ENGINE - HP TURBINE ROTOR AND STATOR ASSEMBLY - PROVIDE A NEW FIRST STAGE HPT BLADE AND FIRST STAGE HPT COOLING DUCT ASSEMBLY - CATEGORY CODE 6 - MOD.ENG-72-0046

1. Planning Information

A. Effectivity

(1) Aircraft: Airbus A320

(2) Engine: V2500-A1 Engines before Serial No.V0113.

B. Reason

(1) Condition

In the experimental Test Program the Stage 1 HPT Blade Tips and Outer Air Seals were distressed more than usual. These parts were stressed because of low cooling airflow to the Turbine Blade Tip area.

(2) Background

Distressed Blade Tips and Outer Air Seals were seen during the engine test programs. Added holes, to permit more flow of the air that cools the Blade tip area, give the Blades and the Outer Air Seals added life.

(3) Objective

To provide more air to cool the Stage 1 HPT Blade tip area, by an increase in the flow of air through the Stage the Stage 1 HPT Cooling Duct Assembly, and added cooling air holes in the Blade tip.

(4) Substantiation

Successful Engine tests of the new Stage 1 HPT Blades and the new Stage 1 HPT Cooling DUct Assembly.

(5) Effect of Bulletin onWorkshop Procedures:

Removal/Installation	No affect
Disassembly/Assembly	No affect
Cleaning	No affect
Inspection/Check	No affect
Repair	No affect
Testing	No affect

(6) Supplemental Information

None

C. Description

(1) Distressed Blade Tips and Outer Airseals are reduced by the installation of a new Stage 1 HPT Rotor Assembly and new Outer Airseals. The new parts permit added airflow to cool the blade tips.

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 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 full 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 accomplish the installation of the new Stage 1 HPT Blades and Cooling Duct Assembly	6 Hours, 10 Minutes
	TOTAL:	6 Hours, 10 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

Special Tools are not required.

I. Weight and Balance

(1)	Weight change	None
(2)	Moment arm	No effect
(3)	Datum	Engine front mount centerline (Powerplant Station P.P.S.100)

J. Electrical Load Data

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

K. References

(1) Internal Reference No.

88VA321A

88VA321H

88VA321L

(2) Other References

IAE V2500 Service Bulletin Numbers.

(a) V2500-ENG-77-0011 (Engine - HP Turbine Rotor and Stator Assembly - Rework the stage 2 Turbine Hub Assembly to incorporate a Turbine Hub Heatshield)

V2500 Engine Illustrated Parts Catalog

V2500 Engine Manual

V2500 Standard Practises Manual

L. Other Publications Affected

(1) The V2500 Engine Illustrated Parts Catalog, Chapter/Section 72-44-50, Figure 1, to add the new part.

(2) The V2500 Engine Manual, Chapter/Section 72-44-50, Cleaning, to add the new part.

(3) The V2500 Engine Manual, Chapter/Section 72-44-50, Inspection/Check, to add the new part.

(4) The V2500 Engine Manual, Chapter/Section 72-44-50, Repair, to add the new part.

(5) The V2500 Engine Illustrated Parts Catalog, Chapter/Section 72-45-14, Figure 1,to add the new part.

(6) The V2500 Engine Manual, Chapter/Section 72-45-14, Cleaning, to add the new part.

(7) The V2500 Engine Manual, Chapter/Section 72-45-14, Inspection/Check, to add the new part.

(8) The V2500 Engine Manual, Chapter/Section 72-45-14, Repair, to add the new part.

Printed in Great Britain

2. Accomplishment Instructions

A. The Source Demonstration requirements of this rework means that any facility not authorized to accomplish this rework either utilize the Authorized Rework 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
287 Main Street
East Hartford, CT 06108 USA
ATTN: Director Technical Services

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

Chromalloy American Corp.
Chromalloy Research and Technology Div.
Blaisdell Rd.
Orangeburg, NY

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 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 2A0008-01 Stage 1 HPT Cooling Duct Assembly (See Reference (2), 72-44-50, Figure/Item No.01-010) and identify as follows:

	Procedure	Supplementary Information
(a)	Flow test the vane passages collectively in the direction shown by the procedure specified	See Figure 1 and Figure 2, Sheets 1 and 2, requirements. Use the procedure in Reference (3) Control No./Task No. 72-44-50-990-009 through 72-44-50-990-011
(i)	Make sure that the flow is in the limit specified	
(ii)	To get the specified flow rate add or make larger 1 to 15 openings, as necessary, to increase flow	

(b) Set-up and machine the Cooling Duct to open blocked passageways		See Figure 2, Sheet 1 and 2, requirements
(i) Open passageways in the sequence shown		
(ii) Remove the material through the weld as shown		
(iii) Surface texture must be by the procedure specified		Use the procedure in Reference (4) Control No./Task No. 70-35-09-350-501
(c) Do the flow test given in step (a) again		See Figure 2, Sheets 1 and 2, requirements. Use the procedure in Reference (3) Control No./Task No. 72-44-50-990-009 through 72-44-50-990-011.
(i) Make sure that the flow rate is in the limit necessary.		
(ii) Correct as necessary.		
(d) Mark the new part number adjacent to the old part number.	OLD PART NUMBER 2A0008-01	NEW PART NUMBER 2A1997-01

(2) Send the 2A1721 Stage 1 HPT Blades (see Reference (2), 72-45-14, Figure/Item No.01-010) to the approved vendor given in the Material Information Section for a modification and identification to 2A2421 Stage 1 HPT Blades. See Figure 3.

E. Assembly Instructions

(1) Replace the 2A1721 Stage 1 HPT Blades (64 off) with 2A2421 Stage 1 HPT Blades, by the approved procedure in Reference (3), Chapter/Section 72-45-10, Assembly. See Figure 3.

(2) Identify the new Stage 1 Turbine Rotor Assemblies as follows:

(a) Identify the 2A2321 Stage 1 Turbine Rotor Assembly as 2A2521.

(i) Use the approved procedure given in Reference (4), Control No./TASK No.70-09-00-400-501, Marking of Parts.

(ii) Use the vibration peen method.

(b) Identify the 2A1621 Stage 1 Turbine Rotor Assembly as 2A2721.

(i) Use the approved procedure given in Reference (4), Control No./TASK No.70-09-00-400-501, Marking of Parts.

(ii) Use the vibration peen method.

(c) Identify the 2A1021 Stage 1 Turbine Rotor Assembly as 2A6321.

(i) Use the approved procedure given in Reference (4), Control No./TASK No.70-09-00-400-501, Marking of Parts.

(ii) Use the vibration peen method.

(d) Identify the 2A1921 Stage 1 Turbine Rotor Assembly as 2A6421.

(i) Use the approved procedure given in Reference (4), Control No./TASK No.70-09-00-400-501, Marking of Parts.

(ii) Use the vibration peen method.

(3) When the Rotor and Stator Assembly is assembled by the approved procedure in Reference (3), Chapter/Section 72-45-00, Assembly, identify the new Rotor and Stator Assemblies as follows:

(a) Identify the 2A0400 Rotor and Stator Assembly as 2A1700.

(i) Use the approved procedure given in Reference (4), Control No./TASK No.70-09-00-400-501, Marking of Parts.

(ii) Use the vibration peen method.

(b) For Engines Incorporating V2500-ENG-72-0011 identify 2A1300 Rotor and Stator Assembly as 2A5200.

(i) Use the approved procedure given in Reference (4), Control No./TASK No.70-09-00-400-501, Marking of Parts.

(ii) Use the vibration peen method.

(c) For Engines not Incorporating V2500-ENG-72-0011 identify 2A1300 Rotor and Stator Assembly as 2A5100.

(i) Use the approved procedure given in Reference (4), Control No./TASK No.70-09-00-400-501, Marking of Parts.

(ii) Use the vibration peen method.

(4) Replace the 2A0008-01 Stage 1 HPT Cooling Duct Assembly (1 off) with 2A1997-01 Stage 1 HPT Cooling Duct Assembly, by the approved procedure in Reference (3), Chapter/Section 72-44-00, Assembly. Refer to Figure 1.

(5) Identify the 2A0600 Turbine Nozzle Group as 2A3800 Turbine Nozzle Group.

(a) Use the approved procedure given in Reference (4), Control No./TASK No.70-09-00-400-501, Marking of Parts.

(b) Use the vibration peen method.

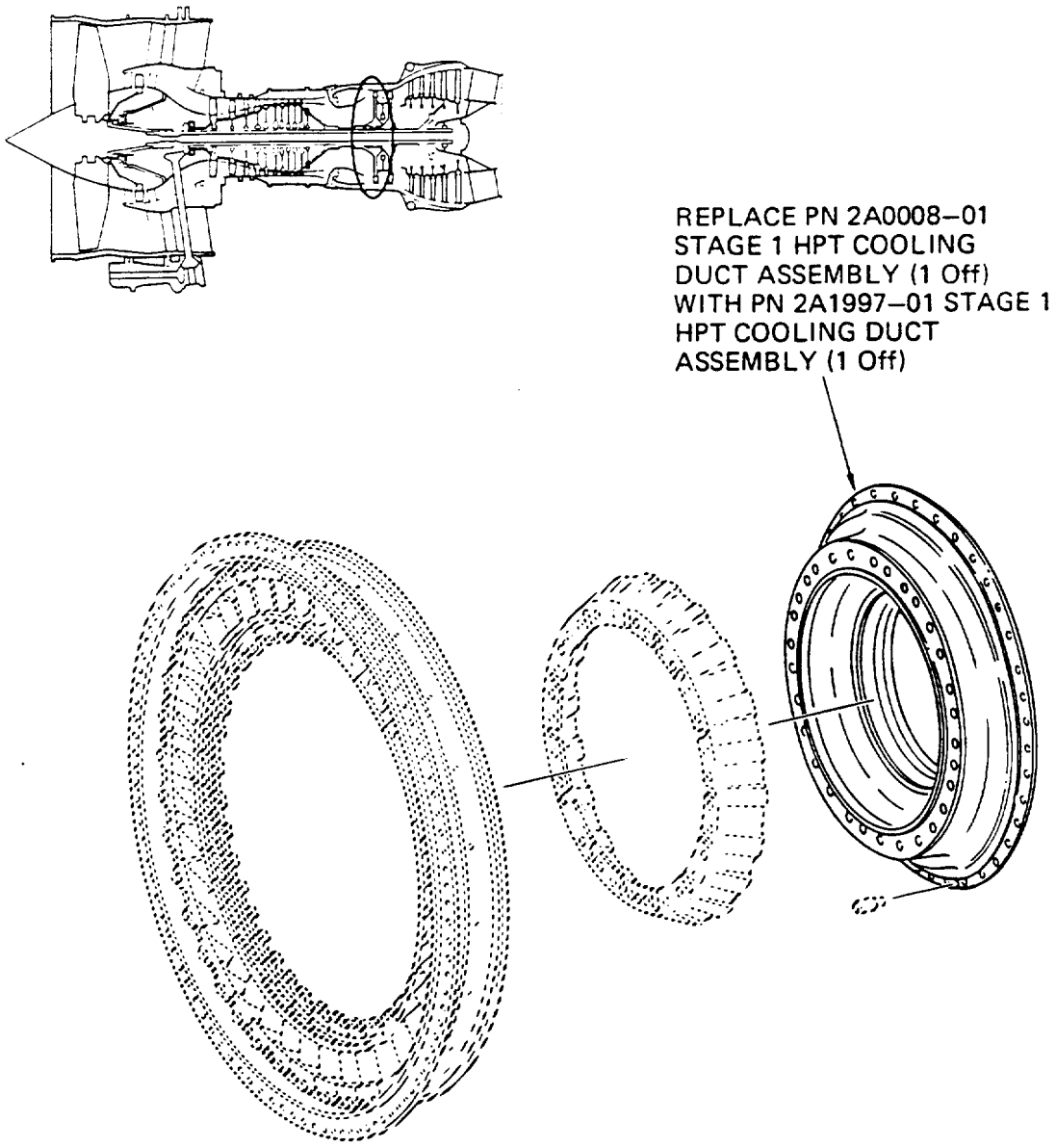
(6) Identify the 2A1200 Turbine Nozzle Group as 2A5000 Turbine Nozzle Group.

(a) Use the approved procedure given in Reference (4), Control No./TASK No.70-09-00-400-501, Marking of Parts.

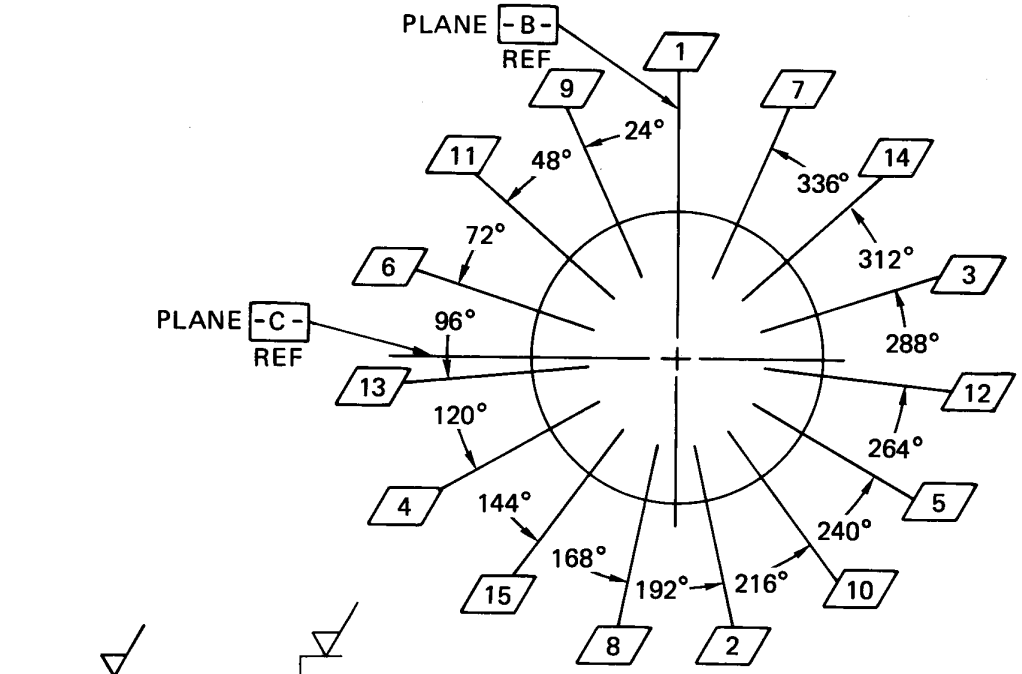
(b) Use the vibration peen method.

C. Recording Instructions

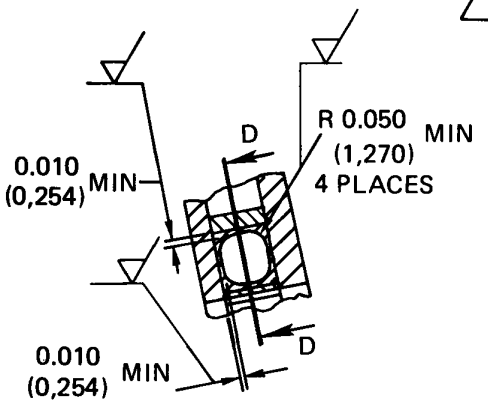
(1) A record of accomplishment is necessary.



Location of stage 1 HPT cooling duct assembly
Fig.1



SCHEMATIC VIEW C–C
FLOW TEST SEQUENCE FOR
REOPERATION OF PASSAGEWAYS



SECTION B–B

NOTE: UNLESS DIFFERENTLY SPECIFIED
ALL SURFACES ARE 125 (3,2)

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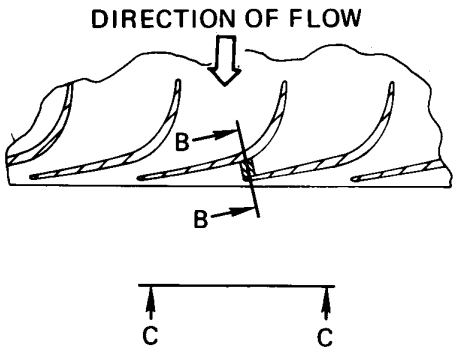
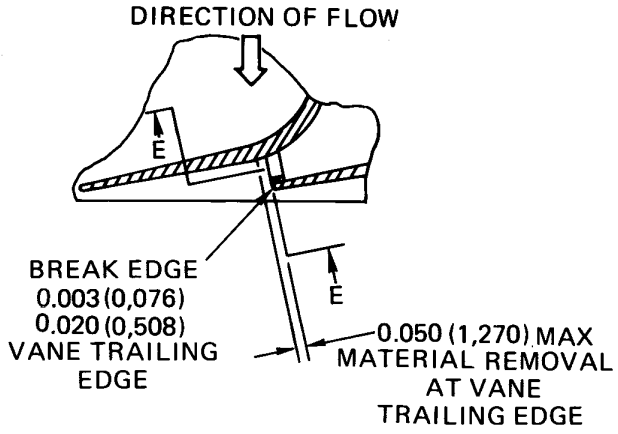
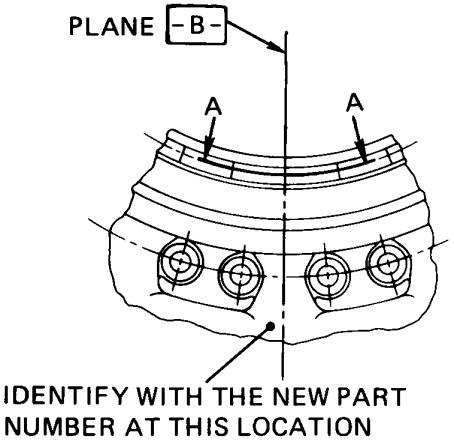
Modification of stage 1 HPT cooling duct assembly
Fig.2 Sheet 1



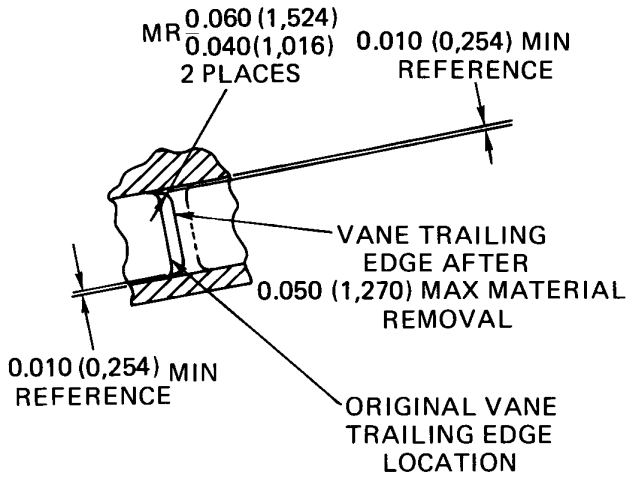
SECTION A–A



SECTION D–D



REAR VIEW OF DUCT



SECTION E–E

NOTE: THE FLOW TEST DATA IS AS FOLLOWS:

$$\frac{W\sqrt{T_3}}{P_{AMB}} = 1.040 \;\&\; \left(\frac{P_3}{P_{AMB}}\right) \text{MIN} = 1.527, \left(\frac{P_3}{P_{AMB}}\right) \text{MAX} = 1.577$$

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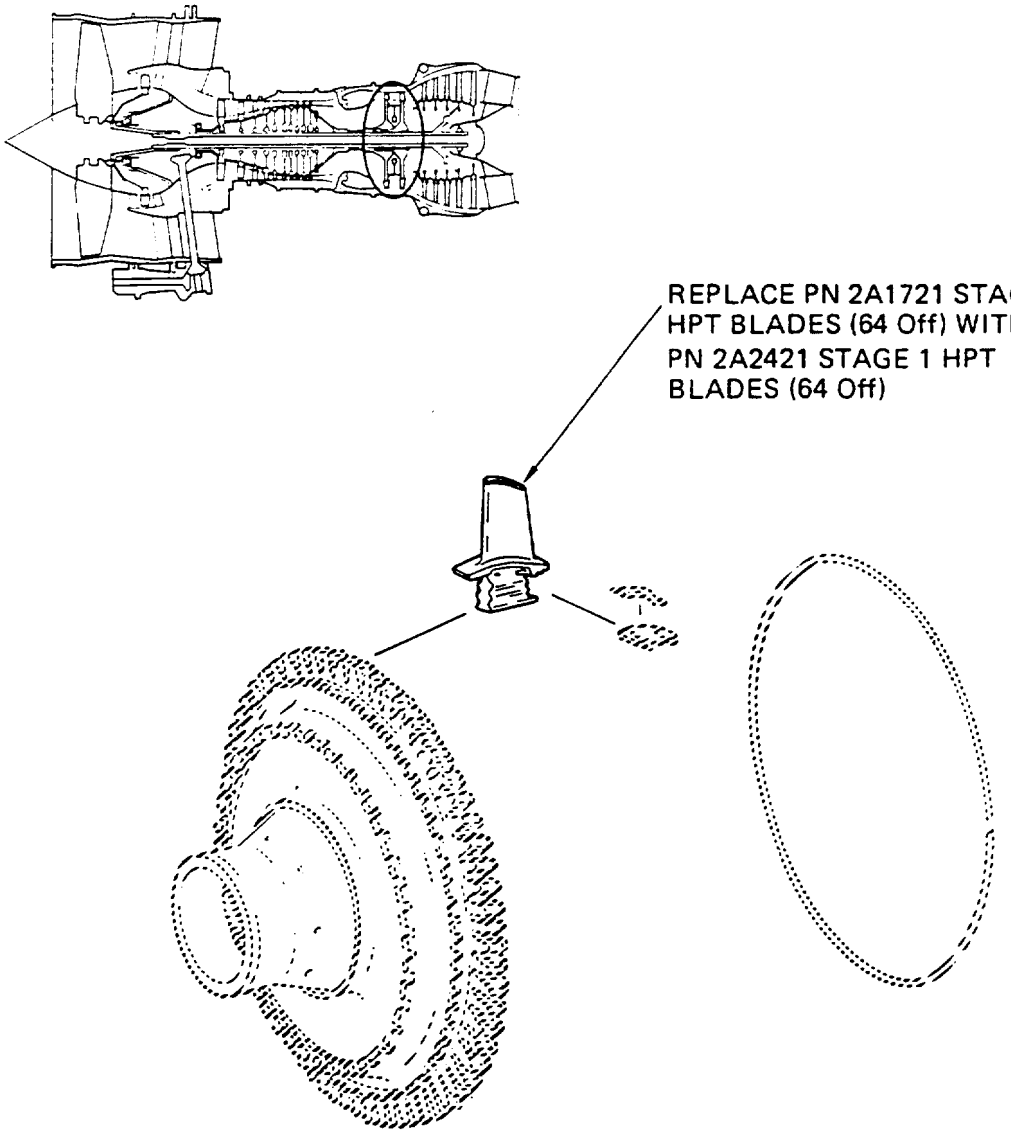
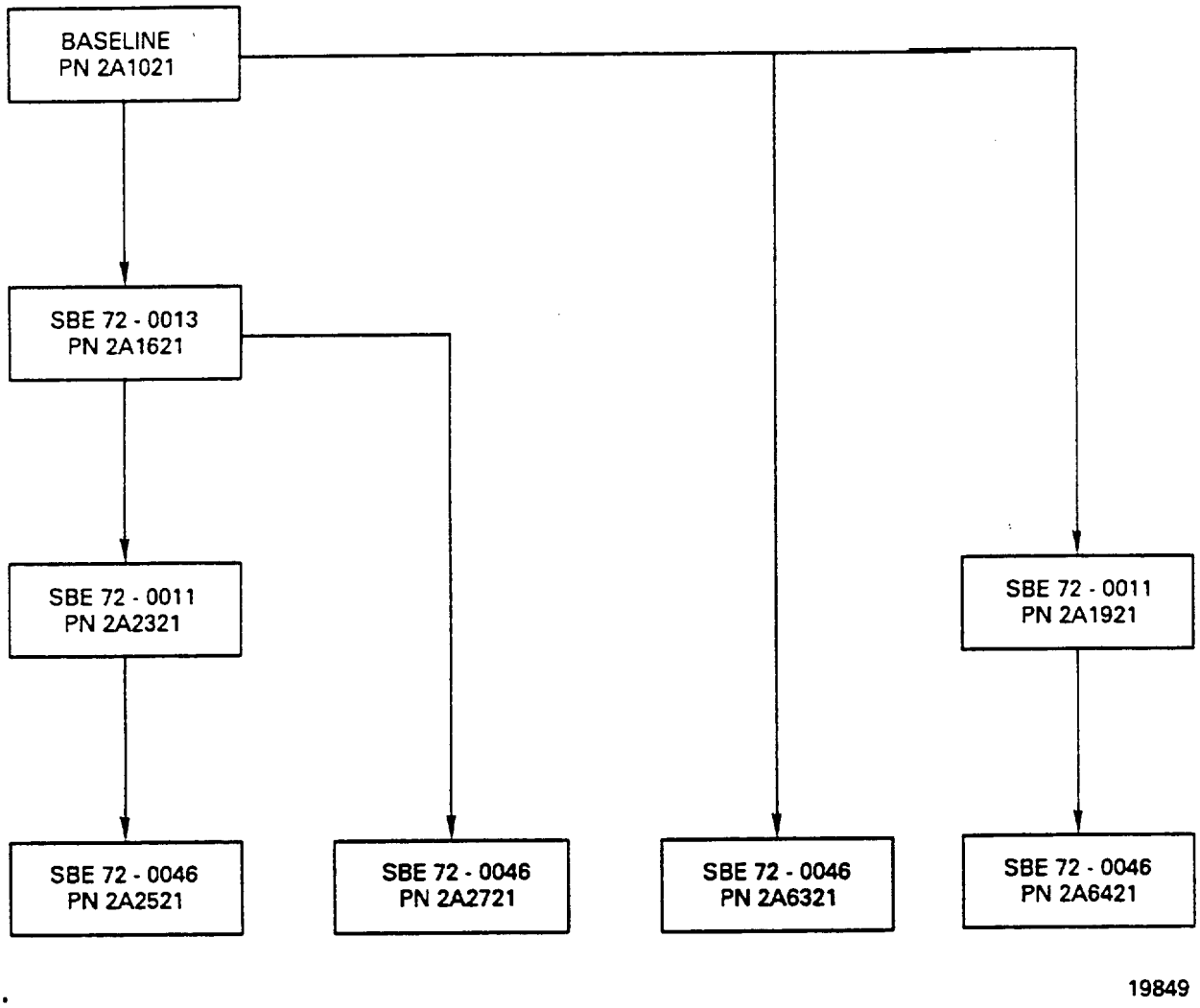
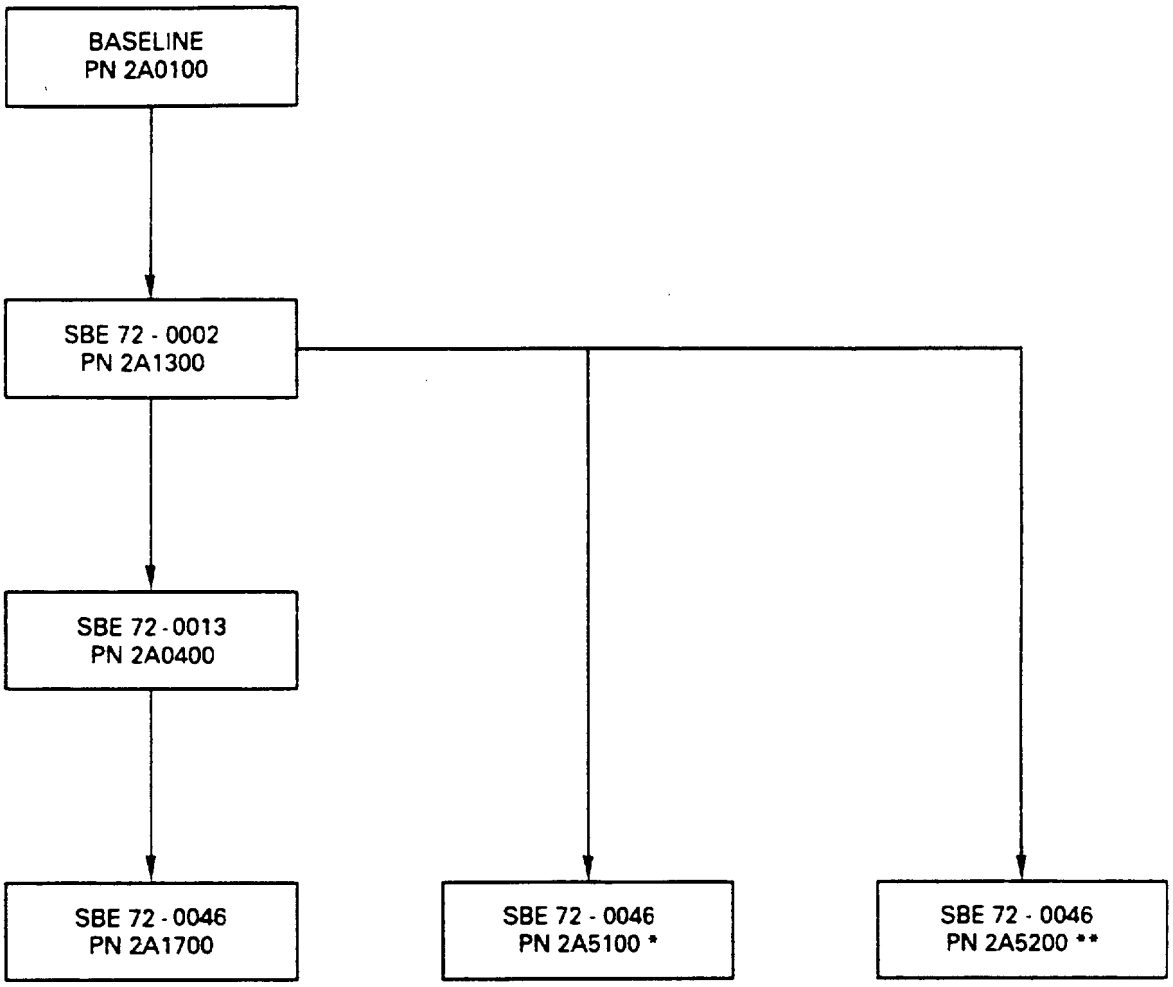
Modification of stage 1 HPT cooling duct assembly
Fig.2 Sheet 2



Location of stage 1 HPT blades
Fig.3



Family Tree - Stage 1 HPT rotor assembly
Fig.4

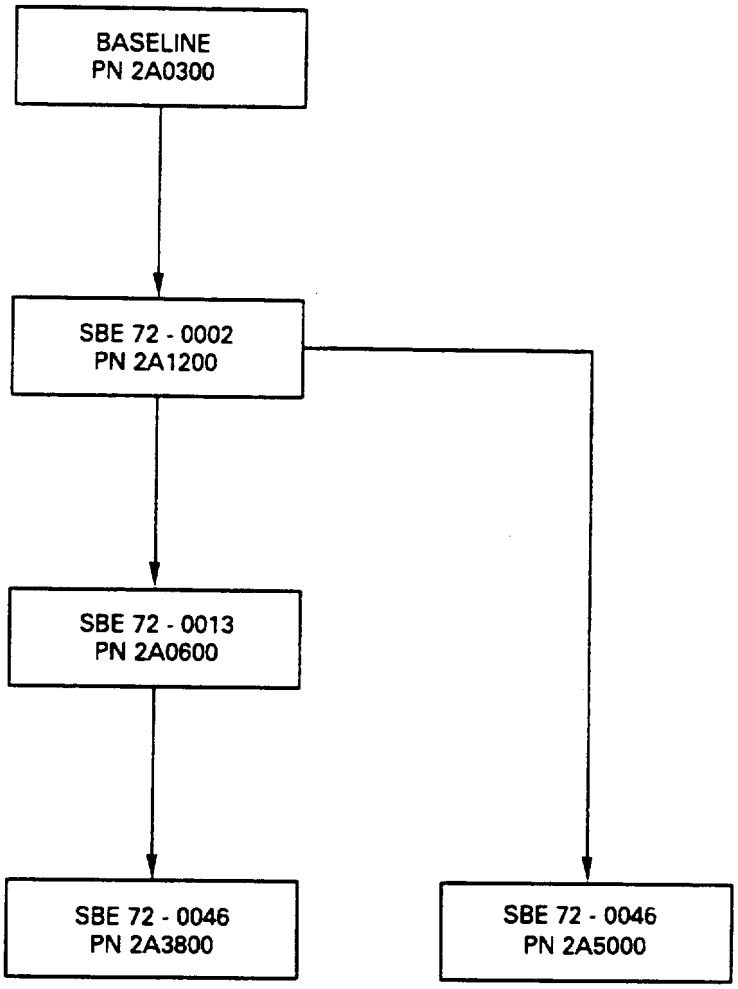


* FOR ENGINES NOT INCORPORATING V2500 - ENG - 72 - 0011

** FOR ENGINES INCORPORATING V2500 - ENG - 72 0011

19850

Family Tree - Rotor and stator assembly HPT Module
Fig.5



Family Tree - Turbine nozzle group
Fig.6

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
For Engines Incorporating V2500-ENG-72-0002, V2500-ENG-72-0011 and V2500-ENG-72-0013					
2A3800 (72-44-00)	1	-	Group - Turbine Nozzle	2A0600 (01-001)	(F)
2A1997-01 (72-44-50)	1	19,750.00	.Duct - Cooling, HPT, Stage 1, Assembly	2A0008-01	(S1)(1D) (A)(B)
2A1700 (72-45-00)	1	-	Rotor and Stator Assembly - HPT Module	2A0400 (01-001)	(B)(C)
2A2521 (72-45-10)	1	-	.Turbine Rotor - Stage 1 Assembly	2A2321 (01-010)	(B)(C)
2A2421 (72-45-14)	64	2,646.00	..Blade - HPT Stage 1	2A1721 (01-010)	(S1)(A)(B) (E)(G)
For Engines Incorporating V2500-ENG-72-0002 and V2500-ENG-72-0013 but not Incorporating V2500-ENG-72-0011					
2A3800 (72-44-00)	1	-	Group - Turbine Nozzle	2A0600 (01-001)	(F)
2A1997 (72-44-50)	1	19,750.00	.Duct - Cooling HPT, Stage 1, Assembly	2A0008-01 (01-010)	(S1)(1D) (A)(B)
2A1700 (72-45-00)	1	-	Rotor and Stator Assembly - HPT Module	2A0400 (01-001)	(B)(C)
2A2721 (72-45-10)	1	-	.Turbine Rotor - Stage 1 Assembly	2A1621 (01-010)	(B)(C)
2A2421 (72-45-14)	64	2,646.00	..Blade - HPT Stage 1	2A1721 (01-010)	(S1)(A)(B) (E)(G)
For Engines Incorporating V2500-ENG-72-0002, but not Incorporating V2500-ENG-72-0011 and V2500-ENG-72-0013					

2A5000 (72-44-00)	1	-	Group - Turbine Nozzle	2A1200 (01-001)	(F)
2A1997-01 (72-44-50)	1	19,750.00	.Duct-Cooling, HPT, Stage 1, Assembly	2A0008-01 (01-010)	(S1)(1D) (A)(B)
2A5100 (72-45-00)	1	-	Rotor and Stator Assembly - HPT Module	2A1300 (01-001)	(B)(C)
2A6321 (72-45-10)	1	-	.Turbine Rotor - Stage 1 Assembly	2A1021 (01-010)	(B)(C)
2A2421 (72-45-14)	64	2,646.00	..Blade - HPT Stage 1	2A1721 (01-010)	(S1)(A)(B) (E)(G)

For Engines Incorporating V2500-ENG-72-0002 and V2500-ENG-72-0011 but not Incorporating V2500-ENG-72-0013

2A5000 (72-44-00)	1	-	Group - Turbine Nozzle	2A1200 (01-001)	(S1)(F)
2A1997-01 (72-44-50)	1	19,750.00	.Duct - Cooling, HPT, Stage 1, Assembly	2A0008-01 (01-010)	(S1)(1D) (A)(B)
2A5200 (72-45-00)	1	-	Rotor and Stator Assembly - HPT Module	2A1300 (01-001)	(B)(C)
2A6421 (72-45-10)	1	-	.Turbine Rotor - Stage 1 Assembly	2A1921 (01-010)	(B)(C)
2A2421 (72-45-14)	64	2,646.00	..Blade - HPT Stage 1	2A1721 (01-010)	(S1)(A)(B) (E)(G)

C. Instruction/Disposition Code Statements

(S1) New parts coded S1 must replace old parts coded S1 in a complete set per Engine (except the 2A1997-01 Duct can be used with either the 2A2521 or 2A2721 Turbine Rotor).
(1D) A modification can be done to the Old Part and it can be identified to the New Part Number.
(A) New Part is currently available.
(B) Old Part will no longer be available.
(C) New Part will be supplied on a quotation basis only.
(E) Keep the Old Part for future modification.
(F) This assembly is a nonprovisioned item, not normally stocked as a spare item.
(G) Send the Old Part Number 2A1721 Stage 1 HPT Blade to the approved vendor to do a modification and identification to the New Part Number 2A2421:

Chromalloy American Corp.
Chromalloy Research and Technology Div.
Blaisdell Rd.
Orangeburg, NY

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 Parts Sales Department for information concerning firm prices.