P U B L I C A T I O N T R A N S M I T T A L

RR-DERBY

V2500 International Aero Engines

400 MAIN STREET, MAIL STOP 121-10
EAST HARTFORD, CT 06108, USA.
TELEPHONE: 860 565 5515
FAX: 860 565 0600

P.O. BOX 31, DERBY
TELEGRAMS - 'ROYCAR' DERBY
TELEX - 37645
TELEPHONE - DERBY 242424

DATE: Sep.14/01

V2500-A5/D5 SERIES PROPULSION SYSTEMS SERVICE BULLETIN

This document transmits the Initial Issue of Service Bulletin EV2500-73-0171

Bulletin Initial Issue

Remove	Incorporate	Reason for change
	Pages 1 to 11 of the Service Bulletin	Initial issue

V2500-ENG-73-0171

CHECK THAT ALL PREVIOUS TRANSMITTALS HAVE BEEN INCORPORATED
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LIST OF EFFECTIVE PAGES

The effective pages to this Service Bulletin are as follows:

Page	Revision Number	Revision Date
Bulletin		
1		Sep.14/01
2		Sep.14/01
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ENGINE FUEL AND CONTROL - FUEL METERING UNIT - INTRODUCTION OF A REVISED TRW FUEL METERING UNIT WITH SUPPLEMENTARY SOV TORQUE MOTOR CAP CLAMPING

1. Planning Information

A. Effectivity

(1) Airbus A319

V2522-A5, V2524-A5, V2527M-A5 Engines prior to Serial No. V11025

(2) Airbus A320

V2527-A5, V2527E-A5 Engines prior to Serial No. V11025

(3) Airbus A321

V2530-A5, V2533-A5 Engines prior to Serial No. V11025

(4) Boeing - Longbeach Division MD-90

V2525-D5, V2528-D5 Engines prior to Serial No. V20286

(5) ATA Locator 73-22-52

B. Concurrent Requirements

None

C. Reason

(1) Condition

The Fuel Metering Unit (FMU) Shut Off Valve (SOV) torque motor cap retaining screws may shear, allowing the cap to lift. In extreme cases the cap may lift sufficiently to allow nozzle bore plugs to be released, resulting in a fuel leak. The resulting fuel loss causes the FMUs spill valve to fully open, redirecting the majority of HP pump flow back to the engines LP fuel system.

The problem has been attributed to a void in the Armature Flexural Sleeve Assembly/baseplate interface seal. This allows one-way fuel leakage into the cap cavity. Temperature induced pressurisation during normal engine operation causes progressive filling and expansion of this trapped fluid, creating a lifting force sufficient to overstress the cap retaining screws.

(2) Background

The problem was discovered following a routine ground de-icing engine run.

(3) Objective

Incorporation of this Service Bulletin (Modification) is designed to maintain unit reliability.

(4) Substantiation

The changes introduced by this Service Bulletin have been the subject of satisfactory engineering assessment, vendor rig testing and successful trial installation on representative unit.

(5) Effect of Bulletin on:

(a) Operation

Not affected

(b) Maintenance

Not affected

(c) Overhaul

Not affected

(d) Repair Schemes

Not affected

(e) Interchangeability

Affected (see 1.M.(2) References).

(f) Fits and Clearances

Not affected

D. Description

(1) This Service Bulletin covers the fitment of an FMU incorporating TRW Lucas Aerospace modification CP8189

(2) This Service Bulletin introduces supplementary FMU SOV torque motor cap retention features to prevent cap lifting and eliminate the potential for nozzle bore plug release.

(a) The changes introduced are:

(i) Two stainless steel C shaped clamps have been introduced onto the top surface of the SOV torque motor baseplate, covering the dedicated torque motor cap retaining screws.

(ii) The main torque motor/FMU retaining bolts have been increased in length to accommodate the additional C clamps.

(3) Existing FMUs may be reworked. Refer to vendor service bulletins FMU55O-73-8189, FMU53O-73-8189, FMU54O-73-8189.

(4) Units incorporating this Service Bulletin will be identified by endorsement of the modification plate with CP8189.

Compliance

Category Code 6

Accomplish when the sub-assembly (i.e. modules, accessories, components, build groups) is disassembled sufficiently to afford access to the affected part and to all affected spare parts.

E. Approval

The part number changes and/or part modification described in Section 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 models listed.

F. Manpower

(1) In service

Not affected

(2) At overhaul

Not affected

G. Material Price and Availability

Refer to TRW Lucas Service Bulletins FMU55O-73-8189, FMU53O-73-8189, FMU54O-73-8189

H. Tooling Price and Availability

Special tools not required

I. Industry Support Information

None

J. Weight and Balance

(1) Weight Change

Plus 0.2lb (+0.08kg)

(2) Moment Arm

16.5in. (419mm) forwards of datum.

(3) Datum

Engine Front Mount Centreline (Power Plant Station PPS 100).

K. Electrical Load Data

The aircraft electrical load is not affected by this Service Bulletin.

L. Software Accomplishment Summary

Not applicable

M. References

(1) Internal reference 00VI006

(2) The following Airbus Industrie Service Bulletin must be referred to for a description of Interchangeability/Mixability conditions:

A320-73-1067 ENGINE FUEL AND CONTROL CONTROLLING IAE V2500 ENGINE INSTALL WOODWARD FMU 8063-633 OR LUCAS FMU 550MK1.

(3) Engine Manual:

(a) 72-00-60, Removal and Installation-06, Config-2 (A5)

(b) 72-00-60, Removal-02 and Installation-06, (D5)

(4) Aircraft Maintenance Manual:

(a) 73-22-52, Removal/Installation (A5)

(b) 73-21-52, Removal/Installation (D5)

(5) Refer to TRW Lucas Service Bulletins FMU550-73-8189, FMU530-73-8189, FMU540-73-8189.

(6) This SB is the subject of Airbus aircraft modification no. 21820/P7225

N. Other Publications Affected

Illustrated Parts Catalogue (IPC) 73-22-52, 2IA, 2IB, 3IA, 3IB, 5IA, 5IB, 6IA, 6IB, 7IA and 7IB will be revised.

O. Interchangeability of Parts

Not affected.

2. Material Information

A. Vendor units affected by this bulletin:

Applicability: For each V2500 engine to incorporate this Bulletin.

The type of equipment affected by this Service Bulletin is listed below for information only:

V2522-A5, V2524-A5, V2527-A5, V2527E-A5 and V2527M-A5 Models only

73-22-52

FIG ITEM NO.	NEW PART NO.	QTY	PART TITLE	MAT	OLD PART NO.	INSTR DISP
01100	FMU550MK1	1	Meter, fuel (VK0131)	-	FMU550MK1	(A)(S1)(1D)

V2530-A5, V2533-A5, V2525-D5 and V2528-D5 Models only

73-22-52

FIG ITEM NO.	NEW PART NO.	QTY	PART TITLE	MAT	OLD PART NO.	INSTR DISP
01100	FMU530MK2	1	Meter, fuel (VK0131)	-	FMU530MK2	(A)(S1)(1D)

For V2522-A5 and V2524-A5 Models pre-Service Bulletin ENG-73-0127

73-22-52

FIG ITEM NO.	NEW PART NO.	QTY	PART TITLE	MAT	OLD PART NO.	INSTR DISP
01100	FMU540MK2	1	Meter, fuel (VK0131)	-	FMU540MK2	(A)(S1)(1D)

For V2527-A5 and V2527E-A5 Models pre-Service Bulletin ENG-73-0150

73-22-52

FIG ITEM NO.	NEW PART NO.	QTY	PART TITLE	MAT	OLD PART NO.	INSTR DISP
01100	FMU530MK2	1	Meter, fuel (VK0131)	-	FMU530MK2	(A)(S2) (1D)

B. Instructions disposition codes:

(A) New standard of unit will be made available from March 2001.

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

(S2) Old and new standards of unit are freely and fully interchangeable, until the limitations described in Airbus Industrie Service Bulletin apply (see 1.M.(2)).

(1D) Old standard of unit may be reworked.

3. Accomplishment Instructions

A. Rework Instructions

None

B. Assembly Instructions

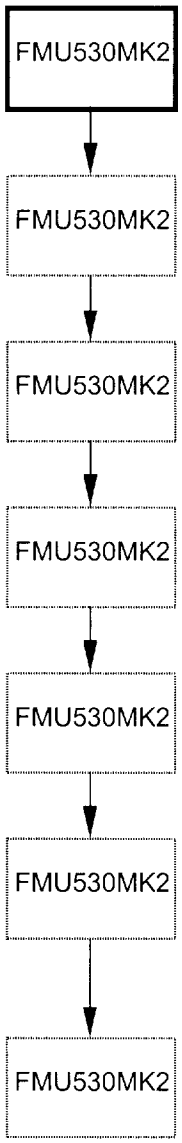
The revised FMU introduced by this Service Bulletin is interchangeable. Remove and install in accordance with current overhaul procedures and maintenance practices (Engine Manual, 72-00-60, Removal and Installation-06, Config-2 (A5), 72-00-60, Removal-02 and Installation-06, (D5) and Aircraft Maintenance Manual, 73-22-52, Removal/Installation, (A5), 73-21-52, Removal/Installation, (D5)).

C. Recording Instructions

A record of accomplishment is necessary. Refer to TRW Lucas Service Bulletins FMU550-73-8189, FMU530-73-8189, FMU540-73-8189.

V2530-A5, V2533-A5, V2525-D5 and V2528-D5 FMU Family Tree *

Service Bulletin Number	Unit Mod Plate Endorsement
V2500-ENG-73-0057 Introduction of revised push rod seal, bearing-pressure and overspeed valves	**None**
None Introduction of a desensitised overspeed valve	**CP6935**
V2500-ENG-73-0091 Introduction of revised overspeed valve with increased bypass flow	**CP6938**
V2500-ENG-73-0099 Introduction of Fuel Metering Unit with revised microswitch and plunger return spring	**CP8002**
V2500-ENG-73-0107 Introduction of Fuel Metering Unit with revised HP SOV torquemotor	**CP8037**
V2500-ENG-73-0123 Introduction of a revised Fuel Metering Unit with Tungsten/Carbide coated SOV/PRSOV push rods	**CP8061**
V2500-ENG-73-0171 Introduction of a revised Fuel Metering Unit with supplementary SOV torque motor cap clamping	**CP8189**



* This family tree is not intended to represent the combination of modifications fitted to units in service

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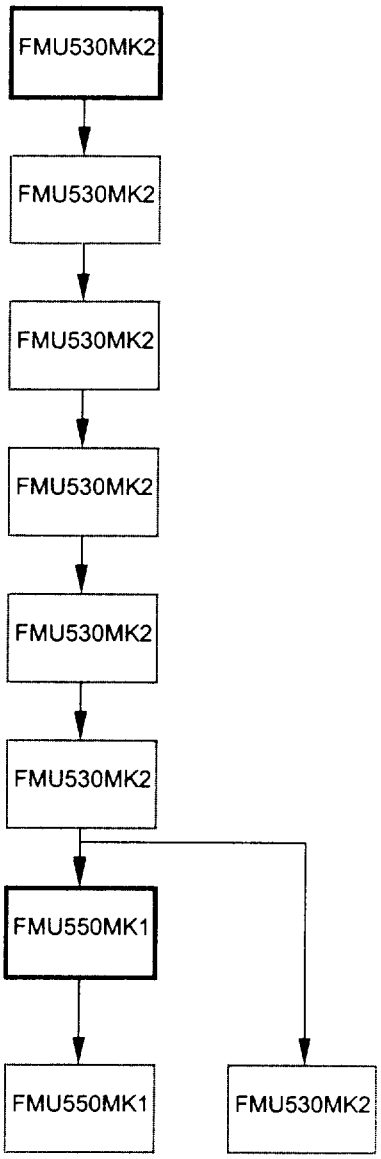
Family tree
Fig 1

V2527-A5 and V2527E-A5 FMU Family Tree *

Service Bulletin Number	Unit Mod Plate Endorsement
V2500-ENG-73-0057 Introduction of revised push rod seal, bearing-pressure and overspeed valves	**None**
None Introduction of a desensitised overspeed valve	**CP6935**
V2500-ENG-73-0091 Introduction of revised overspeed valve with increased bypass flow	**CP6938**
V2500-ENG-73-0099 Introduction of Fuel Metering Unit with revised microswitch and plunger return spring	**CP8002**
V2500-ENG-73-0107 Introduction of Fuel Metering Unit with revised HP SOV torquemotor	**CP8037**
V2500-ENG-73-0123 Introduction of a revised Fuel Metering Unit with Tungsten/Carbide coated SOV/PRSOV push rods	**CP8061**
V2500-ENG-73-0150 Introduction of a Lucas Fuel Metering Unit with revised maximum fuel flow stop (Airbus A320-232/233 applications)	**None**
V2500-ENG-73-0171 Introduction of a revised Fuel Metering Unit with supplementary SOV torque motor cap clamping	**CP8189**



* This family tree is not intended to represent the combination of modifications fitted to units in service

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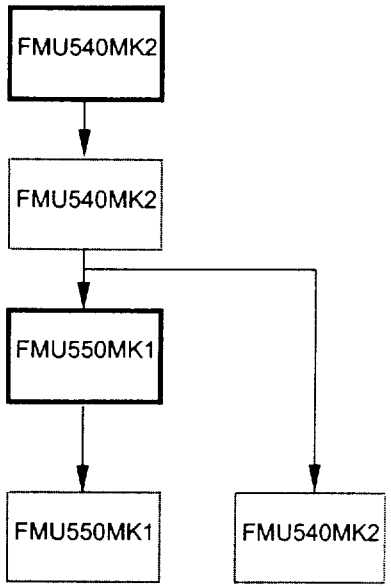
Family tree
Fig 2

V2522-A5 and V2524-A5 FMU Family Tree *

Service Bulletin Number	Unit Mod Plate Endorsement
V2500-ENG-73-0117 Introduction of revised Fuel Meter with reduced fuel flow	**None**
V2500-ENG-73-0123 Introduction of a revised Fuel Metering Unit with Tungsten/Carbide coated SOV/PRSOV push rods	**CP8061**
V2500-ENG-73-0127 Introduction of a Lucas Fuel Metering Unit with revised maximum fuel flow stop (Airbus A319-131/132/133 apps)	**None**
V2500-ENG-73-0171 Introduction of a revised Fuel Metering Unit with supplementary SOV torque motor cap clamping	**CP8189**

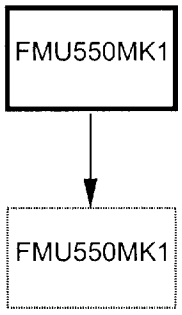


* This family tree is not intended to represent the combination of modifications fitted to units in service

Family tree
Fig 3

V2527M-A5 FMU Family Tree *

Service Bulletin Number	Unit Mod Plate Endorsement
V2500-ENG-73-0127 Introduction of a Lucas Fuel Metering Unit with revised maximum fuel flow stop (Airbus A319-131/132/133 apps)	**None**
V2500-ENG-73-0171 Introduction of a revised Fuel Metering Unit with supplementary SOV torque motor cap clamping	**CP8189**



* This family tree is not intended to represent the combination of modifications

Family tree
Fig 4

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TRW AERONAUTICAL SYSTEMS - LUCAS AEROSPACE
SHAFTMOOR LANE, HALL GREEN, BIRMINGHAM, B28 8SW
ENGLAND

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

The information contained in this transmittal complies with British Civil Airworthiness Requirements, Chapter A5-3.

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FUEL METERING UNIT TYPE FMU 550

This document transmits Service Bulletin FMU 550-73-8189 together with the Bulletin Index Sheet.

Remove	Insert	Reason
Service Bulletin Index Sheet pages 1 and 2 dated Aug 16/01	Service Bulletin Index Sheet pages 1 and 2 dated Aug 23/01.	Changes due to this transmittal.
-	Service Bulletin FMU 550-73-8189 Pages 1 thru 8 dated Aug 23/01.	First Issue

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SERVICE BULLETINS

FUEL METERING UNIT, TYPE FMU 550

BULLETIN INDEX SHEET

SERVICE BULLETIN NUMBER	MOD CP NUMBER	DESCRIPTION	DATE OF ISSUE	DATE OF LAST REVISION
FMU 550-73-8215	8215	Conversion from FMU 550 Mk1 to FMU 560 Mk1/FMU 570 Mk1	Aug 16/01	-
FMU 550-73-8189	8189	Clamps to reinforce the SOV torque motor flange	Aug 23/01	-

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SERVICE BULLETIN

Signed

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

Date: Aug 23/2001

CAA Approval No. DAI/2878/49

SERVICE BULLETIN NUMBER FMU 550-73-8189

ENGINE - FUEL AND CONTROL - CLAMPS TO REINFORCE SOV TORQUE MOTOR FLANGE

MOD NO CP8189

1. Planning Information

A. Effectivity

(1) Aircraft:

(a) Airbus

(2) Engine:

(a) V2500 A2522, A2524, A2527, A2527E, A2527M.

(3) Equipment:

(a) Fuel Metering Unit - Type FMU 550.

B. Reason and Evidence for Necessity

(1) FRACA 2893 and report P57991/AC highlighted the possibility of fuel leakage/engine shut-down following ejection of the nozzle plugs resulting from failure of the SOV torque motor cap retaining screws caused by over-pressurisation of the motor cap. (Primary cause of this problem is fuel seepage past the armature flexure sleeve assembly (AFSA) seal into the torque motor cap, with subsequent thermal expansion of the fluid trapped in the motor cap leading to over-pressurisation).

C. Description

(1) This modification introduces a pair of C-shaped clamps to reinforce the flange of the Moog Shut-Off Valve (SOV) torque motor and, in the event of a torque motor cap failure by over-pressurisation, to prevent liberation of the cross-drilling plugs.

Printed in Great Britain - V2500 A2522, A2524, A2527, A2527E, A2527M
EDL 300344 MB

D. Approval

Service Bulletin No. FMU 550-73-8189 (Mod CP8189) was technically agreed by IAE on Apr 24/01. The procedures 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.

E. Compliance

Category Code 6

Accomplish when the FMU 550 is disassembled sufficiently to get access to the affected parts.

F. Manpower

Estimated manhours:

(1) At Overhaul Facility:

(a) To embody 1 hour 30 minutes.

G. Material - Price and Availability

Modification CP8189 is required (see Section 3 of this Bulletin for details).

H. Tooling - Price and Availability

Additional special tools are not required.

I. Weight

(1) Unit weight change ..... Yes, plus 0.2 lb (+0,08 kg).

(2) Engine weight arm change ..... Not affected.

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

J. Electrical Load Data

No change.

K. References

(1) Lucas Fuel Metering Unit Component Maintenance Manual Ref FMU 550 Chapter 73-28-08.

(2) IAE Service Bulletin 73-0171.

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L. Other Publications Affected

None.

M. Family Tree Charts

Not applicable.

2. Accomplishment Instructions (Refer to Fig 1)

A. Procedure Ref to Figs 1 to 3

Refer to FMU 550 Component Maintenance Manual, Chap 73-28-08, DISASSEMBLY and disassemble the heatshield from the FMU.

CAUTION: DO NOT REMOVE ALL FOUR BOLTS WHICH SECURE THE TORQUE MOTOR SERVO VALVE AT THE SAME TIME. MAKE SURE ONE CLAMP IS INSTALLED AND THE TWO BOLTS TORQUE TIGHTENED BEFORE THE SECOND CLAMP IS INSTALLED.

(1) Remove only two bolts (AS21410) from the SOV torque motor, Ref. Fig 1

(2) Position the cable ties and cable support on the SOV torque motor body to give sufficient clearance to let one of the reinforcing clamp (77153715) to be put into position, Ref. Fig 2.

(3) Install one reinforcing clamp (77153715), Ref. Fig 3.

(4) Install two bolts (AS21416) and tighten to secure the reinforcing clamp (77153715) in position. Torque tighten the two bolts (AS21416) to 36 lbf in. (4,1 Nm).

(5) Do steps (1), (2), (3) and (4) again for the other reinforcing clamp (77153715).

(6) Make sure all the cables are clear of the two reinforcing clamps (77153715) and the retaining bolts (AS21416).

(7) Refer to TEST and test the FMU.

(8) Refer to ASSEMBLY, and install the heatshield

B. Recording Action

(1) Fuel Metering Unit

On accomplishment of this modification, endorse the unit modification plate with Mod. CP8189.

(2) Engine

A record of accomplishment is required.

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3. Material Information

This is a technical document, not a quotation. Prices are FOB UK and are for budgetary purposes only and are in US dollars ($).

The modification kit which contains the items shown in Para A. below are supplied FOC.

NOTE: The table below includes code numbers in the 'Instructions/Dispositions' column identified as 'I/D Code'. These code numbers designate the following dispositions:

1 - Added Part
2 - Scrap Part
3 - Return to Lucas for Rework and Re-identify the Part
4 - Use for Other Applications.

A. New Parts Required for Modification Only

New P/N	Qty	Unit Price $	Lead Time	Nomenclature	Old P/N	I/D Code
77153715	2	373.85	TBA	Re-inforcing Clamp		1
AS21416	4	6.32	TBA	Bolt	AS21410	2

B. Parts to be reworked and re-identified:

None

C. Consumable Parts

None

D. New production parts available as future spares in addition to those listed under A.

None

E. The type of equipment affected by this modification is:

Description	Type No
Fuel Metering Unit	FMU 550

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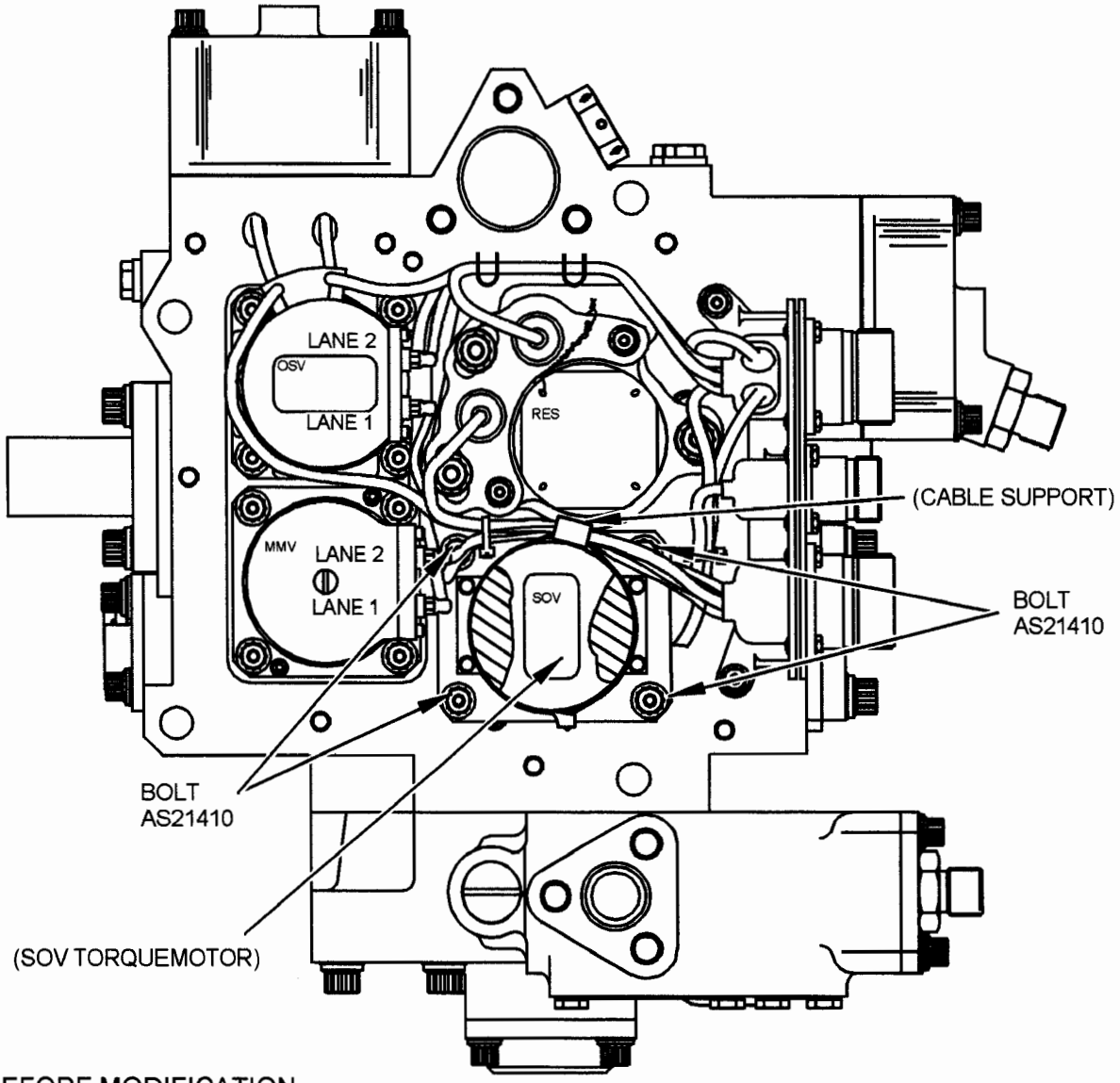

BEFORE MODIFICATION

NOTE: VIEW OF FMU WITH HEATSHIELD REMOVED, AND SOV PARTIALLY SECTIONED TO SHOW CURRENT BOLTS SECURING SOV TORQUEMOTOR TO FMU BODY.

TP 16233

Before Modification

Figure 1

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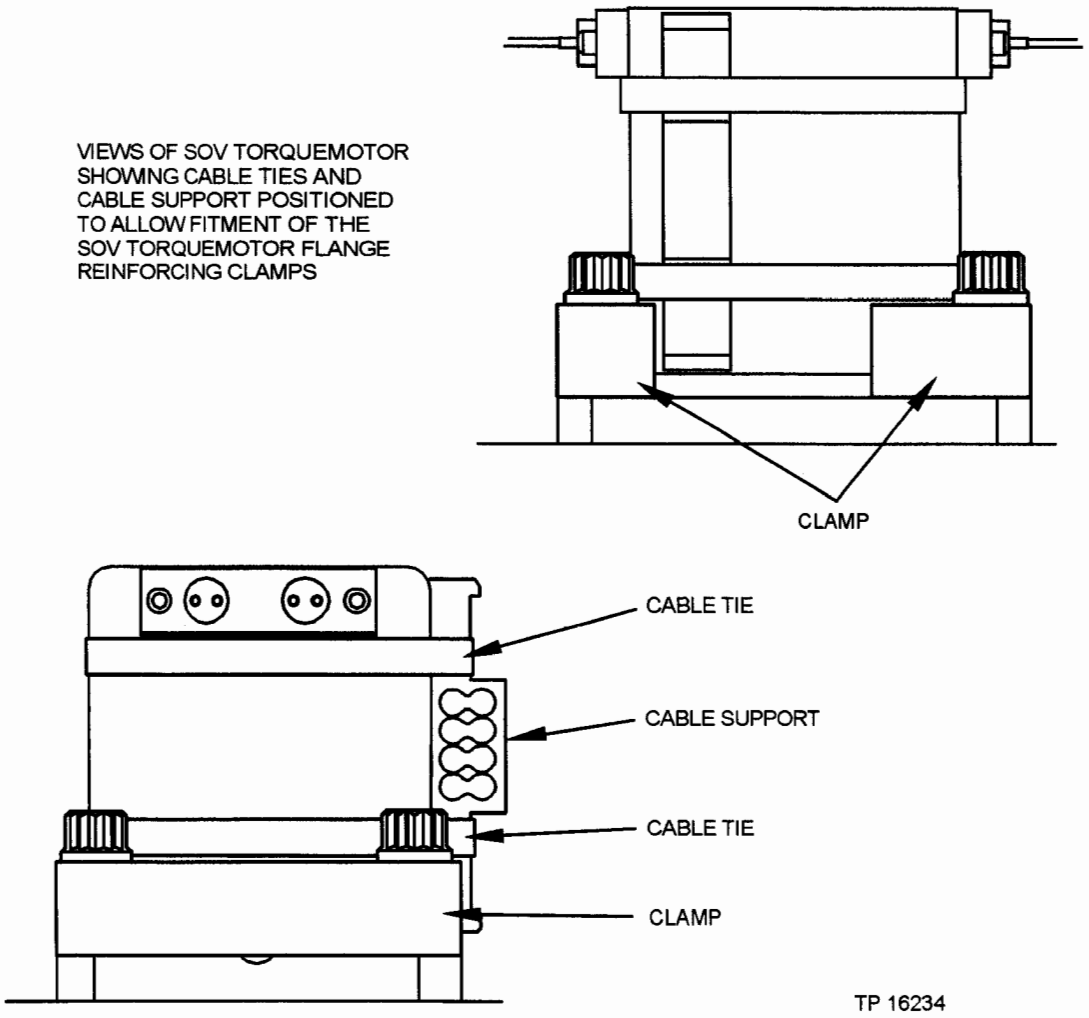
VIEWS OF SOV TORQUEMOTOR SHOWING CABLE TIES AND CABLE SUPPORT POSITIONED TO ALLOW FITMENT OF THE SOV TORQUEMOTOR FLANGE REINFORCING CLAMPS



After Modification

Details to Show Position of Cable Support and Cable Ties on SOV Torque motor

Figure 2

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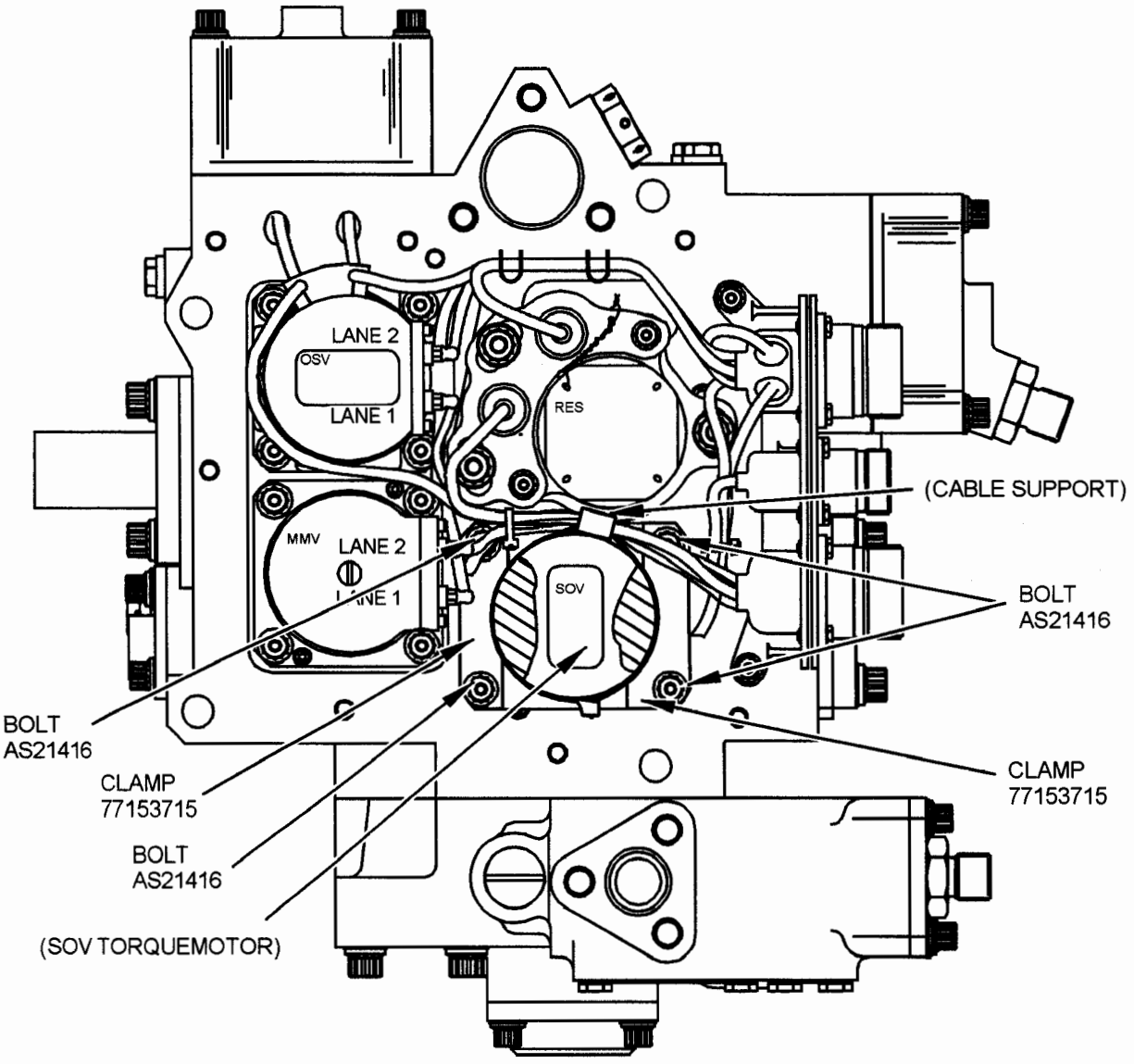

AFTER MODIFICATION

NOTE: VIEW OF FMU WITH HEATSHIELD REMOVED, AND SOV PARTIALLY SECTIONED TO SHOW CLAMPS INSTALLED ON TORQUEMOTOR FLANGE.

TP 16235

After Modification
Figure 3

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TRW AERONAUTICAL SYSTEMS - LUCAS AEROSPACE
SHAFTMOOR LANE, HALL GREEN, BIRMINGHAM, B28 8SW
ENGLAND

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

The information contained in this transmittal complies with British Civil Airworthiness Requirements, Chapter A5-3.

Signed  Date: Aug 23/01 C.A.A. Design Approval No. DAI/2878/49

FUEL METERING UNIT TYPE FMU 530

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Remove	Insert	Reason
Service Bulletin Index Sheet pages 1 and 2 dated May 7/99	Service Bulletin Index Sheet pages 1 and 2 dated Aug 23/01.	Changes due to this transmittal.
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SERVICE BULLETINS

FUEL METERING UNIT, TYPE FMU 530

BULLETIN INDEX SHEET

SERVICE BULLETIN NUMBER	MOD CP NUMBER	DESCRIPTION	DATE OF ISSUE	DATE OF LAST REVISION
FMU 530-73-101	Non-Mod	Metering Valve Torque Motor Integrity Check	Mar 4/94	-
FMU 530-73-6932	6932	Introduction of a Revised Servo Switching Valve (SSV) Piston and Sleeve Mating Assembly	Mar 4/94	Feb 28 /96
FMU 530-73-6947	6947	Introduction of a Revised Metering Valve Torque Motor	Mar 4/94	-
FMU 530-73-6903	6903	Introduction of MOOG Torque Motors with Improved Filtration, a Revised Spill Valve Assembly and revised Pressure Raising Valve Sealing Rings	May 20/94	Mar 27/95
FMU 530-73-6877	6877	Introduction of a Muirhead Vactric Resolver	May 20/94	-
FMU 530-73-6946	6946	Introduction of Revised Seal and Bearing Assemblies in the Pressure Raising Valve and the Overspeed Valve	May 20/94	-
FMU 530-73-6935	6935	Introduction of an Overspeed Valve with a Reduced Leakage Path from the HP Latching Ports	Nov 4/94	-
FMU 530-73-6883	6883	Introduction of an Increased Clearance between the Overspeed Valve (OSV) Cover Assembly and FMU Body, and Revised Pressure Raising Valve (PRV) and OSV Micoswitch Covers	Nov 4/94	Jan 4/95
FMU 530-73-102	Non-Mod	To replace Shut Off Valve Torque Motors with Torque Motors that have the correct Motorcap Retention Screws fitted	Jan 10/95	-
FMU 530-73-6884	6884	Introduction of a Servo Switching Valve (SSV) Filter with Increased Fiftration	Aug 10/95	-
FMU 530-73-6968	6968	Introduction of an Overspeed Valve with an Increased Bypass Flow	Feb 21/97	-
FMU 530-73-8002	8002	Introduction of Gold Alloy Contact Microswitches and Replacement of the Return Spring	Jul 8/97	-
FMU 530-73-8037	8037	Introduction of the Servovalve-SOV with 87 Ohm Minimum Cockpit Coil Windings	Jul 8/97	-
FMU 530-73-8061	8061	This Modification Introduces Tungsten/ Chromimum Carbide coated push rods and seals. Ground spacer replaces the multiple shims	May 22/98	-

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SERVICE BULLETINS

FUEL METERING UNIT, TYPE FMU 530

SERVICE BULLETIN NUMBER	MOD CP NUMBER	DESCRIPTION	DATE OF ISSUE	DATE OF LAST REVISION
FMU 530-73-8060	8060	This Modification Introduces - conversion from FMU 530MK2 to FMU 550MK1	May 7/99	-
FMU 530-73-8189	8189	Clamps to reinforce the SOV Torque Motor flange	Aug 23/01	-

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SERVICE BULLETIN

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

Date: Aug 23/2001

Signed

CAA Approval No. DAI/2878/49

SERVICE BULLETIN NUMBER FMU 530-73-8189

ENGINE - FUEL AND CONTROL - CLAMPS TO REINFORCE SOV TORQUE MOTOR FLANGE

MOD NO CP8189

1. Planning Information

A. Effectivity

(1) Aircraft:

(a) Airbus

(b) Boeing

(2) Engine:

(a) V2530-A5, V2533-A5,

(b) V2525-D5 and V2528-D5.

(3) Equipment:

(a) Fuel Metering Unit - Type FMU 530 Mk 2.

B. Reason and Evidence for Necessity

(1) FRACA 2893 and report P57991/AC highlighted the possibility of fuel leakage/engine shut-down following ejection of the nozzle plugs resulting from failure of the SOV torque motor cap retaining screws caused by over-pressurisation of the motor cap. (Primary cause of this problem is fuel seepage past the armature flexure sleeve assembly (AFSA) seal into the torque motor cap, with subsequent thermal expansion of the fluid trapped in the motor cap leading to over-pressurisation).

C. Description

(1) This modification introduces a pair of C-shaped clamps to reinforce the flange of the Moog Shut-Off Valve (SOV) torque motor and, in the event of a torque motor cap failure by over-pressurisation, to prevent liberation of the cross-drilling plugs.

Printed in Great Britain - V2530 - A5, V2533-A5, V2525-D5 and V2528-D5
EDL 300342 MB

D. Approval

Service Bulletin No. FMU 530-73-8189 (Mod CP8189) was technically agreed by IAE on Apr 24/01. The procedures 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.

E. Compliance

Category Code 6

Accomplish when the FMU 530 is disassembled sufficiently to get access to the affected parts.

F. Manpower

Estimated manhours:

(1) At Overhaul Facility:

(a) To embody 1 hour 30 minutes.

G. Material - Price and Availability

Modification CP8189 is required (see Section 3 of this Bulletin for details).

H. Tooling - Price and Availability

Additional special tools are not required.

I. Weight

(1) Unit weight change ..... Yes plus 0.2 lb (+ 0,08 kg).

(2) Engine weight arm change ..... Not affected.

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

J. Electrical Load Data

No change.

K. References

(1) Lucas Fuel Metering Unit Component Maintenance Manual Ref. FMU 530 Chapter 73-28-02.

(2) IAE Service Bulletin 73-0171.

Printed in Great Britain - V2530 - A5, V2533-A5, V2525-D5 and V2528-D5
EDL 300342 MB

L. Other Publications Affected

None.

M. Family Tree Charts

Not applicable.

2. Accomplishment Instructions (Refer to Fig 1)

A. Procedure Ref. to Figs 1 to 3

Refer to FMU 530 Component Maintenance Manual, Chap 73-28-02, DISASSEMBLY and disassemble the heatshield from the FMU.

CAUTION: DO NOT REMOVE ALL FOUR BOLTS WHICH SECURE THE TORQUE MOTOR SERVO VALVE AT THE SAME TIME. MAKE SURE ONE CLAMP IS INSTALLED AND THE TWO BOLTS TORQUE TIGHTENED BEFORE THE SECOND CLAMP IS INSTALLED.

(1) Remove only two bolts (AS21410) from the SOV torque motor, Ref. Fig 1

(2) Position the cable ties and cable support on the SOV torque motor body to give sufficient clearance to let one of the reinforcing clamp (77153715) to be put into position, Ref. Fig 2.

(3) Install one reinforcing clamp (77153715), Ref. Fig 3.

(4) Install two bolts (AS21416) and tighten to secure the reinforcing clamp (77153715) in position. Torque tighten the two bolts (AS21416) to 36 lbf in (4.1 Nm).

(5) Do steps (1), (2), (3) and (4) again for the other reinforcing clamp (77153715).

(6) Make sure the cables are clear of the two reinforcing clamps (77153715) and the retaining bolts (AS21416).

(7) Refer to FMU 530 Component Maintenance Manual, Chap 73-28-02, Page Block 101 -199, TEST and test the FMU.

(8) Refer to FMU 530 Component Maintenance Manual, Chap 73-28-02, Page Block 701 - 799, ASSEMBLY, and install the heatshield.

B. Recording Action

(1) Fuel Metering Unit

On accomplishment of this modification, endorse the unit modification plate with Mod. CP8189.

(2) Engine

A record of accomplishment is required.

Printed in Great Britain - V2530 - A5, V2533-A5, V2525-D5 and V2528-D5
EDL 300342 MB

3. Material Information

This is a technical document, not a quotation. Prices are FOB UK and are for budgetary purposes only and are in US dollars ($).

The modification kit which contains the items shown in Para A. below are supplied FOC.

NOTE: The table below includes code numbers in the 'Instructions/Dispositions' column identified as 'I/D Code'. These code numbers designate the following dispositions:

1 - Added Part
2 - Scrap Part
3 - Return to Lucas for Rework and Re-identify the Part
4 - Use for Other Applications.

A. New Parts Required for Modification Only

New P/N	Qty	Unit Price $	Lead Time	Nomenclature	Old P/N	I/D Code
77153715	2	373.85	TBA	Re-inforcing Clamp		1
AS21416	4	6.32	TBA	Bolt	AS21410	2

B. Parts to be reworked and re-identified:

None

C. Consumable Parts

None

D. New production parts available as future spares in addition to those listed under A.

None

E. The type of equipment affected by this modification is:

Description	Type No
Fuel Metering Unit	FMU 530

Printed in Great Britain - V2530 - A5, V2533-A5, V2525-D5 and V2528-D5
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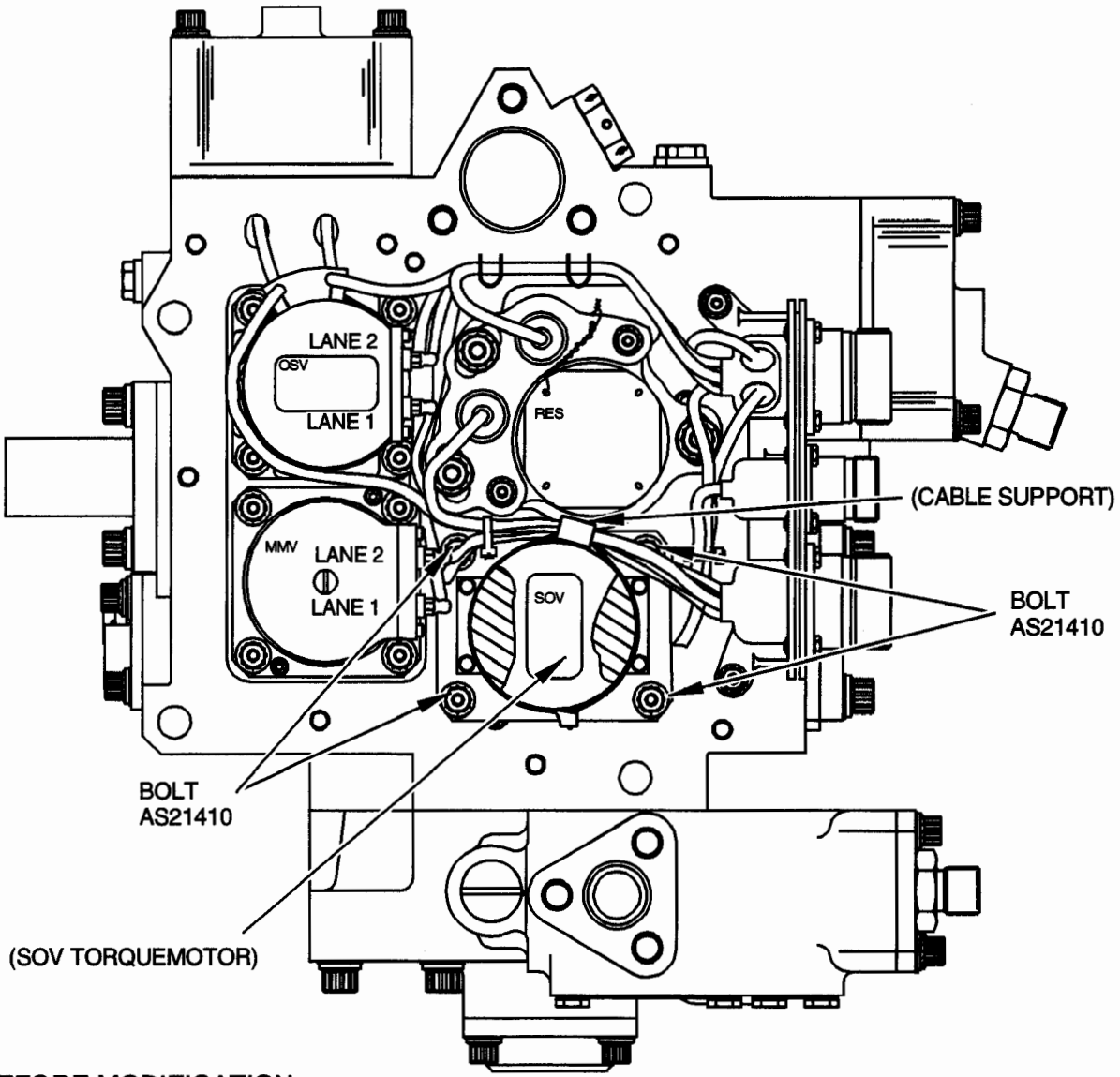

BEFORE MODIFICATION

NOTE: VIEW OF FMU WITH HEATSHIELD REMOVED, AND SOV PARTIALLY SECTIONED TO SHOW CURRENT BOLTS SECURING SOV TORQUEMOTOR TO FMU BODY.

TP 16233

Before Modification

Figure 1

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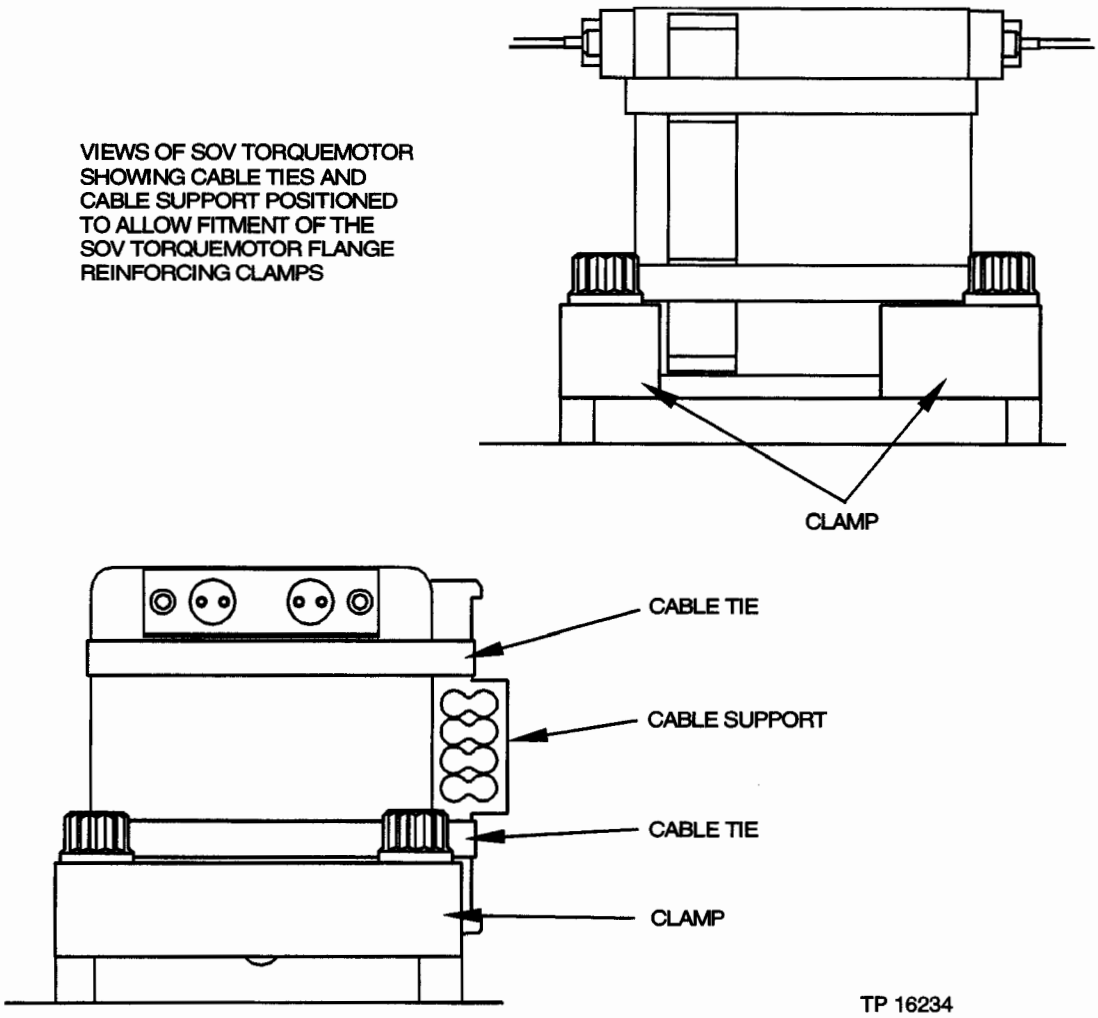
VIEWS OF SOV TORQUEMOTOR SHOWING CABLE TIES AND CABLE SUPPORT POSITIONED TO ALLOW FITMENT OF THE SOV TORQUEMOTOR FLANGE REINFORCING CLAMPS



After Modification

Details to Show Position of Cable Support and Cable Ties on SOV Torque motor

Figure 2

Printed in Great Britain - V2530 - A5, V2533-A5, V2525-D5 and V2528-D5
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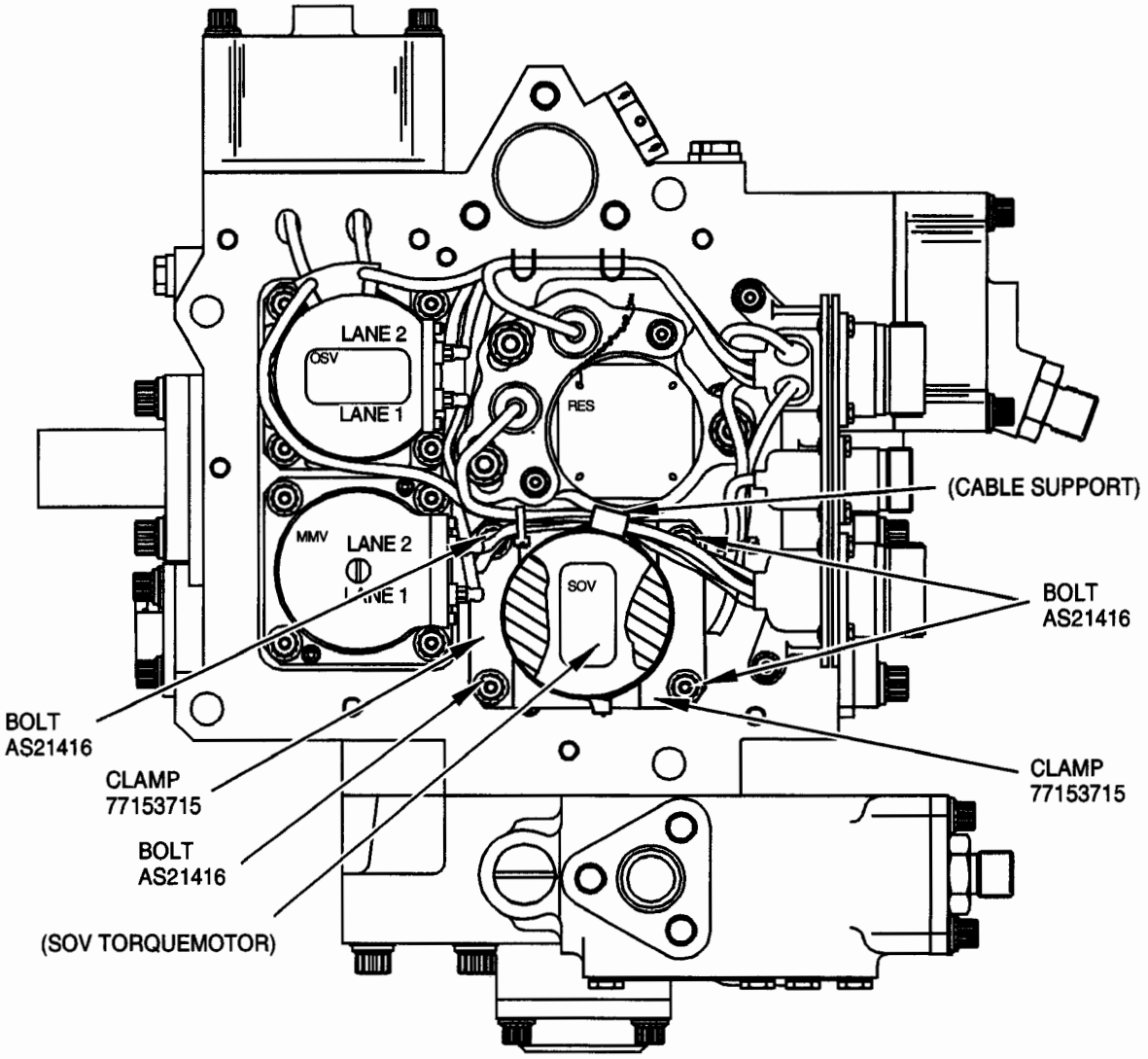

AFTER MODIFICATION

NOTE: VIEW OF FMU WITH HEATSHIELD REMOVED, AND SOV PARTIALLY SECTIONED TO SHOW CLAMPS INSTALLED ON TORQUEMOTOR FLANGE.

TP 16235

After Modification
Figure 3

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SERVICE BULLETIN
PUBLICATION TRANSMITTAL

TRW AERONAUTICAL SYSTEMS - LUCAS AEROSPACE
SHAFTMOOR LANE, HALL GREEN, BIRMINGHAM, B28 8SW
ENGLAND

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

The information contained in this transmittal complies with British Civil Airworthiness Requirements, Chapter A5-3.

Signed  Date: Aug 23/01 C.A.A. Design Approval No. DAI/2878/49

FUEL METERING UNIT TYPE FMU 540

This document transmits Service Bulletin FMU 540-73-8189 together with the Bulletin Index Sheet.

Remove	Insert	Reason
Service Bulletin Index Sheet pages 1 and 2 dated Sep 15/99	Service Bulletin Index Sheet pages 1 and 2 dated Aug 23/01.	Changes due to this transmittal.
-	Service Bulletin FMU 540-73-8189 Pages 1 thru 8 dated Aug 23/01.	First Issue

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TRW Aeronautical Systems - Lucas Aerospace

SERVICE BULLETINS

FUEL METERING UNIT, TYPE FMU 540

BULLETIN INDEX SHEET

SERVICE BULLETIN NUMBER	MOD CP NUMBER	DESCRIPTION	DATE OF ISSUE	DATE OF LAST REVISION
FMU 540-73-8061	8061	This Modification Introduces Tungsten/ Chromium Carbide coated push rods and seals. Ground spacer replaces the multiple shims.	July 26/99	-
FMU 540-73-8059	8059	This Modification Introduces a Customer request to allow the conversion of the FMU 540 Mk2 to the FMU 530 Mk2 Standard.	Sept 15/99	-
FMU 540-73-8189	8189	Clamps to reinforce the SOV torque motor flange	Aug 23/01	-

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TRW Aeronautical Systems - Lucas Aerospace

SERVICE BULLETIN

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

Date: Aug 23/2001

Signed

CAA Approval No. DAI/2878/49

SERVICE BULLETIN NUMBER FMU 540-73-8189

ENGINE - FUEL AND CONTROL - CLAMPS TO REINFORCE SOV TORQUE MOTOR FLANGE

MOD NO CP8189

1. Planning Information

A. Effectivity

(1) Aircraft:

(a) Airbus

(2) Engine:

(a) V2522-A5, V2524-A5 and V2527M-A5.

(3) Equipment:

(a) Fuel Metering Unit - Type FMU 540 Mk 2

B. Reason and Evidence for Necessity

(1) FRACA 2893 and report P57991/AC highlighted the possibility of fuel leakage/engine shut-down following ejection of the nozzle plugs resulting from failure of the SOV torque motor cap retaining screws caused by over-pressurisation of the motor cap. (Primary cause of this problem is fuel seepage past the armature flexure sleeve assembly (AFSA) seal into the torque motor cap, with subsequent thermal expansion of the fluid trapped in the motor cap leading to over-pressurisation).

C. Description

(1) This modification introduces a pair of C-shaped clamps to reinforce the flange of the Moog Shut-Off Valve (SOV) torque motor and, in the event of a torque motor cap failure by over-pressurisation, to prevent liberation of the cross-drilling plugs.

Printed in Great Britain - V2522-A5, V2524-A5 and V2527M-A5
EDL 300343 MB

D. Approval

Service Bulletin No. FMU 540-73-8189 (Mod CP8189) was technically agreed by IAE on Apr 24/01. The procedures 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.

E. Compliance

Category Code 6

Accomplish when the FMU 540 is disassembled sufficiently to get access to the affected parts.

F. Manpower

Estimated manhours:

(1) At Overhaul Facility:

(a) To embody 1 hour 30 minutes.

G. Material - Price and Availability

Modification CP8189 is required (see Section 3 of this Bulletin for details).

H. Tooling - Price and Availability

Additional special tools are not required.

I. Weight

(1) Unit weight change ..... Yes plus 0.2 lb (+ 0,08 kg)

(2) Engine weight arm change ..... Not affected.

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

J. Electrical Load Data

No change.

K. References

(1) Lucas Fuel Metering Unit Component Maintenance Manual Ref. FMU 540 Chapter 73-28-07.

(2) IAE Service Bulletin 73-0171.

Printed in Great Britain - V2522-A5, V2524-A5 and V2527M-A5
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L. Other Publications Affected

None.

M. Family Tree Charts

Not applicable.

2. Accomplishment Instructions (Refer to Fig 1)

A. Procedure Ref. to Figs 1 to 3

Refer to FMU 540 Component Maintenance Manual, Chap 73-28-07, DISASSEMBLY and disassemble the heatshield from the FMU.

CAUTION: DO NOT REMOVE ALL FOUR BOLTS WHICH SECURE THE TORQUE MOTOR SERVO VALVE AT THE SAME TIME. MAKE SURE ONE CLAMP IS INSTALLED AND THE TWO BOLTS TORQUE TIGHTENED BEFORE THE SECOND CLAMP IS INSTALLED.

(1) Remove only two bolts (AS21410) from the SOV torque motor, Ref. Fig 1

(2) Position the cable ties and cable support on the SOV torque motor body to give sufficient clearance to let one of the reinforcing clamp (77153715) to be put into position, Ref. Fig 2.

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(7) Refer to FMU 540 Component Maintenance Manual, Chap 73-28-07, Page Block 101 -199, TEST and test the FMU.

(8) Refer to FMU 540 Component Maintenance Manual, Chap 73-28-07, Page Block 701 - 799, ASSEMBLY, and install the heatshield.

B. Recording Action

(1) Fuel Metering Unit

On accomplishment of this modification, endorse the unit modification plate with Mod. CP8189.

(2) Engine

A record of accomplishment is required.

Printed in Great Britain - V2522-A5, V2524-A5 and V2527M-A5
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3. Material Information

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The modification kit which contains the items shown in Para A. below are supplied FOC.

NOTE: The table below includes code numbers in the 'Instructions/Dispositions' column identified as 'I/D Code'. These code numbers designate the following dispositions:

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A. New Parts Required for Modification Only

New P/N	Qty	Unit Price $	Lead Time	Nomenclature	Old P/N	I/D Code
77153715	2	373.85	TBA	Re-inforcing Clamp		1
AS21416	4	6.32	TBA	Bolt	AS21410	2

B. Parts to be reworked and re-identified:

None

C. Consumable Parts

None

D. New production parts available as future spares in addition to those listed under A.

None

E. The type of equipment affected by this modification is:

Description	Type No
Fuel Metering Unit	FMU 540

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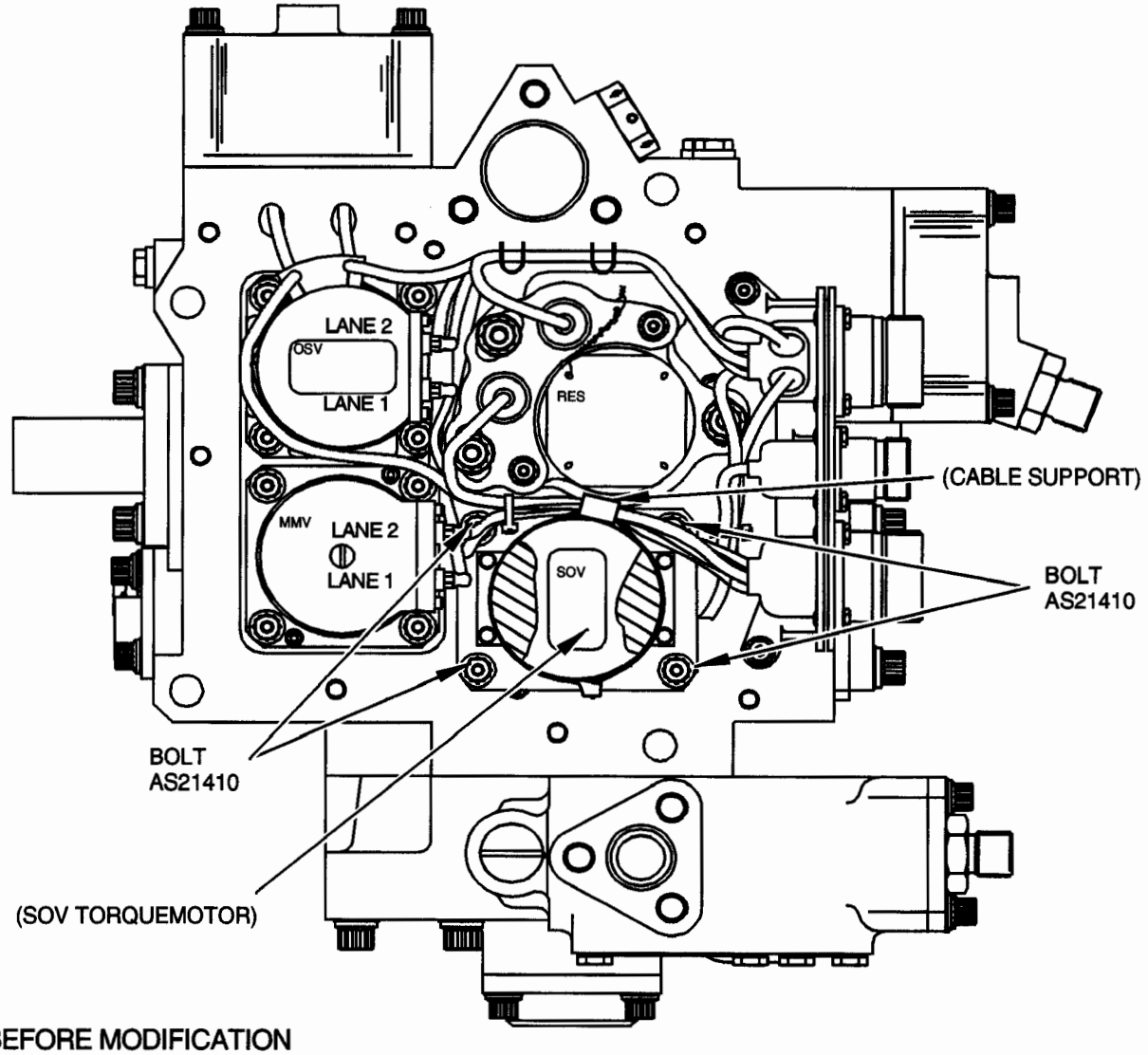

BEFORE MODIFICATION

NOTE: VIEW OF FMU WITH HEATSHIELD REMOVED, AND SOV PARTIALLY SECTIONED TO SHOW CURRENT BOLTS SECURING SOV TORQUEMOTOR TO FMU BODY.

TP 16233

Before Modification
Figure 1

Printed in Great Britain - V2522-A5, V2524-A5 and V2527M-A5
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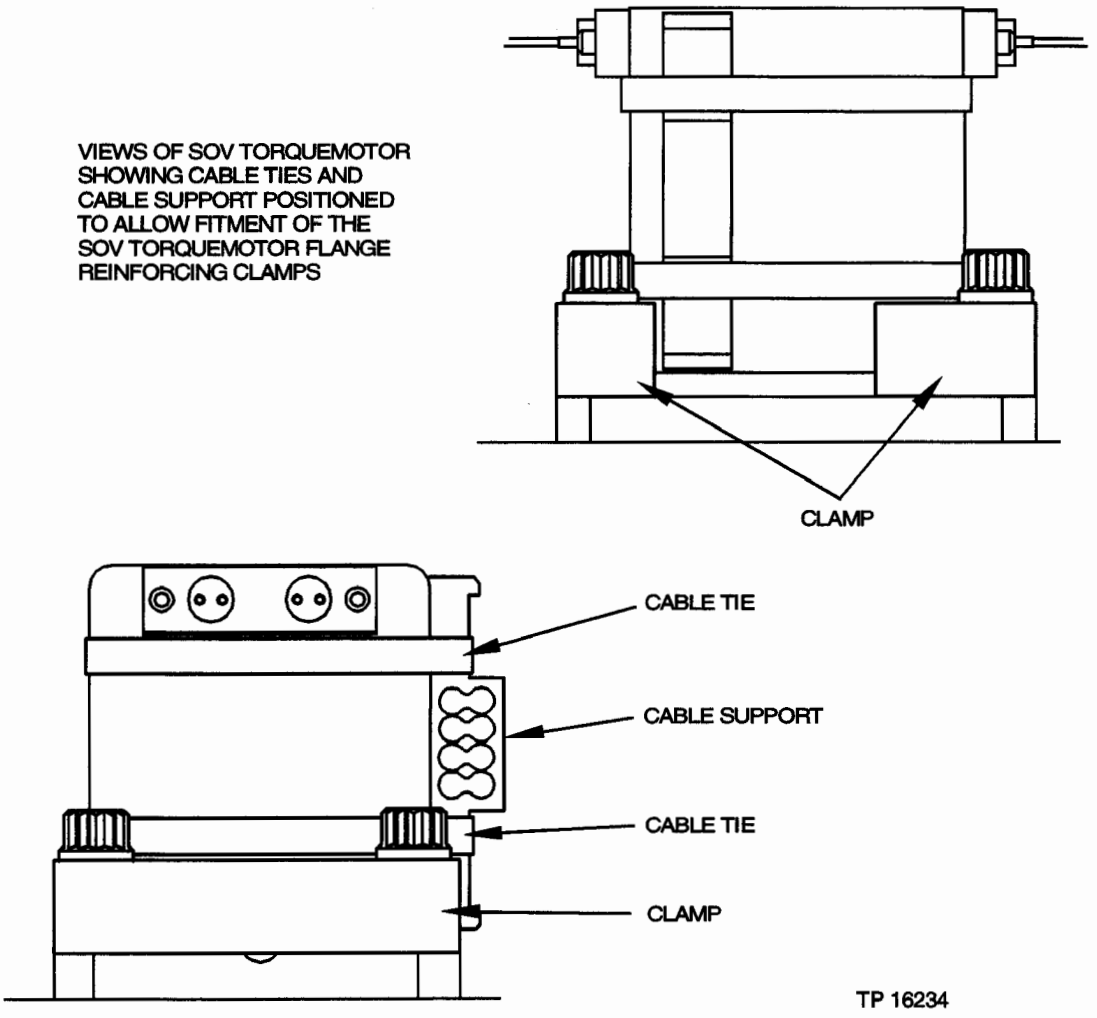
VIEWS OF SOV TORQUEMOTOR SHOWING CABLE TIES AND CABLE SUPPORT POSITIONED TO ALLOW FITMENT OF THE SOV TORQUEMOTOR FLANGE REINFORCING CLAMPS



After Modification

Details to Show Position of Cable Support and Cable Ties on SOV Torque motor

Figure 2

Printed in Great Britain - V2522-A5, V2524-A5 and V2527M-A5
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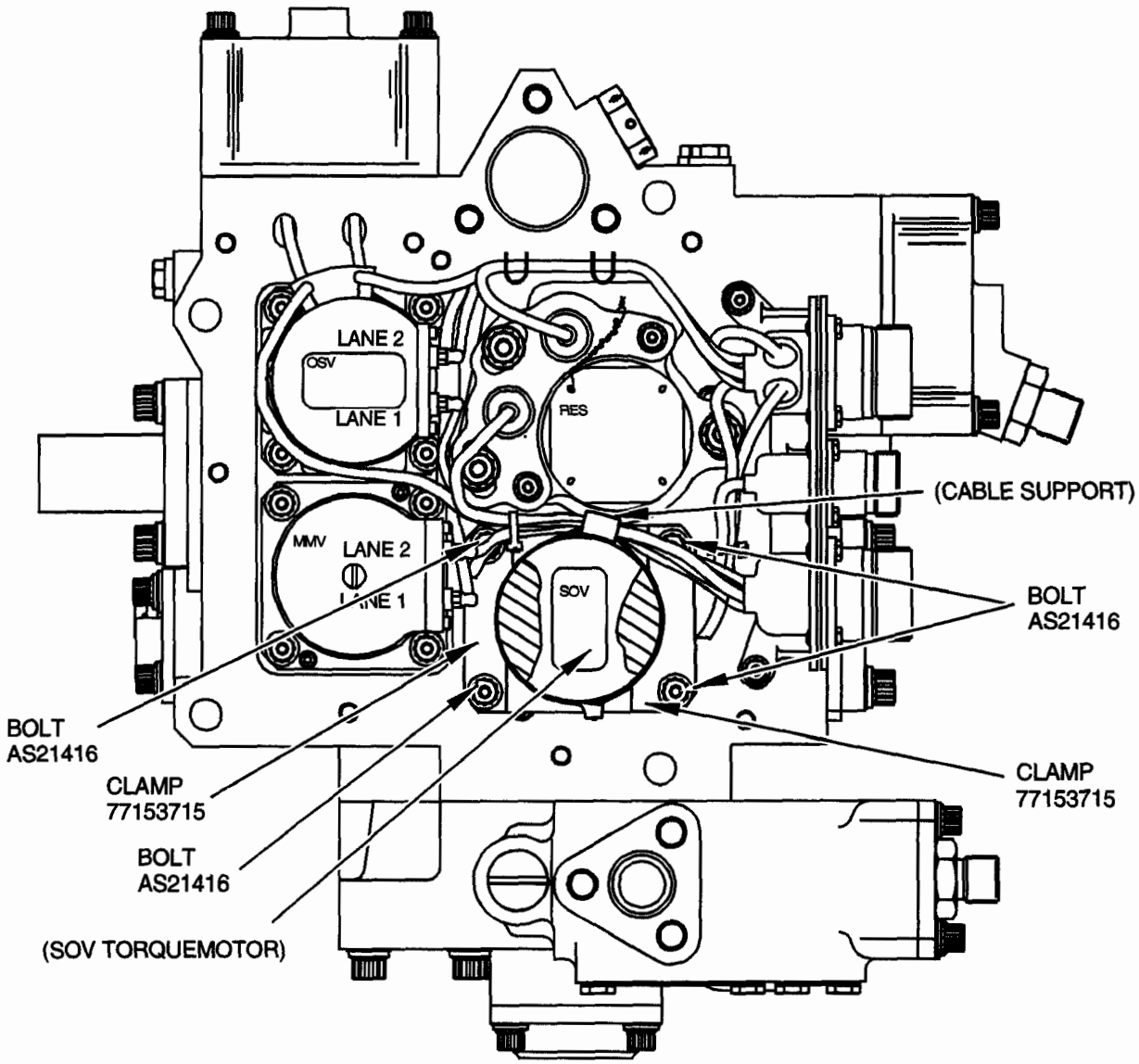

AFTER MODIFICATION

NOTE: VIEW OF FMU WITH HEATSHIELD REMOVED, AND SOV PARTIALLY SECTIONED TO SHOW CLAMPS INSTALLED ON TORQUEMOTOR FLANGE.

TP 16235

After Modification

Figure 3

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