V2500 International Aero Engines

SERVICE BULLETIN

Date: Feb.21/00

Subject: Transmittal of Revision 2 to Service Bulletin No.V2500-ENG-72-0234

Service Bulletin Revision History:

Event	Date
Basic Issue	Feb.10/96
Revision 1	Dec.25/96
Revision 2	Feb.21/00

Reason for Issuance of Revision:

(1) To add EC96VJ002A.
(2) To add aircraft Airbus A319.
(3) To clarify effectivity of engine.
(3) To add Aircraft Engine Maintenance Manual in Paragraph 1.L.
(4) To delete Engine Maintenance Manual in Paragraph 1.L.
(5) To clarify engine models in Paragraph 2.A.
(6) To clarify number of page.

Effect on Past Compliance:

None

List of Effective Pages:

	Bulletin Page No.	Rev. No.	Effective Date
R	1 and 2	2	Feb.21/00
	3 to 5	Basic	Feb.10/96
R	6 and 7	2	Feb.21/00
	8	Basic	Feb.10/96
	9 and 10	1	Dec.25/96
	11 to 15	Basic	Feb.10/96
R	16 to 18	2	Feb.21/00

V2500 International Aero Engines

SERVICE BULLETIN

ENGINE - LP COMPRESSOR - TRIMMING OF ANNULUS FILLER PLATFORM EDGE

MODEL APPLICATION

V2522-A5
V2524-A5
V2527-A5
V2527E-A5
V2530-A5
V2533-A5
V2525-D5
V2528-D5

BULLETIN INDEX LOCATOR

72-31-00

Compliance Category Code	Internal Reference No.
8	96VJ002
R	96VJ002A

ENGINE - LP COMPRESSOR - TRIMMING OF ANNULUS FILLER PLATFORM EDGE

1. Planning Information

A. Effectivity

(1) Aircraft:

R (a) Airbus A319
(b) Airbus A320
(c) Airbus A321
(d) Boeing-Douglas Product Division MD-90

(2) Engine:

R (a) V2522-A5 All Engines
R (b) V2524-A5 All Engines
R (c) V2527-A5 All Engines
R (d) V2527E-A5 All Engines
R (e) V2530-A5 All Engines
R (f) V2533-A5 All Engines
R (g) V2525-D5 All Engines
R (h) V2528-D5 All Engines

B. Reason

(1) Condition

The free movement of the Stage 1 LP Compressor Fan Blade can be restricted by the metal contact between the Annulus Filler and the Fan Blade. This condition will increase imbalance of the Fan Rotor in operation.

(2) Background

It was found for some engines that the gap between the Annulus Filler and the Fan Blade was too narrow in the leading edge portion of convex side of the Fan Blade.

(3) Objective

To eliminate the possibility of the metal contact by trimming of the Annulus Filler Platform Edge. This modification is temporary measure.

(4) Substantiation

The change recommended in this Service Bulletin has been substantiated analytically.

(5) Effects of Bulletin on Workshop Procedures:

Removal/Installation	Affected
Disassembly/Assembly	Not affected
Cleaning	Not affected
Inspection/Check	Not affected
Repair	Not affected
Testing	Not affected

C. Description

(1) This Service Bulletin applies to the engines which experienced the N1 Vibration Shifting.

(2) This Service Bulletin introduces the trimming of the platform edge of the 5A1459, 5A1611 or 5A1710, Annulus Filler to keep each gap between the Annulus Filler and the Stage 1 LP Compressor Fan Blade by minimum 0.025 in (0,64 mm).

(3) Existing Annulus Fillers, which have not kept the gap minimum 0.025 in (0,64 mm), should be reworked (See Figure 1).

D. Approval

The part number changes and/or part modifications described in Sections 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.

E. Compliance

Category Code 8

Accomplish based upon experience with the prior configuration.

F. Manpower

Estimated manhours to incorporate the full intent of this Bulletin:

Venue	Estimated Manhours
(1) In Service or Shop	
(a) To Check Annulus Filler gaps	1 hour 0 minutes
(b) To gain access ..... (Remove the Inlet Cone/ Retaining Ring)	22 minutes
(c) To Rework the Annulus Filler (Remove/Trim)	1 hour 15 minutes
(c) To return engine to flyable status (Install the Annulus Filler/Retaining Ring/ Inlet Cone)	50 minutes
Total	3 hours 27 minutes

N.B. This estimate is done on the assumptiom that ten Annulus Fillers needed rework.

G. Material - Price and Availability

(1) Modification kit is not required.

(2) See Section 3 "Material Information" for prices and availability of future spares.

H. Tooling - Price and Availability

The following tool is required to accomplish this Service Bulletin.

Tool No.	Qty.	Description	Function	Avail.
IAE3J12813	1	Template, Trimming-Annulus Filler, Fan	Trimmimg of Annulus Filler Platform	1) 2)

1) Indicates that Tool Design Aparture Cards are currently available from IAE.
2) Indicates that Tool (or Tool Design) can be procured from IAE on full lead time or 60 days for a price to be quoted upon request.

I. Weight and Balance

(1) Weight change .. .. None

(2) Moment arm .. .. Not effect

(3) Datum .. .. .. Engine front mount centerline (Power Plant Station (PPS) 100)

J. Electrical Load Data

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

K. References

(1) V2500 Engine Illustrated Parts Catalogs, Chapter/Section 72-31-11

(2) Aircraft Maintenance Manual,

For V2500-A5:
Chapter/Section 72-31-11, Removal/Installation Page 401
Chapter/Section 71-00-00, Adjustment/Test Page 501

For V2500-D5:
Chapter/Section 72-31-11, Removal/Installation
Chapter/Section 71-00-00, Adjustment/Test-09/09A

(3) V2500 Engine Manuals(E-V2500-1IA and E-V2500-3IA),
Chapter/Section 72-31-00, Disassembly/Assembly
Chapter/Section 71-00-00, Testing-08 and Testing-09 Page 1301

(4) V2500 Standard Practices/Process Manual(SPP-V2500-1IA),
Chapter/Section 70-09-00, Marking of Parts
Chapter/Section 70-35-03, Hand Polish and Blend Procedures
Chapter/Section 70-38-02, Apply Chromate Conversion Coating-03

(5) Illustrated Tool and Equipment Manual(ITE-V2500-1IA)

(6) IAE Service Bulletin No.V2500-ENG-70-0127, To Announce the Availability of a new Annulus Filler Assembly with a revised profile

(7) IAE Service Bulletin No.V2500-ENG-70-0388, To Announce the Availability of a new Annulus Filler with revised Rubber Seal

L. Other Publications Affected

(1) V2500 Engine Illustrated Parts Catalog, Chapter/Section 72-31-11.

(2) V2500 Engine Manuals (E-V2500-1IA and E-V2500-3IA), Chapter/Section 72-31-00 Assembly and 72-31-11, Cleaning and Inspection/Check.

R (3) A319/320/321 Aircraft Engine Maintenance Manuals, Chapter/Section
R 72-31-11, Removal/Installation, Inspection/Check and Cleaning/
R Painting.

R (4) MD90 Aircraft Engine Maintenance Manuals, Chapter/Section
R 72-31-11, Removal/Installation, Inspection/Check and Cleaning/
R Painting.

2. Accomplishment Instructions

Do the following procedures for the engines which experienced the Vibration Shifting.

A. Prerequisite Instructions

(1) Do the following preparation before Paragraph B.

(a) Put a warning notice of "DON'T START ENGINE".

(b) Make sure that the engine has been shutdown for at least five minutes.

R (c) For V2522-A5, V2524-A5, V2527-A5, V2527E-A5, V2530-A5 and,
R V2533-A5 engines, make sure on the panel 50VU that the ON Legend of the ENG FADEC GND PWR Pushbutton Switch is off. For
R V2525-D5 and V2528-D5 engines, you must open the Circuit Breakers by the approved procedures in Reference (2), 72-31-11 Removal/ Installation.

(d) Put a workmat in the Intake Cowl.

B. Inspection Instructions

Do the following inspection to decide whether the rework in Paragraph D is required or not.

(1) Check each gap between the 5A1459, 5A1611 or 5A1710 Annulus Filler and the Stage 1 LP Compressor Fan Blade as follows: (Refer to Figure 1)

(a) Prepare a stiff Plastic Strip with the dimensions of;

Length : 3.150 to 4.724 in (80,00 to 120,00 mm)
Width : 1.575 to 2.362 in (40,00 to 60,00 mm)
Thickness : 0.025 - 0.028 in (0,64 - 0,71 mm)

CAUTION: 1. MAKE SURE THAT THE PLASTIC STRIP HAS A SMOOTH SURFACE AND EDGES. IF YOU USE A STRIP WITH A ROUGH SURFACE OR EDGES, DAMAGE TO THE RUBBER SEAL CAN OCCUR.

2. MAKE SURE THAT YOU DO NOT BREAK THE PLASTIC STRIP AND LEAVE PIECES OF IT IN THE GAP. PIECES OF PLASTIC CAN CAUSE DAMAGE TO THE RUBBER SEALS.

(b) Put the Plastic Strip into the gap between the Annulus Filler and the convex side of Fan Blade, and traverse it from the leading edge to the trailing edge to check the width of gap. Do the same check for all gaps.

(c) If it can be traversed without sticking in the gap, the subsequent procedures are not required, and return the engine to flyable status.

But, if it stucks in the gap without being traversed, do the subsequent procedures as stated below.

(2) Make a temporary mark on the Annulus Filler with the width 0.025 - 0.028 in (0,64 - 0,71 mm) from the Fan Blade using the Plastic Strip (Refer to Figure 1).

NOTE: Use the CoMat 06-069 Felt Tip Marker for temporary mark.

This mark is for trimming of the Annulus Filler in Paragraph D.

C. Removal Instructions

Do the following removal for the rework of Annulus Fillers in Paragraph D.

(1) Remove the Inlet Cone and the Fairing from the engine as below: (Refer to Figure 2)

(a) Make the temporary mark to show the installation position of the Inlet Cone Fairing with respect to the Inlet Cone and the Retaining Ring by the CoMat06-069 Felt Tip Marker.

(b) Remove the Inlet Cone from the engine by the approved procedures in Reference (2) (In Service) or Reference (3) (In Shop).

(2) Remove the Front Retaining Ring as below: (Refer to Figure 3)

(a) Find the Correlation Mark (*) on the Retaining Ring.

(b) Make the temporary marks on the Retaining Ring Flange to show each installation position of the Trim Balance Weights against the Correlation Mark by the CoMat06-069 Felt Tip Marker.

CAUTION: IF EACH TRIM BALANCE WEIGHT HAS NOT INSTALLED IN THE SAME POSITION, AN IMBALANCE CAN OCCUR.

c) Make the temporary mark numbers 1 through 22 on each Annulus Filler in counterclockwise from the Correlation Mark when you look from the rearward.
Use the CoMat06-069 Felt Tip Marker.

d) Remove the Front Retaining Ring by the approved procedures in Reference (2) (In Service) or Reference (3) (In Shop).

(3) Remove the 5A1459, 5A1611 or 5A1710, Annulus Fillers which have been marked in Paragraph B (2) due to the narrow gaps by the approved procedures in Reference (2) (In Service) or Reference (3) (In Shop). (Refer to Figure 3)

(4) Check the profile of each Annulus Filler removed with the IAE3J12813, Annulus Filler Trimming Template; make sure whether the mark made in Paragraph B (2) is hidden under the Template or not. (Refer to Figure 4)

If the mark is not hidden and out of the Template, do Paragraph D for trimming of the Annulus Fillers.
R But, If the mark is hidden under the Template, or if the
R "SB 72-0234 MAX" is marked adjacent to the part number, replace
R the Fan Blade instead of Paragraph D by the approved procedures
R in Reference (2) (In Service) or Reference (3) (In Shop).

R If the IAE3J12813, Annulus Filler Trimming Template is not
R available, you can do a rework of the Annulus Filler one time
R by trimming the maximum amount.

R CAUTION: THE ANNULUS FILER TRIMMED MAXIMUM AMOUNT MAY INCREASE THE
R POSSIBILITY OF RUBBER SEAL FLIPPING AT OPERATION WHICH MAY
R RESULT IN THE LOW PRESSURE ROTOR VIBRATION PROBLEM.

D. Rework Instructions

(1) Rework and re-number the Annulus Fillers on which marks made in Paragraph B.(2) are not hidden under the Template in the check of Paragraph C.(4) as follows:

	Procedure	Supplemental Information
R	a) Trim the Annulus Filler along with the temporary mark made in Paragraph B.(2) or by maximum amount	Refer to Figure 4 for minimum amount trimming, refer to Figure 4A for maximum amount trimming, Refer to Reference (4), TASK 70-35-03-300-501 Hand Polish and Blend Procedure.

Procedure	Supplemental Information

CAUTION: DO NOT DAMAGE THE END OF RUBBER SEAL.

b) Break sharp edge and blend smoothly.

Refer to Reference (4), TASK 70-35-03-300-501 Hand Polish and Blend Procedure.

c) Re-number adjacent to existing part number and cancel the existing part number by two solid lines.

Existing	Re-Number
5A1459	5A1750
5A1611	5A1752
5A1710	5A1753

R If the Annulus Filler was trimmed
R by maximum amount, Mark
R "SB 72-0234 MAX" adjacent to the
R part number.
Use vibration peenning method.

Refer to Reference (4), TASK 70-09-00-400-501.

d) Erase the weight mark on the Annulus Fillers by vibration penning method.

Refer to Reference (4), TASK 70-09-00-400-501.

e) Do the Chromate Conversion Touch-up Coating to the surface of blended area.

Refer to Reference (4), TASK 70-38-02-300-503, Brushing Procedure

E. Installation Instructions

(1) Assemble the new 5A1750, 5A1752 or 5A1753, Annulus Fillers into the same positions of the Fan Disk, confirming the temporary marks 1 through 22 made in Paragraph C.(2) c).

(2) Assemble the Front Retaining Ring and the Trim Balance Weights, confirming the temporary marks made in Paragraph C.(2) b).

(3) Confirm that the each gap between the Annulus Filler and the Fan Blade is 0.025 - 0.028 in (0,64 - 0,71 mm) with the Plastic Strip. (Refer to Figure 1)

(4) Put the Annulus Filler Rubber Seals in the correct positions as below: (Refer to Figure 5)

a) Push the Plastic Strip used in Paragraph B.(1) between the Annulus Filler and the Fan Blade.

b) Move the Rubber Seal into the correct position with the Plastic Strip.

c) Do the above procedures along the full chordal length at both sides of each Fan Blade.

CAUTION: 1. MAKE SURE THAT THE PLASTIC STRIP HAS A SMOOTH SURFACE AND EDGES. IF YOU USE A STRIP WITH A ROUGH SURFACE OR EDGES, DAMAGE TO THE RUBBER SEAL CAN OCCUR.

2. MAKE SURE THAT YOU DO NOT BREAK THE PLASTIC STRIP AND LEAVE PIECES OF IT IN THE GAP. PIECES OF PLASTIC CAN CAUSE DAMAGE TO THE RUBBER SEALS.

(5) Assemble the Inlet Cone, the Fairing and the Trim Balance Weights, confirming the temporary marks made in Paragraph C.(1) a).

F. Post-Requisite Instructions

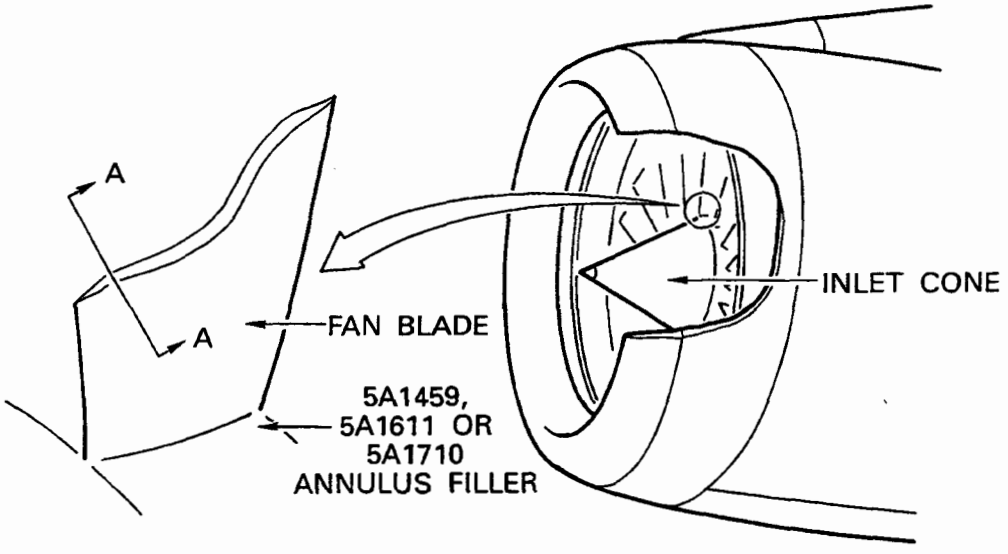
(1) Remove the workmat and the warning notice prepared in Paragraph A.(1).

(2) Do a Vibration Survey by the approved procedures in Reference (2) (In Service) or Reference (3) (In Shop).

(3) If required, do a Trim Balance by the approved procedures in Reference (2) (In Service) or Reference (3) (In Shop).

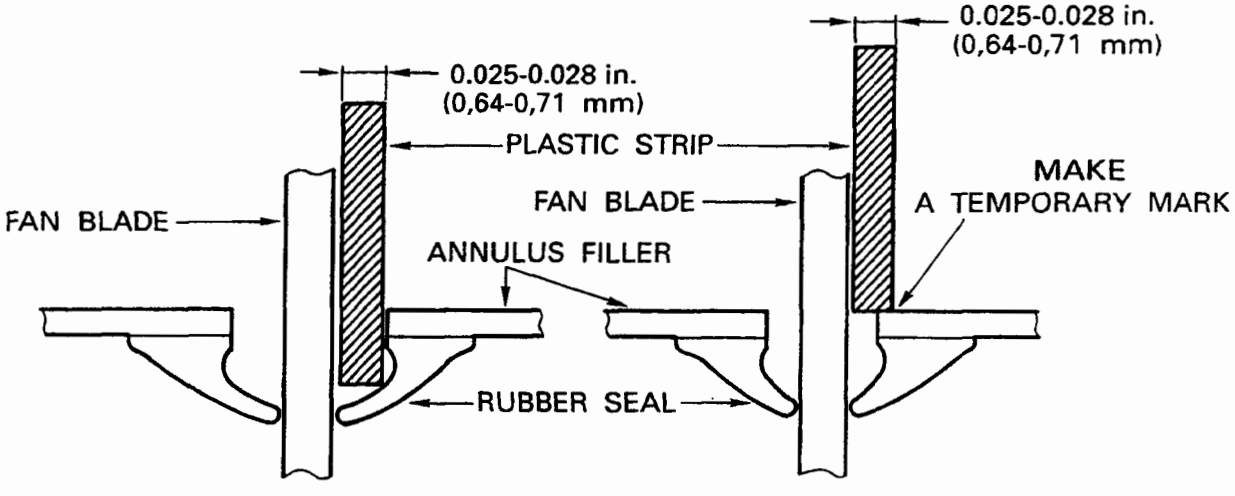
G. Recording Instructions

A record of accomplishment is required.



FRONT VIEW OF POWER PLANT

PUT THE PLASTIC STRIP INTO THE GAP BETWEEN THE ANNULUS FILLER AND THE CONVEX SIDE OF THE FAN BLADE, AND TRAVERSE IT. IF IT STUCK IN THE GAP, MARK ON THE ANNULUS FILLER.



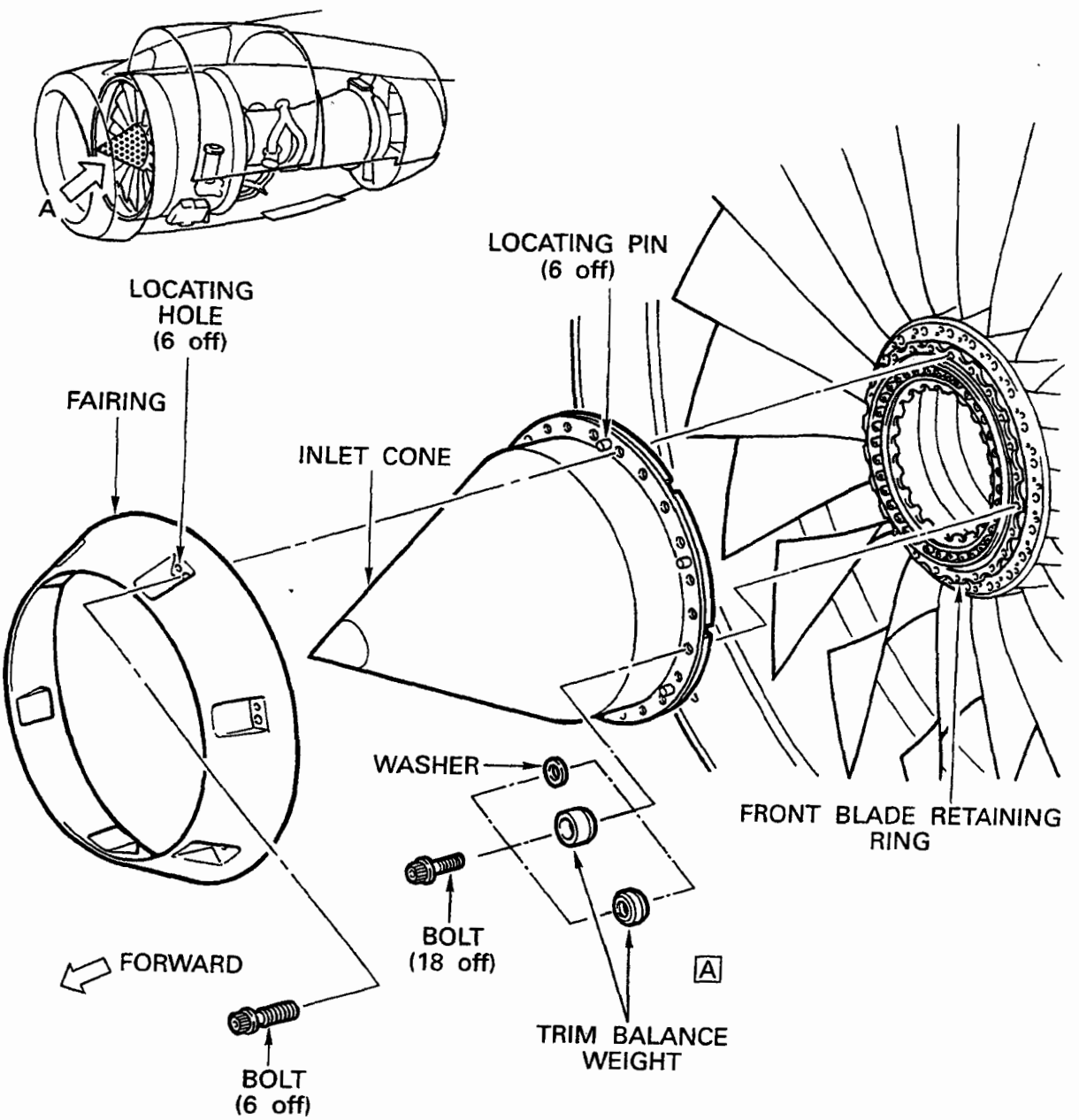
SECTION A-A

TRAVERSE OF THE PLASTIC STRIP

MARK ON THE PLATFORM EDGE

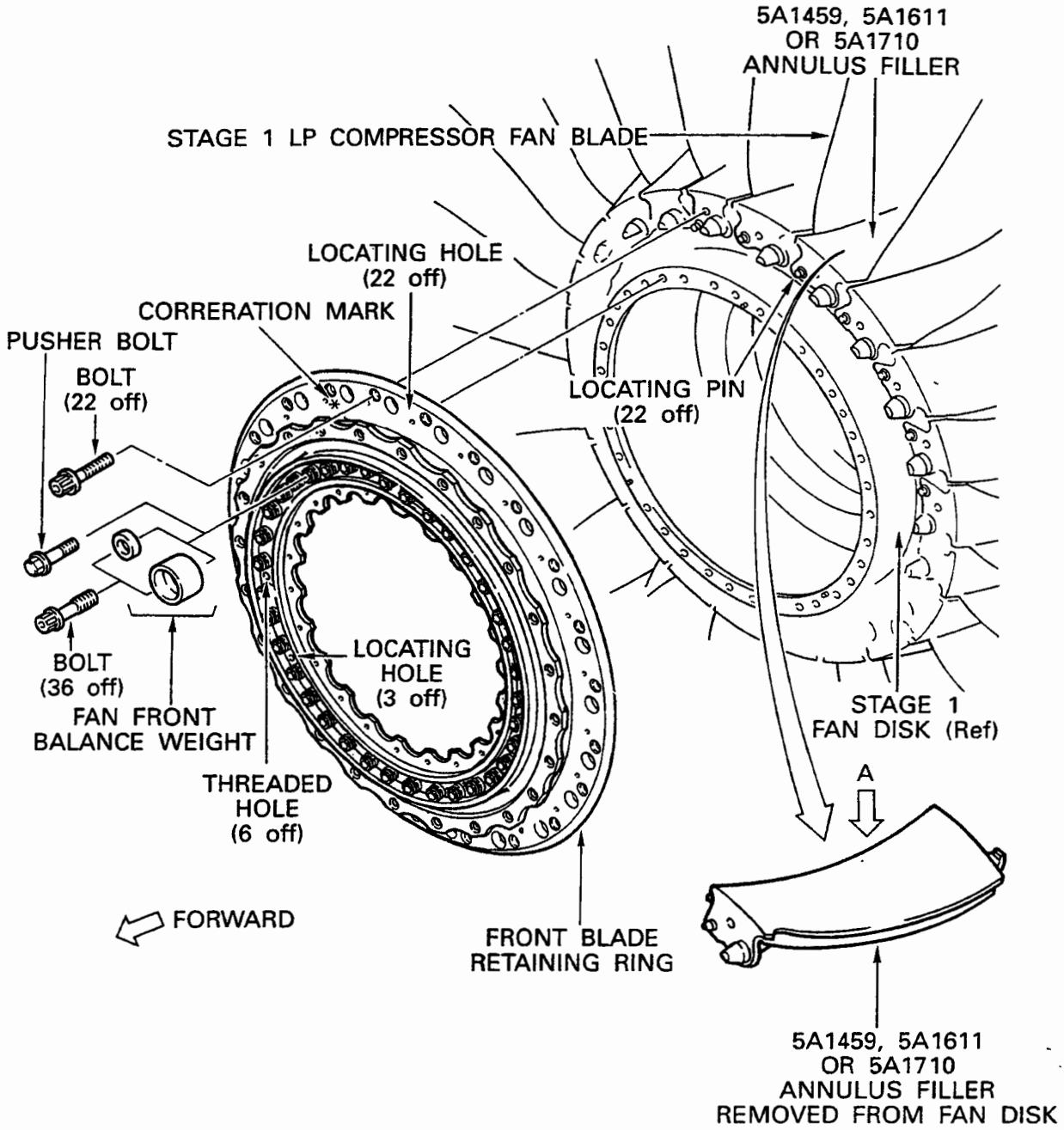
J72002-1

Check the gaps between the Annulus Fillers and the Stage 1 LP Compressor Fan Blade
Figure 1



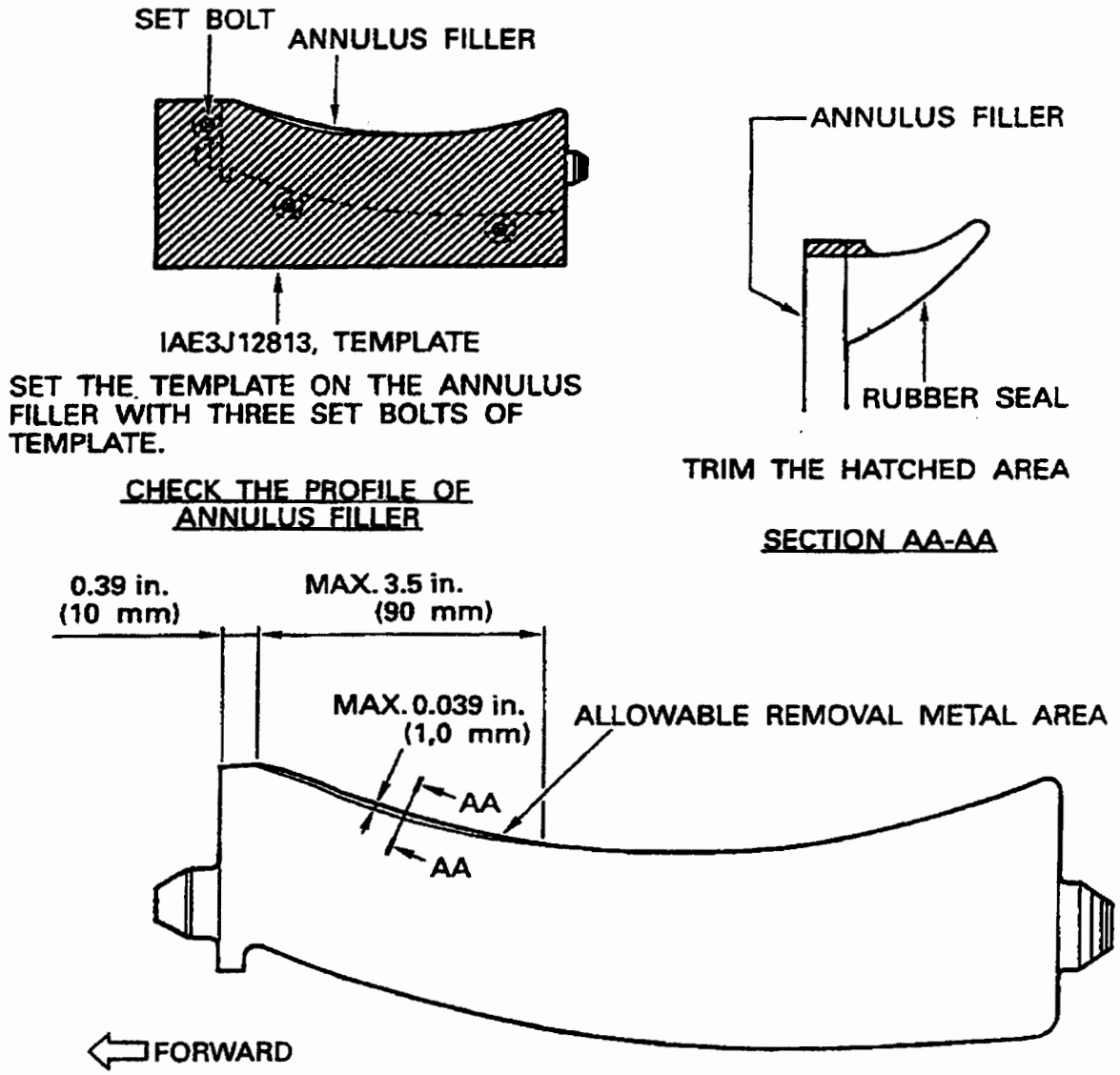
J72002-2

Remove and Reassemble the Inlet Cone and Fairing
Figure 2

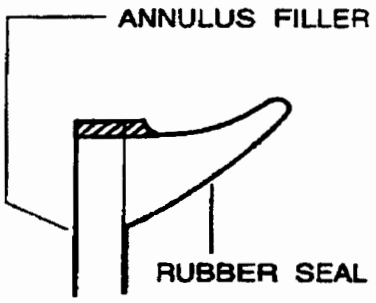


J72002-3

Remove and Reassemble the Front Retaining Ring and the Annulus Fillers
Figure 3

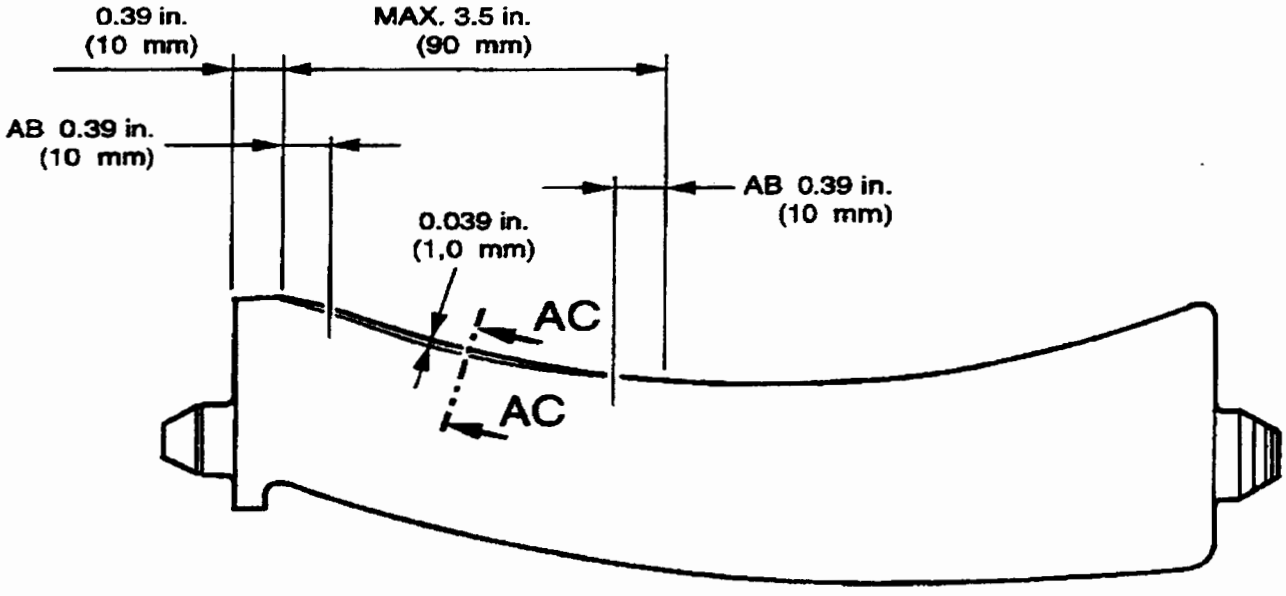


Trimming of the Annulus Filler Platform Edges
Figure 4



TRIM THE HATCHED AREA

SECTION AC-AC

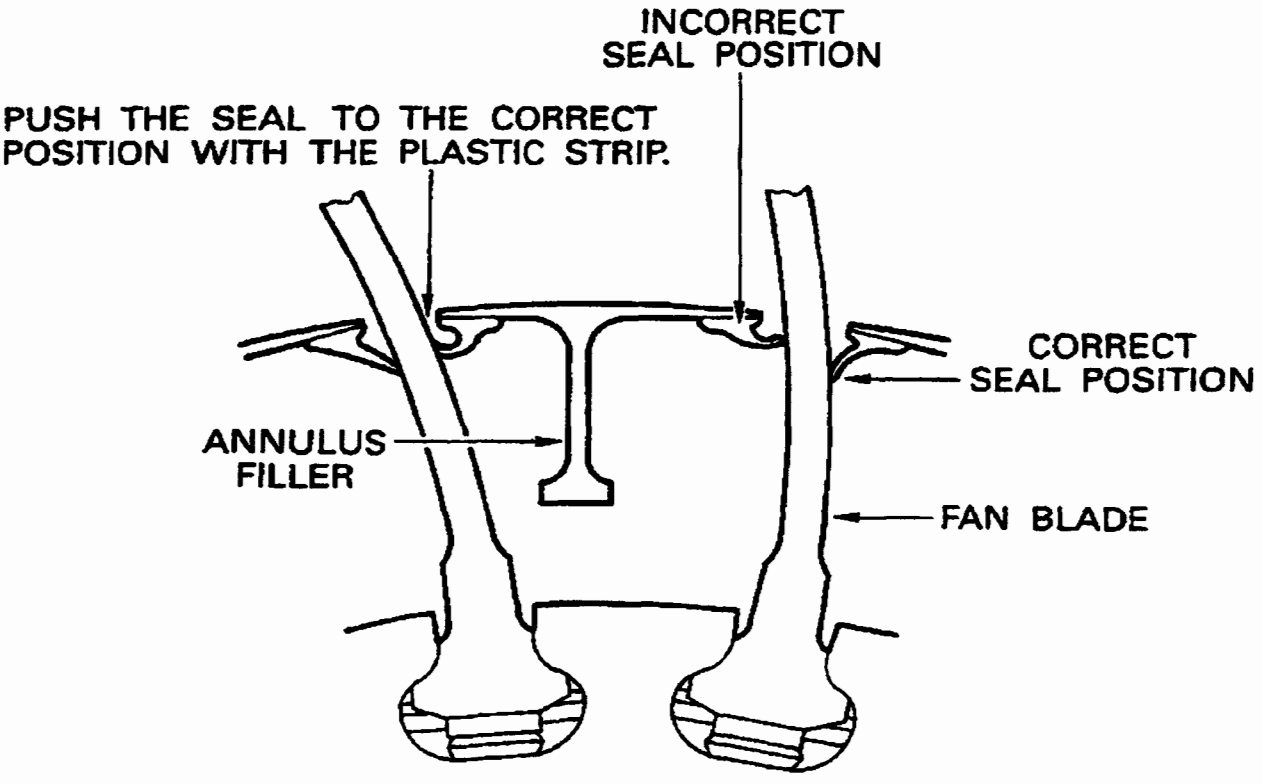


FORWARD

VIEW ON A

NOTE : DECREASE THE TRIMMING DEPTH FROM 0.039 in. (1,0 mm) TO 0 in. (0 mm) UNIFORMLY IN AREAS AB.

Trimming of the Annulus Filler Platform Edges
Figure 4A



SECTION THROUGH BLADE ROOT

Put the Annulus Filler Rubber Seals in the correct positions
Figure 5

3. Material Information

Applicability : For each V2500 engine to incorporate this Service Bulletin.

A. Kits associated for this Service Bulletin:

None.

B. Parts affected with this Service Bulletin:

New Part No. (ATA No.)	Qty	Est'd Unit Price($)	Keyword	Old Part No. (IPC No.)	Instruction /Disposition
(1) For incorporating this Service Bulletin to the BASELINE engine.					
5A1750 (72-31-11)	22		.Filler, A/O Annulus	5A1459 (01-100)	(1D)(S1)
(2) For incorporating this Service Bulletin to the engine incorporated Service Bulletin No. V2500-ENG-70-0127.					
5A1752 (72-31-11)	22		.Filler, A/O Annulus	5A1611 (01-100)	(1D)(S1)
(3) For incorporating this Service Bulletin to the engine incorporated Service Bulletin No. V2500-ENG-70-0388.					
5A1753 (72-31-11)	22		.Filler, A/O Annulus	5A1710 (01-100)	(1D)(S1)

NOTE: The unit prices, if shown, are an estimate and they are given for the purposes of planning only. For information about actual prices, refer to the IAE Price Catalog or contact IAE's Spare Parts Sales Department.

C. Instruction/Disposition Code Statements:

(1D) New part can be obtained only from rework and reidentification of Old part. (New part is non saleable item)

(S1) Old and New parts are freely and fully interchangeable, both physically and functionally.