

ENGINE - STAGE 1 TURBINE NOZZLE ASSEMBLY - REWORK THE STAGE 1 HP TURBINE OUTER AIRSEAL ASSEMBLY TO IMPROVE COOLING AIR TO THE HP TURBINE - CATEGORY CODE 5 - MOD.ENG-72-0029

1. Planning Information

A. Effectivity

- (1) Aircraft: Airbus A320
- (2) Engine: V2500-A1 Engines prior to Serial No.V0046 except Engine Serial No.V0034, V0038, V0039, V0042, and V0043

B. Reason

(1) Condition

The Stage 1 HPT Duct Segments and the Stage 1 HPT Blades are exposed to hotter than desired temperature. This causes burns on the Stage 1 Turbine Blade Tips and damage to the Stage 1 Duct Segments.

(2) Background

Early development testing showed an acceptable temperature profile at the Stage 1 HPT Blade to Stage 1 HPT Duct Segment interface. Subsequent changes in gas path parts caused a shift in the gas path temperature profile which resulted in the OD being hotter than desired. The incorporation of this Service Bulletin will lower the temperature at the OD and, thus, improve part lives.

(3) Objective

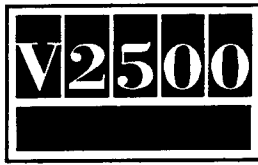
To provide a source of cooling air from the combustor that is directed to the Stage 1 HPT Blade Tips and Stage 1 HPT Duct Segments to improve the durability of these parts.

(4) Substantiation

Successful development testing.

(5) Effect of Bulletin on the following shop functions:

V2500-ENG-72-0029



## SERVICE BULLETIN

Removal/Installation	Not affected
Disassembly/Assembly	Affected (See Supplemental Information)
Cleaning	Not affected
Inspection/Check	Affected (See Supplemental Information)
Repair	Not affected
Testing	Not affected

## (6) Supplemental Information:

The Assembly procedures are different because there is an additional measurement check to make sure the Stage 1 HPT Spacers are installed correctly.

C. Description

(1) A supply of cooling air is provided for the High Turbine as follows:

- (a) A new Stage 1 HPT Seal Assembly with new Spacers makes a gap to let cooling air enter the gas path at the outer wall.

D. Approval

The Part Number changes and/or part modifications described in Sections 2 and 3 of this Service Bulletin have been shown to comply with the applicable Federal Aviation Regulations and are FAA-APPROVED for the Engine Model listed.

E. Compliance

Category Code 5.

Accomplish when the engine is disassembled sufficiently to afford access to the affected subassembly (i.e. modules accessories, components, build groups) and to all affected spare subassemblies.

F. Manpower

Estimated Manhours to incorporate the full intent of this Bulletin:

Venue	Estimated Manhours
-------	--------------------

(1) In Service	Not applicable
----------------	----------------

(2) At Overhaul (Note: The parts affected by this Service Bulletin are accessible at Overhaul).	
---	--

V2500-ENG-72-0029



## SERVICE BULLETIN

- (a) To accomplish modification and identification of Stage 1 HPT Seal Assembly
- (b) Increase in the time necessary for assembly of new Stage 1 HPT Seal Assembly and new Stage 1 HPT Spacers

TOTAL 1 hour 20 minutes

Remarks: \*This estimate is also considered to be applicable for each future Stage 1 Turbine Nozzle Assembly action performed.

G. Material Price and Availability

- (1) Modification Kit not required.
- (2) See Material Information section for prices and availability of future spares.

H. Tooling - Price and Availability

Special tools are not required

I. Weight and Balance

- (1) Weight change .. .. Plus 0.58 lb (0,26 kg)
- (2) Moment arm .. .. No effect
- (3) Datum .. .. Engine front mount centreline  
(Power Plant Station (PPS) 100)

J. Electrical Load Data

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

K. References

- (1) Internal Reference No.

EC88VA130

EC90VA101

EC90VA101A

- (2) Other References

V2500-ENG-72-0029



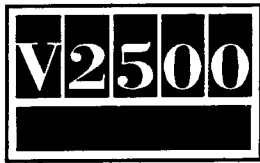
V2500 Engine Illustrated Parts Catalog

V2500 Engine Manual

V2500 Standard Practices manual

**L. Other Publications Affected**

- (1) The V2500 Engine Manual Chapter/Section 72-44-40, Cleaning, to add the new parts.
- (2) The V2500 Engine Manual Chapter/Section 72-44-40, Inspection/Check, to add procedures for the new parts.
- (3) The V2500 Engine Manual Chapter/Section 72-44-00, Assembly, to add the procedure for the new parts.



## 2. Accomplishment Instructions

### A. Prerequisite Instructions

- (1) Remove the Stage 1 HPT Seal Assembly by the approved procedures in Reference (2), Chapter/Section 72-44-00. Disassembly.

### B. Rework Instructions

- (1) Do a modification on PN 2A0330-01 Stage 1 HPT Seal Assembly (1 off) and identify as PN 2A1980-01 as follows:

Procedure	Supplementary Information	
(a) Set-up and machine Surface G to obtain the dimensions specified	Refer to Figures 1 and 2	
(b) Identify with the new part number adjacent to the existing part number. Use the vibration peen method	Old Part Number	New Part Number
	2A0330-01	2A1980-01
	Refer to Figure 2. Refer to Reference (3). Control No./Task No.70-09-00-400-501	

### C. Assembly Instructions

- (1) Install the Stage 1 HPT Seal Assembly by the approved procedure in Reference (2), Chapter/Section 72-44-00, Assembly, and as follows:
  - (a) Install the PN 2A1695 stage 1 HPT Spacers (39 off) in the recesses around the bolt holes (with the tangs positioned to the OD).
  - (b) Install the PN 2A1980-01 Stage 1 HPT Seal Assembly (1 off).
  - (c) Install the PN 2A0332 Spring Tension Washers (39 off).
  - (d) Install the PN 2A0331 Sleeve Bushings (39 off).
  - (e) Install the PN 1A4315 Bolts (39 off) which hold the Stage 1 HPT Seal Assembly in position.
  - (f) Tighten the Bolts with your hand.



**CAUTION:** DO NOT DO THE GAP CHECK UNTIL THE THICKNESS OF THE CLASSIFIED SPACER IS FOUND AND THE BOLTS (Step g.) ARE TORQUED. REFER TO THE APPROVED PROCEDURES IN REFERENCE (2) CHAPTER/SECTION 72-00-44 INSTALLATION-01 OR 72-40-00 ASSEMBLY-05.

**NOTE:** If you install the same Stage 1 HPT Seal Assembly and the same Outer Combustion chamber Liner Assembly that you removed, you can install the same Classified Spacer that you removed.

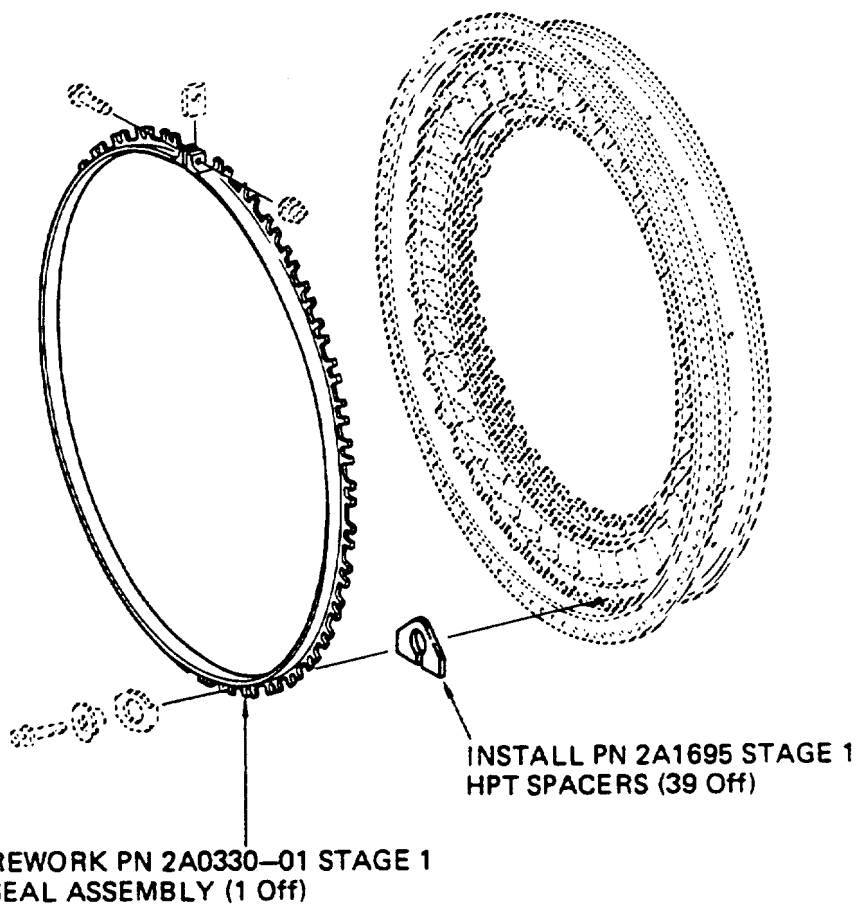
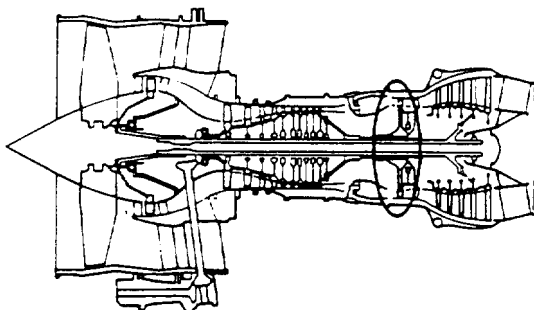
(g) Do a check of the clearance between the Stage 1 HPT Seal Assembly and the Stage 1 HPT Vane at 39 locations. Refer to Figure 3.

(h) If the clearance measured in step (g) is not from 0.024 to 0.050in. (0,61 to 1,27 mm) make sure the Stage 1 HPT Spacers are installed correctly.

(i) Do the procedure, as necessary, until the clearance is correct.

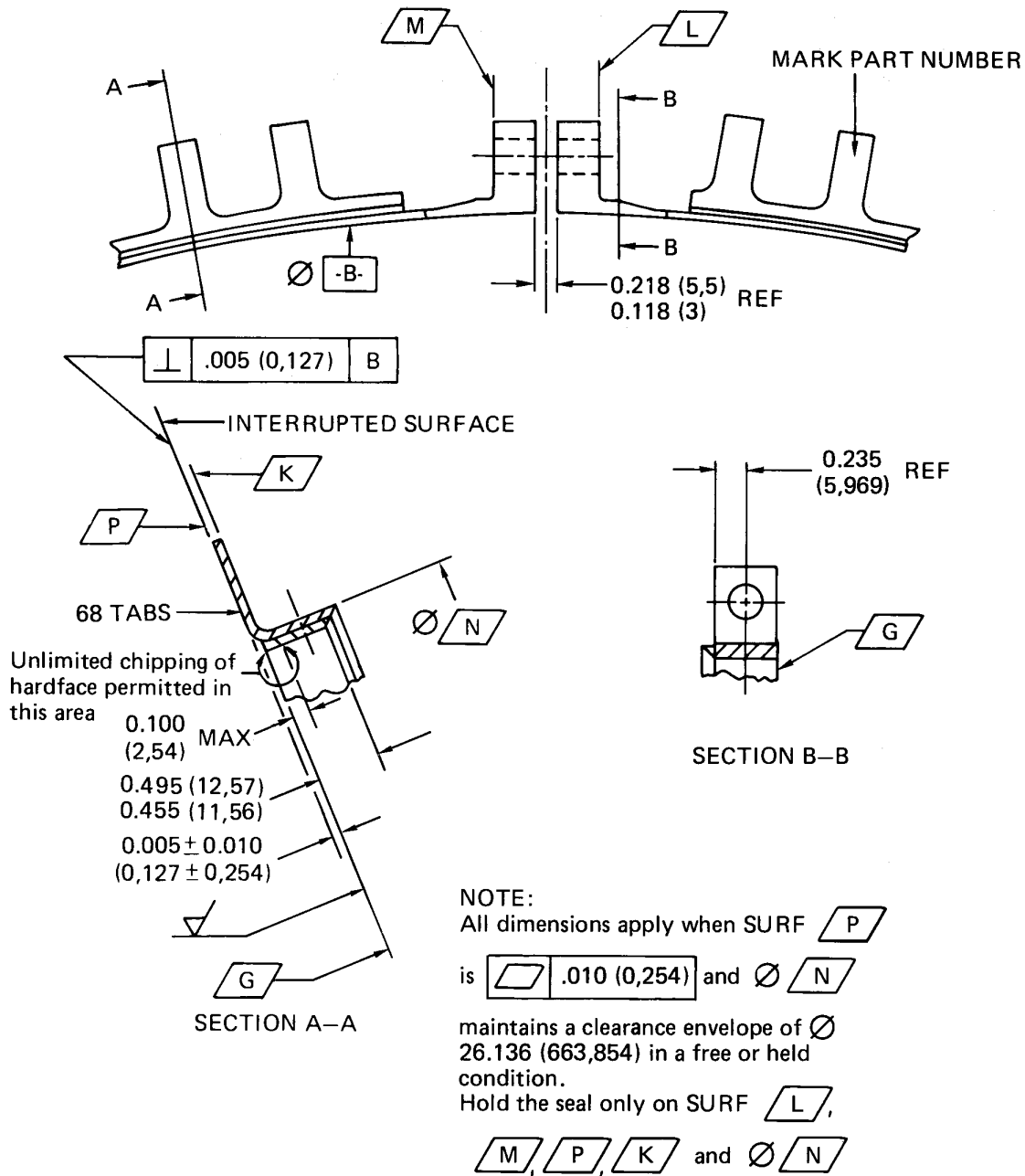
#### D. Recording Instructions

(1) A record of accomplishment is necessary.



Location of Stage 1 HPT Seal Assembly and Stage 1 HPT Spacers  
Fig.1

de00014881



14882A

Modification of Stage 1 HPT Seal Assembly  
Fig.2

V2500-ENG-72-0029

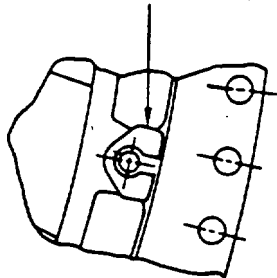




# SERVICE BULLETIN

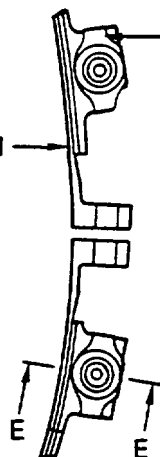
Printed in Great Britain

INSTALL PN 2A1695 STAGE 1  
HPT SPACER (39 Off)



SECTION D-D

INSTALL PN 2A1980-01  
STAGE 1 HPT SEAL  
ASSEMBLY (1 Off)



INSTALL PN 2A0332  
SPRING TENSION  
WASHER (39 Off)

C

PN 2A0091 STAGE 1 VANE CLUSTER  
SHOWN IN POSITION

INSTALL PN 2A0332 SLEEVE  
BUSHING (39 Off)

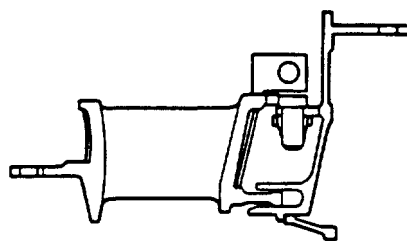
INSTALL PN 1A4135  
BOLT (39 Off)

0.024-0.050  
(0,61-1,27)  
CLEARANCE  
(39 Places)

SECTION E-E

PN 2A1695 STAGE 1 HPT  
SPACER SHOWN IN POSITION

C  
↓

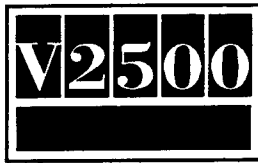


SECTION THROUGH STAGE 1 HPT  
SUPPORT, SEAL, AND VANE  
CLUSTER ASSEMBLIES

de00014883

Install the Stage 1 HPT Seal Assembly and Stage 1 HPT Spacers  
Fig.3

V2500-ENG-72-0029



## SERVICE BULLETIN

3. Material Information

NEW PART NO. (ATA NO.)	QTY	EST'D UNIT PRICE (\$)	KEYWORD	OLD PART NO. (IPC NO.)	INSTRUCTIONS DISPOSITION
------------------------------	-----	-----------------------------	---------	------------------------------	-----------------------------

---

Applicability: For each V2500 Engine to incorporate this Bulletin.

A. Kits associated with this Bulletin:

None

B. Parts affected by this Bulletin:

2A1980-01 (72-44-40)	1	3315.00	Seal - HPT, Stage 1, Assembly	2A0330-01 (01-010)	(S1)(1D) (A)(B)
2A1695 (72-44-40)	39	7.50-	Spacer - HPT, Stage 1 -	(01-019)	(S1)(A)

C. Instruction/Disposition Code Statements:

- (S1) New Parts Coded (S1) must replace Old Parts Coded (S1) as a COMPLETE SET per Engine.
- (1D) Old part can be reworked and reidentified to the New Part Number.
- (A) New part is currently available.
- (B) Old part will no longer be available.

NOTE: The estimated 1989 unit prices shown are provided for planning purposes only and do not constitute a firm quotation. Contact IAE's Spare Parts Department for information concerning firm prices.

V2500-ENG-72-0029