



AIR - LPC BLEED MASTER ACTUATOR - NEW FUEL DRAIN PASSAGE - CATEGORY CODE 6 -
MOD.ENG-75-0023

1. Planning Information

A. Effectivity

(1) Aircraft: Airbus A320

(2) Engine: V2500-A1 Engines prior to Serial No.V0197*

* The Serial Number data shown is of a preliminary nature and is provided for advanced planning only. A future revision to this Service Bulletin will confirm final serial number effectivity.

(3) All Part Number 5L0032, LPC Bleed-Master Actuators (Dowty & Smiths Industries Controls Limited LPC Bleed-Master Actuators Type No. 1666 Mk.3)

B. Reason

(1) Condition

Hydraulic locking of the Linear Variable Differential Transformer (LVDT) may occur if the LVDT air cavity in the LPC Bleed-Master Actuator body becomes full with fuel. This could cause the damage to the fork arm linkage and subsequent loss of LVDT feedback signal to the Electronic Engine Control (EEC).

(2) Background

There have been two instances of damage to the fork arm linkage in service. An investigation has revealed that the cause of damage has been due to the hydraulic locking of the LVDT resulting in fuel leaked into the LVDT air cavity through the LVDT sealing ring which was attributed to damage during initial assembly into unit. A simulation testing has also shown an evidence of this condition.

(3) Objective

The changes in configuration recommended in this Service Bulletin are designed to improve engine reliability.

(4) Substantiation

The Substantiation testing is not required.

(5) Effect of Bulletin on workshop procedure:

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Removal/Installation	Not affected
Disassembly/Assembly	Not affected
Cleaning	Not affected
Inspection/Check	Not affected
Repair	Not affected
Testing	Not affected

(6) Supplemental Information

None

C. Description

- (1) The changes introduced by this Service Bulletin are as follows: Refer to Figure 1 and 2.
 - (a) A drain passage between the LVDT air cavity and the unit seal drain port is introduced to prevent the hydraulic locking of the LVDT.
 - (b) Existing Part Number of LPC Bleed-Master Actuator is changed to a new Part Number.
- (2) Existing LPC Bleed-Master Actuator can be reworked and reidentified to a new Part Number.
- (3) New LPC Bleed-Master Actuator Assembly will be available for future replacement purposes.
- (4) The following Service Bulletin must be incorporated in conjunction with this Service Bulletin:

Dowty Fuel Systems Service Bulletin No. 1666-75-002 (DFS MOD.D.TV.029) (Refer to 1.K.(2)(b)).
- (5) This Service Bulletin must be incorporated after or concurrently with the IAE Service Bulletin No. V2500-ENG-75-0019 and associated vendor (Dowty Fuel System) Service Bulletin No. 1666-75-001 (DFS MOD.D.TV.028) (Refer to 1.K.(1)(a) and 1.K.(2)(a)).
- (6) This Service Bulletin describes in two options to accomplish the modification of the LPC Bleed-Master Actuator.
 - (a) Option 1 - Operators who wish to have the modification accomplished by Dowty Fuel Systems
 - (b) Option 2 - Operators who wish to accomplish the modification in the field

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D. Approval

The Part Number changes and/or part modifications described in Sections 2 and 3 of this Service Bulletin have been shown to comply with the applicable Federal Aviation Regulations and are FAA-APPROVED for the Engine Model listed.

E. Compliance

Category Code 6

Accomplish when the subassembly (i.e. Module, Accessories, Components, Build groups) is disassembled sufficiently to afford access to the affected part and to all affected spare parts.

F. Manpower

Estimated Manhours to incorporate the full intent of this Bulletin

Venue	Estimated Manhours
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(1) In service Not applicable
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(2) At overhaul Not applicable
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G. Material – Price and Availability

(1) Refer to Dowty Mod Kit D.TV.029 for prices and availability of future spares.

(2) See "Material Information" section for prices and availability of future spares.

H. Tooling – Price and Availability

Special tools are not required to accomplish this Service Bulletin.

I. Weight and Balance

(1) Weight change	None
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(2) Moment arm	No effect
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(3) Datum	Engine front mount centerline (Power Plant Station (PPS) 100)
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J. Electrical Load Data

This Service Bulletin has no effect on the aircraft electrical load.

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K. References

- (1) Internal Reference No.

EC90VJ044

- (2) Other References

IAE V2500 Service Bulletins:

V2500-ENG-75-0019 "Air - Incorporate a Non-return Valve into the LPC Bleed-Master Actuator Return Line".

Vendor Service Bulletins:

Dowty Fuel Systems No.1666-75-001 (DFS MOD.D.TV.028) "Engine Compressor Control - LPC Bleed-Master Actuator - Introduction of Return Port Non-return Valve".

Dowty Fuel Systems No.1666-75-002 (DFS MOD.D.TV.029) "Engine Compressor Control - LPC Bleed-Master Actuator - Introduction of Drain between LVDT, LP Seal and LVDT Dust Seal".

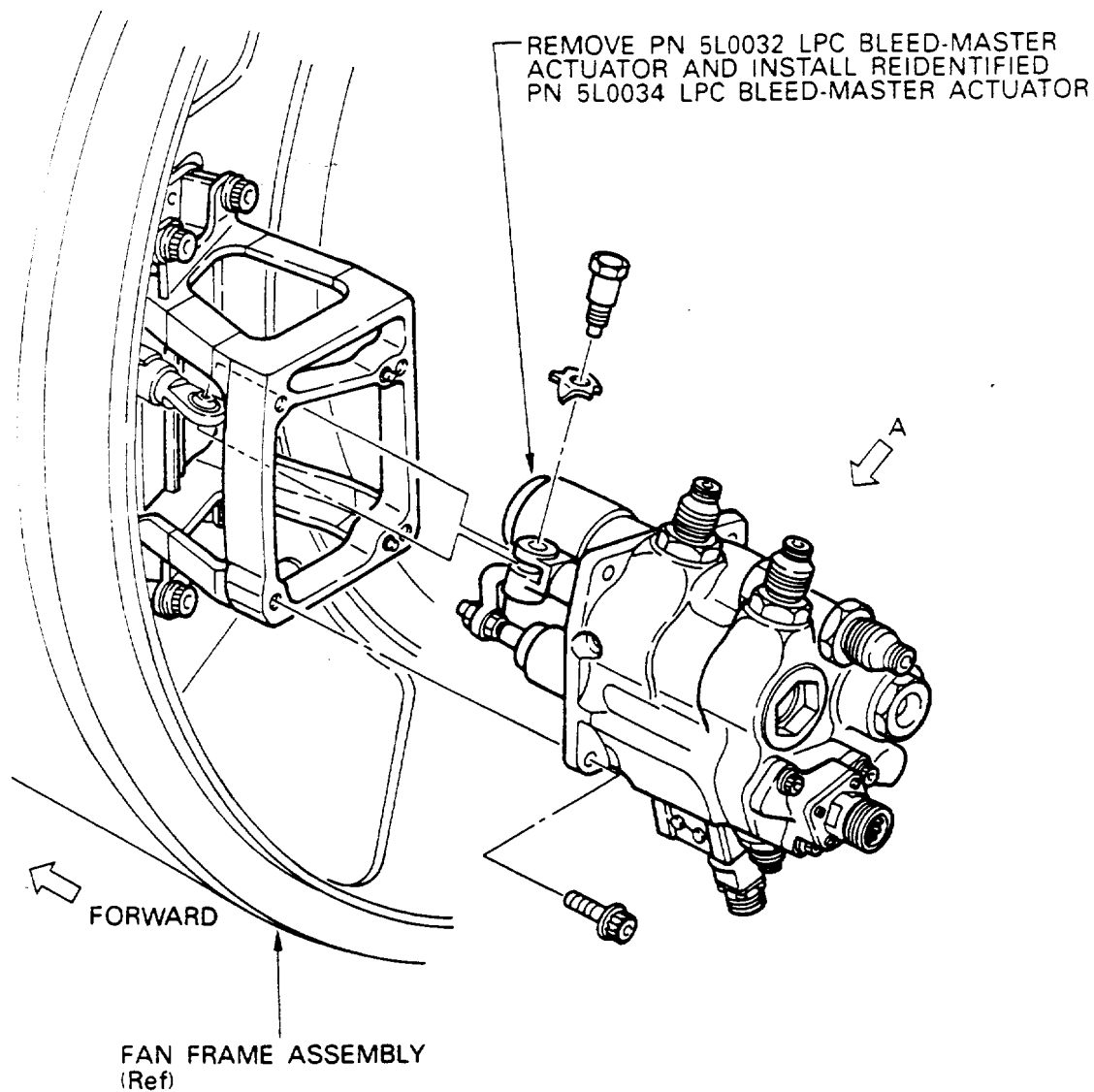
The V2500 Engine Illustrated Parts Catalog, Chapter/Section 75-31-42.

The V2500 Engine Manual, 72-00-32, Installation.

L. Other Publications Affected

- (1) The V2500 Engine Illustrated Parts Catalog, Chapter/Section 75-31-42.
- (2) The V2500 Power Plant Illustrated Parts Catalog, Chapter/Section 75-31-42.
- (3) The Dowty & Smith Industries Controls Limited, Component Maintenance Manual, 75-31-42.

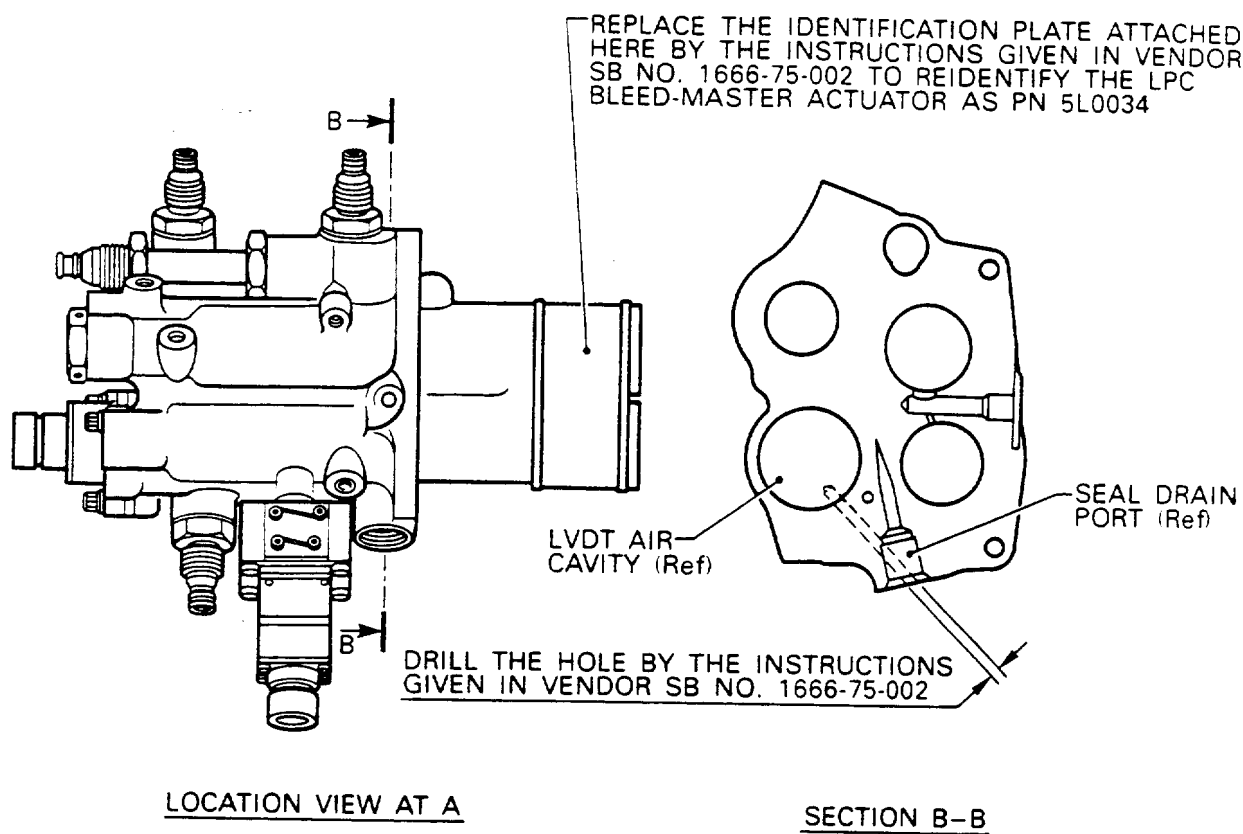
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Location of the LPC Bleed-Master Actuator
Fig.1

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Modification of the LPC Bleed-Master Actuator
Fig.2

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2. Accomplishment Instructions

A. Rework Instructions

(1) Option 1 – Operators who wish to have the modification accomplished by Dowty Fuel Systems

- (a) Return the part number 5L0032, LPC Bleed–Master Actuator (Dowty & Smiths Industries Controls Limited Type No.1666 Mk.3) for modification and reidentification to:

Dowty Fuel Systems
Arle Court,
Cheltenham,
Gloucestershire GL51 0TP,
ENGLAND

Telephone: 0242 221144
Telex: 43176

(2) Option 2 – Operators who wish to accomplish the modification in the field

- (a) Do a modification on existing 5L0032, LPC Bleed–Master Actuator (Dowty & Smiths Industries Controls Limited Type No.1666 Mk3), by accomplishment instructions given in the Dowty Fuel Systems Service Bulletin No.1666–75–002 (DFS MOD.D.TV.029), (Refer to 1.K.(2)(b)).
- (b) Re–identify the LPC Bleed–Master Actuator as 5L0034 (Dowty & Smiths Industries Controls Type No.1666 Mk4) by the accomplishment instructions given in the Dowty Fuel Systems Service Bulletin No.1666–75–002 (DFS MOD.D.TV.029), (Refer to 1.K.(2)(b)).

B. Assembly Instructions

- (1) Install 5L0034, LPC Bleed–Master Actuator to the engine by the approved procedures in the Engine Manual, 72–00–32 Installation (Refer to 1.K.(4) and Figure 1).

C. Recording Instructions

- (1) A record of accomplishment is necessary.



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3. Material Information

Applicability: For each V2500-A1 engine to incorporate this Bulletin.

A. Kits Associated with this Bulletin:

None

B. Parts Affected by this Bulletin:

New Part No. (ATA No.)	Qty	Est'd Unit Price (\$)	Keyword	Old Part No. (IPC No.)	Instructions Disposition
5L0034 (75-31-42)	1		.Actuator, Master-LPC Bleed	5L0032 (01-100)	(A)(B)(S1) (1D)

C. Instruction/Disposition Code Statements:

- (A) New part is currently available for sale.
- (B) Old part will no longer be available for sale.
- (S1) Old and new part is freely and fully interchangeable, both physically and functionally.
- (1D) Old part can be reworked and reidentified to the new part number.

NOTE: The estimated 1991 unit prices shown are provided for planning purposes only and do not constitute a firm quotation. Consult the IAE Price Catalog or contact IAE's Spare Parts Sales Department for information concerning firm prices.

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Dowty Fuel Systems

SERVICE BULLETIN

1666-75-002

ENGINE COMPRESSOR CONTROL - LPC BLEED -
MASTER ACTUATOR - INTRODUCTION OF
DRAIN BETWEEN LVDT, LP SEAL
AND LVDT SHAFT DUST SEAL

(IAE SB V2500-ENG-75-0023)
(DFS MOD D.TV.029)

1. Planning Information

A. Effectivity

- (1) Aircraft: Airbus - A320.
- (2) Engine : V2500-A1 Engines prior to Serial Number V0210.
- (3) LPC Bleed Master Actuators, Type 1666 Mk3, prior to Serial Number 1666400.

B. Reason

(1) Condition.

It has been established that hydraulic locking of the Linear Variable Differential Transformer (LVDT), can occur if the LVDT air cavity in the unit body becomes full with fuel.

(2) Background.

The LVDT air cavity in the unit body is currently unvented. Leakage from the LVDT, LP seal can cause the air cavity to become full with fuel. This results in hydraulic locking of the LVDT, failure of the fork arm linkage and subsequent loss of LVDT feedback signal to the Electronic Engine Control (defined as a tracking failure). Two such incidents have occurred in service, both caused by the LVDT, LP seal sustaining damage during initial assembly into the unit; for this reason, both service failures have been infantile.

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(3) Objective.

Incorporation of the changes introduced by this Service Bulletin (Modification), are designed to vent the LVDT air cavity to the unit seal drain port.

(4) Substantiation.

The changes introduced by this Service Bulletin (Modification), have been shown, by detailed engineering analysis, to correct the condition.

C. Description

- (1) The Modification introduces a drain hole between the LVDT air cavity and the unit seal drain port, to prevent the LVDT air cavity becoming full with fuel.
- (2) The existing LPC Bleed Master Actuator can be re-worked to a new configuration.

D. Compliance

Category Code 6.

Accomplish when the sub-assembly (ie Module, Accessory, Component, Build Group), is disassembled sufficiently to afford access to the affected part and to all affected spare parts.

E. Approval

Service Bulletin 1666-75-002 (Mod.D.TV.029), (IAE SB V2500-ENG-75-0023), was technically agreed by IAE on Jun. 1/91. The part number changes and/or part modifications described in this Bulletin have been shown to comply with the appropriate Federal Aviation Regulations and are FAA approved for those units listed in this Bulletin.

F. Manpower

Estimated man hours to incorporate the full intent of this Bulletin:

- (1) In service. Not applicable
Note: The parts affected by this Service Bulletin are accessible at Component Maintenance Level.

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(2) At Component Maintenance Level

- (a) To re-work the Body, insert and
Plugs Assembly 2 hours, 35 minutes.
- (b) To re-identify the LPC
Bleed Master Actuator. 25 minutes.

G. Material - Price and Availability

(1) The following parts are required:

<u>Part No</u>	<u>Keyword</u>	<u>Qty</u>
215-426	Plate, identification	1
215-410	Strap	1

- (2) For price and availability, see the supplement to this Bulletin.

H. Tooling - Price and Availability

(1) Additional Tools.

None.

(2) Tools Made Redundant.

None.

I. Weight and Balance

- (1) Weight change Negligible decrease.
- (2) Moment arm Not affected.
- (3) Datum Engine front mount centerline
(Power Plant Station(PPS)100).

J. References

- (1) Dowty and Smiths Industries Controls Limited,
Component Maintenance Manual 75-31-42.
- (2) IAE Service Bulletin V2500-ENG-75-0023.
- (3) Dowty Fuel Systems Mod.D.TV.029.

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K. Other Publications Affected

Nil.

2. Accomplishment Instructions

A. Re-Work Instructions (Figure 1).

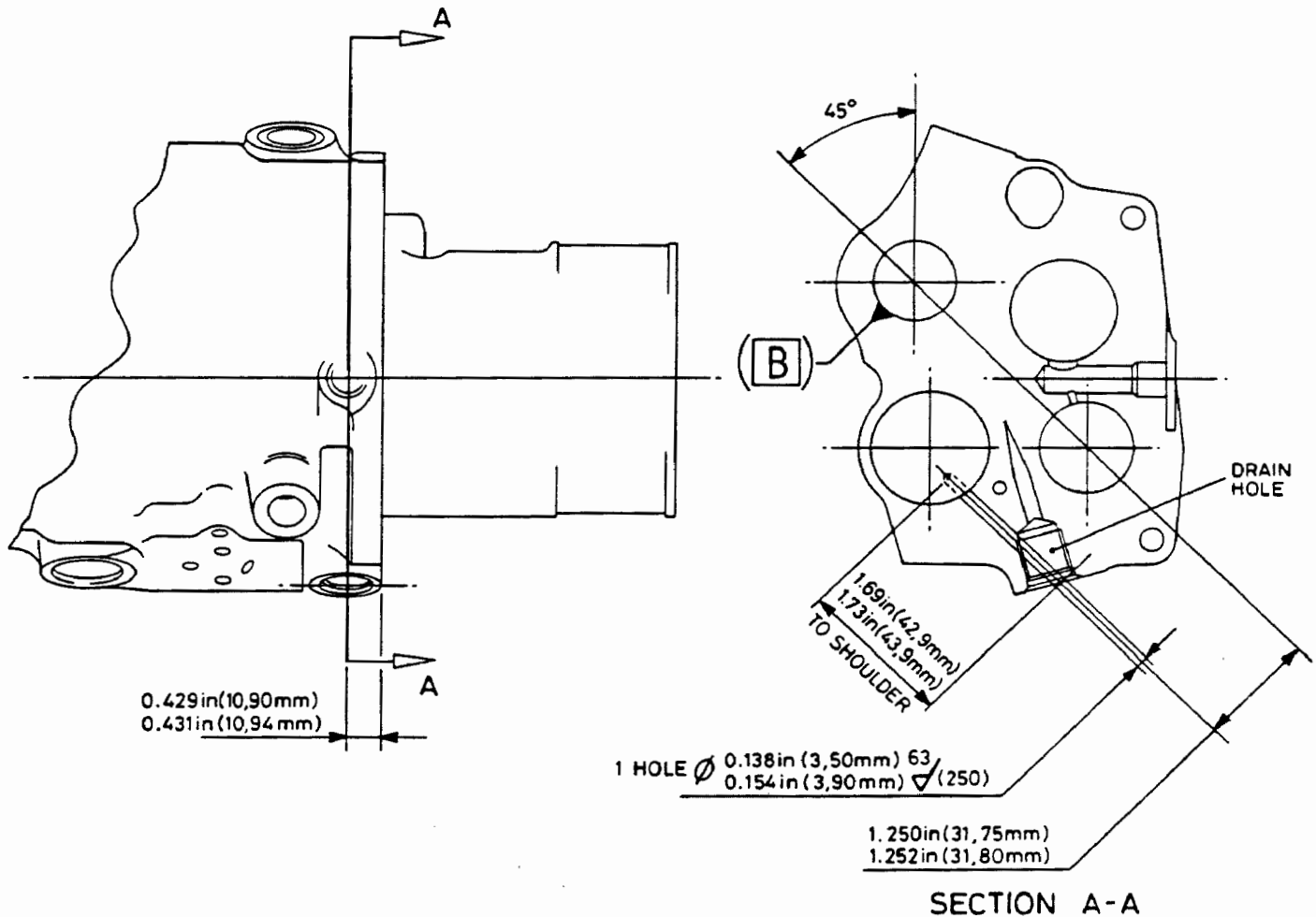
- (1) Inspect Part Number 1656-1057, Body, insert and plugs assembly (4-420), (Refer to 75-31-42, CHECK). Make sure that all the inspection checks agree.
- (2) Attach masking tape over the holes in the LVDT housing that connect with other parts of the body.
- (3) Attach masking tape over all the open holes on the outer surfaces of the body but do not include the hole marked DRAIN.
- (4) Install the body on a jig boring machine and set the body as shown in relation to the machine spindle axis; use the actuator piston hole in the body as datum B.
- (5) Machine a hole 0.138-0.154 in.(3,50-3,90 mm) dia. from the drain hole to the LVDT cavity as shown, (Refer to Figure 1).
- (6) Remove the body from the jig boring machine and remove, by using hand tools, any burrs from the machined hole in the LVDT cavity.
- (7) Clean the body, (Refer to 75-31-42 CLEANING), before removal of the masking tape; use the pressure wash process.

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Body , insert and plugs assembly -
re-work details
Figure 1

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- (8) Remove all the masking tape from the body and clean the body again by the same process.
- (9) Apply Alocrom 1200 to the machined hole and adjacent areas, (Refer to 75-31-42 REPAIR NO.2). Use cotton wool swabs which will pass through the machined hole.
- (10) Inspect the body again, (Refer to 75-31-42, CHECK). Make sure that all the inspection checks agree.
- (11) Re-identify body, insert and plugs assembly to part number 1666-9004, adjacent to the existing assembly number; use a vibro-etch or similar process but do not stamp the body with number stamps. Use a vibro-etch or similar process to erase the first assembly number.

B. Assembly Instructions.

- (1) Assemble the Actuator, using the new or re-worked Part Number 1666-9004 Body, insert and plugs assembly 75-31-42 (4-420). (Refer to 75-31-42, ASSEMBLY).
- (2) Do the tests specified in 75-31-42 to prove that the Actuator has been correctly assembled; there are no additional tests caused by this Service Bulletin.

C. Re-Identify the Actuator

- (1) Get the new data plate 215-426 (supplied with the Mod. kit).
- (2) Refer to the information marked on the first identification plate 75-31-42 (1-30) and mark the new identification plate as follows (use 3/32 in. (2.5mm), letter/number stamps with the data plate held on a flat surface):

IAE No. - Mark 5L0034

TYPE No. - Mark 1666 Mk4

SER. No. - Mark as on the first identification plate.

MOD. No. - Leave empty.

- (3) Where possible, fill in the stamped letters/numbers with black paint and wipe away the surplus.
- (4) Destroy and discard the first identification plate.

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- (5) Attach the identification plate to the Actuator.
(Refer to 75-31-42 ASSEMBLY); with the new strap
215-410.

D. A Record of Accomplishment is Required

3. Material Information

A. Modification Kit

Modification kit D.TV.029 comprises the parts given below:

<u>New Part No</u>	<u>Qty</u>	<u>Keyword</u>	<u>Old Part No</u>
215-426	1	Plate, identification	215-426
215-410	1	Strap	215-410

B. Parts to be Re-Worked

<u>New Part No</u>	<u>Qty</u>	<u>Keyword</u>	<u>Old Part No</u>
1666-9004	1	Body, insert and plugs assembly	1656-1057

C. New Production Parts

The following new parts will be available as spares:

<u>New Part No</u>	<u>Qty</u>	<u>Keyword</u>	<u>Old Part No</u>
1666-9004	1	Body, insert and plugs assembly	1656-1057
215-426	1	Plate, identification	215-426
215-410	1	Strap	215-410

D. Redundant Parts

<u>IPL Fig/Item</u>	<u>New Part No</u>	<u>Qty</u>	<u>Keyword</u>	<u>Old Part No</u>
4-420	1666-9004	1	Body, insert and plugs assembly	1656-1057

E. Identification of Units

The type of equipment affected by this Mod. is:

<u>Unit</u>	<u>Type No</u>
LPC Bleed Master Actuator	1666 Mk3 (becomes 1666 Mk4)

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Dowty Fuel Systems

SERVICE BULLETIN

1666-75-002 (SUPPLEMENT)

ENGINE COMPRESSOR CONTROL - LPC BLEED -
MASTER ACTUATOR - INTRODUCTION OF
DRAIN BETWEEN LVDT, LP SEAL
AND LVDT SHAFT DUST SEAL

(IAE SB V2500-ENG-75-0023)
(DFS MOD.D.TV.029)

1. Modification Kit

Modification kit D.TV.029 comprises the parts given below:

<u>Part No</u>	<u>Qty per</u> <u>Unit</u>	<u>Keyword</u>	<u>Gross</u> <u>World List</u> <u>Price (\$)</u>	<u>Availability</u> <u>On Receipt</u> <u>of Order</u>
215-426	1	Plate, identification	\$14.16	90 days
215-410	1	Strap	\$6.85	90 days

2. New Production Parts

<u>Part No</u>	<u>Qty per</u> <u>Unit</u>	<u>Keyword</u>	<u>Gross</u> <u>World List</u> <u>Price (\$)</u>	<u>Availability</u> <u>On Receipt</u> <u>of Order</u>
1666-9004	1	Body, insert and plugs assembly	\$8,725.00	90 days

SUPPLEMENT
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