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V2500-A5/D5 SERIES PROPULSION SYSTEMS SERVICE BULLETIN

Printed in Great Britain

This document transmits the Initial Issue of Service Bulletin EV2500-72-0511 and the Initial Issue of the Supplement

Bulletin Initial Issue

Remove	Incorporate Page 1 and 2 of the Summary Pages 1 to 17 of the Service Bulletin	Reason for change Initial Issue Initial Issue
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Supplement Initial Issue

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V2500-ENG-72-0511

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LIST OF EFFECTIVE PAGES

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ENGINE – NEW 1ST STAGE ROTOR ASSEMBLY WITH METERING PLUGS REMOVED AND NEW 1ST STAGE
HPT SEAL

SUMMARY

1. PLANNING

A. EFFECTIVITY

Engine V2500-A5 Serial Numbers V10001 thru V12530 and V12532, V12534, V12536, V12538, V12540, V12542, V12544, V12546 and V12548.

Engine V2500-D5 Serial Numbers V20001 thru V20285.

B. CONCURRENT REQUIREMENTS

This Service Bulletin must be done at the same time or after Reference (1), Service Bulletin No. V2500-ENG-72-0190.

DO NOT USE METERING PLUGS IN THIS ASSEMBLY.

C. REASON/PROBLEM

Condition:

Debris may enter the No. 4 Rear Carbon Seal, which may cause damage. A debris discourager on the HPT 1st Stage Inner Air Seal and eliminating 1st Hub Metering Plugs help prevent debris entering the No. 4 Rear Carbon Seal area.

Background:

Debris in the past has entered the No. 4 Rear Carbon Seal area and caused damage.

Objective:

Redesign the A5/D5 1st Stage Inner Air Seal by adding debris discouragers and resize the seal holes to provide metering. This eliminates the 1st Hub Metering Plugs. Create a new 1st Rotor Assembly, revised table of limits and revised upper level assemblies.

Substantiation:

V2500 A5/D5 three dimensional analytical modeling and analytical flow modeling. Analysis was completed on the 33K thrust rating, which is the highest rating and covers all A5 and D5 thrust ratings. Maintained HPT efficiency, flow capacity, weight, and certified lives.

D. DESCRIPTION

Remove all Metering Plugs; add new Seal with Debris Discourager and resize Seal holes to provide metering.

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SUMMARY V2500-ENG-72-0511

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E. COMPLIANCE**Category 7**

Accomplish when supply of superseded parts has been depleted.

F. MANPOWER**(1) In Service**

Not Applicable.

(2) At Overhaul

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

(a) Remove HPT Seal

30 minutes.

(b) Remove Damper

1 minute.

(c) Remove Metering Plugs (24 off)

5 minutes.

(d) Install replacement Damper

1 minute.

(e) Re-identify HPT Rotor

5 minutes.

(f) Correct static unbalance

30 minutes.

Total – 1 hour 12 minutes.

2. 2. MATERIAL INFORMATION**Part Prices**

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

ENGINE – NEW 1ST STAGE ROTOR ASSEMBLY WITH METERING PLUGS REMOVED AND NEW 1ST STAGE
HPT SEAL

1. Planning Information

A. Effectivity Data (For Airbus A319)

(1) For Airbus A319

Engine Models Applicable

V2522-A5, V2524-A5, V2527M-A5

Engine Serial No. V10001 thru V12530.

Engine Serial No. V12532, V12534, V12536, V12538, V12540, V12542, V12544,
V12546, V12548.

(2) For Airbus A320

Engine Models Applicable.

V2527-A5, V2527E-A5

Engine Serial No. V10001 thru V12530.

Engine Serial No. V12532, V12534, V12536, V12538, V12540, V12542, V12544,
V12546, V12548.

(3) For Airbus A321

Engine Models Applicable

V2530-A5, V2533-A5

Engine Serial No. V10001 thru V12530.

Engine Serial No. V12532, V12534, V12536, V12538, V12540, V12542, V12544,
V12546, V12548.

(4) For Boeing MD-90

Engine Models Applicable

V2525-D5, V2528-D5

Engine Serial No. V20001 thru V20285.

B. Concurrent Requirements

This Service Bulletin must be done at the same time or after Reference (1), Service Bulletin No. V2500-ENG-72-0190.

DO NOT USE METERING PLUGS IN THIS ASSEMBLY.

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

Debris may enter the No. 4 Rear Carbon Seal, which may cause damage. A debris discourager on the HPT 1st Stage Inner Air Seal and eliminating 1st Hub Metering Plugs help prevent debris entering the No. 4 Rear Carbon Seal area.

(2) Background:

Debris in the past has entered the No. 4 Rear Carbon Seal area and caused damage.

(3) Objective:

Redesign the A5/D5 1st Stage Inner Air Seal by adding debris discouragers and resize the seal holes to provide metering. This eliminates the 1st Hub Metering Plugs. Create a new 1st Rotor Assembly, revised table of limits and revised upper level assemblies.

(4) Substantiation:

V2500 A5/D5 three dimensional analytical modeling and analytical flow modeling. Analysis was completed on the 33K thrust rating, which is the highest rating and covers all A5 and D5 thrust ratings. Maintained HPT efficiency, flow capacity, weight, and certified lives.

(5) Effects of Bulletin on:**(a) Removal/Installation:**

Not affected.

(b) Disassembly/Assembly:

Not affected.

(c) Cleaning:

Not affected.

(d) Inspection/Check:

See Table of Limits.

(e) Repair:

Not affected.

(f) Testing:

Not affected.

(6) Supplemental Information

None.

D. Description

Remove all Metering Plugs; add new Seal with Debris Discourager and resize Seal holes to provide metering.

E. Compliance

Category 7

Accomplish when supply of superseded parts has been depleted.

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**

Not Applicable.

(2) At Overhaul

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

(a) Remove HPT Seal

30 minutes.

(b) Remove Damper

1 minute.

(c) Remove Metering Plugs (24 off)

5 minutes.

(d) Install replacement Damper

1 minute.

(e) Re-identify HPT Rotor

5 minutes.

(f) Correct static unbalance

30 minutes.

Total – 1 hour 12 minutes.

H. Material – Price and Availability

Modification kit is not required.

For Price and availability of spares refer to the supplement of this service bulletin.

I. Tooling – Price and Availability

Special tools are not required to accomplish this Service Bulletin.

J. Industry Support Program

Not Applicable.

K. Weight and Balance**(1) Weight Change**

None.

(2) Moment Arm

No Effect.

(3) Datum

Engine Front Mount Centerline (Power Plant Station (PPS) 100).

L. Electrical Load Data

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

M. Software Accomplishment Summary

Not Applicable.

N. References

- (1) IAE V2500 Service Bulletin V2500-ENG-72-0190 (Engine - HP Turbine Rotor and Stator Assembly - Introduce a new Stage 1 HPT Air Seal and a new No. 4 Bearing Rear Cooling Duct Assembly).
- (2) IAE V2500 Service Bulletin V2500-ENG-72-0451 (Engine - High Pressure Turbine First Stage Disk Metering Plug Redesign).
- (3) IAE V2500 Service Bulletin V2500-ENG-72-0475 (Engine - HP Turbine Rotor Assembly - Introduce new First Blades and Stage 1 HPT Cooling Duct Assembly with decreased flow).
- (4) V2500 Engine Illustrated Parts Catalogs (S-V2500-2IA, S-V2500-2IB, S-V2500-3IA, S-V2500-3IB, S-V2500-5IA, S-V2500-5IB, S-V2500-6IA, S-V2500-6IB, S-V2500-7IA and S-V2500-7IB), Chapter/Section 72-45-00.
- (5) V2500 Engine Manual (E-V2500-1IA or E-V2500-3IA), Chapter/Section 72-45-00.
- (6) V2500 Standard Practices/Processes Manual (E-V2500-1IA or E-V2500-3IA), Chapter/Section 70-09-00.
- (7) Internal Reference No. - 03VA020, 03VA020B.
- (8) ATA Locator - 72-40-00.

O. Other Publications Affected

- (1) V2500 Engine Illustrated Parts Catalogs (S-V2500-2IA, S-V2500-2IB, S-V2500-3IA, S-V2500-3IB, S-V2500-5IA, S-V2500-5IB, S-V2500-6IA, S-V2500-6IB, S-V2500-7IA and S-V2500-7IB), Chapter/Section 72-45-10, 72-45-11, and 72-45-13, to add the new parts.
- (2) V2500 Engine Manuals (E-V2500-1IA and E-V2500-3IA), Chapter/Section 72-45-00 Cleaning, Inspection and Repair, to add the new part.

P. Interchangeability of Parts

This Service Bulletin must be done at the same time or after Reference 1., Service Bulletin No. V2500-ENG-72-0190.

The 1st Hub Metering Plugs (24 off) 2A3847, 2A3182, and entry in service plug 2A2354 must be removed when installing a redesigned ID Tobi Seal 2A3923 with 18 holes to meter air.

Incorporate into the field when ID Tobi Seal life is exhausted or when ID Tobi Seal is being replaced.

Q. Information in the Appendix

Alternate Accomplishment Instructions (No)

Progression Charts (Yes)

Added Data (No)

Revision to Table of Limits (Yes)

Inspection Procedures (No)

2. Material Information

A. The material data that follows is for each engine.

FIG ITEM NUMBER	NEW PART NUMBER	QTY	PART TITLE	MAT	OLD PN	INSTR DISP
--------------------	--------------------	-----	------------	-----	--------	------------

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

72-45-10

01-010	2A9421	1	Rotor Assembly, 1st Stage OR	-	2A9621	(2) (I)
01-010	2A9031-011	1	Rotor Assembly, 1st Stage OR	-	2A9031-010	(1) (I)
01-010	2A9521-004	1	Rotor Assembly, 1st Stage OR	-	2A9521	(1) (I)
01-010	2A9521-005	1	Rotor Assembly, 1st Stage OR	-	2A9521-001	(1) (I)
01-010	2A9521-006	1	Rotor Assembly, 1st Stage OR	-	2A9521-002	(1) (I)
01-010	2A9621-003	1	Rotor Assembly, 1st Stage OR	-	2A9621	(1) (I)
01-010	2A9621-004	1	Rotor Assembly, 1st Stage OR	-	2A9621-001	(1) (I)
01-010	2A9621-005	1	Rotor Assembly, 1st Stage	-	2A9621-002	(1) (I)

FIG ITEM NUMBER	NEW PART NUMBER	QTY	PART TITLE	MAT	OLD PN	INSTR DISP
--------------------	--------------------	-----	------------	-----	--------	------------

For V2533-A5 Engines:

72-45-10

01-010	2A9421	1	Rotor Assembly, 1st Stage OR	-	2A9621	(2) (I)
01-010	2A9031-011	1	Rotor Assembly, 1st Stage OR	-	2A9031-010	(1) (I)
01-010	2A9521-004	1	Rotor Assembly, 1st Stage OR	-	2A9521	(1) (I)
01-010	2A9621-003	1	Rotor Assembly, 1st Stage OR	-	2A9621	(1) (I)
01-010	2A9621-004	1	Rotor Assembly, 1st Stage	-	2A9621-001	(1) (I)

FIG ITEM NUMBER	NEW PART NUMBER	QTY	PART TITLE	MAT	OLD PN	INSTR DISP
--------------------	--------------------	-----	------------	-----	--------	------------

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

72-45-11

01-040		24	.Plug, Metering, HPT, Hub, 1Stg. OR	-	2A3847	(3) (4)
01-040		24	.Plug, Metering, HPT, Hub, 1Stg.	-	2A3182	(3) (4)

FIG-ITEM NUMBER	NEW PART NUMBER	QTY	PART TITLE	MAT	OLD PN	INSTR-DISP
--------------------	--------------------	-----	------------	-----	--------	------------

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

72-45-13

01-020	2A3923	1	.Seal, Air, HPT, 1Stg	-	2A3424	(2) (5) (6) (I)
--------	--------	---	--------------------------	---	--------	--------------------

B. Reidentified Parts

New PN	Keyword	Old PN
2A9031-011	Turbine Rotor Assembly	2A9031-010
2A9521-004	Turbine Rotor Assembly	2A9521
2A9521-005	Turbine Rotor Assembly	2A9521-001
2A9521-006	Turbine Rotor Assembly	2A9521-002
2A9621-003	Turbine Rotor Assembly	2A9621
2A9621-004	Turbine Rotor Assembly	2A9621-001
2A9621-005	Turbine Rotor Assembly	2A9621-002

C. 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.
- (2) The new part is a replacement part only and cannot be obtained by modification of the old part.
- (3) The old part is not used in this configuration.
- (4) The old part will continue to be supplied.
- (5) The old part will no longer be supplied.
- (6) The new part will be available approximately 30 November 2006.

Spare Parts Availability

Cleaning, Inspection and Repair Information

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

D. Other Material Information Data

Not Applicable.

3. Accomplishment Instructions

- (1) Reoperate and reidentify the 1st Stage Rotor Assembly by removing 24 Metering Plugs (P/N 2A3847) and installing a new 1st Stage HPT Seal (P/N 2A3923).

(a) RECOMMENDED SEQUENCE OF REOPERATION

NOTE: Check the number 4 Bearing Rear Cooling Duct Assembly to insure the intent of V2500-ENG-72-0190 Service Bulletin is incorporated. If debris discourager and lip require removal, reoperate and reidentify per V2500-ENG-0190. See Fig.1.

(i) Remove HPT Seal (P/N 2A3424). See Fig. 2.

(ii) Remove Damper (P/N 2A0491). See Fig. 2.

(iii) Remove 24 Metering Plugs (P/N 2A3182 or 2A3847) and scrap. See Fig. 2.

(1) Remove any fit clearances relative to the plug that are found in the engine manual.

(iv) Clean and Inspect Damper (P/N 2A0491) per the Engine Manual Task 72-45-13-100-001 and 72-45-13-100-002. See Fig. 2.

CAUTION: SERVICE BULLETIN V2500-ENG-72-0190 MUST BE INCORPORATED. DO NOT USE 1ST ROTOR METERING PLUGS IN THIS ASSEMBLY.

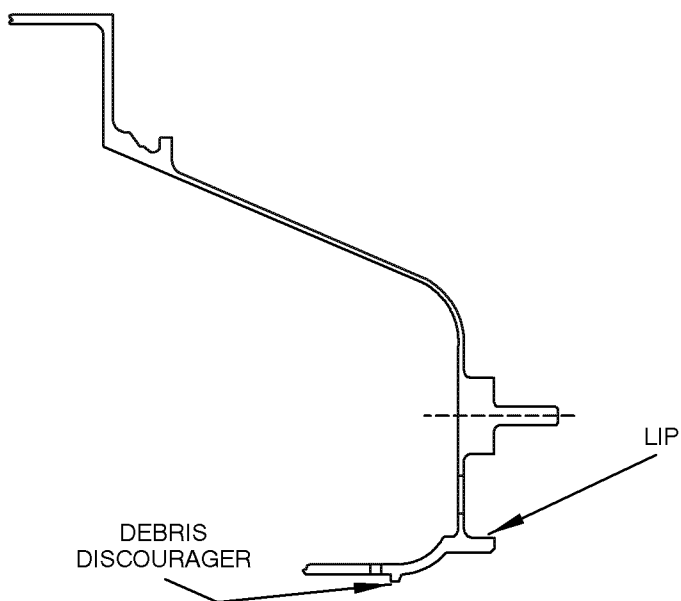
(v) Install a servicable or new Damper (P/N 2A0491) on the new Seal (P/N 2A3923). Install the Seal with Damper on the 1st Stage Rotor. See Fig. 2. Insure HPT Seal is fully engaged.

(vi) Identify the reworked Turbine Rotor using (Electrolytic Etch Deep .002 IN. (0.05 mm) assembly per the Reidentified Parts section of this Service Bulletin. See the Standard Practices/Processes Manual Task 70-09-00-400-50, Subtask 70-09-00-400-001 Procedure 3H-1B.

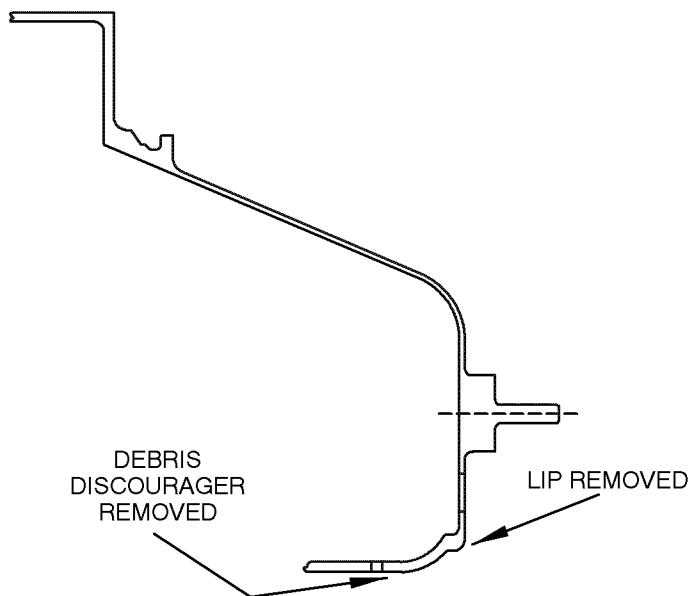
(b) Correct any unbalance condition of the Rotor Assembly per the Engine Manual.

(2) Recording Instructions

(a) A record of accomplishment is required.



NUMBER 4 BEARING COOLING DUCT ASSEMBLY
PRIOR TO INCORPORATION OF V2500-72-0190



NUMBER 4 BEARING COOLING DUCT ASSEMBLY
AFTER INCORPORATION OF V2500-72-0190

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NUMBER 4 BEARING COOLING DUCT ASSEMBLY PRIOR TO AND AFTER SERVICE BULLETIN
V2500-ENG-72-0190

Figure 1

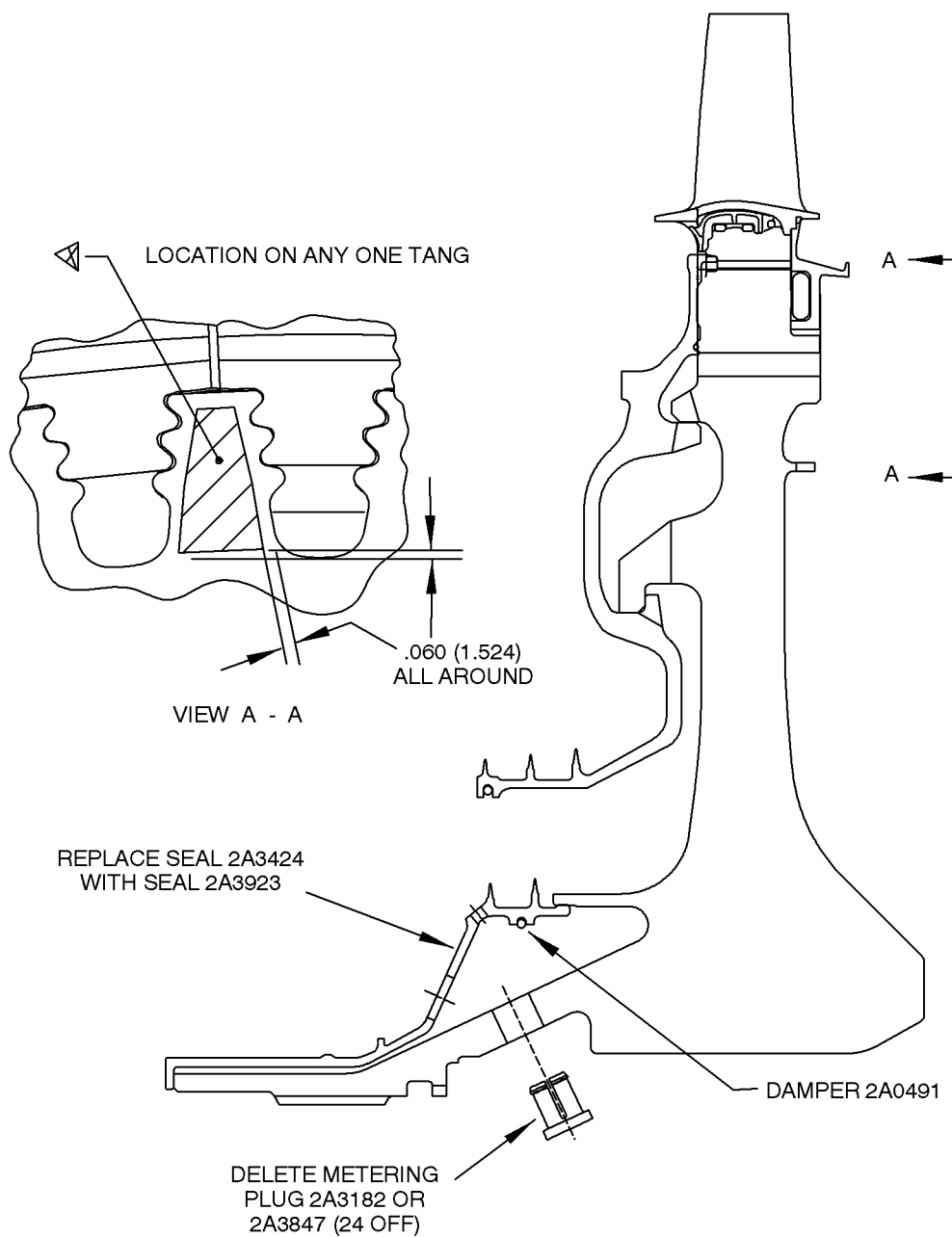
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INSTALLATION OF DAMPER AND SEAL ON 1ST STAGE TURBINE ROTOR ASSEMBLY
Figure 2

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APPENDIXParts Progression To Show the Changed Part in Relation to Other Parts

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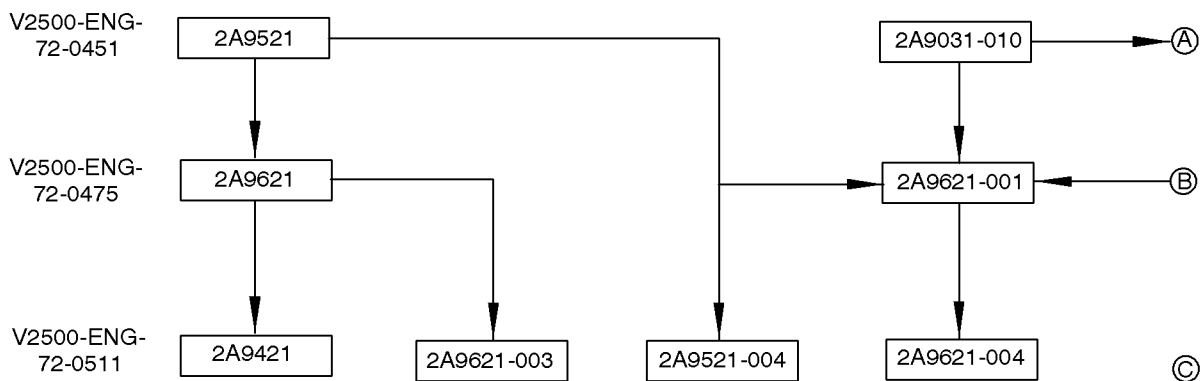
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MODIFICATION

PART NUMBER CHANGE



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FAMILY TREE – TURBINE ROTOR 1ST STAGE ASSEMBLY OF REF. CATALOG SEQUENCE NO. 72-45-10
 FIGURE 01 ITEM 10
 CHART A (Sheet 1 of 2)

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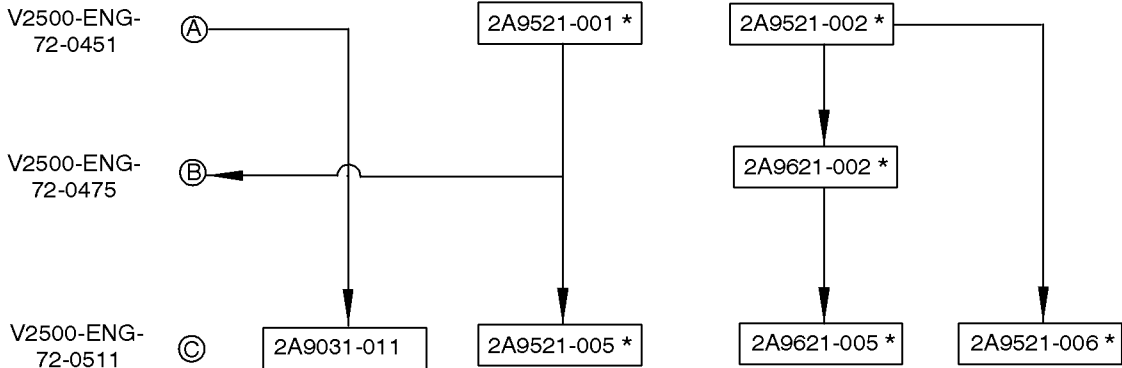
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MODIFICATION

PART NUMBER CHANGE



* DO NOT USE IN MODEL V2533-A5

pw0b515839

FAMILY TREE – TURBINE ROTOR 1ST STAGE ASSEMBLY OF REF. CATALOG SEQUENCE NO. 72-45-10
 FIGURE 01 ITEM 010
 CHART A (Sheet 2 of 2)

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APPENDIX

Revision to Table of Limits

Engine Manual(s), Chapter/Section 72-00-45 and 72-45-11 Revision 67., dated 1 February 2007 is scheduled to incorporate the Part Service Life Limits related to this Service Bulletin and will take precedence over the Service Bulletin.

Revision to Table of Limits fits are as follows:

CL	REF	AFFECTED PARTS	DIMENSIONS (REFERENCE)		LIMITS	
			MIN	MAX	MIN	MAX
Y	1517	DELETED METERING PLUG HUB TURBINE 1 STG DIMENSIONS DELETED				
	2261	SEAL - AIR, HPT, 1 STG	9.031 (229.387)	9.037 (229.540)		
		DUCT - CLG, HPT, 1 STG, ASSY OF	9.055 (231.001)	9.065 (230.25)	.018 (0.457)	.034 (0.864)
	2262	SEAL - AIR, HPT, 1 STG	9.131 (231.927)	9.137 (232.080)		
		DUCT - CLG, HPT, 1 STG, ASSY OF	9.155 (232.54)	9.165 (232.79)	.018 (0.457)	.034 (0.864)

Engine Manual(s), Chapter/Section 05-10-01, Revision 39., dated 1 February 2007 is scheduled to incorporate the Part Service Life Limits related to this Service Bulletin and will take precedence over the Service Bulletin.

Revision to Table of Limits life cycles is as follows:

CL	REF	AFFECTED PARTS	PART # / CL	MODEL	REPLACE IF EITHER LIMIT EXCEED CYCLE MAX HRS MAX
W	1604	SEAL - AIR, HPT, 1 STG	2A3923	V2500-A5/D5	20,000

ENGINE – NEW 1ST STAGE ROTOR ASSEMBLY WITH METERING PLUGS REMOVED AND NEW 1ST STAGE
HPT SEALSupplement

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
2A3923	.Seal,Air, HPT, 1Stg	29,590.00

