ENGINE - FUEL AND CONTROL - INTRODUCE NEW FUEL PUMP TO FUEL COOLED OIL COOLER TUBES WITH A REPOSITIONED RESTRICTOR ORIFICE - CATEGORY CODE 7 - MOD.ENG-73-0063

1. Planning Information

A. Effectivity

(1) Aircraft: McDonnell Douglas MD-90

(2) Engine: (a) V2525-D5 Engines before Serial No.V20026
(b) V2528-D5 Engines before Serial No.V20026

B. Concurrent Requirements

None

C. Reason

(1) Condition

Possible erosion of the Fuel Cooled Oil Cooler (FCOC) matrix.

(2) Background

Experience with a similar engine type has indicated that under extreme circumstances erosion of the FCOC matrix can result in oil contamination of the fuel system. In addition the fuel flow restrictor at the inlet to the FCOC can currently be fitted incorrectly.

Flow visualisation testing of the FCOC has indicted that matrix erosion is caused by direct impingement of fuel borne foreign objects such as wires and metal chips, due to the close proximity of the fuel flow restrictor.

(3) Objective

To reduce direct impingement of foreign objects on the FCOC matrix and prevent incorrect assembly of the fuel flow restrictor thereby ensuring correct fuel flow characteristics.

(4) Substantiation

Rig test have established that the new position of the fuel flow restrictor will alleviate the effects of direct debris impingement on the FCOC matrix. The addition of spigots on the pipe end connector and the fuel flow restrictor ensures against incorrect fitment.

(5) Effect of Bulletin on Workshop Procedures:

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

(6) Supplemental Information

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

D. Description

The existing LP fuel pump to FCOC fuel inlet tube assembly is replaced by two tube assemblies. The first tube runs from the L.P. fuel pump to the connector for the return to tank valve and the second tube runs from this connector to the FCOC fuel inlet. The fuel flow restrictor has been redesigned to prevent incorrect assembly and its location changed from the FCOC inlet end of the existing tube to the return to tank valve tube connector end of the new FCOC fuel inlet tube. The existing fuel diverter valve drain to disconnect tube has also been re-run to accommodate the new fuel tubes. Clip Point 2307 has been modified to suit the new fuel diverter valve drain to disconnect tube.

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 7

Accomplish when supply of superseded parts has been depleted.

G. Manpower

Estimated manhours to incorporate the full intent of this Bulletin:

	Venue	Estimated Manhours
(1)	In Service	Not Applicable
(2)	At Overhaul	Not Affected

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	Plus 1.6lb (0,726kg)
(2)	Moment arm	14.0in. (356mm) forward 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.

EC94VR011

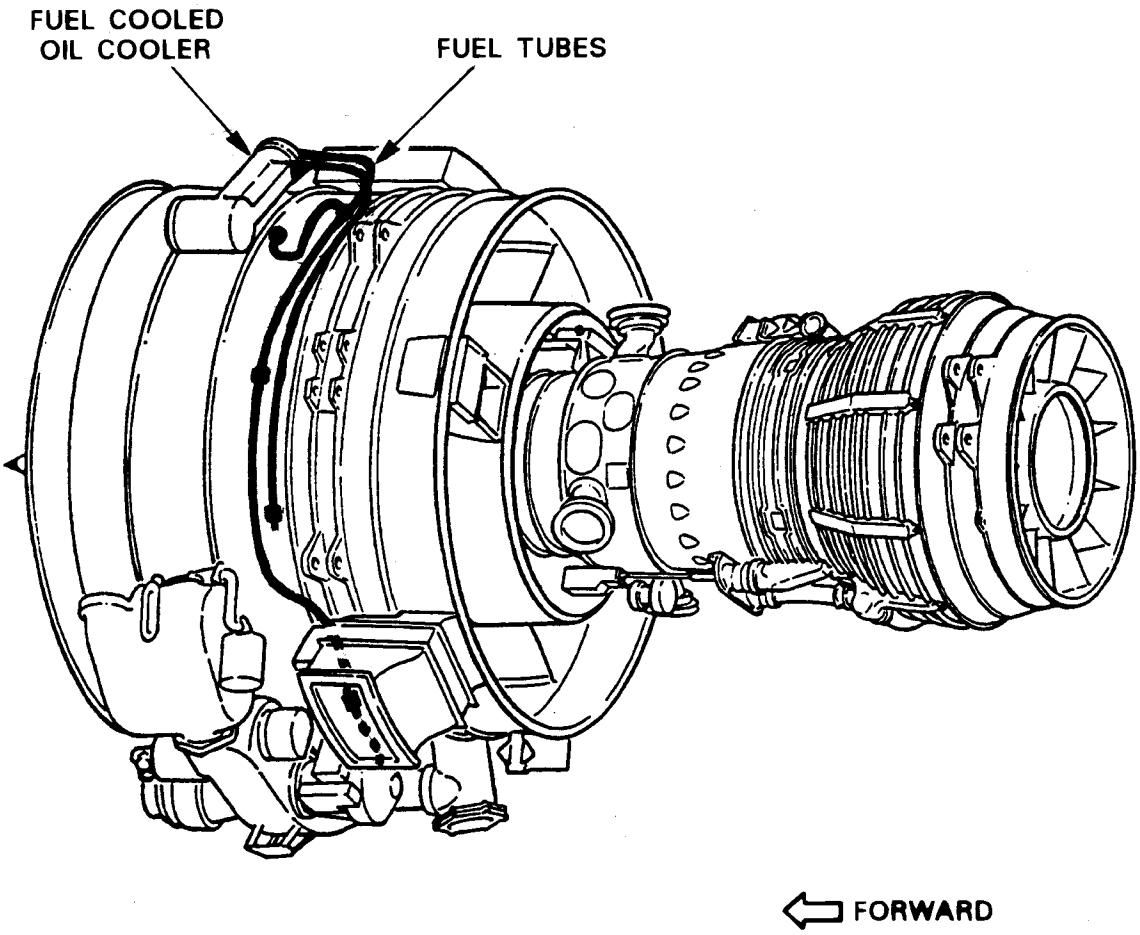
M. Other Publications Affected

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

(2) V2500 Engine Manual (E-V2500-3IA), 72-00-32, Removal -03 and -29, Installation -03 and -29.

(3) V2500 Component Maintenance Manual (CMM-THD-V2500-3IA), 71-71-49, Cleaning, Inspection and Repair, 73-11-49, Cleaning, Inspection and Repair.

(4) V2500 Engine Maintenance Manual (M-V2500-3IA), 73-13-43, Removal and Installation, 79-21-43, Removal and Installation.



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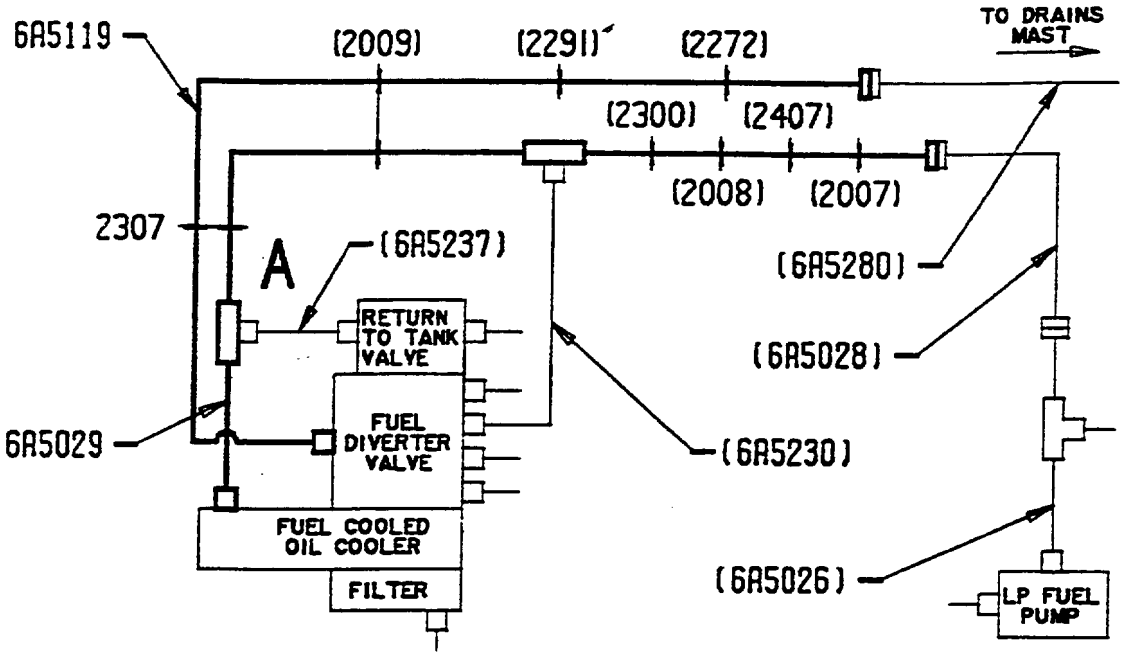
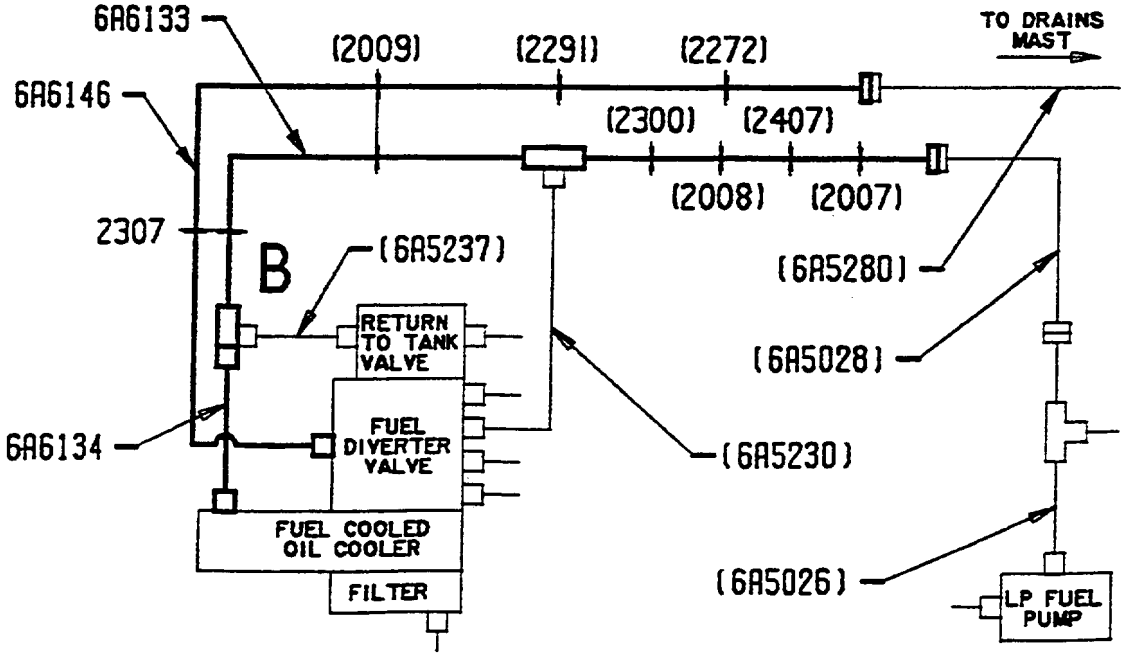
Location of fuel tubes
Fig.1



SCHEMATIC VIEW OF FUEL TUBES
BEFORE ALTERATION



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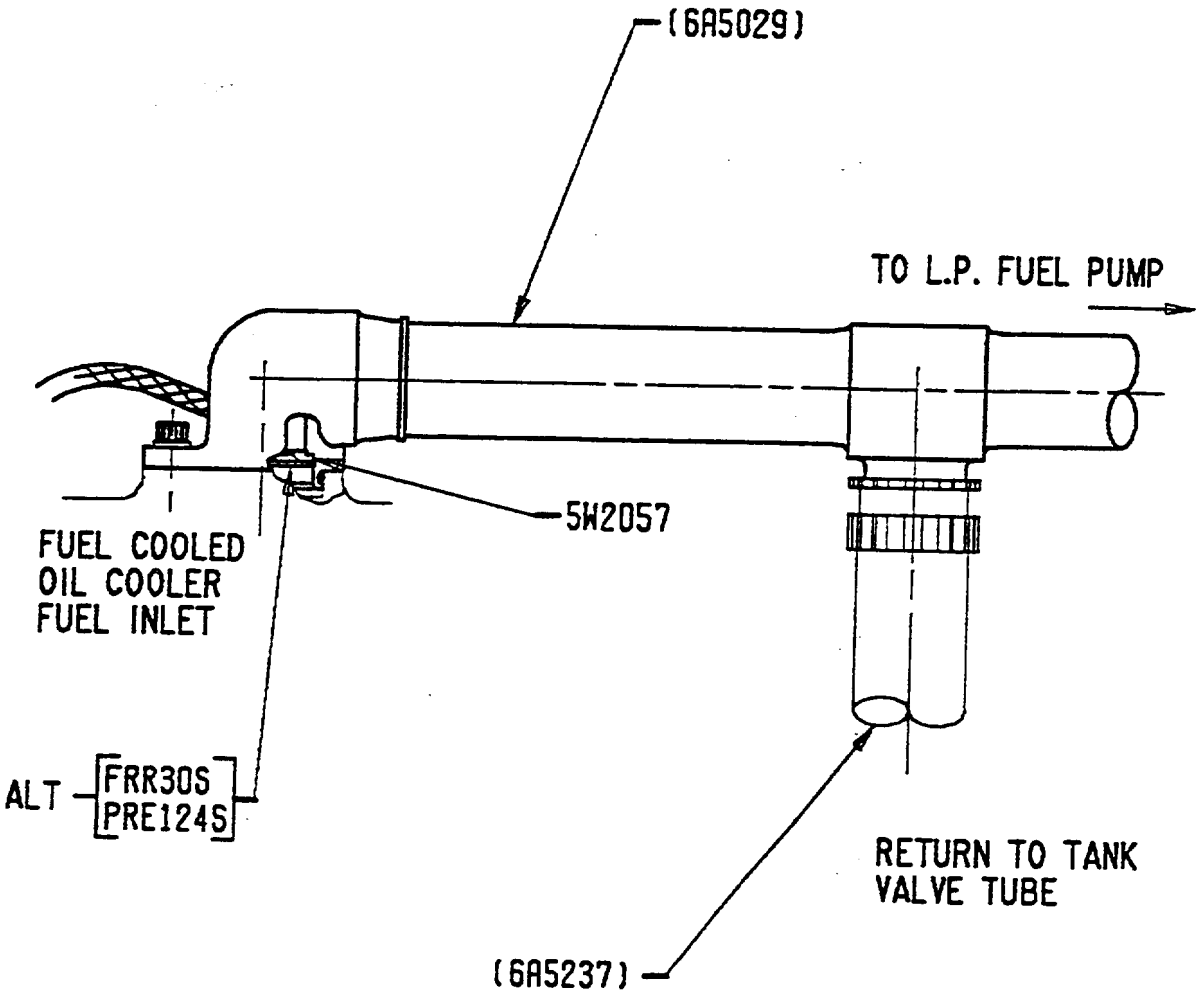
Schematic view of fuel tubes - Before and after alteration
Fig.2



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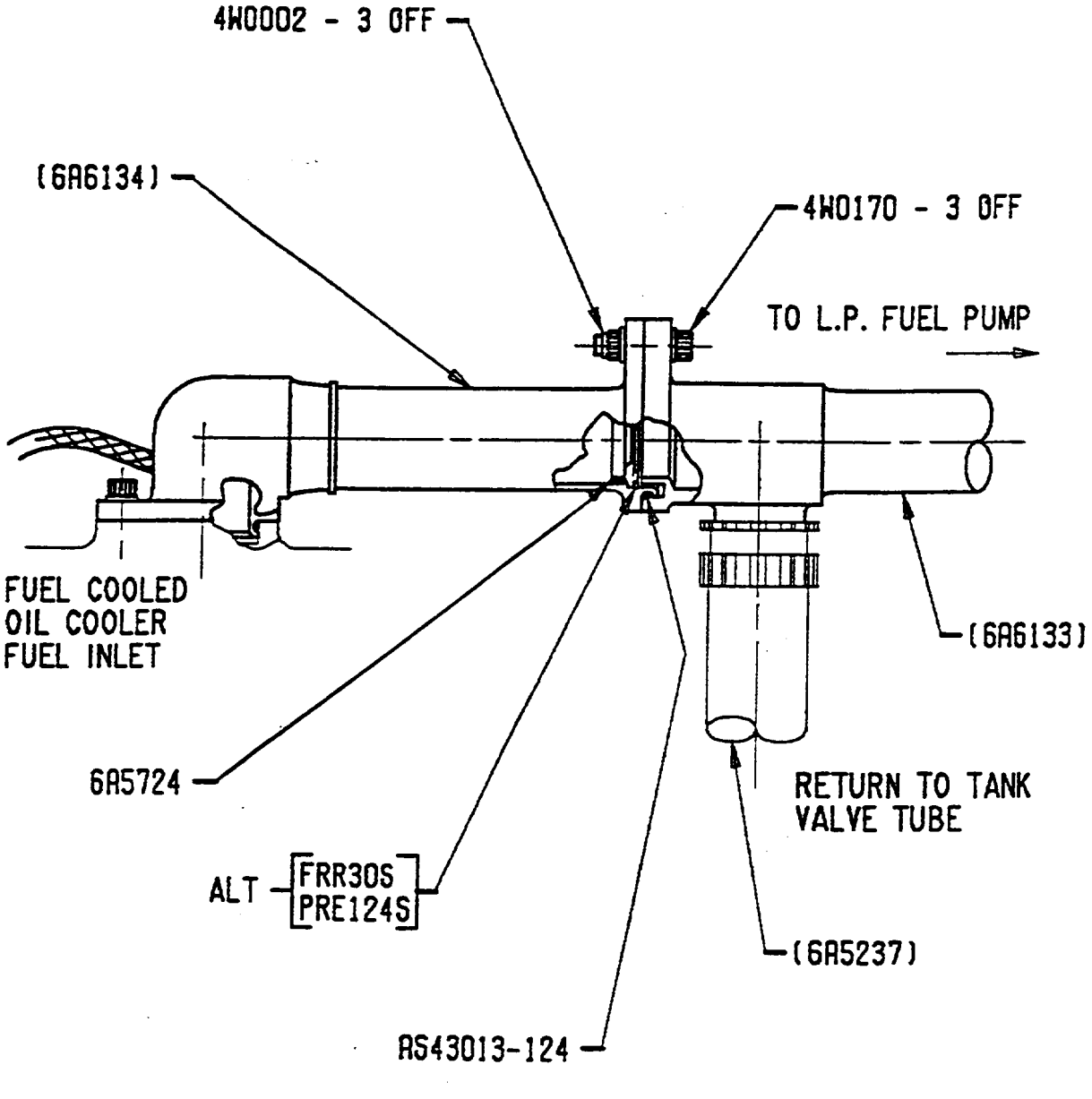
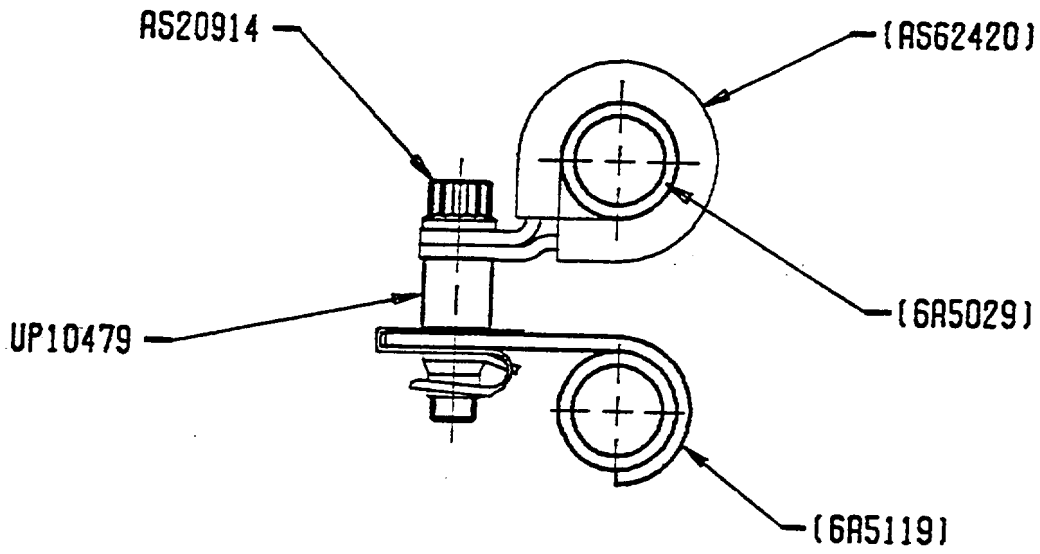
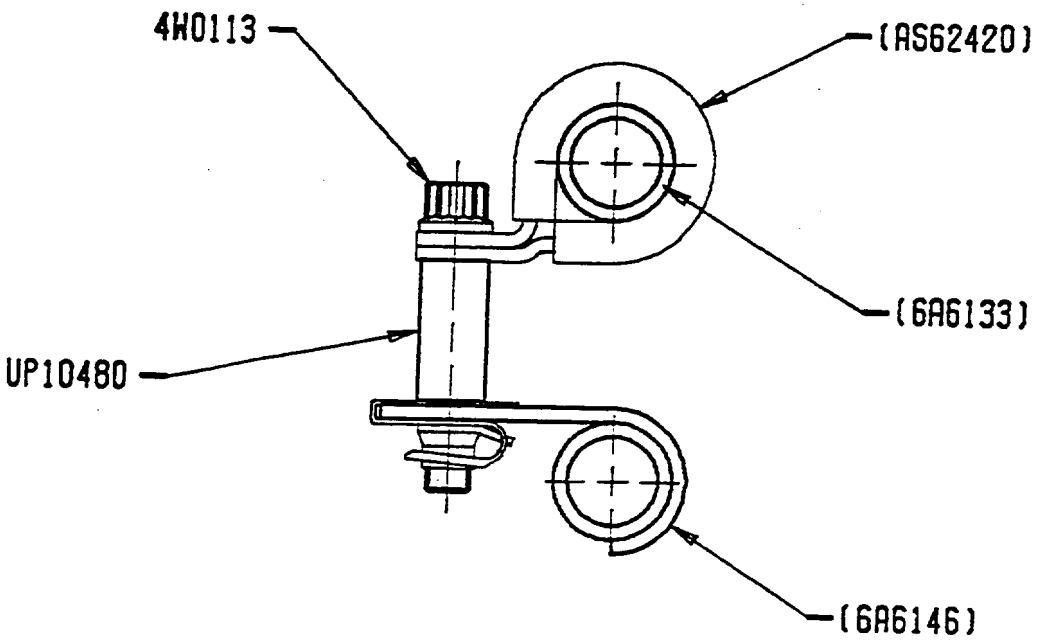
View at A (see Figure 2) - Before alteration
Fig.3



View at B (see Figure 2) - After alteration
Fig.4



CLIPPING POINT 2307
BEFORE ALTERATION



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Clipping point 2307 - Before and after alteration
Fig.5

2. Accomplishment Instructions

A. Rework Instructions

(1) There are no rework instructions necessary to accomplish this Service Bulletin.

B. Assembly Instructions

(1) Refer to V2500 Engine Manual for removal instructions (Refer to M.).

(2) Install a new AS43013-124 sealing ring, lubricated with CoMat 10-038 Petroleum Jelly or CoMat 10-060 Liquid Paraffin, on to the new 6A6133 fuel tube. Connect the 6A6133 fuel tube to the 6A5028 fuel tube using the existing bolts and nuts. Torque the nuts to 85 to 105 lbfin (10 to 12 Nm). Refer to Figures 1 and 2.

(3) Connect the 6A5237 fuel tube to the 6A6133 fuel tube using the union nut of the 6A5237 tube. Torque the union nut to 566 to 611 lbfin (64 to 69 Nm). Safety the union nut with CoMat 02-119 lockwire. Refer to Figures 1 and 2.

(4) Install a new AS43013-124 sealing ring, lubricated with CoMat 10-038 Petroleum Jelly or CoMat 10-060 Liquid Paraffin, on to each end of the new 6A6134 fuel tube. Connect the 6A6134 fuel tube to the 6A6133 fuel tube using the three 4W0170 bolts and three 4W0002 nuts. Torque the nuts to 85 to 105 lbfin (10 to 12 Nm). Refer to Figure 4.

WARNING: WHEN YOU USE COMAT 01-002 INHIBITED AND STABILIZED TRICHLOROETHANE YOU MUST USE THE NECESSARY PROTECTIVE CLOTHING. DO NOT GET THE SOLVENT ON YOUR SKIN OR IN YOUR EYES. YOU MUST NOT SMOKE WHEN YOU USE THE SOLVENT AS THE VAPOR CHANGES AND BECOMES TOXIC.

(5) Clean the mating faces of the existing bonding lead, washers, bolt and 6A6134 tube flange using CoMat 01-002 inhibited and stabilized trichloroethane. Install the 6A6134 fuel tube onto the FCOC using the existing bonding lead, washers and bolts. Torque the bolts to 85 to 105 lbfin (10 to 12 Nm). Refer to Figure 4.

(6) Connect the new 6A6146 drains tube to the Fuel Diverter and Return Valve and to the 6A5280 drains tube using the tube union nuts. Torque the nuts to 159 to 177 lbfin (18 to 20 Nm). Safety the nuts with CoMat 02-147 lockwire. Refer to Figure 2.

(7) Attach the 6A6133 fuel tube to the 6A6146 drains tube at clipping point 2307 using the new 4W0113 bolt and UP10480 spacer with the existing clip and clipnut. Torque the bolt to 36 to 45 lbfin (4 to 5 Nm). Refer to Figure 5.

(8) Install clipping points 2009, 2291, 2300, 2272, 2008, 2407 and 2007 on to the new 6A6133 and 6A6146 fuel tubes using the existing material. Torque the bolt at each clipping point to 36 to 45 lbfin (4 to 5 Nm). Refer to Figure 2.

C. Recording Instructions

(1) A record of accomplishment is necessary.

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
6A6146 (71-71-49)	1	641.00	Tube, Drains, Fuel diverter valve to disconnect - assy of	6A5119 (09-100)	(A)(B)(S1)
- (73-11-49)	1		Ring, Retainer Restrictor	FRR30S (02-488)	(E)(G)
- (73-11-49)	Ref		Ring, Retainer Restrictor	PRE124S (02-488)	(E)(G)
- (73-11-49)	1		Restrictor	5W2057 (02-490)	(B)
6A6133 (73-11-49)	1	10,350.00	Tube, LP Fuel, LP pump to disconnect - assy of	6A5029 (02-500)	(A)(B)(S1)
- (73-11-49)	2		Washer	4W2622 (02-512)	(H)
- (73-11-49)	1		Bolt	4W0173 (02-513)	(J)
- (73-11-49)	2		Bolt	4W0170 (02-514)	(K)
- (73-11-49)	1		Ring, Sealing Toroidal	AS43013-124 (02-516)	(L)

4W0113 (73-11-49)	1	8.24	Bolt))) CP2307	AS20914 (02-549)	(A)(1D)(S1)
UP10480	1	11.00	Spacer)	UP10479	(A)(1D)(S1)
- (73-11-49)	1		Lead, electrical bonding	AS46772E75E (02-660)	(M)
FRR30S (73-11-49)	1	3.44	Ring, Retainer Restrictor	- (32-088)	(N)(F)
PRE124S (73-11-49)	Ref	3.46	Ring, Retainer Restrictor	- (32-088)	(N)(F)
6A5724 (73-11-49)	1	38.90	Restrictor	- (32-090)	(A)
4W0170 (73-11-49)	3	5.42	Bolt	- (32-096)	(A)(C)
4W0002 (73-11-49)	3	8.42	Nut	- (32-097)	(A)(C)
AS43013-124 (73-11-49)	2	2.08	Ring, Sealing Toroidal	- (32-098)	(U)(2D)
6A6134 (73-11-49)	1	1239.00	Tube, L.P. Fuel, disconnect to FCOC - assy of	- (32-100)	(A)(C)
4W0170 (73-11-49)	2		Bolt	- (32-106)	(T)
4W0173 (73-11-49)	1	8.84	Bolt	- (32-107)	(R)
4W2622 (73-11-49)	2	0.81	Washer	- (32-108)	(P)
AS46772E75E (73-11-49)	1	57.90	Lead, electrical bonding	- (32-250)	(V)

C. Instructions/Disposition Code Statements:

(A) New part is currently available
(B) Old part will be discontinued
(C) Additional part
(1D) Old part can be used up in other applications
(2D) Quantity incrased to 2
(E) Alternative Parts
(F) Alternative Parts
(G) Re-itemised (32-088)
(H) Re-itemised (32-108)
(J) Re-itemised (32-107)
(K) Re-itemised (32-106)
(L) Re-itemised (32-098)
(M) Re-itemised (32-250)
(N) Was item (02-448)
(P) Was item (02-512)
(R) Was item (02-513)
(S1) New part may be used in place of old part but not vice-versa
(T) Was item (02-514)
(U) Was item (02-516)
(V) Was item (02-660)

D. Expendable Parts

Part No.	ATA/IPC No.	Qty	Keyword
AS43013-124	73-11-49, 02-310	1	Sealing Ring
AS43013-124	73-11-49, 32-098	2	Sealing Ring

E. Consumable Materials

CoMat 01-002	Inhibited and stabilized trichloroethane
CoMat 02-119	Lockwire
CoMat 02-147	Lockwire
CoMat 10-038	Petroleum Jelly
CoMat 10-060	Liquid Paraffin

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.