International Aero Engines

SERVICE BULLETIN

AIR - HP COMPRESSOR VARIABLE STATOR VANE ACTUATOR (VSVA) - INTRODUCTION OF RETURN PORT, NON RETURN VALVE - CATEGORY CODE 4 - MOD.ENG-75-0020

1. Planning Information

A. Effectivity

(1) Aircraft: Airbus A320

(2) Engine: V2500-A1 Engines prior to Serial No. V0168 except Serial No. V0166.

(3) Variable stator vane actuators - all 1685 Mk4 units

B. Reason

(1) Condition

During priming of the fuel system, contamination may enter the variable stator vane actuator (VSVA). This may cause a deviation in the schedule of the VSVA from the schedule commanded by the Electronic Engine Control.

(2) Background

The condition was identified during engine testing and in service.

(3) Objective

Incorporation of the changes introduced by this Service Bulletin are designed to maintain unit reliability.

(4) Substantiation

The changes introduced by this Service Bulletin have shown by unit rig testing and development engine running to alleviate the condition whilst not adversely affecting the performance of the unit.

(5) Effect of bulletin on workshop procedures

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

(6) Supplemental Information

See Dowty Fuel System Service Bulletin 1685-75-002 for all other information.

C. Description

(1) The changes introduced by this Service Bulletin are as follows:

(a) To eliminate fuel entering the VSVA via the LP fuel return line a non return valve is introduced within th VSVA's LP fuel return union. The existing VSVA LP union is non reworkable.

(b) Units incorporating this Service Bulletin will be identified by the serial number 1685 Mk5.

D. Approval

The part number changes and/or part modification 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 4

Accomplish at the first visit of an engine or module to a maintenance base capable of compliance with the accomplishment instructions regardless of the planned maintenance action or the reason for engine removal.

F. Manpower

Estimated manhours to incorporated the full intent of this Bulletin.

Venue	Estimated Manhours
(1) In service	TOTAL 43 minutes
(a) To gain access	
(i) Open fan cowls	8 minutes
(ii) Open 'C' ducts	9 minutes
TOTAL	17 minutes
(b) To embody	
(i) Removal instructions ..	2 minutes 30 seconds
(ii) Reassemble instructions	3 minutes 30 seconds

TOTAL 6 minutes

(c) To return engine to flyable status

(i) Close 'C' ducts .. .. 12 minutes

(ii) Close fan cowl doors .. 8 minutes

TOTAL 20 minutes

(2) In shop .. .. 2 minutes

G. Material - Price and Availability

(1) Refer to Dowty Mod Kit D.TV.027 for prices and availability of future spares.

(2) See 3. 'Material Information' for prices and availability of future spares.

H. Tooling - Price and Availability

Special tools are not required.

I. Weight and Balance

(1) Weight change .. .. .. None

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

(3) Datum .. .. Engine front centreline (Power Plant Station (PPS) 100)

J. Electrical Load Data

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

K. References

(1) Internal Reference No.

EC90VR018

ECM90VR018-03

(2) Other References

Dowty Fuel Systems Service Bulletin 1685-75-002.

A320 Aircraft Maintenance Manual.

L. Other Publications Affected

(1) V2500 Illustrated Parts Catalog, 75-32-41

2. Accomplishment Instructions

A. Pre-requisite instructions

(1) Open the fan cowls in accordance with the instructions in the A320 Aircraft Maintenance Manual, 72-13-00-010-010.

(2) Open the left thrust reverser half in accordance with the instructions in the A320 Aircraft Maintenance Manual, 78-32-00-010-010.

B. Removal Instructions

CAUTION: MAKE SURE THAT IT IS THE LP RETURN FUEL TUBE THAT IS DISCONNECTED.

(1) Cut and discard the wire and disconnect the LP return fuel tube at the VSVA. Discard the packing. Refer to Figures 2 and 3.

(2) Cut and discard the wire and disconnect the LP return fuel tube at the upper connection. Discard the packing. Refer to Figure 2.

(3) Slacken clipping points 5766 and 5770. Refer to Figure 2.

(4) Position the LP return fuel tube to allow access to the VSVA LP return union.

C. Assembly Instructions

(1) Incorporate the intent of Dowty Fuel Systems Service Bulletin 1685-75-002.

(2) Connect the LP return fuel tube. Refer to Figure 2.

(a) Install the packing MS9967-012. Refer to Figure 2.

(b) Connect the LP return fuel tube at the VSVA.

(c) Torque the connector to between 425 to 475 lbfin.

(d) Safety the connector to the actuator case with V02-126 wire.

(e) Install the packing, MS9967-012, at the upper connection.

(3) Connect the LP return fuel tube at the upper connector. Refer to Figure 2.

(a) Torque the connector to between 425 to 475 lbfin.

(b) Safety the connector to the upper connection with V02-126 wire.

(4) Tighten clipping points 5766 and 5770. Refer to Figure 2.

D. Post requisite instructions

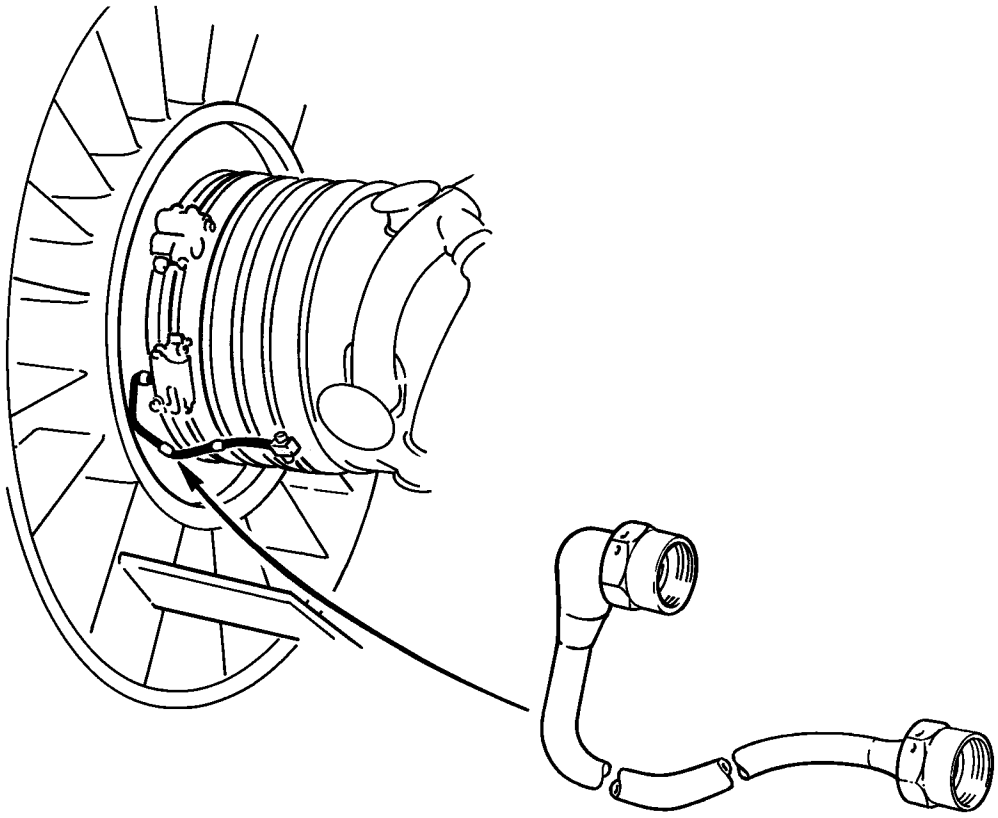
(1) Close the left thrust reverser half in accordance with the instructions in the A320 Aircraft Maintenance Manual 78-32-00-410-010.

(2) Close the fan cowls in accordance with the instructions in the A320 Aircraft Maintenance Manual 71-13-00-410-010.

(3) Do a test of the VSV actuator (TASK 71-00-00-700-012).

E. Recording Instructions

Record in the engine log that this Service Bulletin has been incorporated.



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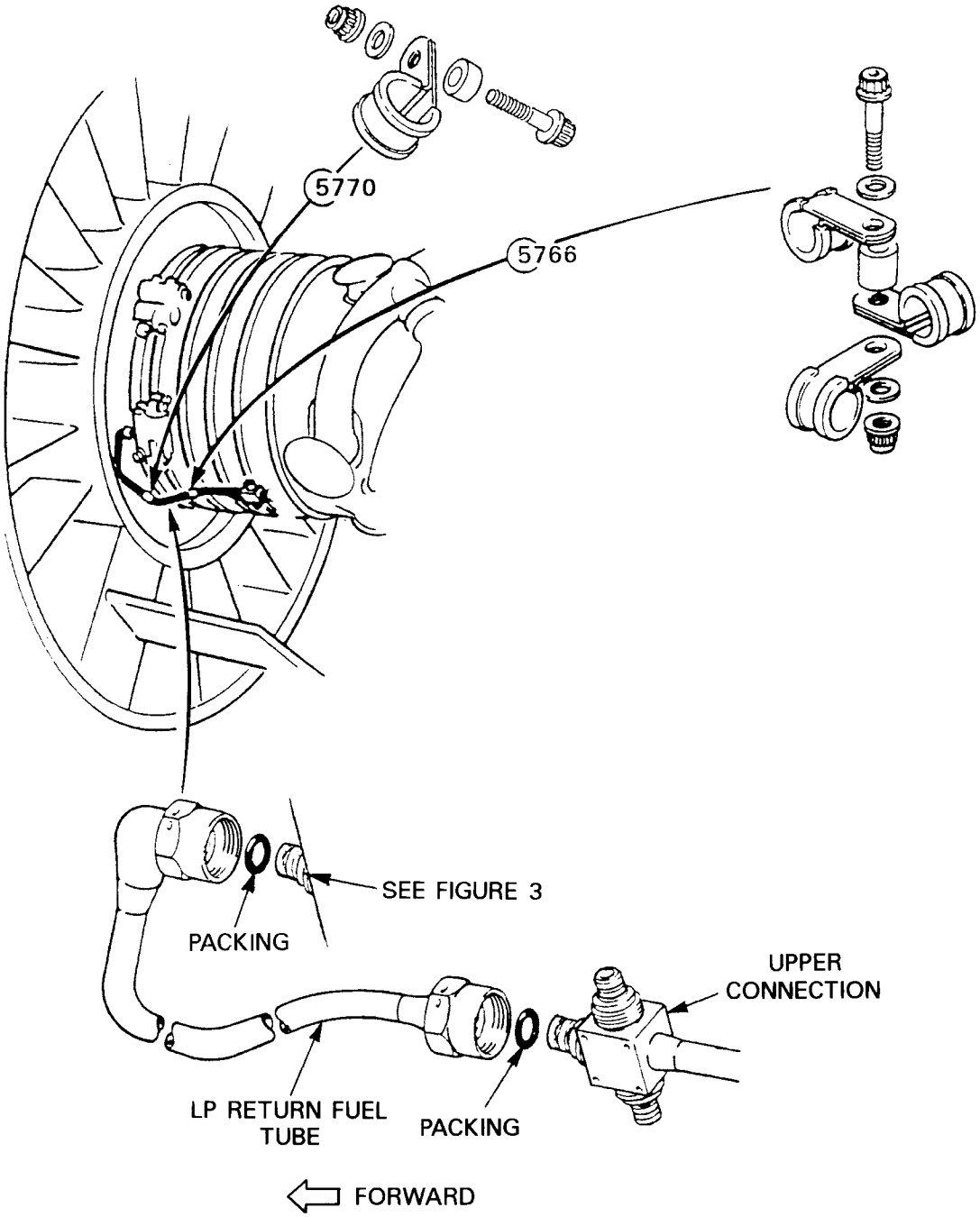
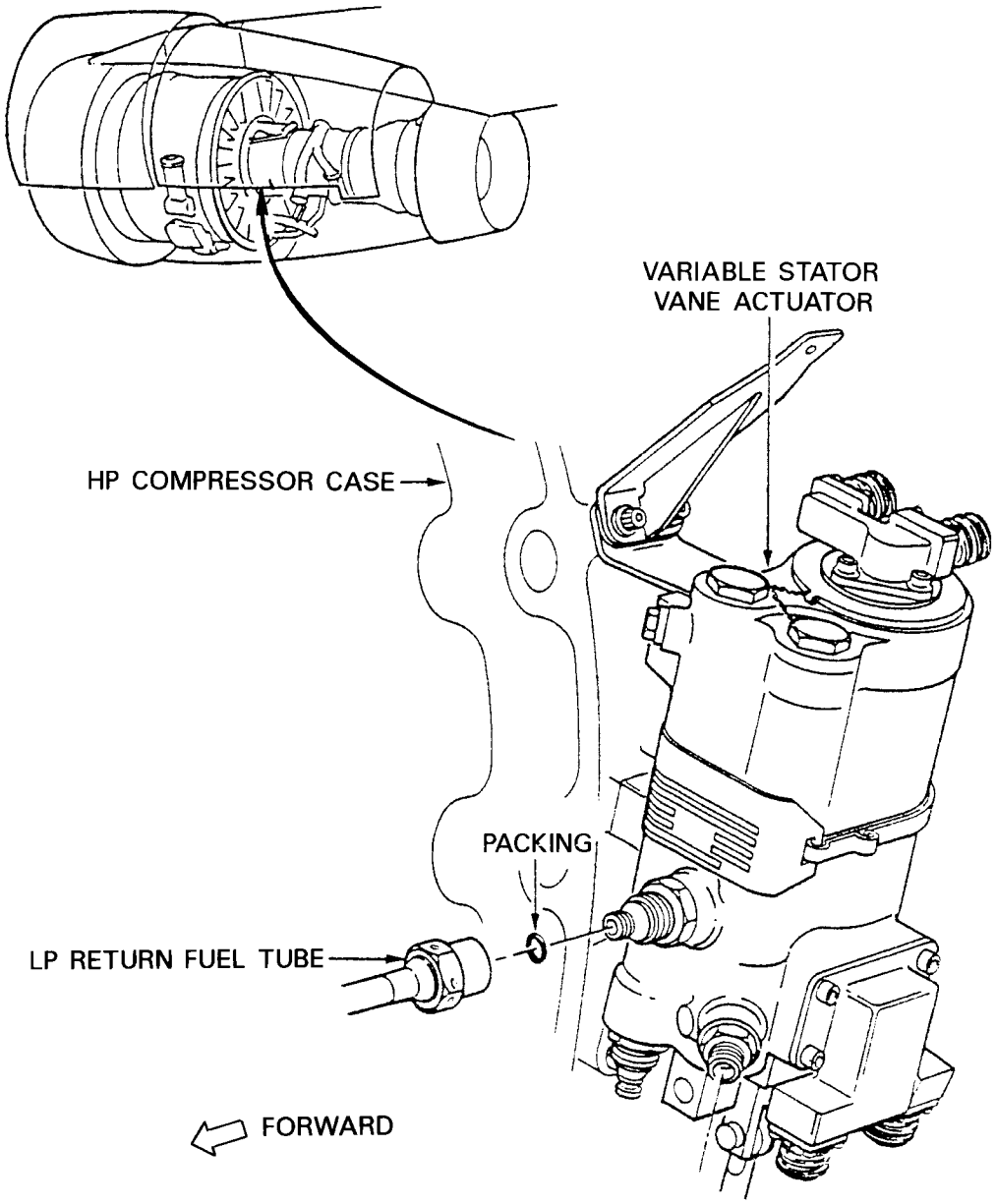
Location of VSVA and LP return fuel tube
Fig.1



LP return fuel tube
Fig.2



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Variable stator vane actuator
Fig.3

3. Material Information

Applicability: For each V2500 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
1685Mk5 (75-32-41)	1		Actuator stator vane	1685Mk4 (01-100)	(S1)(A)(B) (1D)

C. Instructions/Disposition Code Statements

(S1) Old and new part is freely and fully interchangeable, both physically and functionally.
(A) New part currently available.
(B) Old part will no longer be available.
(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's Spare Parts Sales Department for information concerning firm prices.

D. Expendables required to incorporate this Bulletin.

Part No.	ATA/IPC No.	Qty	Keyword
MS9967-012	73-11-49 19-096	2	Packing (Estimated Unit Price $1.89)

NOTE: For uninstalled actuator stator vane to engines, this paragraph is not applicable.

E. Consumable required to incorporate this Bulletin.

CoMat 01-124, Cleaning Fluid (Isopropyl Alcohol)
CoMat 10-039, Lubricant (Engine Oil)
CoMat 02-147, Lockwire

NOTE: For uninstalled actuator stator vane to the engine, this paragraph is not applicable.

Dowty Fuel Systems
SERVICE BULLETIN

1685-75-002
ENGINE COMPRESSOR CONTROL-VARIABLE STATOR VANE ACTUATOR. INTRODUCTION OF RETURN PORT, NON-RETURN VALVE

(IAE SB V2500-ENG-75-0020)
(DFS MOD.D.TV.027)

1. Planning Information

A. Effectivity

(1) Airbus A320

(2) V2500-A1

(3) Variable Stator Vane Actuators Type No. 1685 MK.4 prior to Serial Number 1685300.

B. Reason

(1) Condition

It has been noted that a reversal of the LP return flow may take place during Fuel System priming resulting in possible contamination of the Variable Stator Vane Actuator (VSVA).

(2) Background

The LP return line is currently unprotected from reverse flow and a number of units have been found contaminated as a result. The condition was identified during flight certification testing on the engine.

(3) Objective

Incorporation of the changes introduced by this Service Bulletin (Modification), are designed to protect the unit against fuel borne contamination.

(4) Substantiation

The changes introduced by this Service Bulletin (Modification), have been shown by unit testing and engine testing to correct the condition.

C. Description

The Modification introduces a non-return valve into the unit LP return line to prevent reverse flow into the unit.

D. Compliance

Category Code 4.

Accomplish at the first visit of an engine or module to a maintenance base, capable of compliance with the accomplishment instructions, regardless of the planned maintenance action or the reason for engine removal.

E. Approval

Service Bulletin No. 1685-75-002 (Mod D.TV.027), (IAE SB V2500-ENG-75-0020), was technically approved by IAE on Nov. 23/90. 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

(1) No additional man hours are necessary to incorporate this Service Bulletin (Modification), at Component Maintenance Level.

G. Material - Price and Availability

(1) The following parts are required:-

Part No.	Keyword	Qty
1685-3006	Valve, Assy of	1
STD831-1	Ring, sealing	1
215-408	Plate, data	1
215-410	Strap	1

H. Tooling - Price and Availability

(1) Additional Tools

None.

(2) Tools made redundant

None.

I. Weight and Balance

(1)	Weight change . . .	0.19 oz (5.5gm) increase
(2)	Moment Arm.	Not affected
(3)	Datum	Engine front mount center-line (Power Plant Station (PPS) 100)

J. References

(1) Dowty and Smiths Industries Controls Ltd., Component Maintenance Manual 75-32-41.

(2) IAE Service Bulletin V2500-ENG-75-0020.

(3) Dowty Fuel Systems Mod.D.TV.027.

K. Other Publications Affected

Nil.

2. Accomplishment Instructions

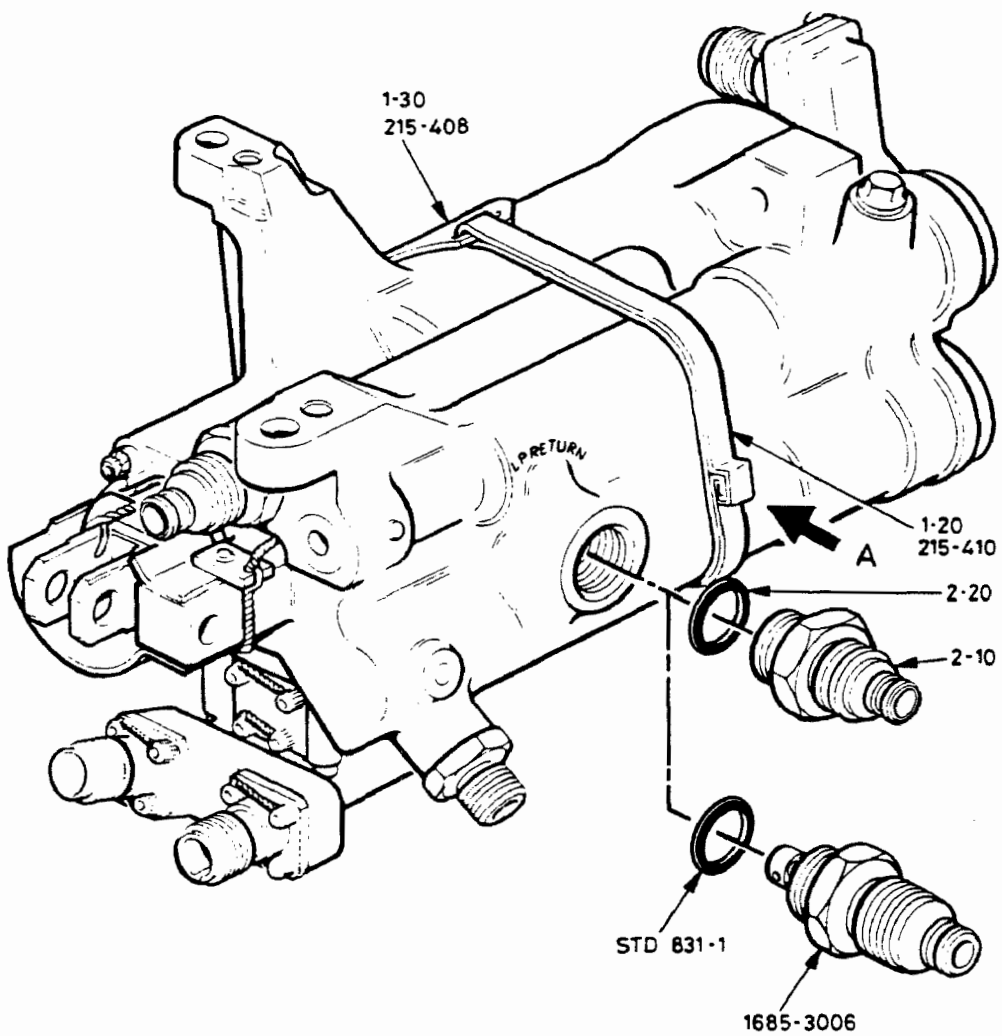
A. Install the Non-return Valve (Figure 1).

CAUTION MAKE SURE THAT THE CONNECTION MARKED 'L.P. RETURN' IS CORRECTLY IDENTIFIED.

(1) Unscrew and remove the union adaptor (2-10) from the connection marked 'L.P. RETURN'; remove the sealing ring (2-20).

(2) Fit the new toroidal sealing ring STD831-1 (supplied with the Mod. kit), to the non-return valve assy. 1685-3006.

VIEW A



Assembly of the Non-return Valve
Figure 1

(3) Assemble the non-return valve assy. 1685-3006 to the unit connection marked 'L.P. RETURN'; torque tighten the non-return valve assy. to 300 lbf.in. (34 Nm).

(4) Release the strap (1-20) which secures the data plate (1-30), remove the strap and the data plate; keep the data plate but discard the strap.

B. Re-identify the VSVA

(1) Obtain the new data plate 215-408 (supplied with the Mod.kit).

(2) Refer to the information on the first data plate (1-30) and mark the new data plate as follows (use 3/32 in. (2.5 mm) letter/number stamps with the data plate held on a flat surface):

TYPE NO. - Mark **1685 Mk.5**

SERIAL NO. - Mark as on the first data plate, plus **D.TV.027**

INSP. - Keep blank

TEST - Keep blank

(3) Where possible, fill-in the stamped letters/numbers with black paint and wipe away the surplus.

(4) Destroy the first data plate.

C. Attach the Data Plate to the VSVA (Figure 1).

(1) Bend the new data plate 215-408 to the shape of the VSVA body; use the body as a former.

(2) Attach the data plate to the VSVA; use the new strap 215-410. Loop the strap through both ends of the data plate and bend the ends together as shown.

(3) Make sure that the data plate is secure on the VSVA.

3. Material Information

A. Modification Kit

Modification kit D.TV. 027 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.
1685-3006	1	Valve, Assy of	-
STD831-1	1	Ring, sealing	STD831-1
215-408	1	Plate, data	215-408
215-410	1	Strap	215-410

D. Redundant Parts

IPL Fig/Item.	New Part No.	Qty	Keyword	Old Part No.
2-10	-	1	Adaptor, union	1685-4000

E. Identification of Units

The type of equipment affected by this Mod. is:

Unit	Type No.
Stator Vane Actuator	1685 MK.4 (Becomes 1685 Mk.5)

Dowty Fuel Systems

SERVICE BULLETIN

1685-75-002 (SUPPLEMENT)

ENGINE COMPRESSOR CONTROL-VARIABLE STATOR VANE ACTUATOR. INTRODUCTION OF RETURN PORT, NON RETURN VALVE

(IAE SB V2500-ENG-75-0020)
(DFS MOD.D.TV.027)

1. Modification Kit

Modification kit D.TV.027 comprises the parts given in para.2.

2. New Production Parts

Part No.	Qty	Keyword	Gross World List Price (Dollars)	Availability On Receipt of Order
1685-3006	1	Valve, Assy of	$1085.18	120 Days
STD831-1	1	Ring, sealing	$ 9.71	140 Days
215-408	1	Plate, data	$ 17.43	90 Days
215-410	1	Strap	$ 6.85	90 Days

SUPPLEMENT
1685-75-002