Bonded Seal Installation Details

AFSC 42152

TIME EST

Safety and Servicing Notes are to be complied with throughout the work detailed on this card.

ASSOCIATED PROCEDURES

SPECIAL TOOLS AND EQUIPMENT

Nil.

NOTE: This Servicing Procedure details the standards for all in service work on joints involving the Dowty bonded-seal.

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1. UNION JOINTS (BONDED SEALS)

1.1 The Dowty bonded-seal provides an extremely simple, efficient and reliable method of face sealing gas and fluid connexions at high and low pressures. The reliability of the joint can be degraded by using the incorrect type of seal, and/or incorrectly assembled components.

2. ASSEMBLY DETAILS

2.1 PTFE rings are for use with union adapters with BSP threads which incorporate taper neck undercuts to AGS100 and AGS1104 and similar standards; and must not be used with banjo bolts.

NOTE: There is a different Sect/Ref. No. for AGS1186 and GD2618 seals with PTFE rings fitted as shown in Table 2.

2.2 For details of the correct assembly of bonded seals and PTFE rings see Fig.1, Detail A.

2.3 For details of the correct method of installing bonded seal/PTFE assemblies see Fig.1, Detail B.

2.4 For typical examples of incorrect bonded seal/PTFE ring assembly and installation see Fig.2.

2.5 For details of bonded seal/banjo bolt installation see Fig.3.

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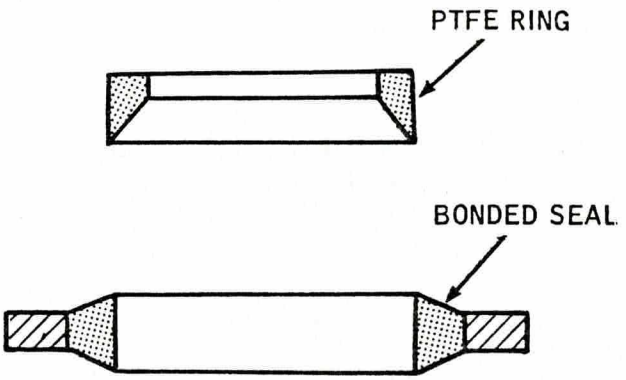
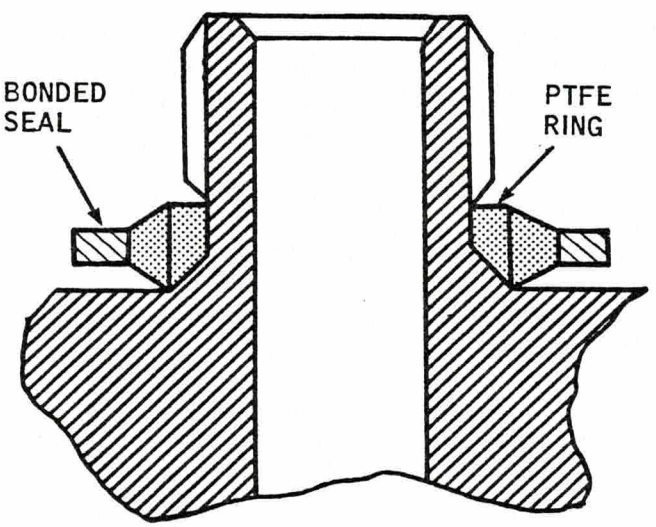


PTFE RING AND BONDED SEAL WILL BE PACKED IN INDIVIDUAL TWIN PACK ENVELOPES TO BSF 69 WITH ASSEMBLY INSTRUCTIONS INSIDE THE PACKET.

DETAIL A - BONDED SEAL/PTFE RING - ASSEMBLY



THE LOCATING RING IS TO BE FITTED INTO THE UNDERCUT AS SHOWN. THIS WILL AUTOMATICALLY ENSURE CORRECT ALIGNMENT OF THE BONDED SEALS, WHEN FITTED OVER THE LOCATING RINGS.

DETAIL B - BONDED SEAL/PTFE RING ASSEMBLY - INSTALLATION
FIGURE 1

Continued

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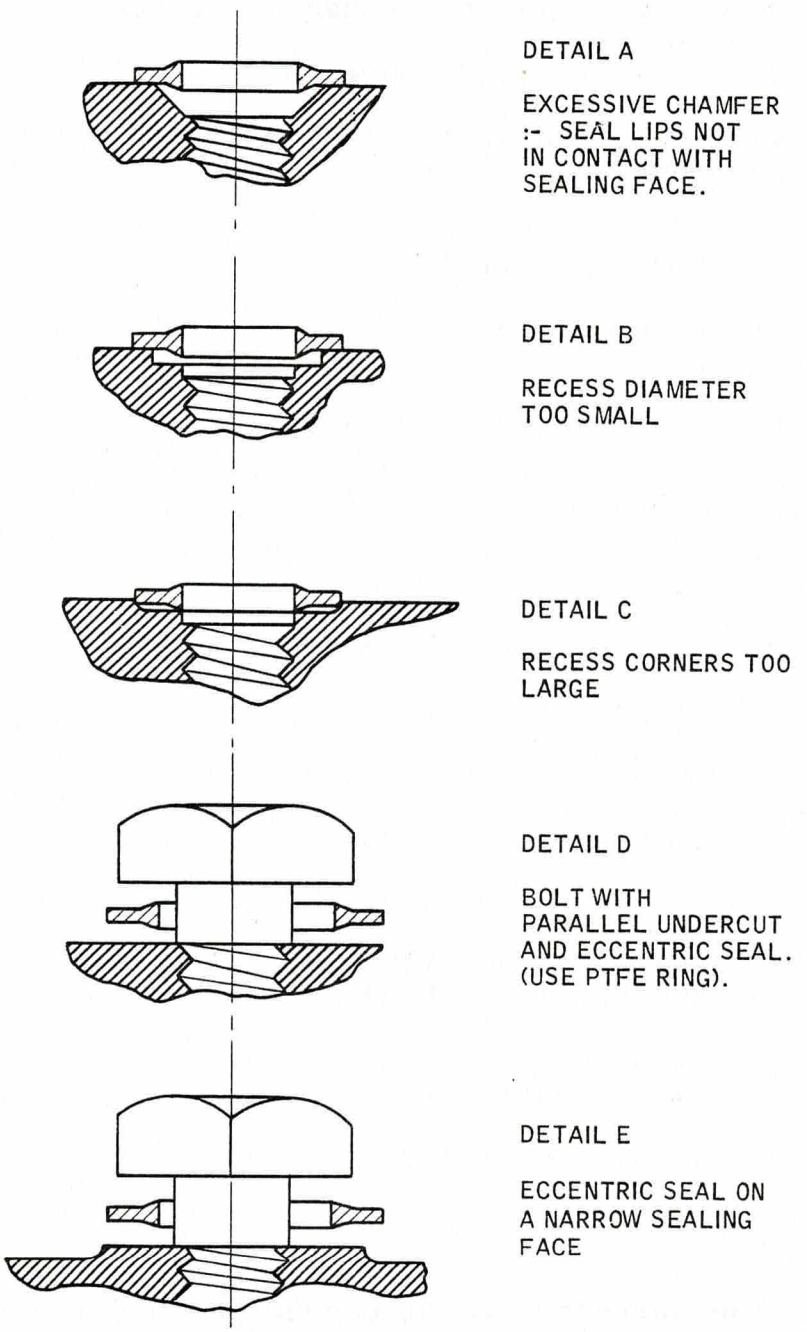
(B) ASSEMBLY ERRORS



DETAIL A

EXCESSIVE CHAMFER :- SEAL LIPS NOT IN CONTACT WITH SEALING FACE.

DETAIL B

RECESS DIAMETER TOO SMALL

DETAIL C

RECESS CORNERS TOO LARGE

DETAIL D

BOLT WITH PARALLEL UNDERCUT AND ECCENTRIC SEAL. (USE PTFE RING).

DETAIL E

ECCENTRIC SEAL ON A NARROW SEALING FACE

TYPICAL EXAMPLES OF INCORRECT BONDED SEAL/PTFE RING ASSEMBLY AND INSTALLATION

FIGURE 2

Continued Overleaf

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3. ASSEMBLY AND INSTALLATION PRECAUTIONS (IN SEQUENCE)

3.1 DO correctly identify the cause of leakage.

3.2 DON'T nip up a leaking connexion.

3.3 DO check the component sealing faces and threads for damage and cleanliness.

3.4 DON'T carry bonded-seals loose in pockets or tool boxes, remember those rubber lips.

3.5 DO mutilate the discarded seal, but watch for foreign object damage.

3.6 DON'T use the same seal twice.

3.7 DO examine new seal before fitment, and ensure correct seal is being fitted (use high temperature seals as called for in LTG/Mod. 4649, see location diagram for GD 2618 and GD 3294 bonded seals), (See Fig.4).

3.8 DO check for incorrect assembly or installation (See Fig.3).

3.9 DON'T use seals that cannot be identified.

3.10 DO lubricate assemblies and seals before assembly (hydraulic assemblies lubricate with grease XG 315. All other assemblies lubricate with system fluid).

3.11 DON'T damage the rubber seal when sliding over screwthread.

3.12 DO fit the seal concentrically; use PTFE locating ring if required (See Fig.1) - it has a right way up.

3.13 DO torque-tighten with correct tools where possible, otherwise check hand-skill against torque wrench first.

3.14 DO pressure check assembly after torque-tightening.

3.15 DO re-wrap assembly with Viton tape if necessary (LTG/Mod. 4601).

NOTE: The correct size of bonded seals for a particular assembly can be determined by identifying the code letter on the seal package and the letter following the AGS number on the assembly (e.g. AGS 1187/E - E being bonded-seal size).

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4. BONDED SEAL/BANJO BOLT INSTALLATION

4.1 Selective assembly of components where PTFE locating rings cannot be used (e.g. banjo connexions) is essential to ensure concentricity of the bonded-seal to the respective mating faces.

4.2 Refer to Fig.3 for examples of correct and incorrect assembly of a banjo connextion.

4.3 Concentricity must be obtained prior to application of the final torque value defined for the respective assembly.

4.4 If the torque-tightening is applied with the bonded-seal(s) eccentric - then the complete assembly must be undertaken again using new replacement bonded-seals.

4.5 When inspection(s) of installed hydraulic systems in the aircraft determine that bonded-seals are not concentric to their respective mating faces then they are similarly to be replaced with new bonded-seals and be correctly re-assembled.

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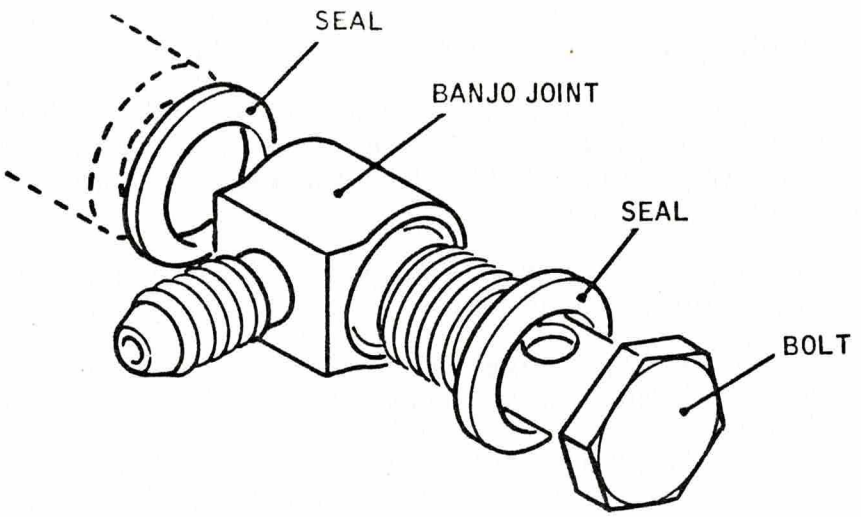
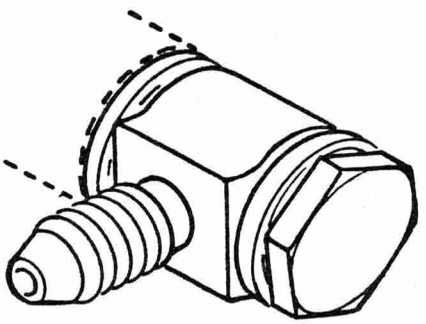
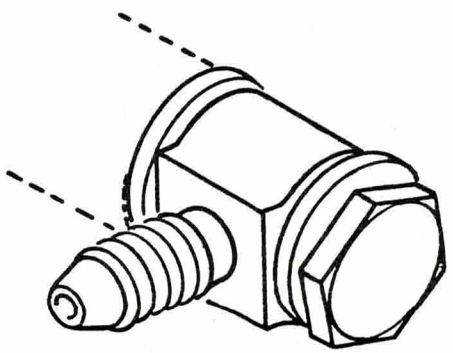


CORRECT ASSEMBLY

BOLT, SEALS AND BANJO JOINT ARE CONCENTRIC





INCORRECT ASSEMBLY

SEALS ECCENTRIC TO REMAINDER OF ASSEMBLY

BONDED SEALS/BANJO BOLT INSTALLATION

FIGURE 3

Continued

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5. TORQUE LOADING TABLES

Exceptions: Rudder feel unit Part No.C8477Y,

1/2 inch BSP blanking bolt-torque tighten 80 lbf/in. max.

Dowty valve Part No.B2017 which screws into fuel pipes in No.2 engine bay - torque-tighten to 360 PLUS 15 lbf/inches.

No.2 services hydraulic pump multi-size (3/8 and 1/2 inch) seals - torque-tighten to 360 PLUS OR MINUS 15 lbf/in. and,

Hydraulic reservoir Part No.EB2-73-4453 with multi-size (1/2 and 3/4 inch) seals - torque-tighten to 615 PLUS OR MINUS 25 lbf/in.

TABLE 1

SIZE	TYPE	LOW TEMPERATURE		TORQUE LOADINGS REQUIRED (lbf/in.)
		AGS 1186 Without PTFE	GD 3239 With PTFE	
1/8	A	28F/9428452	28F/1302016	95-105
1/4	B	28F/9428453	28F/1302017	160-180
19TPI 0.06D	BB	28F/9429527	28F/1302023	247-273
3/8	C	28F/9429532	28F/1302018	343-375
14TPI 0.75D	CC	28F/9428454	28F/1302065	455-495
1/2	D	28F/9428455	28F/1302019	590-640
5/8	E	28F/9434374	28F/1302020	630-690
3/4	F	28F/9428456	28F/1302021	665-735
7/8	G	28F/1011903	28F/1302022	665-735

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5. TORQUE LOADING TABLES (contd)

TABLE 2

SIZE	TYPE	HIGH TEMPERATURE		TORQUE LOADINGS REQUIRED (lbf/in.)
		GD 2618 Without PTFE	GD 3294 With PTFE	
1/8	A	27QA/1030166	27QA/1509930	95-105
1/4	B	27QA/1030167	27QA/1509931	160-180
19TPI 0.06D	BB	27QA/NIV	27QA/NIV	247-273
3/8	C	27QA/1451724	27QA/1509932	343-375
14TPI 0.75D	CC	27QA/NIV	27QA/NIV	455-495
1/2	D	27QA/1451723	27QA/1509933	590-640
5/8	E	27QA/NIV	Not issued	630-690
3/4	F	27QA/1509928	Not issued	665-735
7/8	G	27QA/1451002	Not issued	665-735

NOTE: The torque loadings in the tables do not apply to the 1/2 inch BSP adapters and banjo bolts on Marston Excelsior heat exchanger (Type D237A and Type D2718 - 2A) nor to the 1/2 inch BSP light alloy adapter Part No.9952 on the flap selector (Frames 42-43 left). The torque loadings do apply to 1/2 inch BSP steel adapters Part No. 071.U.00 DB where fitted. Torque loadings to be applied are:- heat exchanger 375 PLUS OR MINUS 25 lbf/in. light alloy adapters 600 lbf/in. max.

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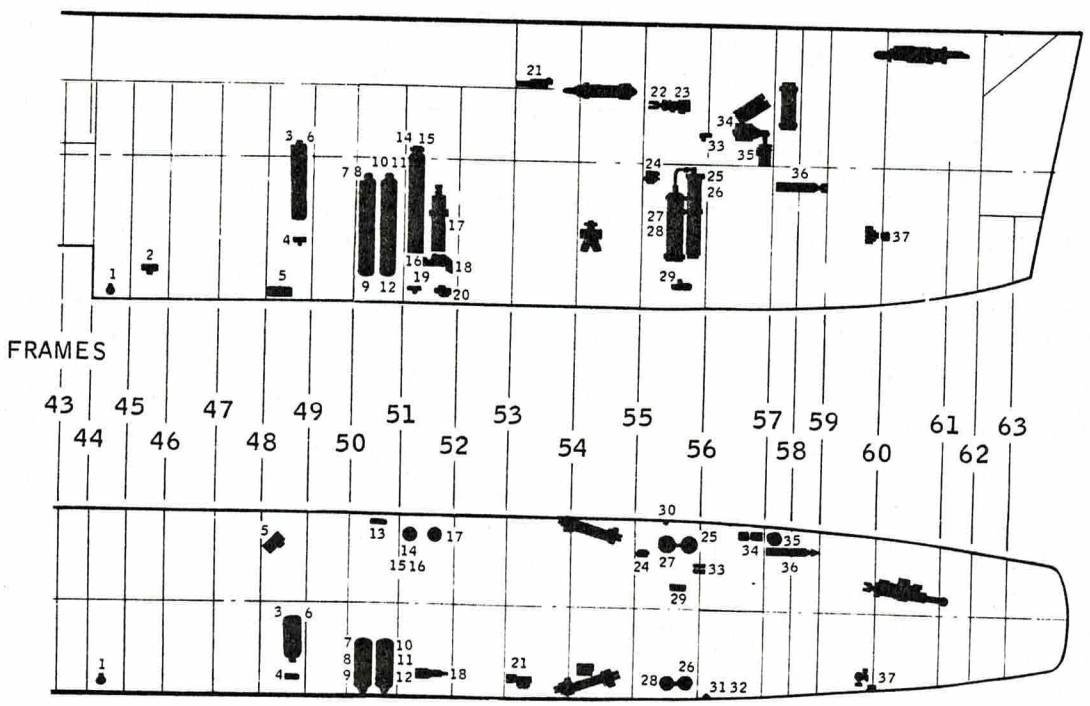

LOCATION OF GD 2618 and GD 3294 BONDED SEALS
(POST MOD. 4649)

FIGURE 4

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NO.	COMPONENT	FRAME	SEAL	QTY.
1	Pressure regulator.	44-45 left	GD.2618/D GD.2618/A	4 2
2	T-piece, press. services line.	45-46 left	GD.3294/D	1
3	Auxiliary reservoir, controls No.1.	48-49 left	GD.2618/F GD.3294/A	4 2
4	T-piece, L/press. return line.	48-49 left	GD.2618/A	2
5	Tailplane feel unit flexible pipe connexion.	48-49 right	GD.2618/A	2
6	Air relief valve.	48-49 left	GD.2618/F GD.2618/B	4 1
7	Oil relief valve, services reservoir.	50-51 left	GD.3294/D	1
8	Reservoir services top connexion.	50-51 left	GD.2618/C	2
9	Reservoir services bottom connexions Banjo connexion, Hydraulic reservoir press. line. Cone adapter, drain line Banjo connexion, return services line.	50-51 left	GD.2618/B GD.3294/B GD.2618/D GD.2618/F	2 1 1 1
10	Oil relief valve, controls No.1 reservoir	50-51 left	GD.2618/D	2
11	Reservoir, controls No.1 top connexion.	50-51 left	GD.2618/C	2

KEY TO FIGURE 4 (continued)

Continued

Safety and Servicing Notes are to be complied with throughout the work detailed on this card.

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NO.	COMPONENT	FRAME	SEAL	QTY.
12	Reservoir, controls No.1 bottom connexions, banjo connexion. Cone adapter, drain line. Banjo connexion ret. cont. line.	50-51 left	GD.2618/B GD.3294/B GD.2618/D GD.2618/F	2 1 1 1
13	4-way connector assy, stringer 15. Adapter (quantity 3) part of 4-way connector above.	50-51 right	GD.2618/G GD.3294/D GD.2618/B	3 1 3
14	Oil relief valve, controls No.2 reservoir.	51-52 right	GD.2618/D	2
15	Reservoir, controls No.2 top connexions.	51-52 right	GD.2618/C	2
16	Reservoir, controls No.2 bottom connexions, banjo hyd. res. press. line. Banjo, ret, con.2 line. Cone adapter, drain line.	51-52 right	GD.2618/B GD.2618/D GD.2618/F GD.3294/B	2 1 1 1
17	Accumulator:- top banjo connexion, bottom connexion.	51-52 right	GD.2618/B GD.3294/C	2 1
18	Hand-pump	51-52 left	GD.2618/B GD.3294/C	2 1
19	T-piece, press. serv. line.	51-52 left	GD.3294/B	1

KEY TO FIGURE 4 (continued)

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Safety and Servicing Notes are to be complied with throughout the work detailed on this card.

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NO.	COMPONENT	FRAME	SEAL	QTY.
20	4-way piece/NRV (stringer 19/20).	51-52 right	GD.3294/B	1
21	Synchroniser valve.	53-53a left	GD.2618/D	7
22	Air brake lock jack.	55-56 right	GD.2618/B	4
23	Air brake lock jack.	55-56 left	GD.2618/B	4
24	Cone adapter/press. switch (stringer 10/11)	55 right	GD.3294/A	1
25	Air bottle, top connexion, bottom connexion.	55-56 right	GD.2618/B GD.3294/B	2 1
26	Air bottle, top connexion, bottom connexion.	55-56 left	GD.2618/B GD.3294/B	2 1
27	Accumulator.	55-56 right	GD.3294/B GD.3294/C	1 1
28	Accumulator.	55-56 left	GD.3294/B GD.3294/C	1 1
29	T-piece, press. cont. 2 line (stringer 10/11).	55 right	GD.3294/C	1
30	Charging valve, tailplane accumulator (stringer 10/11).	55 right	GD.2618/B GD.3294/B	2 1
31	Charging valve, GYP (stringer 10/11).	56 left	GD.3294/B	2
32	Banjo connexion on charging valve (stringer 10/11).	56 left	GD.2618/B	2

KEY TO FIGURE 4 (continued)

Continued

Safety and Servicing Notes are to be complied with throughout the work detailed on this card.

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NO.	COMPONENT	FRAME	SEAL	QTY.
33	Bulkhead fittings, banjo connexions (stringer 5).	56 right	GD.2618/B	8
34	Selector valve/cone adapter. F/unit press, line F/unit, banjo connexions.	56-57 right	GD.3294/B GD.2618/A GD.2618/C	1 2 3
35	Bypass valve:- centre banjo connexions, upper/lower banjo connexions.	56 right	GD.2618/B GD.2618/A	6 4
36	Parachute door jack.	57-59 right	GD.2618/B	4
37	3-way selector (stringer 15).	60 left	GD.2618/C	6

KEY TO FIGURE 4 (concluded)