ENGINE - STAGE 1 TURBINE NOZZLE ASSEMBLY AND HP TURBINE ROTOR AND STATOR ASSEMBLY - INCORPORATION OF OFFSET SUPPORTS - CATEGORY CODE 6 - MOD.ENG-72-0002

1. Planning Information

A. Effectivity

(1) Aircraft: Airbus A320

(2) Engine: V2500-A1 Engines Serial No's. V0003 through V0028 except Engine Serial No. V0007

B. Reason

(1) Condition

Thermal gradients which are not equal may cause distress in the Stage 1 and 2 HPT Duct Segments.

(2) Background

At this time, when an offset grind is done, the ceramic coating on the Stage 1 and 2 Duct Segments is machined so that the thickness is not equal for all segments. This causes thermal gradients which are not equal.

(3) Objective

Offset grind the Stage 1 and 2 HPT Duct Segment Supports so the Duct Segments can be ground with equal thickness but installed in an offset position.

(4) Substantiation

Many hours of engine tests have shown that it is desirable to have equal thermal coating thickness.

(5) Effects of Bulletin on Workshop Procedures:

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

(6) Supplemental Information

The Disassembly/Assembly is different because the grind procedures for the Post Service-Bulletin parts are changed.

The Repair Procedures are different because the dimensions for the Post-Service Bulletin parts are changed.

C. Description

(1) Blade tip wear and outer air seal distress are decreased as follows:

(a) The front and rear support snap diameters will be offset ground by eccentric machining which will allow concentrically ground Outer Air Seals to be installed. The Outer Air Seal will then be in a position offset to the turbine, relative to the Case.

(b) Concentrically ground Outer Air Seals provide equally abradable ceramic material thickness which reduces temperature gradients at blade tip interface.

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 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. 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).	
	Total 9 Hours, 5 Minutes
(a) To do the modification of the Stage 1 HPT Support.	

(i) Remove the Stage 1 HPT Seal. 14 minutes

(ii) Set up and machine the Stage 1 HPT Support to the dimensions given. 30 minutes

(iii) Plasma spray component. 100 minutes

(iv) Set up and machine to the final dimensions. 45 minutes

(v) Install the Stage 1 HPT Seal. 20 minutes

(vi) Vibration peen the new part number adjacent to the existing part number. 1 minute

TOTAL 210 minutes

(b) To do the modification of the Stage 2 HPT Support.

(i) Set-up and machine the Stage 2 HPT Support to the dimensions given. 30 minutes

(ii) Plasma spray component. 100 minutes

(iii) Set-up and machine to final dimensions. 45 minutes

(iv) Set-up and machine holes to dimensions given. 48 minutes

(v) Vibration peen the new part number adjacent to the existing part number. 1 minute

TOTAL 224 minutes

(c) To do the modification of the Turbine Case.

(i) Set-up and machine the front flange bolt holes and the location pin hole. 50 minutes

(ii) Set-up and machine the rear flange bolt holes 48 minutes

(iii) Vibration peen the new part number adjacent to the existing part number. 1 minute

TOTAL 99 minutes

(d) To install the Turbine Case Bracket (1 off).

(i) Rivet the Turbine Case Bracket to the Turbine Case. 5 minutes

(ii) Transfer drill through the holes in the Turbine Case Bracket, enlarge the three holes. 3 minutes

(iii) Vibration peen the new part number adjacent to the existing part number. 1 minute

TOTAL 9 minutes

(e) To install the Shoulder Pin (1 off).

(i) Install the Shoulder Pin to the rear flange of the Turbine Case. 2 minutes

(ii) Vibration peen the new part number adjacent to the existing part number. 1 minute

TOTAL 3 minutes

G. Material - Price and Availability

(1) Modification Kit is 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 None

(2) Moment arm No effect

(3) Datum Engine front centerline

J. Electrical Load Data

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

K. References

(1) Internal Reference No.

88VA005

88VA005H

(2) Other references

V2500 Engine Illustrated Parts Catalog.

V2500 Standard Practices Manual.

V2500 Engine Manual.

L. Other Publications Affected

(1) V2500 Engine Illustrated Parts Catalog to add the new parts.

(2) The V2500 Engine Manual, Chapter/Section 72-45-00 Assembly and 72-45-20 Assembly-01 to add procedures for the Post-Service Bulletin parts.

2. Accomplishment Instructions

A. Rework Instructions

(1) Do a modification of 2A1292 Stage 1 High Pressure Turbine Support Assembly (1 off). See Reference (1) 72-44-10 Figure/Item No. 01-010) and identify as follows:

Procedure	Supplementary Information
(a) Remove the 2A0170 Stage 1 HPT Seal (1 off).	Refer to Figure 1.
(b) Set-up and machine to the dimensions given in C.	Refer to Figure 2.
(c) Coat area D to 0.040-0.060 in. (1,02-1,52 mm). Use PWA 53-37.	Refer to Figure 2 for the location of the plasma coat. Coat will be applied by the procedure given in Reference (2), Chapter/Section 70-34-03, Plasma and Flame Spraying.

NOTE: If not removed the nut plates will be masked when the plasma coat is applied.

(d) Set-up and machine to the dimensions given in F.	Refer to Figure 2.
(e) Install the 2A0170 Stage 1 HPT Seal (1 off).	Refer to Figure 1.
(f) Mark the new part number adjacent to the existing part number. Use the vibration peen method.	Existing / New Part Number 2A1292 / 2A1358 2A1293 / 2A1359 Refer to Figure 2. Refer to Reference (2), Control No./Task No. 70-09-00-400-501.

(2) Do a modification of the 2A0303 Stage 2 High Pressure Turbine Support Assembly (1 off) (See Reference (1) 72-45-27, Figure/Item No. 01-010 and identify as follows:

Procedure	Supplementary Information
(a) Set-up and machine to the dimensions given in E.	Refer to Figure 3 and Figure 4 (Sheets 1 and 2).

(b) Coat area F to 0.040-0.060 in. (1,02-1,52 mm). Use PWA 53-37.	Refer to Figure 4 (Sheet 2) for the location of the plasma coat. Coat will be applied by the procedure given in Reference (2), Chapter/Section 70-34-03, Plasma and Flame Spraying.	

NOTE: If not removed the shouldered pins will be masked when the plasma coat is applied.

(c) Finish machine the support to the dimensions given in G.	Refer to Figure 4.	
(e) Set-up and machine holes J to the dimensions given.	Refer to Figure 4 (sheet 1).	
(f) Mark the new part number adjacent to the existing part number. Use the vibration peen method.	Existing 2A0303 2A0304 Refer to Figure 4 (Sheet 2). Refer to Reference (2), Control No./Task No. 70-09-00-400-501.	New Part Number 2A1360 2A1361

(3) Do a modification of the 2A0200 Turbine Case (1 off) (See Reference (1) 72-45-21, Figure/Item No. 01-012) and identify as follows:

Procedure	Supplementary Information	
(a) Set-up and machine the flange bolt holes on the front flange of the Turbine Case.	Refer to Figure 5, requirements.	
(b) Set-up and machine the flange bolt holes on the rear flange of the Turbine Case.	Refer to Figure 5, requirements.	
(c) Set-up and machine the location pin hole in the front flange of the Turbine Case.	Refer to Figure 5, requirements.	
(d) Mark the new part number adjacent to the existing part number. Use the vibration peen method.	Existing 2A0200 Refer to Figure 5, requirements. Refer to Reference (2), Control No./Task No. 70-09-00-400-501.	New Part Number 2A1599

(4) Do a modification of the 2A0286 Turbine Case Bracket (1 off) (See Reference (1) 72-45-21, Figure/Item No. 01-060) and identify as follows:

Procedure	Supplementary Information
(a) Rivet the Turbine Case Bracket to the Turbine Case by the procedure specified.	Refer to Figure 5, requirements. Refer to Reference (2), Control No./Task No. 70-39-00-390-501.
(b) Transfer drill through the holes in the Turbine Case to enlarge three holes in the Turbine Case Bracket.	Refer to Figure 5, requirements.
(c) Mark the new part number adjacent to the existing part number. Use the vibration peen method.	Existing: 2A0286 — New Part Number: 2A1595 Refer to Figure 5, requirements. Refer to Reference (2), Control No./Task No.70-09-00-400-501.

(5) Do a modification of the 2A0250 Turbine Case Assembly (1 off) (See Reference (1) 72-45-21, Figure/Item No. 01-010) and identify as follows:

Procedure	Supplementary Information
(a) Install the 2A1596 Shoulder Pin (1 off) in the rear flange of the Turbine Case by the procedure specified.	Refer to Figure 5, requirements.
(c) Mark the new part number adjacent to the existing part number. Use the vibration peen method.	Existing: 2A0250 — New Part Number: 2A1600 Refer to Figure 5, requirements. Refer to Reference (2), Control No./Task No.70-09-00-400-501.

B. Assembly Instructions

(1) Assemble and identify the Turbine Nozzle Group (1 off) by use of the approved procedures in Reference (3), Chapter/Section 72-44-00, Assembly and as follows:

(a) Use 2A1358 Stage 1 High Pressure Turbine Support Assembly (1 off).

(b) Identify the 2A0300 Turbine Nozzle Group as 2A1200 by use of the approved procedures in Reference (2) Chapter/Section 70-09-00, Marking of Parts.

(2) Assemble and identify the Case and Vane Assembly by use of the approved procedures in Reference (3), Chapter/Section 72-45-20, Assembly-01 and as follows:

NOTE: The initial assembly is to do the grind procedure.

(a) Use the 2A1600 Turbine Case Assembly (1 off).

(b) Use the 2A1360 Stage 2 High Pressure Turbine Support Assembly (1 off).

(c) Do the grind of the Turbine Case and Vane Assembly by the approved procedures in Reference (3), Chapter/Section 72-45-20, Assembly-01.

(d) Assemble the Case and Vane Assembly by use of the approved procedure in Reference (3), Chapter/Section 72-45-20, Assembly-02.

(e) Identify the 2A1649 Turbine Case and Vane Assembly as 2A1357 Case and Vane Assembly by the approved procedures in Reference (2), Chapter/Section 70-09-00, Marking of Parts. Use the vibration peen method.

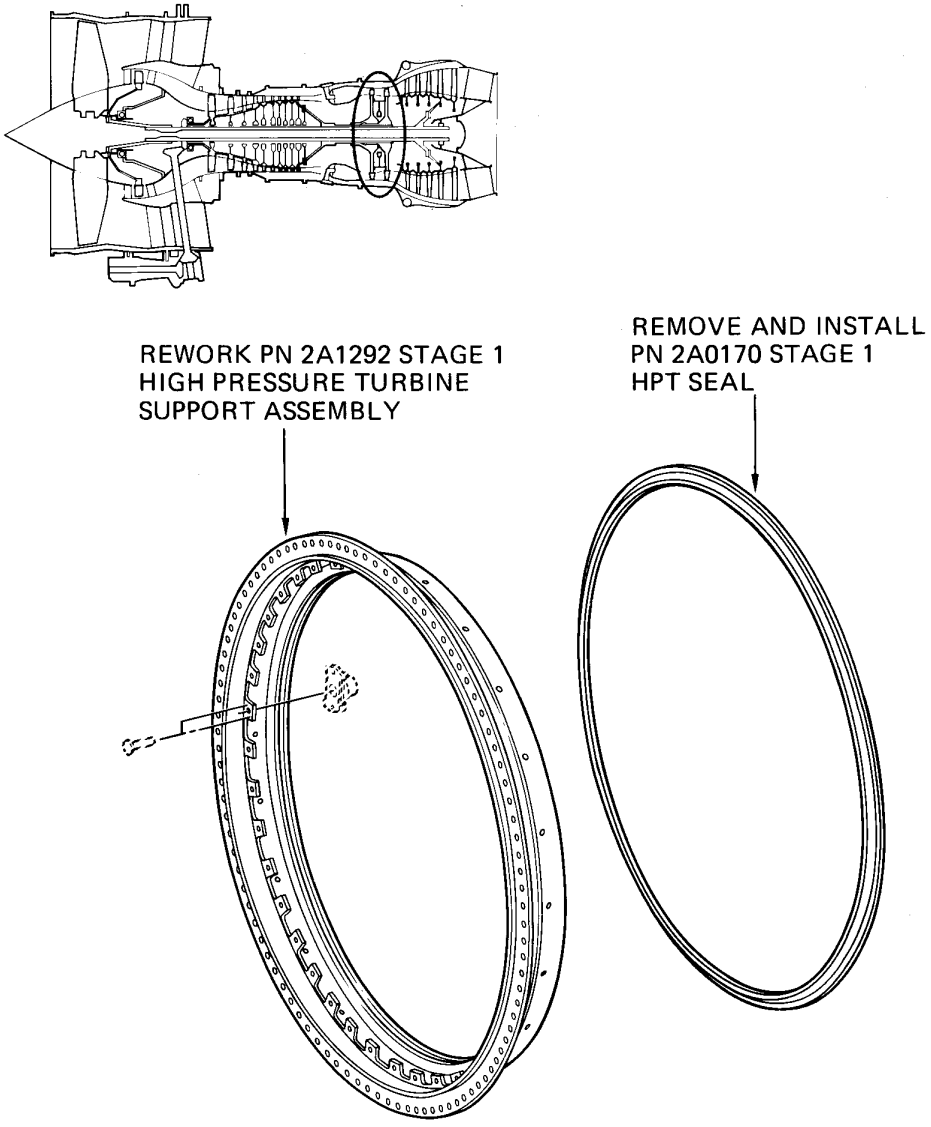
(3) Assemble and identify the High Pressure Turbine Rotor and Stator Assembly by the approved procedure in Reference (3), Chapter/Section 72-45-00 and as follows:

(a) Use 2A1357 Case and Vane Assembly (1 off).

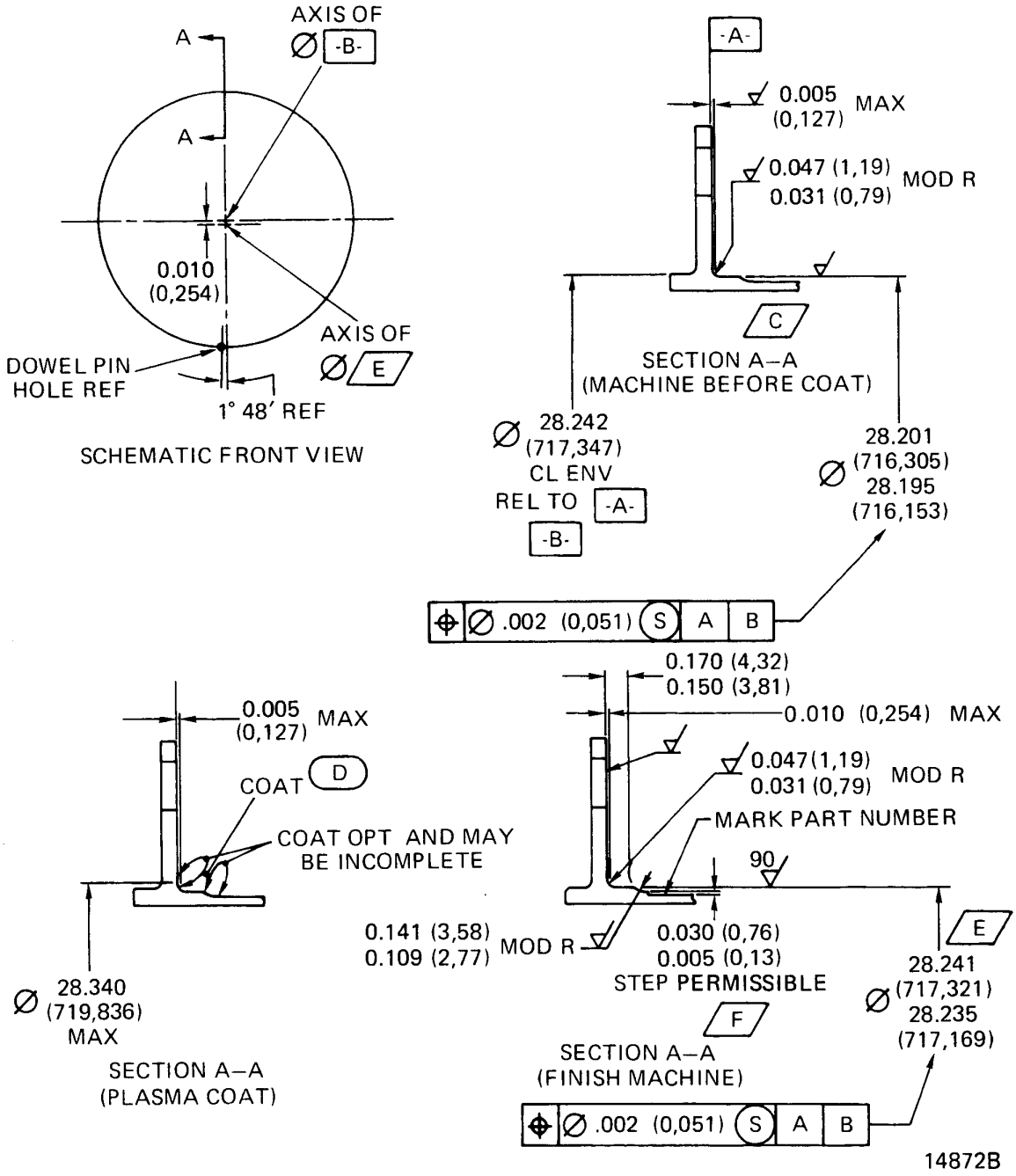
(b) Identify the 2A0100 High Pressure Turbine Rotor and Stator Assembly as 2A1300 by use of the approved procedures in Reference (2), Chapter/Section 70-09-00 Marking of Parts.

C. Recording Instructions

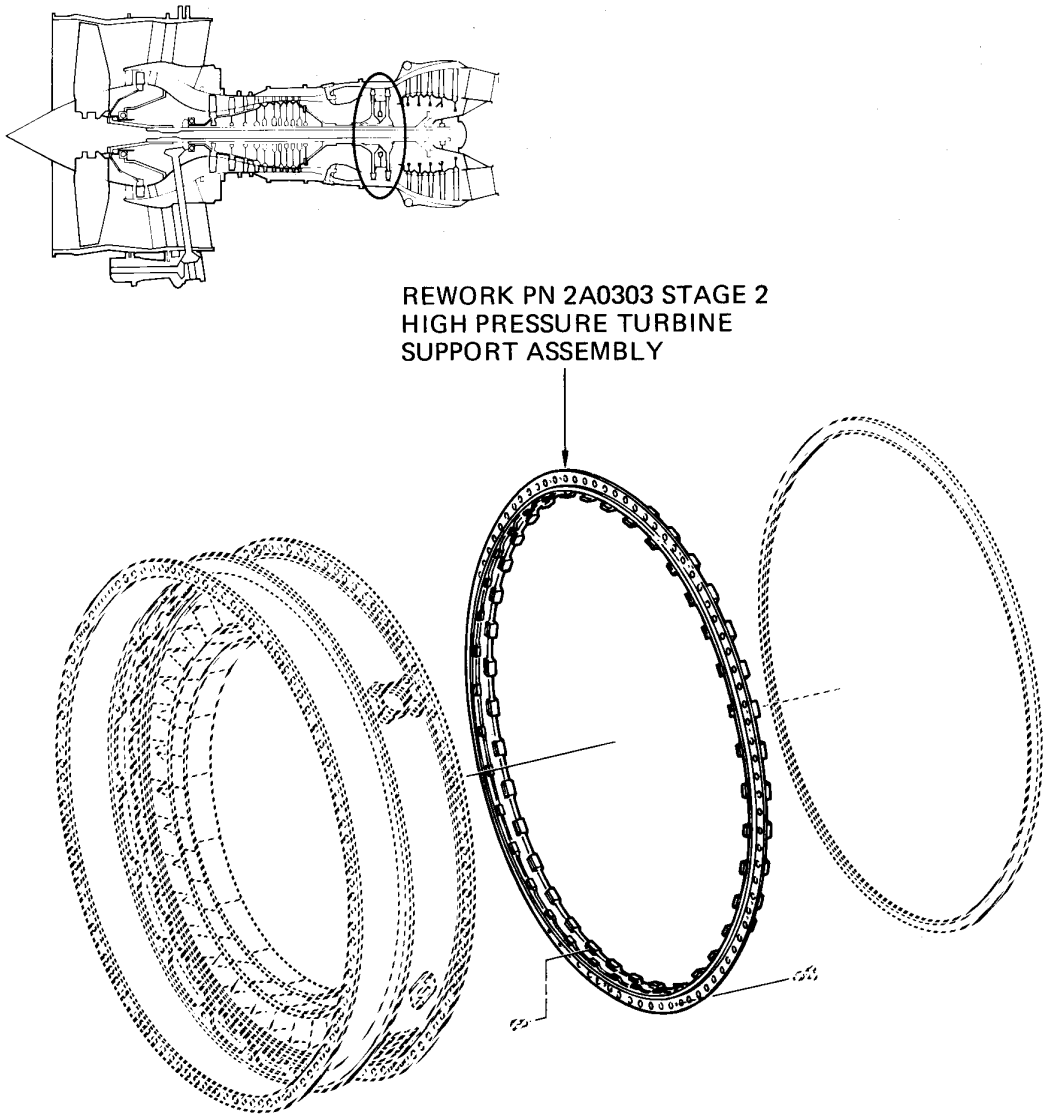
(1) A record of accomplishment is necessary.



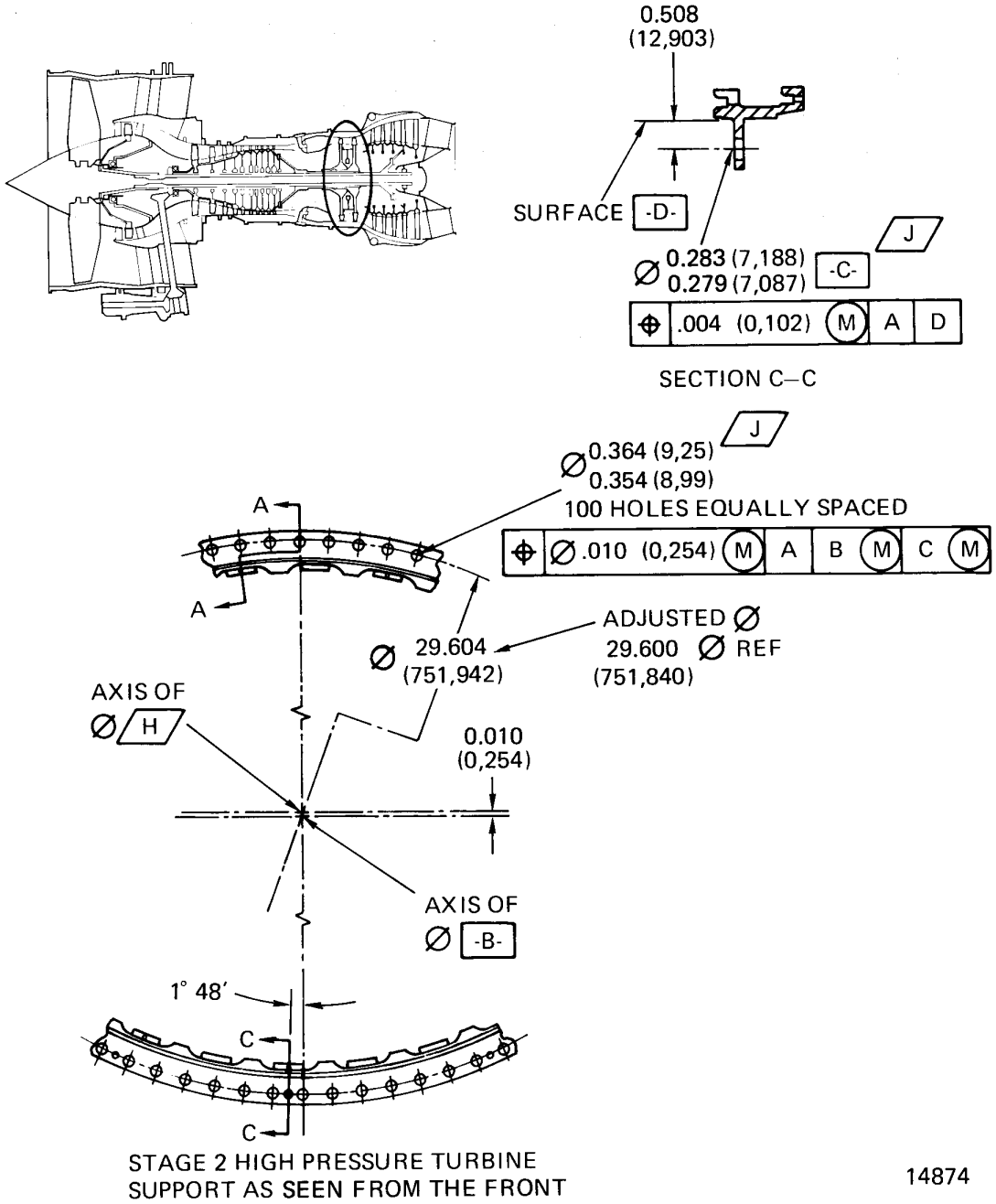
Location of Stage 1 High Pressure Turbine Support Assembly
Fig.1



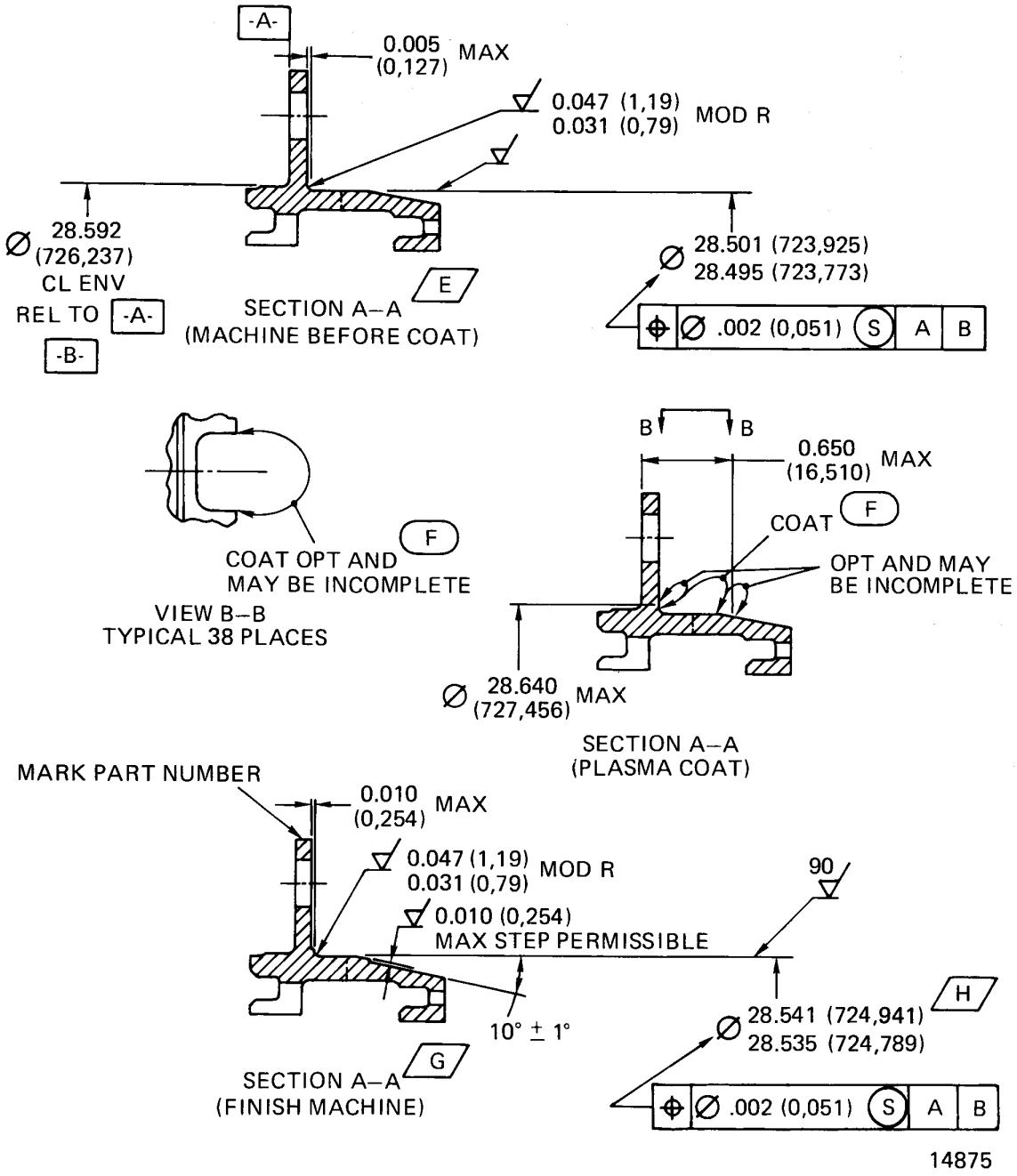
Modification of Stage 1 High Pressure Turbine Support Assembly
Fig.2



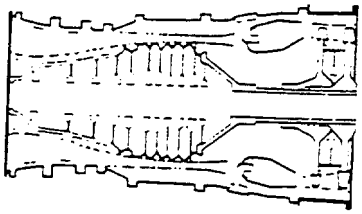
Location of Stage 2 High Pressure Turbine Support Assembly
Fig.3



Modification of Stage 2 High Pressure Turbine Support Assembly
Fig.4 (Sheet 1 of 2)



Modification of Stage 2 High Pressure Turbine Support Assembly
Fig.4 (Sheet 2 of 2)



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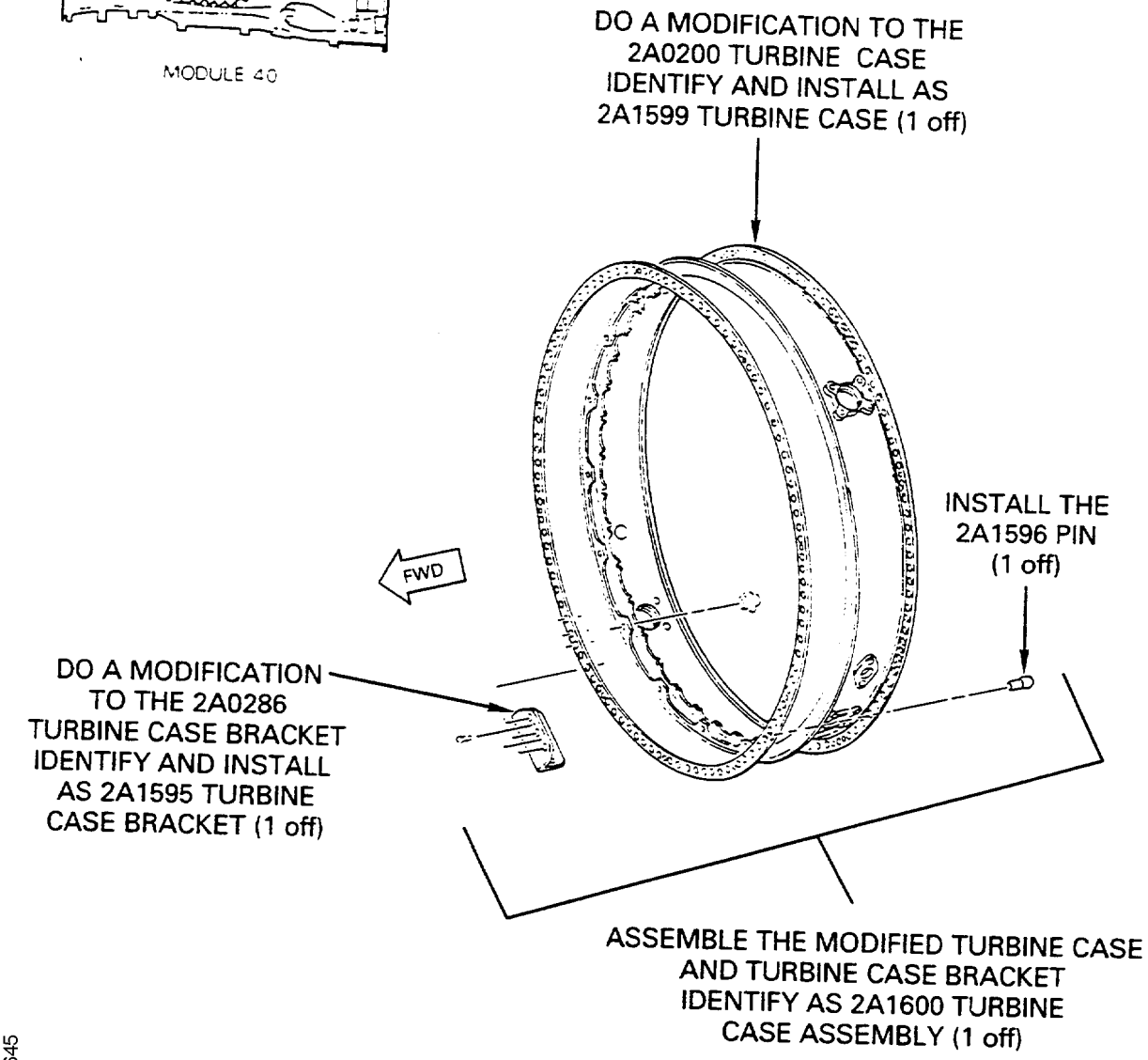

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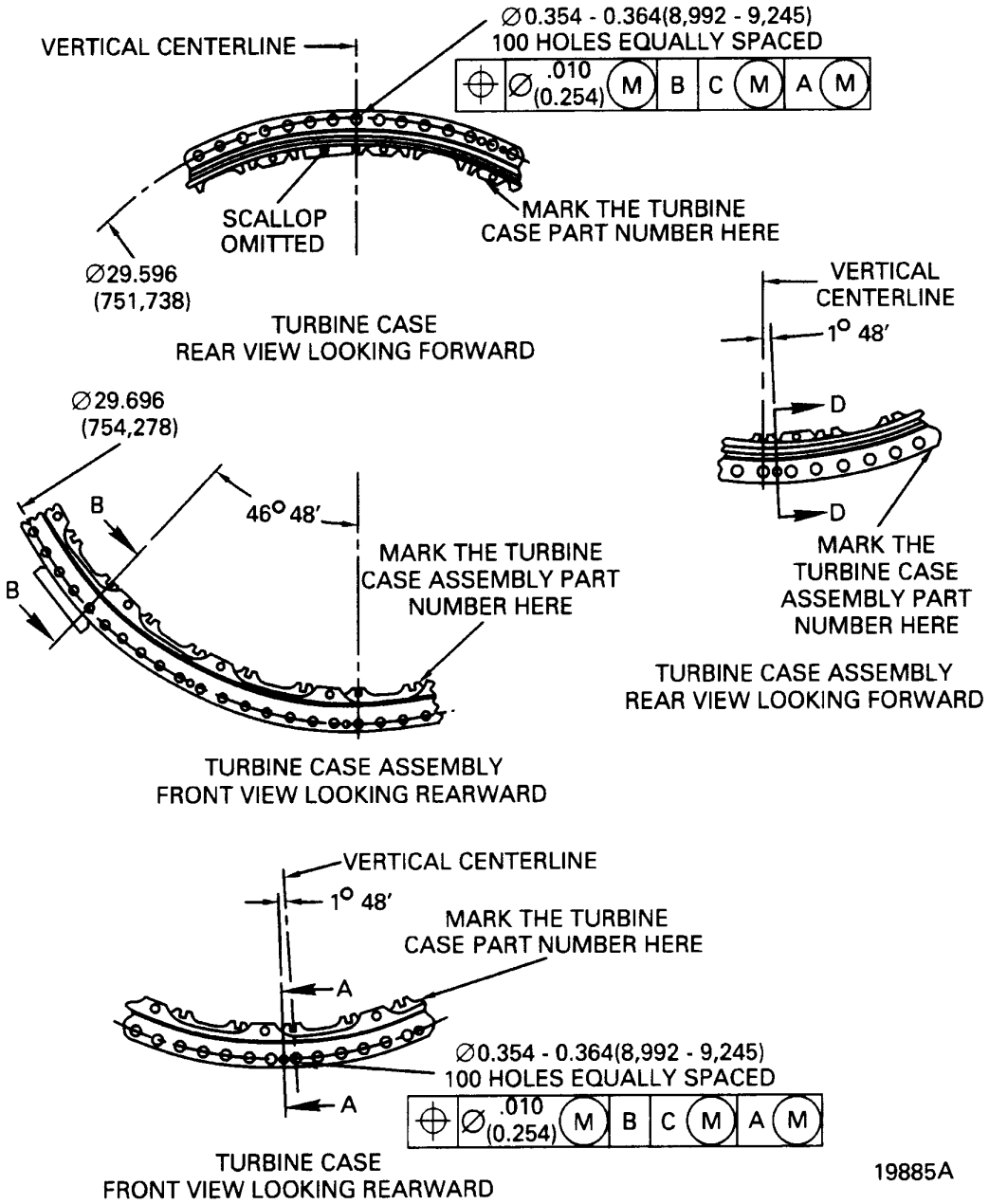
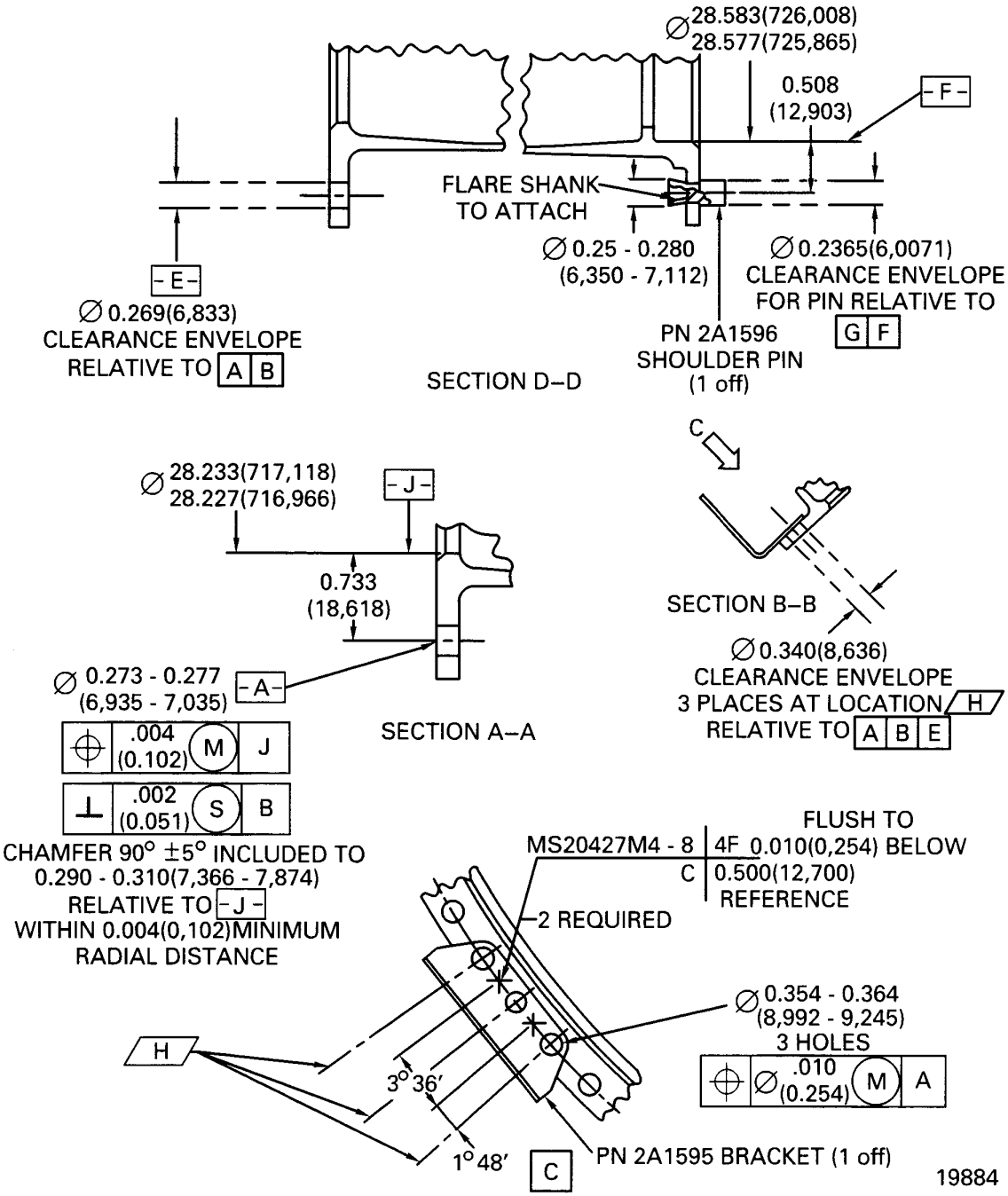
Modification of Turbine Case Assembly
Fig.5 (Sheet 1 of 3)



Modification of Turbine Case Assembly
Fig.5 (Sheet 2 of 3)



Modification of the Turbine Case
Fig.5 (Sheet 3 of 3)

3. Material Information

Applicability: For each V2500 Engine to incorporate this Bulletin.

A. Kits associated with this Bulletin:

None

B. Parts affected by this Bulletin:

New Part No. (ATA No.)	Qty	Est'd Unit Price ($)	Keyword	Old Part No. (IPC No.)	Instructions Disposition
2A1200 (72-44-00)	1		Group - Turbine Nozzle	2A0300 (01-001)	(S1) (1D) (A)
2A1358 (72-44-10)	1		Support HPT 1st Stage Assembly	2A1292 (01-010)	(S1 (1D) (B) (C)
2A1300 (72-45-00)	1		Rotor and Stator Assembly High Pressure Turbine Module	2A0100 (01-001)	(S1) (1D) (A)
2A1357 (72-45-20)	1		Case and Vane Assembly - Turbine	2A1913 (01-005)	(S1) (1D) (A) (B) (C)
2A1360 (72-45-27)	1		Support - High Pressure Turbine, 2nd Stage, Assembly	2A0303 (01-010)	(S1) (1D) (B) (C)
2A1600 (72-45-21)	1		Case - Turbine, Assembly	2A0250 (01-010)	(S1 (1D) (B) (C)
2A1599 (72-45-21)	1		Case - Turbine	2A0200 (01-012)	(S1 (1D) (A)
2A1596 (72-45-21)	1		Pin	2A0256 (01-040)	(S1 (1D) (B) (C)
2A1595 (72-45-21)	1		Bracket, Case Turbine	2A0286 (01-060)	(S1 (1D) (B) (C)

C. Expendables Required to Incorporate this Bulletin.

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D. Instruction/Dispostion Code Statements:

(S1) New Parts coded (S1) must replace Old Parts coded (S1) as a COMPLETE SET per Engine.
(1D) Modify old part per Accomplishment Instructions.
(A) Part is a nonprovisioned item, not normally stocked as a spare item.
(B) New part is available.
(C) 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 Sales Department for information concerning firm prices.

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