V2500 International Aero Engines

Date: Feb.20/97

Subject: Transmittal of Revision 3 to Service Bulletin Number V2500-ENG-72-0192

Service Bulletin Revision History:

Event	Date
Basic Issue	Mar.3/94
Revision 1	Jun.15/94
Revision 2	Aug.10/95
Revision 3	Feb.20/97

Reasons For Issuance Of Revision:

(1) To revise step (3) of Paragraph 2.A.

Effect On Past Compliance:

None

List Of Effective Pages:

	Bulletin Page No.	Rev. No.	Effective Date
R	1	3	Feb.20/97
	2 and 3	1	Jun.15/94
	4	2	Aug.10/95
	5	1	Jun.15/94
R	6	3	Feb.20/97
	7 to 9	1	Jun.15/94
	10	2	Aug.10/95
	11 to 22	1	Jun.15/94

V2500 International Aero Engines
SERVICE BULLETIN

ENGINE - TURBINE EXHAUST CASE ASSEMBLY AND FITTINGS - REMOVE THE TURBINE EXHAUST CASE FAIRING

MODEL APPLICATION

V2500-A1
V2500-A5
V2500-D5

BULLETIN INDEX INDICATOR

72-50-00

Compliance Category Code	Internal Reference No.
3	93VA130 94VC003 94VC003A

ENGINE - TURBINE EXHAUST CASE ASSEMBLY AND FITTINGS -
REMOVE THE TURBINE EXHAUST CASE FAIRING

1. Planning Information

A. Effectivity

(1) Aircraft: Airbus A320, A321
McDonnell Douglas MD-90

(2) Engine: V2500-A1 Engines Serial Nos.V0299 through V0351 except V0345, V0348, and V0351.
V2500-A5 Engines before Serial No.V10071
V2500-D5 Engines before Serial No.V20007

B. Reason

(1) Condition

It was found that the Turbine Exhaust Case Fairing can crack.

(2) Background

Inspection of the fairing on some experimental engines has shown cracks at some rivet locations. Analysis of the design has shown that the fairing can be removed.

(3) Objective

To supply a new Turbine Exhaust Case Assembly without a fairing.

(4) Substantiation

Successful analytical review.

(5) Effects of Bulletin on Workshop Procedures:

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.

C. Description

(1) Do an inspection of the Turbine Exhaust Case Fairing to see if there are any cracks.

(2) Remove the fairing which is riveted to the Turbine Exhaust Case Flange at the Low Pressure Turbine interface.

D. Approval

The Part Number Changes and/or part modifications described in Section 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 3

Accomplish at the next "2A" Check after you get this Service Bulletin.

F. Manpower

Estimated Manhours to incorporate the full intent of this Bulletin:

Venue	Estimated Manhours
(1) In service (Part 1)..	Total 4 Hours 48 Minutes
(a) To inspect the Turbine Exhaust Case Fairing	10 Minutes
(b) To gain access to the turbine exhaust case assembly...	13 Minutes
(c) To remove the tail cone and the common nozzle assembly	54 Minutes
(d) To remove the turbine exhaust case fairing..	2 Hours 18 Minutes
(e) To identify the Turbine exhaust case assembly with the new part number..	2 Minutes
(f) To install the common nozzle assembly and the tail cone...	1 Hour 5 Minutes
(g) To return to flyable status..	16 Minutes
	Total: 4 hours 58 Minutes

(2) At overhaul (Part 2)

(a) To remove the Turbine Exhaust Case Fairing.. .. .. 2 Hours 20 Minutes

(b) To identify the Turbine Exhaust Case Assembly with the new part number.. .. .. 2 Minutes

R Total: 2 Hours 22 Minutes

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 to accomplish Sub-division 2 of this Service Bulletin.

Standard Tools:

NOTE: The standard tools that follow are necessary to do the modification in this Service Bulletin.

Tool No.	Qty.	Description	Function	Availability
JT-8715 or equivalent	1	0.250 in (6,350 mm) High Speed Grinder (90 Degree Tool)	Grind off rivet heads.	(1)

(1) The tool can be locally purchased.

I. Weight and Balance

(1) Weight change .. .. .. Minus 1.7 lbs (0.77 kg.)

(2) Moment arm .. .. .. No effect

(3) Datum .. .. .. Engine front mount Centerline (Powerplant station P.P.S.100)

J. Electrical Load Data

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

K. Reference

(1) V2500 Engine Illustrated Parts Catalogs (V2500-A1, V2500-A5 and V2500-D5).

(2) The A320/A321 Aircraft Maintenance Manual

(3) The MD-90 Aircraft Maintenance Manual

(4) V2500 Standard Practices Manual

(5) V2500 Engine Manual.

(6) V2500-D5 Engine Manual.

L. Other Publications Affected

(1) The V2500 Engine Illustrated Parts Catalog Chapter/Section 72-50-53, Figure 2 (for the V2500-A1, V2500-A5 and V2500-D5), to remove and add parts as applicable.

(2) The V2500 Engine Manual, Chapter/Section 72-50-53, Cleaning, to add the new part number.

(3) The V2500-D5 Engine Manual, Chapter/Section 72-50-53, Cleaning, to add the new part number.

(4) The V2500 Engine Manual, Chapter/Section 72-50-53, Inspection, to add the new part number.

(5) The V2500-D5 Engine Manual, Chapter/Section 72-50-53, Inspection, to add the new part number.

(6) The V2500 Engine Manual, Chapter/Section 72-50-53, Repair, to add the new part number.

(7) The V2500-D5 Engine Manual, Chapter/Section 72-50-53, Repair, to add the new part number.

2. Accomplishment Instructions

Part 1 Installed Engines

A. Inspection Procedure

(1) Do a visual inspection of the Turbine Exhaust Case Fairing by the procedure that follows:

NOTE: You will need to use a light source to see clearly when you do this procedure.

It is not necessary to disassemble any part of the engine to do this inspection.

The manufactured break in the fairing is usually at the 12 o'clock location.

(a) Get access to the Turbine Exhaust Case Fairing through the rear of the engine.

(b) Do a visual inspection of the Turbine Exhaust Case Fairing for cracks by Table 1.

(2) If the fairing is in the limits when you do the inspection by Table 1, you must schedule the engine for fairing removal at the next aircraft "C" Check.

(3) If the fairing is not in the limits when you do the inspection by Table 1, remove the fairing by the procedure given in paragraphs B through D.

R

B. Fairing Removal - Pre-requisite Instructions

(1) Remove the Common Nozzle Assembly by the approved procedure given in Reference (2), Chapter/Section 78-11-11, (TASK 78-11-11-000-010) or Reference (3), Chapter/Section 78-10-01 Removal/Installation.

NOTE: This procedure is optional. It is possible to do the rework with the Common Nozzle Assembly installed.

(2) Remove the Exhaust Cone by the approved procedure given in Reference (2), Chapter/Section 78-11-12, (TASK 78-11-12-000-010) or Reference (3), Chapter/Section 78-10-02, Removal/Installation.

NOTE: This procedure is optional. It is possible to do the rework with the Exhaust Cone installed.

R Fairing Inspection - Table 1

Inspection Area	Condition	Necessary Procedure
1. All areas (Figure 1)	No cracks.	Inspect again at the next 2 "A" Check.
2. Outer rivet crack - in relation to the rivet circle. (Figure 1)	Cracks - outer area only. (No limit)	Inspect again at the next 2 "A" Check.
3. Inner and outer rivet cracks, both sides of rivet circle, at end rivet locations. (The end rivets are the 2 rivets adjacent to the manufactured break. [Figure 1])	Cracks with total length equal to more than fifty percent of the distance between the fairing outer edge and the inner radius.	Remove the Fairing immediately by the procedure given in Paragraphs B through D.
4. Inner and outer rivet cracks, both sides of rivet circle. (Figure 1)	Cracks at any two rivets, adjacent to each other, when the total length is equal to more than fifty percent of the distance between the fairing outer edge and the inner radius.	Remove the Fairing immediately by the procedure given in Paragraphs B through D.
5. Inner and outer rivet cracks, both sides of rivet circle. (Figure 1)	Cracks at a maximum of 15 rivet holes. Cracks cannot be at adjacent rivets, and cannot be at the two end rivets.	Inspect again at the next 2 "A" check.
6. Inner and outer rivet cracks, both sides of rivet circle. (Figure 1)	Cracks in both directions from the rivet, radially in and out, at more than fifteen locations.	Remove the Fairing immediately by the procedure given in Paragraphs B through D.
7. All areas (Figure 1)	Damage other than 1 through 6.	Inspect again at the next 2 "A" Check.

C. Rework Instructions

(1) Make a Low Pressure Turbine (LPT) protective cover (C) from a sheet of flexible plastic 0.020 to 0.040 in. (0,51 - 1,02 mm) thick. See Figure 2 for the necessary dimensions.

(2) Attach the LPT protective cover by Figure 3 and the procedure that follows:

(a) Push the cover through the struts to install it.

(b) Install the cover at the interface of the Low Pressure Turbine and the Turbine Exhaust Case.

1 Position the cover as shown in Figure 3.

(c) Tape the cover to the Turbine Exhaust Case at the inner and outer diameters and tape the split in the cover.

NOTE: If the cover is made in two halves, install as shown in Figure 3. Form a complete ring and cover both splits with tape.

(3) Apply masking tape to protect the instrumented strut leading edges. See Figure 3.

(4) Install cardboard covers for protection on all strut leading edges. See Figure 3.

(5) Apply the necessary masking to cover the exhaust cone flange opening.

(6) Make a Turbine Exhaust Case protective guard to the dimensions given in Figure 4 and as follows:

(a) Use sheet metal that is 0.02 - 0.04 in (0,51 - 1,02 mm) thick.

(b) Make the guard so that the contour is the same as the surface it will touch on the Turbine Exhaust Case.

(7) Install the Turbine Exhaust Case guard next to the rivet that you will grind. See Figure 3.

NOTE: You must move this guard, as necessary, until the rivets are ground at all locations.

CAUTION: DO NOT DAMAGE THE TURBINE EXHAUST CASE DURING FAIRING REMOVAL. DAMAGE CAN RESULT IN ENGINE REMOVAL.

DO NOT DAMAGE LPT BLADES OR OUTER AIR SEALS DURING FAIRING REMOVAL. DAMAGE CAN RESULT IN ENGINE REMOVAL.

(8) Bend the fairing (A) toward the center of the Turbine Exhaust Case. See Figures 5 and 6.

(a) Start at the manufactured break in the fairing.

(b) Use the applicable guards for protection of the engine parts.

(c) Pry the fairing inboard, approximately 45 degrees in relation to the case centerline.

(9) Grind the rivet heads (E) at 32 locations by Figure 6 and as follows:

CAUTION: KEEP THE GRINDING WHEEL AWAY FROM THE STRUTS.

USE A GRINDING WHEEL AS SHOWN IN FIGURE 5 TO MINIMIZE THE RISK OF DAMAGE TO THE LOW PRESSURE TURBINE AND THE TURBINE EXHAUST CASE.

(a) Use a guard for protection and to prevent damage to the Turbine Exhaust Case wall.

(b) Do not grind through the fairing.

(10) Remove the fairing by the procedure that follows:

(a) Pull the fairing away from the ground rivet.

1 Start at the manufactured break.

(b) Pull the fairing rearward through the struts.

1 Bend the fairing, as necessary, and cut it into pieces that are small enough to remove.

2 Use a shears to cut the fairing into pieces.

(11) Remove all unwanted material from the engine gas path. Use a vacuum to clean the area.

(12) Remove the masking tape from all locations.

(13) Identify the Turbine Exhaust Case Assembly by the procedure given in Reference (4), Chapter/Section 70-09-00, Marking of Parts.

(a) Mark through the old part number and mark the new part number adjacent to the old part number.

1 The new part number is 2A3111-01 for V2500-A1 and V2500-A5 Engines.

2 The new part number is 2A3110-01 for V2500-D5 Engines.

(b) Use the vibration peen method.

D. Post-requisite Instructions

(1) Install the Exhaust Cone by the approved procedure given in Reference (2), Chapter/Section 78-11-12, (TASK 78-11-12-400-010) or Reference (3), Chapter/Section 78-10-02, Removal/Installation.

(2) Install the Common Nozzle Assembly by the approved procedure given in Reference (2), Chapter/Section 78-11-11, (TASK 78-11-11-400-010) or Reference (3), Chapter/Section 78-10-01 Removal/Installation.

NOTE: The remaining rivet parts must be removed when the engine is disassembled sufficiently to do the work.

R Part 2 (Uninstalled Engines)

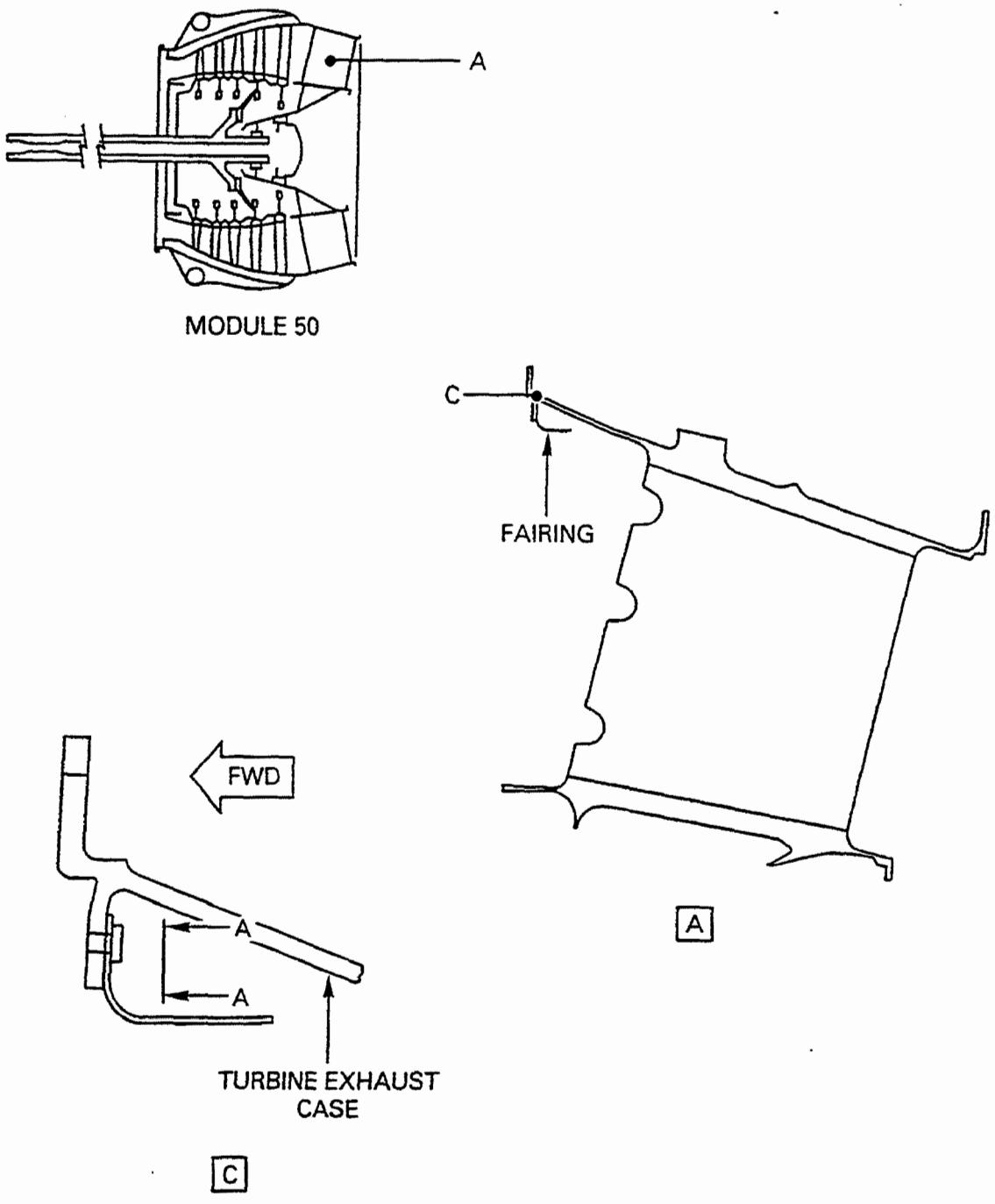
E. Rework Instructions

(1) Remove the Turbine Exhaust Case Fairing and identify the Turbine Exhaust Case Assembly by the procedure given in paragraph 2 C., steps (1) through (13).

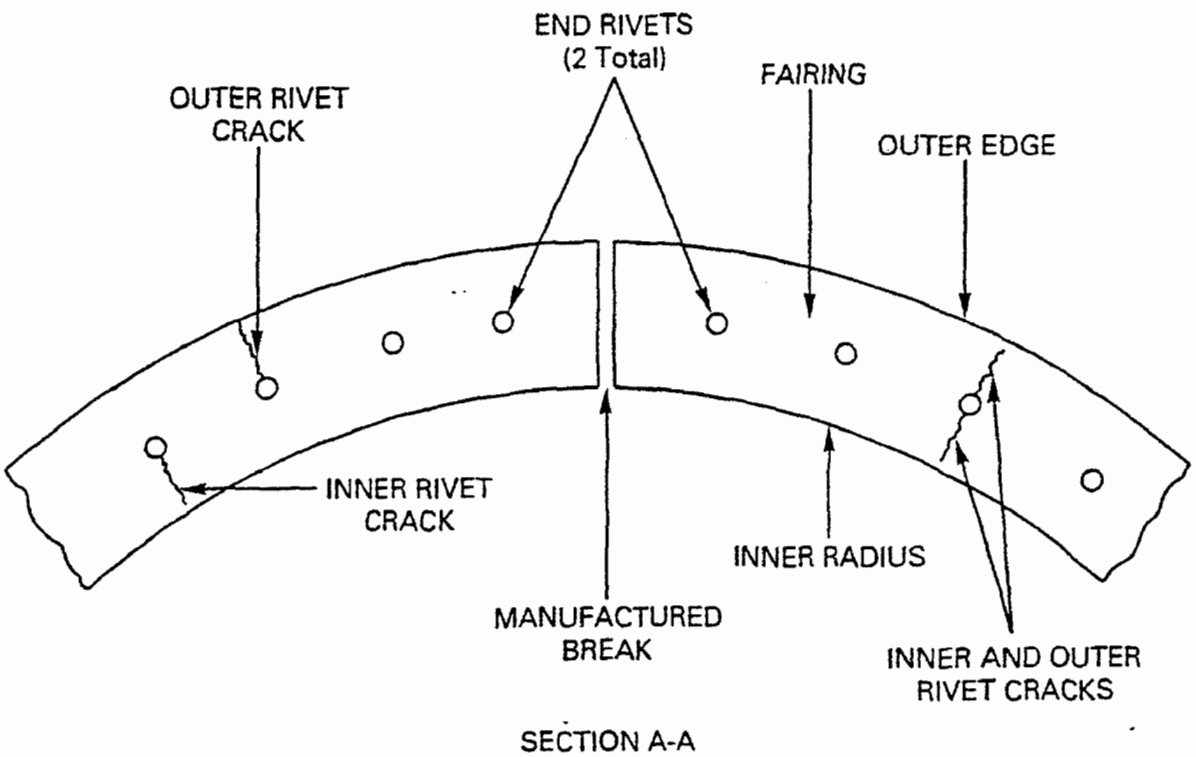
NOTE: If the Turbine Exhaust Case is removed from the Low Pressure Turbine you can drill out the rivets (at 32 locations) with the applicable size drill. Rivet hole diameter is 0.096 to 0.100 in. (2,439 - 2,540 mm).

H. Recording Instructions

(1) A record of accomplishment is necessary.

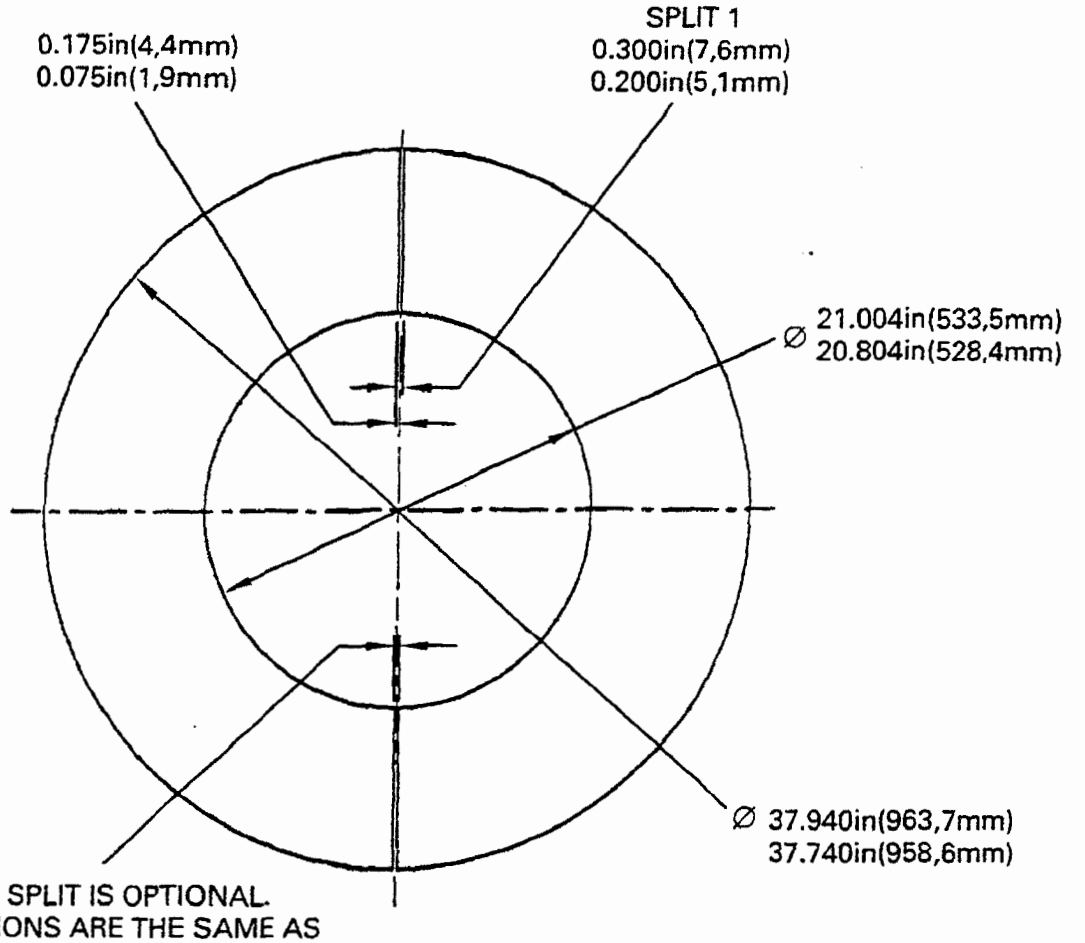


Inspection location Turbine Exhaust Case Fairing
Figure 1 (Sheet 1)



E2133

Inspection location for the Turbine Exhaust Case Fairing
Figure 1 (Sheet 2)

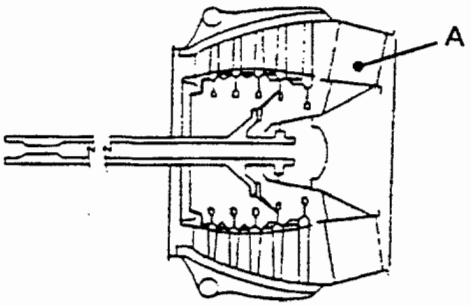


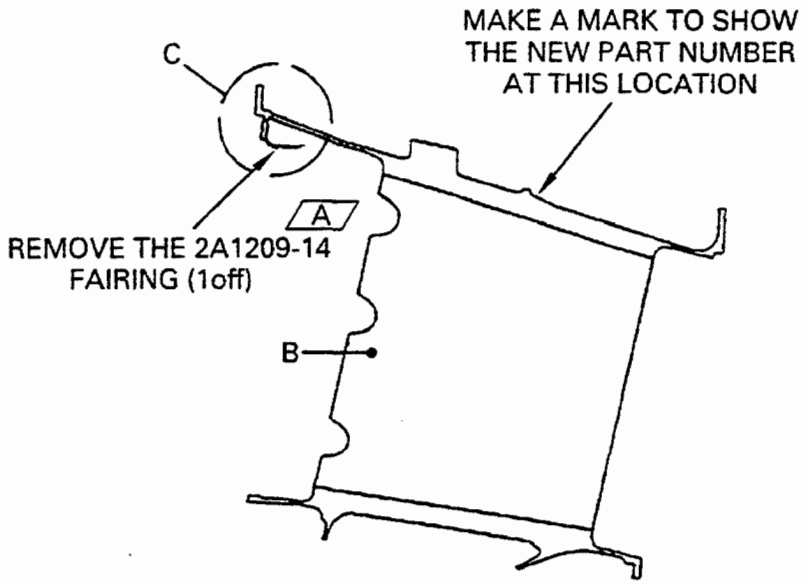
LOW PRESSURE TURBINE
PROTECTIVE COVERING C

NOTE: MATERIAL IS FLEXIBLE PLASTIC.
THICKNESS IS 0.020 - 0.040in(0,51 - 1,02mm)

E2044

Make The Low Pressure Turbine Cover
(Protection against Damage)
Figure 2

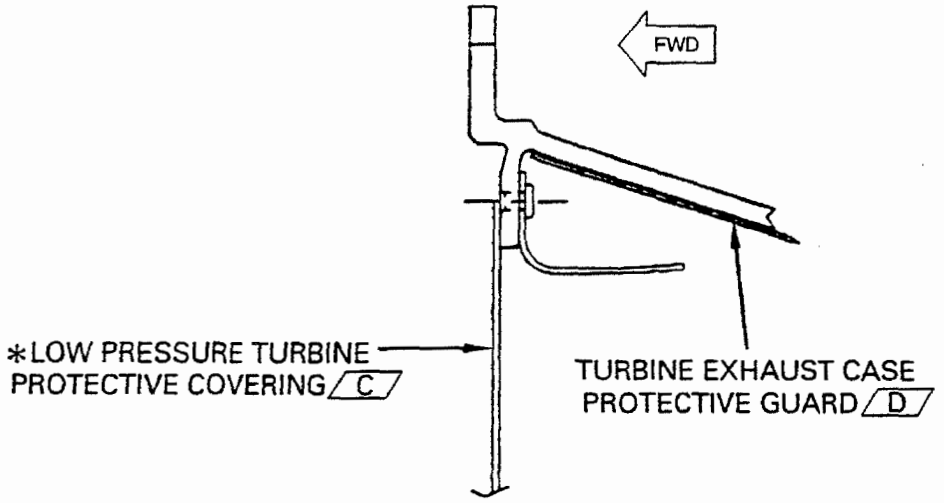




A

E2047

Install the Low Pressure Turbine Cover
and Strut Leading Edge Protection
Figure 3 (Sheet 1)

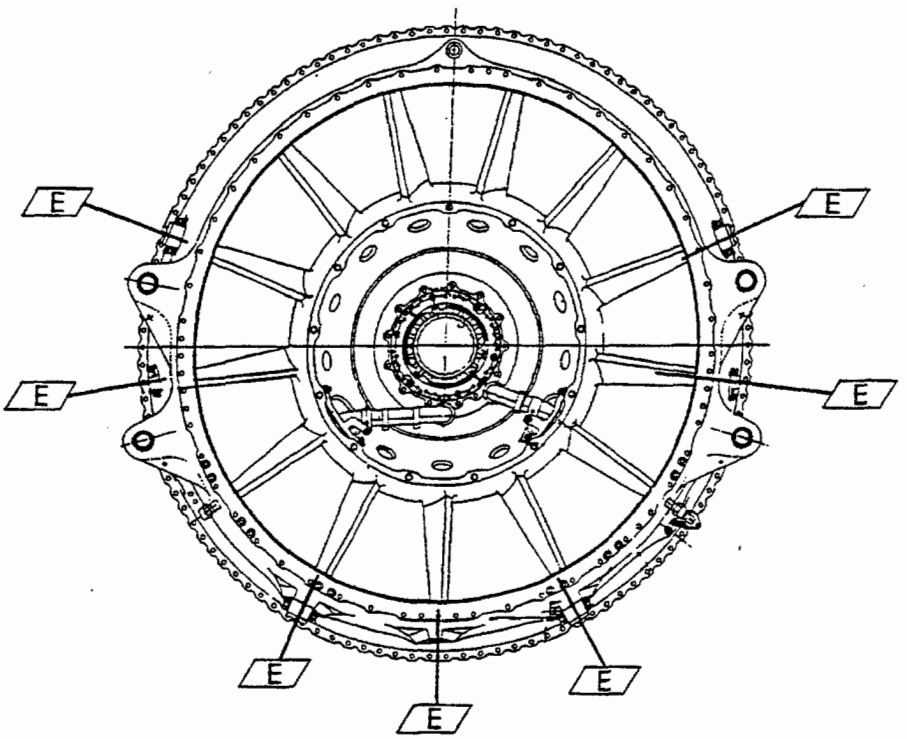


C

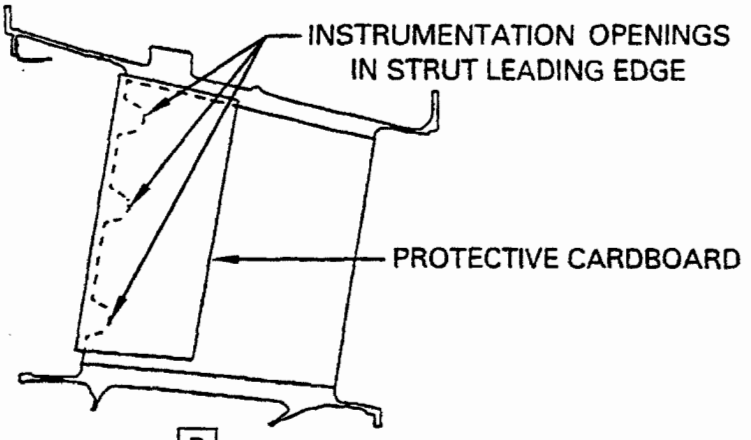
*NOTE : TAPE PART C AT THE ID AND OD AS NECESSARY TO HOLD IT AND COVER THE SPLIT WITH TAPE. IF THE PART IS MADE IN TWO HALVES POSITION THE PARTS AS SHOWN TOGETHER TO FORM A FULL RING AND COVER BOTH SPLITS WITH TAPE.

E2048

Install the Low Pressure Turbine Cover and Strut Leading Edge Protection
Figure 3 (Sheet 2)



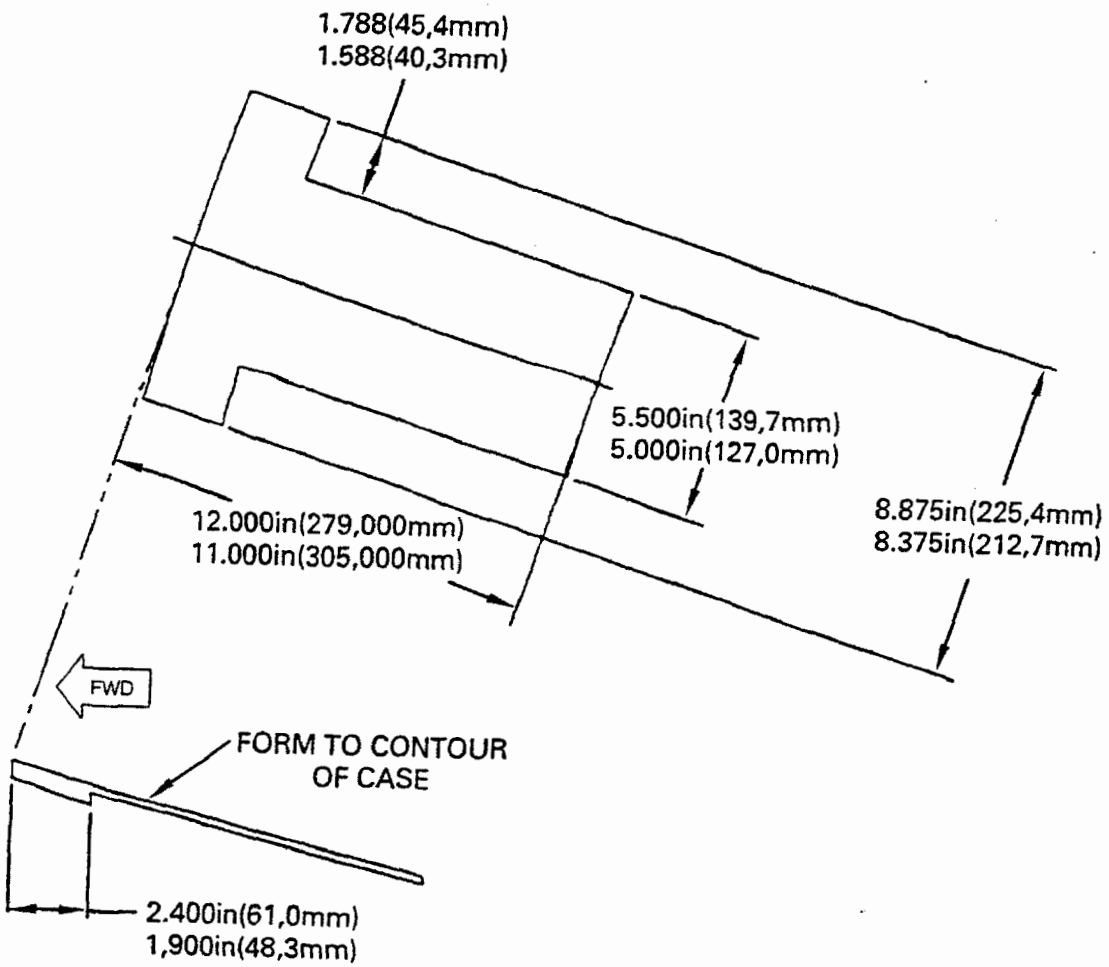
TYPICAL VIEW OF THE
TURBINE EXHAUST CASE ASSEMBLY
WHEN YOU LOOK FROM THE REAR



TYPICAL 7 PLACES
AT LOCATION E

E2049

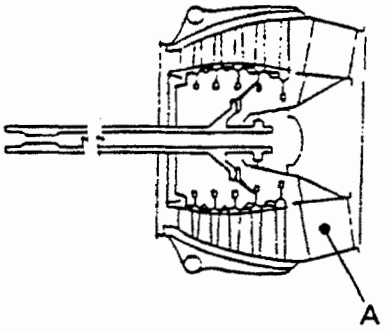
Install the Low Pressure Turbine Cover
and Strut Leading Edge Protection
Figure 3 (Sheet 3)

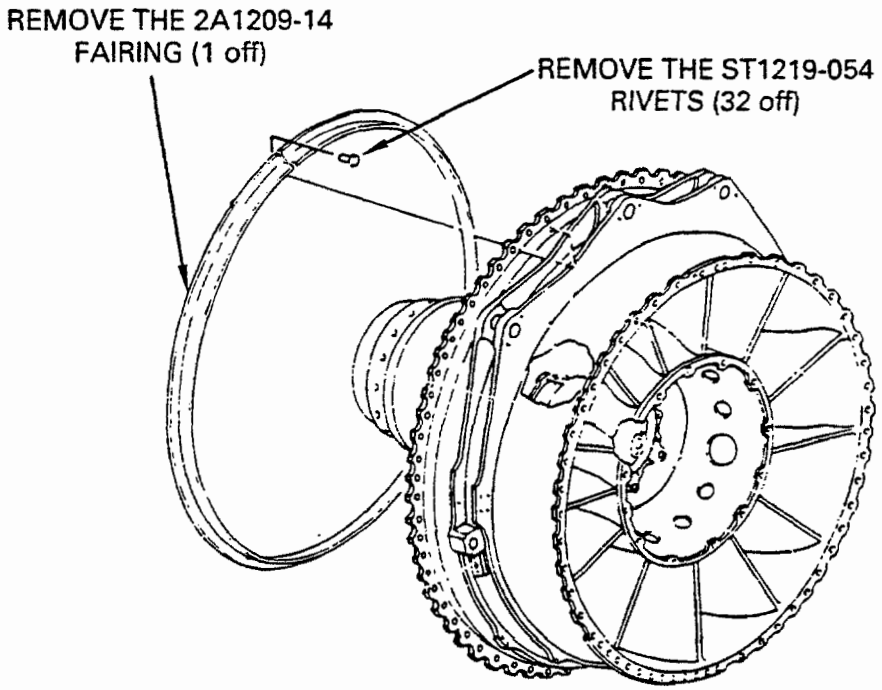


TURBINE EXHAUST CASE
PROTECTIVE GUARD D

E2050

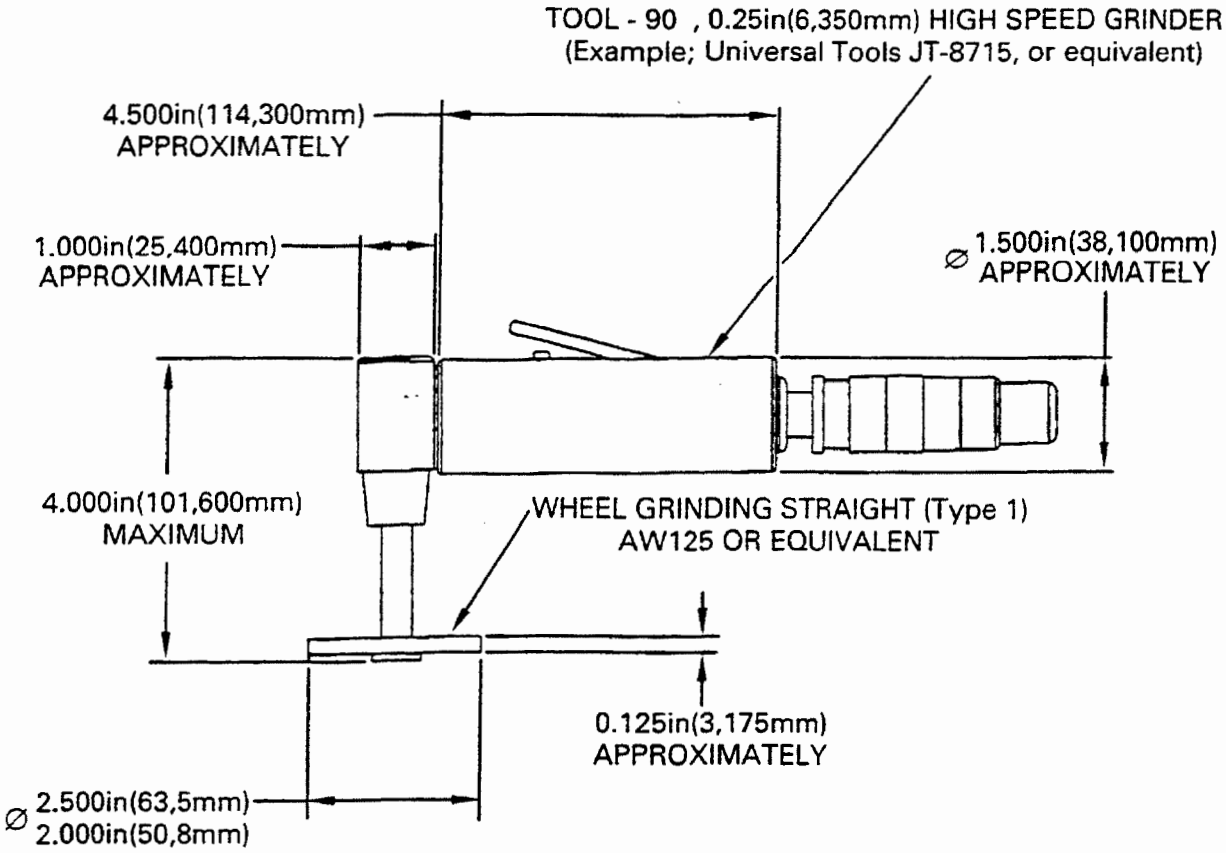
Make The Turbine Exhaust Case Guard
(Protection Against Damage)
Figure 4





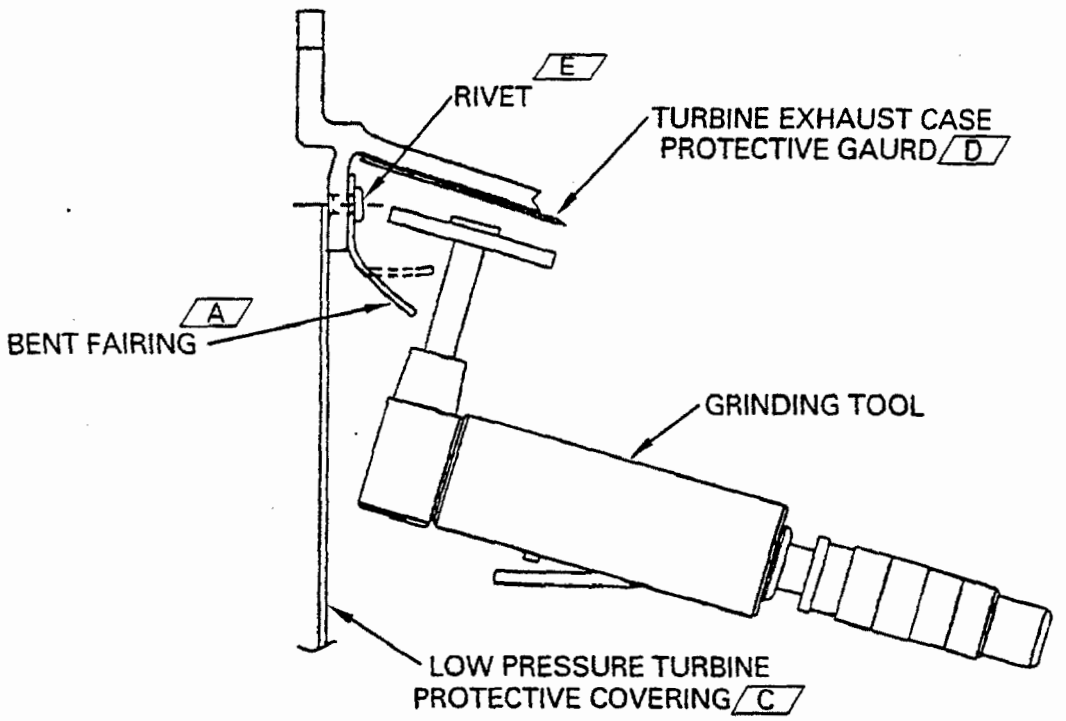
E2051

Location of the Turbine
Exhaust Case Fairing
Figure 5.



E2052

Grind to Remove the Turbine
Exhaust Case Fairing
Figure 6 (Sheet 1)



E2053

Grind to Remove the Turbine
Exhaust Case Fairing
Figure 6 (Sheet 2)

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
Applicability: For each V2500-A1 and V2500-A5 Engine to incorporate this Service Bulletin.					
2A3111-01 (72-50-53)	1		..Case Assembly - Turbine Exhaust	2A2620-01 (21-300)	(S1) (1D) (A) (B)
- (72-50-53)	1		...Fairing - Turbine Exhaust Case	2A1209-14 (21-430)	(A)
- (72-50-53)	32		...Rivet - Solid	ST1219-054 (21-420)	(A)
Applicability: For each V2500-D5 Engine to incorporate this Service Bulletin.					
2A3110-01 (72-50-53)	1		..Case Assembly - Turbine Exhaust	2A1220-01 (21-300)	(S1) (1D) (A) (B)
- (72-50-53)	1		...Fairing - Turbine Exhaust Case	2A1209-14 (21-430)	(A)
- (72-50-53)	32		...Rivet - Solid	ST1219-054 (21-420)	(A)

D. Consumable materials required to accomplish this Service Bulletin

Flexible Plastic Sheets	No Specific - 0.020 to 0.040 in (0,51 - 1,02 mm) thick
Cardboard	No Specific
Sheet Metal	No Specific - 0.020 to 0.040 in (0,51 - 1,02 mm) thick
Tape, Masking	No specific
Wheel, Grinding	Straight (Type 1) AW125, or equivalent

C. Instruction/Disposition Code Statements:

(S1) Old Parts and new parts coded (S1) are freely and fully interchangeable.
(1D) You can do a modification to the old part and identify it as the new part number.
(A) Old part is no longer available.
(B) New part is currently available.

NOTE: The estimated 1994 unit prices shown are provided for planning purposes only and do not constitute a firm quotation. Consult the IAE Price Catalog or contact IAE's Spare Parts Sales Department for information concerning firm prices.