ENGINE - STAGE 9 TO 12 DISK ASSEMBLY - INCREASED LIFE DISK ASSEMBLY - CATEGORY CODE 6 - MOD.ENG-72-0069

1. Planning Information

A. Effectivity

(1) Aircraft: Airbus A320

(2) Engine: V2500-A1 Engines Serial No. before V0114* except Engine Serial No.s V0102, V0104, V0106, V0107, V0108, V0110, V0111 and V0112.

* NOTE: To get the increase in the cycle life limit the modification specified in the Service Bulletin must be performed before the Stage 9 to 12 Disk Assembly reaches 5000 cycles.

B. Reason

(1) Condition

The cycle lift limit for the HPC Stage 9 to 12 Disk Assembly is lower than it could be, because unsatisfactory weight distribution can cause high stresses in the stage 9 and 12 disks.

(2) Background

The removal of metal from some areas on the disk assembly decreases stresses within the disk assembly. As a result, the cycle life limit of the disk assembly can be increased.

(3) Objective

Extend the cycle life for the HPC Stage 9 to 12 Disk Assembly.

(4) Substantiation

This modification has been substantiated analytically and received F.A.A. Approval based on an approved lifing methodology.

(5) Effects of Bulletin on Workshop Procedures:

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

(6) Supplemental Information:

None

C. Description

The changes introduced are:

(1) The stage 9 disk is reprofiled below the abrasive lining for the stage 8 stator vane.

(2) The stage 9 disk vortex reducer outside diameter location is reduced in size.

(3) The stage 9 disk main disk hub is reduced in width.

(4) The stage 12 disk rear flange scallops are reprofiled.

D. Approval

The part numbers 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 6

Accomplish when the subassembly (i.e., modules, accessories, components, build groups) is disassembled sufficiently to afford access to the affected part and to all affected spare parts.

F. Manpower

Estimated manhours to incorporate the intent of this bulletin:

Venue	Estimated Manhours
(1) In Service	Not applicable
(2) At overhaul (Note: The parts affected by this Service Bulletin are accessible at overhaul)	

(a) To embody

(i) To accomplish the modification of the HPC Shaft assembly — 2 Hours, 16 Minutes

Total: 2 Hours, 16 Minutes

G. Material - Price and Availability

(1) Modification Kit not required.

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

H. Tooling - Price and Availability

NOTE: To obtain the tooling necessary to do the balance procedure, contact your IAE Representative.

I. Weight and Balance

(1)	Weight change	Minus 1.7 lb (0,76 Kg)
(2)	Moment arm	21.5 in. (546 mm) rearward
(3)	Datum	Engine Front Mount Centerline (Powerplant Station (P.P.S.) 100)

J. Electrical Load Data

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

K. References

(1) Internal Reference No.

88VR020A

88VA288E

90VC016

90VC016A

(2) Other References

V2500 Illustrated Parts Catalog

V2500 Engine Manual

V2500 Standard Practices Manual

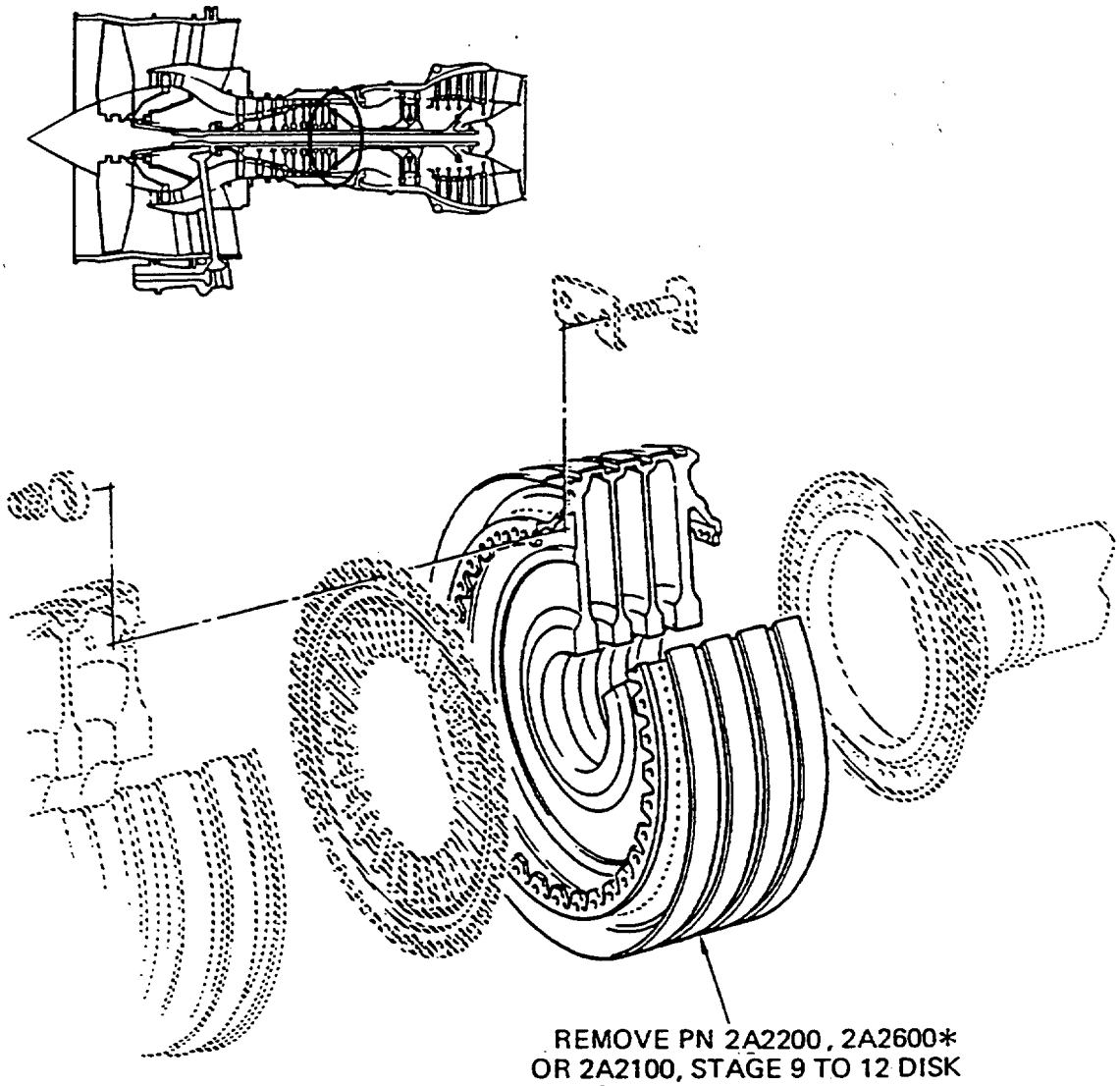
L. Other Publications Affected

(1) The V2500 Engine Manual, Chapter/Section 72-41-12, Cleaning, to add the new parts.

(2) The V2500 Engine Manual, Chapter/Section 72-41-12, Inspection/Check, to add the new parts.

(3) The V2500 Engine Manual, Chapter/Section 72-41-12, Repair, to add the new parts.

(4) The V2500 Engine Manual, Chapter/Section 5-10-01, Group A Parts Lives, to add life limits for the new parts.



*NOTE: PN 2A2600 9 TO 12
STAGE DISK ASSEMBLY
CAN ALSO BE REPLACED
BY PN 2A3200 (WHICH IS
NOT OBTAINED BY MODIFICATION)

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Location of Stage 9 to 12 HP Compressor Disk Assembly
Fig.1

2. Accomplishment Instructions

A. The Source Demonstration requirements of this rework mean that any facility not authorized to accomplish the rework either utilize the Authorized Repair Vendors listed below or contact IAE Technical Services to determine if a qualification program can be initiated at their facility.

IAE - INTERNATIONAL AERO ENGINES AG
Corporate Center II
628 Hebron Ave.
Glastonbury, CT. 06033-2595 USA

B. Authorized Rework Vendors for the bulletin are listed below:

MTU-Maintenance GmbH
Airport Hannover
Muenchner Str. 31
30855 Langenhagen
Germany

Attn: Program Manager, V2500

AVIALL
Ryder Systems, Inc.
Airline Services Division
3412 Putnam Street
Dallas, Texas 75235 USA

C. The designation by IAE of an authorized rework vendor indicates that the vendor has demonstrated the necessary capability to enable it to carry out the listed rework. However, IAE makes no warranties or representations concerning the qualifications or quality standards of the vendors to carry out the rework, and accepts no responsibility whatsoever for any work that may be carried out by a rework vendor, other than when IAE is listed as the vendor. Authorized rework vendors do not act as agents or representatives of IAE.

D. Rework Instructions

(1) Do a modification to the 2A2100, 2A2200, 2A2600 Stage 9 to 12 Disk Assemblies (See Reference (1), Chapter/Section 72-41-12, Fig/Item No.01-600) and identify as follows:

Procedure	Supplementary Information
(a) Send the Stage 9 to 12 Disk Assembly to the approved vendor to do the modification which follows.	

(b)	Set-up and machine to 20 slots (loction as specified) on the inner flange at the stage 12 disk location	Refer to Figure 2, Sheets 1 and 2, requirements
(c)	Abrasive finish the edge of the slots at the loctions indicted by the specification given	Refer to Figure 2, Sheets 1 and 3, requirements. Refer to Reference (3) Control No./TASK No.70-35-19-350-501
(d)	Set-up and machine the stage 9 disk locations to the dimensions specified	Refer to Figure 2, Sheets 1, 4 and 5, requirements
(e)	Shot peen the area indicated by the procedure specified to an intensity of 6A. Use SAE 170 Maximum Cast Steel Shot with a hardness of 45 - 55 HRC or equivalent	Refer to Figure 2, Sheets 1, 3 and 6, requirements. Refer to Reference (3) Control No./TASK No.70-38-13-380-501
	1 Unless differently specified all other areas are optional and can be incomplete	
	2 Overspray is permitted	
	3 Masking is not permitted on optional areas	
(f)	Do a balance check on the disk assembly as follows:	Refer to Figure 3. Refer to Paragraph H. for the necessary tools to do the balance check
	1 Mount the Disk Assembly on Diameters A and B	
	2 Rotate the Disk Assembly at 900 rpm	
	3 Make sure that the dynamic unbalance measured in Plane AX is not more than 0.50 oz.in. (360 g.mm)	
	4 Make sure that the dynamic unbalance measured in Plane AV is not more than 0.50 oz.in. (360 g.mm)	

(g) Correct any unbalance that is not in the limit by removal of material

Refer to Figure 3, requirements

NOTE: The surface must be smooth and continuous after material is removed.

It is not necessary to shot peen again after removal of material.

(h) Make a mark adjacent to the old part number to show the new part number. Use the vibration peen method

Old Part No.	New Part No.
2A2100	2A3400
2A2200	2A3300
2A2600	2A3500

Refer to Reference (3), Control No./TASK No. 70-09-00-400-501

NOTE: The Part number is to be followed by the letters "Assy"

E. Assembly Instructions

(1) Replace the Stage 9 to 12 Disk Assembly 2A2100, 2A2200 or 2A2600 with the applicable part as follows:

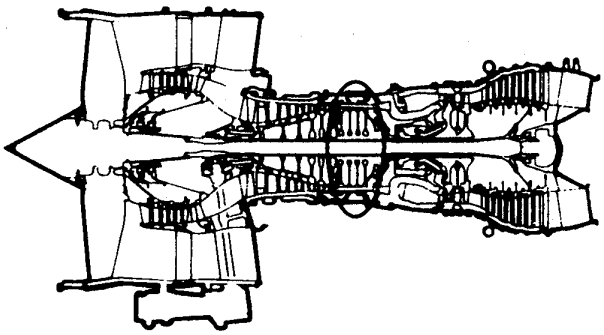
(a) Replace 2A2100 with 2A3400 (1 off).

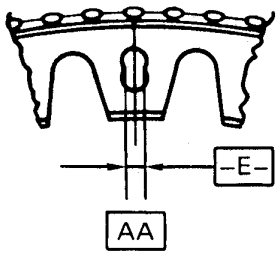
(b) Replace 2A2200 with 2A3300 (1 off).

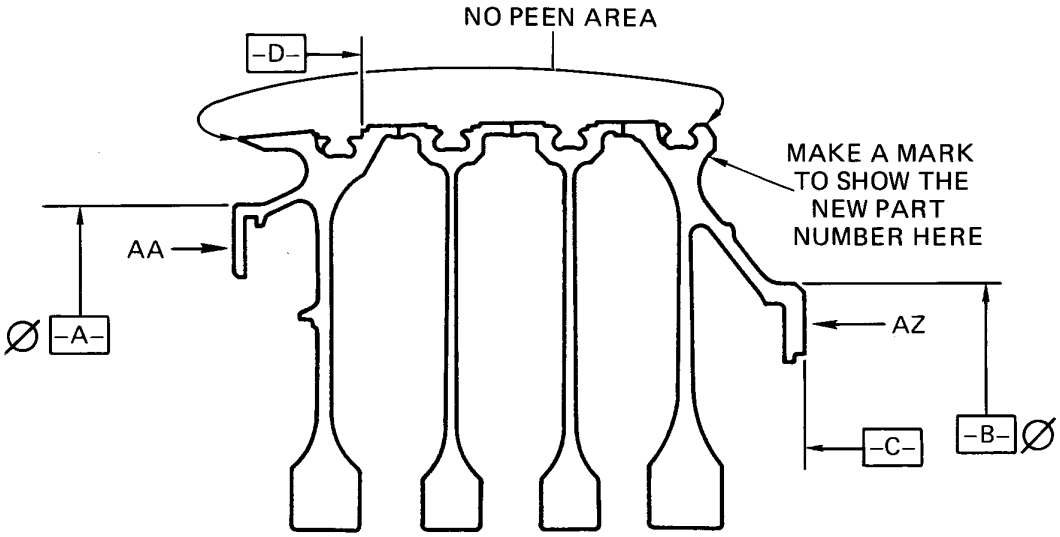
(c) Replace 2A2600 with either 2A3200 (1 off) or 2A3500 (1 off).

F. Recording Instructions

A record of accomplishment is necessary







TYPICAL SECTION THROUGH
9 TO 12 HPC DRUM ASSEMBLY

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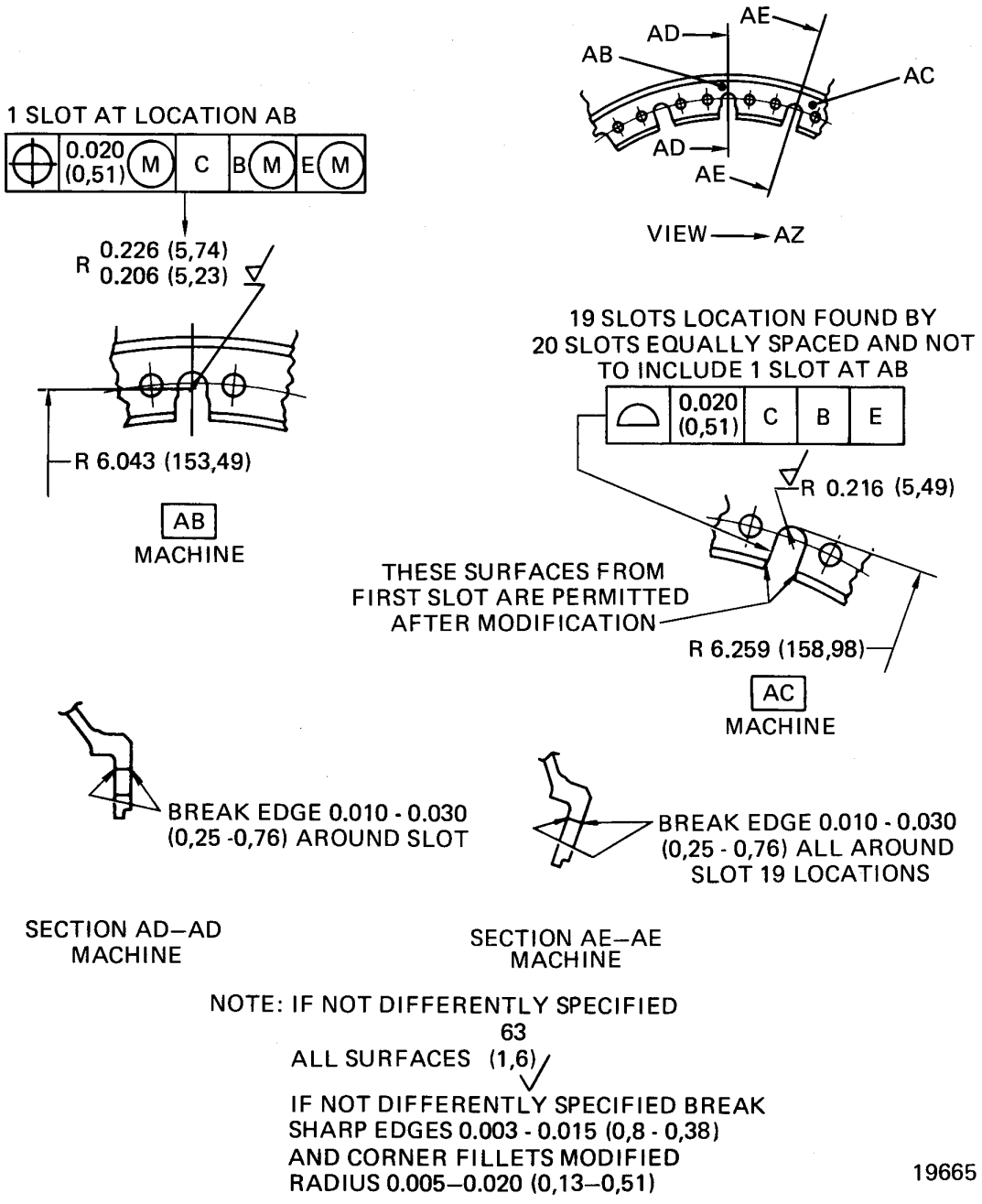
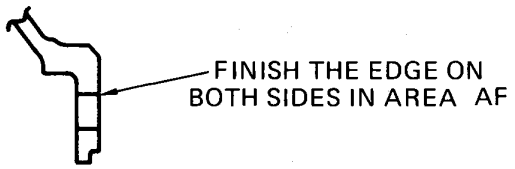
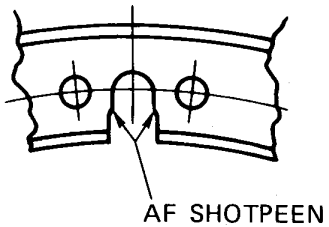
Modification of Stage 9 to 12 Disk Assembly (Datum Locations)
Fig.2 (Sheet 1 of 6)



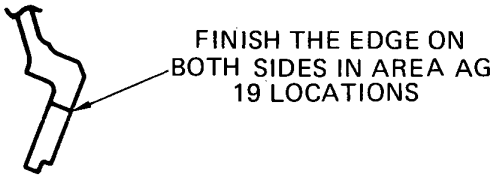
Modification of Stage 9 to 12 Disk Assembly (Machine the Stage 12 Disk Scallops)
Fig.2 (Sheet 2 of 6)



SECTION AD–AD
FINISH



AB
SHOTPEEN



SECTION AE–AE
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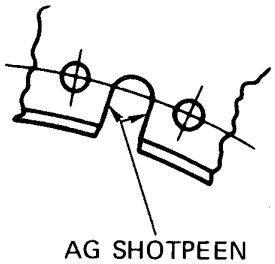
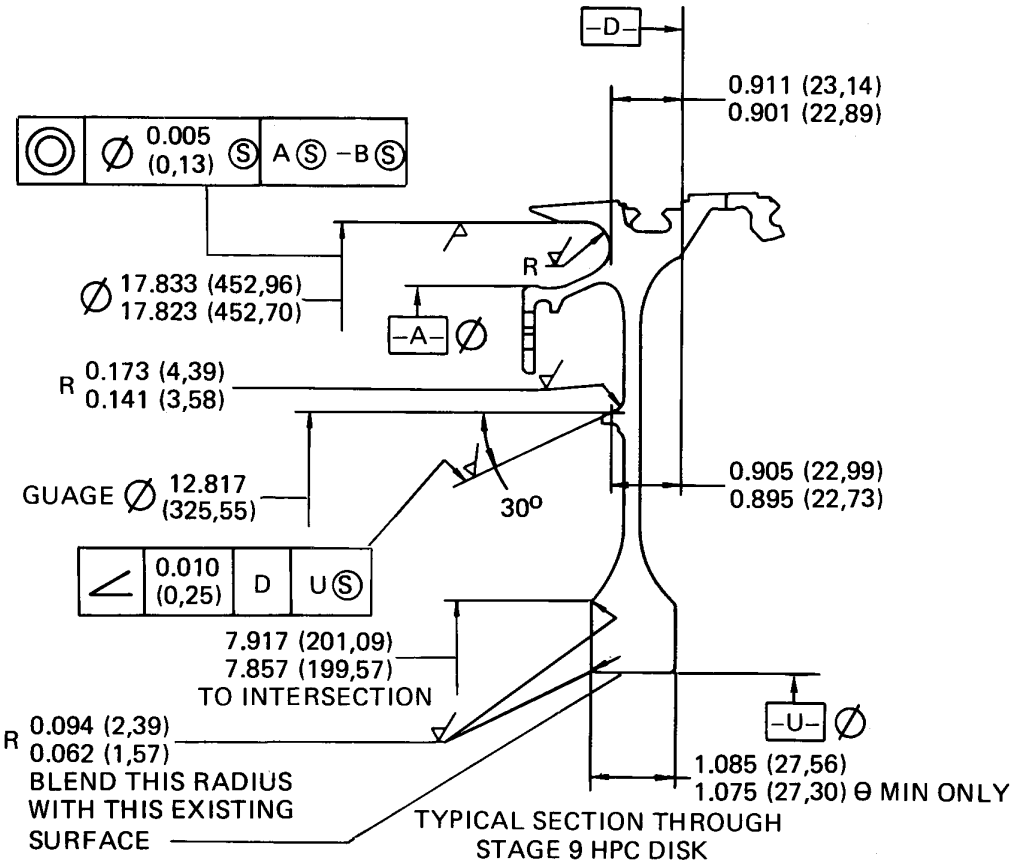


AC
SHOTPEEN

19666

Modification of Stage 9 to 12 Disk Assembly (Shot Peen the Stage 12 Disk Scallops)
Fig.2 (Sheet 3 of 6)



NOTE: IF NOT DIFFERENTLY SPECIFIED

ALL SURFACES 63 (1,6)

IF NOT DIFFERENTLY SPECIFIED BREAK
SHARP EDGES 0.003 - 0.015 (0,8 - 0,38)
AND CORNER FILLETS MODIFIED
RADIUS 0.020–(0,13–0,51)

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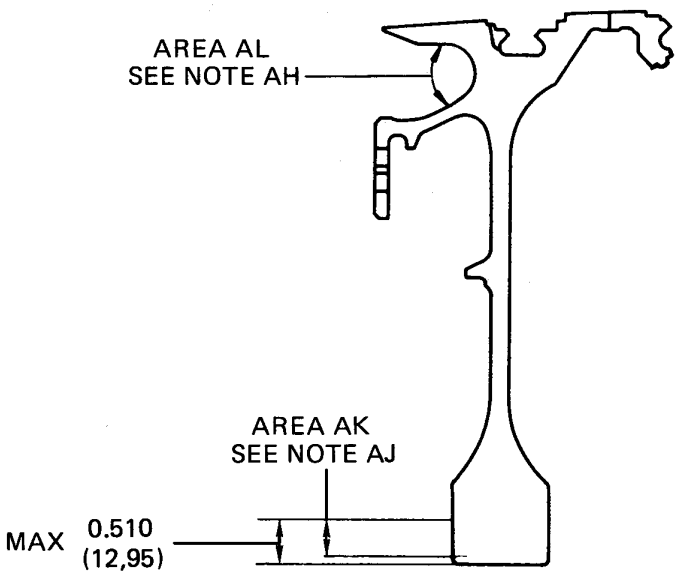
Modification of Stage 9 to 12 Disk Assembly (Machine the Stage 9 Disk)
Fig.2 (Sheet 4 of 6)



TYPICAL SECTION THROUGH STAGE 9
HPC DISK SHOWING PERMISSIBLE
MACHINING MISMATCH.

NOTE AH:
0.001 (0,03) MAX MISMATCH PERMISSIBLE IN AREA AL.
USE 0.094 (2,39) MIN FILLET RUNOUT RADIUS.
MISMATCH MUST NOT OCCUR AT TANGENCY OF FILLET TO FLAT.

NOTE AJ:
0.010 (0,25) MAX MISMATCH PERMISSIBLE IN AREA AK.
USE 0.234–0.266 (5,94–6,76) FILLET RUNOUT RADIUS.
MISMATCH MUST NOT INTERRUPT ADJACENT RADIUS.

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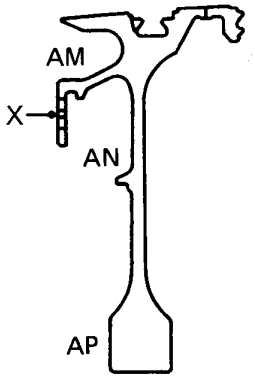
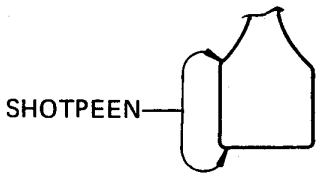
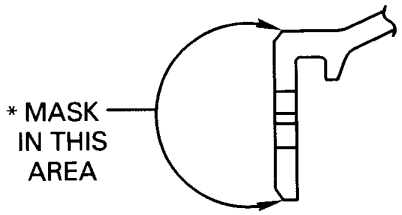
Modification of Stage 9 to 12 HP Compressor Disk Assembly (Machine the Stage 9 Disk)
Fig.2 (Sheet 5 of 6)



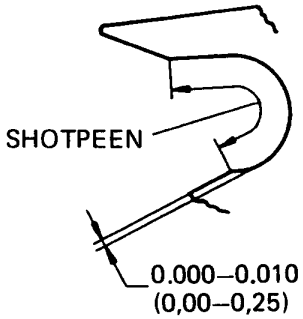
TYPICAL SECTION THROUGH
STAGE 9 HPC DISK ASSEMBLY



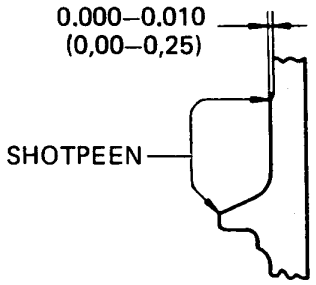
AP



X



AM



AN

*NOTE: NO OVERSPRAY IS PERMITTED IN THIS AREA. YOU CAN MASK THIS AREA. OVERSPRAY IS PERMITTED IN ALL OTHER OPTIONAL AREAS. YOU CANNOT MASK IN ALL OTHER OPTIONAL AREAS

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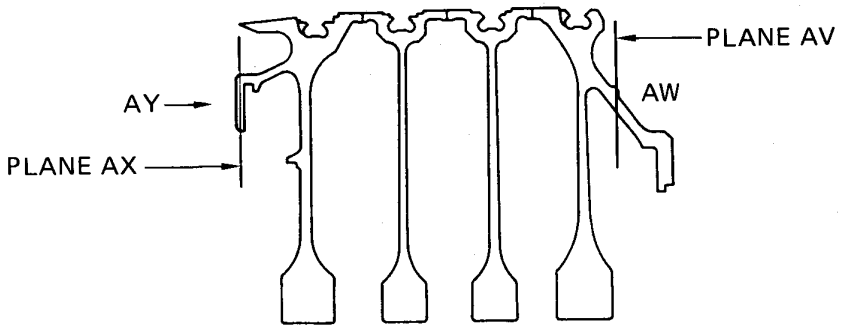
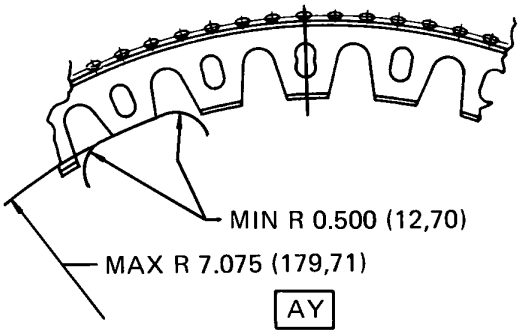
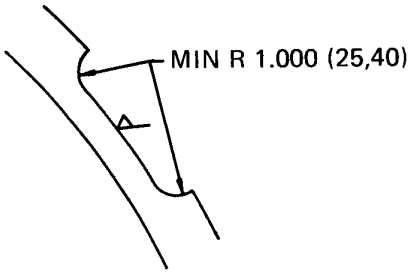
Modification of Stage 9 to 12 HP Compressor Disk Assembly (Shot Peen the Stage 9 Disk)
Fig.2 (Sheet 6 of 6)

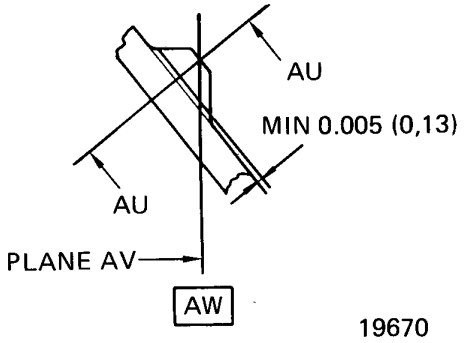


TYPICAL SECTION THROUGH STAGE
9 TO 12 HPC DRUM ASSEMBLY
SHOWING BALANCE INFORMATION





SECTION AU–AU



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Modification of Stage 9 to 12 Disk Assembly (Balance the Stage 9 to 12 Disk Assembly)
Fig.3

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
2A3200 (72-41-12)	1		Disk Assembly Stage 9 to 12	2A2600 (01-600)	(S1)(A) (B)
2A3300 (72-41-12)	1		Disk Assembly Stage 9 to 12	2A2200 (01-600)	(S1)(1D)
2A3500 (72-41-12)	1		Disk Assembly Stage 9 to 12	2A2600 (01-600)	(S1)(1D)
2A3400 (72-41-12)	1		Disk Assembly Stage 9 to 12	2A2100 (01-600)	(S1)(1D)

C. Instruction/Disposition Code Statements:

(S1) All Old and New Parts Coded (S1) are freely and fully interchangeable.
(1D) Old Part can be modified and identified to the New Part Number at the approved vendor specified in the Rework Instructions. (See Figure 1).
(A) New Part currently available for sale.
(B) Old Part no longer available for sale.

NOTE: The estimated 1990 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 Part Sales Department for information concerning firm prices.