



International Aero Engines

RR-DERBY

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 ~~R~~ Apr.14/03

V2500-A5/D5 PROPULSION SYSTEM SERVICE BULLETIN

Printed in Great Britain

This document transmits Revision 1 to Service Bulletin EV2500-73-0180

Document History

Service Bulletin Revision Status
Initial Issue Feb.13/03

Supplement Revision Status

Bulletin Revision 1

Remove
All pages of the
Service Bulletin

Incorporate
Pages 1 to 13 of the
Service Bulletin

Reason for change
To relocate ATA locator
from Effectivity to
References.

V2500-ENG-73-0180
Transmittal - Page 1 of 2

CHECK THAT ALL PREVIOUS TRANSMITTALS HAVE BEEN INCORPORATED
If any have not been received please advise Publication Services, Rolls-Royce plc, Derby, England
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LIST OF EFFECTIVE PAGES

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ENGINE FUEL AND CONTROL – FUEL METERING UNIT – INTRODUCTION OF A WOODWARD AIRCRAFT
ENGINE SYSTEMS (WAES) FMU WITH REVISED FUEL METERING VALVE (FMV) SERVOVALVE
TORQUEMOTOR STOPSCREWS

1. Planning Information

A. Effectivity

(1) Airbus A319

V2522-A5, V2524-A5, V2527M-A5 Engines prior to Serial No.V11375

(2) Airbus A320

V2527-A5, V2527E-A5 Engines prior to Serial No.V11375

(3) Airbus A321

V2530-A5, V2533-A5 Engines prior to Serial No.V11375

(4) Boeing – Longbeach Division MD-90

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

B. Concurrent Requirements

None.

C. Reason

(1) Condition

Omission of the Loctite securing the headless stopscrews in the FMU Fuel Metering Valve servovalve torquemotor may occur.

This may lead to migration of the stopscrews, inhibiting movement of the torquemotor's armature.

(2) Background

The problem has been observed on units in service on other IAE partner company engines and on pre-service V2500 units.

(3) Objective

Incorporation of the changes introduced by 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 analysis, successful vendor testing and in-service experience on engines produced by other manufacturers.

In addition, in-service experience has been gained with overhauled units that have been fitted with selected balls with the higher density material.

(5) Effect of Bulletin on:

(a) Operation

Not affected.

(b) Maintenance

Not affected.

(c) Overhaul

Not affected.

(d) Repair Schemes

Not affected.

(e) Interchangeability

Not affected.

(f) Fits and Clearances

Not affected.

D. Description

(1) This Service Bulletin covers the fitment to engines of a FMU supplied by Woodward (WAES) incorporating design changes to prevent servovalve torquemotor stopscrew migration.

(2) A revised Woodward (WAES) FMU is introduced similar to the existing unit except for the following changes:

(a) Headed stopscrews are introduced into the FMV servovalve torquemotor replacing the existing headless stopscrews.

(b) Revised upper and lower torquemotor frames are introduced, similar to the existing items except for the introduction of slots to form a seating surface at each of the tapped holes.



(c) A washer is introduced under the headed stopscrews to achieve a consistent preload to the stopscrews.

(d) A revised torquemotor wire shield is introduced, similar to the existing item except that the dimensions are revised, to ensure the wire shield will cover the stopscrew head diameter by a minimum of 0.031in. (nominal 0.080in.).

(3) Existing units may be reworked. Refer to Woodward Aircraft Engine Systems Service Bulletin 83724-73-0180.

(4) Units incorporating this Service Bulletin (Modification) will be identified by endorsement of the modification plate with 73-0180.

E. Compliance

Category Code 7

Accomplish when supply of superseded parts has been depleted.

F. 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 models listed.

G. Manpower

In service

Not affected.

At overhaul

Not affected.

NOTE: The parts affected by this Service Bulletin are accessible at overhaul.

H. Material Price and Availability

Modification kit not required; parts supplied as single line items.

I. Tooling Price and Availability

Special tools are not required.

J. Industry Support Information

None.



K. Weight and Balance

(1) Weight Change

None.

(2) Moment Arm

No effect.

(3) Datum

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

L. Electrical Load Data

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

M. Software Accomplishment Summary

Not applicable.

N. References

(1) Aircraft Maintenance Manual, 73-22-52 Config-02, Removal/Installation (A5) (Airbus).

(2) Aircraft Maintenance Manual, 73-21-52, Removal/Installation (D5) (Boeing MD-90).

(3) Woodward CMM 73-28-06.

(4) Woodward Aircraft Engine Systems Service Bulletin 83724-73-0180.

(5) Airbus aircraft modifications No.32648 and 33031.

(6) Internal reference number 01VI003.

R (7) ATA Locator - 73-22-52.

O. Other Publications Affected

(1) Illustrated Parts Catalogue (IPC) S-V2500-2IB, 3IB, 5IB, 6IB and 7IB Chapter/Section 73-22-52 will be revised.

(2) Woodward Component Maintenance Manual, 73-28-06.

P. Interchangeability of Parts

Not affected.



2. Material Information

A. Prices and availability:

For prices and availability of parts refer to Woodward Aircraft Engine Systems Service Bulletin 83724-73-0180.

B. Vendor units affected by this bulletin:

Applicability: - For each V2500 engine to incorporate this bulletin

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

V2522-A5, V2524-A5, V2527-A5, V2527E-A5, V2527M-A5 models only

73-22-52

FIG ITEM NO.	NEW PART NO.	QTY	PART TITLE	MAT	OLD PART NO.	INSTR DISP
01100	8061-636	1	.Meter, fuel (V66503)	-	8061-636	(A)(S1) (1D)

V2530-A5 and V2533-A5 models only

73-22-52

FIG ITEM NO.	NEW PART NO.	QTY	PART TITLE	MAT	OLD PART NO.	INSTR DISP
01100	8061-637	1	.Meter, fuel (V66503)	-	8061-637	(A)(S1) (1D)

V2522-A5, V2524-A5 models (Pre SB ENG-73-0172 and incorporating SB ENG-73-0158)

73-22-52

FIG ITEM NO.	NEW PART NO.	QTY	PART TITLE	MAT	OLD PART NO.	INSTR DISP
01100	8061-633	1	.Meter, fuel (V66503)	-	8061-633	(A)(S1) (1D)



V2527-A5, V2527E-A5 models (Pre SB ENG-73-0172 and incorporating SB ENG-73-0157)

73-22-52

FIG ITEM NO.	NEW PART NO.	QTY	PART TITLE	MAT	OLD PART NO.	INSTR DISP
01100	8061-633	1	.Meter, fuel (V66503)	-	8061-633	(A)(S1) (1D)

V2527M-A5 models (Pre SB ENG-73-0172)

73-22-52

FIG ITEM NO.	NEW PART NO.	QTY	PART TITLE	MAT	OLD PART NO.	INSTR DISP
01100	8061-633	1	.Meter, fuel (V66503)	-	8061-633	(A)(S1) (1D)

V2530-A5 and V2533-A5 models (Pre SB ENG-73-0172)

73-22-52

FIG ITEM NO.	NEW PART NO.	QTY	PART TITLE	MAT	OLD PART NO.	INSTR DISP
01100	8061-632	1	.Meter, fuel (V66503)	-	8061-632	(A)(S1) (1D)

V2525-D5 and V2528-D5 models

73-22-52

FIG ITEM NO.	NEW PART NO.	QTY	PART TITLE	MAT	OLD PART NO.	INSTR DISP
01100	8061-632	1	.Meter, fuel (V66503)	-	8061-632	(A)(S1) (1D)



V2522-A5 and V2524-A5 models (Pre SB ENG-73-0158)

73-22-52

FIG ITEM NO.	NEW PART NO.	QTY	PART TITLE	MAT	OLD PART NO.	INSTR DISP
01100	8061-627	1	.Meter, fuel (V66503)	-	8061-627	(A)(S1) (1D)

V2527-A5 and V2527E-A5 models (Pre SB ENG-73-0157)

73-22-52

FIG ITEM NO.	NEW PART NO.	QTY	PART TITLE	MAT	OLD PART NO.	INSTR DISP
01100	8061-632	1	.Meter, fuel (V66503)	-	8061-632	(A)(S1) (1D)

V2525-D5 and V2528-D5 models (Pre SB ENG-73-0108)

73-22-52

FIG ITEM NO.	NEW PART NO.	QTY	PART TITLE	MAT	OLD PART NO.	INSTR DISP
01100	8061-626	1	.Meter, fuel (V66503)	-	8061-626	(A)(S1) (1D)

C. Instructions disposition codes:

(A) New standard of unit will be made available from August 2002.

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

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



3. Accomplishment Instructions

A. Rework Instructions

Refer to Vendor Service Bulletin, Woodward Aircraft Engine Systems 83724-73-0180

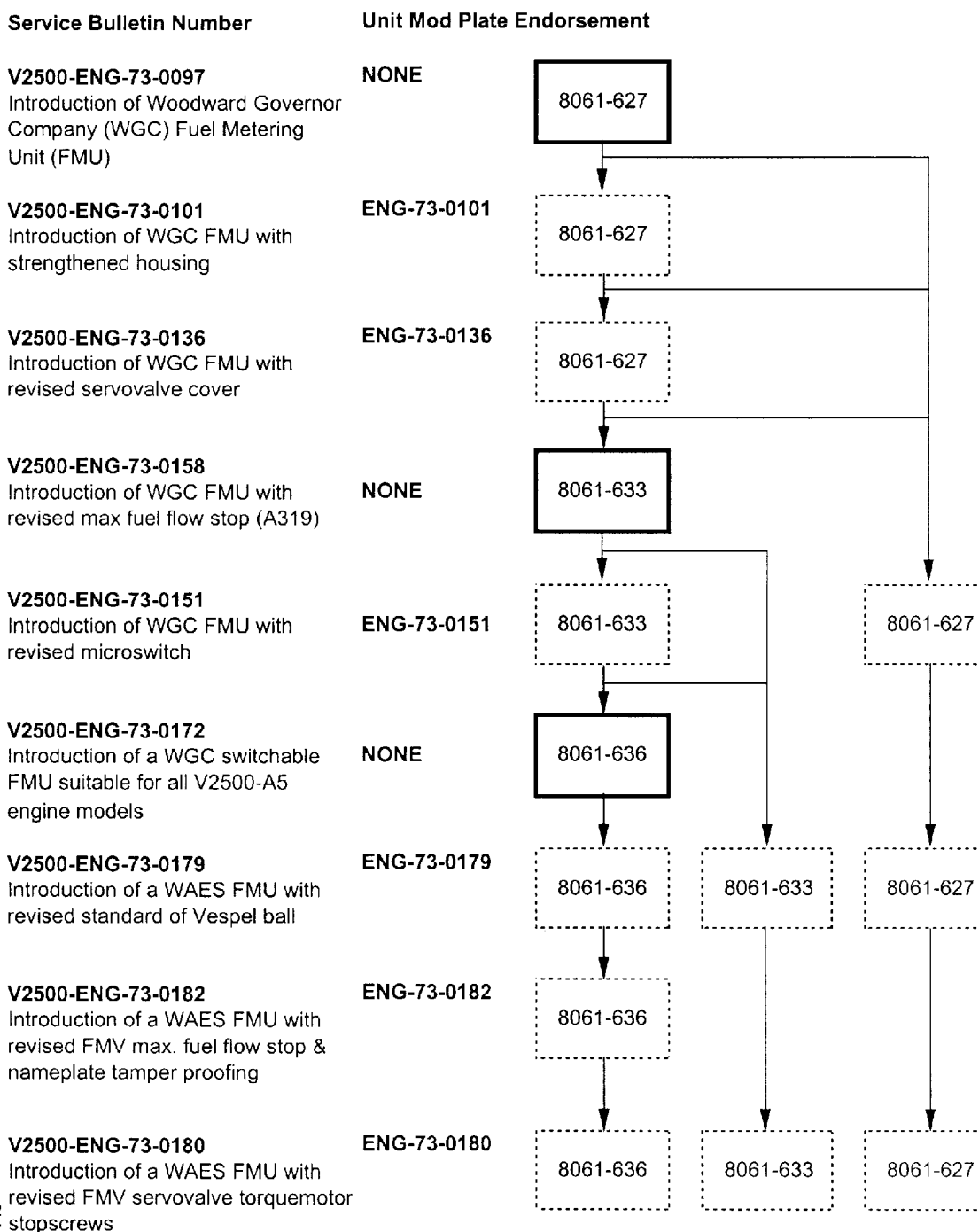
B. Assembly Instructions

The revised FMU introduced by this Service Bulletin is freely and fully interchangeable with the existing. Remove and install in accordance with current overhaul procedures and maintenance practices (Engine Manual, 72-00-60 Config-02, Removal-06/Installation-06, Aircraft Maintenance Manual, 73-22-52 Config-02, Removal/Installation (Airbus A319/320/321). Engine Manual, 72-00-60, Removal-06/Installation-06, Aircraft Maintenance Manual, 73-21-52, Removal/Installation (Boeing MD-90)).

C. Recording Instructions

A record of accomplishment is necessary. Refer to vendor Service Bulletin, Woodward Aircraft Engine Systems 83724-73-0180.

V2522-A5 and V2524-A5 FMU Family Tree *



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

Family Tree
Fig.1

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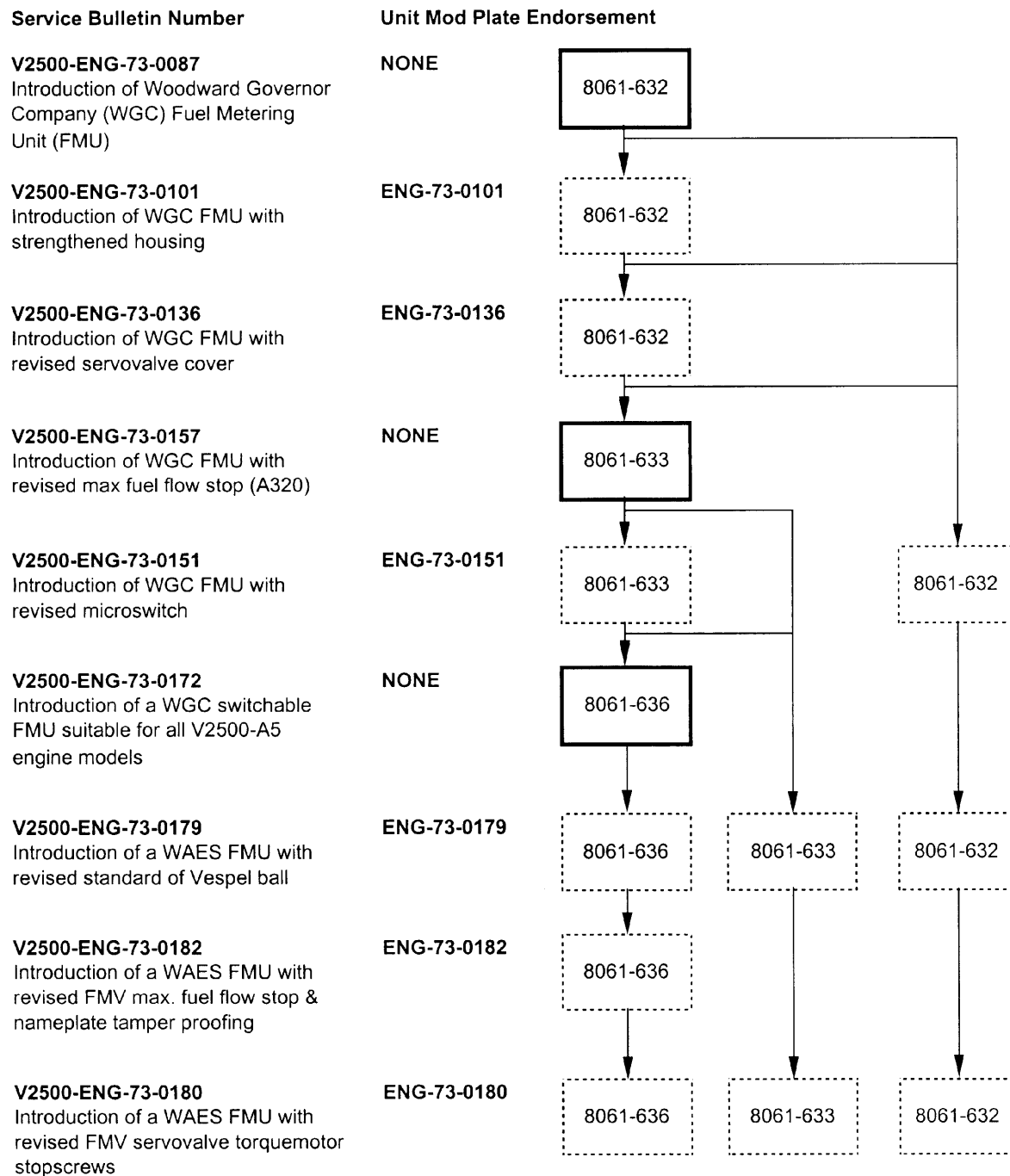
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V2527-A5 and V2527E-A5 FMU Family Tree *



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

Family Tree
Fig.2

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**V2527M-A5 FMU Family Tree *****Service Bulletin Number****Unit Mod Plate Endorsement****V2500-ENG-73-0158**

Introduction of Woodward Governor Company (WGC) Fuel Metering Unit (FMU) with revised max fuel flow stop (A319)

NONE**V2500-ENG-73-0151**

Introduction of a WGC FMU with revised microswitch

ENG-73-0151**V2500-ENG-73-0172**

Introduction of a WGC switchable FMU suitable for all V2500-A5 engine models

NONE**V2500-ENG-73-0179**

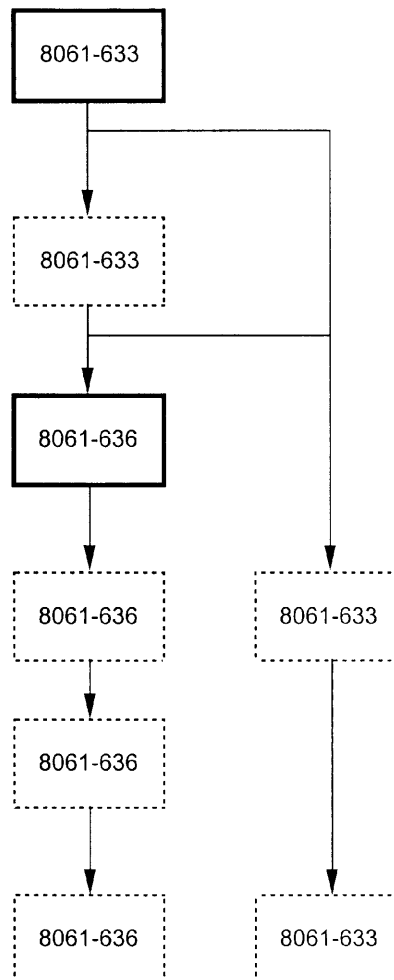
Introduction of a WAES FMU with revised standard of Vespel ball

ENG-73-0179**V2500-ENG-73-0182**

Introduction of a WAES FMU with revised FMV max. fuel flow stop & nameplate tamper proofing

ENG-73-0182**V2500-ENG-73-0180**

Introduction of a WAES FMU with revised FMV servovalve torquemotor stopscrews

ENG-73-0180

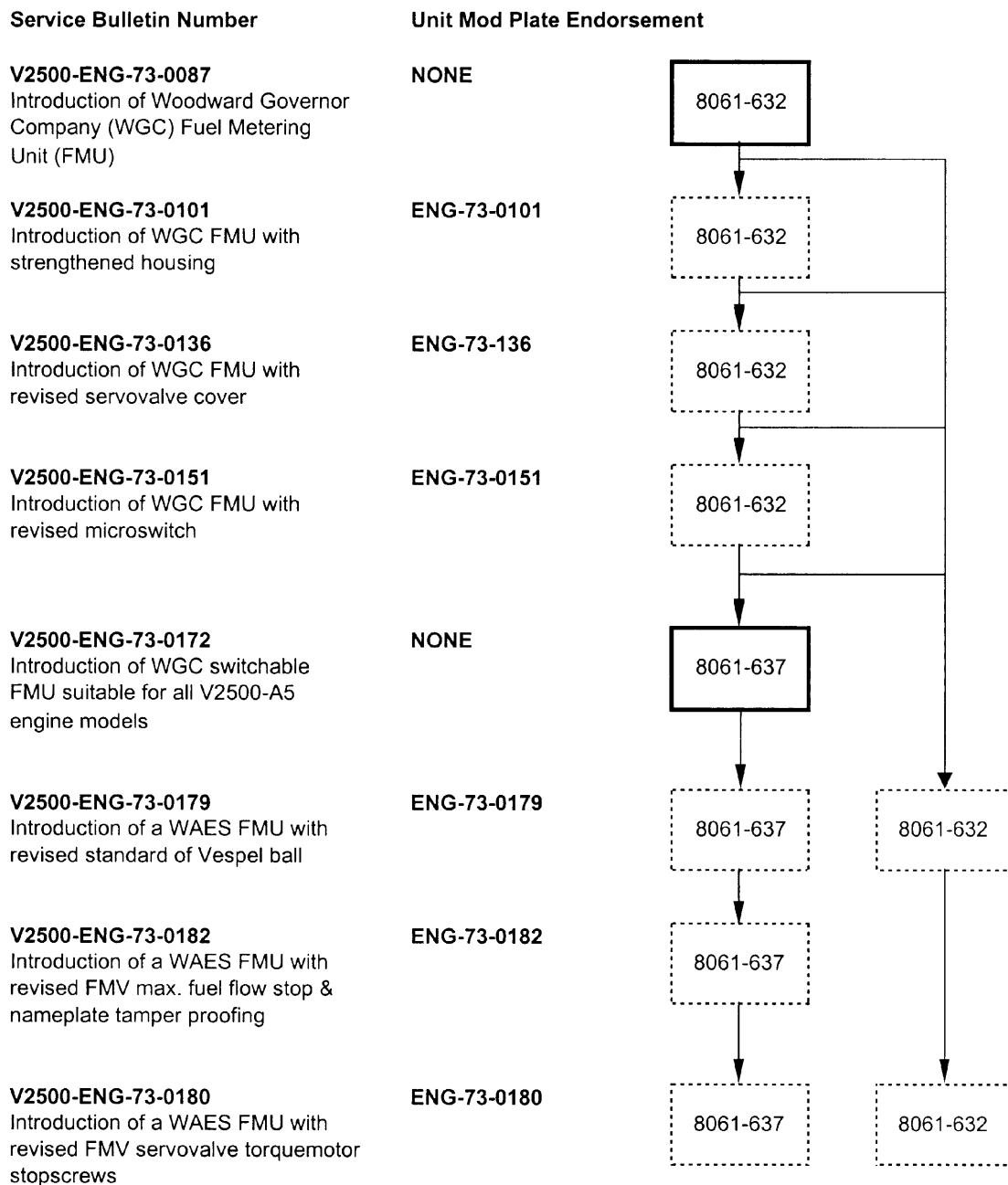
* This family tree is not intended to represent the combination of modifications fitted to units in service

Family Tree
Fig.3

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V2530-A5 and V2533-A5, FMU Family Tree *

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

Family Tree
Fig.4

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**V2525-D5 and V2528-D5 FMU Family Tree *****Service Bulletin Number****Unit Mod Plate Endorsement****V2500-ENG-73-0085**

Introduction of Woodward Governor Company (WGC) Fuel Metering Unit (FMU)

NONE

V2500-ENG-73-0101

Introduction of WGC FMU with strengthened housing

ENG-73-0101

V2500-ENG-73-0108

Introduction of WGC FMU with fuel flow straightener

ENG-73-0108

V2500-ENG-73-0136

Introduction of WGC FMU with revised servovalve cover

ENG-73-0136

V2500-ENG-73-0151

Introduction of WGC FMU with revised microswitch

ENG-73-0151

V2500-ENG-73-0179

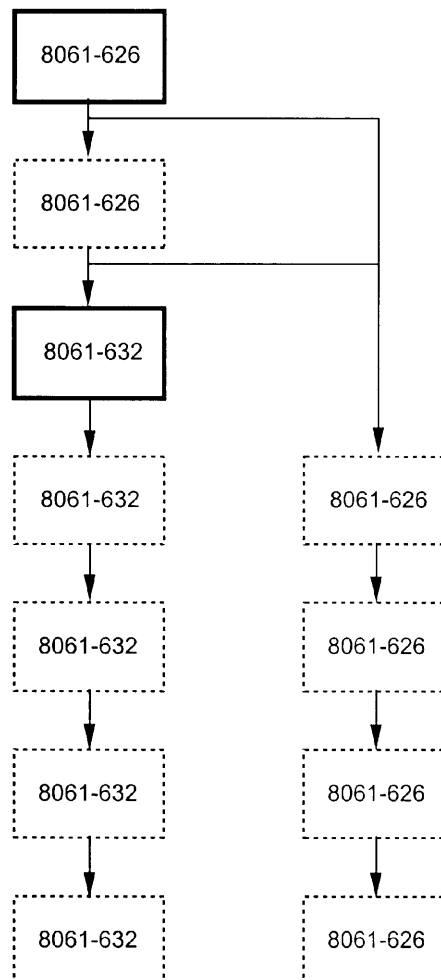
Introduction of a WAES FMU with revised standard of Vespel ball

ENG-73-0179

V2500-ENG-73-0180

Introduction of a WAES FMU with revised FMV servovalve torquemotor stopscrews

ENG-73-0180



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

Family Tree
Fig.5

**ENGINE FUEL and CONTROL - FUEL METERING UNIT (FMU) - Incorporation of
Modified Fuel Metering Valve (FMV) Servovalve.**

1. Planning Information

A. Effectivity

This Service Bulletin affects the following Fuel Metering Units manufactured by Woodward Aircraft Engine Systems: 8061-626, 8061-627, 8061-632, 8061-633, 8061-636 and 8061-637.

The following V2500 engine models are affected:

- V2500-A5: V2522, V2524, V2527, V2527M, V2527E, V2530, and V2533.
- V2500-D5: V2525, V2528

B. Concurrent Requirements

Not applicable.

C. Reason

Objective: To inform users of a modified FMV Servovalve with improved stop screw locking features.

Condition: A quality concern on Woodward FMU's was previously identified regarding the possibility of loose Servovalve stop screws. The potential existed for loose stop screws to cause an uncommanded acceleration or deceleration. IAE Non Mod Service Bulletin V2500-ENG-73-0162 was issued to provision the inspection of all field units in order to ensure that the stop screws are properly retained.

Cause: There was inadequate verification of the presence of Loctite epoxy to retain the stop screws.

Improvement: The FMV Servovalve design standard has been modified to utilize headed stop screws with three retaining methods: torque, Loctite and wire shield retention. The existing design standard used non-headed stop screws with Loctite retention only.

Substantiation: Engineering test and evaluation has confirmed that the proposed design will mitigate the potential for loose stop screws.

D. Description

This Service Bulletin introduces a new FMV Servovalve, Part Number 1886-428, as a replacement for Part Number 1886-300. This is applicable to all Woodward V2500 FMU's.

E. Compliance

Category 7 - Do at customer convenience/option.

F. Approval

S/B 83724-73-0180 has been technically approved by IAE on (June 26, 2002) in accordance with appropriate FAR regulations and is FAA approved for those units listed herein.

G. Manpower

After removal from the engine, an estimated 1 hour, not including test, is required to perform this service bulletin.

H. Weight and Balance

There is no change in weight and balance.

I. Electrical Load Data

Not applicable.

J. Software Accomplishment Summary

Not applicable.

K. References

Woodward Aircraft Engine Systems Component Maintenance Manual 73-28-06.

Woodward Aircraft Engine Systems Engineering Change E/C R-1033637 (for internal use only).

IAE V2500 Non-Modification Service Bulletin Number V2500-ENG-73-0162

IAE V2500 Service Bulletin Number V2500-ENG-73-0180

L. Other Publications Affected

Not applicable.

2. Material Information

A. Material - Price and Availability

Contact Woodward Aircraft Engine Systems for part availability and pricing.

B. Industry Support Information

Not applicable.

C. Material Necessary for Each Aircraft/Engine/Component

One replacement P/N 1886-428 Fuel Metering Valve Servovalve will be required for affected units.

D. Material Necessary for Each Spare

One replacement P/N 1886-428 Fuel Metering Valve Servovalve will be required for affected units.

E. Reidentified Parts

Not applicable.

F. Tooling - Price and Availability

Not applicable.

3. Accomplishment Instructions

- (1) Disassemble the FMU as told in CMM 73-28-06 to gain access to the FMV Servovalve, CMM 73-28-06 Illustrated Parts List, Figure 1, Item 320, P/N 1886-300.
- (2) Remove the FMV Servovalve, P/N 1886-300, as told in CMM 73-28-06.
- (3) Install the FMV Servovalve, P/N 1886-428.
- (4) Assemble the FMU as told in CMM 73-28-06.
- (5) Test the FMU as told in CMM 73-28-06 TESTING AND FAULT ISOLATION.
- (6) Mark the Service Bulletin dataplate 73-0180.