at the same time. Discard the self-locking nut (2-170).

NOTE: Use the adjuster part of the tool A.043222 to hold the LVDT adjuster stem, use the sleeve socket to turn the nut.

(e) Unscrew the LVDT adjuster stem from the ram piston (3-110) (clockwise when viewed from arrow A); use the adjuster part of the tool A.043222.

(f) Unscrew and remove the three machine bolts (2-190) and the countersunk washers (2-200) which secure the LVDT (2-180) to the body assembly (4-340).

(g) Remove the LVDT (2-180) from the body assembly (4-340). Remove the toroidal sealing ring (2-210) from the LVDT, discard the toroidal sealing ring.

(h) The removed LVDT is classified as scrap.

(9) Install the Replacement LVDT, Figure 1

(a) Carefully remove the replacement LVDT (part number 2607-4002) from the protective package. If the Supplier's Certificate is with the LVDT, make sure that the Serial Number on the Certificate is the same as that on the flange of the LVDT.

NOTE: Keep the Supplier's Certificate available during the procedure.

(b) Write on the Supplier's Certificate (if available), the serial number of the VSVA unit into which the LVDT is to be installed (i.e. 2607***).

(c) Remove the LVDT from the polythene bag and clean all the surfaces with a dry, lint-free cloth.



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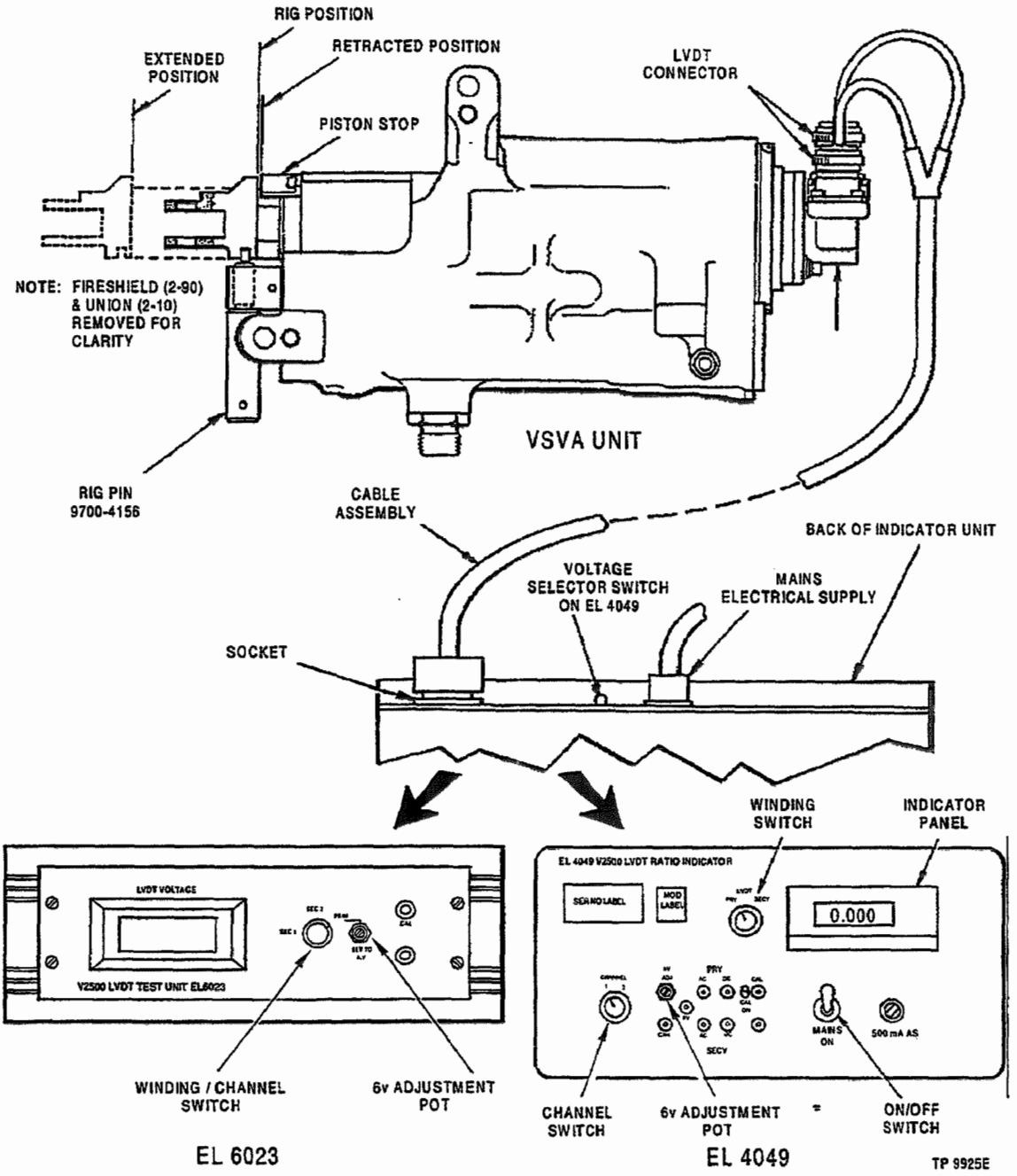


LVDT Output Voltage Checks
Figure 2



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(d) Get the replacement toroidal sealing ring (part number STD1017-4121), remove the sealing ring from the protective package and assemble it to the LVDT. Make sure the seal is not twisted in the groove.

(e) Position the ram piston (3-110) to the mid stroke position. Extend the stem of the LVDT and install the LVDT to the body assembly (4-340), through the ram piston (piston assembly) (3-110). Make sure that the LVDT adjuster stem engages the hole in the shoulder of the ram piston (3-110).

(f) Use the adjuster part of the tool A.043222 to screw the adjuster stem of the LVDT into the shoulder of the ram piston (3-110) (counterclockwise when viewed from arrow A). Make sure that the thread of the adjuster stem is fully engaged.

(g) Align the three holes in the flange of the LVDT with the three holes in the LVDT housing (body assembly (4-340)). Install the three flat, countersunk washers (2-200) and the three machine bolts (2-190) to secure the LVDT.

(h) Check, when the bolts are tightened, that there is a minimum of 0,23 Nm (2 lbf.in.) inbuilt torque in each of the inserts. If the inbuilt torque is less than this figure, reject the unit for Repair. Torque tighten the machine bolts to 4,5 Nm (40 lbf.in.).

(i) Use the adjuster part of the tool A.043222 to set the LVDT adjuster stem to a dimension of 15,66 ± 0,2 mm (0.6165 ± 0.008 in) as shown on Figure 1. Check with a vernier depth gauge.

(j) Get the replacement self-locking nut (part number AS20625) and assemble the nut to the adjuster stem of the LVDT. Use the adjuster part of the tool A.043222 to hold the adjuster stem in the set position. At the same time, use the sleeve socket to tighten the nut but do not torque tighten at this stage. Remove the tool A.043222.

(k) Make sure that the fork end (2-130) is clean, if necessary, clean it with a dry lint-free cloth.

(l) Get the replacement toroidal sealing ring (part number STD831-28), remove the sealing ring from the protective package and assemble it to the fork end (2-130).

(m) Install the fork end (2-130) into the end of the ram piston (3-110). Hold the ram piston with the reaction tool (of tool A.043321) and torque tighten the fork end (2-130) to 50 Nm (440 lbf.in.), use the torque adapter.

(10) Check the LVDT Adjustment, Figure 2

(a) Connect the cable assembly to the socket on the LVDT indicator unit (EL4049) or EL6023, and the Channel 1 and Channel 2 connectors on the VSVA unit.

NOTE: Channels 1 and 2 are marked on the cable assembly and the connector keyways, make sure of correct assembly.

(b) If necessary, adjust the energising voltage to 6.000 ± 0.005v by means of the 6v adjustment potentiometer on the indicator unit; check that the winding switch is in the PRIMARY position.



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CAUTION: THROUGHOUT THE PROCEDURE, MAKE SURE THAT THE ENERGISING VOLTAGE REMAINS WITHIN THE LIMIT OF 6.000 ± 0.005V; RE-ADJUST THE VOLTAGE AS NECESSARY.

NOTE: The Prim position on the LVDT test unit EL6023 has the same function as PRIMARY position on the LVDT test unit EL4049.

(c) Move the ram piston (3-110) to the 'rig' position and put the rig pin 9700-4156 through the fireshield mounting block to engage the hole in the fork end (2-130).

(d) Turn the winding switch to the SECONDARY position and the CHANNEL switch to CHANNEL 1. Read the LVDT output voltage on the indicator panel and write the indicated voltage down under the heading 'Channel 1 - Rig Position'.

NOTE: SEC 1 and SEC 2 positions on the LVDT test unit EL6023 is the same function as CHANNEL 1 and 2 positions on the LVDT test unit EL4049.

(e) Turn the channel switch to the CHANNEL 2 position and repeat sub. para. (d). Write the indicated voltage down under the heading 'Channel 2 - Rig Position'.

(f) If the LVDT Supplier's Certificate is available, continue from sub. para. (g). If no Certificate is available, continue from sub. para. (j).

(g) Get the LVDT Supplier's Certificate and compare the Channel 1 and Channel 2 Rig Position, output voltages (as recorded), with those on the Certificate. For the LVDT to be accepted at the current setting, the voltages must be as follows:

Channel 1 output voltage must equal that stated on the Supplier's Certificate ± 0.002v.

Channel 2 output voltage must equal that stated on the Supplier's Certificate ± 0.003v.

(h) If the output voltages are within the limits given in sub. para. (g), check the output voltages at the retracted and extended positions (sub. paras. (11) (i) and (l)).

(i) If the output voltages are outside the limits given in sub. para. (g), calculate the difference between the voltages as follows (use the Channel 1 voltages only):

| | | |
|---|---|---|
| e.g. | Channel 1 voltage as recorded: | 2.681v |
| | Channel 1 nominal voltage: | 2.667v |
| | Difference: | +0.014v |

This shows that the LVDT output voltage must be reduced by 0.014v at the rig position.

(j) If the LVDT Supplier's Certificate is not available, compare the Channel 1 and 2 voltages recorded at sub. paras. (d) and (e) with the nominal voltages as follows:

Channel 1 voltage: 2.650v ± 0.002v nominal voltage

Channel 2 voltage: 2.643v ± 0.013v nominal voltage



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(k) If the output voltages are within the limits given in sub. para. (j), check the output voltages at the retracted and extended positions (sub. paras. (11) (i) and (l)).

(l) If the output voltages are outside the limits given in sub. para. (j), calculate the difference between the voltages as follows (use the Channel 1 voltages only):

| | | |
|---|---|---|
| e.g. | Channel 1 voltage as recorded: | 2.675v |
| | Channel 1 nominal voltage: | 2.650v |
| | Difference: | +0.025v |

This shows that the LVDT output voltage must be reduced by 0.025v at the rig position.

(11) Adjust the LVDT output voltage, Figures 1 and 2.

(a) Remove the rig pin 9700-4156. Move the ram piston (3-110) to approximately the extended position and remove the fork end (2-130) as described in sub. para. (8),(b) and (c). Turn the channel switch to the CHANNEL 1 position and read the new indicated Channel 1 output voltage.

CAUTION: DO NOT MOVE THE RAM PISTON, IN THE STROKE MODE, DURING THE ADJUSTMENT PROCEDURE.

(b) Slacken the self-locking nut (2-170) and turn the stem of the LVDT to adjust the output voltage, use the tool A.043222. Use the reaction tool of tool A.043321 to prevent rotation of the ram piston.

NOTE: Counterclockwise rotation of the LVDT adjuster stem (when viewed from arrow A), REDUCES the LVDT, indicated output voltage. Clockwise rotation INCREASES the indicated voltage.

(c) Adjust the stem of the LVDT to increase or reduce the indicated voltage by the value calculated at sub. para. (10),(i) or (10) (l) as applicable. Monitor the output voltage as the adjuster stem is turned. When the required voltage is indicated, torque tighten the self-locking nut (2-170) to 11,5 Nm (102 lbf. in.).

(d) Measure the depth of the adjuster stem from the end face of the ram piston (3-110) (dimension X, Figure 1). Write this dimension down in case no further adjustment is required.

(e) Re-assemble and torque tighten the fork end (2-130), as described in sub. para. (9),(m). Return the ram piston (3-110) to the 'rig' position and re-insert the rig pin 9700-4156.

(f) Turn the winding switch to the PRIMARY position and the channel switch to the CHANNEL 1 position; check the energising voltage as given in sub. para. (10),(b). Return the winding switch to the SECONDARY position.

(g) Re-check the Channel 1 and Channel 2 Rig Position, output voltages which must be within the limits given in sub. para. (10),(g) or (10),(j) as applicable. If the voltages are still outside of the limits stated, re-adjust the LVDT adjuster stem as given in sub. paras. (a) through (e).



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(h) Repeat sub. para. (f).

(i) Remove the rig pin 9700-4156 and move the ram piston to the fully retracted position (with the fork end against the piston stop). Check the indicated output voltage for both Channel 1 and Channel 2 at this position. The indicated output voltage is to be within the limit of 2.689v minimum and 2.736v maximum.

(j) If the indicated output voltage (for either Channel), is outside of the limit given in sub. para. (i), it is possible to adjust the voltage only within the tolerance available at the 'rig' position. If necessary, repeat the adjustment procedure given in sub. paras. (a) through (g) and write down the indicated voltages for the 'rig' position.

(k) Repeat sub. para. (f).

(l) Move the ram piston (3-110) to the fully extended position. Check the indicated output voltage for both Channel 1 and Channel 2 at this position. The indicated output voltage for each Channel is to be within the limit of 0.385v minimum and 0.417v maximum. If the output voltage (for either Channel), is outside of the limit, the same adjustment conditions as for sub. para. (j) apply.

(m) Repeat the checks at the retracted and extended positions after any adjustment. Make sure that the self-locking nut (2-170) and the fork end (2-130) are correctly torque tightened, once adjustment is complete. Before the fork end is installed, re-measure dimension X, if any adjustment has been made since sub. para. (d).

(n) Where the LVDT Supplier's Certificate is available and is to be returned with the first LVDT, write on the Supplier's Certificate the final values of indicated voltage and adjuster stem depth as follows:

| Channel 1 | Channel 2 |
|---|---|
| Rig: | Rig: |
| Retracted: | Retracted: |
| Extended | Extended |
| Adjuster stem depth: | |

(o) Disconnect the cable assembly from the Channel 1 and Channel 2 connectors of the VSVA unit.

NOTE: If the EL4049 or EL6023 LVDT indicator unit is to be used to accomplish another VSVA unit, within the next two hours it is advisable to keep it switched ON.

(p) Remove the VSVA from the holding fixture and apply Ardrox 3302 to the areas of the joint faces of the LVDT and the unit body, as given in 75-32-61, Assembly.

(12) Re-identify the Actuator, Figure 1

(a) When the Assembly is complete get the new identification plate (1-30) and the new strap (1-20) (supplied with the Mod. Kit).

(b) Refer to the information marked on the first identification plate (1-30) and mark the new identification plate as follows (use 1/16in. (1,6mm), letter/number stamps). Use the stamps with the identification plate held on a flat surface:



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| | |
|---|---|
| TYPE No. | MARK: 2607 Mk 2 |
| SERIAL No. | Mark as on the original plate |
| MOD No. | Mark as on the original plate, plus D.TV.058 |
| INSP. | Keep blank |
| TEST | Keep blank |

(c) Fill the stamped letters and numbers with black paint and wipe away the surplus.

(d) Attach the new identification plate (1-30) to the actuator with the new strap (1-20).

(e) Discard the first identification plate.

(13) Install the VSVA and do the necessary leakage tests as instructed by IAE Service Bulletin V2500-ENG-75-0078.

(14) A record of accomplishment is required.

B. Replace the Variable Stator Vane Actuator (Part 2, Unit Replacement Only)

(1) Remove the Variable Stator Vane Actuator (VSVA), Unit as instructed by IAE Service Bulletin V2500-ENG-75-0078.

NOTE: Removed VSVA units should be returned to one of the Repair Bases listed below:

Lucas Aerospace
The Radleys
Marston Green
Birmingham, B33 0HZ
England

Lucas Aerospace
Customer Support
30 Van Nostrand Avenue
Englewood
New Jersey 07631
USA

(2) Install the replacement VSVA unit as instructed by IAE Service Bulletin V2500-ENG-75-xxxx. The modification number D.TV.058, MOD shows that this Service bulletin (Modification) has been incorporated.

(3) A record of accomplishment is required.

C. Replace the LVDT (Part 3, Overhaul Facility Accomplishment Instructions)

(1) Remove the transport components in accordance with Page Block 301, Disassembly procedure in the Lucas Aerospace Variable Stator Vane Actuator, TYPE 2607 Component Maintenance Manual.

(2) Remove the LVDT in accordance with Page Block 301, Disassembly procedure in the Lucas Aerospace Variable Stator Vane Actuator, TYPE 2607 Component Maintenance Manual.

(3) Install the LVDT in accordance with Page Block 701, Assembly procedure in the Lucas Aerospace Variable Stator Vane Actuator, TYPE 2607 Component Maintenance Manual.



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(4) Do a Check of the LVDT Adjustment in accordance with Page Block 101, Testing and Trouble Shooting procedure of the Lucas Aerospace Variable Stator Vane Actuator, TYPE 2607 Component Maintenance Manual.

(5) The removed LVDT is classified as scrap.

(6) Re-identify the Actuator, Figure 1

(a) When the Assembly is complete get the new identification plate (1-30) and the new strap (1-20) (supplied with the Mod. Kit).

(b) Refer to the information marked on the first identification plate (1-30) and mark the new identification plate as follows (use 1/16in. (1,6mm), letter/number stamps). Use the stamps with the identification plate held on a flat surface:

| | |
|---|---|
| TYPE No. | MARK: 2607 Mk 2 |
| SERIAL No. | Mark as on the original plate |
| MOD No. | Mark as on the original plate, plus D.TV.058 |
| INSP. | Keep blank |
| TEST | Keep blank |

(c) Fill the stamped letters and numbers with black paint and wipe away the surplus.

(d) Attach the new identification plate (1-30) to the actuator with the new strap (1-20).

(e) Discard the first identification plate.

(7) A record of accomplishment is required.

3. Material Information

A. Modification Kit

Modification kit D.TV.058 (comprises the parts given in Para. C.).

B. Parts to be Re-worked

None.

C. New Production Parts

The following new parts will be available as spares:

| New Part No. | Qty | Keyword | Old Part No. |
|---|---|---|---|
| 2607-4002 | 1 | LVDT | 2607-4000 (SB 2607-75-001)<br>2607-4001 (SB 2607-75-001) |
| STD1017-4121 | 1 | Ring, sealing | STD1017-4121 |
| STD831-28 | 1 | Ring, sealing | STD831-28 |
| AS20625 | 1 | Nut, self-locking | AS20625 |
| 215-410 | 1 | Strap, label retaining | 215-410 |
| 215-4012 | 1 | Plate, identification | 215-4012 |



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D. Redundant Parts:

| IPL Fig./Item | Qty | Keyword | Old Part No. |
|---|---|---|---|
| 2-180 | | LVDT | 2607-4000 (SB 2607-75-001)<br>2607-4001 (SB 2607-75-001) |

E. Identification of Units

The type of equipment affected by this Service Bulletin (Modification), is:

| Unit | Type No. |
|---|---|
| Variable Stator Vane Actuator | 2607 Mk 2 |



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# Lucas Aerospace
# SERVICE BULLETIN

SB 2607-75-002 (SUPPLEMENT)

ENGINE COMPRESSOR CONTROL - VARIABLE STATOR VANE ACTUATOR (VSVA)
INTRODUCTION OF NEW LINEAR VARIABLE DIFFERENTIAL TRANSFORMER (LVDT),
REVISED MATERIALS TO PREVENT JOINT DEGRADATION.

(LUCAS AEROSPACE MOD. D.TV.058)

(IAE SB V2500-ENG-75-0078)

1. Modification Kit

Modification kit D.TV.058 comprises the parts given in Para. 2.

2. New Production Parts

| Part No. | Qty per Unit | Keyword | Gross World List Price (US Dollars) | Availability on Receipt of Order |
|---|---|---|---|---|
| 2607-4002 | 1 | LVDT | Price on application | 30 days |
| STD1017-4121 | 1 | Ring, sealing | Price on application | 15 days |
| STD831-28 | 1 | Ring, sealing | Price on application | 15 days |
| AS20625 | 1 | Nut, self-locking | Price on application | 15 days |
| 215-410 | 1 | Strap, label retaining | Price on application | 15 days |
| 215-4012 | 1 | Plate, identification | Price on application | 15 days |

3. New Tooling

None.

4. Spare Parts Supply

Spares distribution and Customer Service is available from the following Lucas Aerospace Customer Support Centres:

| REGION | ADDRESS | COMMUNICATION | |
|---|---|---|---|
| AMERICAS | LUCAS AEROSPACE<br>CUSTOMER SUPPORT<br>30 VAN NOSTRAND AVENUE<br>ENGLEWOOD<br>NEW JERSEY 07631<br>USA. | PHONE<br>FAX<br>AOG<br>SITA/ARINC | (1) 201 567 6400<br>(1) 201 894 1965<br>(1) 201 567 6411<br>EWR LU7X |
| EUROPE/MIDDLE EAST/AFRICA | LUCAS AEROSPACE<br>CUSTOMER SUPPORT<br>STRATFORD ROAD<br>SOLIHULL, B90 4LA<br>ENGLAND. | PHONE<br>FAX<br>AOG<br>SITA/ARINC | (44) (0)121 451 5999<br>(44) (0)121 451 5881<br>(44) (0)121 451 5904<br>BHX LW7X |
| ASIA/PACIFIC | LUCAS AEROSPACE<br>CUSTOMER SUPPORT<br>35 - 37 LOYANG WAY<br>SINGAPORE 508733. | PHONE<br>FAX<br>AOG<br>SITA/ARINC | (65) 545 9975<br>(65) 543 0419<br>(65) 545 6253<br>SIN LU7X |



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# Lucas Aerospace

# SERVICE BULLETIN

## PUBLICATION TRANSMITTAL

LUCAS AEROSPACE
SHAFTMOOR LANE, BIRMINGHAM, B28 8SW
ENGLAND.

TELEPHONE: 0121-707-7111
FACSIMILE: 0121-707-8826

Date: Mar 2/99

VARIABLE STATOR VANE ACTUATOR
TYPE 1685

THIS DOCUMENT TRANSMITS SERVICE BULLETIN 1685-75-008.

| Remove | Insert | Reason |
|---|---|---|
| - | Service Bulletin 1685-75-008, Pages 1 thru 14 dated Mar 2/99 and Supplement, Pages 1 and 2 dated Mar 2/99. | Part Numbers 2607-4000 and 2607-40001 (SB 1685-75-007) are superseded by 2607-4002. |



*CHECK THAT ANY PREVIOUS REVISIONS HAVE BEEN INCORPORATED*

If any have not been received please advise Technical Publications Department, Lucas Aerospace, Birmingham B28 8SW, ENGLAND. Telephone: 0121-707-7111

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**Lucas Aerospace**

# SERVICE BULLETIN

ENGINE COMPRESSOR CONTROL - VARIABLE STATOR VANE ACTUATOR, INTRODUCTION OF NEW LINEAR VARIABLE DIFFERENTIAL TRANSFORMER (LVDT), REVISED MATERIALS TO PREVENT JOINT DEGRADATION.

(LUCAS AEROSPACE MOD. D.TV.058)

1. Planning Information

A. Effectivity

(1) Aircraft

(a) Airbus - A319, A320 and A321.

(b) Boeing-Douglas MD90.

(2) Engine

(a) All V2500 Engines.

(3) Equipment

(a) Variable Stator Vane Actuator (VSVA) - Type 1685 Mk 7 Units.

B. Reason

(1) Condition

The current standard of Linear Variable Differential Transformer (LVDT), in the Variable Stator Vane Actuator (VSVA) Unit, could fail open circuit due to the release of hexa-decanoic acid from the acrylic adhesive coated polyimide insulation tape. The result is a corrosive degradation of the high temperature solder which leads to the LVDT going open circuit on the affected channel.

(2) Background

The condition was identified during the investigation of an LPC Bleed Master Actuator LVDT failing open circuit due to chemical degradation of the soldered joints.

(3) Objective

Incorporation of the changes introduced by this Service Bulletin (Modification), are designed to remove the possibility of chemical degradation of the soldered joints.

(4) Substantiation

The changes introduced by this Service Bulletin (Modification), have been shown by testing, to alleviate the condition.



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C. Description

(1) This Service Bulletin (Modification) introduces the silicon adhesive coated polyimide tape used in the LVDT.

(2) This Service Bulletin has three parts:

Part 1 is to do this Service Bulletin at the operator's facility.

Part 2 is to do this Service Bulletin by unit replacement.

Part 3 is to do this Service Bulletin at an overhaul facility.

D. Compliance

Category Code 7.

Accomplish when the sub-assembly (i.e. Modules, Accessories, Components or Build Groups) is disassembled sufficiently to afford access to the affected part and to all affected spare parts.

E. Approval

Service Bulletin No. 1685-75-008 (Mod. D.TV.058), (IAE SB V2500-ENG-75-0078) was technically approved by IAE on 26 Nov/98. The part number changes and/or part modifications described in this Service Bulletin have been shown to comply with the appropriate Federal Aviation (FAA) Regulations and are FAA approved for those units listed in this Bulletin.

F. Manpower

2.25 man hours are necessary to accomplish this Service Bulletin (Modification), at Engine Maintenance Level (Part 1). 1.73 man hours are necessary to accomplish this Service Bulletin (Modification), by unit replacement (Part 2). 2.25 man hours are necessary to accomplish this Service Bulletin (Modification) by overhaul facility (Part 3).

G. Material - Price and Availability

See the Supplement to this Bulletin.

H. Tooling - Price and Availability

(1) Additional tools

See the supplement to this Bulletin.

(2) Tools made redundant

None.

I. Weight and Balance

(1) Weight change ..... Nil.

(2) Moment arm ..... No effect.

(3) Datum ..... Engine front mount centerline (Power(PPS)100).



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J. References

(1) Lucas Aerospace, Mod. D.TV.058.

(1) Lucas Aerospace, Component Maintenance Manual (CMM) 75-32-41.

(2) IAE Service Bulletin V2500-ENG-75-0078.

K. Other Publications Affected

Nil.

2. Accomplishment Instructions (Figures 1 and 2)

CAUTION: KEEP THE UNIT AND COMPONENTS CLEAN. DO THE WORK IN AN AREA WHICH HAS NO DIRT AND OTHER UNWANTED MATERIAL OR CONTAMINATION.

Paragraph 2.A. are the engine maintenance accomplishment instructions (Part 1).

Paragraph 2.B. are the unit replacement instructions (Part 2).

Paragraph 2.C. are the overhaul facility accomplishment instructions (Part 3).

A. Replace the LVDT (Part 1, Engine Maintenance Accomplishment Instructions)

(1) Remove the Variable Stator Vane Actuator (VSVA), as instructed by IAE Service Bulletin V2500-ENG-75-0078.

(2) Let the fuel drain from the actuator and, where possible, install the transport blanks called up in 75-32-41.

(3) Remove the label retaining strap (1-20) and the identification plate (1-30). Discard the label retaining strap (1-20) but keep the identification plate (1-30) until the service bulletin is completed.

(4) Check the mains supply voltage (120v or 240v). Connect the indicator unit (LVDT indicator unit EL4049 or EL6023) to the mains supply.

(5) Set the voltage selector switch on the LVDT indicator unit EL4049 to equal the mains supply voltage.

NOTE: The EL6023 LVDT indicator unit automatically sets the supply voltage to 85-264v AC

(6) On indicator unit EL4049 set the mains switch to ON.

(7) Set the winding selector switch to the 'PRY' position and adjust the energising voltage to 6.000 ± 0.005v by means of the 6v adjustment potentiometer.

NOTE: The 'PRIM' position on the LVDT indicator unit EL6023 has the same function as the 'PRY' position on the LVDT indicator unit EL4049.

NOTE: Keep the indicator unit switched on while the LVDT is replaced, this will keep the energising voltage stabilised.



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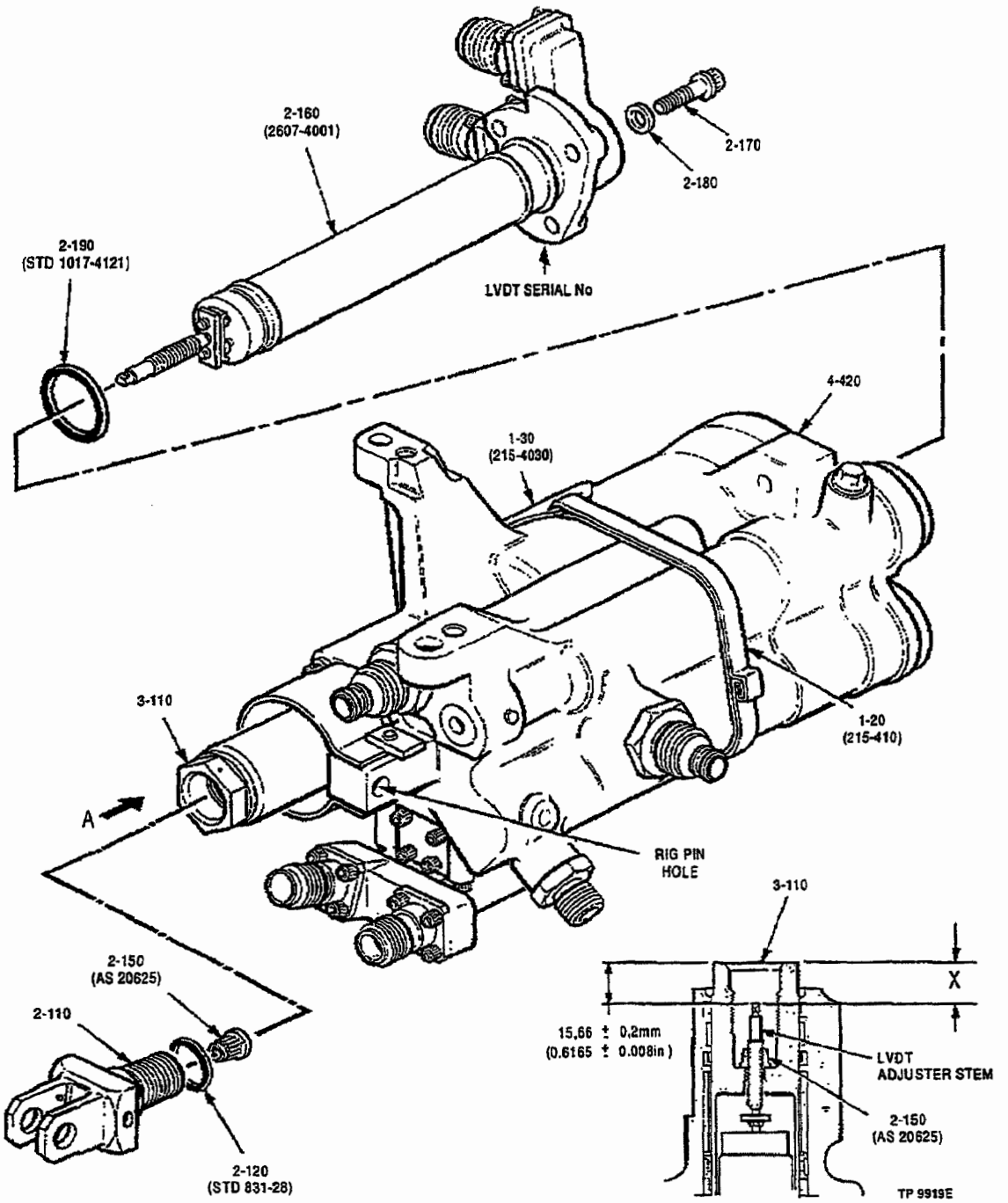


Removal and Installation of the LVDT
Figure 1



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(8) Remove the LVDT, Figure 1

(a) Install the VSVA on the workholder A.043236 and attach the workholder to a hydraclamp or hold it in a vice.

(b) Extend the ram piston (piston assembly) (3-110) by hand to the fully extended position. Use the reaction tool A.043321 to hold the ram piston and unscrew the fork end with the torque adapter.

(c) Remove the fork end (2-110) together with the toroidal sealing ring (2-120) from the ram piston (3-110). Remove the toroidal sealing ring (2-120) from the fork end (2-110), discard the toroidal sealing ring.

(d) Unscrew and remove the self-locking nut (2-150) from the adjuster stem of the LVDT (2-160). Use the adjusting tool A.043222 to hold the LVDT adjuster stem while the self-locking nut (2-150) is unscrewed at the same time. Discard the self-locking nut (2-150).

NOTE: Use the adjuster part of the tool A.043222 to hold the LVDT adjuster stem, use the sleeve socket to turn the nut.

(e) Unscrew the LVDT adjuster stem from the ram piston (3-110) (clockwise when viewed from arrow A), use the adjuster part of the tool A.043222.

(f) Unscrew and remove the three machine bolts (2-170) and the countersunk washers (2-180) which secure the LVDT (2-160) to the body assembly (4-420).

(g) Remove the LVDT (2-160) from the body assembly (4-420).

(h) The removed LVDT is classified as scrap.

(9) Install the Replacement LVDT, Figure 1

(a) Carefully remove the replacement LVDT (part number 2607-4002) from the protective package. If the Supplier's Certificate is with the LVDT, make sure that the Serial Number on the Certificate is the same as that on the flange of the LVDT.

NOTE: Keep the Supplier's Certificate available during the procedure.

(b) Write on the Supplier's Certificate (if available), the serial number of the VSVA unit into which the LVDT is to be installed (i.e. 1685***).

(c) Remove the LVDT from the polythene bag and clean all the surfaces with a dry, lint-free cloth.



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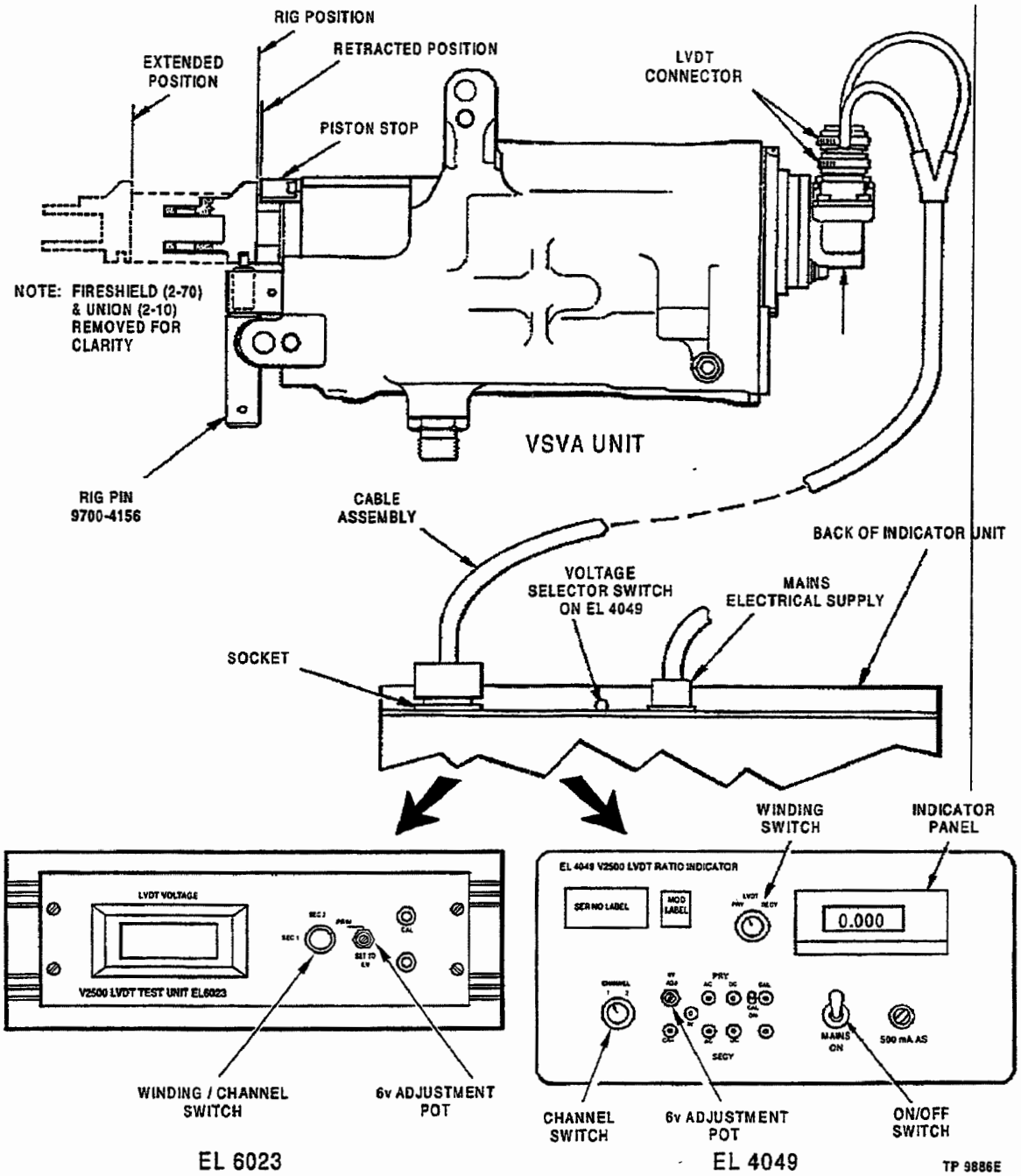


LVDT Output Voltage Checks
Figure 2

(d) Get the replacement toroidal sealing ring (part number STD1017-4121), remove the sealing ring from the protective package and assemble it to the LVDT. Make sure the seal is not twisted in the groove.

(e) Position the ram piston (3-110) to the mid stroke position. Extend the stem of the LVDT and install the LVDT to the body assembly (4-420), through the ram piston (piston assembly) (3-110). Make sure that the LVDT adjuster stem engages the hole in the shoulder of the ram piston (3-110).

(f) Use the adjuster part of the tool A.043222 to screw the adjuster stem of the LVDT into the shoulder of the ram piston (3-110) (counterclockwise when viewed from arrow A). Make sure that the thread of the adjuster stem is fully engaged.

(g) Align the three holes in the flange of the LVDT with the three holes in the LVDT housing (body assembly (4-340)). Install the three flat, countersunk washers (2-180) and the three machine bolts (2-170) to secure the LVDT.

(h) Check, when the bolts are tightened, that there is a minimum of 0,23 Nm (2 lbf.in.) inbuilt torque in each of the inserts. If the inbuilt torque is less than this figure, reject the unit for Repair. Torque tighten the machine bolts to 4,5 Nm (40 lbf.in.).

(i) Use the adjuster part of the tool A.043222 to set the LVDT adjuster stem to a dimension of 15,66 ± 0,2 mm (0.6165 ± 0.008 in) as shown on Figure 1. Check with a vernier depth gauge.

(j) Get the replacement self-locking nut (part number AS20625) and assemble the nut to the adjuster stem of the LVDT. Use the adjuster part of the tool A.043222 to hold the adjuster stem in the set position. At the same time, use the sleeve socket to tighten the nut but do not torque tighten at this stage. Remove the tool A.043222.

(k) Make sure that the fork end (2-110) is clean, if necessary, clean it with a dry lint-free cloth.

(l) Get the replacement toroidal sealing ring (part number STD831-28), remove the sealing ring from the protective package and assemble it to the fork end (2-110).

(m) Install the fork end (2-110) into the end of the ram piston (3-110). Hold the ram piston with the reaction tool (of tool A.043321) and torque tighten the fork end (2-110) to 50 Nm (440 lbf.in.), use the torque adapter.

(10) Check the LVDT Adjustment, Figure 2.

(a) Connect the cable assembly to the socket on the LVDT indicator unit (EL4049) or EL6023, and the Channel 1 and Channel 2 connectors on the VSVA unit.

NOTE: Channels 1 and 2 are marked on the cable assembly and the connector keyways, make sure of correct assembly.

(b) If necessary, adjust the energising voltage to 6.000 ± 0.005v by means of the 6v adjustment potentiometer on the indicator unit, check that the winding switch is in the PRIMARY position.



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CAUTION: THROUGHOUT THE PROCEDURE, MAKE SURE THAT THE ENERGISING VOLTAGE REMAINS WITHIN THE LIMIT OF 6.000 ± 0.005V. RE-ADJUST THE VOLTAGE AS NECESSARY.

NOTE: The 'PRIM' position on the LVDT test unit EL6023 has the same function as 'PRY' position on the LVDT test unit EL4049.

(c) Move the ram piston (3-110) to the 'rig' position and put the rig pin 9700-4156 through the fireshield mounting block to engage the hole in the fork end (2-110).

(d) Turn the winding switch to the SECONDARY position and the CHANNEL switch to CHANNEL 1. Read the LVDT output voltage on the indicator panel and write the indicated voltage down under the heading 'Channel 1 - Rig Position'.

NOTE: SEC 1 and SEC 2 positions on the LVDT test unit EL6023 is the same function as CHANNEL 1 and 2 positions on the LVDT test unit EL4049.

(e) Turn the channel switch to the CHANNEL 2 position and repeat sub. para. (d). Write the indicated voltage down under the heading 'Channel 2 - Rig Position'.

(f) If the LVDT Supplier's Certificate is available, continue from sub. para. (g). If no Certificate is available, continue from sub. para. (j).

(g) Get the LVDT Supplier's Certificate and compare the Channel 1 and Channel 2 Rig Position, output voltages (as recorded), with those on the Certificate. For the LVDT to be accepted at the current setting, the voltages must be as follows:

Channel 1 output voltage must equal that stated on the Supplier's Certificate ± 0.002v.

Channel 2 output voltage must equal that stated on the Supplier's Certificate ± 0.003v.

(h) If the output voltages are within the limits given in sub. para. (g), check the output voltages at the retracted and extended positions (sub. paras. 11) (i) and (l)).

(i) If the output voltages are outside the limits given in sub. para. (g), calculate the difference between the voltages as follows (use the Channel 1 voltages only):

| | | |
|---|---|---|
| e.g. | Channel 1 voltage as recorded: | 2.681v |
| | Channel 1 nominal voltage: | 2.667v |
| | Difference: | +0.014v |

This shows that the LVDT output voltage must be reduced by 0.014v at the rig position.

(j) If the LVDT Supplier's Certificate is not available, compare the Channel 1 and 2 voltages recorded at sub. paras. (d) and (e) with the nominal voltages as follows:

Channel 1 voltage: 2.650v ± 0.002v nominal voltage

Channel 2 voltage: 2.643v ± 0.013v nominal voltage



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(k) If the output voltages are within the limits given in sub. para. (j), check the output voltages at the retracted and extended positions (sub. paras. (11) (i) and (l)).

(l) If the output voltages are outside the limits given in sub. para. (j), calculate the difference between the voltages as follows (use the Channel 1 voltages only):

| | | |
|---|---|---|
| e.g. | Channel 1 voltage as recorded: | 2.675v |
| | Channel 1 nominal voltage: | 2.650v |
| | Difference: | +0.025v |

This shows that the LVDT output voltage must be reduced by 0.025v at the rig position.

(11) Adjust the LVDT output voltage, Figures 1 and 2.

(a) Remove the rig pin 9700-4156. Move the ram piston (3-110) to approximately the extended position and remove the fork end (2-110) as described in sub. para. (8) (b) and (c). Turn the channel switch to the CHANNEL 1 position and read the new indicated Channel 1 output voltage.

CAUTION: DO NOT MOVE THE RAM PISTON, IN THE STROKE MODE, DURING THE ADJUSTMENT PROCEDURE.

(b) Slacken the self-locking nut (2-150) and turn the stem of the LVDT to adjust the output voltage, use the tool A.043222. Use the reaction tool of tool A.043321 to prevent rotation of the ram piston.

NOTE: Counterclockwise rotation of the LVDT adjuster stem (when viewed from arrow A), REDUCES the LVDT, indicated output voltage. Clockwise rotation INCREASES the indicated voltage.

(c) Adjust the stem of the LVDT to increase or reduce the indicated voltage by the value calculated at sub. para. (10),(i) or (10) (l) as applicable. Monitor the output voltage as the adjuster stem is turned. When the required voltage is indicated, torque tighten the self-locking nut (2-150) to 11,5 Nm (102 lbf. in.).

(d) Measure the depth of the adjuster stem from the end face of the ram piston (3-110) (dimension X, Figure 1). Write this dimension down in case no further adjustment is required.

(e) Re-assemble and torque tighten the fork end (2-110), as described in sub. para. (9) (m). Return the ram piston (3-110) to the 'rig' position and re-insert the rig pin 9700-4156.

(f) Turn the winding switch to the PRIMARY position and the channel switch to the CHANNEL 1 position; check the energising voltage as given in sub. para. (10) (b). Return the winding switch to the SECONDARY position.

(g) Re-check the Channel 1 and Channel 2 Rig Position, output voltages which must be within the limits given in sub. para. (10) (g) or (10) (j) as applicable. If the voltages are still outside of the limits stated, re-adjust the LVDT adjuster stem as given in sub. paras. (a) through (e).



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(h) Repeat sub. para. (f).

(i) Remove the rig pin 9700-4156 and move the ram piston to the fully retracted position (with the fork end against the piston stop). Check the indicated output voltage for both Channel 1 and Channel 2 at this position. The indicated output voltage is to be within the limit of 2.689v minimum and 2.736v maximum.

(j) If the indicated output voltage (for either Channel), is outside of the limit given in sub. para. (i), it is possible to adjust the voltage only within the tolerance available at the 'rig' position. If necessary, repeat the adjustment procedure given in sub. paras. (a) through (g) and write down the indicated voltages for the 'rig' position.

(k) Repeat sub. para. (f).

(l) Move the ram piston (3-110) to the fully extended position. Check the indicated output voltage for both Channel 1 and Channel 2 at this position. The indicated output voltage for each Channel is to be within the limit of 0.385v minimum and 0.417v maximum. If the output voltage (for either Channel), is outside of the limit, the same adjustment conditions as for sub. para. (j) apply.

(m) Repeat the checks at the retracted and extended positions after any adjustment. Make sure that the self-locking nut (2-150) and the fork end (2-110) are correctly torque tightened, once adjustment is complete. Before the fork end is installed, re-measure dimension X, if any adjustment has been made since sub. para. (d).

(n) Where the LVDT Supplier's Certificate is available, write on the Supplier's Certificate the final values of indicated voltage and adjuster stem depth as follows:

| Channel 1 | Channel 2 |
|---|---|
| Rig: | Rig: |
| Retracted: | Retracted: |
| Extended | Extended |
| Adjuster stem depth: | |

(o) Disconnect the cable assembly from the Channel 1 and Channel 2 connectors of the VSVA unit.

NOTE: If the EL4049 or EL6023 LVDT indicator unit is to be used to accomplish another VSVA unit within the next two hours, it is advisable to keep it switched ON.

(p) Remove the VSVA from the holding fixture and apply Ardrox 3302 to the areas of the joint faces of the LVDT and the unit body, as given in 75-32-41, Assembly.

(12) Re-identify the Actuator, Figure 1

(a) When the Assembly is complete get the new identification plate (1-30) and the new strap (1-20) (supplied with the Mod. Kit).

(b) Refer to the information marked on the first identification plate (1-30) and mark the new identification plate as follows (use 1/16in. (1,6mm), letter/number stamps). Use the stamps with the identification plate held on a flat surface:



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| | |
|---|---|
| TYPE No. | 1685 Mk 7 |
| SERIAL No. | Mark as on the original plate |
| MOD No. | Mark as on the original plate, plus D.TV.058 |
| INSP. | Keep blank |
| TEST | Keep blank |

(c) Fill the stamped letters and numbers with black paint and wipe away the surplus.

(d) Attach the new identification plate (1-30) to the actuator with the new strap (1-20).

(e) Discard the first identification plate.

(13) A record of accomplishment is required.

(14) Install the VSVA and do the necessary leakage tests as instructed by IAE Service Bulletin V2500-ENG-75-0078.

(15) A record of accomplishment is required.

B. Replace the Variable Stator Vane Actuator (Part 2, Unit Replacement Only)

(1) Remove the Variable Stator Vane Actuator (VSVA), Unit as instructed by IAE Service Bulletin V2500-ENG-75-0078.

NOTE: Removed VSVA units should be returned to one of the Repair Bases listed below:

Lucas Aerospace
The Radleys
Marston Green
Birmingham, B33 0HZ
England.

Lucas Aerospace
Customer Support
30 Van Nostrand Avenue
Englewood
New Jersey 07631
USA

(2) Install the replacement VSVA unit as instructed by IAE Service Bulletin V2500-ENG-75-0078. The modification number D.TV.058, MOD shows that this Service bulletin (Modification) has been incorporated.

(3) A record of accomplishment is required.

C. Replace the LVDT (Part 3, Overhaul Facility Accomplishment Instructions)

(1) Remove the transport components in accordance with Page Block 301, Disassembly procedure in the Lucas Aerospace Variable Stator Vane Actuator, TYPE 1685 Component Maintenance Manual.

(2) Remove the LVDT in accordance with Page Block 301, Disassembly procedure in the Lucas Aerospace Variable Stator Vane Actuator, TYPE 1685 Component Maintenance Manual.

(3) Install the LVDT in accordance with Page Block 701, Assembly procedure in the Lucas Aerospace Variable Stator Vane Actuator, TYPE 1685 Component Maintenance Manual.



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(4) Do a Check of the LVDT Adjustment in accordance with Page Block 101, Testing and Trouble Shooting procedure of the Lucas Aerospace Variable Stator Vane Actuator, TYPE 1685 Component Maintenance Manual.

(5) The removed LVDT is classified as scrap

(6) Re-identify the Actuator, Figure 1

(a) When the Assembly is complete get the new identification plate (1-30) and the new strap (1-20) (supplied with the Mod. Kit).

(b) Refer to the information marked on the first identification plate (1-30) and mark the new identification plate as follows (use 1/16in. (1,6mm), letter/number stamps). Use the stamps with the identification plate held on a flat surface:

| | |
|---|---|
| TYPE No. | 1685 Mk 7 |
| SERIAL No. | Mark as on the original plate |
| MOD No. | Mark as on the original plate, plus D.TV.058 |
| INSP. | Keep blank |
| TEST | Keep blank |

(c) Fill the stamped letters and numbers with black paint and wipe away the surplus.

(d) Attach the new identification plate (1-30) to the actuator with the new strap (1-20).

(e) Discard the first identification plate.

(7) A record of accomplishment is required.

3. Material Information

A. Modification Kit

Modification kit D.TV.058 (comprises the parts given in Para. C.).

B. Parts to be Re-worked

None.

C. New Production Parts

The following new parts will be available as spares:

| New Part No. | Qty | Keyword | Old Part No. |
|---|---|---|---|
| 2607-4002 | 1 | LVDT | 2607-4000 (SB 1685-75-007)<br>2607-4001 (SB 1685-75-007) |
| STD1017-4121 | 1 | Ring, sealing | STD1017-4121 |
| STD831-28 | 1 | Ring, sealing | STD831-28 |
| AS20625 | 1 | Nut, self-locking | AS20625 |
| 215-410 | 1 | Strap, label retaining | 215-410 |
| 215-4012 | 1 | Plate, identification | 215-4012 |



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D. Redundant Parts:

| IPL Fig./Item | Keyword | Old Part No. |
|---|---|---|
| 2-160 | LVDT | 2607-4000 (SB 1685-75-007)<br>2607-4001 (SB 1685-75-007) |

E. Identification of Units

The type of equipment affected by this Service Bulletin (Modification), is:

| Unit | Type No. |
|---|---|
| Variable Stator Vane Actuator | 1685 MK 7 |



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# Lucas Aerospace

# SERVICE BULLETIN

SB 1685-75-008 (SUPPLEMENT)

ENGINE COMPRESSOR CONTROL - VARIABLE STATOR VANE ACTUATOR (VSVA)
INTRODUCTION OF NEW LINEAR VARIABLE DIFFERENTIAL TRANSFORMER (LVDT),
REVISED MATERIALS TO PREVENT JOINT DEGRADATION.

(LUCAS AEROSPACE MOD. D.TV.058)

(IAE SB V2500-ENG-75-0078)

1. Modification Kit

Modification kit D.TV.058 comprises the parts given in Para. 2.

2. New Production Parts

| Part No. | Qty per Unit | Keyword | Gross World List Price (US Dollars) | Availability on Receipt of Order |
|---|---|---|---|---|
| 2607-4002 | 1 | LVDT | Price on application | 30 days |
| STD1017-4121 | 1 | Ring, sealing | Price on application | 15 days |
| STD831-28 | 1 | Ring, sealing | Price on application | 15 days |
| AS20625 | 1 | Nut, self-locking | Price on application | 15 days |
| 215-410 | 1 | Strap, label retaining | Price on application | 15 days |
| 215-4012 | 1 | Plate, identification | Price on application | 15 days |

3. New Tooling

None.

4. Spare Parts Supply

Spares distribution and Customer Service is available from the following Lucas Aerospace Customer Support Centres:

| REGION | ADDRESS | COMMUNICATION | |
|---|---|---|---|
| AMERICAS | LUCAS AEROSPACE<br>CUSTOMER SUPPORT<br>30 VAN NOSTRAND AVENUE<br>ENGLEWOOD<br>NEW JERSEY 07631<br>USA. | PHONE<br>FAX<br>AOG<br>SITA/ARINC | (1) 201 567 6400<br>(1) 201 894 1965<br>(1) 201 567 6411<br>EWR LU7X |
| EUROPE/MIDDLE EAST/AFRICA | LUCAS AEROSPACE<br>CUSTOMER SUPPORT<br>STRATFORD ROAD<br>SOLIHULL, B90 4LA<br>ENGLAND. | PHONE<br>FAX<br>AOG<br>SITA/ARINC | (44) (0)121 451 5999<br>(44) (0)121 451 5881<br>(44) (0)121 451 5904<br>BHX LW7X |
| ASIA/PACIFIC | LUCAS AEROSPACE<br>CUSTOMER SUPPORT<br>35 - 37 LOYANG WAY<br>SINGAPORE 508733. | PHONE<br>FAX<br>AOG<br>SITA/ARINC | (65) 545 9975<br>(65) 543 0419<br>(65) 545 6253<br>SIN LU7X |



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