P U B L I C A T I O N T R A N S M I T T A L

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DATE R Feb.20/02

V2500-A5/D5 PROPULSION SYSTEMS SERVICE BULLETIN

This document transmits Revision 2 to Service Bulletin EV2500-72-0241

Document History

Service Bulletin Revision Status		Supplement Revision Status
Initial Issue	Jun.30/96	
Revision 1	Apr.30/98	

Bulletin Revision 2

Remove	Incorporate	Reason for change
All pages of the Service Bulletin	Pages 1 to 14 of the Service Bulletin	To update Effectivity and correct illustration (Fig.6)
All pages of Appendix 1	Pages 1 to 4 of Appendix 1	To update Effectivity and correct illustration (Fig.6)

V2500-ENG-72-0241

CHECK THAT ALL PREVIOUS TRANSMITTALS HAVE BEEN INCORPORATED
If any have not been received please advise Publication Services, Rolls-Royce plc, Derby, England

LIST OF EFFECTIVE PAGES

The effective pages to this Service Bulletin following incorporation of Revision 2 are as follows:

Page		Revision Number	Revision Date
	Bulletin		
R	1	2	Feb.20/02
R	2	2	Feb.20/02
R	3	2	Feb.20/02
R	4	2	Feb.20/02
R	5	2	Feb.20/02
R	6	2	Feb.20/02
R	7	2	Feb.20/02
R	8	2	Feb.20/02
R	9	2	Feb.20/02
R	10	2	Feb.20/02
R	11	2	Feb.20/02
R	12	2	Feb.20/02
R	13	2	Feb.20/02
R	14	2	Feb.20/02
	Appendix 1		
R	1	2	Feb.20/02
R	2	2	Feb.20/02
R	3	2	Feb.20/02
R	4	2	Feb.20/02

ENGINE - STAGE 1 TURBINE NOZZLE ASSEMBLY - PROVIDE A NEW STAGE ! HPT COOLING DUCT ASSEMBLY AND SEGMENTS

1. Planning Information

A. Effectivity

(1) Airbus A319

R V2522-A5, V2524-A5, V2527M-A5 Engines Serial No. V10001 thru V10197

(2) Airbus A320

R V2527-A5, V2527E-A5 Engines Serial No. V10001 thru V10197

(3) Airbus A321

R V2530-A5 Engines Serial No. V10001 thru V10197

(4) Boeing Longbeach Division MD-90

R V2525-D5, V2528-D5 Engines Serial No. V20001 thru V20072

(5) ATA Locator

72-44-00

B. Concurrent Requirements

This Service Bulletin must be incorporated prior to or at the same time as V2500-ENG-72-0242. Any quantity of the superseding Blades, 2A8801, must be used with the superseding Stage 1 Cooling Duct Assembly, 2A3180-01, and Duct Segments, 2A3181. However, if any superseding Blades, 2A8801, are used, the discontinued Seals, 2A0530, must be removed. If the 2A2621 Blades before Service Bulletin V2500-ENG-72-0146 are used, the superseded 2A2141-01 Stage 1 HPT Duct Assembly, the 2A2364 Duct Segments, before V2500-ENG-72-0241, and the 2A0530 Seals must be used.

C. Reason

(1) Condition:

Higher thrust versions of the V2500 Engine result in a more severe operating environment for the high pressure turbine (HPT) first stage hub and different operating pressures that affect the flow of cooling air to the first stage blade.

(2) Background:

Increased thrust versions of the V2500 Engine result in higher HPT operating temperatures and different internal cavity pressures. These higher temperatures directly cause higher operating temperatures of the first stage hub attachment area. The new pressures affect the amount of cooling flow to the first stage blades.

(3) Objective:

Provide a new HPT cooling duct assembly that has been resized to maintain the amount of cooling air flow to the first stage blade.

(4) Substantiation:

Satisfactorily completed by structural analytical review. Design validation was satisfactorily completed on a test engine.

(5) Effects of Bulletin on:

Removal/Installation: Not affected.

Disassembly/Assembly: Not affected.

Cleaning: Not affected.

Inspection/Check: Not affected.

Repair: Not affected.

Testing: Not affected.

(6) Supplemental Information

None.

D. Description

Install a new Stage 1 HPT Cooling Duct Assembly and Segments.

E. Compliance

Category 8

Accomplish based upon experience with the prior configuration.

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.

G. Manpower

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

Venue	Estimated Manhours
In Service	Not Applicable
At Overhaul	
(a) To make modifications to Stage 1 High Pressure Turbine Cooling Duct Assembly 2A2141-01 (1 off)	2 Hours 8 Minutes
(b) To make modifications to Stage 1 High Pressure Turbine Cooling Duct Assembly 2A2364 (20 off)	11 Hours 11 Minutes
At Overhaul Total	13 Hours 19 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

1. IAE V2500 Service Bulletin V2500-ENG-72-0242 (Engine - HP Turbine Rotor and Stator Assembly - Provide New Stage 1 HPT Blades).

2. IAE V2500 Service Bulletin V2500-ENG-72-0146 (Engine - HP Turbine Rotor And Stator Assembly - Provide A New Stage 1 HPT Blade).

3. V2500 Engine Illustrated Parts Catalogs (S-V2500-2IA, S-V2500-2IB, S-V2500-3IA, S-V2500-3IB, S-V2500-6IA, S-V2500-6IB, S-V2500-7IA, and S-V2500-71B), Chapter/Section 72-44-50.

4. V2500 Standard Practices Manual (SPP-V2500-1I-A), 70-09-00, Marking of Parts, 70-23-03 Fluorescent Penetrant Inspection and 70-32-03 Finish by Electrochemical or Electrodischarge Metal Removal.

5. V2500 Engine Manual (E-V2500-1IA), Chapter/Section 72-44-00, Assembly and 72-44-50 Repair, VRS3177.

6. V2500 Engine Manual (E-V2500-3IA), Chapter/Section 72-44-00, Assembly and 72-44-50 Repair, VRS3177.

L. Other Publications Affected

1. V2500 Engine Illustrated Parts Catalogs (S-V2500-2IA, S-V2500-2IB, S-V2500-3IA, S-V2500-3IB, S-V2500-6IA, S-V2500-6IB, S-V2500-7IA, and S-V2500-7IB), Chapter/Section 72-44-50 Figure-01 to add the new part.

2. V2500 Engine Manuals (E-V2500-1IA and E-V2500-3IA), Chapter/Section 72-44-50 Cleaning, Inspection and Repair, to add the new part.

M. Interchangeability of Parts

Old and new parts are directly interchangeable.

This Service Bulletin must be done before or at the same time as Reference 1, Service Bulletin No. V2500-ENG-72-0242.

N. Information in the Appendix

Alternate Accomplishment Instructions (No)

Progression Charts (Yes)

Added Data (Yes)

Revision to Table of Limits (No)

Inspection Procedures (No)

2. Material Information

A. Material - Price and Availability

1. The estimated price of new material is $ 75,040.00 to do this Service Bulletin when the part modification procedure is used.

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

3. Part availability information is provided in material data Instructions-Disposition.

B. Industry Support Program

Not Applicable.

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

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.

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

	New PN	Qty	Estimate of Unit Price ($)	Keyword	Old PN	Insts-Disp
R	2A3180-01	1	65,540.00	Duct, Cooling, HPT, Stage 1, Assy	2A2141-01 (72-44-50-01-010)	(S1)(1D)(A)(B)
R	2A3181	20	475.00	Duct, Cooling, HPT, Stage 1	2A2364 (72-44-60-01-010)	(S1)(1D)(A)(B)

D. Instructions/Disposition Code Statements:

(S1) This Service Bulletin must be incorporated prior to or at the same time as V2500-ENG-72-0242. Any quantity of the superseding Blades, 2A8801, must be used with the superseding Stage 1 Cooling Duct Assembly, 2A3180-01, and Duct Segments, 2A3181. However, if any superseding Blades, 2A8801, are used, the discontinued Seals, 2A0530, must be removed. If the 2A2621 Blades before Service Bulletin V2500-ENG-72-0146 are used, the superseded 2A2141-01 Stage 1 HPT Duct Assembly, the 2A2364 Duct Segments, before V2500-ENG-72-0241, and the 2A0530 Seals must be used.
(1D) You can obtain the new part by modification of the old part and identification to the new part number.
(A) The new part is currently available.
(B) The old part will no longer be supplied.

E. Tooling - Price and Availability

Special tools are not required to accomplish this Service Bulletin.

F. Reidentified Parts

Reidentified Parts Data

New PN	Keyword	Old PN
2A3180-01	Duct, Cooling, HPT, Stage 1, Assy.	2A2141-01
2A3181	Duct, Cooling, HPT, Stage 1.	2A2364

G. Other Material Information Data

Not Applicable.

3. Accomplishment Instructions

(1) Do a modification of the 2A2141-01 Stage 1 High Pressure Turbine (HPT) Duct Assembly (1 off). See Reference (3), 72-44-50 Figure/Item No. 01-010).

(a) Set-up and machine 16 holes 0.213 - 0.223 in. (5,41 - 5,66 mm) diameter. Refer to Figures 1 and 3 (Sheets 1 thru 3)

(b) Set-up and machine two holes 0.196 - 0.206 in. (4,98 - 5,23 mm) diameter. Refer to Figures 1 and 3 (Sheets 2 and 3).

(c) Do a modification to obtain the airflow level of 2A3180. Use the procedure given in TASK 72-44-50-300-010. Required Flow Parameter: 1.152 Required Average: 1.533. Refer to Reference (5) or (6) Chapter/Section 72-44-50, Repair, VRS 3177.

Required Flow Parameter: 1.152

Required Average: 1.533

(d) Add plug welds as necessary by the procedure specified in TASK 72-44-50-300-010. Refer to Reference (5) or (6) Chapter/Section 72-44-50, Repair, VRS 3177.

(e) Do a fluorescent penetrant inspection by the procedure specified in TASK 70-23-03-230-501. No cracks are permitted. Refer to Figure 4. Refer to the approved procedure in Reference (4), Chapter/Section 70-23-03 Fluorescent Penetrant Inspection.

(f) Mark the new part number adjacent to the existing part number. Use the vibration peen method. Refer to Reference (4), Control No./Task No. 70-09-00-400-501. See Reidentified Parts section for part numbers.

(2) Do a modification of the 2A2364 Stage 1 High Pressure Turbine (HPT) Duct Segments (20 off). See Reference (3), 72-44-60 Figure/Item No. 01-010).

(a) Set-up and machine to open the two 0.079 - 0.083 in. (2,007 - 2,108 mm) to 0.114 - 0.124 in. (2,90 - 3,15 mm) diameter. Refer to Figures 2 and 4. Reference (4).

NOTE: Electrochemical or Electrodischarge machining method specified in TASK 70-32-03-320-501 is an acceptable method.

When Electrochemical or Electrodischarge machining method is used finish by Electrochemical or Electrodischarge Metal Removal, Chapter/Section 70-32-03.

(b) Do a fluorescent penetrant inspection by the procedure specified in TASK 70-23-03-230-501. No cracks are permitted. Refer to Figure 4. Refer to the approved procedure in Reference (4), Chapter/Section 70-23-03 Fluorescent Penetrant Inspection.

(c) Mark the new part number adjacent to the existing part number. Use the vibration peen method. Refer to Reference (4), Control No./Task No. 70-09-00-400-501. See Reidentified Parts section for part numbers.

(3) Install the 2A3180-01 Stage 1 High Pressure Turbine (HPT) Cooling Duct Assembly (1 off) by the procedure given in Reference (5), Chapter/Section
R 72-44-00, Assembly (for V2522-A5, V2524-A5, V2527-A5, V2527E-A5,
R V2527M-A5 and V2530-A5 Engines) or Reference (6), Chapter/Section 72-44-00, Assembly (for V2525-D5 and V2528-A5 Engines).

(4) Install the 2A3181 High Pressure Turbine (HPT) Duct Segments (20 off) by the procedure given in Reference (5), Chapter/Section 72-44-00, Assembly
R (for V2522-A5, V2524-A5, V2527-A5, V2527E-A5, V2527M-A5 and V2530-A5
R Engines) or Reference (6), Chapter/Section 72-44-00, Assembly (for V2525-D5 and V2528-A5 Engines)

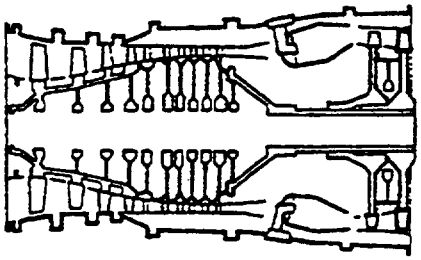
(5) When you assemble the new Turbine Nozzle Group identify it by the procedure given in Reference (2), Control No./Task No. 70-09-00-400-501 and as follows:

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

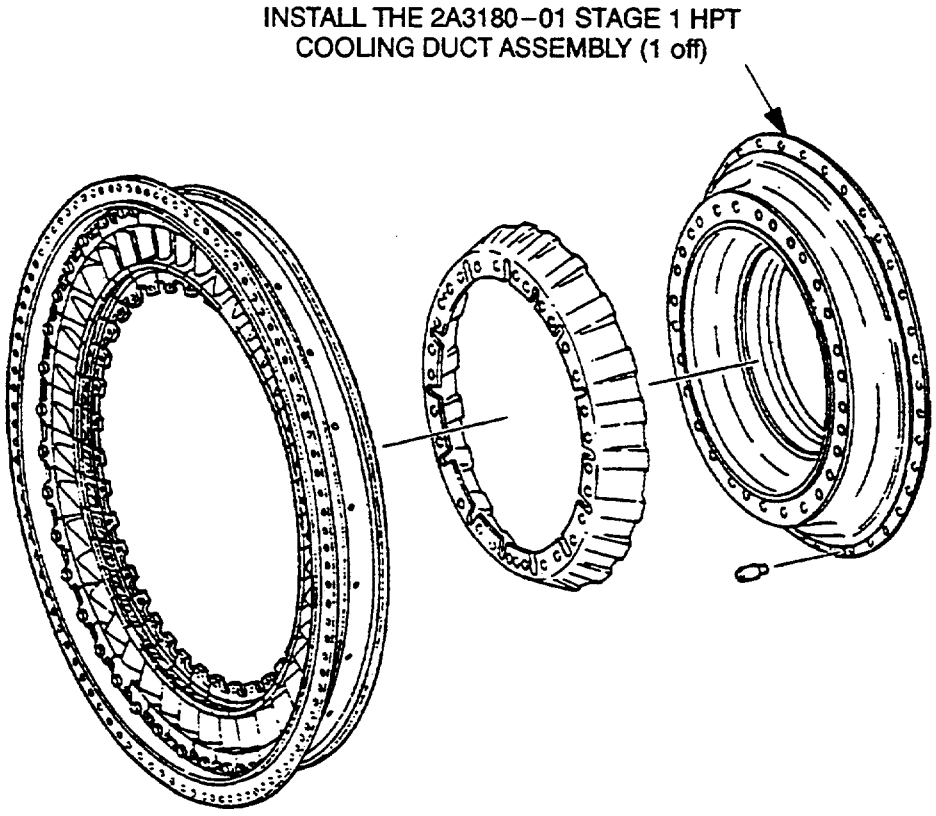
(b) Use the number given in the Reidentified Parts section.

(6) Recording Instructions

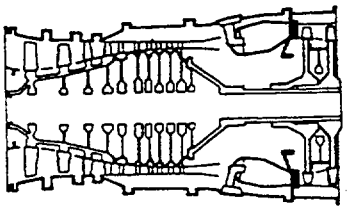
(a) A record of accomplishment is required.



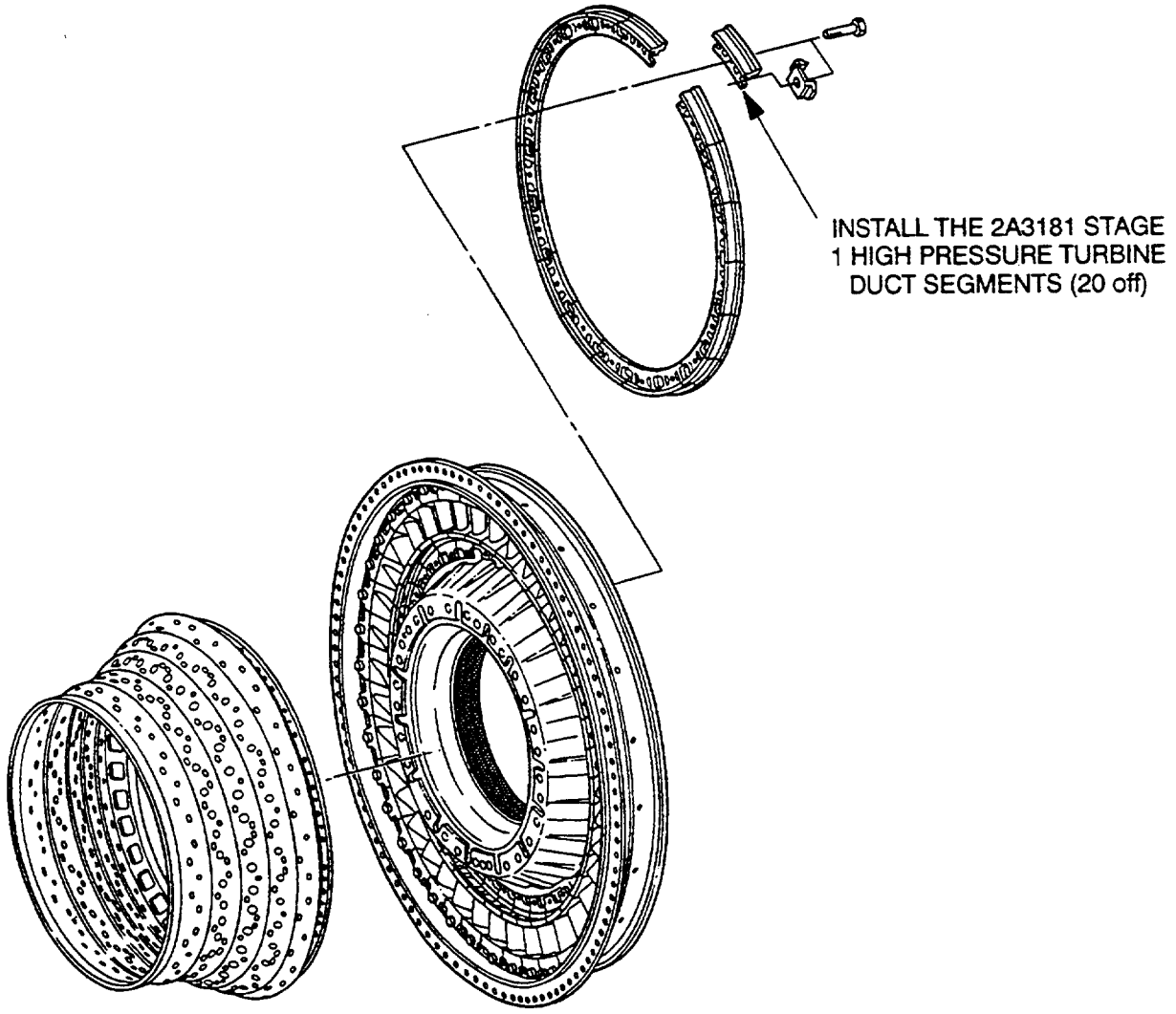
MODULE 40



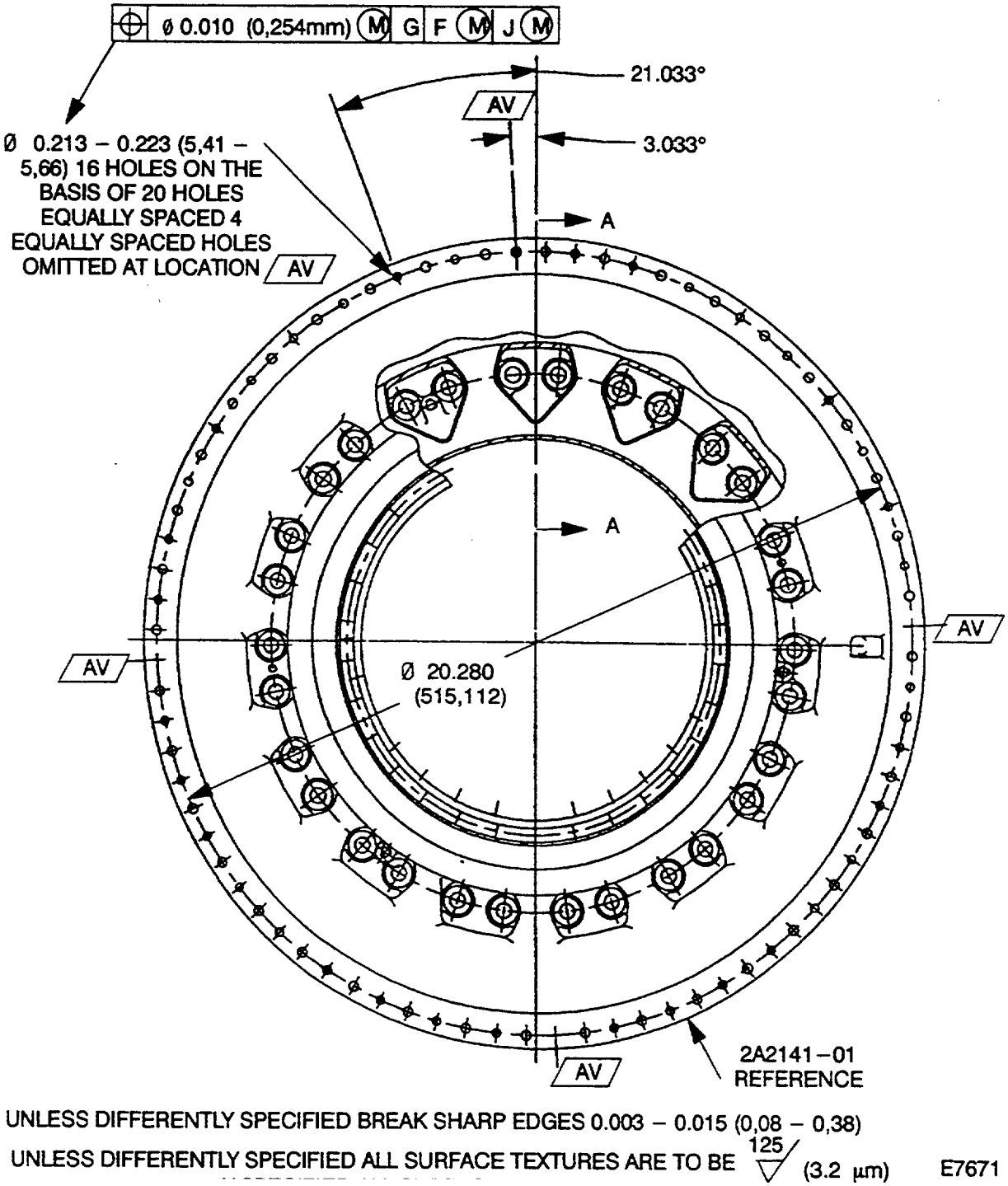
Location of the Stage 1 High Pressure Turbine Duct Assembly
Figure 1



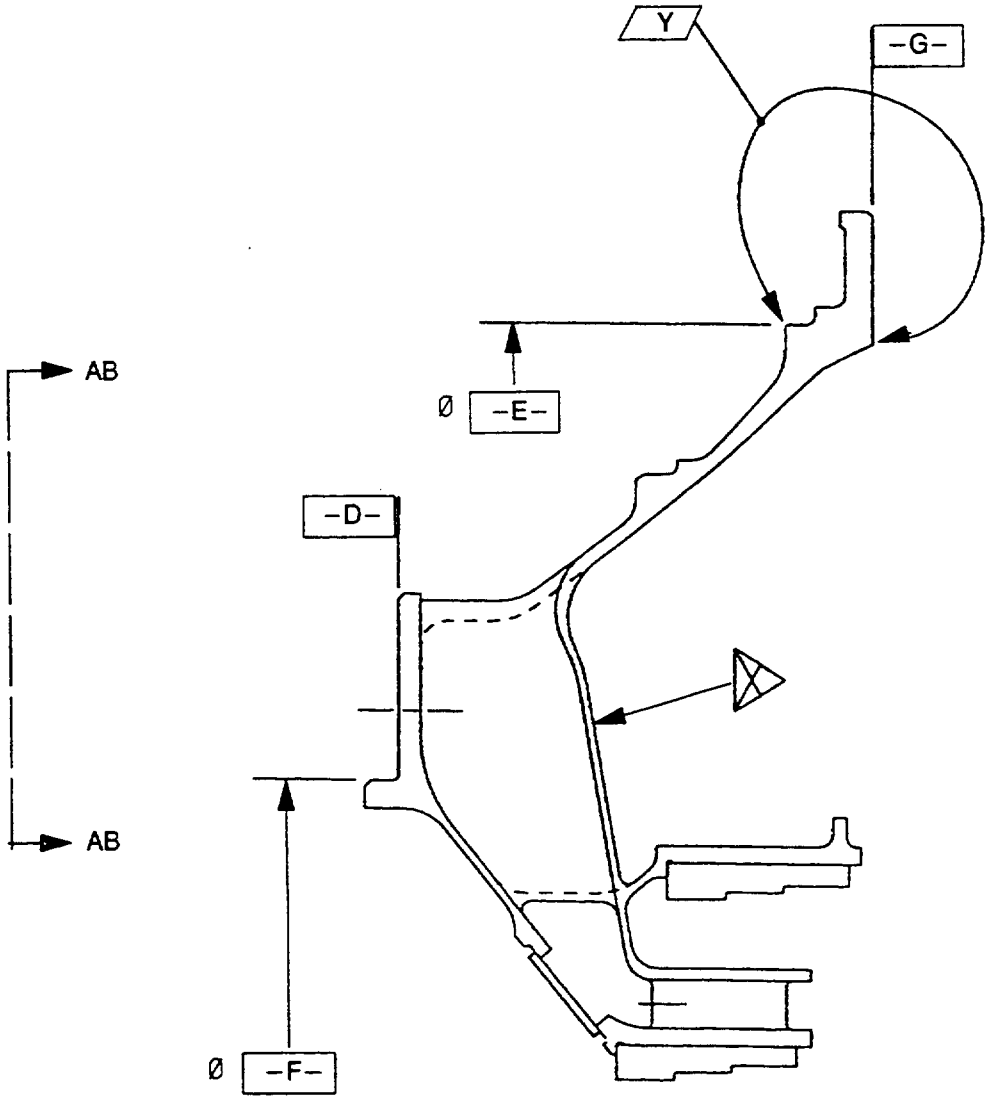
MODULE 40



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



Modification of the Stage 1 High Pressure Turbine Duct Assembly
Figure 3 (Sheet 1)

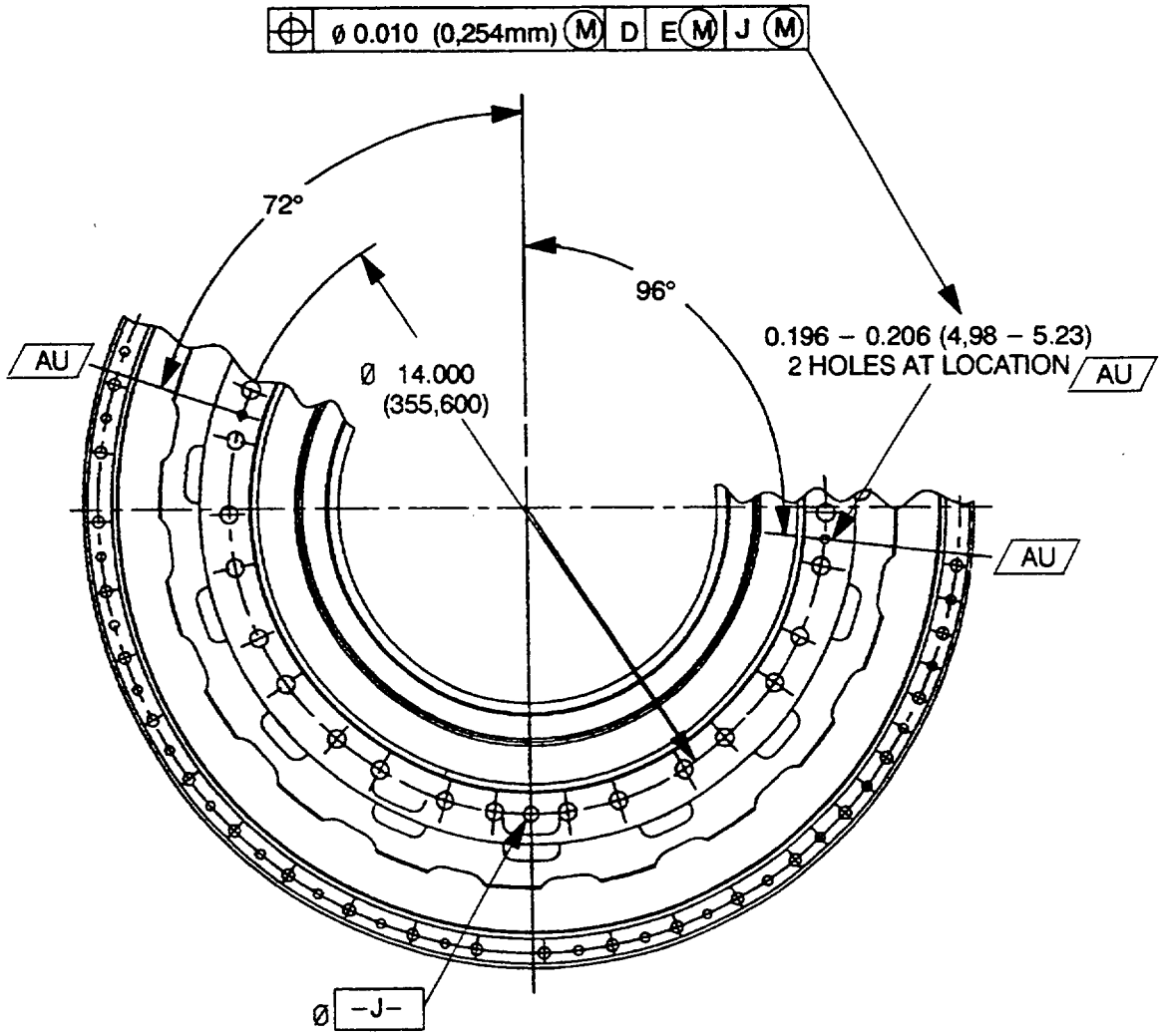


SECTION A – A

E7672

MARK IDENTIFICATION AT THIS LOCATION BY PROCEDURE SPECIFIED IN TEXT

Modification of the Stage 1 High Pressure Turbine Duct Assembly
Figure 3 (Sheet 2)



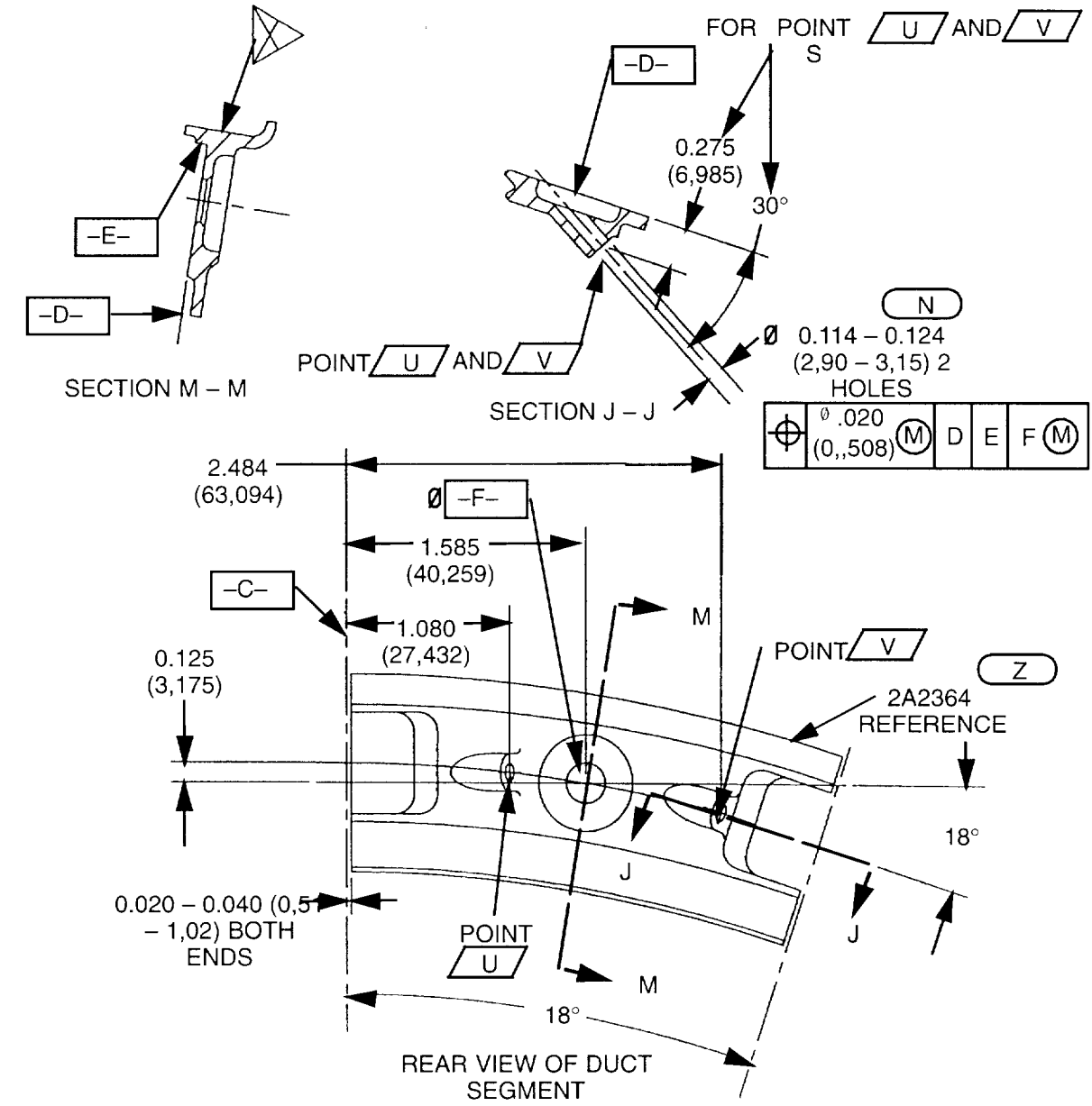
VIEW AB – AB

UNLESS DIFFERENTLY SPECIFIED BREAK SHARP EDGES 0.003 – 0.015 (0,08 – 0,38)

UNLESS DIFFERENTLY SPECIFIED ALL SURFACE TEXTURES ARE TO BE 125 (3.2 µm)

E7673

Modification of the Stage 1 High Pressure Turbine Duct Assembly
Figure 3 (Sheet 3)



N WHEN ELECTROCHEMICAL OR ELECTRODISCHARGE MACHINING IS USED FINISH SURFACE OF THIS PART BY THE PROCEDURE GIVEN IN THE TEXT

UNLESS DIFFERENTLY SPECIFIED BREAK SHARP EDGES 0.003 – 0.015 (0,08 – 0,38)

UNLESS DIFFERENTLY SPECIFIED ALL SURFACE TEXTURES ARE TO BE 125 (3.2 µm)

MARK IDENTIFICATION AT THIS LOCATION BY PROCEDURE SPECIFIED IN TEXT

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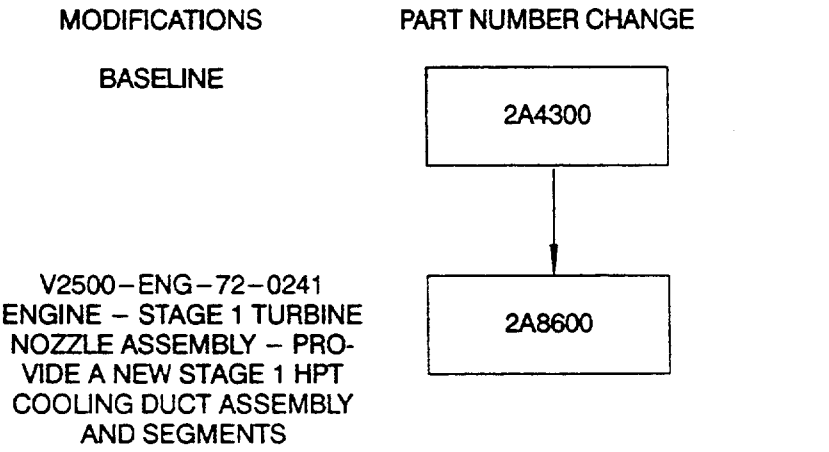
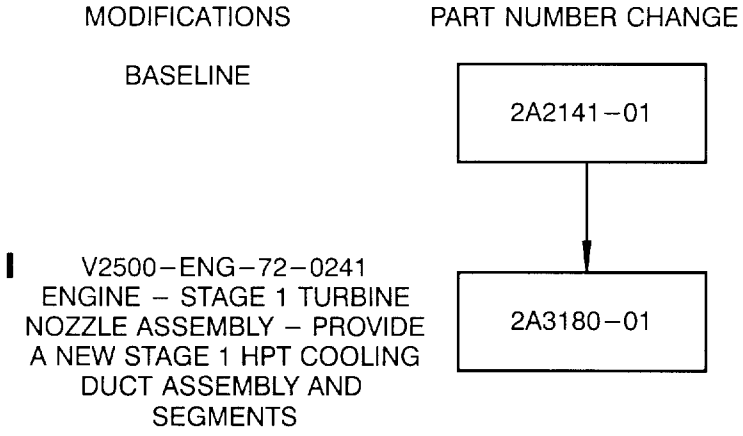
Modification of the Stage 1 High Pressure Turbine Duct Segments
Figure 4

APPENDIX 1

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



Family Tree - Turbine Nozzle Group Ref. Catalog Sequence No. 72-44-00. Fig. 01 Item 001
Figure 5



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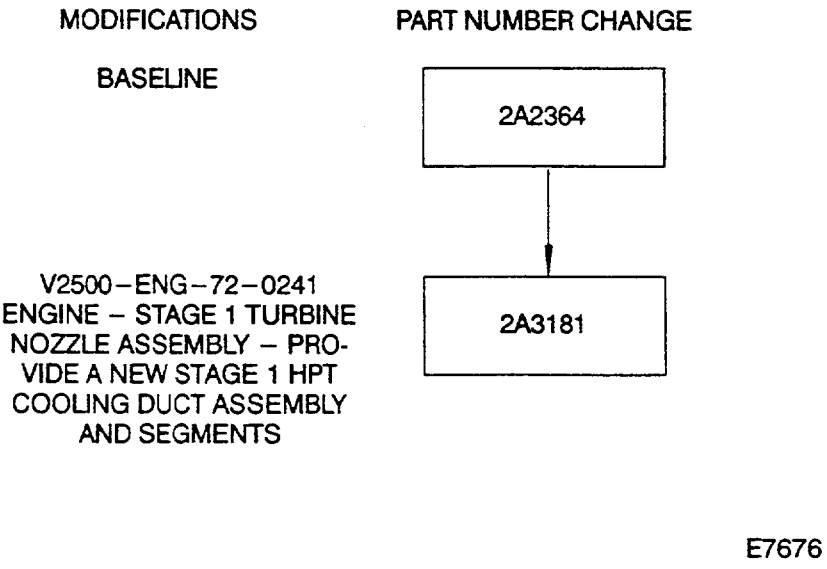
Family Tree - High Pressure Turbine (HPT) Cooling Duct Assembly Ref. Catalog Sequence No. 72-44-50. Fig. 01 Item 010
Figure 6



Family Tree - High Pressure Turbine (HPT) Duct Segments Ref. Catalog Sequence No. 72-44-60. Fig. 01 Item 010
Figure 7