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Rolls-Royce

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

The technical information contained in this document has been approved under the authority of – See Planning Information, Approval.

Date Jul.18/14

RB211 TRENT 700 SERIES PROPULSION SYSTEMS NON-MODIFICATION SERVICE BULLETIN

ALERT

This document transmits Revision 2 to Service Bulletin RB211-73-AH522

Document History

Service Bulletin Revision Status		Supplement Revision Status
Initial Issue	Sep.20/13	
Revision 1	Mar.18/14	

Bulletin Revision 2

Remove	Incorporate	Reason for change
All pages of the Service Bulletin	Pages 1 to 36 of the Service Bulletin	To revise Aircraft Maintenance Manual reference in 3. Accomplishment Instructions and to revise Fig.9 (RR-RMR13446)
All pages of Appendix 1	Page 1 of Appendix 1	To revise Aircraft Maintenance Manual reference in 3. Accomplishment Instructions and to revise Fig.9 (RR-RMR13446)

CHECK THAT ALL PREVIOUS TRANSMITTALS HAVE BEEN INCORPORATED
If any have not been received please advise Customer Data Services, Rolls-Royce plc, Derby, England

All pages of Appendix 2	Page 1 and 2 of Appendix 2	To revise Aircraft Maintenance Manual reference in 3. Accomplishment Instructions and to revise Fig.9 (RR-RMR13446)
All pages of Appendix 3	Page 1 and 2 of Appendix 3	To revise Aircraft Maintenance Manual reference in 3. Accomplishment Instructions and to revise Fig.9 (RR-RMR13446)

Printed in Great Britain

LIST OF EFFECTIVE PAGES

The effective pages to this Service Bulletin following incorporation of Revision 2 are as follows:

	Page	Revision Number	Revision Date
	Bulletin		
R	1	2	Jul.18/14
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TRENT 700 - LP FUEL TUBES, CLIPS, AND FOHE MOUNTING HARDWARE - INSPECTION FOR FRETTAGE - NON-MODIFICATION SERVICE BULLETIN - MOD.73-AH522

1. Planning Information

A. Effectivity

Airbus A330

RB211 TRENT 768-60/15 Engines, Post SB73-F343 Engines

RB211 TRENT 768-60/16 Engines, Post SB73-F343 Engines

RB211 TRENT 772-60/15 Engines, Post SB73-F343 Engines

RB211 TRENT 772-60/16 Engines, Post SB73-F343 Engines

RB211 TRENT 772B-60/15 Engines, Post SB73-F343 Engines

RB211 TRENT 772B-60/16 Engines, Post SB73-F343 Engines

RB211 TRENT 772C-60/15 Engines, Post SB73-F343 Engines

RB211 TRENT 772C-60/16 Engines, Post SB73-F343 Engines

B. Reason

Low-pressure (LP) fuel leaks from the LP fuel tube run between the Fuel/Oil Heat Exchanger (FOHE), and the LP/HP fuel pump have occurred in-service in the Trent 700 fleet. Movement of the FOHE mounts due to wear allows the fuel tubes to move excessively within the clipping points. This has resulted in excessive wear of the rubber section of the P-Clips, and the subsequent frettage between the exposed metal band and the fuel tubes. The frettage reduces the fuel tube outer wall thickness, leading to fracture of the fuel tube and the consequent fuel leak. This may cause the leakage of significant amounts of fuel and can cause IFSD and diversion events. This Non-Modification Service Bulletin (NMSB) is designed to provide proactive mitigation for wear on the clipping of the fuel pipe from the FOHE to the HP pump inlet when installed on-wing and to make sure wear on other connected pipes and clips is inspected for at engine shop visit.

R Revision 1 of this NMSB was issued to correct errors reported against initial issue and to include a complete inspection of all the LP fuel pipes as per NMSB 73-G848, which will now be cancelled.

R Revision 2 of this NMSB is issued to revise Aircraft Maintenance Manual
R reference in 3. Accomplishment Instructions and to revise Fig.9 to show correct
R link orientation.

C. Description

This NMSB is issued to recommend on-wing inspection of the P-clips on the LP fuel tube (P/N FW53576) and the FOHE mounts and also to inspect all the LP fuel pipes between the FOHE fuel pump and the FOHE mounts at each engine shop visit.

Advise your local Rolls-Royce representative of NMSB accomplishment and any significant inspection results in the table provided (Appendix 1) or similar, and provide to Rolls-Royce.

D. Compliance

ALERT

This NMSB is anticipated to be the subject of an EASA/FAA Airworthiness Directive.

(1) On-wing

Complete the actions detailed in 3.A. Accomplishment Instructions at the following intervals:

(a) Inspect within 4000 hours either from:

(i) New delivery

(ii) Last fuel tube inspection. This may have been in accordance with NSMB 73-G848, implementation of NMSB 73-G848 addresses all the inspections of this NMSB.

(b) If elapsed time has already exceeded 3200 hours then inspect within 800 hours.

(c) Following initial inspection, repeat the inspection at intervals not exceeding 4000 hours.

(2) In-shop

Complete the actions detailed in 3.B. Accomplishment Instructions at the following intervals:

At every engine shop visit.

E. Approval

The technical content of this Non-Modification Service Bulletin was approved
R under the authority of Design Organisation Approval EASA.21J.035 on Sep.20/13,
R Mar.12/14 and re-approved on Jul.10/14.

F. Manpower

(1) On-wing

(a) Time to gain access

0.5 hours (2 persons)

(b) Time to inspect

1 hours (1 person)

(c) Time to replace tubes and restore to serviceable condition

2 hours (2 persons)

(2) In-shop

(a) Time to inspect

2 hours (1 person)

(b) Time to replace tubes

3 hours (2 persons)

NOTE: The parts affected by this Non-Modification Service Bulletin are accessible at overhaul and on-wing

G. Material Price and Availability

Not affected.

H. Tooling Price and Availability

Special tools are not required.

I. References

(1) Rolls-Royce RB211 Service Bulletin:

73-F343

Fuel - Fuel Tubes - LP Compressor Case - Introduction of revised LP Fuel Tube Assemblies, Associated Bracketry and Clipstacks

(2) Rolls-Royce RB211 Non-Modification Service Bulletin:

73-G848

LP - Fuel Tubes, Clips, and FOHE Mounting Hardware - Inspection for Frettage - Non-Modification Service Bulletin

(3) Engine Manual:

(a) 72-00-34, Install the Components on the Low Pressure (LP) Compressor Case

(b) 72-00-34, Install the Tubes and Raceways on the Low Pressure (LP) Compressor

(c) 72-00-34, Remove the Tubes and Raceways from the Low Pressure (LP) Compressor

(d) 72-00-34, Remove the Components from the Low Pressure (LP) Compressor Case

(4) Engine Illustrated Parts Catalogue:

(a) 73-11-47, Fuel Tubes LP Compressor Case

(b) 79-21-11, Fuel Oil Heat Exchanger

(c) 72-34-15, LP Compressor Rear Case

(d) 72-35-16, LP Compressor Case Accessory Mounts

(5) Airbus A330 Aircraft Maintenance Manuals

(a) 79-21-41, Removal of the Fuel Oil Heat Exchanger

(b) 79-21-41, Installation of the Fuel Oil Heat Exchanger

(c) 71-13-00, Open the Fan Cowl Doors

(d) 71-13-00, Close the Fan Cowl Doors

(e) 71-00-00, Test No.2, The Fuel and Oil Leak Test

(f) 70-12-01, Removal of Rigid Tubes and Flexible Hose Assemblies

(g) 70-12-01, Installation of Rigid Tubes and Flexible Hose Assemblies

(6) Aircraft Illustrated Parts Catalogue:

(a) 73-12-41, Pump - Fuel

(b) 79-21-41, Pump - Lubrication and Scavenge Oil

2. Material Information

A. The following parts may be required if rejected during inspection:

73-11-47

FIG/ITEM NO.	PART NO.	QTY	PART TITLE	MAT
04045	AS48408	1	Bolt, Bihex hd, 0.190 in. dia x 0.500 in.	-
04050	FW26690	1	Bracket, Assy accessory mounting	-
04051	AS20625	2	Nut, 0.250 in. dia	-
04052	AS12944	2	Washer, 0.250 in. dia	-
04054	AS48515	2	Bolt, 0.250 in. dia x 0.938 in.	-
04070	FW36334	1	Bracket, Assy accessory mounting	-
04071	AS20625	2	Nut, 0.250 in. dia	-
04072	AS12944	2	Washer, 0.250 in. dia	-
04074	AS48515	2	Bolt, 0.250 in. dia x 0.938 in.	-
04075	AS48516	1	Bolt, 0.250 in. dia x 1.000 in.	-
04100	FW26589	1	Tube, assy fuel - LP pump to line disconnect	-
04106	BLT5529	3	Bolt, 0.250 in. dia x 1.028 in.	-
04108	AS43013-134	1	Ring	-
04110	AS20625	4	Nut, 0.250 in. dia	-
04114	AS48515	4	Nut, 0.250 in. dia x 0.938 in.	-
04116	AS43013-127	1	Ring, 36.17 mm I/D x 2.62 mm	-
04300	FW36335	1	Tube, assy fuel line disconnect to line disconnect	-
04304	AS20625	4	Nut, 0.250 in. dia	-
04306	AS48515	4	Bolt, 0.250 dia x 0.938	-
04308	AS43013-127	1	Ring, 36.17 mm I/D x 2.62 mm	-
04341	AS48410	1	Bolt, 0.190 in. dia x 0.625 in.	-
04342	K8831	1	Washer, 0.190 in. dia	-
04344	AS62424	1	Clip, 38.10 mm (1.500 in.)	-
04347	AS12943	1	Washer, 0.190 in. dia	-
04348	AS20624	1	Nut, 0.190 dia	-
04500	FW26587	1	Tube, assy fuel - Line disconnect to FCOC	-
04514	BLT5529	3	Bolt, 0.250 in. dia x 1.028 in.	-

04516	AS43013-134	1	Ring	-
04533	AS48409	1	Bolt, 0.190 in. dia x 0.562 in.	
04534	K8831	1	Washer, 0.190 in. dia x 0.51 mm thk	-
04536	AS62424	1	Clip, 38.10 mm	-
04539	AS12943	1	Washer, 0.190 in. dia	-
04540	AS20624	1	Nut, 0.190 in. dia	-
04557	AS48409	1	Bolt, 0.190 in. dia x 0.562 in.	-
04558	K8831	2	Washer, 0.190 dia x 0.51 mm thk	
04560	AS62424	1	Clip, 38.10 mm	-
04564	AS20624	1	Nut, 0.190 in. dia	-
04565	AS48412	1	Bolt, 0.190 in. dia x 0.750 in.	-
04566	K8831	2	Washer, 0.190 in. dia x 0.51 mm thk	-
04568	AS62424	1	Clip, 38.10 mm	-
04572	AS20624	1	Nut, 0.190 in. dia	-
04576	AS62424	1	Clip, 38.10 mm	-
04581	AS48408	1	Bolt, 0.190 in. dia x 0.562 in.	-
04582	K8831	1	Washer, 0.190 in. dia x 0.51 mm thk	-
04584	AS62424	1	Clip, 38.10 mm	-
04587	AS12943	1	Washer, 0.190 in. dia	-
04588	AS20624	1	Nut, 0.190 in. dia	-

73-11-47

FIG/ITEM NO.	NEW PART NO.	QTY	PART TITLE	MAT
05070	FW27392	1	Bracket, angle, clipping	-
05100	FW53576	1	Tube, assy fuel, FCOC to line disconnect	-
05106	BLT5529	3	Bolt, 0.250 in. dia x 1.028 in.	-
05108	AS43013-134	1	Ring	-
05110	AS20625	4	Nut, 0.250 in. dia	-
05114	AS48515	4	Bolt, 0.190 in. dia x 0.938 in.	-
05116	AS43013	1	Ring, 36.17 mm I/D 2.62 mm	-
05125	AS48409	1	Bolt, 0.190 in. dia x 0.562 in.	-
05126	K8831	1	Washer, 0.190 in. dia x 0.51 mm thk	-

05128	AS62424	1	Clip, 38.10 mm (1.500 in.)	-
05131	AS12943	1	Washer, 0.190 in. dia	-
05132	AS20624	1	Nut, 0.190 in. dia	-
05141	AS48408	1	Bolt, 0.190 in. dia x 0.500 in.	-
05142	K8831	1	Washer, 0.190 in. dia x 0.51 mm thk	-
05144	AS62424	1	Clip, 38.10 mm (1.500 in.)	-
05150	K8831	1	Washer, 0.190 in. dia x 0.51mm thk	-
05152	AS62424	1	Clip, 38.10 mm (1.500 in.)	-
05155	AS12943	1	Washer, 0.190 in. dia	-
05156	AS20624	1	Nut, 0.190 in. dia	-
05165	AS48410	1	Bolt, 0.190 in. x 0.625 in.	-
05166	K8831	1	Washer, 0.190 in. dia x 0.51 mm thk	-
05168	AS62424	1	Clip, 38.10 mm (1.500 in.)	-
05171	AS12943	1	Washer, 0.190 in. dia	-
05172	AS20624	1	Nut, 0.190 in. dia	-
05500	FW53577	1	Tube, assy fuel - line disconnect to HP pump	-
05514	BLT5529	3	Bolt, 0.250 in. dia x 1.028 in.	-
05516	AS43013-134	1	Ring	-

79-21-11

FIG/ITEM NO.	NEW PART NO.	QTY	PART TITLE	MAT
01015	FK24907	1	Bracket, angle bonding lead	-
01031	AS20626	1	Nut, 0.3125 in.	-
01035	AS54722	1	Bolt	-
01036	BLT5477	2	Bolt, 0.3125 in. dia x 1.240 in.	-
01070	AS20626	1	Nut, 0.3125 in.	-
01072	AS12945	1	Washer	-
01074	AS54744	1	Bolt, 0.3125 in. dia x 2.750 in.	-
01280	FK10141	1	Bracket, assy of FCOC support strut	-
01282	BLT5477	2	Bolt, 0.3125 in. dia x 1.240 in.	-
01284	AS12945	2	Washer	-
01300	FK19290	1	Strut, assy FOHE support - Front	-
01302	AS20626	1	Nut, 0.3125 in.	-
01306	AS54722	1	Bolt	-
01310	UP11630	2	Spacer	-
01350	FK10129	1	Bracket, assy of FCOC mounting - Upper	-
01352	AS20625	2	Nut, 0.250 in. dia	-

01354	AS48521	2	Bolt, 0.250 in. dia x 1.312 in.	-
01356	AS12944	4	Washer, 0.250 in. dia	-
01400	FK19924	1	Plate, assy FCOC support	-
01402	AS20626	1	Nut, 0.3125 in.	-
01404	AS54722	1	Bolt	-
01500	FK19264	1	Strut, assy FOHE support - Lower	-
01502	AS20626	1	Nut, 0.3125 in.	-
01504	AS54722	1	Bolt	-
01510	UP11630	1	Spacer	-
01512	AS20626	1	Nut, 0.3125in.	-
01513	AS12945	1	Washer	-
01514	BLT5579	1	Bolt, 0.3125 in. dia x 1.500 in. LG	-
01560	FK19265	1	Link, assy FOHE support - Lower	-
01562	AS20626	1	Nut, 0.3125 in.	-
01564	AS54722	1	Bolt	-
01580	FK19266	1	Link, assy FOHE support - Upper	-

72-34-15

FIG/ITEM NO.	NEW PART NO.	QTY	PART TITLE	MAT
02330	FK11165	1	Bracket, assy FCOC forward mounting	-
02340	FK11164	1	Bracket, assy FCOC brace mounting	-
04321	BLT5512	4	Bolt	-
04330	AS12945	4	Washer	-

72-35-16

FIG/ITEM NO.	NEW PART NO.	QTY	PART TITLE	MAT
05445	FEB5032	1	Strap, Bonding lower - FCOC to rear fancase	-
05446	AS20624	1	Nut, 0.190 in. dia	-
05447	AS12943	2	Washer, 0.190 in. dia	-
05448	AS48410	1	Bolt, 0.190 dia x 0.625 in.	-
05480	FK10140	1	Bracket, assy of FCOC mounting - Lower	-
05502	AS20625	2	Nut, 0.250 in. dia	-
05504	AS12944	3	Washer, 0.250 in. dia	-
05505	AS48518	2	Bolt, 0.250 in. dia x 1.125 in.	-
05507	AS48408	2	Bolt, 0.190 in. dia x 0.500 in.	-

79-11-11

01035	FW26692	1	Bracket, clipping - oil tank top flange -

3. Accomplishment Instructions

A. On-wing - Inspect the fuel tube under the p-clips on the fuel tube (P/N FW53576), FOHE to HP fuel pump. Also inspect the FOHE mounting hardware. Refer to Fig.1 through Fig.10.

WARNING: YOU MUST BE CAREFUL WHEN YOU WORK ON THE ENGINE AFTER THE ENGINE IS SHUTDOWN. THE ENGINE CAN STAY HOT FOR ALMOST ONE HOUR.

WARNING: YOU MUST NOT TOUCH HOT PARTS WITHOUT APPLICABLE GLOVES. HOT PARTS CAN CAUSE INJURY. IF YOU GET AN INJURY, PUT IT IN COLD WATER FOR 10 MINUTES. THEN GET MEDICAL AID.

CAUTION: IN ORDER TO REDUCE THE POTENTIAL FOR MULTIPLE ENGINE IN-FLIGHT SHUT DOWN, POWER LOSS, OR OTHER ANOMALY DUE TO MAINTENANCE ERROR, ROLLS-ROYCE RECOMMENDS THAT OPERATORS AVOID PERFORMING MAINTENANCE ON MULTIPLE ENGINES INSTALLED ON THE SAME AIRCRAFT AT THE SAME TIME. IF IT IS NOT POSSIBLE TO AVOID MAINTENANCE ON MORE THAN ONE ENGINE AT THE SAME TIME, ROLLS-ROYCE RECOMMENDS THAT ADDITIONAL CONTROLS ARE APPLIED IN ORDER TO ENSURE THAT MAINTENANCE TASKS HAVE BEEN COMPLETED AS DEFINED. MAINTENANCE GUIDELINES SHOULD BE REVISED, WERE POSSIBLE, TO PROMOTE THIS RECOMMENDATION.

(1) Gain access

(a) Open the fan cowl doors; refer to Aircraft Maintenance Manual (AMM) 71-13-00.

(i) For 4030EM1 (POWERPLANT- DEMOUNTABLE, ENG1): 415AL 416AL

(ii) For 4030EM2 (POWERPLANT- DEMOUNTABLE, ENG2): 425AL 426AR

(b) Put suitable access platform into a safe position.

(2) Visually inspect all clip positions (CP4881, CP2607 and CP2427) on the FOHE to HP fuel pump fuel pipe upper section (P/N FW53576) for damage/wear. Refer to Fig.1, Fig.3, Fig.4 and Fig.5.

(a) Remove clip CP4881 to inspect the fuel tube in accordance with criteria as specified in step 3.A.(2)(c).

(i) Clipping positions CP4881, CP2607 and CP2427 are located on fuel tube FW53576 (FOHE outlet to HP fuel pump inlet). Refer to Fig.1, Fig.3, Fig.4 and Fig.5.

(ii) Do not refit this clip, replace with new at each inspection in accordance with Aircraft Maintenance Manual 70-12-01. Refer to Service Bulletin 73-F343 for specific installation instructions and Fig.3, Fig.4 and Fig.5 for clipping point details.

(iii) If a fuel tube is rejected, remove and replace it in accordance with Aircraft Maintenance Manual 70-12-01. Refer to Service Bulletin 73-F343 for specific installation instructions and Fig.2, Fig.3, Fig.4 and Fig.5 for tube and clipping point details.

(b) Make sure clip and tube are returned to a serviceable condition before moving to the next task.

NOTE: During removal of the clips look for any significant relaxation of strain that suggests poor alignment of the tubes and stressing of certain clipping positions. If necessary loosen adjacent clips and carefully manipulate the tube alignment to minimise any strain in the system. Make a note on the proforma (Appendix 1) if alignment issues are seen.

(c) Fuel tube acceptance and rejection criteria.

Contact frettage to a depth greater than 0.1 mm (0.004 in.) on the outer surface of a bend	Reject
Contact frettage to a depth greater than 0.2 mm (0.008 in.) in any other area is evident	Reject

NOTE: Take particular care to inspect the entire exposed surface of the tube. A mirror can be used in areas where direct line of sight access is difficult.

(d) Repeat steps 3.A.(2)(a) to 3.A.(2)(c) for the clips CP2607 and CP2427. Refer to Fig.4 and Fig.5.

(3) Inspect all FOHE mounts and associated hardware for signs of obvious damage and excessive wear. Refer to Fig.6, Fig.7, Fig.8, Fig.9 and Fig.10.

NOTE: It is not necessary to remove the FOHE from the engine or disconnect the oil and fuel tubes. It is acceptable to inspect the FOHE mounts and associated hardware whist the FOHE is installed on the engine.

NOTE: The FOHE mounts/links/brackets can be removed, inspected and replaced one at a time.

NOTE: The purpose of this inspection is to identify noticeable play in the spherical bearings of the FOHE mounts. In most cases this can be done without removing hardware, by manipulating the FOHE and mounts. If wear is suspected then remove the bolt at one end of the link/strut for more detailed assessment.

(a) Inspect the following FOHE mounts and associated hardware one at a time. If required remove the bolt at one end of the link/strut for assessment in accordance with Aircraft Maintenance Manual 79-21-41 and examine by manipulation and visual inspection in accordance with the criteria as specified in step 3.A.(3)(b).

EIPC Ref	Part No.	Description
79-21-11, 01-280	FK10141	Bracket, assy of FCOC support strut
79-21-11, 01-300	FK19290	Strut, assy FOHE support - Front
79-21-11, 01-350	FK10129	Bracket, assy of FCOC mounting - Upper
79-21-11, 01-400	FK19924	Plate, assy FCOC support
79-21-11, 01-500	FK19264	Strut, assy FOHE support - Lower
79-21-11, 01-560	FK19265	Link, assy FOHE support - Lower
79-21-11, 01-580	FK19266	Link, assy FOHE - Upper
72-34-15, 02-330	FK11165	Bracket, assy FCOC forward mounting
72-34-15, 02-340	FK11164	Bracket, assy FCOC brace mounting
72-35-16, 05-480	FK10140	Bracket, assy FCOC brace mounting

NOTE: If replacement of damaged parts is not possible during inspection then they can be replaced within 800 flight hours.

(b) FOHE mounting hardware acceptance and rejection criteria:

Bearing tight but not seized	Accept
Low friction but no play in bearings	Accept
Minor scratches/score marks	Accept
Play in spherical bearings	Replace within 800 flight hours
Spherical bearings seized	Replace within 800 flight hours
Bent or twisted	Replace within 800 flight hours

(4) If fancase mounting brackets P/N FK10140, P/N FK11165 or P/N FK11164 is found to be unserviceable, remove and replace in accordance with the following instructions. Refer to Fig.8 and Fig.10.

(a) Remove and install the bracket (P/N FK10140). Refer to Fig.8.

(i) Remove the three bolts (P/N AS48518), the four washers (P/N AS12944) and the three nuts (P/N AS20625) that attach the bracket to flange FC.

(ii) Remove the bracket (P/N FK10140).

(iii) Attach the new bracket to bracket (P/N FK14374) and the flange FC. Use the three bolts (P/N AS48518), the four washers (P/N AS12944) and the three nuts (P/N AS20625).

(iv) Torque the nuts (72-35-16, 05-502) to 11.5 Nm (100 lbfin).

(b) Remove and install the bracket (P/N FK11165). Refer to Fig.10.

(i) Remove the two bolts (P/N BLT5512) and the two washers (P/N AS12945) that attach the bracket to flange FB.

(ii) Remove the bracket (P/N FK11165).

(iii) Locally clean bracket fitment area and new bracket mating faces using an OMat 2/101 lint-free cloth moistened with either OMat 135 Methyl Ethyl Ketone, OMat 150 Acetone, OMat 1/40 Isopropyl alcohol or OMat 1/257 cleaning solvent.

(iv) Apply jointing compound MSRR 9055 (Hylomar Grade L) to the mating face of bracket (P/N FK11165).

(v) Attach the new bracket to flange FB. Use the two bolts (P/N BLT5512) and the two washers (P/N AS12945).

(vi) Torque the bolts (P/N BLT5512) to 24 Nm (210 lbfin).

(vii) Remove excess jointing compound.

(c) Remove and install the brackets (P/N FK11164) and (P/N FK20859). Refer to Fig.10.

(i) Remove the two bolts (P/N BLT5512) and the two washers (P/N AS12945) that attach the bracket to flange FB.

(ii) Remove the brackets (P/N FK11164) and (P/N FK20859).

(iii) Locally clean bracket fitment area and new bracket mating faces using an OMat 2/101 lint-free cloth moistened with either OMat 135 Methyl Ethyl Ketone, OMat 150 Acetone, OMat 1/40 Isopropyl alcohol or OMat 1/257 cleaning solvent.

(iv) Apply jointing compound MSRR 9055 (Hylomar Grade L) to the mating face of bracket (P/N FK11165).

(v) Attach the new brackets (P/N FK11164) and (P/N FK20859) to flange FB. Use the two bolts (P/N BLT5512) and the two washers (P/N AS12945).

(vi) Torque the bolts (P/N BLT5512) to 24 Nm (210 lbfin).

(vii) Remove excess jointing compound.

(5) Re-assemble the FOHE mounts and links in accordance with Aircraft
R Maintenance Manual, 79-21-41.

(6) Close the fan cowl doors; refer to Aircraft Maintenance Manual (AMM) Task 71-13-00.

(a) For 4030EM1 (POWERPLANT-DEMOUNTABLE, ENG1): 415AL 416AL

(b) For 4030EM2 (POWERPLANT-DEMOUNTABLE, ENG2): 425AL 426AR

(7) Remove the access platform.

(8) If any fuel tube was replaced then do a fuel and oil leak test in accordance with Aircraft Maintenance Manual, 71-00-00, Test No.2, The Fuel and Oil Leak Test.

(9) If any abnormal findings or damage was noted, complete Proforma (Appendix 2) and return to Rolls-Royce FSO.

B. At shop visit - Inspect the fuel tubes (Part numbers FW26589, FW36335, FW26587 and FW53576, FW53577), P-clips and FOHE mounting hardware for

wear/damage/frettage. Refer to Fig.1 to Fig.17.

WARNING: YOU MUST BE CAREFUL WHEN YOU WORK ON THE ENGINE AFTER THE ENGINE IS SHUTDOWN. THE ENGINE CAN STAY HOT FOR ALMOST ONE HOUR.

WARNING: YOU MUST NOT TOUCH HOT PARTS WITHOUT APPLICABLE GLOVES. HOT PARTS CAN CAUSE INJURY. IF YOU GET AN INJURY, PUT IT IN COLD WATER FOR 10 MINUTES. THEN GET MEDICAL AID.

(1) Visually inspect the LP fuel tubes (EIPC 73-11-47 Fig/Item No.05-100, 05-500, 04-100, 04-300 and 04-500) and the relevant clipstacks for damage/wear. Refer to Fig.1 to Fig.5 and Fig.11 to Fig.17.

NOTE: If it is not planned to remove the tubes as part of the existing shop visit, the clips should be removed and replaced with new, one at a time to prevent pre-loading of the clip position.

(a) Visually inspect all the clips for obvious evidence of wear that may have damaged the fuel tubes (for example, significant wear to rubber and/or dust/debris at location of clip).

(i) Remove any obviously damaged clip(s) first and inspect fuel tube(s) in accordance with the criteria as specified in 3.B.(1)(e).

(ii) If fuel tubes are found unserviceable, remove and replace in accordance with Accomplishment Instructions 3.B.(1)(f).

(iii) Do not refit any used clips, replace with new at each inspection.

(b) Remove and inspect each remaining clip one at a time (positions specified in 3.B.(1)(b)(i) and 3.B.(1)(b)(ii)) and inspect fuel tube(s) in accordance with the criteria as specified in 3.B.(1)(e). Start from either the top or the bottom of the tube run.

(i) Clipping positions CP2433, CP2729, CP2556, CP2430, CP2664, CP2946 and CP2428 are located on the fuel tubes FW26587, FW36335, FW26589 (LP outlet to FOHE inlet tube run). Refer to Fig.11, Fig.13 to Fig.17.

(ii) Clipping positions CP4881, CP2607 and CP2427 are located on the fuel tubes FW53576, FW53577 (FOHE outlet to HP inlet tube run). Refer to Fig.1, Fig.3, Fig.4, Fig.5.

NOTE: Inspection of the clips must be done one at a time to prevent alteration to the system alignment and stressing of the tube and clips.

(iii) Do not refit any used clips, replace with new at each inspection.

(c) Inspect the fuel tube around the area which the clip was fitted in accordance with criteria as specified in 3.B.(1)(e).

(i) If fuel tube is found to be serviceable, reinstall tube and replace clips in accordance with Engine Manual 72-00-34. Refer to Fig.3, Fig.4, Fig.5, Fig.13 or Fig.17 for specific tube and clipping point details.

(ii) If any tubes are found to be unserviceable, replace in accordance with Accomplishment Instructions 3.B.(1)(f).

(d) Ensure clip is replaced and the tube is back to a serviceable condition before moving to the next clipping point.

NOTE: During removal of the clips look for any significant relaxation of strain that suggests poor alignment of the tubes and stressing of certain clipping positions. If necessary loosen adjacent clips and carefully manipulate the tube alignment to minimise any strain in the system. Make a note on the proforma (Appendix 2) or similar if alignment issues are seen.

(e) Fuel tube acceptance and rejection criteria

Contact frettage to a depth greater than 0.1 mm (0.004 in.) on the outer surface of a bend on the tube	Reject
Contact frettage to a depth greater than 0.2 mm (0.008 in.) in any other area of the tube	Reject

(f) If the fuel tube is rejected, remove and replace it in accordance with Engine Manual 72-00-34. Refer to Fig.3, Fig.4, Fig.5, Fig.13 to Fig.17 for specific tube and clipping point details.

NOTE: Take particular care to inspect the entire exposed surface of the tube. A mirror can be used in areas where direct line of sight access is difficult.

(2) Inspect all FOHE mounts and associated hardware for signs of obvious damage and excessive wear. Refer to Fig.6, Fig.7, Fig.8, Fig.9 and Fig.10.

NOTE: It is not necessary to remove the FOHE from the engine or disconnect the oil and fuel tubes. It is acceptable to inspect the FOHE mounts and associated hardware whist the FOHE is installed on the engine.

NOTE: The FOHE mounts/links/brackets can be removed, inspected and replaced one at a time.

NOTE: The purpose of this inspection is to identify noticeable play in the spherical bearings of the FOHE mounts. In most cases this can be done without removing hardware, by manipulating the FOHE and mounts. If wear is suspected then remove the bolt at one end of the link/strut for more detailed assessment.

(a) Inspect the following FOHE mounts and associated hardware one at a time. If required remove the bolt at one end of the link/strut for assessment in accordance with Engine Manual 72-00-34 and examine by manipulation and visual inspection in accordance with the criteria as specified in step 3.A.(2)(b).

EIPC Ref	Part No.	Description
79-21-11, 01-280	FK10141	Bracket, assy of FCOC support strut
79-21-11, 01-300	FK19290	Strut, assy FOHE support - Front
79-21-11, 01-350	FK10129	Bracket, assy of FCOC mounting - Upper
79-21-11, 01-400	FK19924	Plate, assy FCOC support
79-21-11, 01-500	FK19264	Strut, assy FOHE support - Lower
79-21-11, 01-560	FK19265	Link, assy FOHE support - Lower
79-21-11, 01-580	FK19266	Link, assy FOHE - Upper
72-34-15, 02-330	FK11165	Bracket, assy FCOC forward mounting
72-34-15, 02-340	FK11164	Bracket, assy FCOC brace mounting
72-35-16, 05-480	FK10140	Bracket, assy FCOC brace mounting

(b) FOHE mounting hardware acceptance and rejection criteria:

Bearing tight but not seized	Accept

Low friction but no play in bearings	Accept
Minor scratches/score marks	Accept
Play in spherical bearings	Reject
Spherical bearings seized	Reject
Bent or twisted	Reject

(3) If fancase mounting bracket, 72-35-16, 05-480, 72-34-15, 02-330 or 02-340 is found to be unserviceable, remove and replace in accordance with the following instructions. Refer to Fig.8 and Fig.10.

(a) Remove and install the bracket (72-35-16, 05-480). Refer to Fig.8.

(i) Remove the three bolts, the four washers and the three nuts that attach the bracket to flange FC.

(ii) Remove the bracket.

(iii) Attach the new bracket to bracket (73-35-16, 05-500) and the flange FC. Use the three bolts (72-35-16, 05-505), the four washers (72-35-16, 05-504) and the three nuts (72-35-16, 05-502).

(iv) Torque the nuts (72-35-16, 05-502) to 11.5 Nm (100 lbfin).

(b) Remove and install the bracket (72-34-15, 02-330). Refer to Fig.10.

(i) Remove the two bolts and the two washers that attach the bracket to flange FB.

(ii) Remove the bracket.

(iii) Locally clean bracket fitment area and new bracket mating faces using an OMat 2/101 lint-free cloth moistened with either OMat 135 Methyl Ethyl Ketone, OMat 150 Acetone, OMat 1/40 Isopropyl alcohol or OMat 1/257 cleaning solvent.

(iv) Apply jointing compound MSRR 9055 (Hylomar Grade L) to the mating face of bracket (72-34-15, 02-330).

(v) Attach the new bracket to flange FB. Use the two bolts (72-34-15, 04-321) and the two washers (72-34-15, 04-330).

(vi) Torque the bolts (72-34-15, 04-321) to 24 Nm (210 lbfin).

(vii) Remove excess jointing compound.

(c) Remove and install the brackets (72-34-15, 02-340) and (72-34-15, 02-775). Refer to Fig.10.

(i) Remove the two bolts and the two washers that attach the bracket to flange FB.

(ii) Remove the brackets (72-34-15, 02-340) and (72-34-15, 02-775).

(iii) Locally clean bracket fitment area and new bracket mating faces using an OMat 2/101 lint-free cloth moistened with either OMat 135 Methyl Ethyl Ketone, OMat 150 Acetone, OMat 1/40 Isopropyl alcohol or OMat 1/257 cleaning solvent.

(iv) Apply jointing compound MSRR 9055 (Hylomar Grade L) to the mating face of bracket (72-34-15, 02-330).

(v) Attach the new brackets (72-34-15, 02-340) and (72-34-15, 02-775) to flange FB. Use the two bolts (72-34-15, 04-321) and the two washers (72-34-15, 04-330).

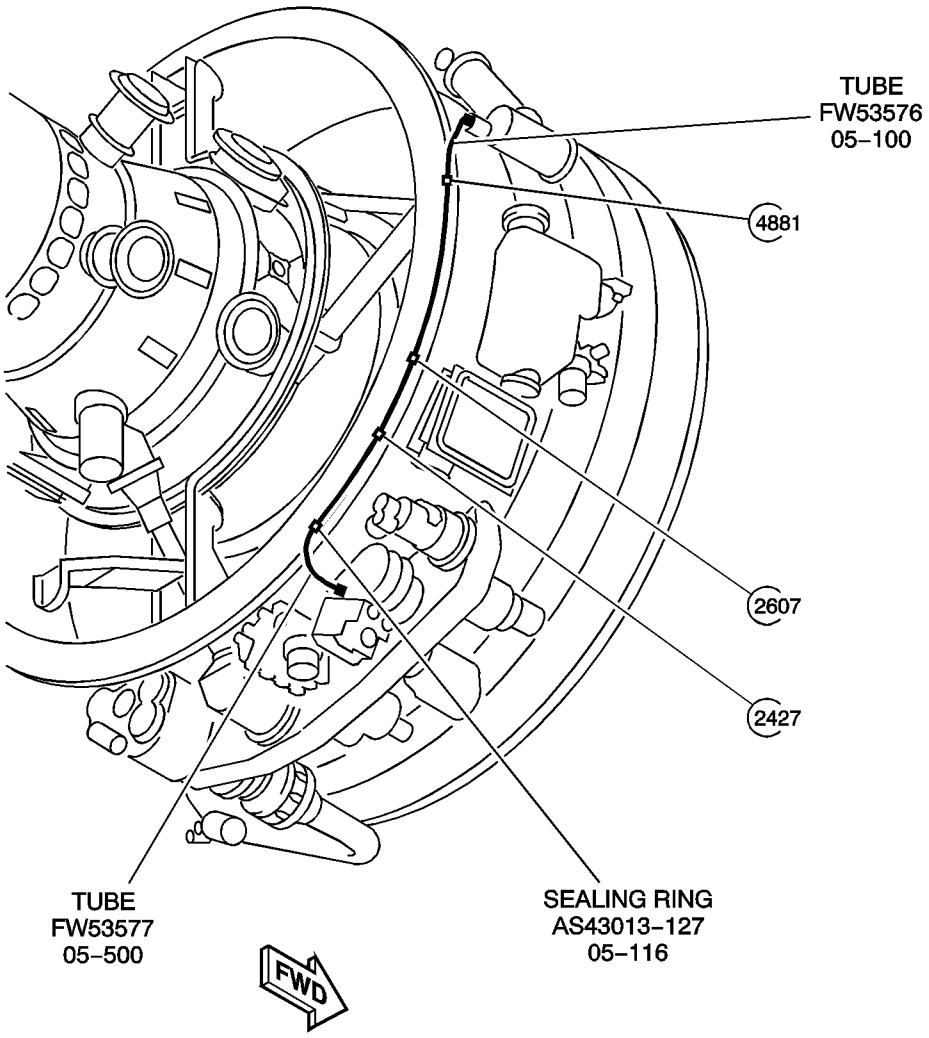
(vi) Torque the bolts (72-34-15, 04-321) to 24 Nm (210 lbfin).

(vii) Remove excess jointing compound.

(4) Re-assemble the FOHE mounts and links in accordance with Engine Manual, 72-00-34 and 72-34-00.

(5) If any abnormal findings or damage was noted, complete Proforma (Appendix 2) and return to Rolls-Royce FSO.

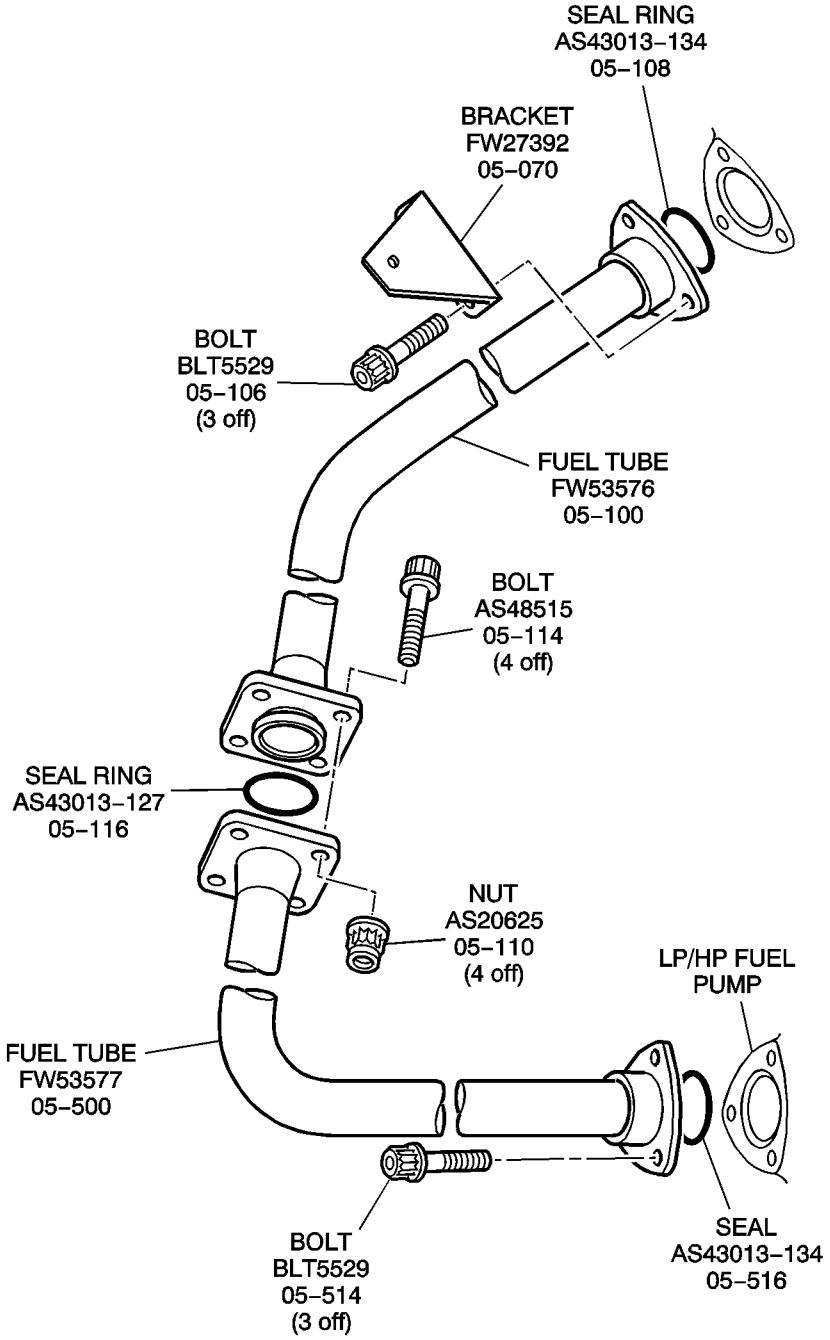
C. A record of accomplishment is required, refer to Appendix 1.



NOTE:
All IPC Fig/Item numbers are EIPC Ref No 73–11–47 unless identified differently

def0016841

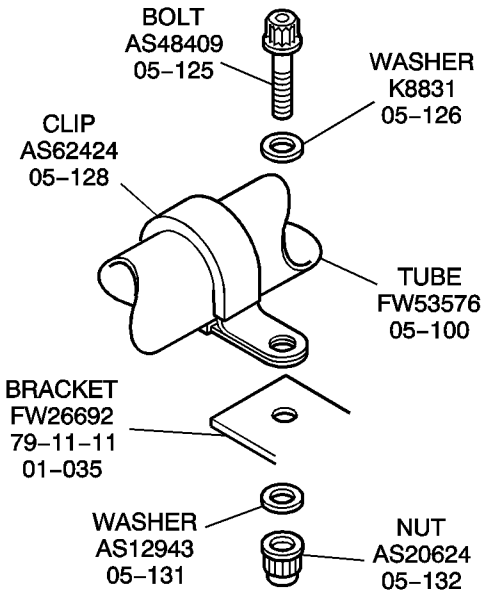
General Fuel Tube Arrangement
Fig.1



NOTE:
All IPC Fig/Item numbers are EIPC Ref No 73-11-47 unless identified differently

def0016819

Arrangement of Fuel Tubes FW53577 and FW53576
Fig.2

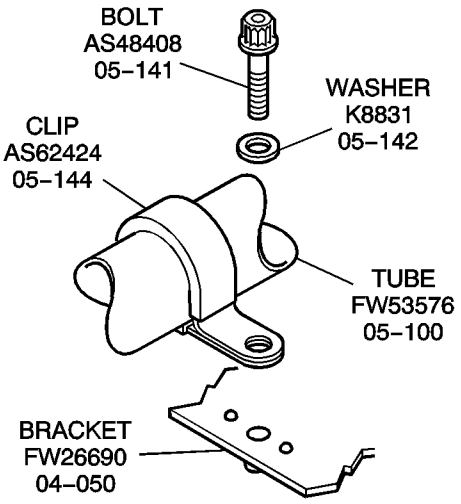


CLIP POSITION 4881
SB 73-F343

NOTE:
All IPC Fig/Item numbers are EIPC Ref No 73-11-47 unless identified differently

def0016848

Arrangement of Clip Position CP4881
Fig.3

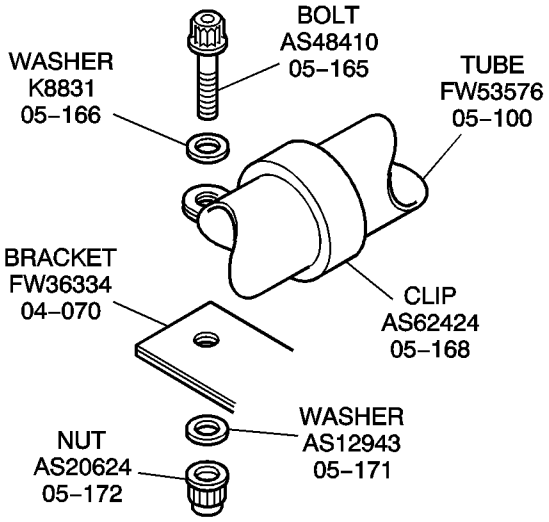


CLIP POSITION 2427
SB 73-F343

NOTE:
All IPC Fig/Item numbers are EIPC Ref No 73-11-47 unless identified differently

def0016844

Arrangement of Clip Position CP2427
Fig.4

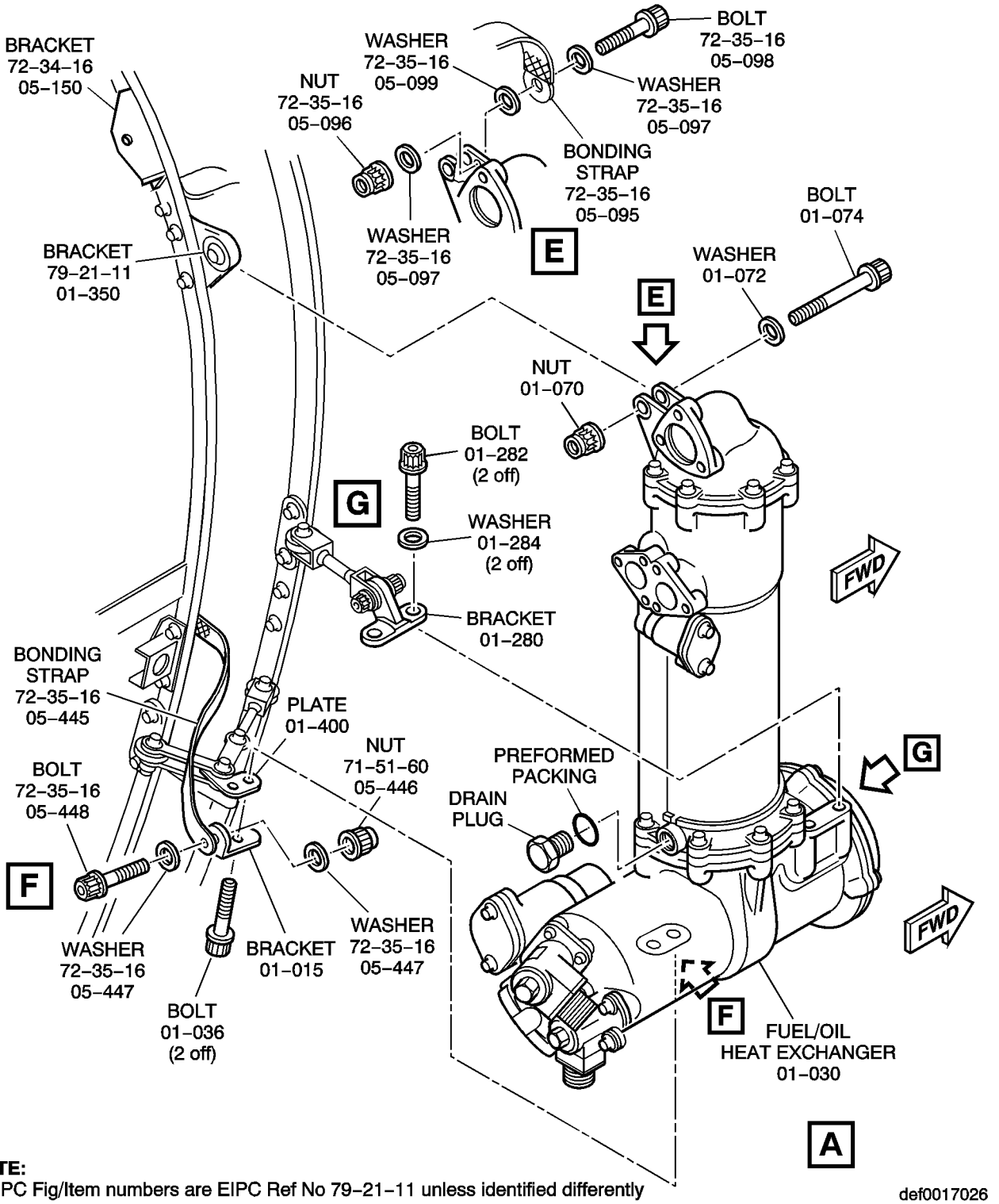


CLIP POSITION 2607
SB 73-F343

NOTE:
All IPC Fig/Item numbers are EIPC Ref No 73-11-47 unless identified differently

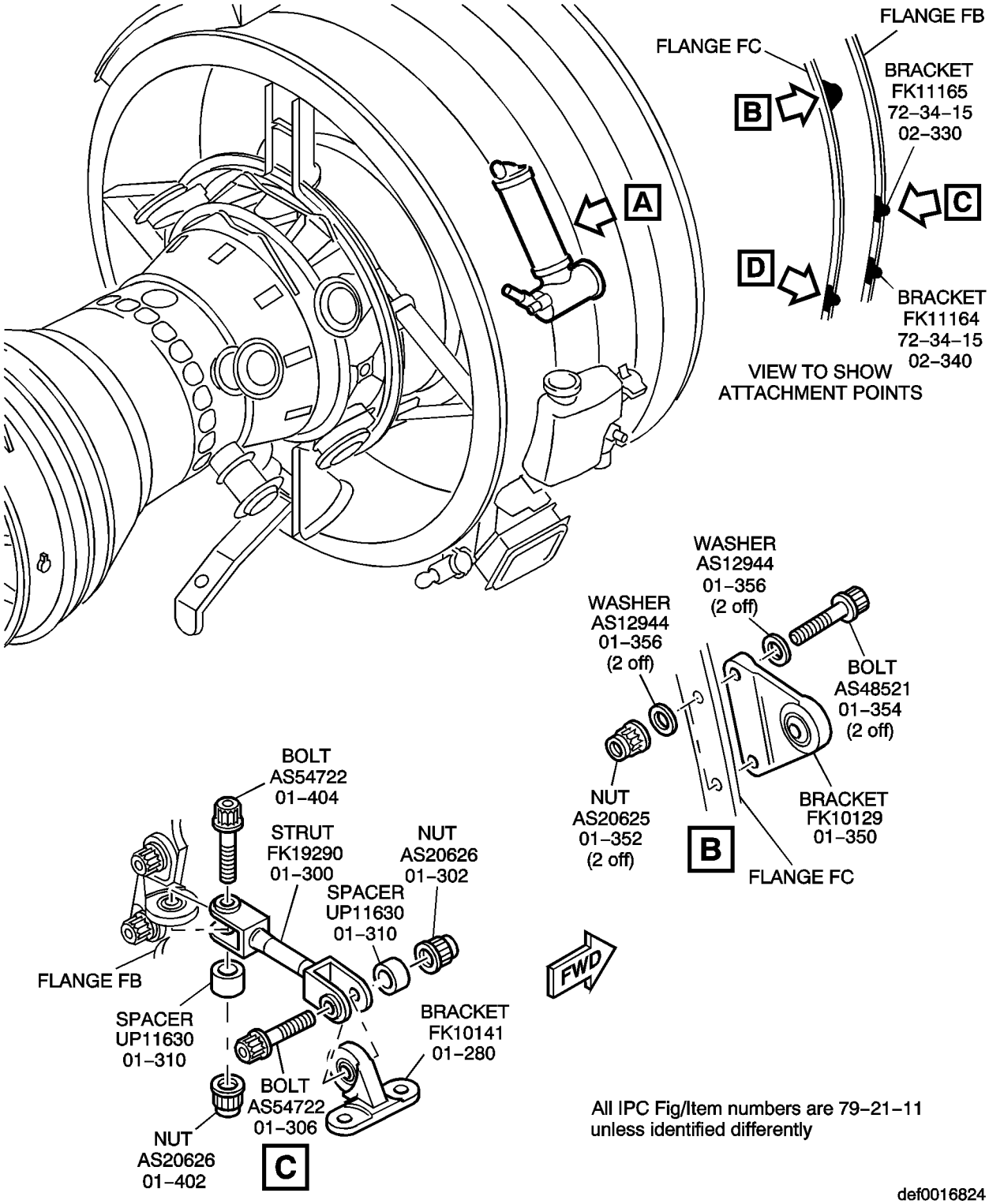
def0016845

Arrangement of Clip Position CP2607
Fig.5

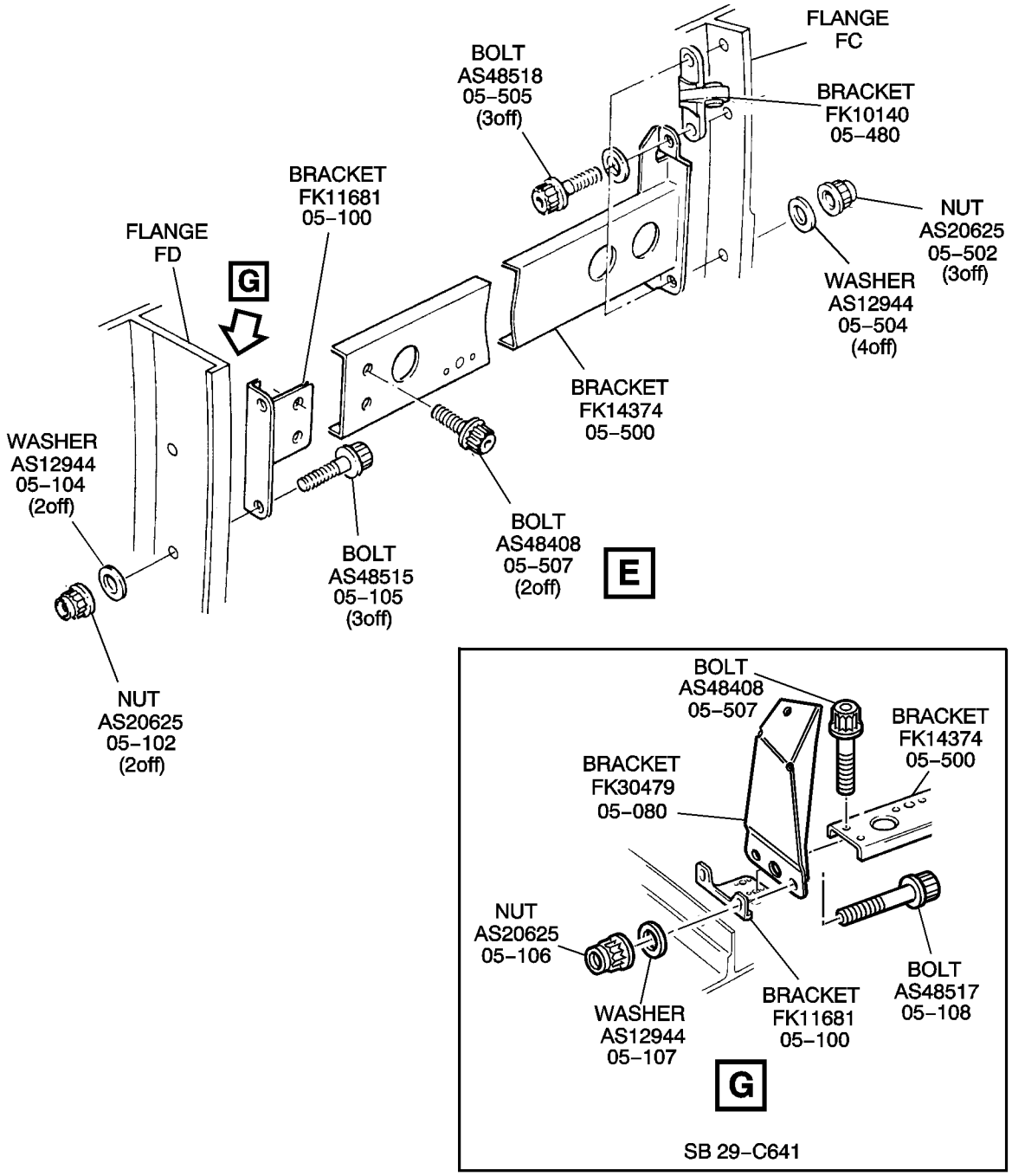


NOTE:
All IPC Fig/Item numbers are EIPC Ref No 79-21-11 unless identified differently

General Arrangement of FOHE Mounting Hardware
Fig.6



Arrangement of F0HE Upper Mounting Bracket (P/N FK10129) and Upper Front Strut (P/N FK19290)
Fig.7

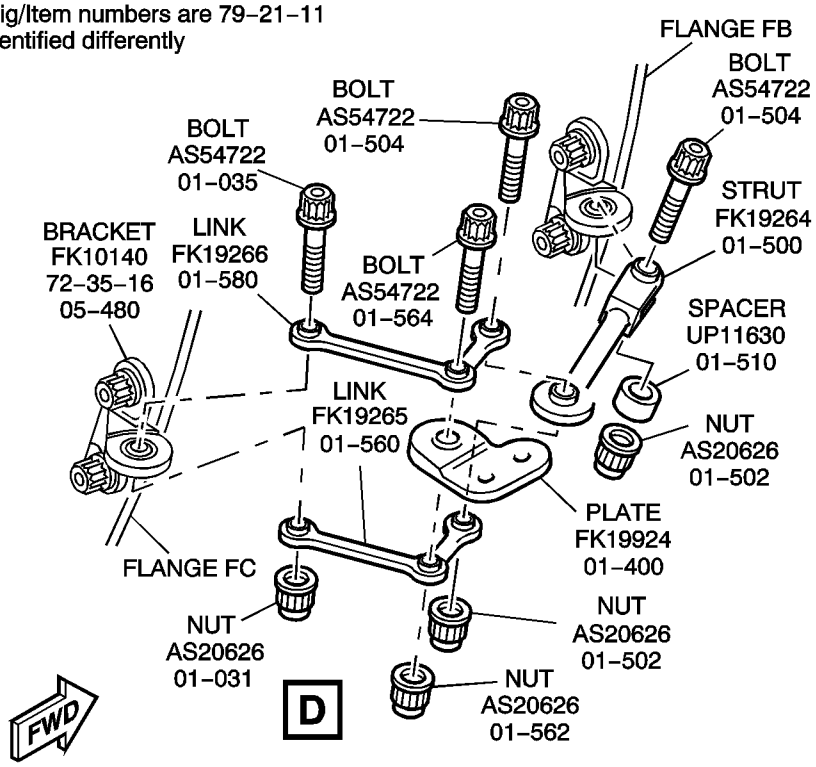


NOTE:
All IPC Fig/Item numbers are 72–35–16 unless identified differently

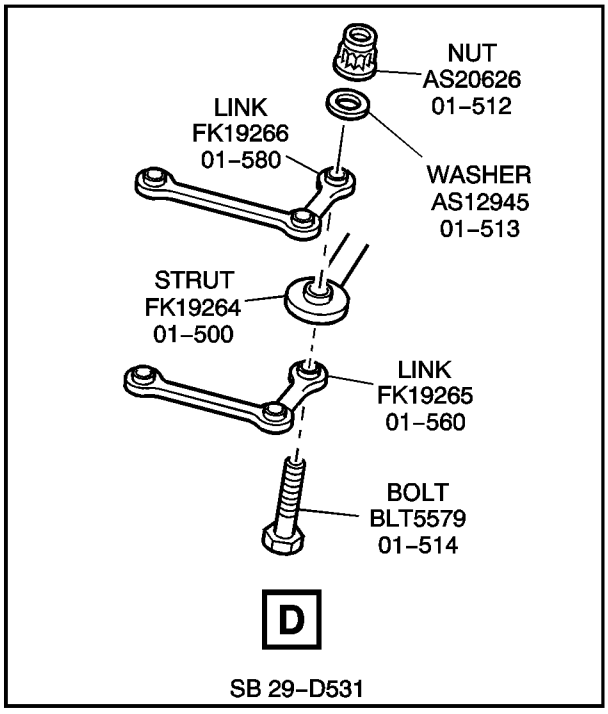
def0016826

Arrangement for Brackets (FK10140 and FK14347)
Fig.8

All IPC Fig/Item numbers are 79-21-11 unless identified differently

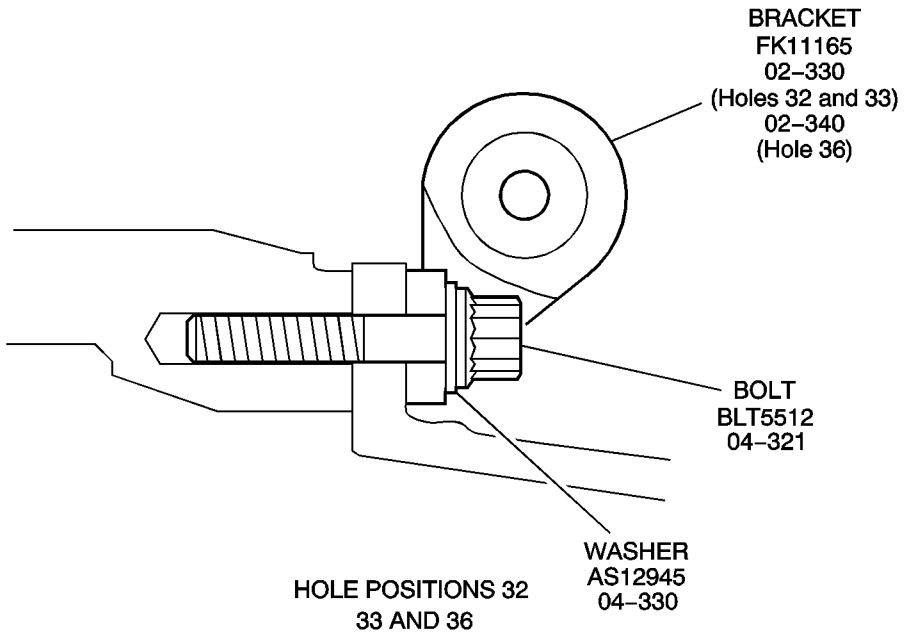


R

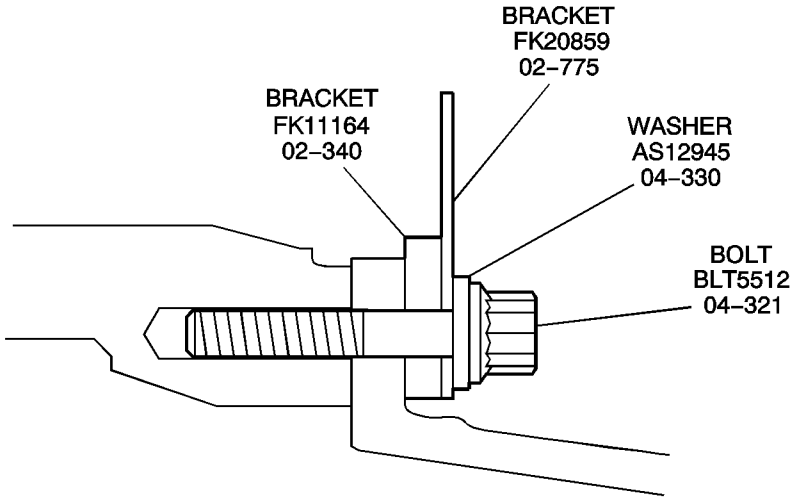


def0017294

R Arrangement of FOHE Lower Mounting Brackets, Struts and Links
R Fig.9



HOLE POSITIONS 32
33 AND 36

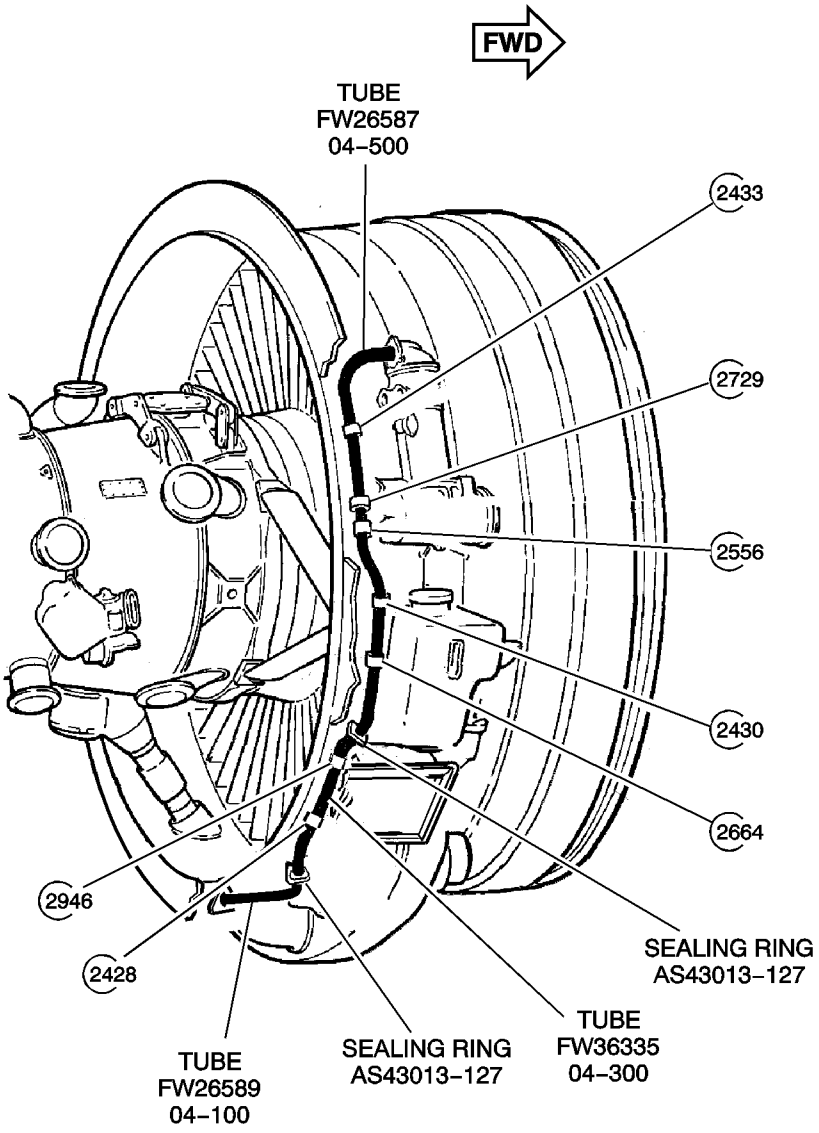


HOLE POSITION 37

NOTE:
All IPC Fig/Item numbers are 72–34–15 unless identified differently

def0016827

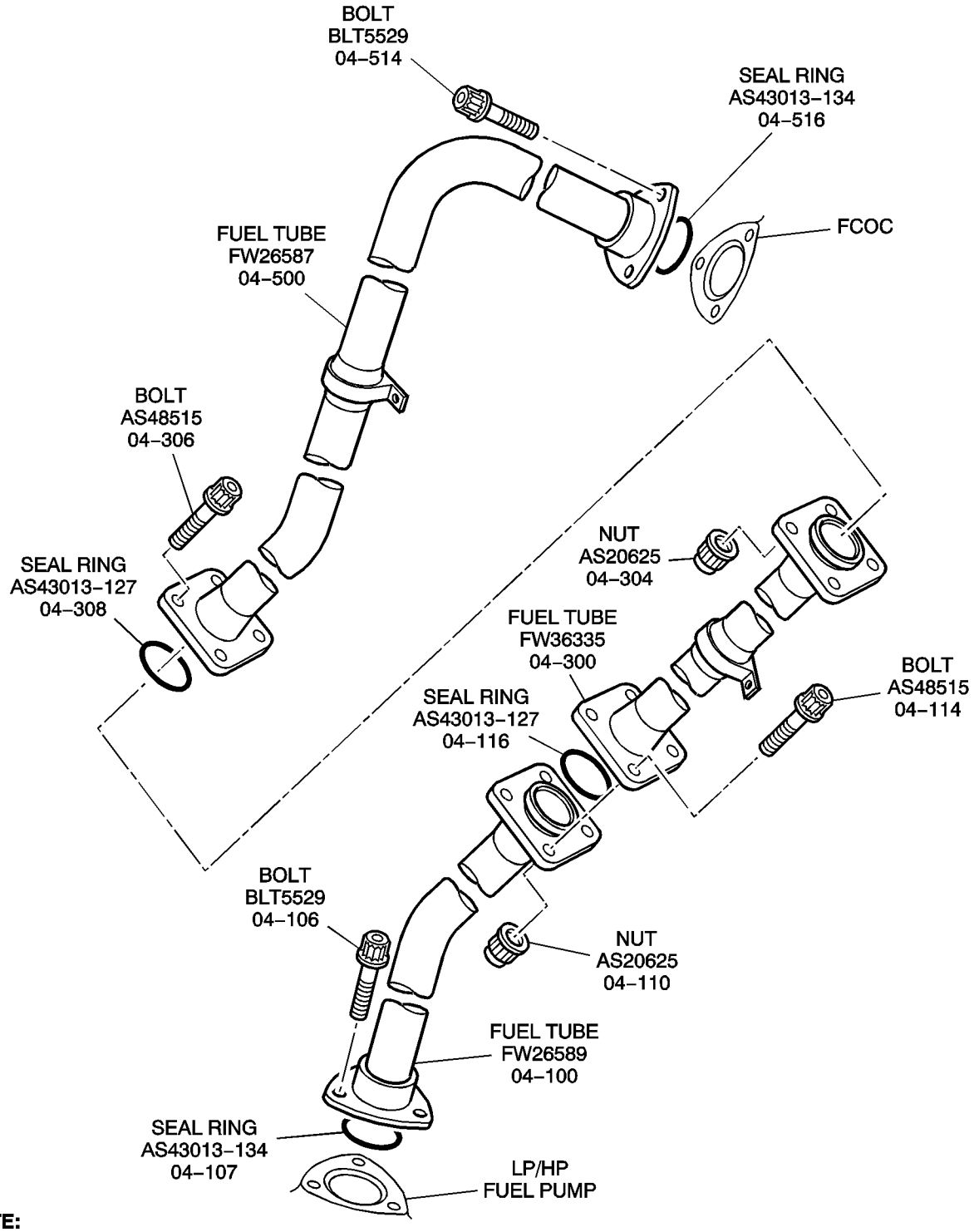
Arrangement for Brackets (FK11164 and FK11165)
Fig.10



NOTE:
All IPC Fig/Item numbers are EIPC Ref No 73-11-47 unless identified differently

def0017018

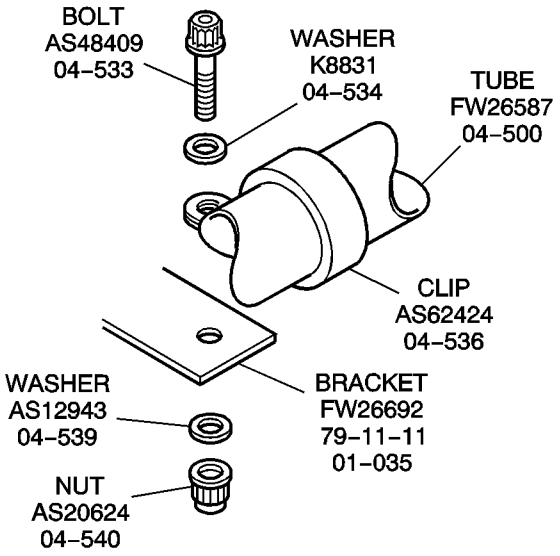
General Fuel Tube Arrangement
Fig.11



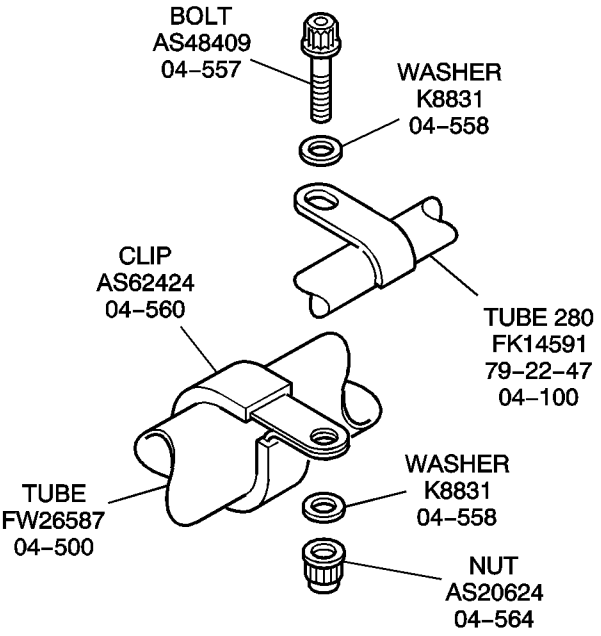
NOTE:
All IPC Fig/Item numbers are EIPC Ref No 73–11–47 unless identified differently

def0017019

Arrangement of Fuel Tubes FW26587, FW36335 and FW26589
Fig.12



CLIP POSITION 2430
SB 73-F343

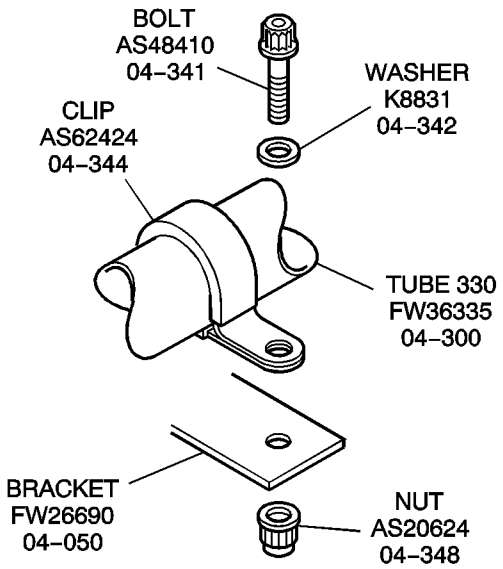


CLIP POSITION 2433
SB 73-F343

NOTE:
All IPC Fig/Item numbers are EIPC Ref No 73-11-47 unless identified differently

def0017021

Arrangement of Clip Positions CP2430 and CP2433
Fig.13

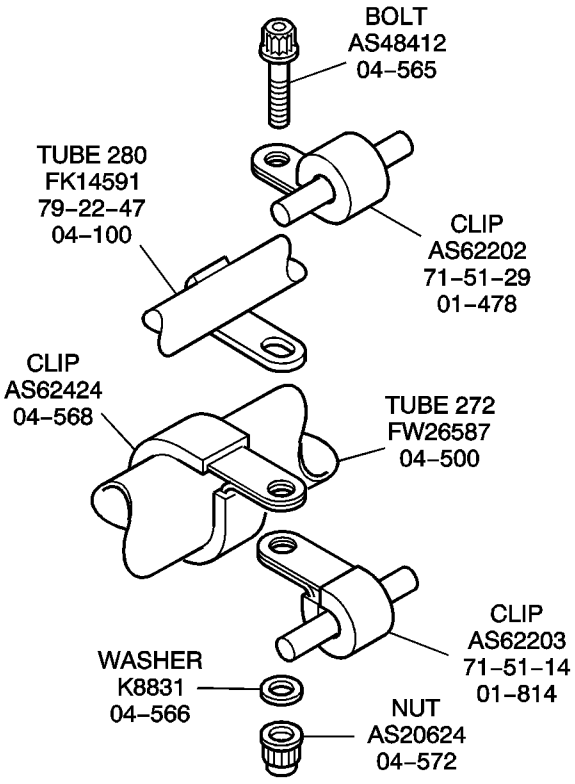


CLIP POSITION 2428
SB 73-F343

NOTE:
All IPC Fig/Item numbers are EIPC Ref No 73-11-47 unless identified differently

def0017022

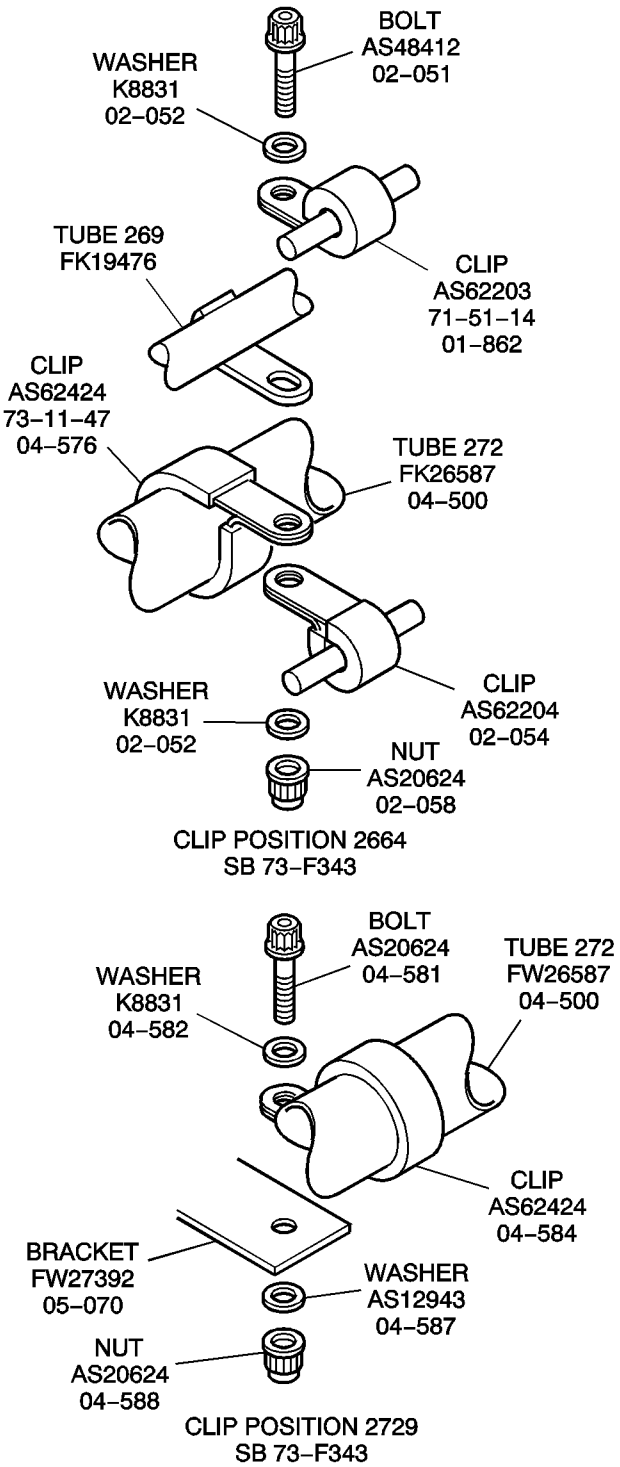
Arrangement of Clip Position CP2428
Fig.14



NOTE:
All IPC Fig/Item numbers are EIPC Ref No 73-11-47 unless identified differently

def0017023

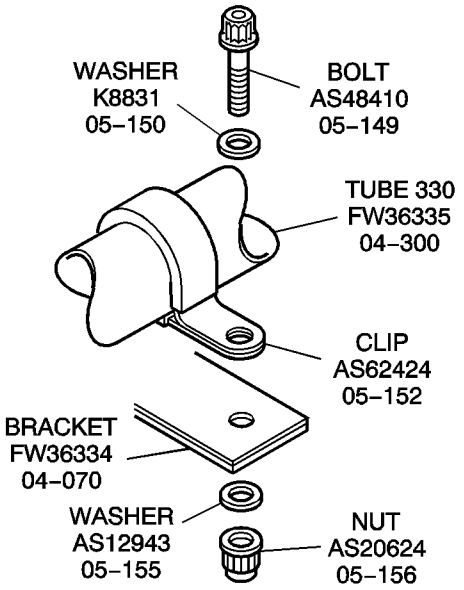
Arrangement of Clip Position CP2556
Fig.15



NOTE:
All IPC Fig/Item numbers are EIPC Ref No 73-11-47 unless identified differently

def0017024

Arrangement of Clip Positions CP2664 and CP2729
Fig.16



CLIP POSITION 2946
SB 73–F343

NOTE:
All IPC Fig/Item numbers are EIPC Ref No 73–11–47 unless identified differently

def0017025

Arrangement of Clip Positions CP2946
Fig.17

APPENDIX 1

1. Fill in the Proforma in Appendix 2 for In-shop Inspections or Appendix 3 for On-wing Inspections.

2. Forward the inspection results and associated information to your Rolls-Royce FSO.

3. Accomplishment of this Non-Modification Service Bulletin should be in accordance with local SB tracking system procedures.

APPENDIX 2

Feedback Sheet NMSB 73-AH522 (In-shop Inspection)				
Date:		Operator:		
Engine No.		Aircraft:		
		Hours	Cycles	
Engine Life:				
Life Since Last Shop Visit:				
Life Since Embodiment of SB73-F343:				

Fuel Tubes Condition	Observations (material transfer/fretted/dented/worn - please specify depth)	Fig.No.
FW53576		Fig.1
FW53577		Fig.1
FW26587		Fig.11
FW36335		Fig.11
FW26589		Fig.11
Clips Condition	Observations (material transfer/dust/worn/cracked/metal band exposed)	Fig.No.
4881		Fig.3
2607		Fig.5
2427		Fig.4
2433		Fig.13
2729		Fig.16
2556		Fig.15
2430		Fig.13

2664		Fig.16
2946		Fig.17
2428		Fig.14
FOHE Mounts Condition	Observations (wear/cracked/fretted/dented/bent/twisted - Please specify depth)	Fig./Part No.
Plate 01-400		Fig.9, FK19924
Link 01-580		Fig.9, FK19266
Link 01-560		Fig.9, FK19265
Strut 01-500		Fig.9, FK19264
Bracket 72-35-16, 05-480		Fig. 8/ Fig. 9/Fig.10, FK10140
Strut 01-300		Fig.7, FK19290
Bracket 01-280		Fig.7, FK10141
Bracket 01-350		Fig.7, FK10129
Bracket 02-775		Fig.10, FK20859
Bracket 01-035		Fig.3, FK26692
Bracket 02-330		Fig. 7/Fig.10, FK11165
Bracket 02-340		Fig. 7/Fig.10, FK11164
Notes:		

APPENDIX 3

Feedback Sheet NMSB 73-AH522 (On-wing Inspection)				
Date:		Operator:		
Engine No.		Aircraft:		
		Hours	Cycles	
Engine Life:				
Life Since Last Shop Visit:				
Life Since Embodiment of SB73-F343:				
Fuel Tubes Condition	Observations (material transfer/fretted/dented/worn - please specify depth)			Fig.No.
FW53576				Fig.1
FW53577				Fig.1
Clips Condition	Observations (material transfer/dust/worn/cracked/metal band exposed)			Fig.No.
4881				Fig.3
2607				Fig.5
2427				Fig.4
FOHE Mounts Condition	Observations (wear/cracked/fretted/dented/bent/twisted - Please specify depth)			Fig./Part No.
Plate 01-400				Fig.9, FK19924
Link 01-580				Fig.9, FK19266
Link 01-560				Fig.9, FK19265
Strut 01-500				Fig.9, FK19264
Bracket 72-35-16, 05-480				Fig. 8/ Fig. 9/Fig.10, FK10140

Strut 01-300		Fig.7, FK19290
Bracket 01-280		Fig.7, FK10141
Bracket 01-350		Fig.7, FK10129
Bracket 02-775		Fig.10, FK20859
Bracket 01-035		Fig.3, FK26692
Bracket 02-330		Fig. 7/Fig.10, FK11165
Bracket 02-340		Fig. 7/Fig.10, FK11164
Notes:		