International Aero Engines

SERVICE BULLETIN

ENGINE - HP TURBINE ROTOR AND STATOR ASSEMBLY - PROVIDE NEW STAGE 2 HPT VANES - CATEGORY CODE 8 - MOD.ENG-72-0237

1. Planning Information

A. Effectivity

(1) Aircraft: Airbus A319, A320, A321

McDonnell Douglas MD-90
V2522-A5 Engines before Serial No. V10198
V2524-A5 Engines before Serial No. V10198

(2) Engine: V2527-A5 Engines before Serial No. V10198
V2527E-A5 Engines before Serial No. V10198
V2530-A5 Engines before Serial No. V10198
V2525-D5 Engines before Serial No. V20073
V2528-D5 Engines before Serial No. V20073

NOTE: This Service Bulletin must be incorporated at the same time as or after Service Bulletin V2500-ENG-72-0236 specified in Reference (1).

B. Reason

(1) Condition:

Potentially high operating temperatures in the front and rear knife edge cavities of the high pressure turbine second stage air seal.

(2) Background:

The possibility of increased high pressure turbine second stage air seal knife edge clearances in overhauled engines can lead to ingestion of hot, flowpath gases into the front and rear air seal cavities. This hot, flowpath gas increases the operating temperatures of the second stage air seal and the second stage disk in the blade attachment area,

(3) Objective:

Increase the flow of cooling air being fed to the second stage air seal cavities through the second stage vane by increasing the size of the second stage vane cooling air feed hole. This, in conjunction with an increased cooling air supply orifice, will eliminate hot gas ingestion and reduce the operating temperatures of the second stage air seal and disk.

(4) Substantiation

Satisfactorily completed by structural analytical review. The intent of this configuration was demonstrated in a test engine.

(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

(1) Do a modification to Stage 2 HPT Vane Assemblies.

(2) Install new or modified Stage 2 HPT Vane Assemblies.

The Part Number Changes and/or part modifications described in Section 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.

D. Compliance

Category Code 8

Accomplish based upon experience with the prior configuration.

E. Manpower

Estimated Manhours to incorporate the full intent of this Bulletin:

Venue	Estimated Manhours
(1) In Service	Not applicable
(2) At Overhaul	1 hour 28 minutes

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

(a) To make modification to the Stage 2 HPT Vane Assembly re-identify	1 hour 28 minutes

TOTAL: 1 hour 28 minutes

F. Material - Price and Availability

(1) Modification Kit not required. Parts are supplied as single line items.

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

G. Tooling - Price and Availability

Special tools are not required to accomplish this Service Bulletin.

H. Weight and Balance

(1)	Weight Change	None
(2)	Moment Arm	No effect
(3)	Datum	Engine Front mount Centerline Power Plant station (PPS) 100)

I. Electrical Load Data

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

K. References

(1) Internal Reference No.

95VA021C

(2) Other References

IAE V2500 Service Bulletins:

V2500-ENG-70-0428 - Engine - HP Turbine Rotor and Stator Assembly - To Announce The Availability of New Stage 2 Turbine Vanes.

V2500-ENG-72-0236 - Engine - HP Turbine Rotor and Stator Assembly - provide a New Orifice Plate With An Increased Opening Size

V2500 Standard Practises Manual (SPP-V2500_1I-A), 70-09-00, Marking of Parts and 70-32-03, Finish by Electrochemical or Electrodischarge Metal Removal..

V2500-A5 Engine illustrated Parts Catalog (S-V2500-2IA), Chapter/Section 72-45-20 and 72-45-24

V2500-D5 Engine illustrated Parts Catalog (S-V2500-3IA), Chapter/Section 72-45-20 and 72-45-24

V2500 Engine Manual (E-V2500-1I-A), 72-45-20, Assembly and 72-45-24, Cleaning, Inspection and Repair.

V2500 Engine Manual (E-V2500-3I-A), 72-45-20, Assembly and 72-45-24, Cleaning, Inspection and Repair.

L. Other Publications Affected

(1) The V2500 Engine Manual (E-V2500-1IA), Chapter/Section 72-45-24, Cleaning to add the new part number.

(2) The V2500 Engine Manual (E-V2500-3IA), Chapter/Section 72-45-24, Cleaning to add the new part number.

(3) The V2500 Engine Manual (E-V2500-1IA), Chapter/Section 72-45-24, Inspection to add the new part number.

(4) The V2500 Engine Manual (E-V2500-3IA), Chapter/Section 72-45-24, Inspection to add the new part number.

(5) The V2500 Engine Manual (E-V2500-1IA), Chapter/Section 72-45-24, repair to add the new part number.

(6) The V2500 Engine Manual (E-V2500-3IA), Chapter/Section 72-45-24, repair to add the new part number.

2. Accomplishment Instructions

A. Rework Instructions

(1) Do a modification of the 2A3352 Stage 2 HPT Vane Assembly (2 off) the 2A3352 Stage 2 HPT Vane Assembly (1 off) and the 2A3452 Stage 2 HPT Vane Assembly (1 off) (See Reference (3) or (4), 72-45-24 Figure/Item No. 02-130, 02-350 and 02-420 respectively).

NOTE: Each engine has 17 Ring Segment and Vane Cluster Assemblies, which use two 2A3352 Stage 2 HPT Vane Assemblies. Also, each engine has two Ring Segment and Vane Cluster Assemblies, which use one 2A3352 Stage 2 HPT Vane Assembly and one 2A3452 Stage 2 HPT Vane Assembly.

NOTE: This procedure can be accomplished when the Ring Segment and Vane Cluster Assembly is disassembled. Refer to Reference (5) or (6), Chapter/Section 72-45-24, repair-18 (VRS 3391).

Procedure	Supplementary Information
(a) Set-up machine one hole to 0.075 - 0.081 in. (1,905 - 2,057 mm) diameter. The electrodischarge machining method given in TASK 70-32-03-320-501 can be used.	Refer to Figures 1 and 2. Reference (2), Chapter/Section 70-32-03, Finish by Electrochemical or Electrodischarge Metal Removal.
(b) Flow test passage EY in direction shown with area EZ and leading edge shower head (4 rows total) holes blocked by the procedure specified.	Refer to Reference (5) or (6) Figure 2.
(c) Mark the new part number adjacent to the existing part number. Use the vibration peen method	Existing / New Part Number: 2A3352 / 2A3832; 2A3452 / 2A3842. Refer to Reference (2), Control No./Task No. 70-09-00-400-501.

(2) Assemble the Ring Segment and Vane Cluster Assembly by the procedure specified in Reference (5) or (6), Chapter/Section 72-45-24, repair-18 (VRS 3391).

(a) Identify the new assembly as 2A3812 or 2A3822, as applicable.

(b) Mark the new part number adjacent to the existing part number.

(c) Use the vibration peen method specified in Reference (2), Chapter/Section 70-09-00, Marking of Parts.

(3) When you assemble the HPT Case and Vane Assembly by the procedure specified in Reference (5) or (6), Chapter/Section 72-45-20, Assembly it is permissible to intermix Ring Segment and Vane Cluster Assemblies 2A3372 with 2A3812 and 2A3472 with 2A3822.

(a) Identify the new assembly as 2A3215-001.

(b) Mark the new part number adjacent to the existing part number.

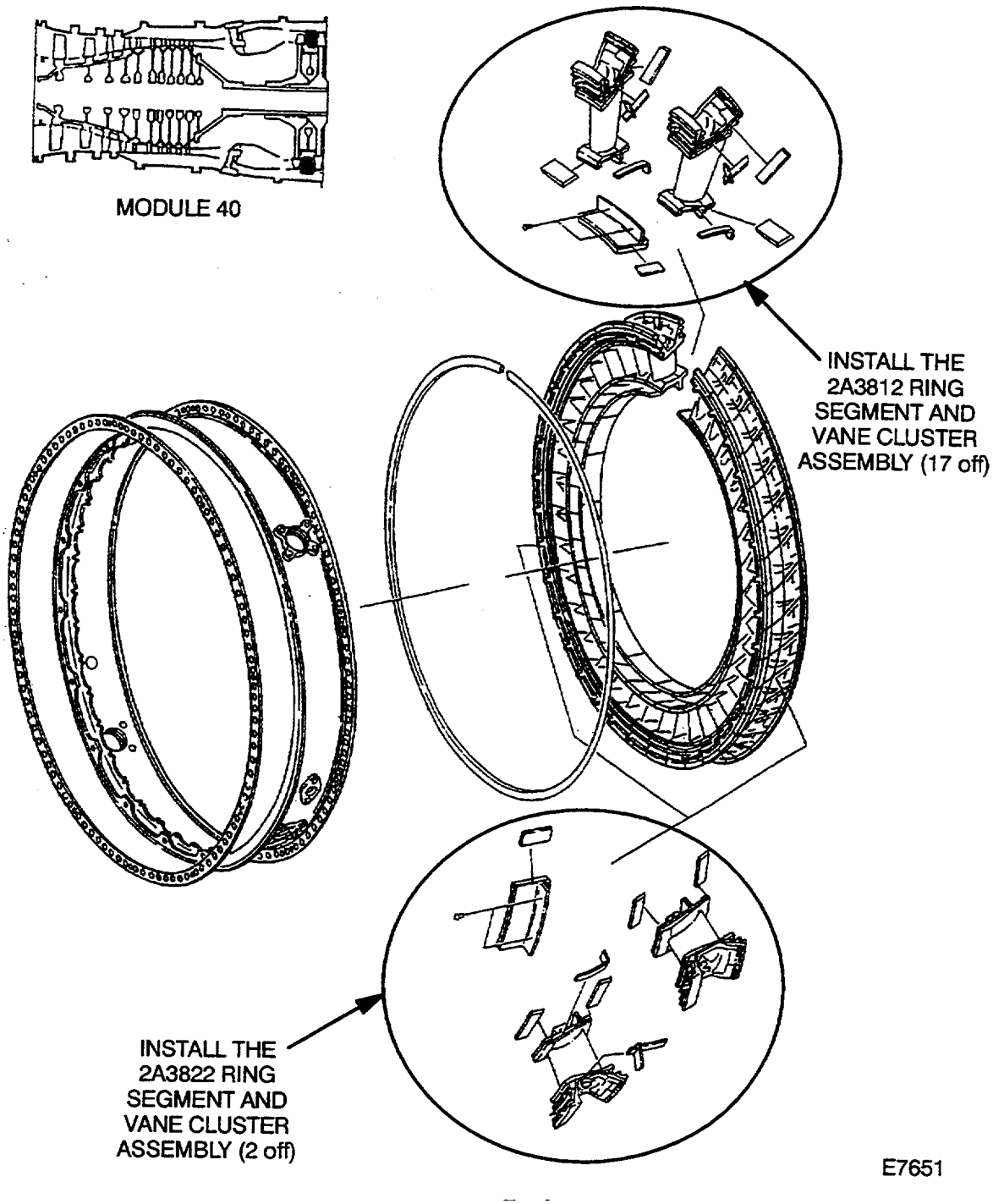
(c) Use the vibration peen method specified in Reference (2), Chapter/Section 70-09-00, Marking of Parts.

(4) When you assemble the HPT Case and vane Assembly by the procedure specified in Reference (5) or (6), Chapter/Section 72-45-20, Assembly and use only Ring Segment and Vane Cluster Assemblies 2A3812 and 2A3822 identify the new assembly as follows:

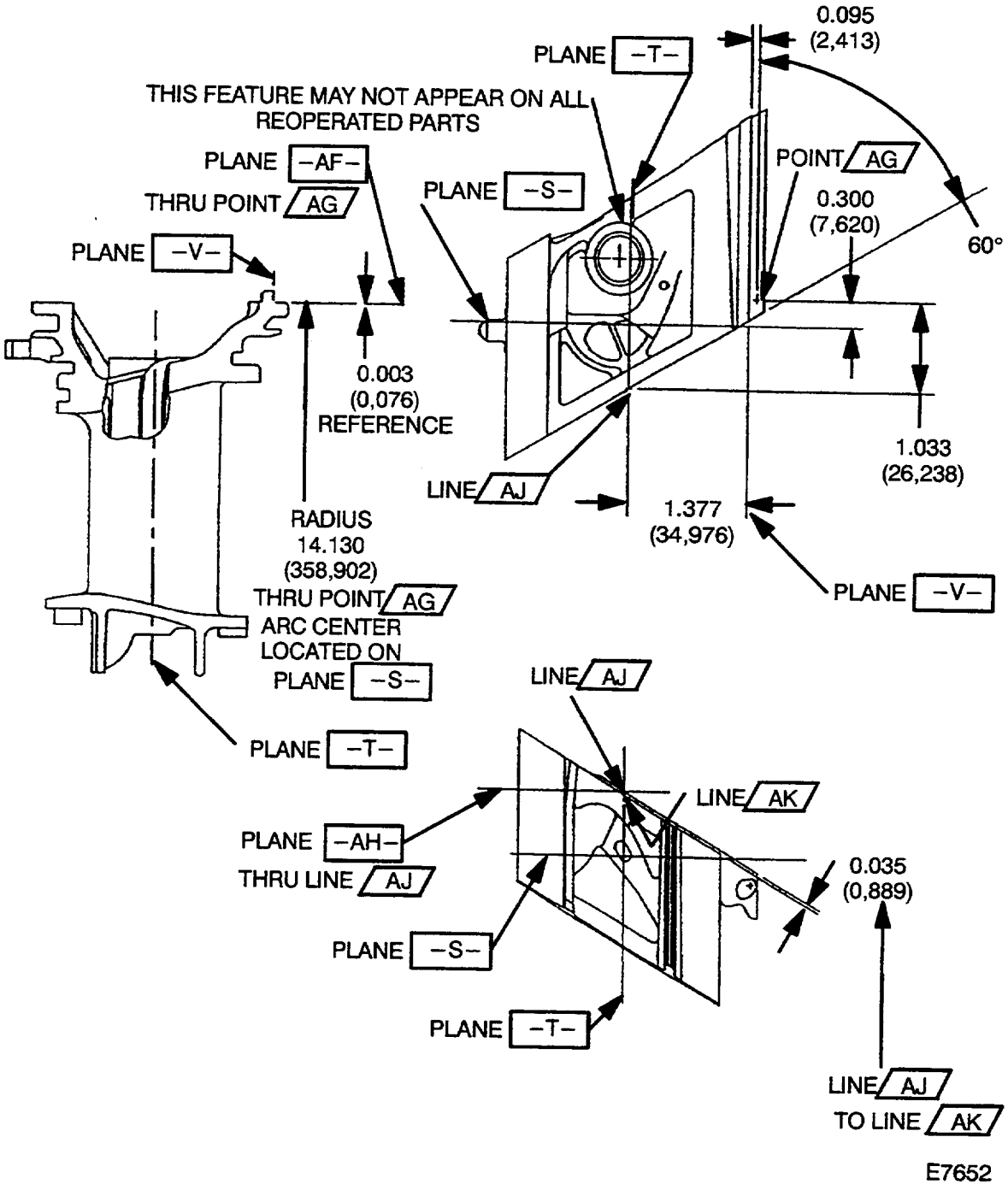
(a) Identify the new assembly as 2A3819.

(b) Mark the new part number adjacent to the existing part number.

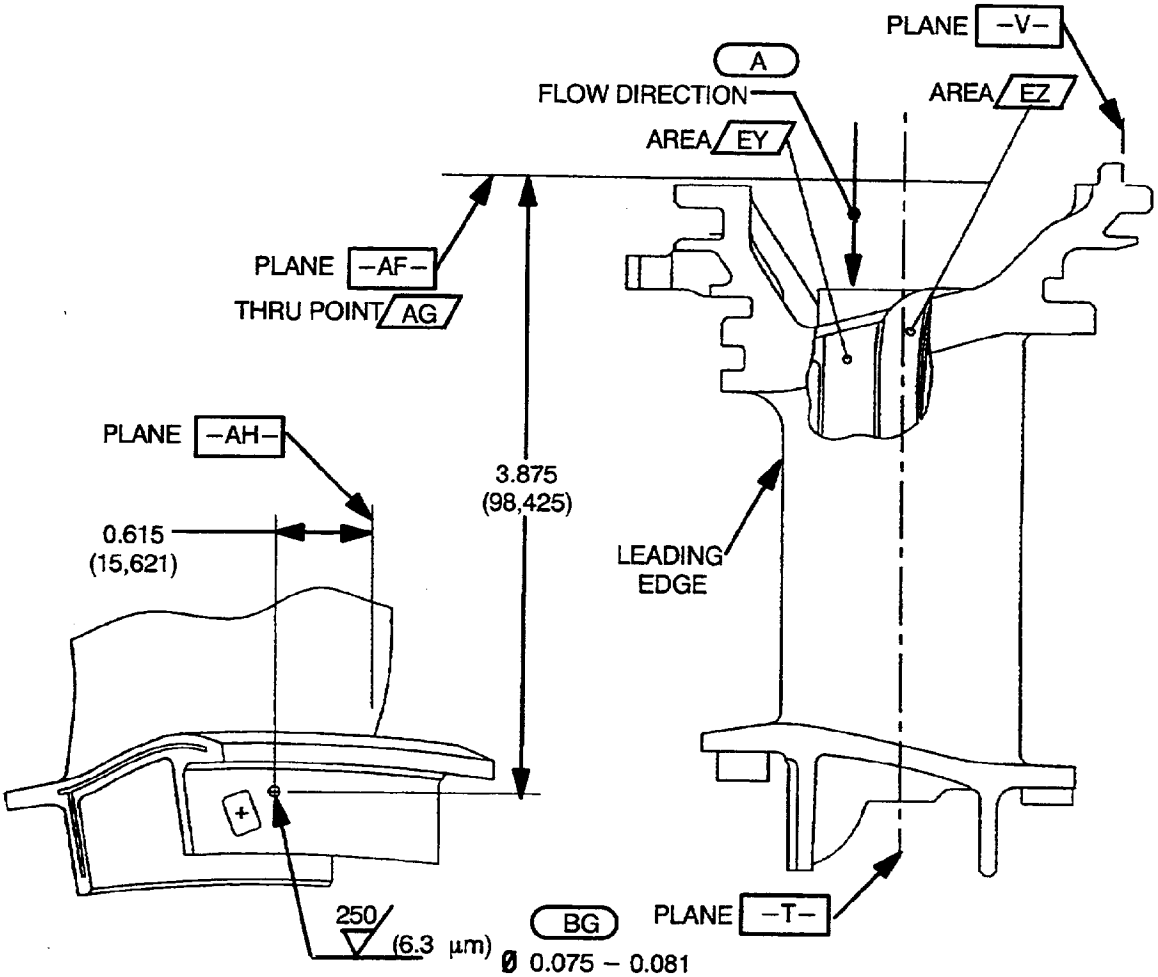
(c) Use the vivration peen method specified in Reference (2), Chapter/Section 70-09-00, Marking of Parts.



Location of the Stage 2 High Pressure Turbine (HPT) Vane Assemblies
Fig.1



Location of the Stage 2 High Pressure Turbine (HPT) Vane Assemblies
Fig.2(Sheet 1)



		$\left(\frac{P_3}{P_a}\right)$ min	$\left(\frac{P_3}{P_a}\right)$ TARGET REFERENCE	$\left(\frac{P_3}{P_a}\right)$ max
$\frac{W\sqrt{T_3}}{P_a}$ = .0184	BASIC LIMIT	1.412	1.500	1.621

BG FINISH SURFACE OF THIS PART BY PROCEDURE GIVEN IN TEXT. BREAK EDGE NOT REQUIRED
UNLESS DIFFERENTLY SPECIFIED BREAK SHARP EDGES 0.030 (0,762)
UNLESS DIFFERENTLY SPECIFIED ALL SURFACE TEXTURES ARE TO BE 125 (3.2 µm)

E7653

Modification of the Stage 2 High Pressure Turbine (HPT) Vane Assemblies
Fig.2(Sheet 2)

3. Material Information

Applicability: For each V2500 Engine to incorporate this Bulletin.

A. Kit 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
Applicability: For each V2527-A5, V2530-A5, V2525-D5 and V2528-D5 Engine to incorporate this Service Bulletin					
2A3219 (72-45-20)	1		Case & Vane Assembly	2A3215 (01-005)	(S1)(A)(B)
2A3215-001 (72-45-20)	1		Case & Vane Assembly	2A3215 (01-005)	(S1)(1D)(B)(C)
2A3812 (72-45-24)	17		Ring Segment & Vane Cluster Assembly	2A3372 (02-050)	(S1)(B)(D)
2A3832 (72-45-24)	2		.Vane, HPT, Stage 2, Assembly	2A3352 (01-130)	(S1)(1D)(B)(D)
2A3822 (72-45-24)	2		Ring Segment & Vane Cluster Assembly	2A3472 (02-260)	(S1)(B)(D)
2A3832 (72-45-24)	1		.Vane, HPT, Stage 2, Assembly	2A3352 (02-350)	(S1)(1D)(B)(D)
2A3842 (72-45-24)	1		.Vane, HPT, Stage 2, Assembly	2A3452 (02-420)	(S1)(1D)(B)(D)

C. Consumable Materials

D. Instructions/Dispositions Code Statements:

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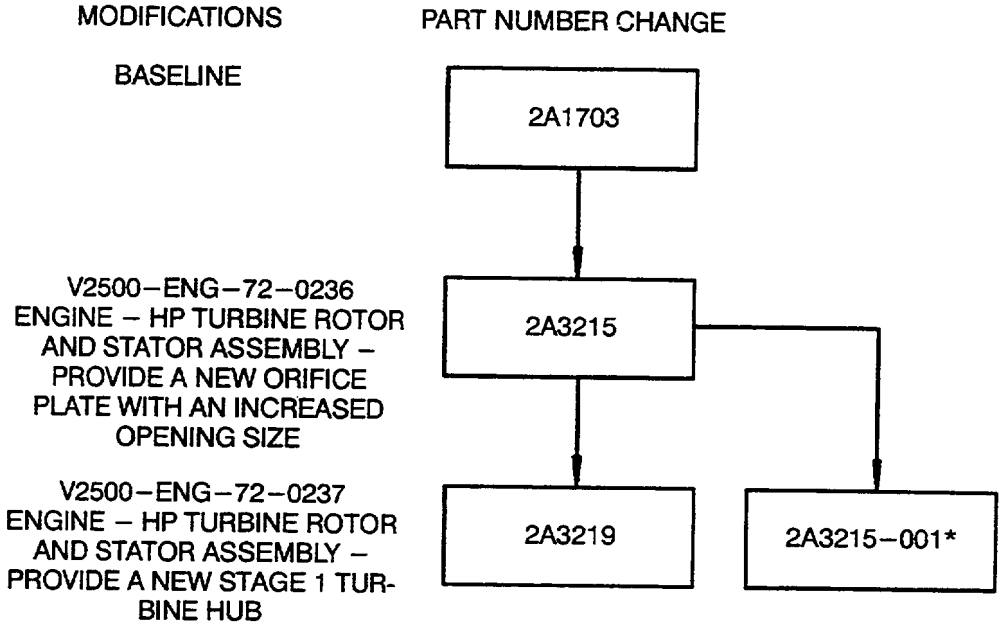
(S1) Vane assemblies must be maintained in sets per Ring Segment and Vane Cluster Assemblies, But a mixture of superseded and superseding vane clusters in 2A3215-001 Case and Vane Assemblies is permitted.
(1D) You can obtain the new part by modification of the old part and identification to the new part number.
(A) The new part will be supplied on a lead time quotation basis only.
(B) The old part will no longer be supplied.
(C) This Case and Vane Assembly can have an intermix of Ring Segment and Vane Cluster Assemblies 2A2272, 2A2372, 2A3372, 2A3472, 2A3812 and with 2A3822.
(D) The new part is currently available.

NOTE: The estimated 1996 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.



*THIS ASSEMBLY CONTAINS A MIXTURE OF RING SEGMENT AND VANE CLUSTER ASSEMBLIES 2A3372 WITH 2A3812 AND 2A3472 WITH 2A3822

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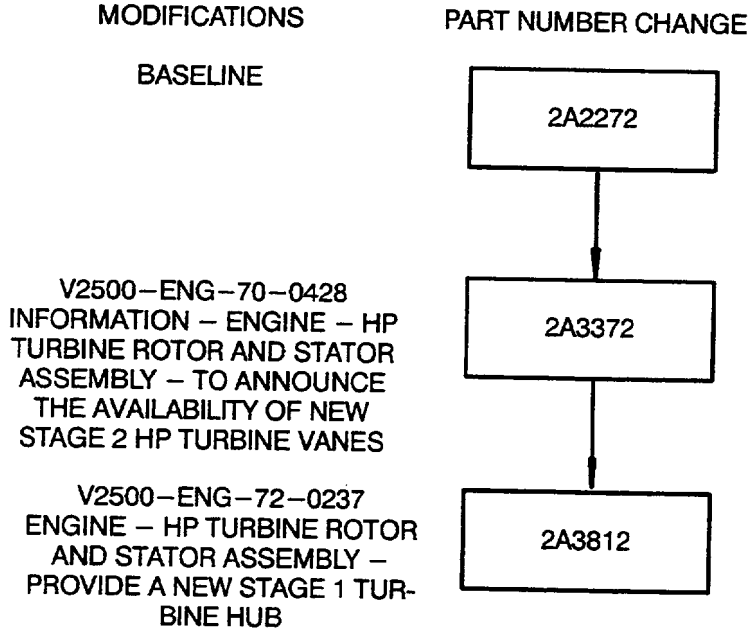
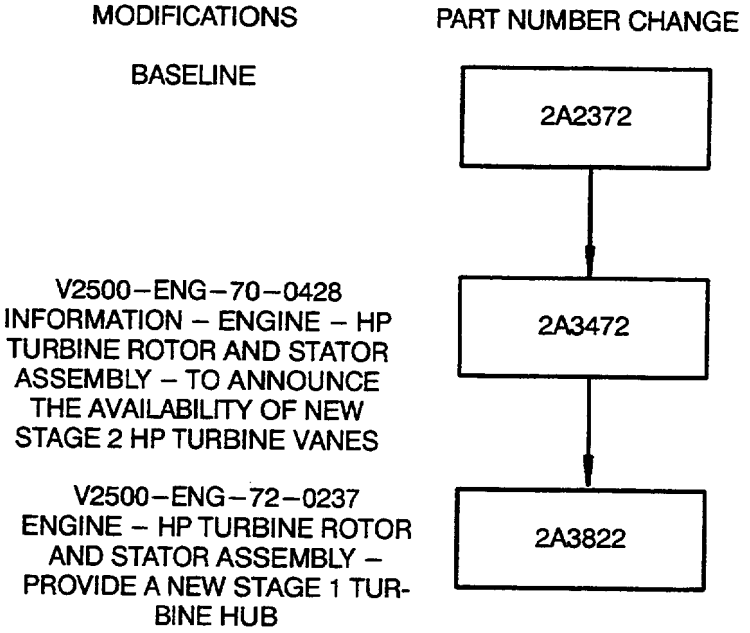
Family Tree - HPT Case and vane Assembly Ref. Catalog Sequence No. 72-45-20. Fig. 01
Item 005
Fig.3



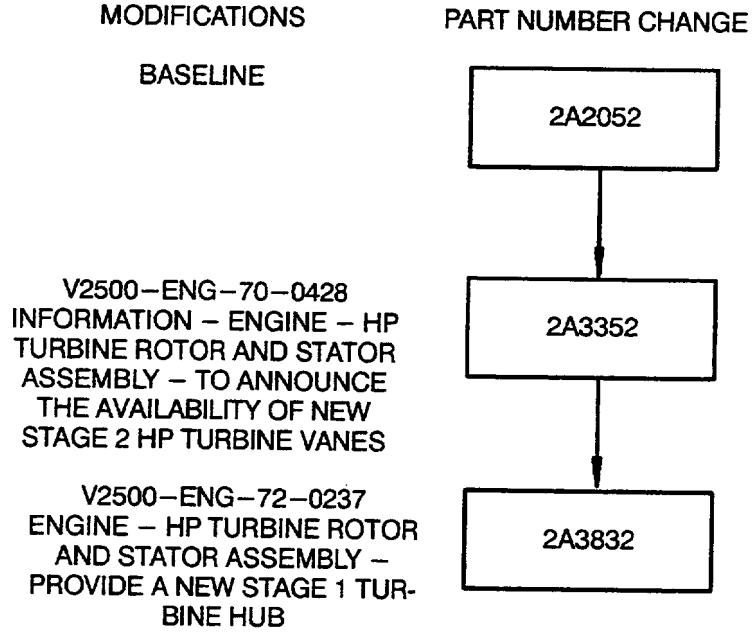
E7688

Family Tree - Ring Segment and Vane Cluster Assembly Ref. Catalog Sequence No. 72-45-24. Fig. 02 Item 050
Fig.4



E7689

Family Tree – Ring Segment and Vane Cluster Assembly Ref. Catalog Sequence No. 72-45-24. Fig. 02 Item 260
Fig.5



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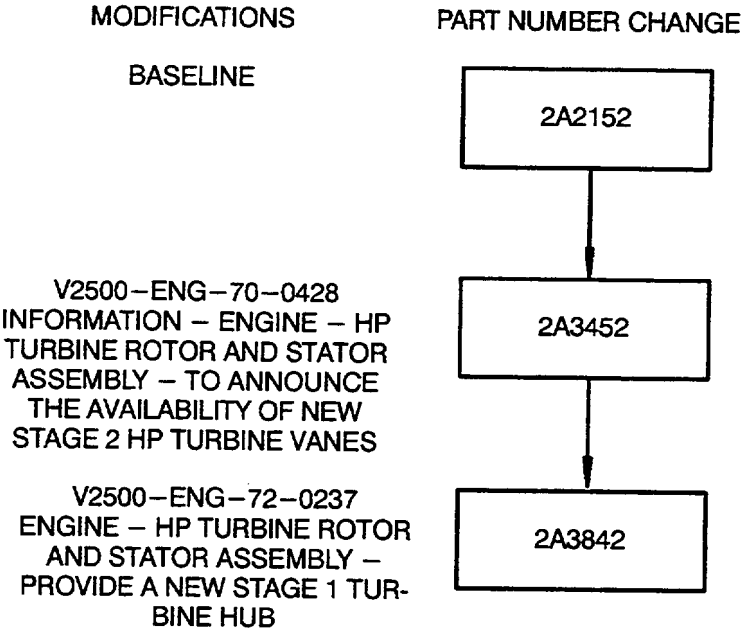
Family Tree - Stage 2 High Pressure Turbine Vane Assembly Ref. Catalog Sequence No. 72-45-24. Fig. 02 Items 130 and 350
Fig.6



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Family Tree - Stage 2 High Pressure Turbine Vane Assembly Ref. Catalog Sequence No. 72-45-24. Fig. 02 Item 420
Fig.7

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