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DATE: Mar.18/04

V2500-A1 PROPULSION SYSTEMS SERVICE BULLETIN

This document transmits Revision 1 to Service Bulletin EV2500-72-0431 and Revision 1 to the Supplement

Document History

Service Bulletin Revision Status		Supplement Revision Status	
Initial Issue	Nov.18/02	Initial Issue	Nov.18/02

Bulletin Revision 1

Remove	Incorporate	Reason for change
Pages 1 to 17 of the Service Bulletin	Pages 1 to 18 of the Service Bulletin	To add spacer which is used to rework sub-assembly 6A8100.

Supplement Revision 1

Remove	Incorporate	Reason for change
All pages	Page 1	To add spacer which is used to rework sub-assembly 6A8100.

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

LIST OF EFFECTIVE PAGES

The effective pages to this Service Bulletin following incorporation of Revision 1 to the Bulletin and Revision 1 to the Supplement are as follows:

	Page	Revision Number	Revision Date
	Bulletin		
R	1	1	Mar.18/04
R	2	1	Mar.18/04
R	3	1	Mar.18/04
R	4	1	Mar.18/04
R	5	1	Mar.18/04
R	6	1	Mar.18/04
R	7	1	Mar.18/04
R	8	1	Mar.18/04
R	9	1	Mar.18/04
R	10	1	Mar.18/04
R	11	1	Mar.18/04
R	12	1	Mar.18/04
R	13	1	Mar.18/04
R	14	1	Mar.18/04
R	15	1	Mar.18/04
R	16	1	Mar.18/04
R	17	1	Mar.18/04
R	18	1	Mar.18/04
	Supplement		
R	1	1	Mar.18/04

ENGINE - ACTUATING MECHANISM HP COMPRESSOR VARIABLE VANES - INTRODUCTION OF STAGE 6 UNISON RING ASSEMBLY WITH A REVISED ONE PIECE LEVER PIN BUSH

1. Planning Information

A. Effectivity

(1) Airbus A320

(a) V2500 A1 Engines prior to Serial No. V0362

B. Concurrent Requirements

None.

C. Reason

(1) Problem

Premature deterioration of the HP Compressor VSV unison ring lever arm bushes may occur which can result in mal-scheduling of the variable vanes.

The problem is attributed to a concentration of stress near the undercut of the retaining feature on the bush.

(2) Evidence

The problem has been experienced on engines in service.

(3) Substantiation

The changes introduced by this Service Bulletin have been the subject of extensive engineering analysis and have been successfully used on other engine projects. The revised bush has been introduced onto the V2500 engine performing an identical function on other HPC stages.

(4) Objective

Incorporation of this modification is designed to maintain reliability.

(5) Effect of Bulletin on:

(a) Operation

Not affected.

(b) Maintenance

Affected.

(c) Overhaul

Affected.

(d) Repair Schemes

Affected.

(e) Interchangeability

Affected (See Interchangeability of Parts 1.P.).

(f) Fits and Clearances

Not affected.

D. Description

(1) This Service Bulletin introduces a revised longer one piece lever arm bush replacing each existing pair of bushes. The revised bush eliminates the click retaining feature and is used at all lever positions where the existing parts are used. The new bush is inserted from the outside into unison rings and from the inside into stage 6 bridge pieces.

The changes introduced are:

(a) Revised unison ring assemblies for stage 6 upper and lower are introduced similar to the existing items except for the following:

(i) The existing two bushes per lever pin are replaced by one longer bush per lever pin position.

(ii) The bushes are retained by an interference fit with the unison ring or bridge piece.

(iii) The chamfer on the inner hole of the upper and lower unison ring is deleted.

R (iv) The internal bracket has been reworked to ensure that the
R bushes seat properly within the unison ring.

E. Compliance

Category Code 7

Accomplish when the supply of superseded parts has been depleted.

F. Approval

The part number transactions shown in section 2. Material Information of this Service Bulletin have been shown to comply with the applicable Federal Aviation Regulations and are FAA-Approved for the engine model(s) listed.

G. Manpower

(1) In service

Not applicable.

(2) At overhaul

Not affected.

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

H. Material Price and Availability

Modification kit is not required.

For prices and availability of future spares see section 2. Material Information.

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) Engine Manual, 72-41-00, Disassembly and Assembly.

(2) IAE Engineering Change Number 02VR008.

(3) ATA Locator - 72-41-34.

O. Other Publications Affected

(1) Illustrated Parts Catalogue (IPC) S-V2500-1IA, Chapter/Section 72-41-34 will be revised.

(2) Engine Manual, 72-41-00, Disassembly and Assembly.

(3) Engine Manual, 72-41-34, Cleaning, Inspection/Check and Repairs.

P. Interchangeability of Parts

It is recommended that the parts introduced by this Service Bulletin are fitted as a complete engine set.

2. Material Information

A. Parts required to accomplish this Service Bulletin:

All Engines.

72-41-34

	FIG ITEM NO.	NEW PART NO.	QTY	PART TITLE	MAT	OLD PART NO.	INSTR DISP
	06460	UP12206	34	..Bush	-	UP10815	(A)(S1)(1D)(2D)
	06560	UP12206	34	..Bush	-	UP10815	(A)(S1)(1D)(2D)
R	06587	UP12172	2	...Spacer	-	-	(4D)

B. Parts to be reworked:

All Engines.

72-41-34

FIG ITEM NO.	NEW PART NO.	QTY	PART TITLE	MAT	OLD PART NO.	INSTR DISP
06440	6A8097	1	.Ring, assy, st.6, act.upper	-	6A3551	(A)(S2)(3D)
06540	6A8098	1	.Ring, assy, st.6, act.lower	-	6A3553	(A)(S2)(3D)

C. New production parts:

None.

D. Instruction disposition codes:

(A) New part will be made available from December 2002.

(S1) Old and new parts are not interchangeable.

(S2) Old and new parts are freely and fully interchangeable.

(1D) Quantity reduced from 68 to 34.

(2D) Old part becomes redundant upon embodiment of this modification.

(3D) Old part may be reworked and re-identified to the new part number.

R (4D) For rework of sub-assembly 6A8100, not available as a spare.

3. Accomplishment Instructions

A. Rework Instructions

(1) Rework the following parts:

6A3551, Ring Assembly - Upper

6A3553, Ring Assembly - Lower

6A3683, Bracket - Lower

Standard Equipment

Drilling Machine

Drill 0.307in. (7,8 mm.) diameter

Standard workshop equipment

Vibro-engraving tool

Manual welding equipment

Penetrant crack test equipment

Portable grinding equipment

Repair Parts

UP12206 - Bushing, sleeve - 68 off

UP12172 - Spacer - 2 off

AGS3731 - Helicoil insert - 2 off

CAUTION: TITANIUM COMPONENT - YOU MUST USE SILICON CARBIDE TYPE ABRASIVE WHEELS, STONES AND PAPERS TO DRESS, BLEND AND POLISH THIS COMPONENT.

CAUTION: TITANIUM COMPONENT - AVOID BUILD UP OF HEAT BY APPLYING ONLY GENTLE PRESSURE AND KEEPING THE TOOL SPEED AS LOW AS POSSIBLE.

CAUTION: TITANIUM COMPONENT - YOU MUST MAKE SURE THAT WHEN YOU DRESS MATERIAL, BLEND AND POLISH, TO MAKE SMOOTH, THAT NO SPARKS ARE PRODUCED.

CAUTION: TITANIUM COMPONENT - IF THE MATERIAL SHOWS A CHANGE IN COLOUR, TO DARKER THAN A LIGHT STRAW COLOUR, THE COMPONENT IS TO BE REJECTED.

CAUTION: DO NOT DAMAGE THE BUSH LOCATION HOLES IN THE RING ASSEMBLY.

(a) Remove the bushes

PROCEDURE	RELATED DATA
(i) Drill the head of the bush (UP10815 - 136 off) until the head is released	See Figure 1 and Figure 2. Use a drilling machine with a 0.307in. (7,8 mm.) diameter drill.
(ii) Push the bush from the hole	Use a round bar.
(iii) Remove the bush and brackets from the channel and retain the brackets	
(b) Clean the bush location holes in the ring	See Figure 2. Use a soft clean cloth and air blast, remove the sharp edges around the holes. Use standard workshop equipment.
(c) Visually examine and measure the dimensions of the bush location holes	See Figures 2, 3 and 4. Examine the interference on the diameter. Reject if the location hole is oversize.
(d) Remove UP11118 spacers (2 off) on bracket 6A3683	See Figure 5. Use portable grinding equipment to remove existing welds. After removal, bracket surface to be made smooth.

(e) Position UP12172 new spacers (2 off) on bracket	See Figure 6. Refer to SPM, TASK 70-31-02-310-501. Use 2 equispaced welds per spacer. Use CoMat 03-204 filler material if required.
(f) Do a visual inspection of the welds	See Figure 6. Use workshop inspection equipment. Cracks are not permitted.
(g) Do a local penetrant crack test of the reworked areas	See Figure 6. Refer to SPM, TASK 70-23-05-230-501. Use CoMat 06-022 fluorescent penetrant with penetrant crack test equipment. Cracks are not permitted.
(h) Visually examine and measure the dimensions of the reworked areas	See Figure 6. Use workshop inspection equipment.
(i) Install AGS3731 wire thread inserts (2 off) in spacers	See Figure 7. Refer to SPM, TASK 70-35-08-300-501, SUBTASK 70-35-08-350-002. Use standard workshop equipment.
(j) Visually inspect wire thread inserts	See Figure 7. Refer to SPM, TASK 70-35-08-300-501, SUBTASK 70-35-08-220-001.
(k) Cancel the existing bracket part number and re-identify with the new part number	Use vibro-engraving equipment. Refer to SPM, TASK 70-09-00-400-501, SUBTASK 70-09-00-400-001. Existing: 6A3683 — Re-number: 6A8100
(l) Install brackets into position	See Figure 3. Use hand tightened No.10 (0.190in., 4,82 mm.) diameter UNF bolts as necessary, to hold the brackets in position.
(m) Install the new bushes into the holes	
(i) Push the bush fully into position in the hole	See Figures 3 and 4. Use bushes UP12206 - 68 off.
(ii) Visually inspect the bush location	See Figure 4.

(n) Cancel the existing part number and re-identify with the new part number

Use vibro-engraving equipment. Refer to SPM, TASK 70-09-00-400-501, SUBTASK 70-09-00-400-001.

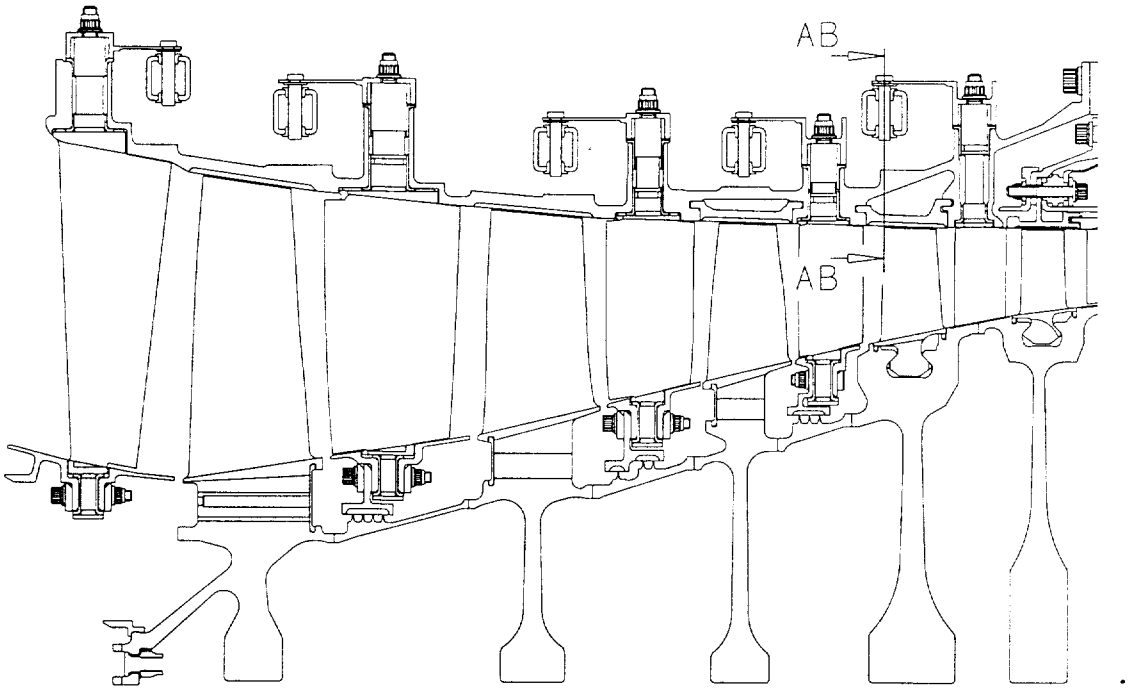
Existing	Re-number
6A3551	6A8097
6A3553	6A8098

B. Assembly Instructions

(1) It is recommended that the parts introduced by this Service Bulletin are fitted as a complete engine set. Install in accordance with current procedures (Engine Manual, 72-41-00, Assembly).

C. Recording Instruction

(1) A record of accomplishment is required.



TYPICAL SECTION THRU H.P. COMPRESSOR

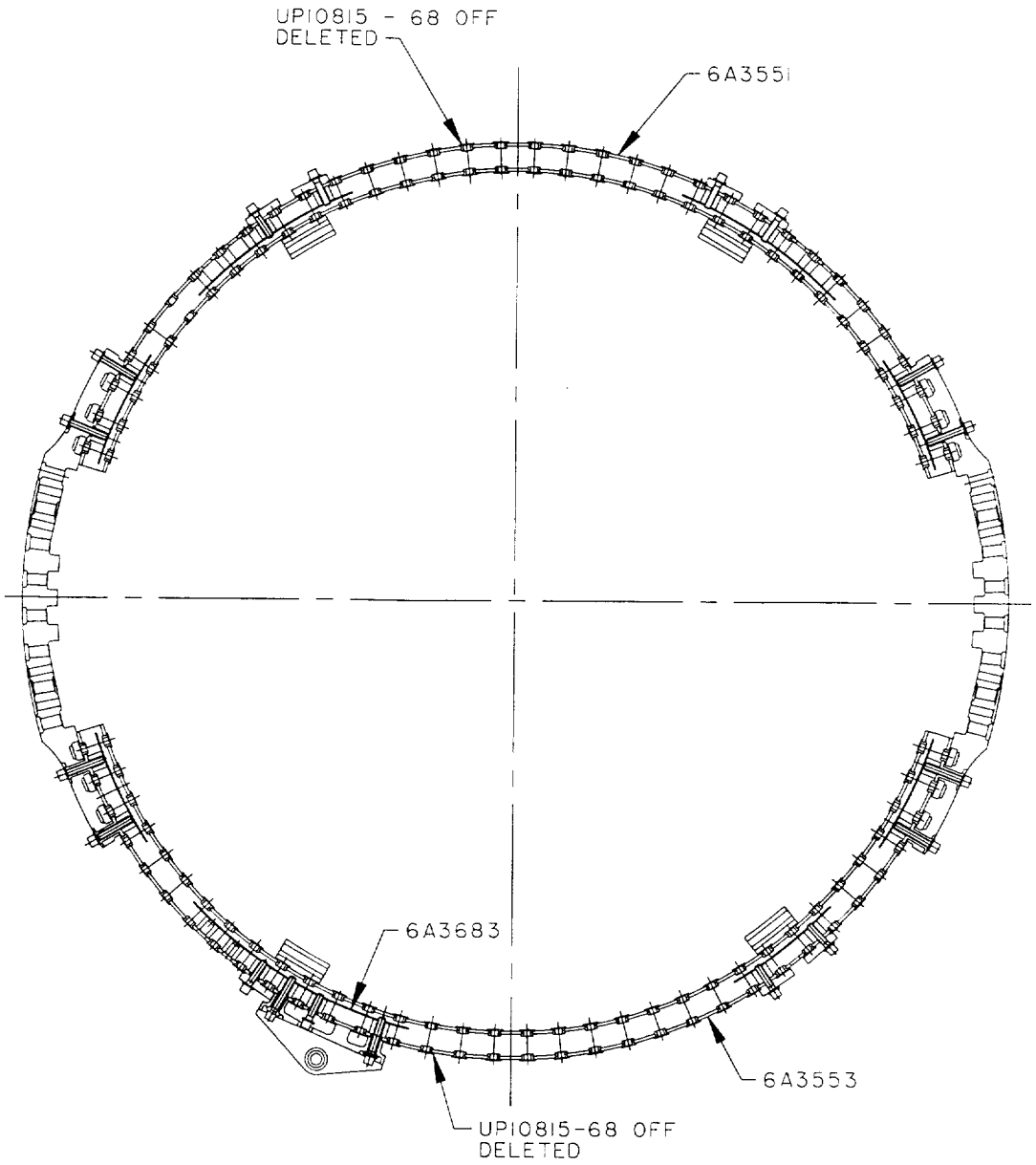
REMOVE SHARP EDGES 0.012±0.008in (0,30±0,20mm) UNLESS OTHERWISE STATED

THE GEOMETRIC SYMBOLS ARE GIVEN IN THE I.S.O. MANUAL (R11O1)

ANGULAR DIMENSIONS ARE IN DEGREES AND DECIMAL PARTS OF A DEGREE

dem0001038

Typical Section Through HP Compressor
Figure 1



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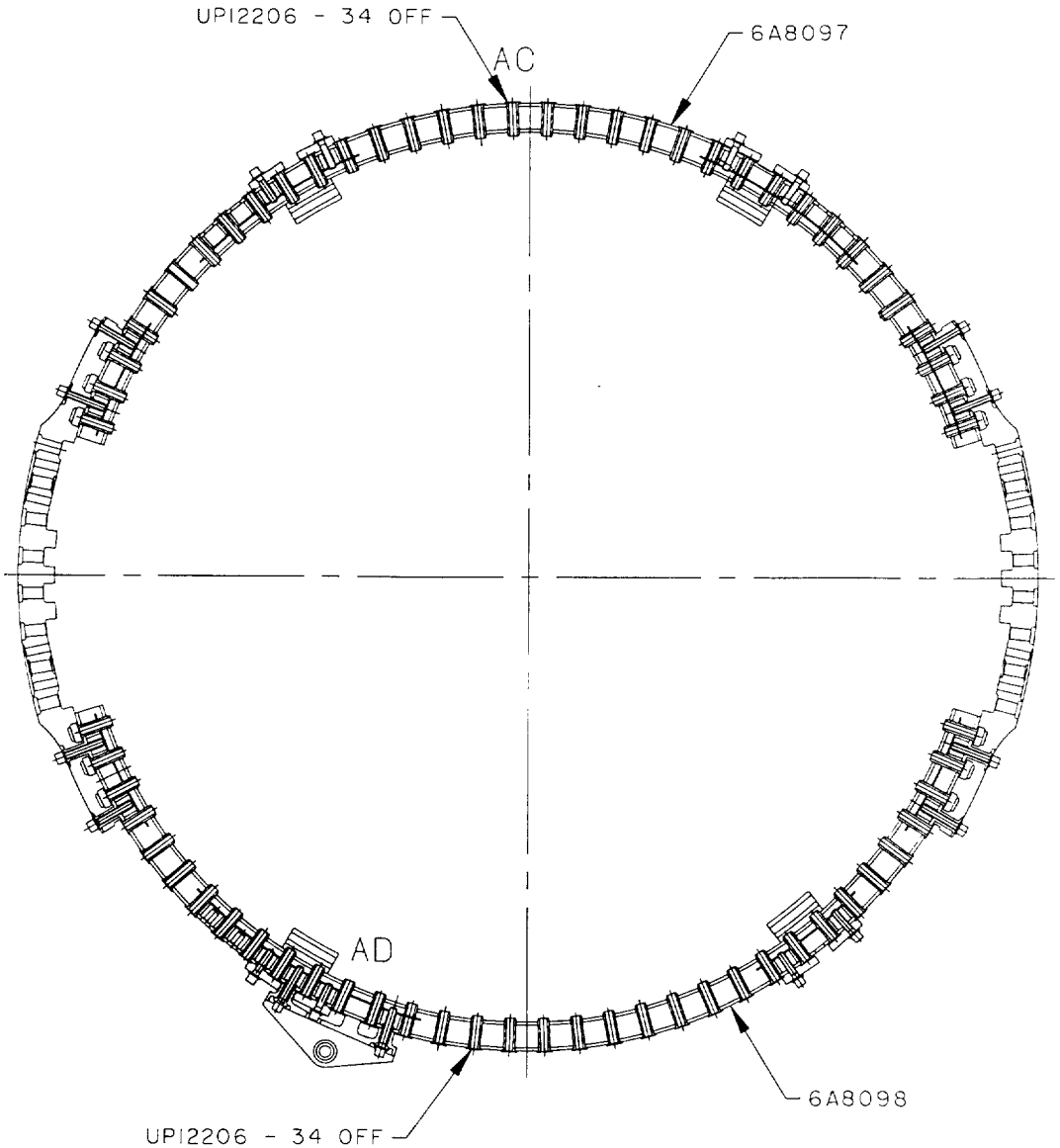
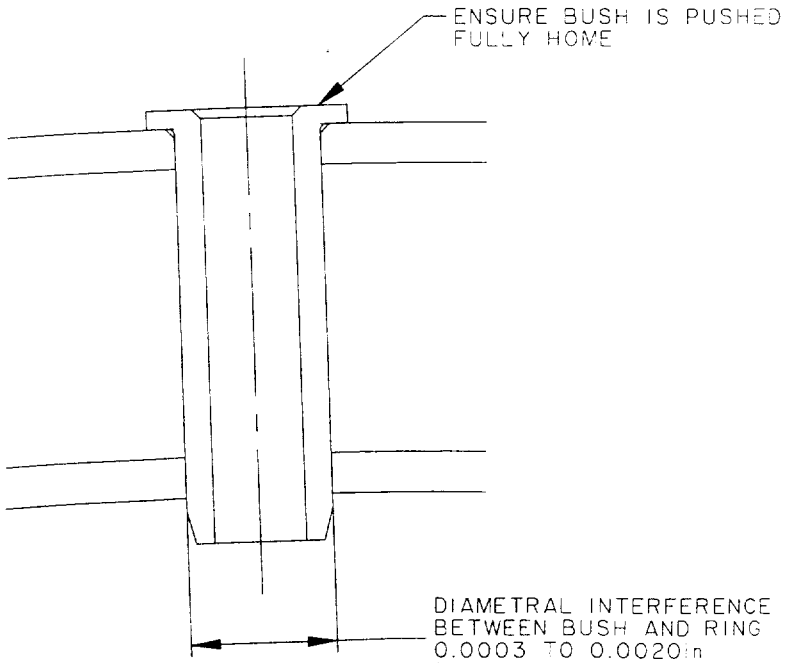
Removal of Redundant Bushes (Before Alteration)
Figure 2



REPEAT SECTION AB STAGE 6
INSTALLATION OF NEW BUSHES
(AFTER ALTERATION)

dem0001040

Installation of New Bushes
Figure 3



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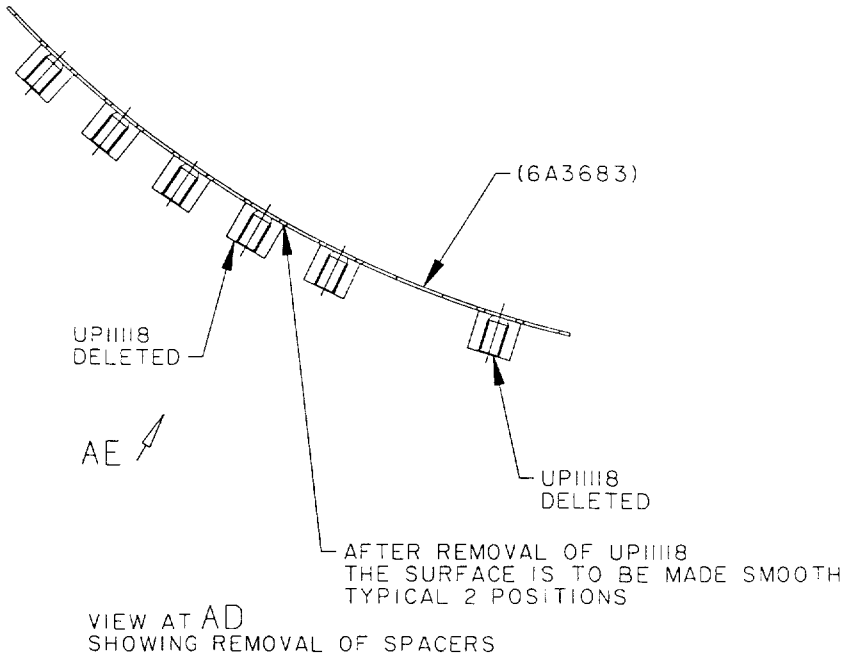
Installation of New Bushes (After Alteration)
Figure 4



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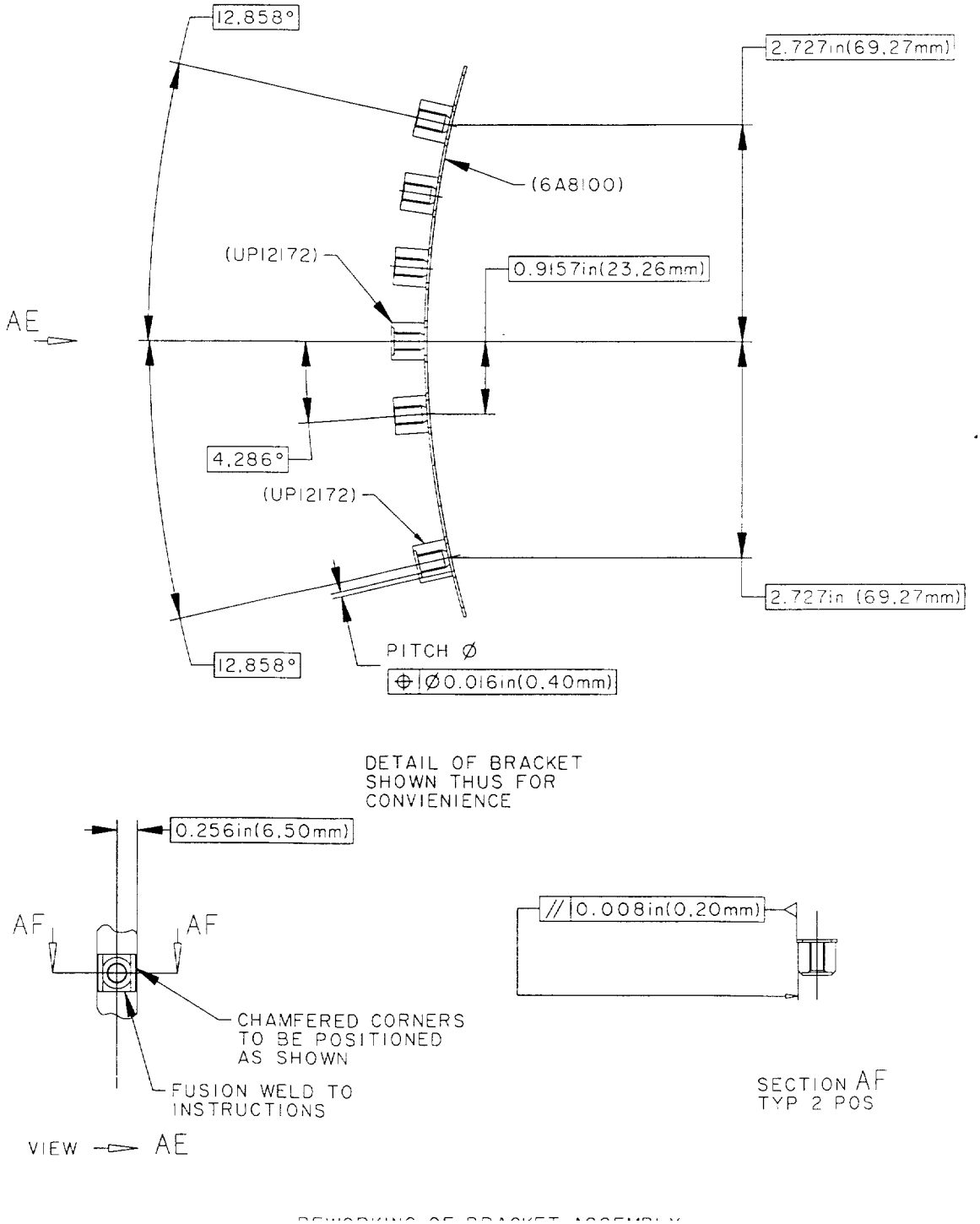
REWORKING OF BRACKET ASSEMBLY

Rework of Bracket Assembly
Figure 5



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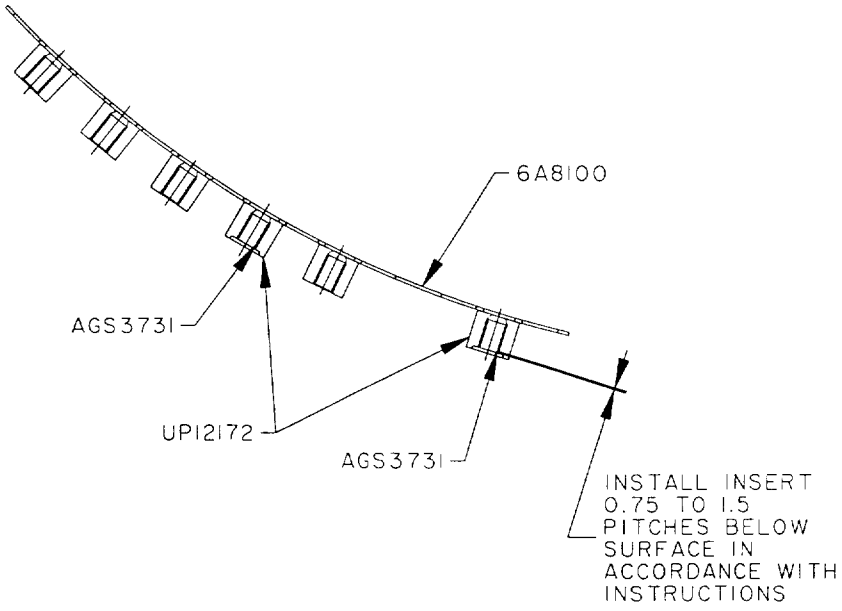
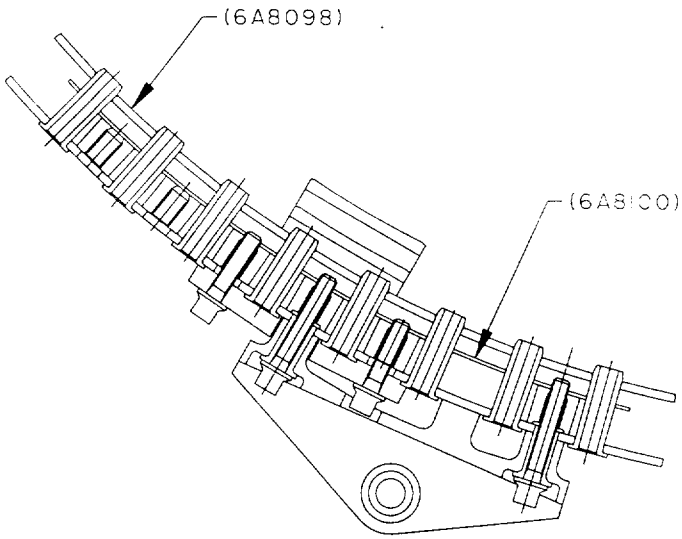
Rework of Bracket Assembly
Figure 6



VIEW AT AD
SHOWING REWORKED BRACKET ASSEMBLY

dem0001044

Bracket Assembly - After Rework
Figure 7



VIEW AT AD
SHOWING INSTALLATION OF BRACKET ASSEMBLY

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Installation of Bracket Assembly
Figure 8

ENGINE – ACTUATING MECHANISM HP COMPRESSOR VARIABLE VANES – INTRODUCTION OF STAGE 6 UNISON RING ASSEMBLY WITH A REVISED ONE PIECE LEVER PIN BUSH

SUPPLEMENT – PRICES AND AVAILABILITY

The prices if shown are for estimating purposes only and as such are given in good faith, without commercial liability for advanced planning purposes only. Refer to IAE Spares and/or current price catalogue for current prices.

1. Modification Kit

Not applicable. Parts supplied as single line items

2. New Production or Rework Parts

	Part No.	Desc.	Unit Price US Dollars
R	UP12206	Bush	32.50
R	6A8097	Ring assy	9,113.00
R	6A8098	Ring assy	9,046.00