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DATE ~~R~~ Oct.15/03**V2500-A5/D5 SERIES PROPULSION SYSTEMS SERVICE BULLETIN**

Printed in Great Britain

This document transmits Revision 1 to Service Bulletin EV2500-72-0451 and
 Revision 1 to the Supplement

Document History

Service Bulletin Revision Status
 Initial Issue Sep.1/03

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 Initial Issue Sep.1/03

Bulletin Revision 1

Remove	Incorporate	Reason for change
All pages of the	Pages 1 to 13 of the	To revise Effectivity
Service Bulletin	Service Bulletin	
All pages of	Pages 1 to 6 of	To revise Effectivity
Appendix 1	Appendix 1	
All pages of	Page 1 of Appendix 2	To revise Effectivity
Appendix 2		

Supplement Revision 1

Remove	Incorporate	Reason for change
All pages	Page 1	To revise Effectivity

V2500-ENG-72-0451
 Transmittal - Page 1 of 2

CHECK THAT ALL PREVIOUS TRANSMITTALS HAVE BEEN INCORPORATED

If any have not been received please advise Publication Services, Rolls-Royce plc, Derby, England

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LIST OF EFFECTIVE PAGES

The effective pages to this Service Bulletin following incorporation of Revision 1 to the Bulletin and Revision 1 to the Supplement are as follows:

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Printed in Great Britain



ENGINE – HIGH PRESSURE TURBINE FIRST STAGE DISK METERING PLUG REDESIGN

1. Planning Information

A. Effectivity Data

(1) Airbus A319

Engine Models Applicable

V2522-A5, V2524-A5, V2527M-A5 Engine Serial Nos. V10001 thru V11628, V11630

(2) Airbus A320

Engine Models Applicable

V2527-A5, V2527E-A5 Engine Serial Nos. V10001 thru V11628, V11630

(3) Airbus A321

Engine Models Applicable

V2530-A5, V2533-A5* Engine Serial Nos. V10001 thru V11628, V11630

NOTE: * V2533-A5 Base Line Serial Number is V10198.

(4) Boeing MD-90

Engine Models Applicable

V2525-D5, V2528-D5 Engine Serial Nos. V20001 thru V20285

B. Concurrent Requirements

This Service Bulletin must be done at the same time or after Reference 1, Service Bulletin No. V2500-NAC-75-0062.

This Service Bulletin must be done at the same time or after Reference 7, Service Bulletin No. V2500-ENG-72-0239.

This Service Bulletin must be done at the same time or after Reference 8, Service Bulletin No. V2500-ENG-72-0240.



C. Reason

- (1) Problem: High Cycle Fatigue (HFC) is a concern with a loose fit of the metering plug in the 1st stage High Pressure Turbine (HPT) hub. Similar plugs fractured due to HFC, causing debris to enter the No. 4 carbon seal area that may cause the carbon seal to fracture. Once the carbon seal is fractured, oil may be released into the High Pressure Turbine (HPT) and an ignition event could likely occur.
- (2) Background: Similar designed metering plugs with loose fit in the 1st stage (HPT) hub potentially may fail in high cycle fatigue.
- (3) Objective: Redesign the metering plug to eliminate the loose fit in the 1st stage HPT hub. This modification would prevent debris from entering the No. 4 carbon seal area. Incorporate the redesigned metering plugs into production engines and the field by replacing existing metering plugs at every HPT overhaul.
- (4) Substantiation: There has been extensive 3D structural analysis of the redesigned metering plug. The stress in the plugs are within the material capability and therefore the plugs will exceed the maximum overhaul interval in the V2500 A5/D5 fleet. The redesigned plugs were tested at assembly and disassembly into the 1st Hub/Disk. The measurements of the plug before the assemble test and after the disassembly test were documented. The results of the test correlate to the predictions. All required product reviews were completed and approved.
- (5) Effects of Bulletin on:

Removal/Installation: Not Applicable

Disassembly/Assembly: Not Applicable

Cleaning: None

Inspection/Check: Not Applicable

Repair: Not Applicable

Testing: Not Applicable
- (6) Supplemental Information

None.

D. Description

A new First Stage Turbine Rotor Assembly with a redesigned Metering Plug is available for all in service engines.

E. Compliance

Category 4

Accomplish at the first visit of an engine or module to a maintenance base capable of compliance with the accomplishment instructions regardless of the planned maintenance action or the reason for engine removal.

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

Estimated man-hours to incorporate the full intent of this Bulletin:

Venue	Estimated Manhours
In Service	Not Applicable
At Overhaul	15 minutes

H. Weight and Balance

Weight Change	None
Moment	No Effect
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

- IAE V2500 Service Bulletin V2500-NAC-75-0062 (Air - Nacelle - Exhaust - ACAC Exhaust Duct - Exit Area Increase 0f).



2. IAE V2500 Service Bulletin V2500-ENG-72-0146 (Engine - HP Turbine Rotor And Stator Assembly - Provide A New Stage 1 HPT Blade).
3. IAE V2500 Service Bulletin V2500-ENG-72-0180 (Engine - HP Turbine Rotor And Stator Assembly - Introduce a New First Stage Turbine Air Seal).
4. 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).
5. IAE V2500 Service Bulletin V2500-ENG-72-0194 (Engine - HP Turbine Rotor And Stator Assembly - Introduce a New Stage 1 HP Turbine Air Seal).
6. IAE V2500 Service Bulletin V2500-ENG-72-0238 (Engine - HP Turbine Rotor And Stator Assembly - Provide A New Stage 1 Turbine Hub).
7. IAE V2500 Service Bulletin V2500-ENG-72-0239 (Engine - Diffuser And Combustor Group - Provide New Diffuser Group Adapters And Tube Assemblies).
8. IAE V2500 Service Bulletin V2500-ENG-72-0240 (Engine - High Pressure Turbine Rotor And Stator Assembly - Provide A New Stage 2 HPT Air Seal And New Stage 1 High Pressure Turbine (HPT) Hub Metering Plugs).
9. IAE V2500 Service Bulletin V2500-ENG-72-0242 (Engine - HP Turbine Rotor And Stator Assembly - Provide New Stage 1 HPT Blades).
10. IAE V2500 Service Bulletin V2500-ENG-72-0302 (Engine - HP Turbine Rotor And Stator Assembly - Introduce New First Second Stage Turbine Blades Which Have Protective Coating In The Damper Pocket Area Under Platform).
11. IAE V2500 Service Bulletin V2500-ENG-72-0327 (Engine - High Pressure Turbine Rotor And Stator Assembly - Introduce New Rotating Parts With Potential For Increased Cyclic Life).
12. IAE V2500 Service Bulletin V2500-ENG-72-0357 (Engine - HP Turbine Rotor Assembly - Introduce New First Stage Turbine Blades With Protective Coating On The Internal Cavities).
13. IAE V2500 Service Bulletin V2500-ENG-72-0361 (Engine - HP Turbine Rotor Assembly - Introduce New First Stage Turbine Blades With Blade Root Attachment Coating).
14. 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-V2500-71B), Chapter/Section 72-45-11.
15. V2500 Engine Manual (E-V2500-1IA), Chapter/Section 72-45-11.
16. V2500 Standard Practices/Processes Manual (E-V2500-3IA), Chapter/Section 70-90-00.

V2500-ENG-72-0451

Page 4



R 17. Internal Reference No. - 02VA017, 02VA017-01.

18. ATA Locator - 72-45-00.

L. 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 72-45-11.

M. Interchangeability of Parts

Old and new parts are directly interchangeable in complete sets.

NOTE: Do not use Plug PN 2A2354 in Hub PN 2A5001.

N. Information in the Appendix

Alternate Accomplishment Instructions (No)

Progression Charts (Yes)

Added Data (Yes)

Revision to Table of Limits (Yes)

Inspection Procedures (No)

**2. Material Information****A. Material – Price and Availability**

1. The estimated price of new material to do this Service Bulletin using new replacement parts is \$ 1,070.00
2. There is no kit provided to do this Service Bulletin.

B. Industry Support Program

Not Applicable.

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

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

72-45-10

FIG ITEM NO.	NEW PART NO.	QTY	PART TITLE	OLD PART NO.	INSTR DISP
01010	2A9521	1	.Turbine Rotor, Stage 1, Assy of	2A9041	(1)(F) (N)(I)

72-45-11

FIG ITEM NO.	NEW PART NO.	QTY	PART TITLE	OLD PART NO.	INSTR DISP
01040	2A3847	24	..Metering Plug HPT Hub, Stage 1	2A3182	(B)(C1) (D)

For V2522-A5, V2524-A5, V2527-A5, V2527E-A5, V2527M-A5, V2530-A5, V2533-A5, V2525-D5, V2528-D5 Delivered Engines Incorporating Service Bulletin V2500-ENG-72-0357, But Not Incorporating Service Bulletin V2500-ENG-72-0361:

72-45-10

FIG ITEM NO.	NEW PART NO.	QTY	PART TITLE	OLD PART NO.	INSTR DISP
01010	2A9031-010	1	.Turbine Rotor, Stage 1, Assy of	2A9031	(M)(N)



72-45-11

FIG ITEM NO.	NEW PART NO.	QTY	PART TITLE	OLD PART NO.	INSTR DISP
01040	2A3847	24	..Metering Plug HPT Hub, Stage 1	2A3182	(B)(C1) (D)

For V2522-A5, V2524-A5, V2527-A5, V2527E-A5, V2527M-A5, V2530-A5, V2533-A5,
V2525-D5, V2528-D5 Delivered Engines Incorporating Service Bulletin
V2500-ENG-72-0357:

72-45-10

FIG ITEM NO.	NEW PART NO.	QTY	PART TITLE	OLD PART NO.	INSTR DISP
01010	2A9031	1	.Turbine Rotor, Stage 1, Assy of OR	2A9021	(M)(N)
01010	2A9521-001	1	.Turbine Rotor, Stage 1, Assy of OR	2A9031-001	(M)(N)
01010	2A9521-001	1	.Turbine Rotor, Stage 1, Assy of OR	2A9031-002	(M)(N)
01010	2A9521-001	1	.Turbine Rotor, Stage 1, Assy of OR	2A9031-003	(M)(N)
01010	2A9521-001	1	.Turbine Rotor, Stage 1, Assy of OR	2A9031-004	(M)(N)
01010	2A9521-001	1	.Turbine Rotor, Stage 1, Assy of OR	2A9031-005	(M)(N)
01010	2A9521-001	1	.Turbine Rotor, Stage 1, Assy of OR	2A9031-006	(M)(N)
01010	2A9521-001	1	.Turbine Rotor, Stage 1, Assy of OR	2A9031-007	(M)(N)
01010	2A9521-001	1	.Turbine Rotor, Stage 1, Assy of OR	2A9031-008	(M)(N)
01010	2A9521-001	1	.Turbine Rotor, Stage 1, Assy of	2A9031-009	(M)(N)



72-45-11

FIG ITEM NO.	NEW PART NO.	QTY	PART TITLE	OLD PART NO.	INSTR DISP
01040	2A3847	24	..Metering Plug HPT Hub, Stage 1	2A3182	(D)(N)

For V2522-A5, V2524-A5, V2527-A5, V2527E-A5, V2527M-A5, V2530-A5, V2525-D5, V2528-D5 Delivered Engines: Incorporating Service Bulletin V2500-ENG-72-0242.

72-45-10

FIG ITEM NO.	NEW PART NO.	QTY	PART TITLE	OLD PART NO.	INSTR DISP
01010	2A9021	1	.Turbine Rotor, Stage 1, Assy of OR	2A3401	(M)(N)
01010	2A9521-002	1	.Turbine Rotor, Stage 1, Assy of OR	2A8421-004	(M)(N)
01010	2A9521-002	1	.Turbine Rotor, Stage 1, Assy of OR	2A8721-003	(M)(N)
01010	2A9521-002	1	.Turbine Rotor, Stage 1, Assy of OR	2A8821-003	(M)(N)
01010	2A9521-002	1	.Turbine Rotor, Stage 1, Assy of	2A8921-003	(M)(N)

72-45-11

FIG ITEM NO.	NEW PART NO.	QTY	PART TITLE	OLD PART NO.	INSTR DISP
01040	2A3182	24	..Metering Plug HPT Hub, Stage 1	2A2354	(D)(N)



For V2522-A5, V2524-A5, V2527-A5, V2527E-A5, V2527M-A5, V2530-A5, V2525-D5, V2528-D5 Delivered Engines Incorporating Service Bulletin V2500-ENG-72-0240:

72-45-10

FIG ITEM NO.	NEW PART NO.	QTY	PART TITLE	OLD PART NO.	INSTR DISP
01010	2A3401	1	.Turbine Rotor, Stage 1, Assy of OR	2A3301	(M)(N)
01010	2A9521-002	1	.Turbine Rotor, Stage 1, Assy of OR	2A8421-002	(M)(N)
01010	2A9521-002	1	.Turbine Rotor, Stage 1, Assy of OR	2A8721-001	(M)(N)
01010	2A9521-002	1	.Turbine Rotor, Stage 1, Assy of OR	2A8821-001	(M)(N)
01010	2A9521-002	1	.Turbine Rotor, Stage 1, Assy of	2A8921-001	(M)(N)

72-45-11

FIG ITEM NO.	NEW PART NO.	QTY	PART TITLE	OLD PART NO.	INSTR DISP
01040	2A3182	24	..Metering Plug HPT Hub, Stage 1	2A2354	(D)(N)

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

- (B) The new part will be available approximately November 2003.
(C1) The old part will continue to be supplied for use at other locations.
(D) The new part is a detail of the assembly. It is available as a replacement part.
(F) The new part will be available on a Full Manufacturing Lead time quote basis only.
(M) It is possible to get the new part only by modification.
(N) The old part is not available.



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. Reidentified Parts

Reidentified Parts	Data	
New PN	Keyword	Old PN
2A9521	Turbine Rotor - 1	2A9041
	Stg, Assy of	
2A9031	Turbine Rotor - 1	2A9021
	Stg, Assy of	
2A9021	Turbine Rotor - 1	2A3401
	Stg, Assy of	
2A3401	Turbine Rotor - 1	2A3301
	Stg, Assy of	
2A9521-001	Turbine Rotor - 1	2A9031-001
	Stg, Assy of	
2A9521-001	Turbine Rotor - 1	2A9031-002
	Stg, Assy of	
2A9521-001	Turbine Rotor - 1	2A9031-003
	Stg, Assy of	
2A9521-001	Turbine Rotor - 1	2A9031-004
	Stg, Assy of	
2A9521-001	Turbine Rotor - 1	2A9031-005
	Stg, Assy of	
2A9521-001	Turbine Rotor - 1	2A9031-006
	Stg, Assy of	
2A9521-001	Turbine Rotor - 1	2A9031-007
	Stg, Assy of	
2A9521-001	Turbine Rotor - 1	2A9031-008
	Stg, Assy of	
2A9521-001	Turbine Rotor - 1	2A9031-009
	Stg, Assy of	
2A9521-002	Turbine Rotor - 1	2A8421-002
	Stg, Assy of	
2A9521-002	Turbine Rotor - 1	2A8421-004
	Stg, Assy of	
2A9521-002	Turbine Rotor - 1	2A8721-001
	Stg, Assy of	
2A9521-002	Turbine Rotor - 1	2A8721-003
	Stg, Assy of	
2A9521-002	Turbine Rotor - 1	2A8821-001
	Stg, Assy of	
2A9521-002	Turbine Rotor - 1	2A8821-003
	Stg, Assy of	
2A9521-002	Turbine Rotor - 1	2A8921-001
	Stg, Assy of	



New PN	Keyword	Old PN
2A9521-002	Turbine Rotor - 1	2A8921-003
	Stg, Assy of	
2A9031-010	Turbine Rotor - 1	2A9031
	Stg, Assy of	

F. Other Material Information Data

Not Applicable.

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3. Accomplishment Instructions

- (1) Remove the 1st Stage Disk Metering Plugs P/N 2A3182 (24 off) from the Turbine Rotor Assembly, 1st Stage (see Reference (5) Chapter Section 72-45-00).
- (2) Clean the Hub Metering Plug holes (24 off) in accordance with task 70-10-00-100-501.
- (3) Measure the Metering Plug holes in the Turbine Hub.
 - (a) If the hole diameter is between 0.379 in. (9.627 mm) and 0.383 in. (9.728 mm) accept and record the dimensions.
 - (b) If the hole diameter is greater than 0.383 in. (9.728 mm) to 0.387 in. (9.830 mm) accept part for select fit only and record the dimension. See Select Fit Chart.

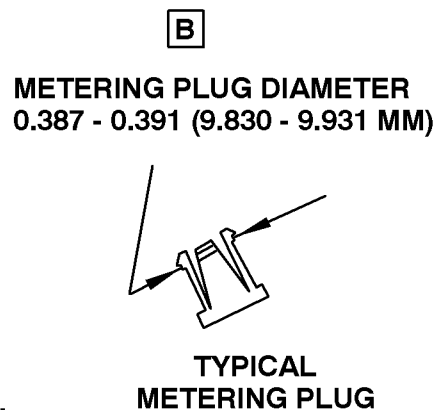
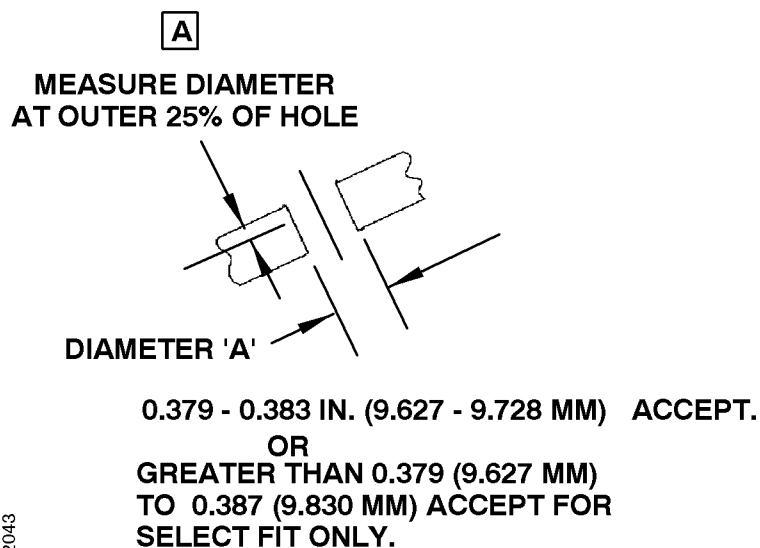
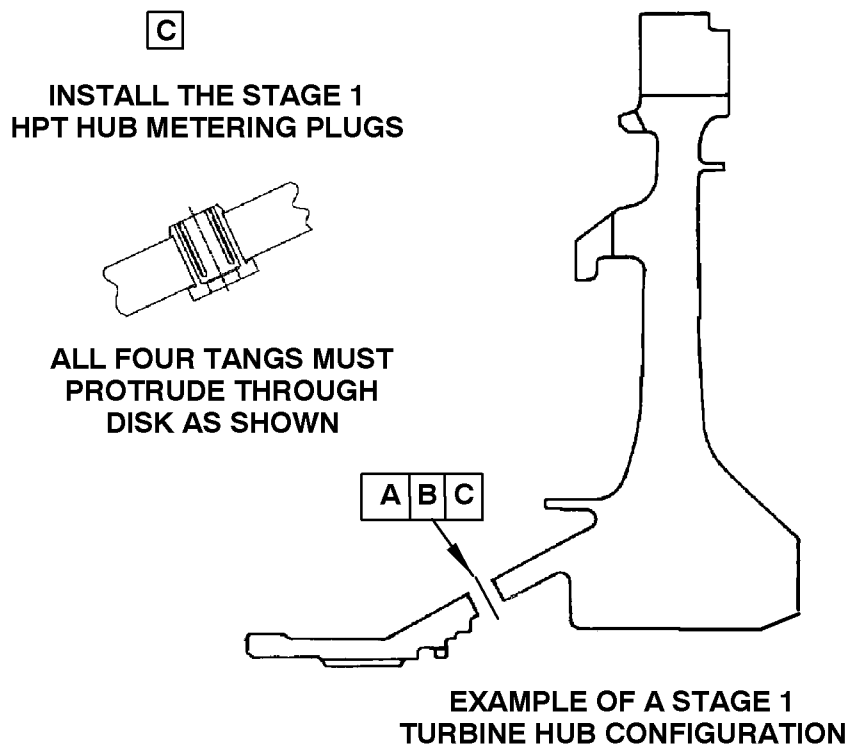
SELECT FIT CHART

IF HOLE IS

USE PLUG 2A3847

0.383 in. (9.728 mm)	0.387-0.391 in. (9.830-9.931 mm)
0.384 in. (9.754 mm)	0.388-0.391 in. (9.855-9.931 mm)
0.385 in. (9.779 mm)	0.389-0.391 in. (9.881-9.931 mm)
0.386 in. (9.804 mm)	0.390-0.391 in. (9.906-9.931 mm)
0.387 in. (9.830 mm)	0.391 in. (9.931 mm)

- (c) If A. or B. does not apply, perform one of the following:
 - (i) If only one hole does not meet requirements in A. or B. identify the hole location, assembly requirements will allow one plug not to be installed if hole diameter is out of limits. This must be recorded in the engine build records.
 - (ii) If more than one hole does not meet requirements in A. or B. contact IAE.
- (4) If all fits are acceptable, use IAE tool P/N IAE1P16495 or IAE1P17763 or other suitable drift to install and seat all 24 (or 23 depending on requirements reference 2. C. (1)) new stage 1 Metering Plugs through the rear bore of the hub into the inner diameter holes of the stage 1 Turbine Hub. Make sure the rear side of the Metering Plug tab touches the outer diameter surface of the Hub. See Figure 1.
- (5) Identify the modified Turbine Rotor Assembly in accordance with the Reidentified Parts section of this Service Bulletin. See reference 16. for marking of parts..
- (6) Recording Instructions
 - (a) A record of accomplishment is required.



LOCATION OF METERING PLUG IN HUB ASSEMBLY TURBINE STAGE 1
Figure 1



International Aero Engines

SERVICE BULLETIN

APPENDIX 1

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

Added Data

Number values shown in parenthesis adjacent to U.S. values are Systeme Internationale equivalents.

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Not subject to the EAR per 15 C.F.R. Chapter 1, Part 734.3(b)(3).

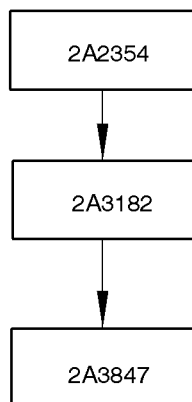
MODIFICATIONS

PART NUMBER CHANGE

BASELINE

V2500-ENG-
72-0240

V2500-ENG-
72-0451



pw0b512609

FAMILY TREE – METERING PLUG, HPT 1ST STAGE DISK. REF. CATALOGUE SEQUENCE NO
72-45-11. FIG. 01 ITEM 040
Figure 2

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R Oct.15/03

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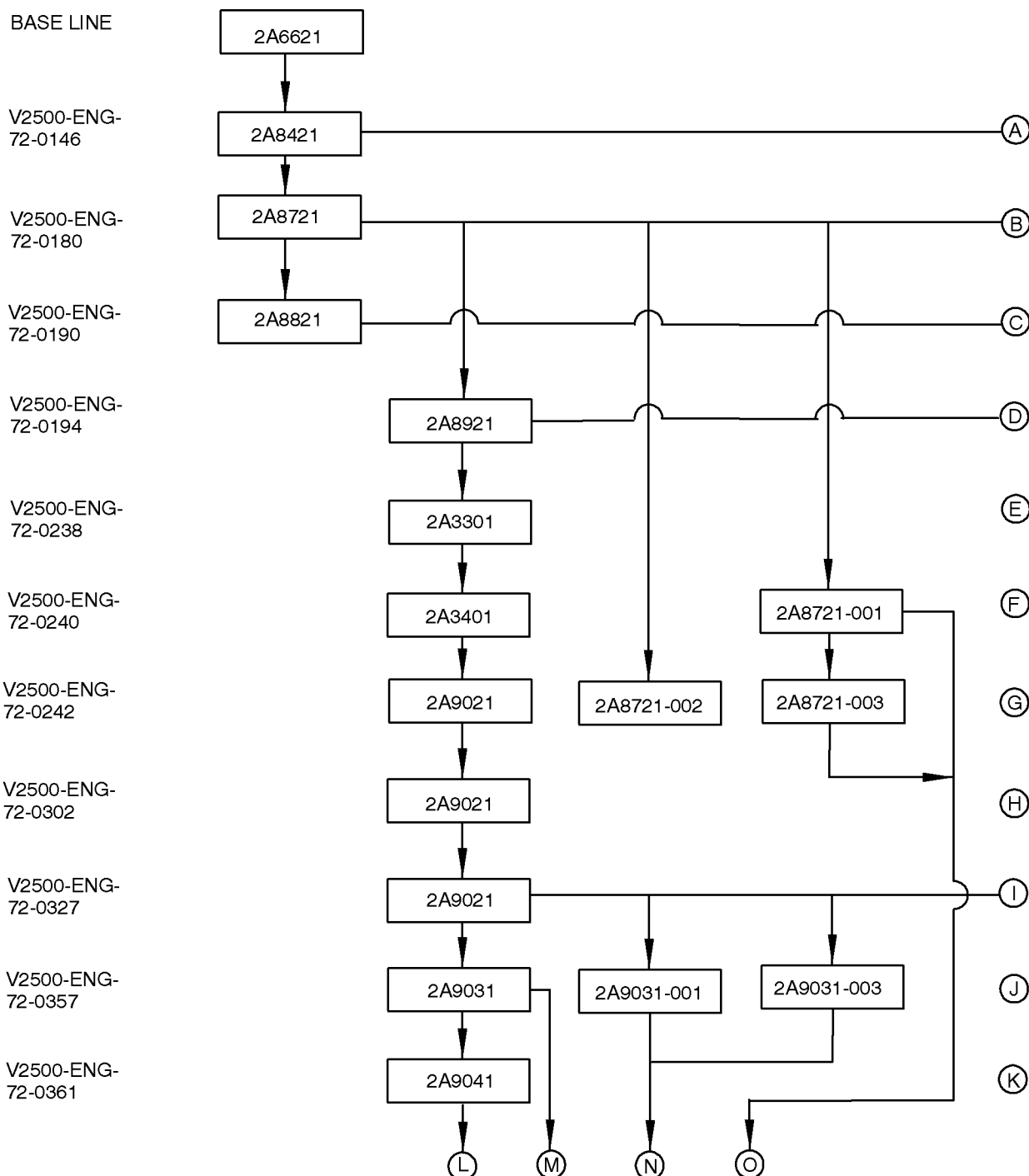
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MODIFICATIONS

PART NUMBER CHANGE

BASE LINE



pq0b512610

FAMILY TREE - TURBINE ROTOR ASSEMBLY, STAGE 1. REF. CATALOGUE SEQUENCE NO 72-45-13.

FIG. 01 ITEM 010

Figure 3 (Sheet 1)

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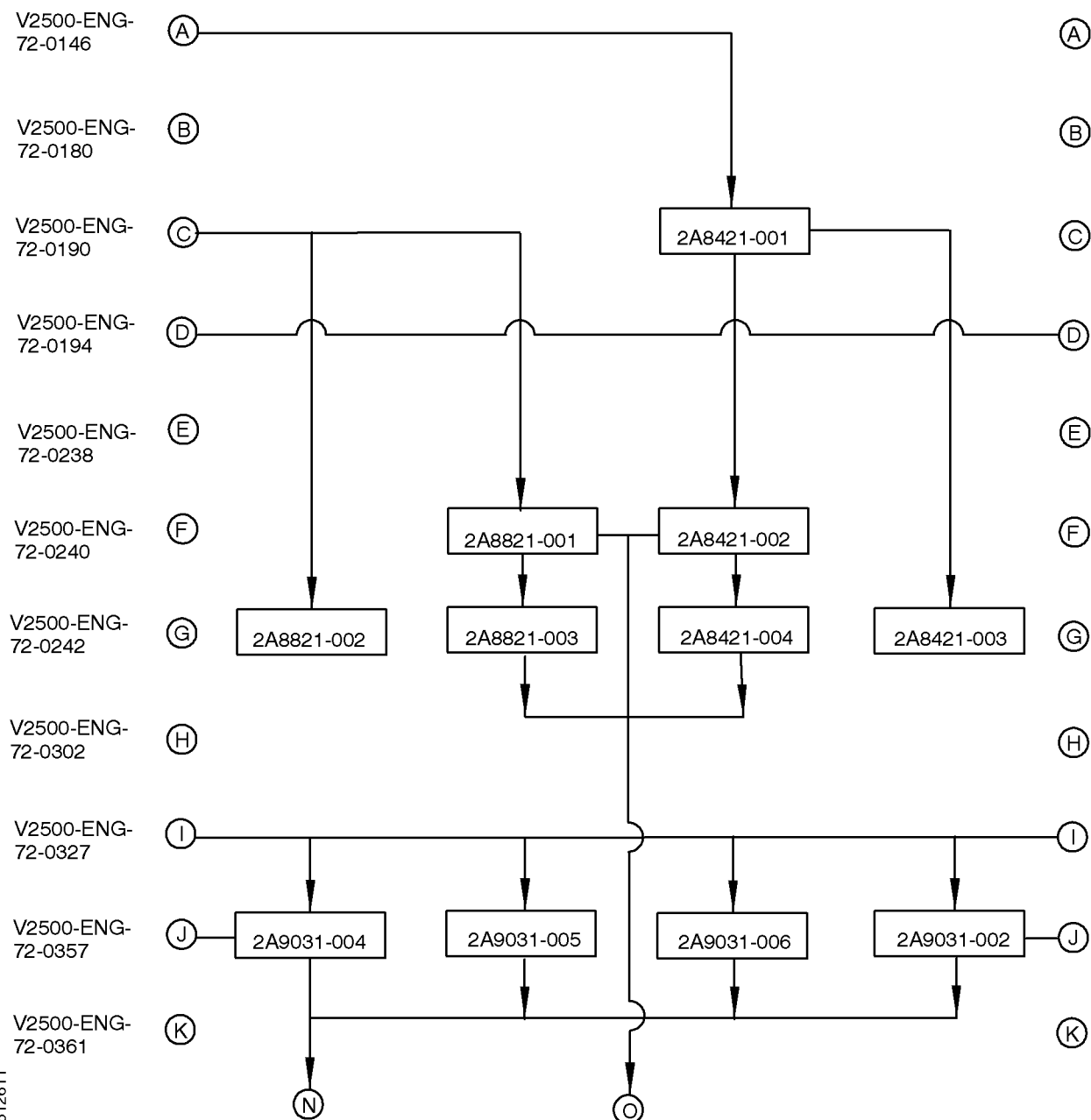
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MODIFICATIONS

PART NUMBER CHANGE

BASE LINE



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FAMILY TREE - TURBINE ROTOR ASSEMBLY, STAGE 1. REF. CATALOGUE SEQUENCE NO 72-45-13.
FIG. 01 ITEM 010
Figure 3 (Sheet 2)

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R Oct.15/03

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MODIFICATIONS

PART NUMBER CHANGE

BASE LINE

V2500-ENG-
72-0146

(A)

V2500-ENG-
72-0180

(B)

V2500-ENG-
72-0190

(C)

V2500-ENG-
72-0194

(D)

V2500-ENG-
72-0238

(E)

V2500-ENG-
72-0240

(F)

V2500-ENG-
72-0242

(G)

V2500-ENG-
72-0302

(H)

V2500-ENG-
72-0327

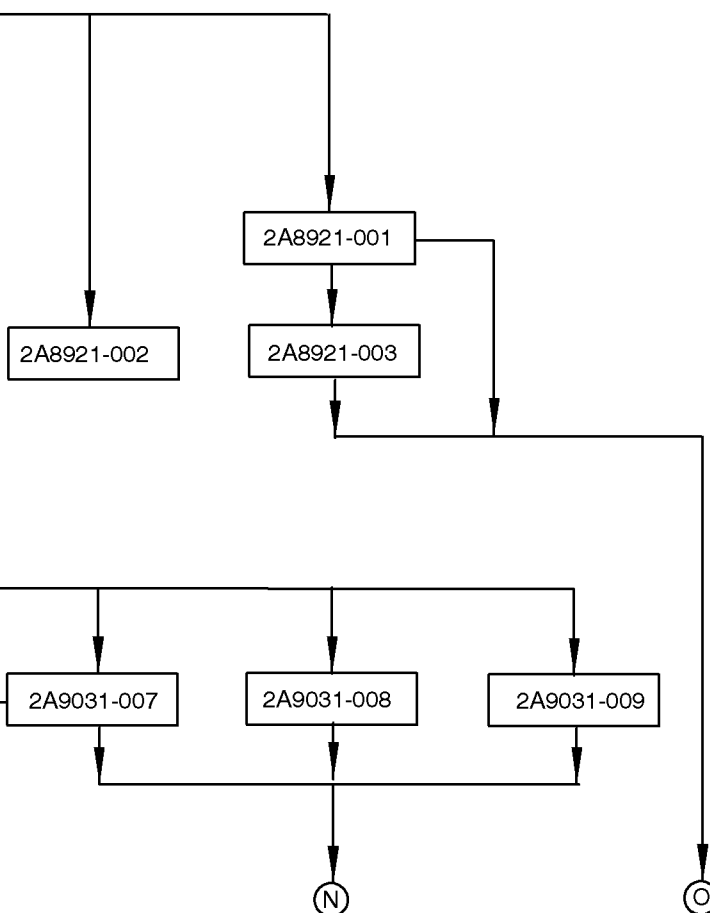
(I)

V2500-ENG-
72-0357

(J)

V2500-ENG-
72-0361

(K)



pw0b512612

FAMILY TREE - TURBINE ROTOR ASSEMBLY, STAGE 1. REF. CATALOGUE SEQUENCE NO 72-45-13.

FIG. 01 ITEM 010

Figure 3 (Sheet 3)

MODIFICATIONS

PART NUMBER CHANGE

V2500-ENG-
72-0451

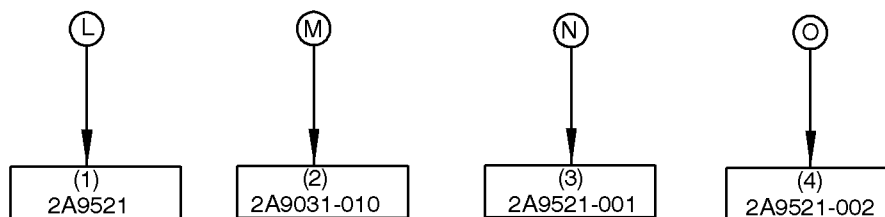


FIGURE 3 (SHEET 4) LEGEND

ROTOR	HUB P/N	PLUG P/N	BLADE P/N
(1)	2A5001	2A3847	2A9201
(2)	2A2801	2A3847	List A
	or 2A5001		
(3)	2A2801	2A3847	List A & B
	or 2A5001		
(4)	* 2A2201	2A3182	List A & B
	* DO NOT USE IN 33K MODEL		

BLADE LIST A
ALL MODELS

2A9201
2A9101
2A9001
2A8521-005
2A8521-003

BLADE LIST B
NON 33K MODELS

2A8701-002
2A8721-001
2A8521-004
2A8521-002
2A8321-004
2A8321-003
2A8321-002

ANY MIXTURE OF BLADES WITHIN
LIST MAY BE USED

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pw0b512613

FAMILY TREE - TURBINE ROTOR ASSEMBLY, STAGE 1. REF. CATALOGUE SEQUENCE NO 72-45-13.

FIG. 01 ITEM 010

Figure 3 (Sheet 4)

V2500-ENG-72-0451

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Not subject to the EAR per 15 C.F.R. Chapter 1, Part 734.3(b)(3).

Sep 1/03
R Oct.15/03

APPENDIX 2Revision to Table of Limits

Engine Manual(s), Chapter/Section 72-45-10, Revision 52., dated November 1, 2002 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

Ref No.	I F R	Part Name	Dimensions New Parts Min - Max	Limits Min - Max	Used Parts Fits Min - Max
1516		Metering Plug	0.387-0.392 in. (9.830-9.957 mm)		0.387-0.392 in. (9.830-9.957 mm)
		Hub-Turb, 1 Stage	0.379-0.383 in. (9.627-9.728 mm)	0.0004T-0.015T (0.012T-0.381T)	0.384-0.387 in. (9.754-9.830 mm)

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ENGINE - HIGH PRESSURE TURBINE FIRST STAGE DISK METERING PLUG REDESIGNSUPPLEMENT - PRICES AND AVAILABILITY

The prices if 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 catalogue for current prices.

1. Modification Kit:

Not applicable.

2. New Production Parts:

Part No.	Desc.	Unit Price US Dollars
2A3847	Metering Plug,HPT Hub,Stage 1	44.60
2A3182	Metering Plug,HPT Hub,Stage 1	44.60

