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V2500-A5/D5 SERIES PROPULSION SYSTEM SERVICE BULLETIN

This document transmits the Revision 3 of Service Bulletin V2500-ENG-72-0522.

Document History

Service Bulletin Revision Status

Initial Issue	Dec.20/06.
Revision 1	Feb.16/07.
Revision 2	Jan. 7/09.

Service Bulletin Revision 3

Remove	Incorporate	Reason for change
All pages of the Service Bulletin.	Pages 1 to 25 of the Service Bulletin.	To correct part titles in the Material Table. To delete the (B) disposition code. Minor editorial changes.

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Transmittal - Page 1 of 2

CHECK THAT ALL PREVIOUS TRANSMITTALS HAVE BEEN INCORPORATED
If any have not been received please advise IAE International Aero Engines AG

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All pages of the
Appendix 1

Pages 1 to 14 of the
Appendix 1.

No change.

All pages of the
Appendix 2.

Page 1 of the
Appendix 2.

No change.

All pages of the
Supplement.

Page 1 of the
Supplement.

To provide current part
pricing.

ENGINE – PROVIDE NEW SECOND STAGE VANE WITH INCREASED COOLING AIR**1. Planning Information****A. Effectivity Data****(1) For Airbus A319**

Engine Models Applicable

V2522-A5, V2524-A5, V2527M-A5.

Engine Serial No. V10001 thru V12556.

Engine Serial No. V12558, V12560, V12562, V12564, V12566, V12568, V12570, V12572, V12574, V12576, V12578.

(2) For Airbus A320

Engine Models Applicable

V2527-A5, V2527E-A5.

Engine Serial No. V10001 thru V12556.

Engine Serial No. V12558, V12560, V12562, V12564, V12566, V12568, V12570, V12572, V12574, V12576, V12578.

(3) For Airbus A321

Engine Models Applicable

V2530-A5, V2533-A5.

Engine Serial No. V10001 thru V12556.

Engine Serial No. V12558, V12560, V12562, V12564, V12566, V12568, V12570, V12572, V12574, V12576, V12578.

(4) For Boeing MD-90

Engine Models Applicable

V2525-D5, V2528-D5

Engine Serial No. V20001 thru V20285.

B. Concurrent Requirements

Service Bulletin V2500-ENG-72-0236, V2500-ENG-72-0237 and V2500-ENG-72-0310 must be incorporated prior to this Service Bulletin.

NOTE: Incorporation of this Service Bulletin completes the intent of Service Bulletin V2500-ENG-72-0236 and V2500-ENG-72-0237. Reference accomplishment instructions 5.B.

R Engines which incorporate this Service Bulletin must be assembled with a new
R Stage 2 High Pressure Turbine (HPT) Airseal or a serviceable Stage 2 HPT
Airseal which has had the knife edges recoated per VRS3209.

C. Reason**(1) Condition:**

R V2500 A5/D5 Stage 2 HPT Airseal is experiencing cracking in the field. The
fleet is being managed by a fleet management plan which includes vibration
monitoring and replacing the seal per Service Bulletins 72-0500, 72-0501
and Service Bulletin 72-0502.

R **NOTE:** V2500-A1 engines will be addressed in a separate Service Bulletin.

(2) Background:

R Root cause investigation has indicated hot gas path air is ingested into
the Stage 2 HPT Airseal cavity, which increases stress in the region of
the fillet where the cracking occurs. This Service Bulletin introduces
changes which will increase cooling air and reduces leakage thereby
reducing ingestion.

(3) Objective:

R Add a hole to the Stage 2 HPT Vanes to increase cooling air by 0.5% to
R reduce ingestion and cool the Stage 2 HPT Airseal cavity. The leading edge
R honeycomb on the Stage 2 HPT Vane is repositioned forward to reduce
leakage by maintaining better axial alignment between the first stage rear
seal and the honeycomb. The pre-trench is removed on the ring segment
honeycomb to reduce leakage.

(4) Substantiation:

R The Stage 2 HPT Airseal life is improved by reducing ingestion and by
R cooling the Stage 2 HPT Airseal cavity, which reduces the temperature and
the stress of the seal fillet.

- R This Service Bulletin has been substantiated by the following testing:
- Test simulating the increased air through the Orifice Plates and data matching temperatures and pressures.
- Cold flowing and data matching hardware.
- R Back to back flow testing Stage 2 HPT Vanes with and without increased cooling hole to data match the durability models.
- (5) Effects of Bulletin on:
- (a) Removal/Installation:
- R Not affected.
- (b) Disassembly/Assembly:
- R Not affected.
- (c) Cleaning:
- R Not affected.
- (d) Inspection/Check:
- Flow test passage per Figure 2 Sheet 2 note 4 and Engine Manual for service hardware.
- (e) Repair:
- R Not affected.
- (f) Testing:
- R Not affected.
- (6) Supplemental Information
- R These changes are predicted to increase Thrust Specific Fuel Consumption (TSFC) by up to 0.2% and to reduce the Exhaust Gas Temperature (EGT) margin by up to 2.0 degree C. The reduction in EGT margin may have a small impact on time on wing.
- D. Description
- R Provide new Stage 2 HPT Vanes with increase cooling air and honeycomb without pre-trench and new orifice plate in the HPT Case.

E. Compliance**Category 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. Approval Data

The part number changes and/or part modifications specified in the Accomplishment Instructions and Material Information sections of this Service Bulletin have been shown to comply with the applicable Federal Aviation Regulations and are FAA-APPROVED for the engine model(s) given.

The compliance statement and the procedures described in this Service Bulletin have been shown to comply with the applicable Federal Aviation Regulations and are FAA-APPROVED for the Engine Model listed.

G. Manpower**(1) In Service**

R Not Applicable.

(2) At Overhaul

(a) Disassemble Ring Segment and Vane Cluster, Clean, Repair and Inspect

1 hour 30 minutes.

R (b) Rework the Vane Assembly, Flow Test and Reidentify.

R 2 hours 28 minutes.

R (c) Reassemble Ring Segment and Vane Cluster.

R 7 hours 55 minutes.

R (d) Assemble Case and Vane Assembly.

R 17 hours 45 minutes.

Total

R 29 hours 38 minutes.

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.

J. Software Accomplishment Summary

Not Applicable.

K. References

- (1) IAE V2500 Service Bulletin V2500-ENG-70-0428 (Standard Practices – Engine – Information – Engine – HP Turbine Rotor And Stator Assembly – To Announce The Availability Of New Stage 2 HP Turbine Vanes)
- (2) IAE V2500 Service Bulletin V2500-ENG-72-0236 (Engine – HP Turbine Rotor And Stator Assembly – Provide A New Orifice Plate With An Increased Opening Size).
- (3) IAE V2500 Service Bulletin V2500-ENG-72-0237 (Engine – HP Turbine Rotor And Stator Assembly – Provide New Stage 2 HPT Vanes).
- (4) IAE V2500 Service Bulletin V2500-ENG-72-0310 (Engine – High Pressure Turbine – Provide New Stage 1 And 2 High Pressure Turbine Duct Segments).
- (5) IAE V2500 Service Bulletin V2500-ENG-72-0365 (Engine – Provide Pretrenched Second Stage HPT Air Sealing Ring Segments).
- (6) IAE V2500 Service Bulletin V2500-ENG-72-0364 (Engine – High Pressure Turbine – Provide New Stage 2 High Pressure Turbine Duct Segments).
- (7) IAE V2500 Service Bulletin V2500-ENG-72-0368 (Engine – Provide New 2nd Stage High Pressure Turbine (HPT) Vanes).
- (8) IAE V2500 Service Bulletin V2500-ENG-72-0483 (Engine – New First Stage Duct Segments And HPT Vane Support).

- (9) IAE V2500 Service Bulletin V2500-ENG-72-0489 (Engine - Allow For The Use Of Reoperated 2nd Stage HPT Vanes In Newer Delivered Configurations).
- (10) IAE V2500 Service Bulletin V2500-ENG-72-0500 (Non - Modification Service Bulletin - N2 Vibration Monitoring For The High Pressure Turbine (HPT) Stage 2 Air Seal).
- (11) IAE V2500 Service Bulletin V2500-ENG-72-0501 (Non - Modification Service Bulletin - N2 Vibration Monitoring For The High Pressure Turbine (HPT) Stage 2 Air Seal).
- (12) IAE V2500 Service Bulletin V2500-ENG-72-0502 (Non-Modification Service Bulletin - Replacement Of High Pressure Turbine (HPT) Stage 2 Air Seal).
- R (13) V2500 Engine Illustrated Parts Catalogs (S-V2500-2IA, S-V2500-2IB, S-V2500-3IA, S-V2500-3IB, S-V2500-3IC, S-V2500-5IA, S-V2500-5IB, S-V2500-6IA, S-V2500-6IB, S-V2500-7IA and S-V2500-7IB), Chapter/Section 72-45-00.
- (14) V2500 Engine Manual (E-V2500-1IA or E-V2500-3IA), Chapter/Section 72-45-00.
- R (15) V2500 Standard Practices/Processes Manual (SPP-V2500-1IA), Chapter/Section 70-09-00.
- R (16) Internal Reference No. - 05VA036, 05VA036-01, EC 08VA058 and EC 97VK019A.
- (17) ATA Locator - 72-45-00.

L. Other Publications Affected

- R (1) V2500 Engine Illustrated Parts Catalogs (S-V2500-2IA, S-V2500-2IB, S-V2500-3IA, S-V2500-3IB, S-V2500-3IC, S-V2500-5IA, S-V2500-5IB, S-V2500-6IA, S-V2500-6IB, S-V2500-7IA and S-V2500-7IB), Chapter/Section 72-45-00.
- (2) V2500 Engine Manuals (E-V2500-1IA or E-V2500-3IA), Chapter/Section 72-45-00 Cleaning, Inspection and Repair, to add the new part.

M. Interchangeability of Parts

Old and new parts are directly interchangeable in complete sets only.

It is acceptable to use 2A0047 Honeycomb in place of 2A4076 until supply is exhausted.

N. Information in the Appendix

Alternate Accomplishment Instructions (No)

Progression Charts (Yes)

R Supplement (Yes)
Added Data (Yes)
Revision to Table of Limits (No)
Inspection Procedures (No)

2. Material Information

A. Material Price and Availability

Modification kit is not required.

For Price and availability of spares refer to the supplement of this Service Bulletin.

B. Industry Support Program

Not Applicable.

C. For V2522-A5, V2524-A5, V2527-A5, V2527E-A5, V2527M-A5, V2530-A5, V2533-A5, V2525-D5, V2528-D5 Engines:

72-45-20

The material data that follows is for each engine.

FIG- ITEM NUMBER	NEW PART NUMBER	QTY	PART TITLE	MAT	OLD PN	INSTR - DISP
01-005	2A4050	1	Case And Vane Assy, Turbine OR	-	2A3916	(F) (N) (I)
01-005	2A3469-004	1	Case And Vane Assy, Turbine OR	-	2A3469	(1) (N) (I)
01-005	2A4050	1	Case And Vane Assy, Turbine OR	-	2A3416	(1) (N) (I)
01-005	2A4050	1	Case And Vane Assy, Turbine OR	-	2A3475	(1) (N) (I)
01-005	2A3469-004	1	Case And Vane Assy, Turbine OR	-	2A3215-003	(1) (N) (I)
01-005	2A4050	1	Case And Vane Assy, Turbine OR	-	2A3215-004	(1) (N) (I)
01-005	2A4050	1	Case And Vane Assy, Turbine OR	-	2A3364-001	(1) (N) (I)
01-005	2A4050	1	Case And Vane Assy, Turbine OR	-	2A3215-005	(1) (N) (I)
01-005	2A3416-005	1	Case And Vane Assy, Turbine OR	-	2A3364-005	(1) (N) (I)
01-005	2A3469-004	1	Case And Vane Assy, Turbine	-	2A3364-004	(1) (N) (I)

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FIG- NUMBER	ITEM NUMBER	NEW PART NUMBER	QTY	PART TITLE	MAT	OLD PN	INSTR - DISP
01-005		2A3469-004	1	OR Case And Vane Assy, Turbine	-	2A3469-002	(1) (N) (I)
01-005		2A3416-005	1	OR Case And Vane Assy, Turbine	-	2A3416-002	(1) (N) (I)
01-005		2A3469-004	1	OR Case And Vane Assy, Turbine	-	2A3215-012	(1) (N) (I)
01-005		2A3469-004	1	OR Case And Vane Assy, Turbine	-	2A3215-013	(1) (N) (I)
01-005		2A3416-005	1	OR Case And Vane Assy, Turbine	-	2A3215-014	(1) (N) (I)
01-005		2A3416-005	1	OR Case And Vane Assy, Turbine	-	2A3215-015	(1) (N) (I)
01-005		2A3219-003	1	OR Case And Vane Assy, Turbine	-	2A3215-011	(1) (N) (I)
01-005		2A3219-003	1	OR Case And Vane Assy, Turbine	-	2A3219-002	(1) (N) (I)

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FIG- NUMBER	ITEM NUMBER	NEW PART NUMBER	QTY	PART TITLE	MAT	OLD PN	INSTR - DISP
R	01-100	2A3738	4	Plate, Orifice	-	2A3734	(1) (A1) (S1)

72-45-24

The material data that follows is for each engine prior to Service Bulletin V2500-ENG-72-0365.

FIG- NUMBER	ITEM NUMBER	NEW PART NUMBER	QTY	PART TITLE	MAT	OLD PN	INSTR - DISP
02-050		2A2272-006	17	.Ring Segment and Vane Cluster Assy of, Non - Boroscope OR	-	2A2272	(1) (N) (S1) (I)

FIG- ITEM NUMBER	NEW PART NUMBER	QTY	PART TITLE	MAT	OLD PN	INSTR - DISP
02-050	2A2272-006	17	.Ring Segment and Vane Cluster Assy of, Non - Boroscope OR	-	2A2272-001	(1) (N) (S1) (I)
02-050	2A2272-006	17	.Ring Segment and Vane Cluster Assy of, Non - Boroscope OR	-	2A3372	(1) (N) (S1) (I)
02-050	2A2272-006	17	.Ring Segment and Vane Cluster Assy of, Non - Boroscope	-	2A3812	(1) (N) (S1) (I)

72-45-24

The material data that follows is for each engine incorporating Service Bulletin V2500-ENG-72-0365.

FIG- ITEM NUMBER	NEW PART NUMBER	QTY	PART TITLE	MAT	OLD PN	INSTR - DISP
02-050	2A6102	17	.Ring Segment and Vane Cluster Assy of, Non - Boroscope OR	-	2A5602	(1) (A1) (N1) (S1) (I)
02-050	2A2272-006	17	.Ring Segment and Vane Cluster Assy of, Non - Boroscope OR	-	2A2272-002	(1) (N) (S1) (I)
02-050	2A2272-006	17	.Ring Segment and Vane Cluster Assy of, Non - Boroscope OR	-	2A3372-001	(1) (N) (S1) (I)
02-050	2A2272-006	17	.Ring Segment and Vane Cluster Assy of, Non - Boroscope OR	-	2A2272-004	(1) (N) (S1) (I)
02-050	2A2272-006	17	.Ring Segment and Vane Cluster Assy of, Non - Boroscope OR	-	2A2272-003	(1) (N) (S1) (I)

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FIG- ITEM NUMBER	NEW PART NUMBER	QTY	PART TITLE	MAT	OLD PN	INSTR - DISP
02-050	2A2272-006	17	.Ring Segment and Vane Cluster Assy of, Non - Boroscope	-	2A5102	(1) (N) (S1) (I)

72-45-24

The material data that follows is for all engines.

FIG- ITEM NUMBER	NEW PART NUMBER	QTY	PART TITLE	MAT	OLD PN	INSTR - DISP
02-120	2A1106-01	1	..Ring Segment Assy of, Air Slg, 2Stg, HPT	-	2A3431-01	(1) (A) (B) (I)
Non - Borescope Vane Assemblies						
02-130	2A4272	2	..Vane Assy of, HPT, 2 Stage OR	-	2A3572	(A1) (N1) (I)
02-130	2A2052-002	2	..Vane Assy of, HPT, 2 Stage OR	-	2A2052	(1) (N) (I)
02-130	2A3572-001	2	..Vane Assy of, HPT, 2 Stage OR	-	2A3572	(1) (N1) (I)
02-130	2A3402-001	2	..Vane Assy of, HPT, 2 Stage OR	-	2A3402	(1) (N) (I)
02-130	2A3352-001	2	..Vane Assy of, HPT, 2 Stage OR	-	2A3352	(1) (N) (I)
02-130	2A3832-001	2	..Vane Assy of, HPT, 2 Stage OR	-	2A3832	(1) (N) (I)
02-130	2A2052-002	2	..Vane Assy of, HPT, 2 Stage	-	2A2052-001	(1) (N) (I)
02-171	2A4076	1	...Ring Seg Cellular	-	2A0047	(A2) (B) (C) (N) (I)

72-45-24

The material data that follows is for each engine prior to Service Bulletin V2500-ENG-72-0365.

FIG- ITEM NUMBER	NEW PART NUMBER	QTY	PART TITLE	MAT	OLD PN	INSTR - DISP
R 02-260	2A2372-006	2	.Ring Segment and Vane Cluster Assy of, Boroscope OR	-	2A2372	(1) (N) (S1) (I)
R 02-260	2A2372-006	2	.Ring Segment and Vane Cluster Assy of, Boroscope OR	-	2A3472	(1) (N) (S1) (I)
R 02-260	2A2372-006	2	.Ring Segment and Vane Cluster Assy of, Boroscope OR	-	2A2372-001	(1) (N) (S1) (I)
R 02-260	2A2372-006	2	.Ring Segment and Vane Cluster Assy of, Boroscope	-	2A3822	(1) (N) (S1) (I)

72-45-24

The material data that follows is for each engine incorporating Service Bulletin V2500-ENG-72-0365.

FIG- ITEM NUMBER	NEW PART NUMBER	QTY	PART TITLE	MAT	OLD PN	INSTR - DISP
R 02-260	2A4072	2	.Ring Segment and Vane Cluster Assy of, Boroscope OR	-	2A5502	(1) (A1) (N1) (S1) (I)
R 02-260	2A2372-006	2	.Ring Segment and Vane Cluster Assy of, Boroscope OR	-	2A2372-002	(1) (N) (S1) (I)
R 02-260	2A2372-006	2	.Ring Segment and Vane Cluster Assy of, Boroscope OR	-	2A3472-001	(1) (N) (S1) (I)
R 02-260	2A2372-006	2	.Ring Segment and Vane Cluster Assy of, Boroscope OR	-	2A5202	(1) (N) (S1) (I)
R 02-260	2A2372-006	2	.Ring Segment and Vane Cluster Assy of, Boroscope	-	2A2372-004	(1) (N) (S1) (I)

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FIG- ITEM NUMBER	NEW PART NUMBER	QTY	PART TITLE	MAT	OLD PN	INSTR - DISP
02-260	2A2372-006	2	OR ..Ring Segment and Vane Cluster Assy of, Boroscope	-	2A2372-003	(1) (N) (S1) (I)

R

72-45-24

The material data that follows is for all engines.

FIG- ITEM NUMBER	NEW PART NUMBER	QTY	PART TITLE	MAT	OLD PN	INSTR - DISP
02-320	2A1106-01	1	..Ring Segment Assy of, Air Sealing, 2nd Stage, HPT	-	2A3431-01	(1) (A) (B) (S1) (I)
Non - Borescope Vane Assemblies						
02-350	2A4272	1	..Vane Assy of, HPT, 2 Stage	-	2A3572	(A1) (N1) (S1) (I)
02-350	2A2052-002	1	OR ..Vane Assy of, HPT, 2 Stage	-	2A2052	(1) (N) (S1) (I)
02-350	2A3572-001	1	OR ..Vane Assy of, HPT, 2 Stage	-	2A3572	(1) (N) (S1) (I)
02-350	2A3402-001	1	OR ..Vane Assy of, HPT, 2 Stage	-	2A3402	(1) (N) (S1) (I)
02-350	2A3352-001	1	OR ..Vane Assy of, HPT, 2 Stage	-	2A3352	(1) (N) (S1) (I)
02-350	2A3832-001	1	OR ..Vane Assy of, HPT, 2 Stage	-	2A3832	(1) (N) (S1) (I)
02-350	2A2052-002	1	OR ..Vane Assy of, HPT, 2 Stage	-	2A2052-001	(1) (N) (S1) (I)
02-391	2A4076	1	...Ring Seg Cellular	-	2A0047	(A2) (B) (C) (I)
Borescope Vane Assemblies						
02-420	2A4082	1	..Vane Assy of, HPT, 2 Stage	-	2A3282	(A1) (N) (S1) (I)
02-420	2A2152-002	1	OR ..Vane Assy of, HPT, 2 Stage	-	2A2152	(1) (N) (S1) (I)
			OR			

FIG- ITEM NUMBER	NEW PART NUMBER	QTY	PART TITLE	MAT	OLD PN	INSTR - DISP
02-420	2A3282-001	1	..Vane Assy of, HPT, 2 Stage OR	-	2A3282	(1) (N) (S1) (I)
02-420	2A3302-001	1	..Vane Assy of, HPT, 2 Stage OR	-	2A3302	(1) (N) (S1) (I)
02-420	2A3452-001	1	..Vane Assy of, HPT, 2 Stage OR	-	2A3452	(1) (N) (S1) (I)
02-420	2A3842-001	1	..Vane Assy of, HPT, 2 Stage OR	-	2A3842	(1) (N) (S1) (I)
02-420	2A2152-002	1	..Vane Assy of, HPT, 2 Stage	-	2A2152-001	(1) (N) (S1) (I)
02-450	2A4076	1	...Ring Seg Cellular	-	2A0047	(A2) (B) (C) (I)

D. Instructions/Disposition Code Statements:

Parts Modification Conditions

(1) The new part can be obtained by modification of the old part as specified in the Accomplishment Instructions.

Spare Parts Availability

(A) The new part is available.

(A1) The new part will be available approximately January 1, 2007.

(A2) The new part will be available approximately March 1, 2007.

(B) The old part will continue to be supplied for use in V2500-A1 Engine.

(C) It is acceptable to use 2A0047 in place of 2A4076 until the supply of 2A0047 is exhausted.

(F) The new part will be available on a Full Manufacturing Lead time quote basis only.

(N) The old part is not available.

(N1) The old part will be available until approximately January 1, 2007.

(S1) New parts must replace old parts as a complete set. Mixing of old and new parts is not permissible.

Cleaning, Inspection and Repair Information

(I) The cleaning, inspection and repair requirements are the same for the old and new part. The applicable engine manuals will be revised.

E. Tooling – and Availability

Tools required:

IAE Tool Number	Qty	Description	Function	Availability
2P16101	1	Airflow Base	List Function	(1) (2)
2P16176	1	Airflow Fixture	List Function	(1) (2)
2P16511	1	Airflow Insert	List Function	(1) (2)
2P16544	1	Airflow Master	List Function	(1) (2)

(1) Indicates that Tool Design Aperture Cards are currently available from IAE.

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

F. Reidentified Parts

Reidentified Parts Data

New PN	Keyword	Old PN
2A3219-003	Case And Vane Assy, Turbine	2A3215-011
2A3219-003	Case And Vane Assy, Turbine	2A3219-002
2A3416-005	Case And Vane Assy, Turbine	2A3215-014
2A3416-005	Case And Vane Assy, Turbine	2A3215-015
2A3416-005	Case And Vane Assy, Turbine	2A3364-005
2A3416-005	Case And Vane Assy, Turbine	2A3416-002
2A3469-004	Case And Vane Assy, Turbine	2A3215-003
2A3469-004	Case And Vane Assy, Turbine	2A3469
2A3469-004	Case And Vane Assy, Turbine	2A3215-012
2A3469-004	Case And Vane Assy, Turbine	2A3215-013
2A3469-004	Case And Vane Assy, Turbine	2A3364-004
2A3469-004	Case And Vane Assy, Turbine	2A3469-002
2A4050	Case And Vane Assy, Turbine	2A3215-004
2A4050	Case And Vane Assy, Turbine	2A3215-005

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New PN	Keyword	Old PN
2A4050	Case And Vane Assy, Turbine	2A3364-001
2A4050	Case And Vane Assy, Turbine	2A3416
2A4050	Case And Vane Assy, Turbine	2A3475
2A1106-01	Ring Segment Assy Of, Air Sealing, 2nd Stage, HPT	2A3431-01
2A3738	Plate, Orifice	2A3734
2A2272-006	Ring Segment and Vane Cluster Assy of, Non - Borescope	2A2272
2A2272-006	Ring Segment and Vane Cluster Assy of, Non - Borescope	2A2272-001
2A2272-006	Ring Segment and Vane Cluster Assy of, Non - Borescope	2A2272-002
2A2272-006	Ring Segment and Vane Cluster Assy of, Non - Borescope	2A2272-003
2A2272-006	Ring Segment and Vane Cluster Assy of, Non - Borescope	2A2272-004
2A2272-006	Ring Segment and Vane Cluster Assy of, Non - Borescope	2A3372
2A2272-006	Ring Segment and Vane Cluster Assy of, Non - Borescope	2A3372-001
2A2272-006	Ring Segment and Vane Cluster Assy of, Non - Borescope	2A3812
2A2272-006	Ring Segment and Vane Cluster Assy of, Non - Borescope	2A5102
2A6102	Ring Segment and Vane Cluster Assy of, Non - Borescope	2A5602
2A2372-006	Ring Segment and Vane Cluster Assy of, Borescope	2A2372
2A2372-006	Ring Segment and Vane Cluster Assy of, Borescope	2A2372-001

New PN	Keyword	Old PN
2A2372-006	Ring Segment and Vane Cluster Assy of, Borescope	2A2372-002
2A2372-006	Ring Segment and Vane Cluster Assy of, Borescope	2A2372-003
2A2372-006	Ring Segment and Vane Cluster Assy of, Borescope	2A2372-004
2A2372-006	Ring Segment and Vane Cluster Assy of, Borescope	2A3472
2A2372-006	Ring Segment and Vane Cluster Assy of, Borescope	2A3472-001
2A2372-006	Ring Segment and Vane Cluster Assy of, Borescope	2A3822
2A2372-006	Ring Segment and Vane Cluster Assy of, Borescope	2A5202
2A4072	Ring Segment and Vane Cluster Assy of, Borescope	2A5502
2A2052-002	Vane Assy of, HPT, 2 Stage	2A2052
2A3572-001	Vane Assy of, HPT, 2 Stage	2A3572
2A3402-001	Vane Assy of, HPT, 2 Stage	2A3402
2A3352-001	Vane Assy of, HPT, 2 Stage	2A3352
2A3832-001	Vane Assy of, HPT, 2 Stage	2A3832
2A2052-002	Vane Assy of, HPT, 2 Stage	2A2052-001
2A2152-002	Vane Assy of, HPT, 2 Stage	2A2152
2A3282-001	Vane Assy of, HPT, 2 Stage	2A3282
2A3302-001	Vane Assy of, HPT, 2 Stage	2A3302
2A3452-001	Vane Assy of, HPT, 2 Stage	2A3452
2A3842-001	Vane Assy of, HPT, 2 Stage	2A3842
2A2152-002	Vane Assy of, HPT, 2 Stage	2A2152-001

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G. Other Material Information Data

Not Applicable.

3. Accomplishment Instructions

A. Recommended sequence of re-operation for parts on hand or in process.

- (1) Service Bulletin V2500-ENG-72-0236, V2500-ENG-72-0237 and V2500-ENG-72-0310 must be incorporated prior to this Service Bulletin.

NOTE: Incorporation of this Service Bulletin completes the intent of Service Bulletin V2500-ENG-72-0236 and V2500-ENG-72-0237. Reference accomplishment instruction 5.B.

R (a) Clean, repair and inspect per Engine Manual 72-45-24-100-002 and/or Standard Practices/Processes Manual (SPP) 70-10-00-100-501.

(b) For parts in service, disassemble Ring Segment and Vane Cluster per Engine Manual and send the Stage 2 HPT Vane Assembly to an approved vendor for repair per VRS3218 task 72-45-24-300-001.

- (2) Reoperate the Vane Assembly.

(a) Machine (1) hole in each Vane Assembly as follows:

- (i) For Non - Borescope Vanes 2A2052, 2A3352, 2A3832 and 2A2052-001 machine (1) hole 0.162-0.168 (4.115-4.267 mm) diameter. See Figure 1 Sheets 1 and 2. Refer to Table 1 on sheet 2.

R Electro discharge method given in SPP task 70-32-03-320-501 may be used. See reference (15), and Engine Manual Chapter/Section 70-32-03, finish by electrochemical or electro discharge metal removal.

- (ii) For Borescope Vanes 2A2152, 2A3452, 2A3842 and 2A2152-001 machine (1) hole 0.162-0.168 (4.115-4.267 mm) diameter. See Figure 1 Sheets 1 and 2. Refer to Table 1 on sheet 2.

R Electro discharge method given in SPP task 70-32-03-320-501 may be used. See reference (15), and Engine Manual Chapter/Section 70-32-03, finish by electrochemical or electro discharge metal removal.

- (iii) For Non - Borescope Vanes 2A3402 and 2A3572 machine (1) hole 0.137-0.143 (3.480-3.632 mm) diameter. See Figure 1 Sheets 1 and 2. Refer to Table 1 on sheet 2.

R Electro discharge method given in SPP task 70-32-03-320-501 may be used. See reference (15), and Engine Manual Chapter/Section 70-32-03, finish by electrochemical or electro discharge metal removal.

- (iv) For Borescope Vanes 2A3302 and 2A3282 machine (1) hole 0.137–0.143 (3.480–3.632 mm) diameter. See Figure 1 Sheets 1 and 2. Refer to Table 1 on sheet 2.

R

Electro discharge method given in SPP task 70-32-03-320-501 may be used. See reference (15), and Engine Manual Chapter/Section 70-32-03, finish by electrochemical or electro discharge metal removal.

- (b) Replace front and rear Inner Diameter Platform honeycombs as shown in Figure 1, Sheet 1. Use the engine manual repair 006 VRS3223 task 72-45-24-300-006 with the dimensions shown in Figure 1.

When replacing rear honeycomb use part number 2A4076. It is acceptable to use 2A0047 until supply is exhausted.

- (c) Flow test passage per note 4 in Figure 1, Sheet 2. Refer to Tooling Availability for tools required.
- (d) Identify the reoperated vane assemblies in accordance with the Reidentified Parts Section of this Service Bulletin.
- (3) Replace Ring Segment part number 2A3431-01 with 2A1106-01 if pre-trenched honeycomb is present.

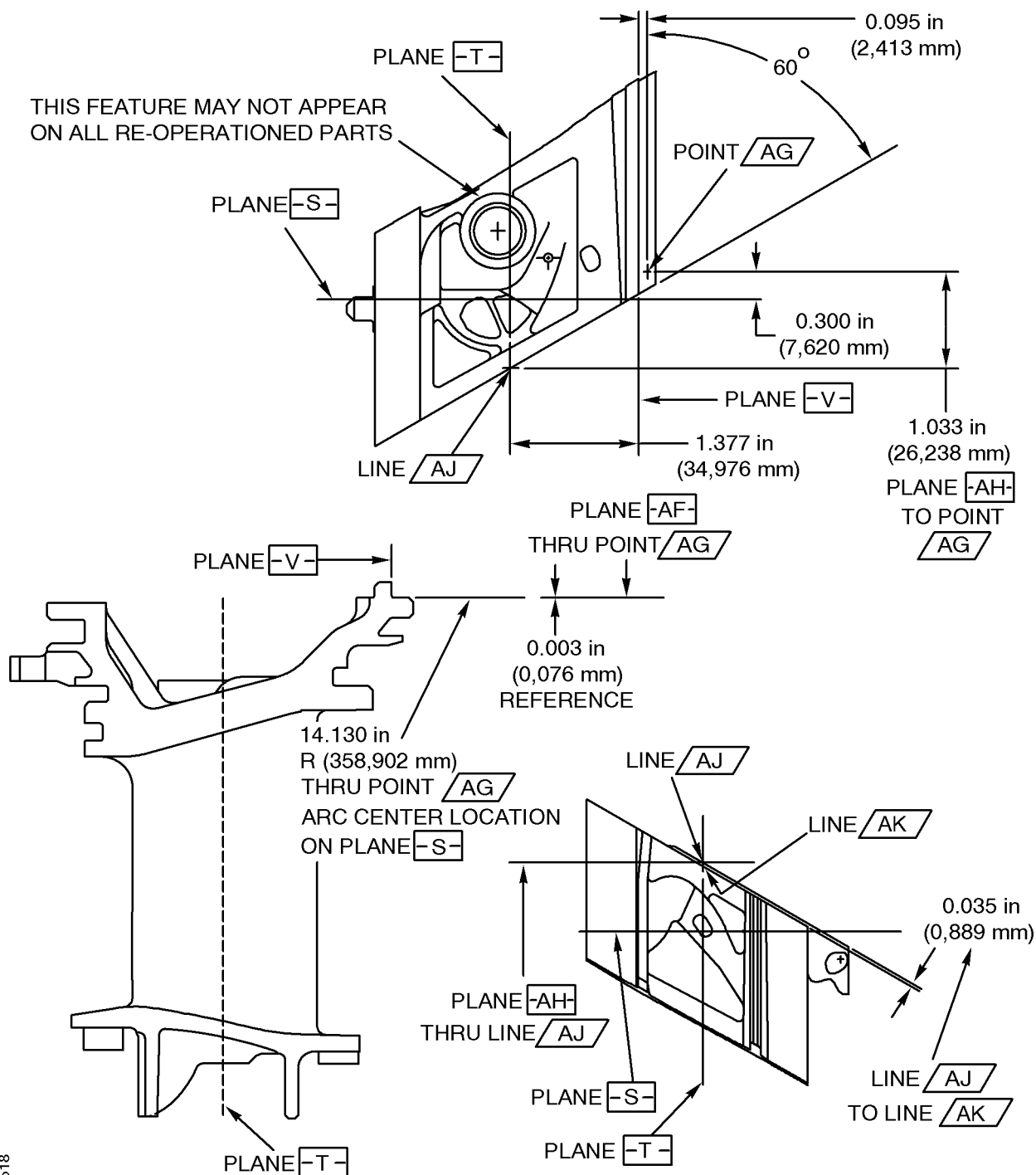
NOTE: Old part number 2A3431-01 may be reoperated by removing pre-trenched honeycomb and replace with non trenched honeycomb per engine manual repair 016 VRS3380 task 72-45-24-300-016.

Identify the reoperated Ring Segment Assembly of, Air Sealing 2nd Stage, HPT part number in accordance with the Reidentified Parts Section of this Service Bulletin. Use the vibration peen method specified in reference (15), chapter/section SPP 70-09-00, marking of parts. See Figure 3 for part marking locations.

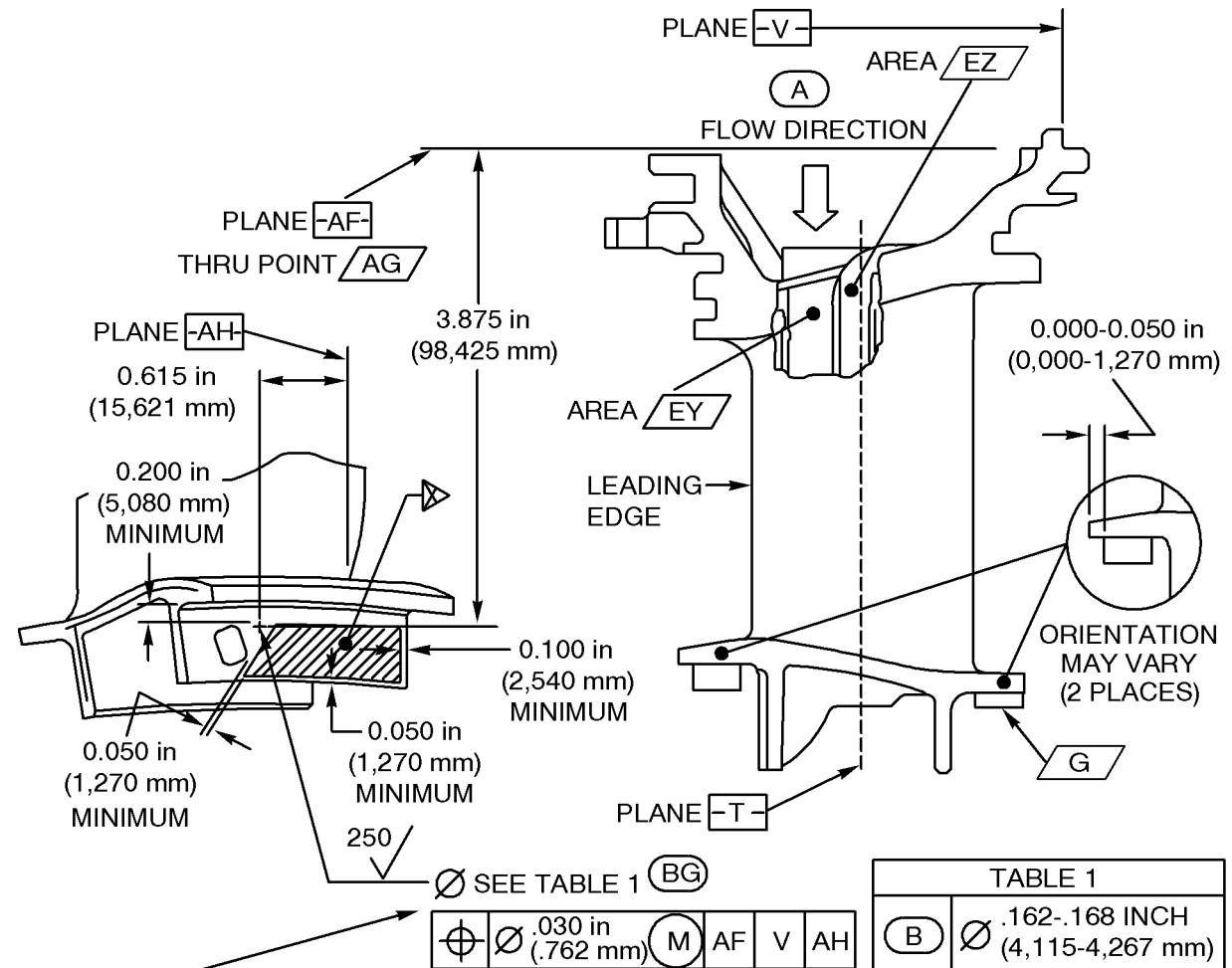
R

- (4) Assemble Ring Segment and Vane Cluster using re-operated Vane Assembly with replaced or re-operated ring segment by the procedure specified in reference (14), Chapter/Section 72-45-24, repair-18 (VRS3391).
- (a) Mix any two of the re-operated Non-Borescope Vane Assemblies 2A2052-002, 2A3352-001, 2A3832-001, 2A3402-001, 2A3572-001 and/or new 2A4272.
- (b) Mix any one of the re-operated Non-Borescope Vane Assemblies 2A2052-002, 2A3352-001, 2A3832-001, 2A3402-001, 2A3572-001 and/or new 2A4272 and any one of the re-operated Borescope Vane Assemblies 2A2152-002, 2A3452-001, 2A3842-001, 2A3302-001, 2A3282-001 and/or new 2A4082.

- R (c) Identify the re-operated Ring Segment and Vane Cluster Assemblies in accordance with the Reidentification Section of this Service Bulletin. Use the vibration peen method specified in reference (15), Chapter/Section SPP 70-09-00, marking of parts. See Figure 3 for part marking locations.
- (5) Assemble Case and Vane Assembly by the procedure specified in reference (14), Chapter/Section 72-45-20-440
- (a) Use re-operated Vane Clusters per Reidentification Section of this Service Bulletin and/or production cluster 2A6102 (Non Borescope) and/or 2A4072 (Borescope).
- (b) Replace the Orifice Plate part no. 2A3734 (4 places) with JAEC part number 2A3738. See figure 2 or re-operate as follows:
- (i) Increase the orifice plate diameter as follows:
- (1) Set-up and machine the orifice plate 2A3734 to open the diameter 0.870-0.880 (22.10-22.35 mm) to 0.955-0.965 (24.26-24.51 mm).
- (ii) Hold concentric to the outside diameter 0.010 (0.254 mm).
- (iii) Break sharp edges 0.003-0.015 (0.08-0.38 mm).
- (iv) Mark the new part number in accordance with the reidentification section of this Service Bulletin adjacent to the existing part number. Use the vibration peen method specified in reference (15), Chapter/Section SPP 70-09-00, marking of parts.
- R (6) Identify the re-operated Case and Vane Assembly in accordance with the reidentification section of this Service Bulletin. Use the vibration peen method specified in reference (15), Chapter/Section SPP 70-09-00, marking of parts. See Figure 3 for part marking locations.
- R (7) Recording Instructions
- (a) A record of accomplishment is required.



SECOND STAGE HPT VANE RE-OPERATION
Figure 1 (Sheet 1 of 2)



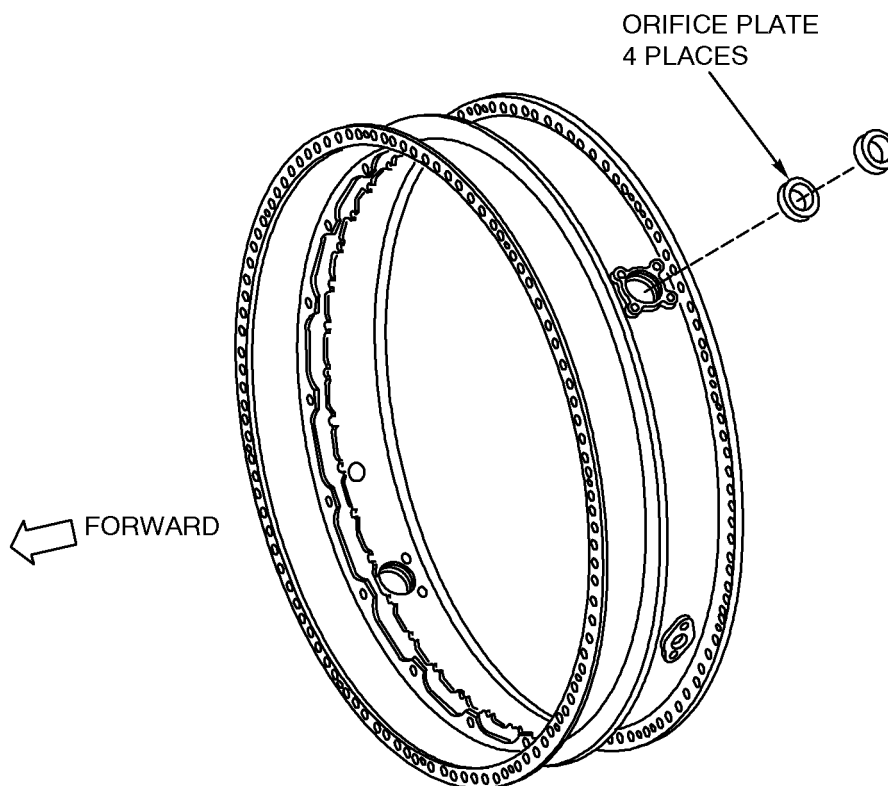
NOTE: THE HOLE MUST BREAK INTO CAVITY /EY/

1. UOS, BREAK EDGES .030 MAXIMUM
2. ▽ MARK IDENT PER MANUAL VIBRATION PEEN (.006 MAXIMUM DEPTH).
3. SURFACE TEXTURE PER IAE 70-35-09, UOS ALL SURFACES $\sqrt{125}$
4. (A) FLOW TEST PASSAGE /EY/ IN DIRECTION SHOWN WITH AREA /EZ/ AND LEADING EDGE AND SHOWER HEAD (4 ROWS TOTAL) HOLES BLOCKED PER IAE 70-72-01 OR SPEC 322 TO OBTAIN AIRFLOW LEVEL OF:

		$\left(\frac{P_3}{P_a} \right)_{\text{MIN}}$	$\left(\frac{P_3}{P_a} \right)_{\text{TARGET REF}}$	$\left(\frac{P_3}{P_a} \right)_{\text{MAX}}$
$\frac{W}{Pa} \sqrt{T_3} = 0.0247$ in (0.627 mm)	BSC LIMIT	1.412 in (35,865 mm)	1.500 in (38,100 mm)	1.621 in (41,173 mm)

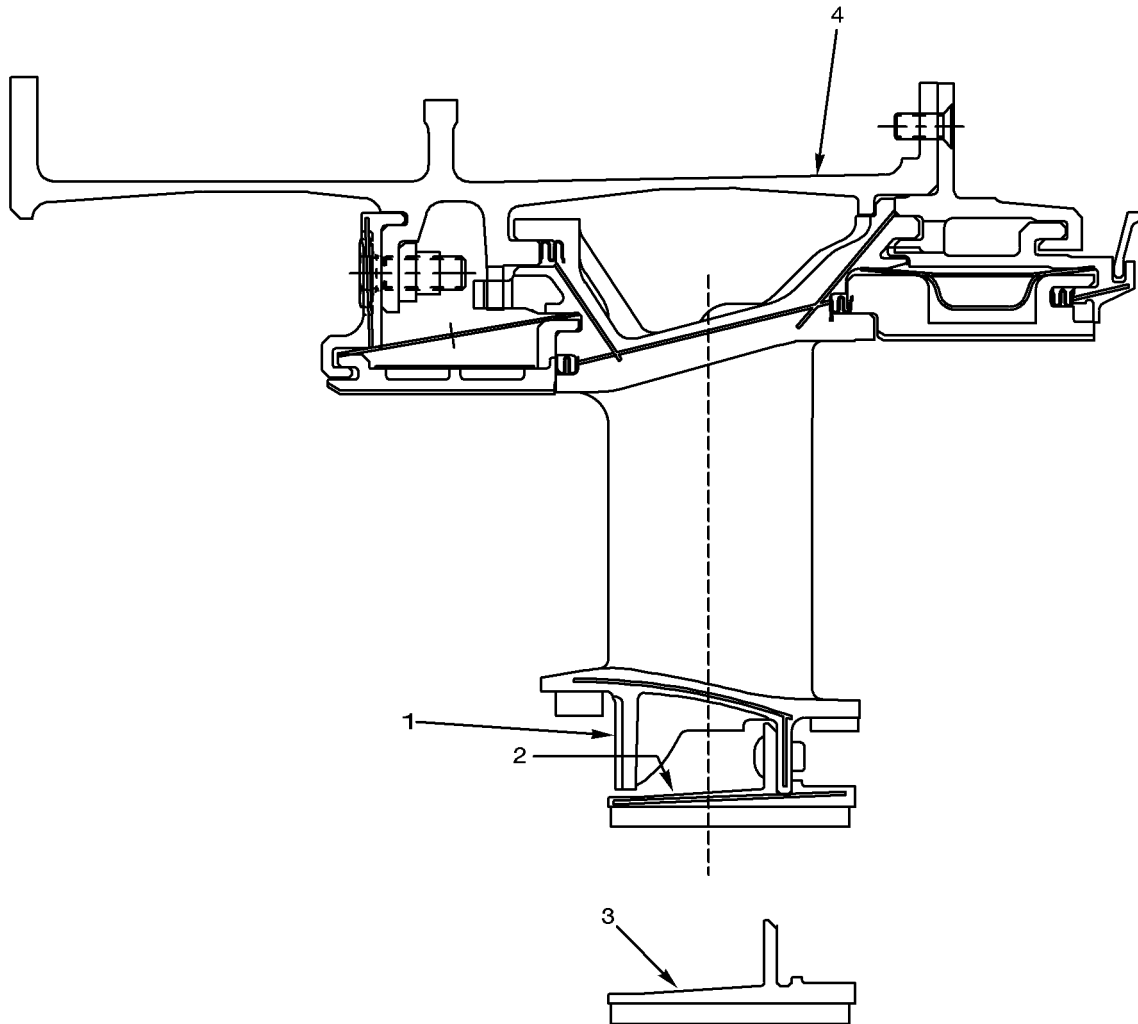
pw0b518519

SECOND STAGE HPT VANE RE-OPERATION
Figure 1 (Sheet 2 of 2)



ORIFICE PLATE LOCATION
Figure 2

pw0b518520

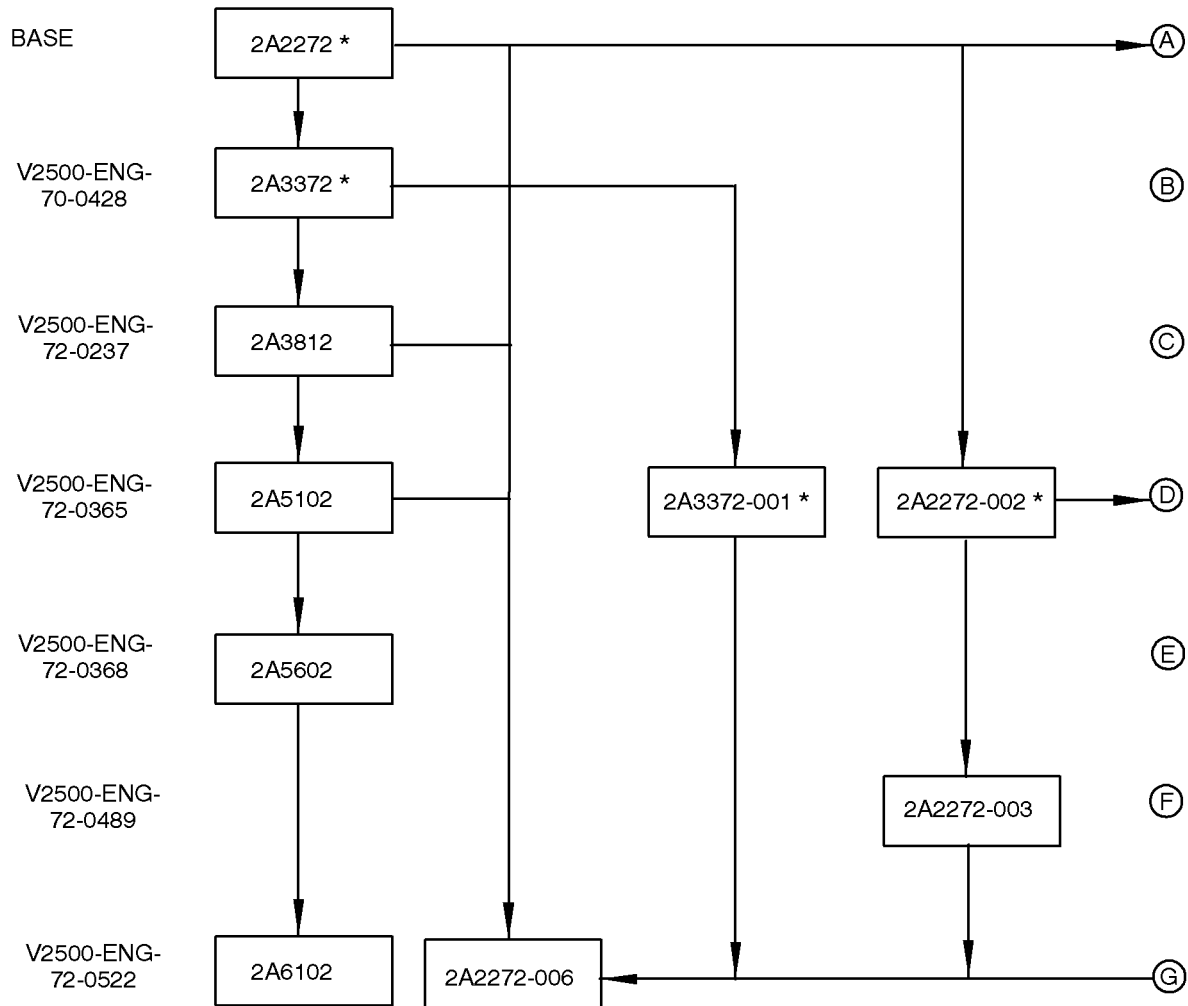


- 1.)  MARK REOPERATED VANE ASSEMBLY
- 2.)  MARK REOPERATED VANE CLUSTER ASSEMBLY
- 3.)  MARK REOPERATED RING ASSEMBLY
- 4.)  MARK REOPERATED CASE AND VANE ASSEMBLY

pw0b518521

PART MARKING LOCATION
Figure 3

APPENDIX 1Parts Progression To Show the Changed Part in Relation to Other Parts



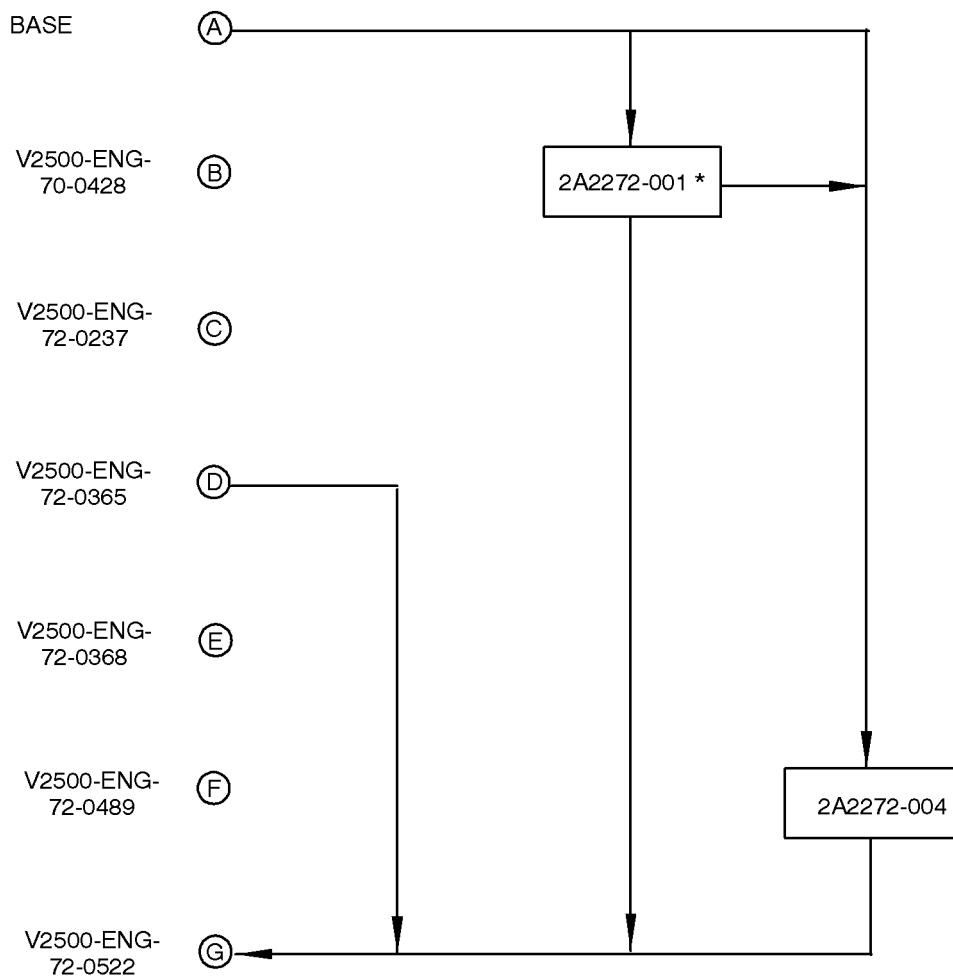
* DO NOT USE IN MODEL V2533-A5

pw0b518522

RING SEGMENT AND VANE CLUSTER ASSEMBLY (NON-BORESCOPE) REF. CATALOG SEQUENCE NO.
72-45-24 FIGURE 02 ITEM 050.
Chart A (Sheet 1 of 2)

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* DO NOT USE IN MODEL V2533-A5

pw0b518523

RING SEGMENT AND VANE CLUSTER ASSEMBLY (NON-BOREScope) REF. CATALOG SEQUENCE NO.
72-45-24 FIGURE 02 ITEM 050.
Chart A (Sheet 2 of 2)

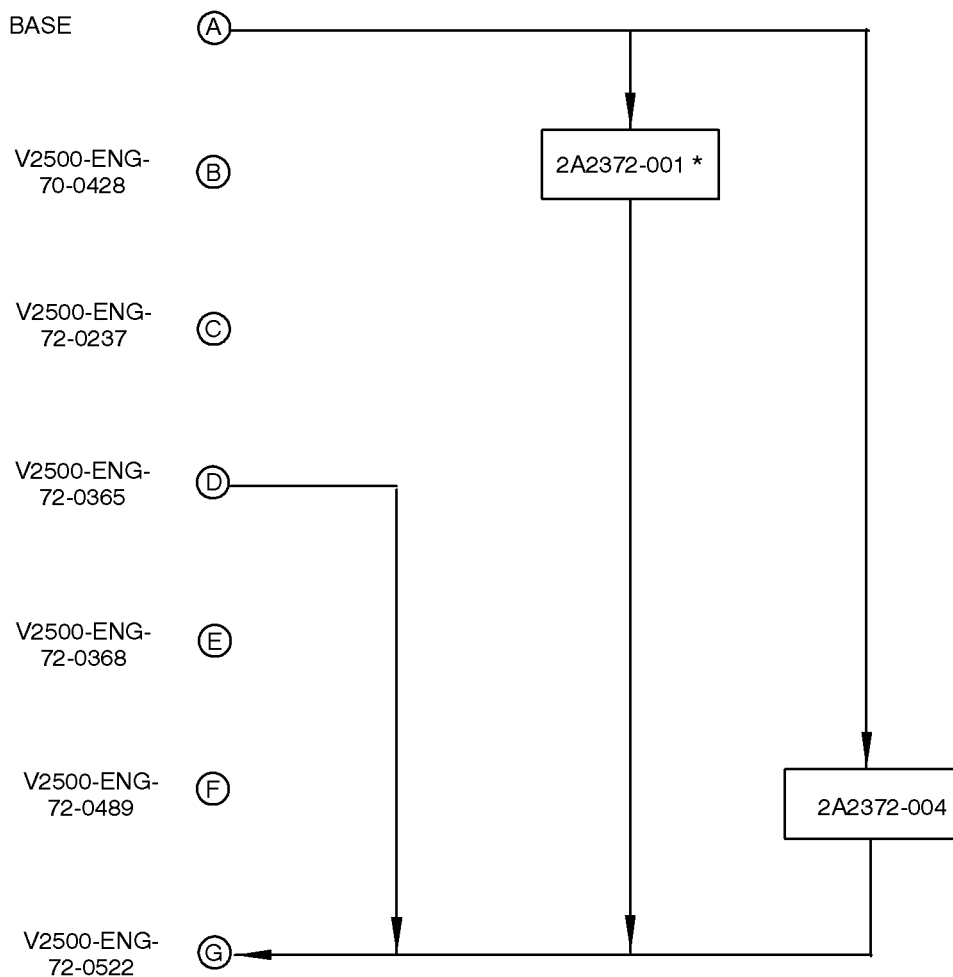
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RING SEGMENT AND VANE CLUSTER ASSEMBLY (BORESCOPE) REF. CATALOG SEQUENCE NO.
72-45-24 FIGURE 02 ITEM 260.
Chart B (Sheet 1 of 2)

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* DO NOT USE IN MODEL V2533-A5

pw0b518525b

RING SEGMENT AND VANE CLUSTER ASSEMBLY (BORESCOPE) REF. CATALOG SEQUENCE NO.
72-45-24 FIGURE 02 ITEM 260.
Chart B (Sheet 2 of 2)

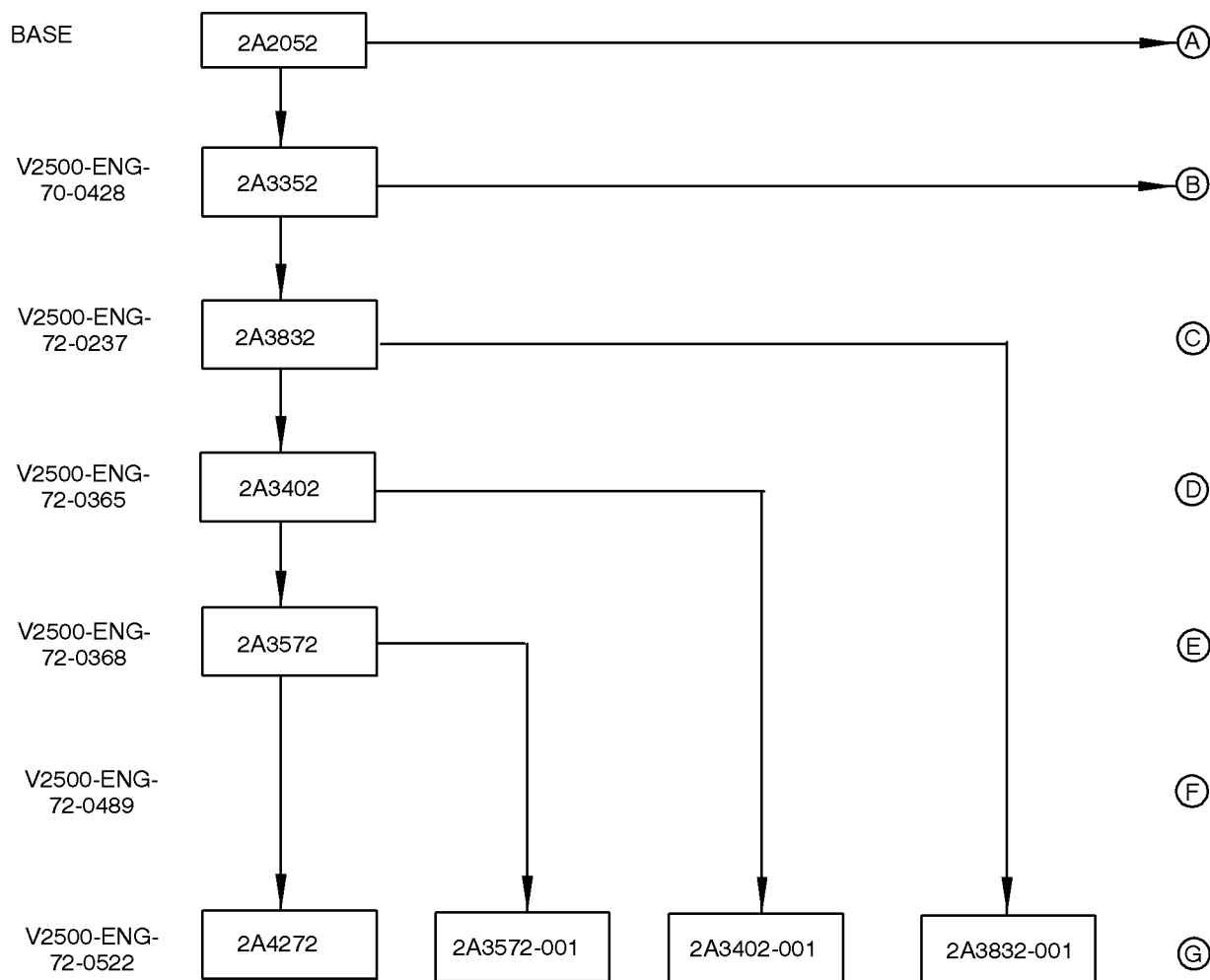
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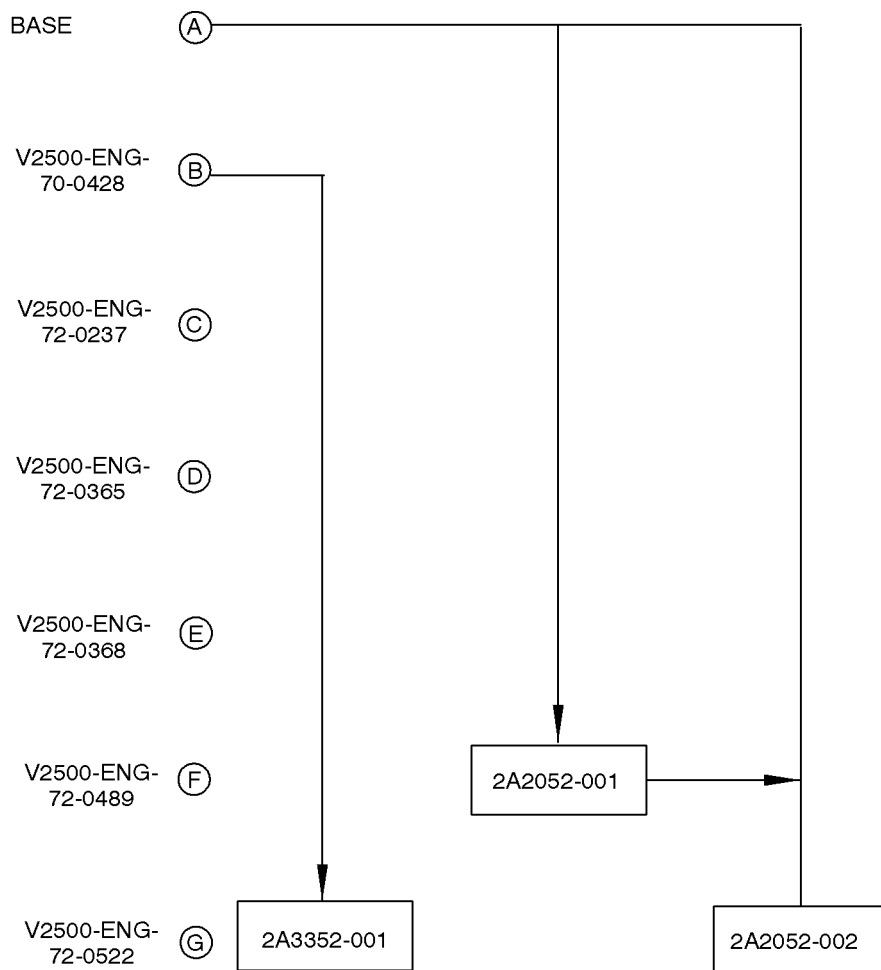
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VANE ASSEMBLY OF, HPT, 2ND STAGE (NON-BOREScope) REF. CATALOG SEQUENCE NO.
72-45-24 FIGURE 02 ITEM 130 and 350.
Chart C (Sheet 1 of 2)



pw0b518527

VANE ASSEMBLY OF, HPT, 2ND STAGE (NON-BORESCOPE) REF. CATALOG SEQUENCE NO.
72-45-24 FIGURE 02 ITEM 130 and 350.
Chart C (Sheet 2 of 2)

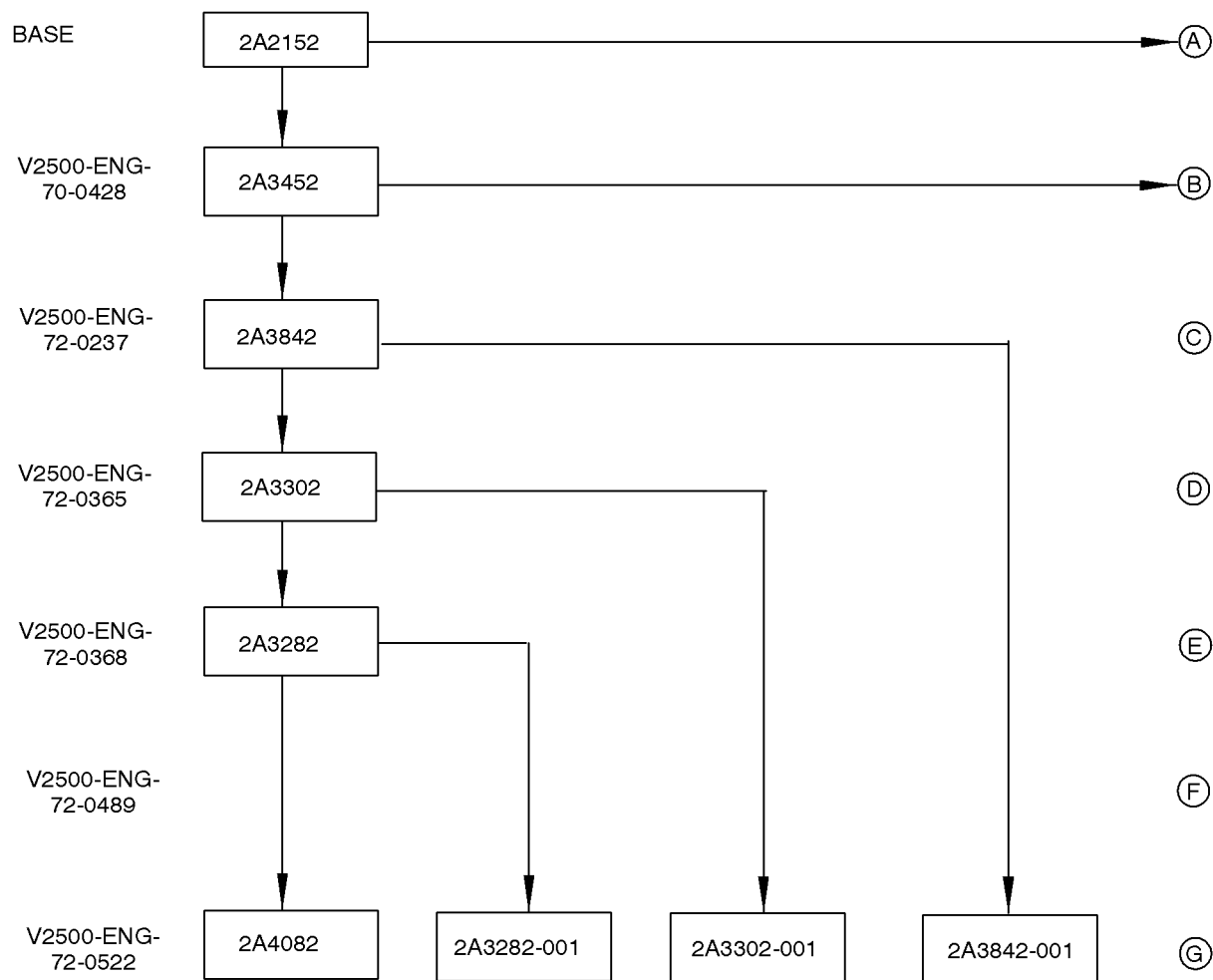
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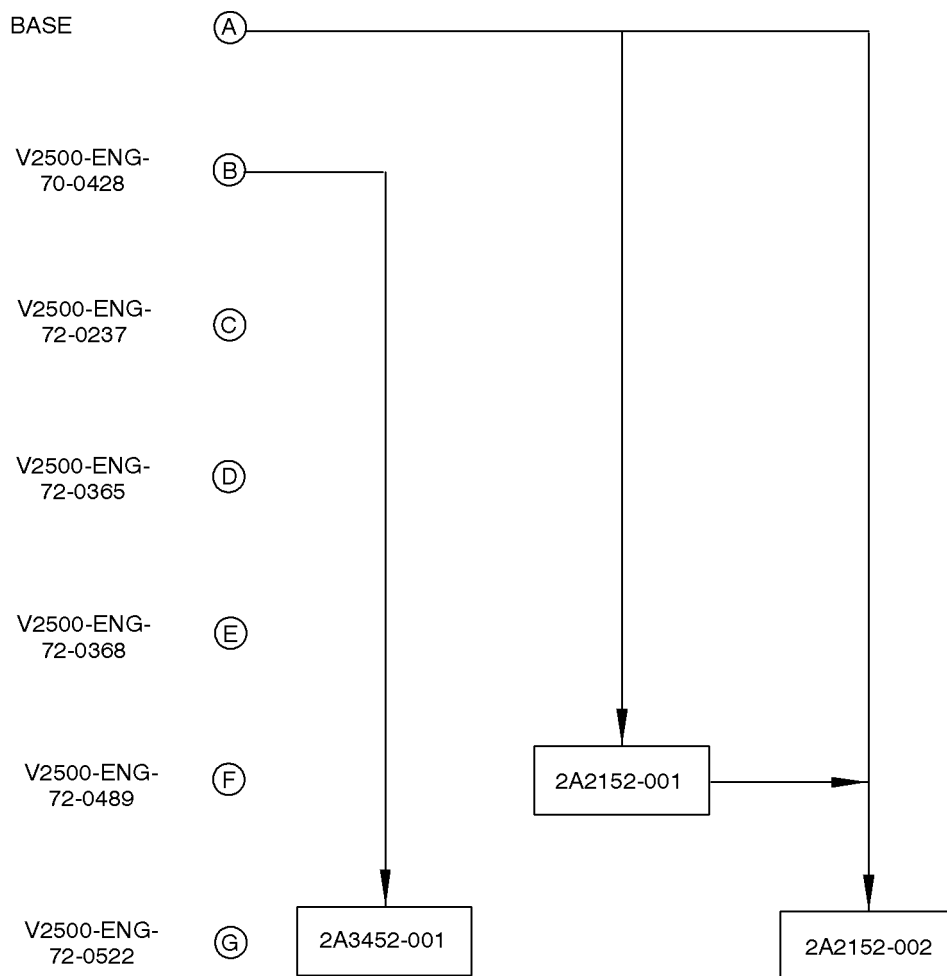
VANE ASSEMBLY OF, HPT, 2ND STAGE (BORESCOPE) REF. CATALOG SEQUENCE NO. 72-45-24
FIGURE 02 ITEM 420.
Chart D (Sheet 1 of 2)

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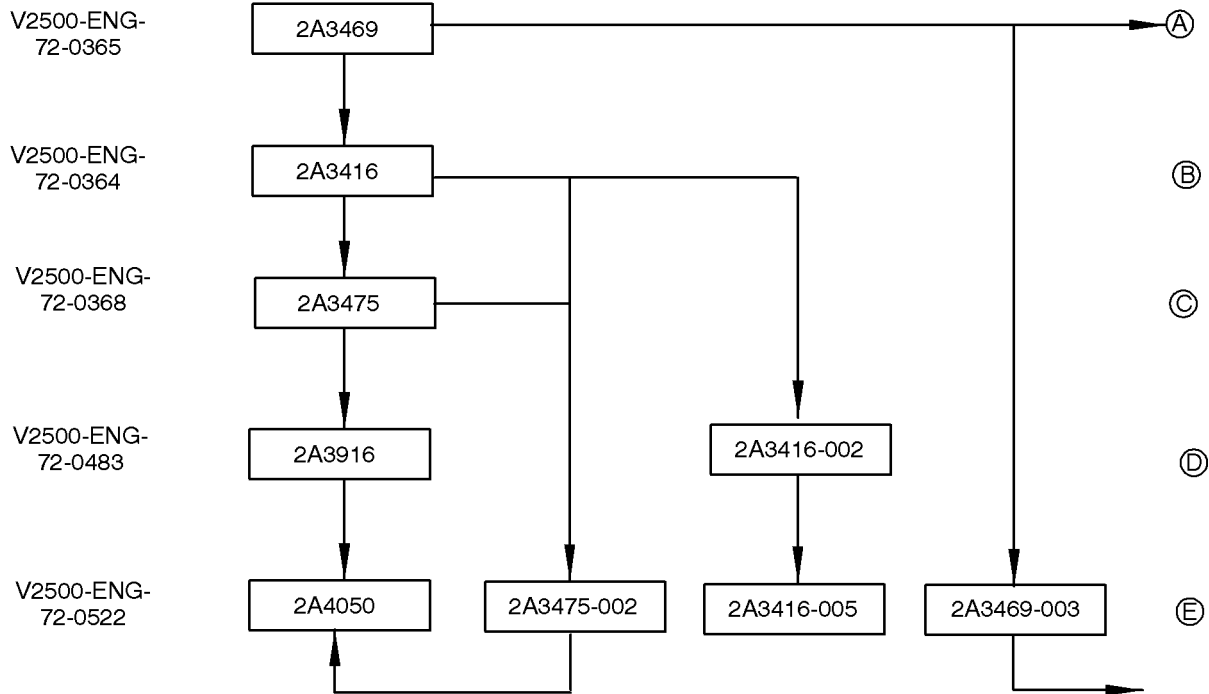
VANE ASSEMBLY OF, HPT, 2ND STAGE (BOREScope) REF. CATALOG SEQUENCE NO. 72-45-24
FIGURE 02 ITEM 420.
Chart D (Sheet 2 of 2)

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MODIFICATION

PART NUMBER CHANGE



pw06518530b

CASE AND VANE ASSEMBLY, TURBINE REF. CATALOG SEQUENCE NO. 72-45-20 FIGURE 01 ITEM 005.

Chart E (Sheet 1 of 5)

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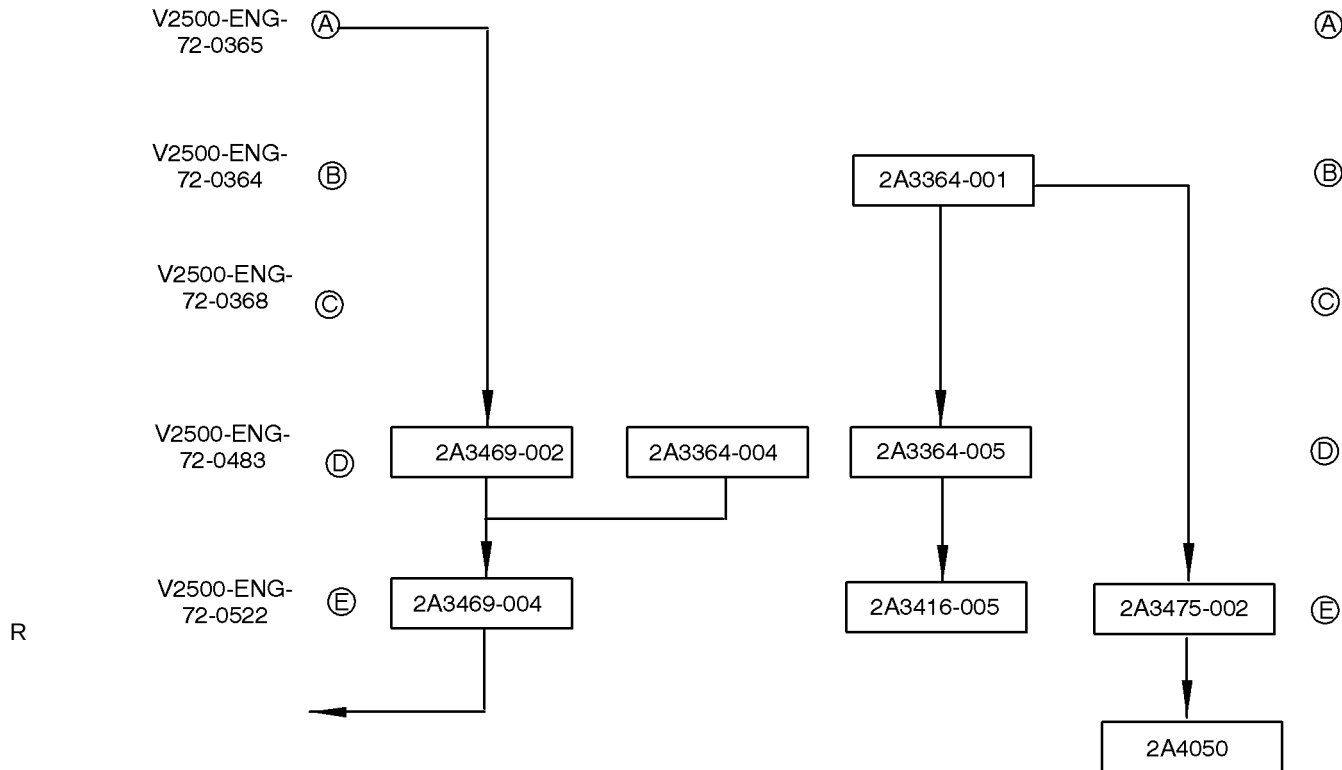
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MODIFICATION

PART NUMBER CHANGE



pw0b518531b

CASE AND VANE ASSEMBLY, TURBINE REF. CATALOG SEQUENCE NO. 72-45-20 FIGURE 01 ITEM 005.

Chart E (Sheet 2 of 5)

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MODIFICATION

PART NUMBER CHANGE

V2500-ENG-
72-0365 (A)

(A)

V2500-ENG-
72-0364 (B)

(B)

V2500-ENG-
72-0368 (C)

(C)

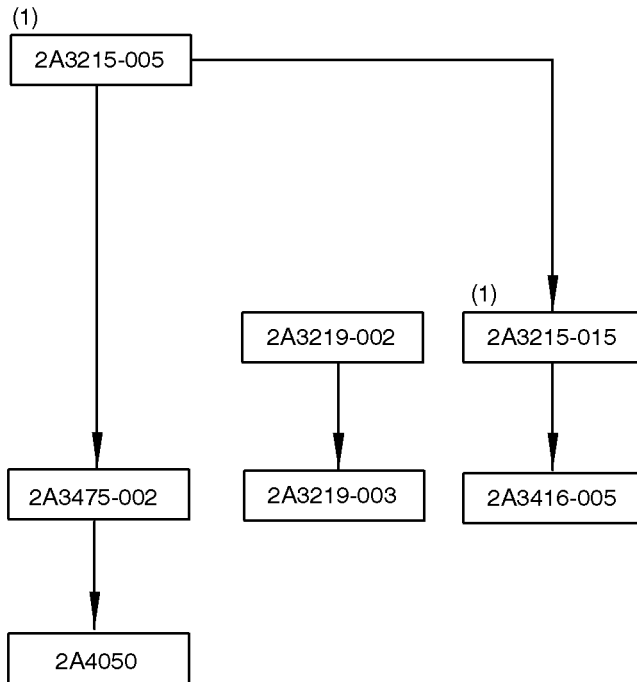
V2500-ENG-
72-0483 (D)

(D)

V2500-ENG-
72-0522 (E)

(E)

R



(1) DO NOT USE IN MODEL V2533-A5 IF CASE AND VANE ASSEMBLY CONTAINS ANY RING SEGMENT AND VANE CLUSTER ASSEMBLY 2A2272, 2A2272-001, 2A2272-002, 2A2372, 2A2372-002, 2A3372, 2A3372-001, 2A3472, OR 2A3472-001.

pw06518532b

CASE AND VANE ASSEMBLY, TURBINE REF. CATALOG SEQUENCE NO. 72-45-20 FIGURE 01 ITEM 005.

Chart E (Sheet 3 of 5)

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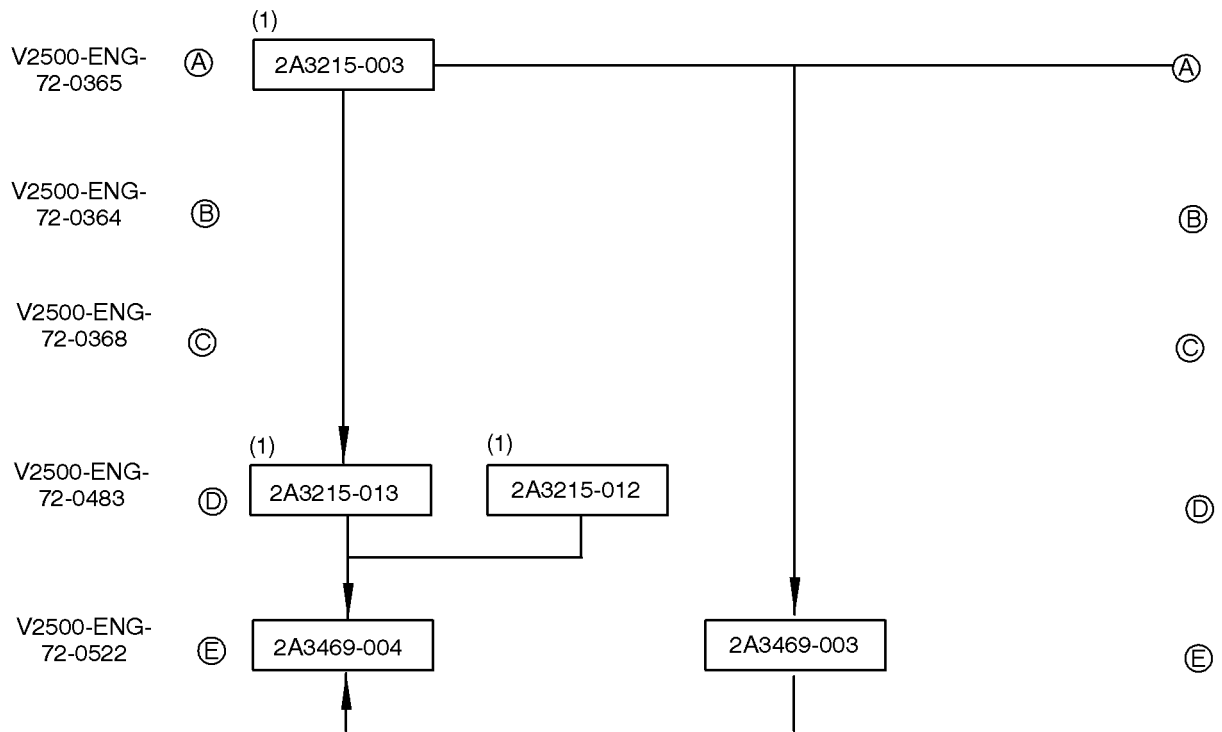
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MODIFICATION

PART NUMBER CHANGE



(1) DO NOT USE IN MODEL V2533-A5 IF CASE AND VANE ASSEMBLY CONTAINS ANY RING SEGMENT AND VANE CLUSTER ASSEMBLY 2A2272, 2A2272-001, 2A2272-002, 2A2372, 2A2372-002, 2A3372, 2A3372-001, 2A3472, OR 2A3472-001.

pw06518533b

CASE AND VANE ASSEMBLY, TURBINE REF. CATALOG SEQUENCE NO. 72-45-20 FIGURE 01 ITEM 005.

Chart E (Sheet 4 of 5)

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MODIFICATION

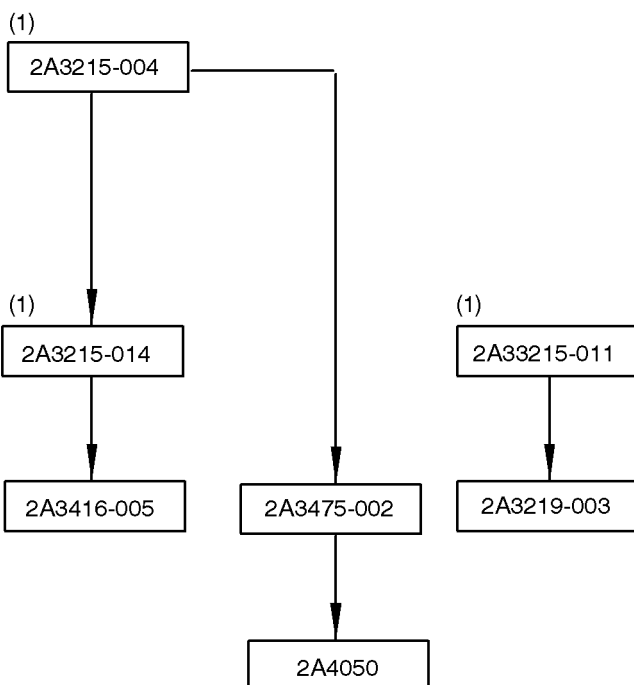
PART NUMBER CHANGE

V2500-ENG-
72-0365 (A)

V2500-ENG-
72-0364 (B)

V2500-ENG-
72-0368 (C)

V2500-ENG-
72-0483 (D)

V2500-ENG-
72-0522 (E)


- (1) DO NOT USE IN MODEL V2533-A5 IF CASE AND VANE ASSEMBLY CONTAINS ANY RING SEGMENT AND VANE CLUSTER ASSEMBLY 2A2272, 2A2272-001, 2A2272-002, 2A2372, 2A2372-002, 2A3372, 2A3372-001, 2A3472, OR 2A3472-001.

pw0b518534b

CASE AND VANE ASSEMBLY, TURBINE REF. CATALOG SEQUENCE NO. 72-45-20 FIGURE 01 ITEM 005.

Chart E (Sheet 5 of 5)

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APPENDIX 2

Added Data

Number values shown in parentheses adjacent to U.S. values are International System of units (SI) equivalents.

To calculate part life, include the hours and/or cycles since the part was made. Use the total hours or cycles to calculate life limits that are the result of part modification, a part used in an engine with different thrust, or for some other reason.

Internal Reference Information

Revision No.	Reference Document	Origination
2	EC 08VA058	BB/TR
3	EC 08VA058 EC 97VK019A	JJP/JDH

R
R

ENGINE – PROVIDE NEW SECOND STAGE VANE WITH INCREASED COOLING AIR

Supplement

V2500 ALL

1. Modification Kit

A. There is no kit provided to do this Service Bulletin.

2. Material Cost

NOTE: The prices shown are for estimating purposes only and as such are given in good faith without commercial liability for advanced planning purposes only. Refer to IAE Spares and/or current Price Catalog for current prices.

A. There is no new material cost to do this Service Bulletin when the part modification procedure is used.

B. There is no kit provided to do this Service Bulletin.

3. New Production Parts

	New Production Part Number	Description	Unit Price US Dollars
	2A4050	Case and Vane Assembly, Turbine	Quote
R	2A3738	Plate, Orifice	218.00
R	2A6102	Ring Segment and Vane Cluster Assy of, Non – Boroscope	21,360.00
R	2A4072	Ring Segment and Vane Cluster Assy of, Borescope	22,040.00
R	2A4076	Ring Segment, Cellular	5.15
R	2A1106-01	Ring Segment Assembly of, Air Sealing, 2 Stage, HPT	1,893.00
R	2A4272	Vane Assembly of, 2 Stage	8,950.00