### **International Aero Engines**

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DATE: Oct. 3/01

V2500-A5/D5 PROPULSION SYSTEMS SERVICE BULLETIN

This document transmits the Initial Issue of Service Bulletin EV2500-73-0176

**Bulletin Initial Issue** 

Remove Incorporate Pages 1 to 4 of the

Service Bulletin

Reason for change Initial issue

V2500-ENG-73-0176

Printed in Great Britain

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### LIST OF EFFECTIVE PAGES

The effective pages to this Service Bulletin are as follows:

<u>Page</u>	Revision	Number	Revision	Date

Bulletin	
1	0ct.3/01
2	0ct.3/01
3	0ct.3/01
4	0ct.3/01



### ENGINE - FUEL AND CONTROL - TRW LUCAS AEROSPACE FUEL METERING UNIT (FMU) - REWORK INSTRUCTION FOR MACHINING THE MAIN METERING VALVE PLUNGER INSTALLED IN THE FMU 530, 540 AND 550 UNITS

#### 1. Planning Information

#### A. Effectivity

(1) Airbus A319

V2522-A5, V2524-A5, V2527M-A5 Engines

(2) Airbus A320

V2527-A5, V2527E-A5 Engines

(3) Airbus A321

V2530-A5, V2533-A5 Engines

(4) Boeing - Longbeach Division MD-90

V2525-D5, V2528-D5 Engines

- (5) TRW Fuel Metering Units
  - (a) FMU 540Mk2 all units
  - (b) FMU 530Mk2 prior to B1669
  - (c) FMU 550Mk1 prior to B3097
- (6) ATA locator 73-22-52

### B. Concurrent Requirements

None

### C. Reason

The purpose of this Non Modification Service Bulletin is to inform operators of a requirement to rework a number of Fuel Metering Units (FMUs) manufactured by TRW, that have a metering valve plunger which is 0.1in. too long. This variation has no effect on the performance of the unit.

### D. <u>Description</u>

(1) The change introduced by this Service Bulletin is a shortening of the metering valve plunger.

0ct. 3/01
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V2500-ENG-73-0176

(2) Existing metering valve plungers can be reworked when the unit has been disassembled for repair/maintenance.

### E. Compliance

Category Code 6

Accomplish when the accessory is disassembled sufficiently to afford access to the affected parts

#### F. Approval

The compliance statement and the procedures given in this Non Modification Service Bulletin have been shown to comply with the applicable Federal Aviation Regulations and are FAA approved for the engine models listed.

#### G. Manpower

Refer to the applicable Vendor Service Bulletin

#### H. Weight and Balance

(1) Weight Change

Less than 1 percent

(2) Moment Arm

No effect

(3) Datum

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

#### I. Electrical Load Data

The aircraft electrical load is not affected by this Service Bulletin

### J. Software Accomplishment Summary

Not applicable

#### K. References

- (1) 01VR794
- (2) TRW Lucas Aerospace NMSBs
  - (a) FMU 530-73-103
  - (b) FMU 540-73-101

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#### (c) FMU 550-73-101

### L. Other Publications Affected

- (1) Vendor CMM, FMU530, 73-28-02
- (2) Vendor CMM, FMU540, 73-28-07
- (3) Vendor CMM, FMU550, 73-28-08

### 2. Material Information

None

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#### 3. Accomplishment Instructions

A. Rework Instructions

Refer to the TRW Lucas Aerospace Service Bulletins

- (1) FMU 530-73-103
- (2) FMU 540-73-101
- (3) FMU 550-73-101
- B. Assembly Instructions

For the correct Removal /Installation procedure, refer to the Airbus Aircraft Maintenance Manual (AMM), 73-22-52, Removal/Installation.

C. Recording Instructions

Refer to the relevant Vendor Service Bulletin

### SERVICE BULLETIN PUBLICATION TRANSMITTAL

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

Signed

NIP ...

Date: Sep 18/2001

C.A.A. Design Approval No. DAI/2878/49

### **FUEL METERING UNIT TYPE FMU 530**

This document transmits Non-Mod Service Bulletin FMU 530-73-103 together with the Bulletin Index Sheet.

Remove	Insert	Reason
Service Bulletin Index Sheet pages 1 and 2 dated Aug 23/01	Service Bulletin Index Sheet pages 1 and 2 dated Sep 18/01.	Changes due to this transmittal.
-	Service Bulletin FMU 530-73-103 Pages 1 thru 4 dated Sep 18/01.	First Issue

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### **Lucas Aerospace**

### **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 Bear- ing 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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### **Lucas Aerospace**

### **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	-
FMU 530-73-103	Non-Mod	Rework instructions for machining the main metering valve plunger.	Sep 18/01	-

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Sep 18/01

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

Date: Sep 18/2001

Signed No Payer 70/40

CAA Approval No. DAI/2878/49

#### NON-MOD SERVICE BULLETIN NUMBER FMU 530-73-103

ENGINE - FUEL AND CONTROL - FUEL METERING UNIT
REWORK INSTRUCTIONS FOR MACHINING THE MAIN METERING VALVE PLUNGER PT. NO. 77139310
INSTALLED IN THE FMU 530 UNIT

#### 1. Planning Information

- A. Effectivity
  - (1) Aircraft
    - (a) Airbus A320
    - (b) Airbus A321
    - (c) McDonnell Douglas MD-90.
  - (2) Engine
    - (a) V2527-A5, V2527E-A5, V2530-A5 and V2533-A5
    - (b) V2525-D5 and V2528-D5.
  - (3) All Fuel Metering Unit Type FMU 530 units returned from service, Pre Unit Serial No. B1669
- B. Reason

The current dimensions of the plungers installed in the FMU 530 units do not conform to the drawing requirements.

C. Description

The Main Metering Valve (MMV) Plunger is 0.100 in. (2,54 mm) longer in overall length than the drawing nominal dimension. The increase in length is the result of a machining process omission during original manufacture.

The extension in the plunger length does not affect normal operation of the metering valve in this application.

D. Compliance

Recommended: Accomplish this Non-Mod Service Bulletin when the FMU has been disassembled for repair/maintenance at the next shop visit regardless of reason for the return.

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#### E. Approval

Non-Mod Service Bulletin No. FMU 530-73-103 was technically agreed by IAE on Sep 3/2001. 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.

- F. Manpower
  - (1) In Service

Not affected.

(2) At Repair

3 hours.

G. Material - Price and Availability

Not applicable.

H. Tooling - Price and Availability

Not applicable.

Weight and Balance

Unit weight change - < 1%.

Engine weight arm change - no effect.

- J. References
  - (1) TRW Component Maintenance Manual, V2500, 73-28-02.
- K. Electrical Load Data

Not affected.

L. Other Publications Affected

FMU 540 - Component Maintenance Manual, 73-28-07

FMU 550 - Component Maintenance Manual, 73-28-08

M. Prerequisites

None.

#### 2. Accomplishment Instructions

- A. Disassembly
  - (1) Disassemble the unit, ref. CMM FMU 530, 73-28-02, DISASSEMBLY, Page Block 301 to 399.
- B. Rework the MMV Plunger, Ref. Fig 1

WARNING: YOU MUST OBEY THE MANUFACTURERS HEALTH AND SAFETY INSTRUCTIONS WHEN YOU OPERATE MACHINERY.

- (1) Remove the rack Pt. No. 77135288 from the plunger, ref. CMM FMU 530, 73-28-02, DISASSEMBLY, Page Block 301 to 399.
- (2) Clean the plunger, ref. CMM FMU 530, 73-28-02, CLEANING, Page Block 401 to 499.

CAUTION: IT IS ESSENTIAL THAT THE PROCESS USED TO SET UP THE PLUNGER FOR GRINDING DOES NOT RESULT IN DISTORTION OF THE PLUNGER OR DAMAGE TO THE MATED SURFACES REF. 'X', 'Y' AND 'Z' FIG 1.

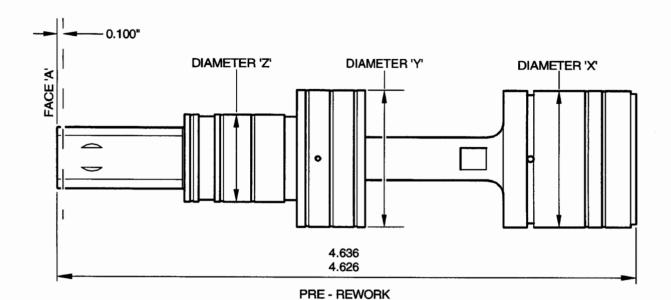
- (3) Position the plunger at 90 degrees to the traverse of the grinding wheel.
- (4) Surface grind the end face, adjacent to the rack location, ref. Face 'A' Fig 1, and reduce the overall dimension to the drawing limits of between 4.536 in. to 4.526 in. (115,214 mm to 114,960 mm).
- (5) Remove the plunger from the grinding machine.
- (6) Deburr the machined edges, keep the sharp definition.
- (7) Clean the plunger, ref. CMM FMU 530, 73-28-02, CLEANING, Page Block 401 to 499.
- (8) Carefully examine the plunger for remaining grinding swarf. Make sure that all the swarf has been cleaned from the holes and drillings.
- (9) Install the rack and the pin into the plunger, ref. CMM FMU 530, 73-28-02, ASSEMBLY, Page Block 701 to 799.
- (10) Install the plunger into the sleeve and install the assembly into the FMU, ref. CMM FMU 530, 73-28-02, ASSEMBLY, Page Block 701 to 799.
- C. Recording Action
  - Endorse the MOD plate with SB103 after completion.
- D. Engine
  - (1) No record of accomplishment is required.
- 3. Material Information

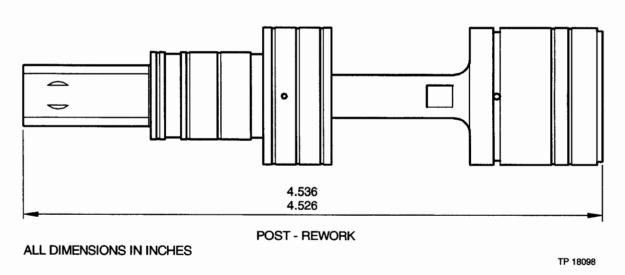
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FMU 530-73-103

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Main Metering Valve Plunger Re-work Detail Figure 1

Sep 18/01

FMU 530-73-103

Page 4 of 4

### SERVICE BULLETIN PUBLICATION TRANSMITTAL

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

Signed

NIP-M

Date: Sep 18/01

C.A.A. Design Approval No. DAI/2878/49

### **FUEL METERING UNIT TYPE FMU 540**

This document transmits Non-Mod Service Bulletin FMU 540-73-101 together with the Bulletin Index Sheet.

Remove	Insert	Reason
Service Bulletin Index Sheet pages 1 and 2 dated Aug 23/01	Service Bulletin Index Sheet pages 1 and 2 dated Sep 18/01.	Changes due to this transmittal.
-	Service Bulletin FMU 540-73-101 Pages 1 thru 4 dated Sep 18/01.	First Issue

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**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	-
FMU 540-73-101	Non-Mod	Rework instructions for machining the main metering valve plunger	Sep 18/01	-

**FUEL METERING UNIT, TYPE FMU 540** 

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Sep 18/01

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Date: Sep 18/2001

Signed Wi C - M

CAA Approval No. DAI/2878/49

#### NON-MOD SERVICE BULLETIN NUMBER FMU 540-73-101

ENGINE - FUEL AND CONTROL - FUEL METERING UNIT
REWORK INSTRUCTIONS FOR MACHINING THE MAIN METERING VALVE PLUNGER PT. NO. 77139310
INSTALLED IN THE FMU 540 UNIT

### 1. Planning Information

- A. Effectivity
  - (1) Aircraft
    - (a) Airbus A319.
  - (2) Engine
    - (a) V2522-A5, V2524-A5.
  - (3) All Fuel Metering Unit Type FMU 540 units returned from service.
- B. Reason

The current dimensions of the plungers fitted to the FMU 540 units do not conform to the drawing requirements.

C. Description

The Main Metering Valve (MMV) Plunger is 0.100 in. (2,54 mm) longer in overall length than the drawing nominal dimension. The increase in length is the result of a machining process omission during original manufacture.

The extension in the plunger length does not affect normal operation of the metering valve in this application.

D. Compliance

Recommended: Accomplish this Non-Mod Service Bulletin when the FMU has been disassembled for repair/maintenance at the next shop visit regardless of the reason for the return.

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### E. Approval

Non-Mod Service Bulletin No. FMU 540-73-101 was technically agreed by IAE on Sep 3/2001. 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.

- F. Manpower
  - (1) In Service

Not affected.

(2) At Repair

3 hours.

G. Material - Price and Availability

Not applicable.

H. Tooling - Price and Availability

Not applicable.

I. Weight and Balance

Unit weight change - < 1%.

Engine weight arm change - no effect.

- J. References
  - (1) TRW Component Maintenance Manual, V2500, 73-28-07.
- K. Electrical Load Data

Not affected.

L. Other Publications Affected

FMU 530 - Component Maintenance Manual, 73-28-02

FMU 550 - Component Maintenance Manual, 73-28-08

M. Prerequisites

None.

### 2. Accomplishment Instructions

- A. Disassembly
  - (1) Disassemble the unit, ref. CMM FMU 540, 73-28-07, DISASSEMBLY, Page Block 301 to 399.
- B. Rework the MMV Plunger, Ref. Fig 1

WARNING: YOU MUST OBEY THE MANUFACTURERS HEALTH AND SAFETY INSTRUCTIONS WHEN YOU OPERATE MACHINERY.

- (1) Remove the rack Pt. No. 77135288 from the plunger, ref. CMM FMU 540, 73-28-07, DISASSEMBLY, Page Block 301 to 399.
- (2) Clean the plunger, ref. CMM FMU 540, 73-28-07, CLEANING, Page Block 401 to 499.

CAUTION: IT IS ESSENTIAL THAT THE PROCESS USED TO SET UP THE PLUNGER FOR GRINDING DOES NOT RESULT IN DISTORTION OF THE PLUNGER OR DAMAGE TO THE MATED SURFACES REF. 'X', 'Y' AND 'Z' FIG 1.

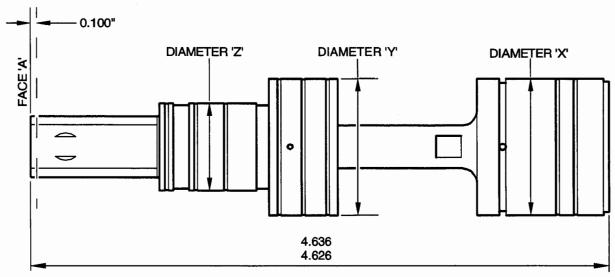
- (3) Position the plunger at 90 degrees to the traverse of the grinding wheel.
- (4) Surface grind the end face, adjacent to the rack location, ref. Face 'A' Fig 1, and reduce the overall dimension to the drawing limits of between 4.536 in. to 4.526 in. (115,214 mm to 114,960 mm).
- (5) Remove the plunger from the grinding machine.
- (6) Deburr the machined edges, keep the sharp definition.
- (7) Clean the plunger, ref. CMM FMU 540, 73-28-07, CLEANING, Page Block 401 to 499.
- (8) Carefully examine the plunger for remaining grinding swarf. Make sure that all the swarf has been cleaned from the holes and drillings.
- (9) Install the rack and the pin into the plunger, ref. CMM FMU 540, 73-28-07, ASSEMBLY, Page Block 701 to 799.
- (10) Install the plunger into the sleeve and install the assembly into the FMU, ref. CMM FMU 540, 73-28-07, ASSEMBLY, Page Block 701 to 799.
- C. Recording Action
  - (1) SB101 is to be embodied on the MOD plate after completion.
- D. Engine
  - No record of accomplishment is required.
- 3. Material Information

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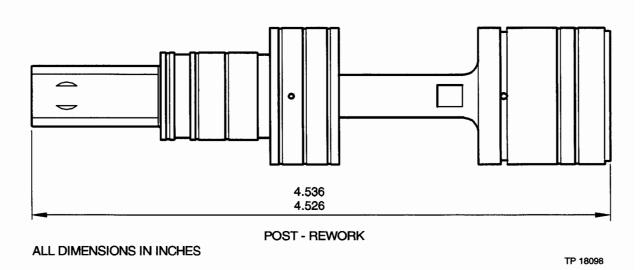
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FMU 540-73-101

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Main Metering Valve Plunger Re-work Detail Figure 1

Sep 18/01

FMU 540-73-101

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### SERVICE BULLETIN PUBLICATION TRANSMITTAL

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Signed

NI C. M

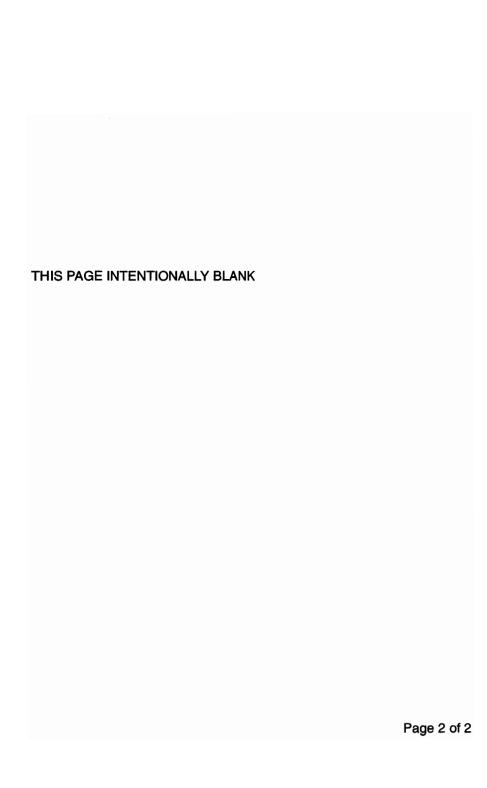
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#### **FUEL METERING UNIT TYPE FMU 550**

This document transmits Non-Mod Service Bulletin FMU 550-73-101 together with the Bulletin Index Sheet.

<u>Remove</u>	<u>Incorporate</u>	Reason
Bulletin Index Sheet Pages 1 and 2 dated Aug 23/01	Bulletin Index Sheet Pages 1 and 2 dated Sep 18/01	Changes due to this transmittal
-	SB FMU 550-73-101 Pages 1 thru 4	First Issue



### 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	-
FMU 550-73-101	Non-Mod	Rework instructions for machining the main metering valve plunger.	Sep 18/01	-

**FUEL METERING UNIT, TYPE FMU 550** 

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SERVICE BULLETIN INDEX SHEET

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

Date: Sep 3/2001

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#### NON-MOD SERVICE BULLETIN NUMBER FMU 550-73-101

ENGINE - FUEL AND CONTROL - FUEL METERING UNIT
REWORK INSTRUCTIONS FOR MACHINING THE MAIN METERING VALVE PLUNGER PT. NO. 77139310
INSTALLED IN THE FMU 550 UNIT

### 1. Planning Information

- A. Effectivity
  - (1) Aircraft
    - (a) Airbus A319
    - (a) Airbus A320.
  - (2) Engine
    - (a) A2522, A2524, A2527, A2527E, A2527M.
  - (3) All Fuel Metering Unit Type FMU 550 units returned from service, Pre Unit Serial No. B3097
- B. Reason

The current dimensions of the plungers fitted to the FMU 550 units do not conform to the drawing requirements.

C. Description

The Main Metering Valve (MMV) Plunger is 0.100 in. (2,54 mm) longer in overall length than the drawing nominal dimension. The increase in length is the result of a machining process omission during original manufacture.

The extension in the plunger length does not affect normal operation of the metering valve in this application.

D. Compliance

Recommended: Accomplish this Non-Mod Service Bulletin when the FMU has been disassembled for repair/maintenance at the next shop visit regardless of reason for the return.

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### E. Approval

Non-Mod Service Bulletin No. FMU 550-73-101 was technically agreed by IAE on Sep 3/2001. 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.

- F. Manpower
  - (1) In Service

Not affected.

(2) At Repair

3 hours.

G. Material - Price and Availability

Not applicable.

H. Tooling - Price and Availability

Not applicable.

I. Weight and Balance

Unit weight change - < 1%.

Engine weight arm change - no effect.

- J. References
  - (1) TRW Component Maintenance Manual, V2500, 73-28-08.
- K. Electrical Load Data

Not affected.

L. Other Publications Affected

FMU 530 - Component Maintenance Manual, 73-28-02

FMU 540 - Component Maintenance Manual, 73-28-07

M. Prerequisites

None.

### Accomplishment Instructions

- A. Disassembly
  - (1) Disassemble the unit, ref. CMM FMU 550, 73-28-08, DISASSEMBLY, Page Block 301 to 399.
- B. Rework the MMV Plunger, Ref. Fig 1

WARNING: YOU MUST OBEY THE MANUFACTURERS HEALTH AND SAFETY INSTRUCTIONS WHEN YOU OPERATE MACHINERY.

- (1) Remove the rack Pt. No. 77135288 from the plunger, ref. CMM FMU 550, 73-28-08, DISASSEMBLY, Page Block 301 to 399.
- (2) Clean the plunger, ref. CMM FMU 550, 73-28-08, CLEANING, Page Block 401 to 499.

CAUTION: IT IS ESSENTIAL THAT THE PROCESS USED TO SET UP THE PLUNGER FOR GRINDING DOES NOT RESULT IN DISTORTION OF THE PLUNGER OR DAMAGE TO THE MATED SURFACES REF. 'X', 'Y' AND 'Z' FIG 1.

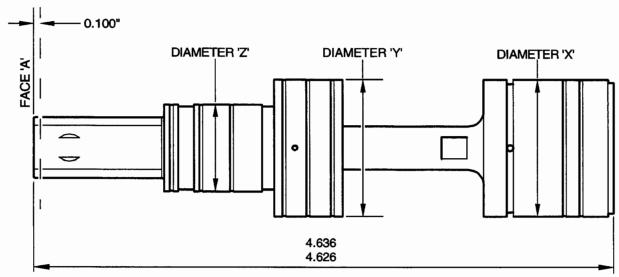
- (3) Position the plunger at 90 degrees to the traverse of the grinding wheel.
- (4) Surface grind the end face, adjacent to the rack location, ref. Face 'A' Fig 1, and reduce the overall dimension to the drawing limits of between 4.536 in. to 4.526 in. (115,214 mm to 114,960 mm).
- (5) Remove the plunger from the grinding machine.
- (6) Deburr the machined edges, keep the sharp definition.
- (7) Clean the plunger, ref. CMM FMU 550, 73-28-08, CLEANING, Page Block 401 to 499.
- (8) Carefully examine the plunger for remaining grinding swarf. Make sure that all the swarf has been cleaned from the holes and drillings.
- (9) Install the rack and the pin into the plunger, ref. CMM FMU 550, 73-28-08, ASSEMBLY, Page Block 701 to 799.
- (10) Install the plunger into the sleeve and install the assembly into the FMU, ref. CMM FMU 550, 73-28-08, ASSEMBLY, Page Block 701 to 799.
- C. Recording Action
  - (1) SB101 is to be embodied on the MOD plate after completion.
- D. Engine
  - No record of accomplishment is required.
- 3. Material Information

This is a technical document, not a quotation. Prices are FOC UK and are for budgetary purposes only.

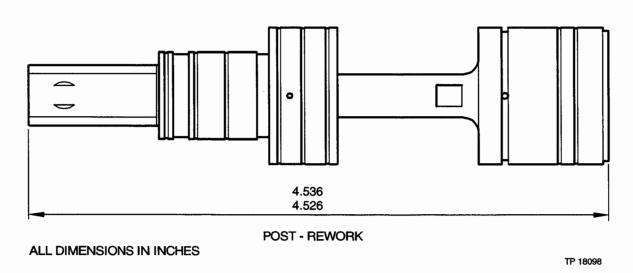
Sep 18/01

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PRE - REWORK



Main Metering Valve Plunger Re-work Detail Figure 1

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FMU 550-73-101

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