

Date: May 12/00

Subject: Transmittal of Revision 1 To Service Bulletin Number

V25000-ENG-72-0364.

#### Service Bulletin Revision History:

Event Date

Basic Issue Feb.23/00 Revision 1 May 12/00

#### Reason For Issuance Of Revision:

(1) Incorporate intent of EC 98VC016N.

- (2) Delete Concurrence Requirements.
- (3) To Add dimensions to Illustrations.
- (4) Editional corrections.
- (5) To Update Material Information.
- (6) To Update Family Trees.

#### Effect on Prior Compliance:

None.

#### List of Effective Pages:

Bulletin	Rev.	Effective
Page No.	No.	Date
l to 19	1	May 12/00

V2500-ENG-72-0364

Transmittal Page 1 of 1





ENGINE - HIGH PRESSURE TURBINE - PROVIDE NEW STAGE 2 HIGH PRESSURE TURBINE DUCT SEGMENTS

#### MODEL APPLICATION

V2500-A1 V2522-A5 V2524-A5 V2527-A5 V2527E-A5 V2527M-A5 V2530-A5 V2533-A5 V2525-D5 V2528-D5

#### BULLETIN INDEX LOCATOR

72-45-00

Compliance Category Code

Internal Reference No.

98VC016, 98VC016N

Feb.23/00 Revision 1 May 12/00

1 7



ENGINE - HIGH PRESSURE TURBINE - PROVIDE NEW STAGE 2 HIGH PRESSURE TURBINE DUCT SEGMENTS

#### 1. Planning Information

#### A. Effectivity

(1) Aircraft: Airbus A319, A320, A321

McDonnell Douglas MD-90

(2) Engine: V2500-Al Engines Before Serial No. V0362.

V2522-A5 Engines Before Serial No. V10760, Except V10737, V10739, V10741, V10743, V10745, V10751, V10755, V10757, and V10759.

V2524-A5 Engine Serial No. V10760, Except V10737, V10739, V10741, V10743, V10745, V10751, V10755, V10757, and V10759.

V2527-A5 Engine Serial No. V10760, Except V10737, V10739, V10741, V10743, V10745, V10751, V10755, V10757, and V10759.

V2527E-A5 Engine Serial No. V10760, Except V10737, V10739, V10741, V10743, V10745, V10751, V10755, V10757, and V10759.

V2527M-A5 Engine Serial No. V10760, Except V10737, V10739, V10741, V10743, V10745, V10751, V10755, V10757, and V10759.

V2530-A5 Engine Serial No. V10760, Except V10737, V10739, V10741, V10743, V10745, V10751, V10755, V10757, and V10759.

V2533-A5 Engine Serial No. V10760, Except V10737, V10739, V10741, V10743, V10745, V10751, V10755, V10757, and V10759.

V2525-D5 Engines before Serial No. V20284.

V2528-D5 Engines before Serial No. V20284.

#### B. Concurrent Requirements

None.

#### C. Reason

(1) Condition:

Ceramic spalling of the second stage High Pressure Turbine (HPT) Duct Segments can cause downstream damage.

(2) Background:

There are potential causes for HPT Stage 2 Duct Segment ceramic liberation. These include segment to segment contact, ceramic damage incurred at assembly grind, excessive ceramic thickness. Ceramic liberation has resulted in many instances of LPT airfoil damage.

(3) Objective:

Provide new second stage HPT Duct Segments incorporating a decreased thickness of ceramic coating. The segments are also decreased in size which requires increasing the quantity of segments.



(4) Substantiation

This ceramic outer Air Seal design has been successfully demonstrated in the first stage of the V2500-A5/D5, as well as, other engine models.

(5) Effects of Bulletin on Workshop Procedures:

Removal/Installation

Not affected

Disassembly/Assembly

Affected

Cleaning

Affected

Inspection/Check

Affected

Repair

Affected

Testing

Not affected

(6) Supplemental Information

None.

D. Description

Install new Stage 2 Duct Assemblies which incorporate the thinner ceramic Duct Segments.

E. Approval

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.

F. Compliance

Category 7

Accomplish when supply of superseded parts has been depleted.

G. Manpower

Estimated Manhours to incorporate the full intent of this Bulletin:

#### Venue

#### Estimated Manhours

(1) In service

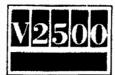
Not applicable

(2) At overhaul

Not applicable

- Material Price and Availability н.
  - Modification kit is not required. Parts are supplied as single line (1)items.
  - See "Material Information" section for prices and availability of future spares.

Feb.23/00 Revision 1 May 12/00



None

Tooling - Price and Availability The following tools are required to accomplish the Service Bulletin.

Tool No.	Qty	<u>Description</u>	Function	Avail
1P16466	1	Ring, Orientation - Case & Vane Assy, HPT 2nd Duct Assy.	Positions Case and Vane Assy.	(1)

- (1) Indicates that tool design aperture card is currant available from IAE.
- Weight and Balance
  - Weight change

No effect (2) Moment arm

Engine Front mount Centerline (3) Datum

Electrical Load Data

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

- L. References
  - IAE V2500 Service Bulletins: (1)

V2500-ENG-70-0450 (Information - Engine - HP Turbine Rotor And Stator Assembly - To Announce The Availability Of A New Turbine Case And Vane Assembly)

V2500-ENG-72-0002 (Engine- Stage 1 Turbine Nozzle Assembly And HP Turbine Rotor And Stator Assembly - Incorporation Of Offset

V2500-ENG-72-0085 (Engine - HP Turbine Rotor And Stator Assembly -Provide New Stage 2 Duct Segments Incorporating Revised Coating Requirements)

V2500-ENG-72-0092 (Engine - HP Turbine - Provide A Turbine Case And Vane Assembly That Will Allow Individual First Stage Duct Replacement)

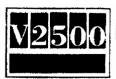
V2500-ENG-72-0108 (Engine - HP Turbine Rotor And Stator Assembly -Incorporate New Stage 1 Duct Segments With Improved Ceramic Coating )

V2500-ENG-72-0122 (Engine - HP Turbine Rotor And Stator Assembly -Provide New Stage 2 HPT Vane Assemblies, Stage 2 Air Sealing Ring Segment Assemblies And Stage 2 HPT Seals)

V2500-ENG-72-0236 (Engine - HP Turbine Rotor And Stator Assembly -Provide A New Orifice Plate With An Increased Opening Size)

V2500-ENG-72-0237 (Engine - HP Turbine Rotor And Stator Assembly -Provide New Stage 2 HPT Vanes)

(Power Plant station (PPS) 100)



V2500-ENG-72-0310 (Engine - High Pressure Turbine - Provide New Stage 1 And 2 High Pressure Turbine Duct Segments)

V2500-ENG-72-0339 (Engine - HP Turbine Rotor And Stator Assembly -Provide New Stage 1 Hptp Duct Segments, Band Segments, Supports, Seals And Bolts)

V2500-ENG-72-0365 (Engine - Provide Pretrenched Second Stage HPT Air Sealing Ring Segments)

- The V2500-A1 Engine Illustrated Parts Catalog (S-V2500-1IA), (2) Chapter/Section 72-45-20, 72-45-25, 72-45-30 to add new part number.
- The V2500-A5 Engine Illustrated Parts Catalog (S-V2500-2IA, S-V2500-2IB, S-V2500-5IA, S-V2500-5IB, S-V2500-6IA, S-V2500-6IB, S-V2500-7IA, S-V2500-7IB), Chapter/Section 72-45-20, 72-45-25, 72-45-30 to add new part number...
- The V2500-D5 Engine Illustrated Parts Catalog (S-V2500-3IA, S-V2500-3IB), Chapter/Section 72-45-20, 72-45-25, 72-45-30 to add new part number ...
- The V2500 Engine Manual (E-V2500-11A), Chapter/Section 72-45-20, (5) Assembly-01.
- The V2500-D5 Engine Engine Manual (E-V2500-3IA), Chapter/Section 72-45-20, Assembly-01.
- The V2500 Standard Practices/Processes Manual (SPP-V2500-1IA), 70-09-00 Marking of Parts.

#### Other Publications Affected Μ.

- The V2500 Engine Manual (E-V2500-1IA), Chapter/Section 72-45-25, Cleaning, to add the new part number.
- The V2500 Engine Manual (E-V2500-1IA), Chapter/Section 72-45-25, (2) Inspection, to add the new part number.
- The V2500 Engine Manual (E-V2500-11A), Chapter/Section 72-45-25, (3) Repair, to add the new part number.
- The V2500 Engine Manual (E-V2500-3IA), Chapter/Section 72-45-25, (4) Cleaning, to add the new part number.
- The V2500 Engine Manual (E-V2500-3IA), Chapter/Section 72-45-25, (5) Inspection, to add the new part number.
- The V2500 Engine Manual (E-V2500-3IA), Chapter/Section 72-45-25, (6) Repair, to add the new part number.



#### Accomplishment Instructions

#### Rework Instructions

Do a modification of the 2A1653 or 2A2270 Stage 2 HPT Support Assembly (1 off). See Reference (1), Chapter/Section 72-45-26, Figure/Item No. 01-020. See Figures X and Y.

#### Procedure

#### Supplementary Information

(a) Drill Hole.

- Refer to Figure 2 (Sheetl) Section A-A
- Select (Class 1-4, P3, P5) Pin Part Number 2Al268 (1 off) to obtain a 0.0005T - 0.0015T (0.0.013T - 0.038T) Fit.
- Refer to Figure 2 Sheet 2).
- (C) Install the Pin Part Number Refer to Figure 2 (Sheet2). Support Assembly.

vibration peen method.

(d) Mark the new part number adjacent to the existing part number. Use the

2A1268 (1 off) in the 2 HPT Note: 1 Pin is required for each Duct Segment

> Existing New Part Number 2A1653 2A3408 2A2270 2A3407

Use the procedure specified in Reference (6), Chapter/Section 70-09-00, Marking of Parts. See Figure Z.

#### Installation Instructions

- Assemble the following by the procedure specified in Reference (2) or (3), Chapter/Section 72-45-20 Assembly-01. See Figure 1.
  - Stage 2 High Pressure Turbine Duct Segments (38 off), 2A3392 (V2500-A1) or 2A3393 (V2500-A5/D5).

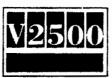
This configuration requires 38 Duct Segments.

(b) Seal (38 off) 2A3447.

This configuration requires 38 Seals.

- Support Assembly (19 off), 2A3407 (V2500-A1) or 2A3408 (c) (V2500-A5/D5).
- (d) Band Segments 2A3411-01 (2 off) and 2A3413-01 (1 off) (V2500-A1) or 2A3412-01 (2 off) and 2A3414-01 (1 off) (V2500-A5/D5).
- Do not do the grind procedure specified in Reference (2) or (3), Chapter/Section 72-45-20, Assembly-01. See the applicable subtask for the particular engine model.

NOTE: The new Stage 2 High Pressure Turbine Duct Segments are finish machined at manufacture eliminating, the need to machine (grind) at assembly.



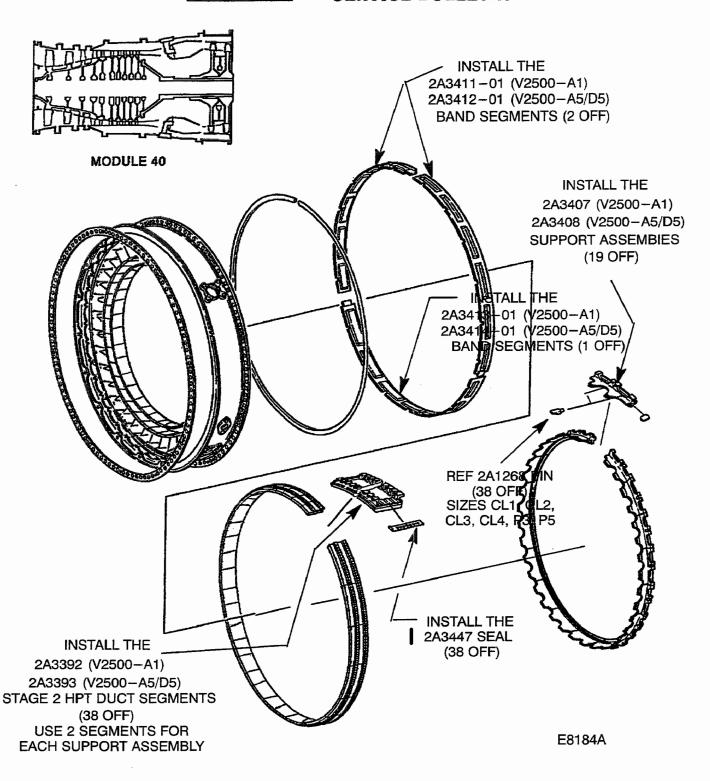
Identify the new Case and Vane Assembly by the procedure specified in Reference (6) Chapter/Section 70-09-00, Marking of Parts, and as follows:

Old Part Number	New Part Number
2A3468	2A3415
2A3469	2A3416
2A3304	2A3304-001
2A3364	2A3364-001
2A3415-002	2A3415-005
2A3415-003	2A3415-004

- Recording Instructions
- A record of accomplishment is necessary.



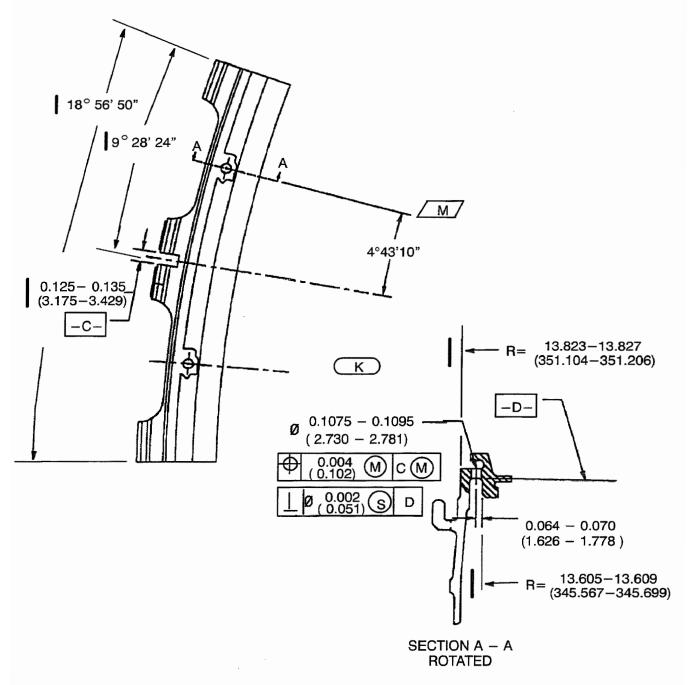
### $oldsymbol{V2500}$ International Aero Engines **SERVICE BULLETIN**



Location of the Stage 2 High Pressure Turbine Duct Segments And Support Figure 1

Feb.23/00 Revision 1 May 12/00





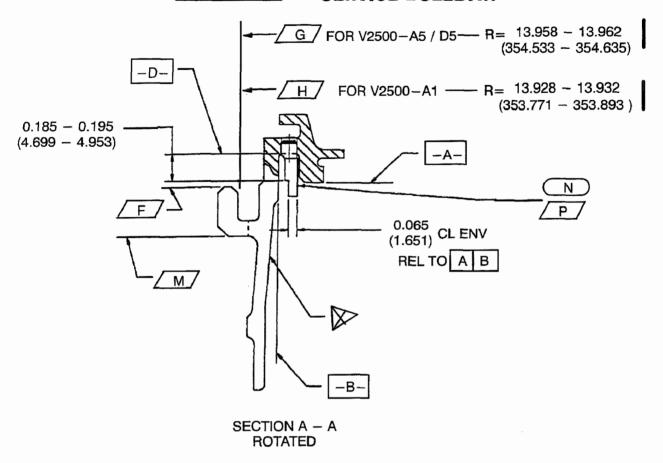
K MAY BE FINISHED PRE SPEC PWA 97.3.

E8185A

Modification of the Stage 2 High Pressure Turbine Duct Assembly Figure 2 (Sheet 1 of 2)

Feb.23/00 Revision 1 May 12/00





UNLESS SPECIFIED DIFFERENTLY BREAK EDGES 0.003 - 0.015 (0.076 - 0.381).

SURFACE TEXTURE PER SPEC PWA 388, UNLESS SPECIFIED DIFFERENTLY ALL SURF

MARK IDENT PER SPEC PWA 310, CLASS 40.

K MAY BE FINISHED PRE SPEC PWA 97.3.

UNLESS SPECIFIED DIFFERENTLY ALL DIM APPLY WHEN SURFACE F IS 0.002 (0.051)

AND DIM G OR H IS WITHIN LIMITS SHOWN IN FREE

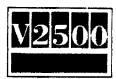
STATE OR CONSTRAINED. CONSTRAINT CONTACT ALLOWED

ONLY ON SURFACES M F & RADIUS H

N SELECT CLASS TO OBTAIN 0.0005T - 0.0015T (0.013T - 0.038T ) FIT.

E8186A

Modification of the Stage 2 High Pressure Turbine Duct Assembly Figure 2 (Sheet 2 of 2)



#### 3. Material Information

A. Kit associated with this bulletin.

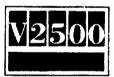
None

B. Parts affected by this bulletin.

	New		Est'd		01d	
	Part No.		Unit		Part No.	Instructions
	(ATA No.)	Qty	Price(\$)	<u> Keyword</u>	(IPC No.)	<u>Disposition</u>
	Applicabili	ty:	For each V2500-	-Al Engine to i	ncorporate t	his Service Bulletin
ı	2A3415 (72-45-20)	1		Case & Vane Assembly OR	2A3468 (01-005)	(S1)(B)(D)
	2A3304-001 (72-45-20)	1		Case & Vane Assembly	2A3304 (01-005)	(S1)(B)(D)
	2A3411-01 (72-45-25)	2		.Band Segment, HPT, 2 Stg, Assy Of	2A2271-01 (01-020)	(S1)(A)(E)
	2A3413-01 (72-45-25)	1		.Band Segment, HPT, 2 Stg, Assy Of	2A2269-01 (01-040)	(S1)(A)(E)
	(72-45-25)	19		.Duct Segment HPT, 2 Stg	2A3362 (01-060)	(S1)(E)
	2A3392	38		.Duct Segment HPT, 2 Stg		(S1)(A)
		19		.Seal-HPT	2A0194	(S1)(S1)
	(72-45-25) 2A3447	38		Duct 2 Stg .Seal-HPT	(01-080)	(S1)(A)
	2A3407 (72-45-26)	19		Duct 2 Stg .Support Assy HPT Duct	2A2270 (01-020)	(S1)(C)(E)
	(72-45-26)	19		Pin-Shoulder (Class 1-4, P3, P5)		(S1)(F)
	2A1268	38		Pin-Shoulder (Class 1-4, P3, P5)		(S1)(A)



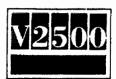
New		Est'd		Old	
Part No.	_	Unit		Part No.	Instructions
(ATA No.)	Qty	Price(\$)	Keyword	(IPC No.)	Disposition
					527E-A5, V2527M-A5, orporate this Service
2A3416 (72-45-20)	1		Case & Vane Assembly OR	2A3469 (01-005)	(S1)(B)(D)
2A3364-001 (72-45-20)	1		Case & Vane Assembly OR	2A3364 (01-005)	(S1)(B)(D)
2A3215-004 (72-45-20)	1		Case & Vane Assembly OR	2A3215-003 (01-005)	(S1)(B)(D)
2A3215-005 (72-45-20)	1		Case & Vane Assembly	2A3215-002 (01-005)	(S1)(B)(D)
2A3412-01 (72-45-25)	2		.Band Segment HPT, 2 Stg, Assy Of	2A1655-01 (01-020)	(S1)(A)(E)
2A3414-01 (72-45-25)	1		.Band Segment HPT, 2 Stg, Assy Of	2A1663-01 (01-040)	(S1)(A)(E)
(72-45-25)	19		.Duct Segment HPT, 2 Stg	2A3363 (01-060)	(S1)(E)
2A3393	38		.Duct Segment HPT, 2 Stg		(S1)(A)
(72-45-25)	19		.Seal-HPT Duct 2 Stg	2A2149 (01-080)	(SI)(E)
2A3447	38		.Seal-HPT Duct 2 Stg		(S1)(A)
2A3408 (72-45-26)	19		.Support Assy HPT Duct	2A1653 (01-020)	(S1)(A)(C)(E)
(72-45-26)	19		Pin-Shoulder (Class 1-4, P3, P5)		(S1)(F)
2A1268	38		Pin-Shoulder (Class 1-4, P3, P5)		(S1)(A)



- C. Consumable Materials
  - Not applicable
- Instructions/Disposition Code Statements:
  - (S1) New Parts coded (S1) must replace Old Parts coded (S1) in a COMPLETE SET per engine.
  - (A) The new part will be available approximately February 2000.
  - (B) The new part will be supplied on a quotation basis only.(C) The new part may also be obtained by rework.

  - (D) The old part is no longer available.
  - (E) The old part will continue to be supplied until supply is used up.
  - (F) The old part is being retained.

The estimated unit prices, if 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.



## 2500 International Aero Engines

### **SERVICE BULLETIN**

MODIFICATIONS

BASE LINE

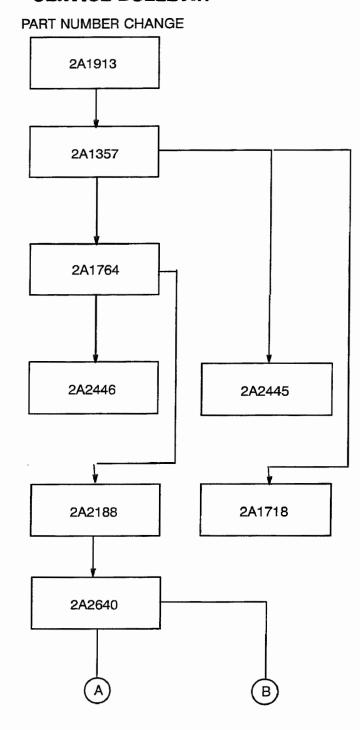
V2500-ENG-72-0002
ENGINE- STAGE 1 TURBINE
NOZZLE ASSEMBLY AND HP
TURBINE ROTOR AND STATOR
ASSEMBLY - INCORPORATION OF
OFFSET SUPPORTS

V2500-ENG-72-0092
ENGINE - HP TURBINE - PROVIDE
A TURBINE CASE AND VANE
ASSEMBLY THAT WILL ALLOW
INDIVIDUAL FIRST STAGE DUCT
REPLACEMENT

V2500-ENG-72-0122 PART 1 NEW STAGE 2 HPT AIR SEALING RING SEGMENT ASSEMBLY AND FEATHERSEALS

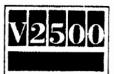
V2500-ENG-72-0122 PART 2 NEW STAGE 2 HPT AIR SEALING RING SEGMENT ASSEMBLY VANE COVERS AND FEATHERSEALS

V2500-ENG-70-0450
INFORMATION ENGINE - HP
TURBINE ROTOR AND STATOR
ASSEMBLY - ANNOUNCE THE
AVAILABILITY OF A NEW TURBINE
CASE AND VANE ASSEMBLY



E8187A

Family Tree - High Pressure Turbine Case And Vane Assembly (V2500-A1) Ref. Catalog Sequence No. 72-45-20. Fig. 01 Item 005 Figure 3 (Sheet 1)



**MODIFICATIONS** 

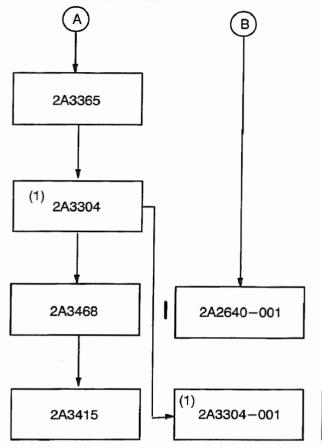
PART NUMBER CHANGE

V2500-ENG-72-0310 ENGINE - HIGH PRESSURE TURBINE - PROVIDE NEW HIGH PRESSURE TURBINE STAGE 1 AND 2 DUCT SEGMENTS

V2500-ENG-72-0339 **ENGINE - HP TURBINE ROTOR AND** STATOR ASSEMBLY - PROVIDE NEW STAGE 1 HPT DUCT SEGMENTS, BAND SEGMENTS, SUPPORTS, **SEALS AND BOLTS** 

V2500-ENG-72-0365 PROVIDE PRETRENCHED SECOND STAGE HPT AIR SEALING RING **SEGMENTS** 

V2500-ENG-72-0364 **ENGINE - HIGH PRESSURE** TURBINE - PROVIDE NEW STAGE 2 HIGH PRESSURE TURBINE **DUCT SEGMENTS** 



(1) PHOENIX

E8188A

Family Tree - High Pressure Turbine Case And Vane Assembly (V2500-A1) Ref. Catalog Sequence No. 72-45-20. Fig. 01 Item 005 Figure 3 (Sheet 2)

Feb.23/00 Revision 1 May 12/00

#### MODIFICATIONS BASE LINE

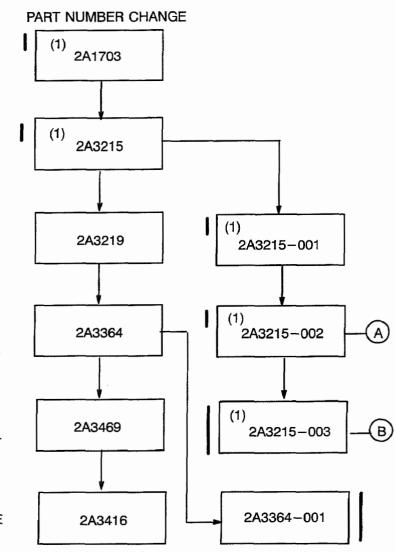
V2500-ENG-72-0236 **ENGINE- HP TURBINE ROTOR AND** STATOR ASSEMBLY - PROVIDE A NEW ORIFICE PLATE WITH AN INCREASED OVERSIZE

V2500-ENG-72-0237 **ENGINE- HP TURBINE ROTOR AND** STATOR ASSEMBLY - PROVIDE A **NEW STAGE 2 HPT VANES** 

V2500-ENG-72-0310 ENGINE - HIGH PRESSURE TURBINE - PROVIDE NEW HIGH PRESSURE TURBINE STAGE 1 AND 2 DUCT SEGMENTS

V2500-ENG-72-0365 (98VC012) PRETRENCHED SECOND STAGE HPT AIR SEALING RING SEG-MENTS

V2500-ENG-72-0364 ENGINE - HIGH PRESSURE TURBINE - PROVIDE NEW STAGE 2 HIGH PRESSURE TURBINE **DUCT SEGMENTS** 



### (A) AND (B) CONTINUED ON SHEET 2

#### (1) DO NOT USE IN V2533-A5 ENGINES

E8189A

Family Tree - High Pressure Turbine Case And Vane Assembly (All V2500-A5 and V2500-D5 Engines) Ref. Catalog Sequence No. 72-45-20. Fig. 01 Item 005 Figure 4 (Sheet 1)

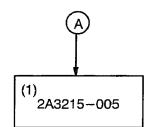
Feb.23/00 Revision 1 May 12/00

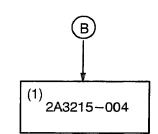


**MODIFICATIONS** 

PART NUMBER CHANGE

V2500-ENG-72-0364 **ENGINE - HIGH PRESSURE** TURBINE - PROVIDE NEW STAGE 2 HIGH PRESSURE TURBINE **DUCT SEGMENTS** 



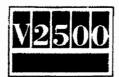


- (A) AND (B) CONTINUED FROM SHEET 1
  - (1) DO NOT USE IN V2533-A5 ENGINES

E8205

Family Tree - High Pressure Turbine Case And Vane Assembly (All V2500-A5 and V2500-D5 Engines) Ref. Catalog Sequence No. 72-45-20. Fig. 01 Item 005 Figure 4 (Sheet 2)

Feb.23/00 Revision 1 May 12/00

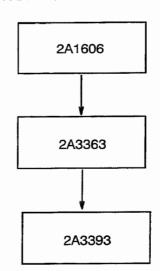


**MODIFICATIONS** BASE LINE

PART NUMBER CHANGE

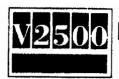
V2500~ENG-72-0310 ENGINE - HIGH PRESSURE TURBINE - PROVIDE NEW HIGH PRESSURE TURBINE STAGE 1 AND 2 DUCT SEGMENTS

V2500-ENG-72-0364 ENGINE - HIGH PRESSURE TUR-BINE - PROVIDE NEW STAGE 2 HIGH PRESSURE TURBINE DUCT **SEGMENTS** 



E8190

Family Tree - Stage 2 High Pressure Turbine Duct Segment (All V2500-A5 and V2500-D5 Engines) Ref. Catalog Sequence No. 72-45-25. Fig. 01 Item 060 Figure 5



**MODIFICATIONS BASE LINE** 

V2500-ENG-72-0085 ENGINE - HP TURBINE ROTOR AND STATOR ASSEMBLY - PROVIDE A NEW STAGE 2 DUCT INCORPORATING RE-VISED COATING REQUIREMENTS

V2500-ENG-72-0310 ENGINE - HIGH PRESSURE TURBINE - PROVIDE NEW HIGH PRESSURE TURBINE STAGE 1 AND 2 DUCT SEGMENTS

V2500-ENG-72-0364 ENGINE - HIGH PRESSURE TUR-BINE - PROVIDE NEW STAGE 2 HIGH PRESSURE TURBINE DUCT SEGMENTS

PART NUMBER CHANGE 2A0108 2A1944 2A3362 2A3392

E8191

Family Tree - Stage 2 High Pressure Turbine Duct Segment (V2500-Al) Ref. Catalog Sequence No. 72-45-25. Fig. 01 Item 060 Figure 6

Feb.23/00 Revision 1 May 12/00

