POWER PLANT - ENGINE - FUEL AND CONTROL - FUEL FLOWMETER WITH MODIFIED SUPPORT BRACKETS AND IMPROVED BONDING - CATEGORY CODE 6 - MOD.ENG-71-0117

1. Planning Information

A. Effectivity

(1) Aircraft: McDonnell Douglas MD-90

(2) Engine: V2500-D5 Engines before Serial No.V20007

B. Concurrent Requirements

None

C. Reason

(1) Condition

The flowmeter can not be removed/installed unless the 'C' duct doors are opened.

Improved bonding of the flowmeter is necessary.

(2) Background

On left hand installed engines the 'C' duct door hinge is located adjacent to the flowmeter. With the doors opened, access to the fasteners securing the flowmeter to its support brackets is restricted. In addition, the need to open the doors is an unacceptable maintenance penalty.

It has also been determined that there is a requirement for improved electrical bonding of the flowmeter.

This Service Bulletin introduces changes which permit flowmeter removal/installation with the 'C' duct doors closed and provides improved electrical bonding.

(3) Objective

To make removal/installation of the flowmeter easier and to increase the electrical resistance of the flowmeter bonding.

(4) Substantiation

Successful trial installation on a mock-up engine has been completed.

The additional bonding provides the required level of electrical resistance.

(5) Effect of Bulletin on Workshop Procedures:

Removal/Installation	Affected (see Supplement Information)
Disassembly/Assembly	Not affected
Cleaning	Affected
Inspection/Check	Affected
Repair	Not affected
Testing	Not affected

(6) Supplement Information

(a) The Removal/Installation will be revised to add new configuration of this Service Bulletin.

D. Description

This Service Bulletin introduces two new flowmeter support brackets and adaptors. The brackets are attached by two of the three bolts which secure the inlet and outlet tube flanges to the adaptors and flowmeter.

The existing flowmeter bonding lead is now secured to a leg on the lower (inlet end) bracket. An additional bonding lead is also attached to the bracket and runs through clips located at existing clip points CP2337 and CP2338 (for the electrical lead to the flowmeter) and then to an existing bonding point on flange FG.

Existing adaptors can be reworked by machining off the redundant bracket bolting features.

E. Approval

The part number changes and/or part modifications 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 Model listed.

F. 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 parts and to all affected spare parts.

G. Manpower

Estimated manhours to incorporate the full intent of this Bulletin:

	Venue	Estimated Manhours
(1)	In service	Not applicable
(2)	At Overhaul	The parts affected by this Service Bulletin are accessible at overhaul. No additional time is necessary to do this Service Bulletin.

H. Material - Price and Availability

(1) Modification Kit not required.

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

I. Tooling - Price and Availability

Special tools are not required.

J. Weight and Balance

(1)	Weight change	Minus 0,14 Kg (-0.3lb.)
(2)	Moment arm	51 mm (2.0in.) Rearward of Datum
(3)	Datum	Engine front mount centerline (Power Plant Station (PPS) 100)

K. Electrical Load Data

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

L. References

(1) Internal Reference No.

EC93VR066/A

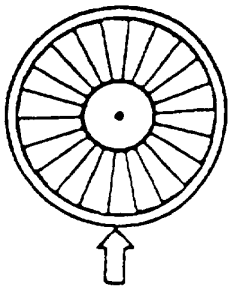
M. Other Publications Affected

(1) V2500 Engine Illustrated Parts Catalog (S-V2500-3IA), Chapter/Section 71-51-51, 73-11-49 and 73-31-17.

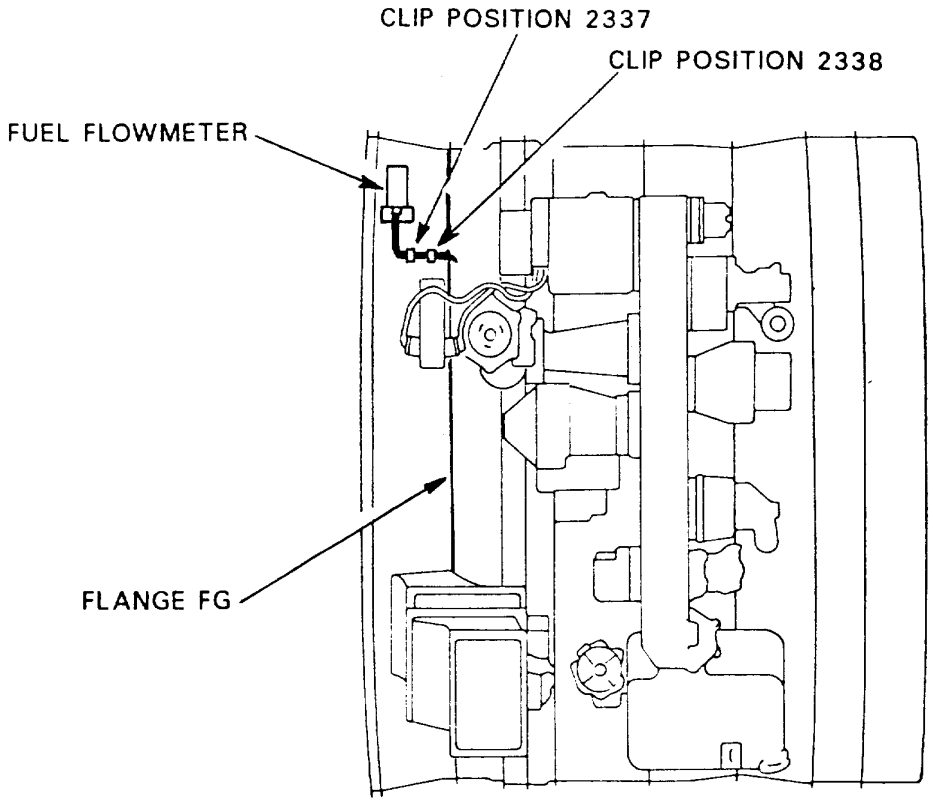
(2) V2500 Engine Manual (E-V2500-3IA), 72-00-32, Removal-02 and Installation-04.

(3) V2500-05 Component Maintenance Manuals Chapter/Section 71-51-51, 73-11-49 and 73-31-17, Cleaning and Inspection/Check.

(4) V2500 Engine Maintenance Manual (M-V2500-3IA), 73-31-02, Removal/Installation.



FORWARD



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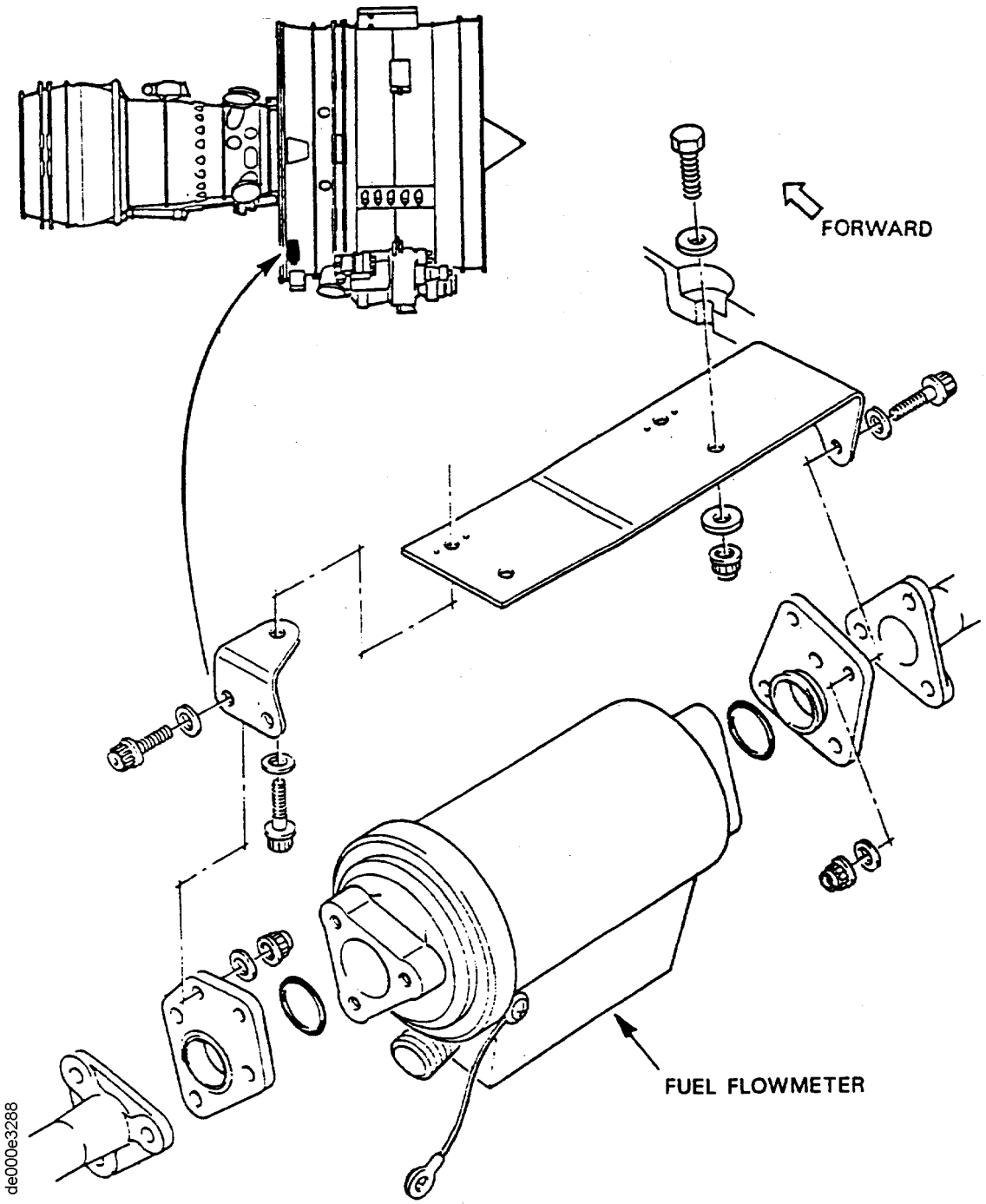
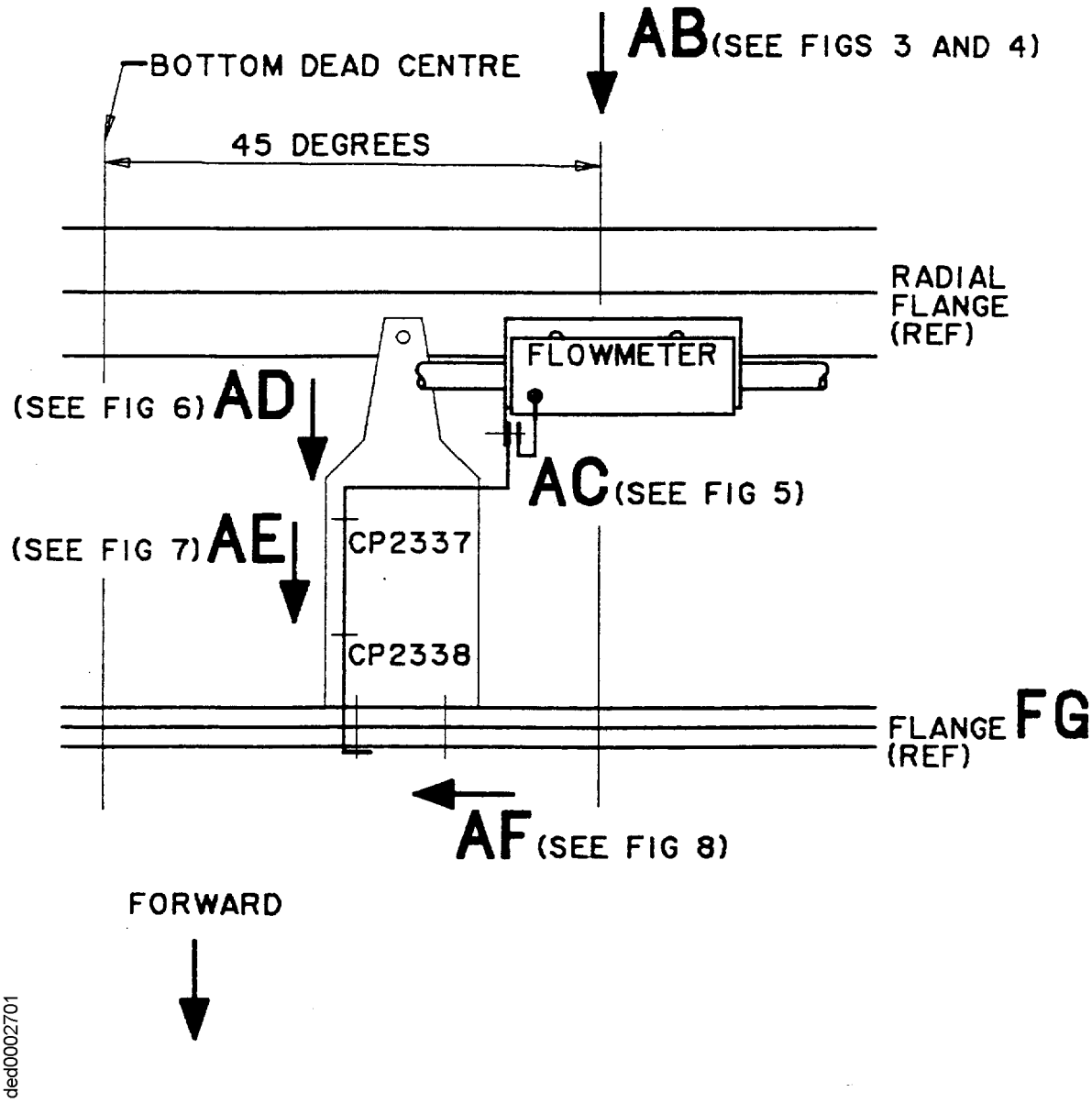
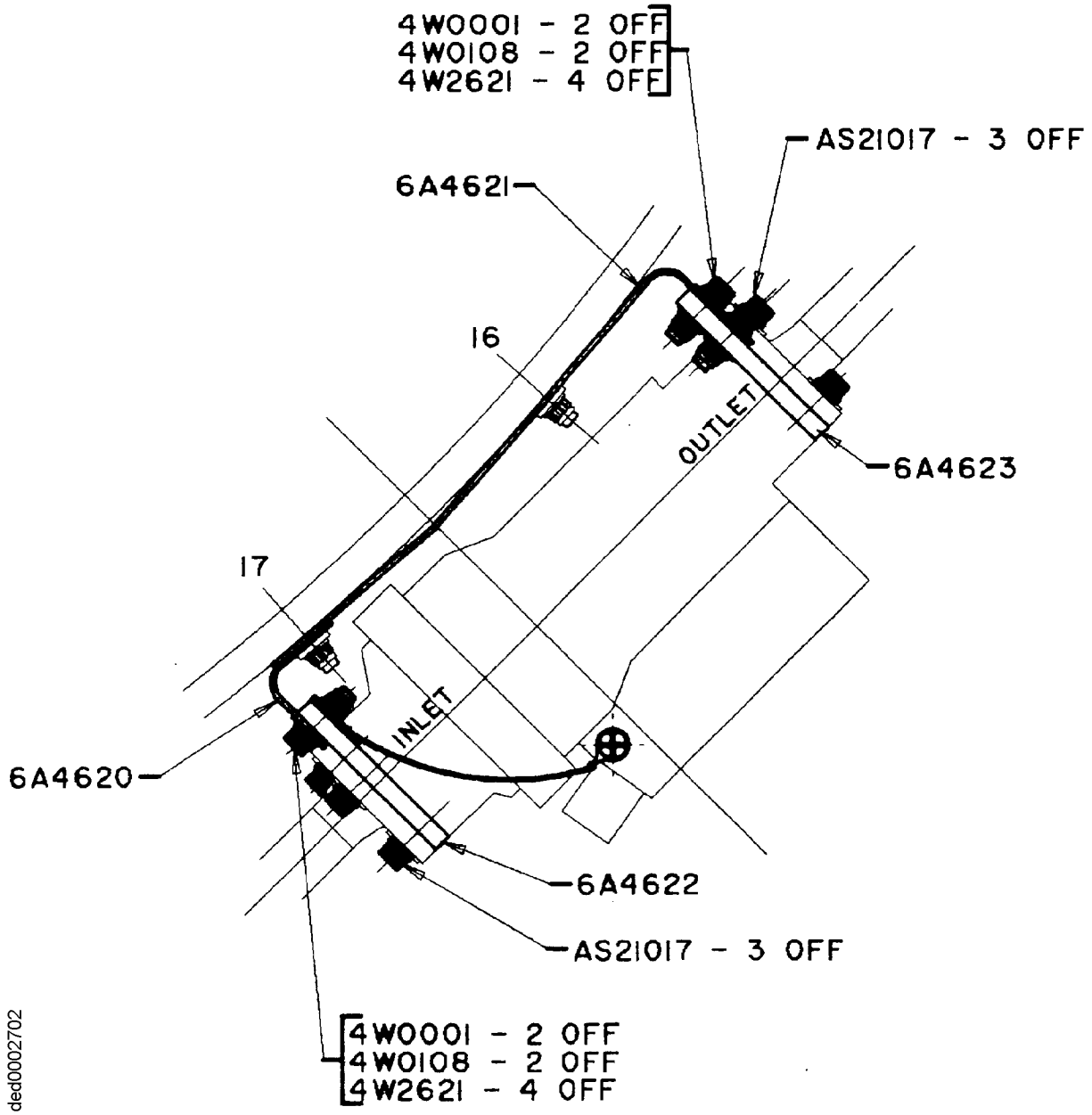
Location of fuel flowmeter, flange FG and clip points 2337 and 2338
Fig.1 (Sheet 1 of 2)



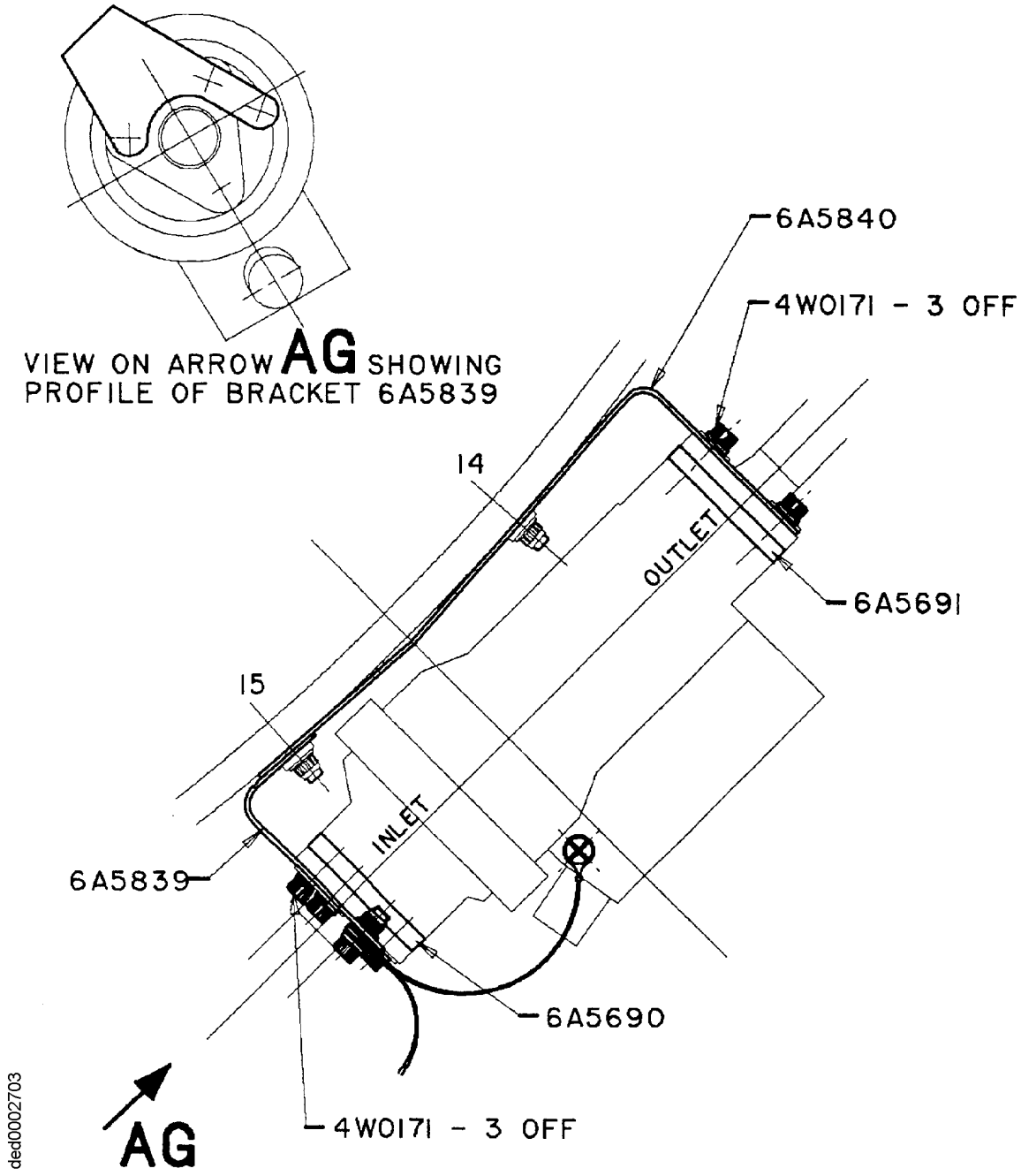
Location of fuel flowmeter, flange FG and clip points 2337 and 2338
Fig.1 (Sheet 2 of 2)



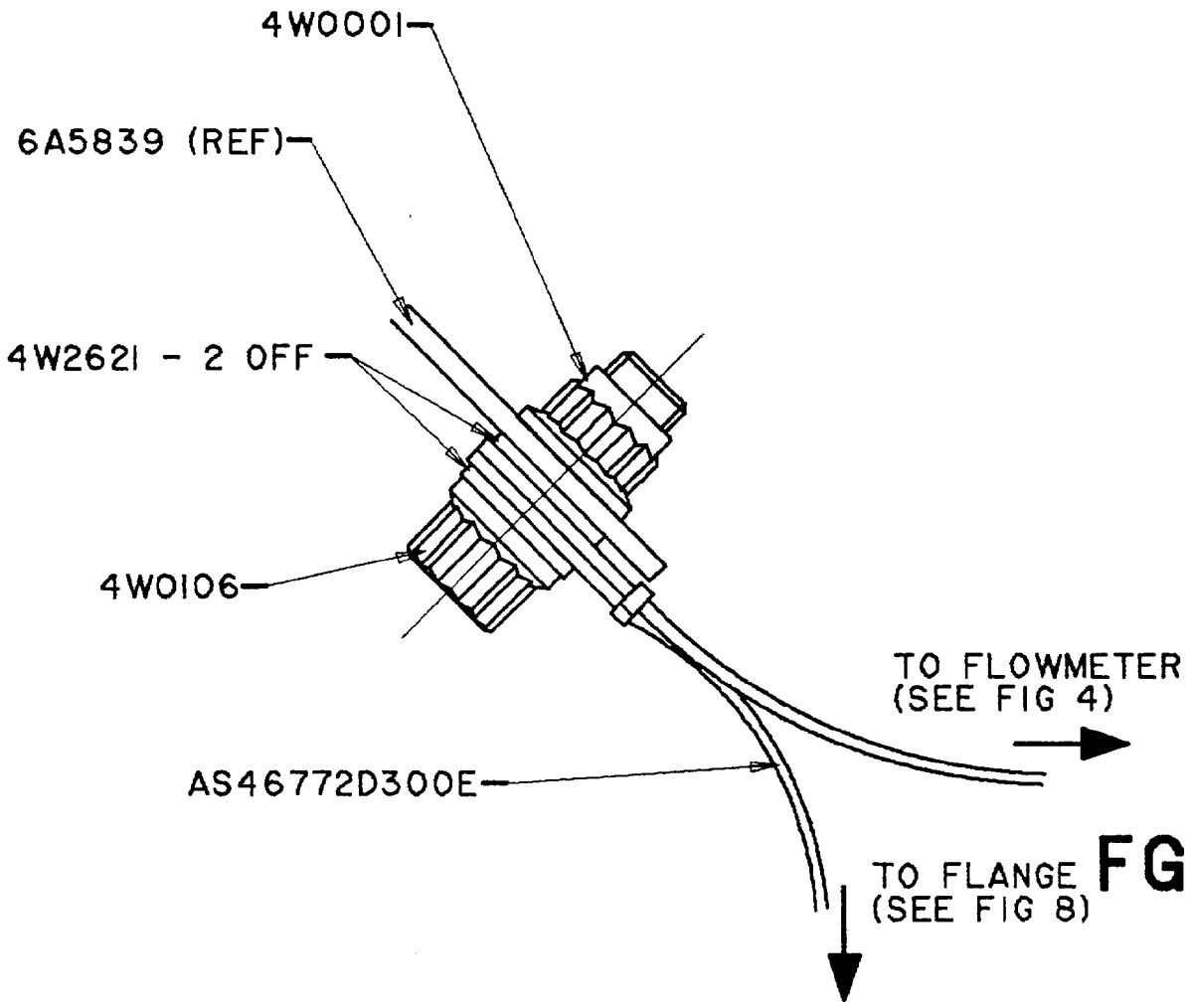
Schematic diagram showing position of clipping and bonding points
Fig.2



View on arrow AB (see figure 2) - Before alteration
Fig.3



View on arrow AB (see figure 2) - After alteration
Fig.4



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Enlarged view at AC (see figure 2) showing bonding point
Fig.5

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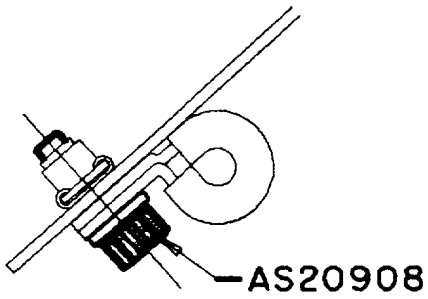
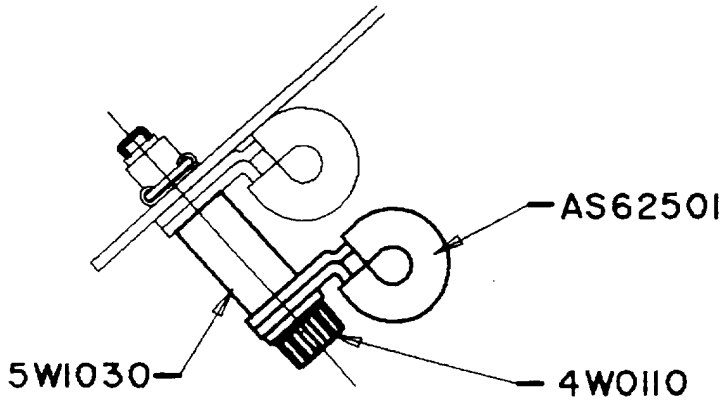


VIEW ON ARROW **AD** (SEE FIG 2)
CP2337 BEFORE ALTERATION



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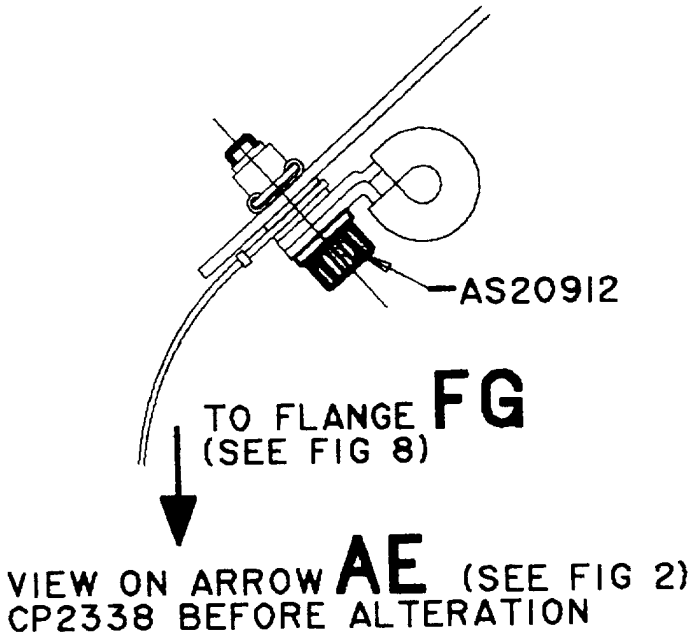
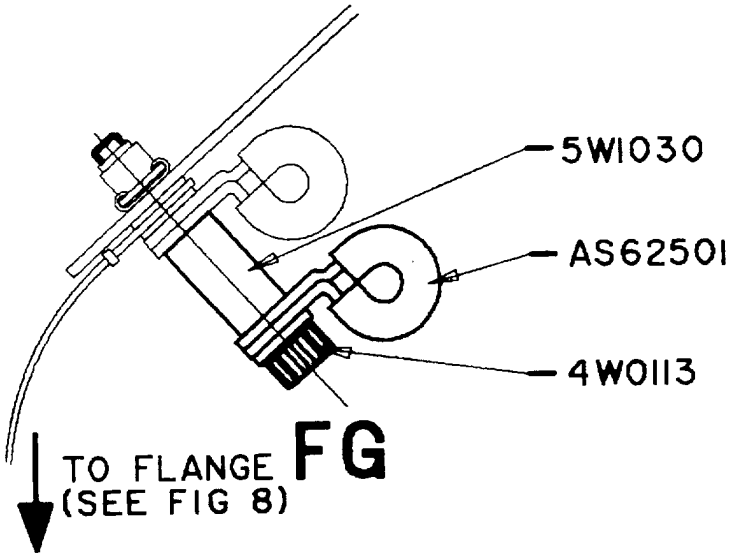
View on arrow AD (see figure 2) CP2337 - Before and after alteration
Fig.6





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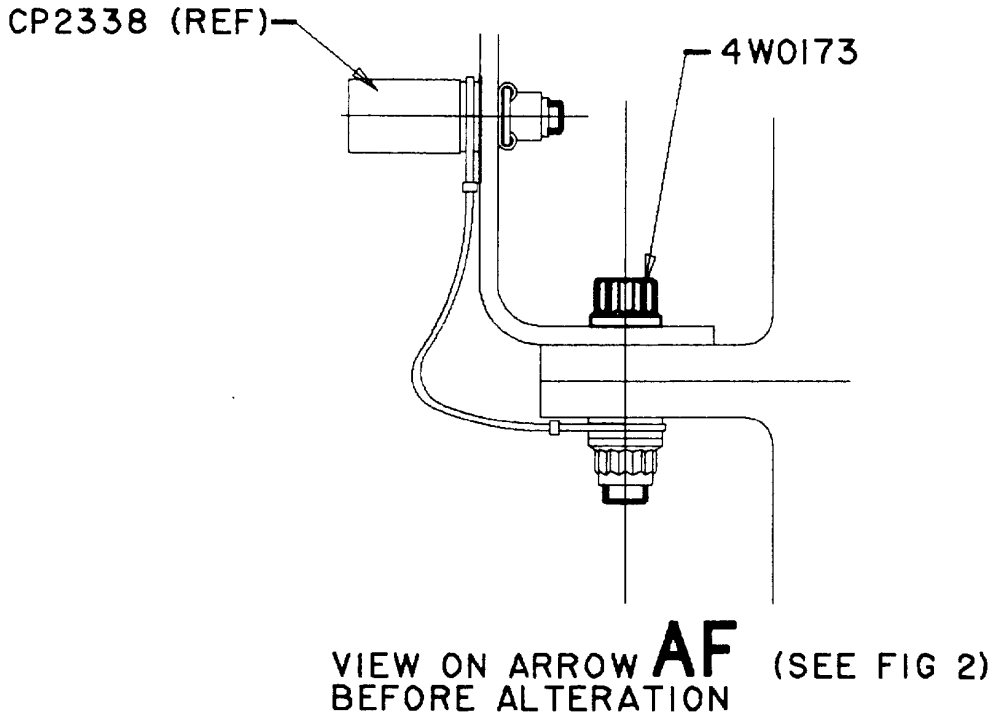
View on arrow AE (see figure 2) CP2338 - Before and after alteration
Fig.7



View on arrow AF (see figure 2) - Before and after alteration
Fig.8

2. Accomplishment Instructions

A. Rework Instructions

(1) Rework the parts that follow (for D5 Engine Marks):

6A4622 Adaptor - Flowmeter inlet end
(Refer to 73-31-17, Fig/Item 01-060)

Consumable Materials

CoMat 06-022 Fluorescent penetrant

Standard Equipment

Chemical cleaning equipment
Standard workshop equipment
Penetrant crack test equipment
Scribing tool
Vibro-engraving equipment

	Procedure	Supplementary Information
(a)	Chemically clean the adaptor	Refer to SPM TASK 70-11-03-300-503. Use chemical cleaning equipment
(b)	Mark the rework area	See Figure 9. Use a locally manufactured template with a scribing tool
(c)	Remove the unwanted material	See Figure 9. Use standard workshop equipment
(d)	Remove burrs and break sharp edges	Use standard workshop equipment
(e)	Do a local penetrant crack test of the reworked area	Refer to SPM TASK 70-23-05-230-501. Use CoMat 06-022 fluorescent penetrant, with penetrant crack test equipment. Cracks are not permitted
(f)	Visually examine and measure the dimensions of the adaptor	See Figure 9. Use standard workshop equipment
(g)	Cancel the existing part number and identify with the new part number	Refer to SPM TASK 70-09-00-400-501, SUBTASK 70-09-00-400-001. Existing Re-number 6A4622 6A5690 Use vibro-engraving equipment

(2) Rework the parts that follow (for D5 Engine Marks):

6A4623 Adaptor - Flowmeter outlet end
(Refer to 73-31-17, Fig./Item 01-070)

Consumable Materials

CoMat 06-022 Fluorescent penetrant

Standard Equipment

Chemical cleaning equipment
Standard workshop equipment
Penetrant crack test equipment
Scribing tool
Vibro-engraving equipment

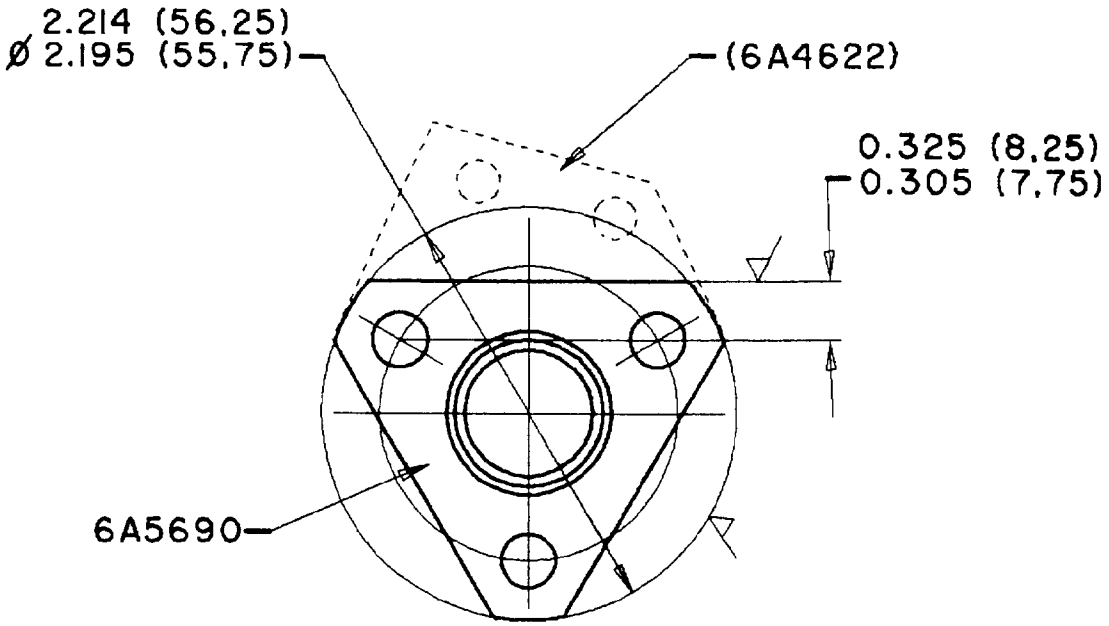
	Procedure	Supplementary Information
(a)	Chemically clean the adaptor Use chemical cleaning equipment	Refer to SPM TASK 70-11-03-300-503.
(b)	Mark the rework area	See Figure 10. Use a locally manufactured template with a scribing tool
(c)	Remove the unwanted material	See Figure 10. Use standard workshop equipment
(d)	Remove burrs and break sharp edges	Use standard workshop equipment
(e)	Do a local penetrant crack test of the reworked area	Refer to SPM TASK 70-23-05-230-501. Use CoMat 06-022 fluorescent penetrant, with penetrant crack test equipment. Cracks are not permitted
(f)	Visually examine and measure the dimensions of the adaptor	See Figure 10. Use standard workshop equipment
(g)	Cancel the existing part number and identify with the new part number	Refer to SPM TASK 70-09-00-400-501, SUBTASK 70-09-00-400-001 Existing Re-number 6A4623 6A5691 Use vibro-engraving equipment

B. Assembly Instructions

None.

C. Recording Instructions

(1) A record of accomplishment is necessary.



0.020 (0.50)
BREAK SHARP EDGES 0.004 (0.10)

SURFACE FINISH TO BE 125 (3.2) U.O.S.

ALL DIMENSIONS IN INCHES (MILLIMETRES)

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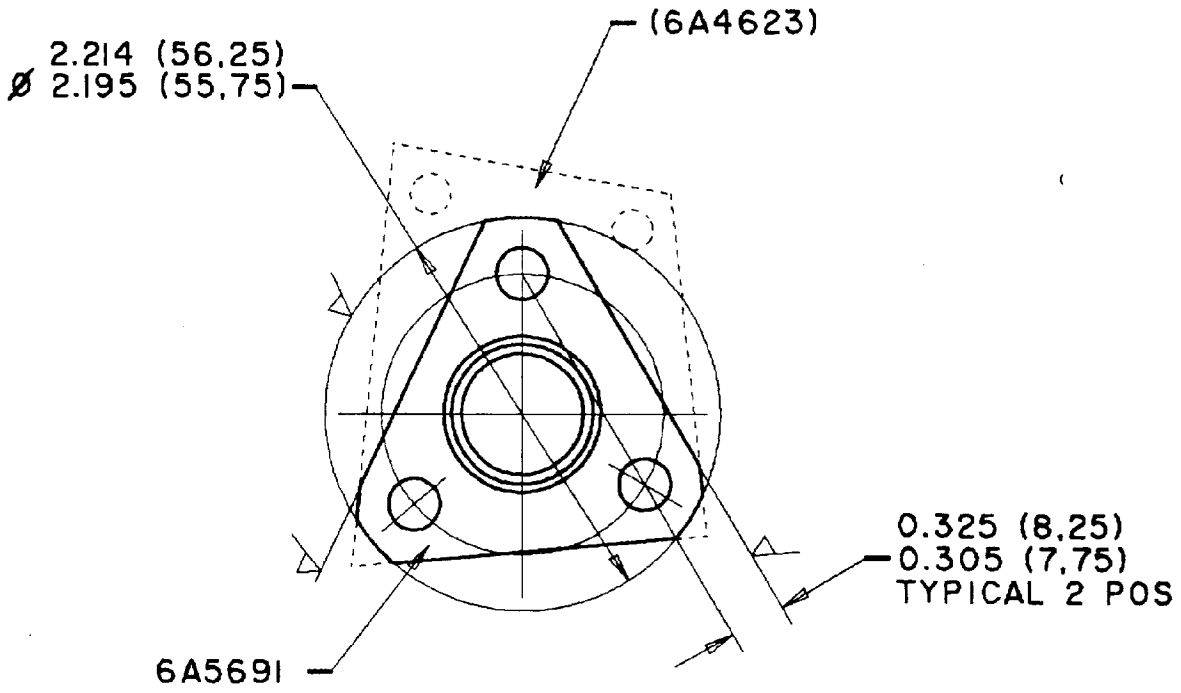
View showing rework of existing adaptors (6A4622)
Fig.9



0.020 (0,50)
BREAK SHARP EDGES 0.004 (0,10)

SURFACE FINISH TO BE 125 (3,2) U.O.S.

ALL DIMENSIONS IN INCHES (MILLIMETRES)

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View showing rework of existing adaptors (6A4623)
Fig.10

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
4W0113 (71-51-51)	1	8.24	Bolt, double hex) CP2338	AS20912 (01-853)	(A)(B)
5W1030 (71-51-51)	1	11.30	Spacer, sleeve) CP2338	- (01-858)	(A)(E)
4W0110 (71-51-51)	1	4.57	Bolt, double hex) CP2337	AS20908 (01-861)	(A)(B)
5W1030 (71-51-51)	1		Spacer, sleeve) CP2337	- (01-866)	(A)(E)
4W0172 (71-51-51)	1	6.78	Bolt, double hex - Bonding lead to flange FG	4W0173 (05-305)	(A)(B)
4W0171 (73-11-49)	3	8.46	Bolt, double-hex - Fuel inlet tube to flowmeter	AS21017 (07-506)	(A)(B)
AS46772D 300E (73-11-49)	1	58.50	Lead, electrical bonding	- (07-600)	(A)(E)
4W0106 (73-11-49)	1	4.39	Bolt, double-hex - Bonding lead to flowmeter support bracket	- (07-670)	(A)(E)
4W2621 (73-11-49	2	0.81	Washer	- (07-672)	(A)(E)
4W0001 (73-11-49)	1	2.53	Nut, double hex	- (07-674)	(A)(E)
AS6250l (73-11-49)	1	7.99	Clamp, cushion CP2337	- (07-676)	(A)(E)

AS62501 (73-11-49)	1		Clamp, cushion CP2338	- (07-678)	(A)(E)
4W0171 (73-11-49)	3	8.46	Bolt, double hex - Fuel outlet tube to flowmeter	AS21017 (08-106)	(A)(B)
6A5839 (73-31-17)	1	38.70	Bracket, support - Flowmeter inlet end	6A4620 (01-040)	(A)(C)
6A5690 (73-31-17	1	183.00	Adaptor - Flowmeter inlet end	6A4622 (01-060)	(A)(C)(F)
- (73-31-17)	2		Bolt, double hex - Bracket to inlet end adaptor	4W0108 (01-062)	(B)
- (73-31-17)	4		Washer	4W2621 (01-064)	(B)
- (73-31-17)	2		Nut, double hex	4W0001 (01-066)	(B)
6A5691 (73-31-17	1	183.00	Adaptor - Flowmeter outlet end	6A4623 (01-070)	(A)(C)(F)
- (73-31-17)	2		Bolt, double hex - Bracket to outlet end adaptor	4W0108 (01-072)	(B)
- (73-31-17)	4		Washer	4W2621 (01-074)	(B)
- (73-31-17)	2		Nut, double hex	4W0001 (01-076)	(B)
6A5840 (73-31-17)	1	236.00	Bracket assy - Flowmeter	6A4621 (01-080)	(A)(C)

C. Instructions/Disposition Code Statements:

(A) New parts currently available for sale
(B) Old parts will continue to be available for sale for other applications.
(C) Old parts no longer available for sale
(E) Old parts can be reworked and re-identified to the new part number

NOTE: The estimated 1997 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.