V2500 International Aero Engines

V2500 Propulsion System — Nacelle

SERVICE BULLETIN

Date: March 16, 1999

Subject: Transmittal of Revision 2 to Service Bulletin Number V2500-NAC-78-0119

Service Bulletin Revision History:

Event	Date
Basic Issue	May 07/97
Revision 1	Sep. 17/97
Revision 2	May 16/99

Reasons for Issuance of Revision

(1) To change the serial numbers in the Effectivity statement on page 2.

Effect on Past Compliance

(1) None.

List of Effective Pages:

Page No.	Rev. No.	Date
1 and 2	2	May 16/99
3 thru 19	Basic	May 07/96

V2500 International Aero Engines

V2500 Propulsion System — Nacelle

SERVICE BULLETIN

NACELLE - EXHAUST - OUTER SKIN, EXIT NOZZLE, COMMON NOZZLE ASSEMBLY (CNA) - MODIFICATION OF

MODEL APPLICATION

V2500-D5

BULLETIN INDEX LOCATOR

78-11-00

Compliance Category Code

6

Internal Reference No.

JG 95VN360

May 7, 1997
Revision 2 - March 16, 1999

V2500-NAC-78-0119

1. Planning Information

A. Effectivity

(1) Airplane: MD-90

(2) Nacelle: V2500-D5 common nozzle assembly (CNA) serial
R numbers 0011001, 0013001, 0014001, 0015001,
R 0017001, 0018001 and 0021001 through 0154001.

B. Reason

(1) Condition

Heat aft of the CNA thrust recovery hood may cause deformation of the CNA exit nozzle skin in that area.

(2) Background

Operators have experienced deformation of the CNA exit nozzle skin aft of the thrust recovery hood.

(3) Objective

Modify the CNA exit nozzle skin to prevent the possibility of deformation.

(4) Substantiation

Testing of a modified CNA exit nozzle was successful.

(5) Impact of Bulletin on Workshop Procedures:

Removal/Installation	Not Affected
Disassembly/Assembly	Not Affected
Cleaning	Not Affected
Inspection/Repair	Affected
Repair	Affected
Testing	Not Affected

(6) Supplemental Information

None.

C. Description

The exit nozzle skin on both sides of the CNA aft of the thrust recovery hood is removed, splices are installed and a titanium skin is riveted to the splices.

NOTE: It is not necessary to do this service bulletin to areas of the CNA on which repair VRS2440 has been done.

D. Approval

Incorporation of this Service Bulletin must be accomplished only in conjunction with Douglas Aircraft Company Service Bulletin MD-90-78-021 which has received exclusive FAA approval for MD-90 Series aircraft.

E. Compliance

Category 6

Accomplish when the nacelle subassembly (i.e. accessories, components) 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 for each nacelle:

VENUE			ESTIMATED MANHOURS
(1)	In Service		
	(a)	To gain access	0.0 M/Hrs.
	(b)	To rework	5.0 M/Hrs.
	(c)	To return to service	0.0 M/Hrs.
		Total	5.0 M/Hrs.
(2)	In Shop		
	(a)	To Rework	5.0 M/Hrs.
		Total	5.0 M/Hrs

NOTE: After incorporation of this modification, a maximum of 10.0 manhours for labor will be reimbursed by Rohr, as a labor credit allowance per affected aircraft to obtain a labor credit allowance after procurement of noted material. Labor claims should reference this service bulletin number and aircraft fuselage number and be submitted to:

Rohr, Inc.
850 Lagoon Drive
Chula Vista, CA 91910-2098
Attn: Airline Support Manager, MZ 107A
Warranty Department
(Ref. Service Bulletin V2500-NAC-78-0119)

G. Material - Cost and Availability

The parts to do this service bulletin are available from Rohr, Inc. as kit V2578119-551.

Operators with units shown in Paragraph 1.A. should send a no charge purchase order for the applicable quantity of kits. The purchase order must give this Service Bulletin number with applicable Operator serial numbers and list only the parts shown in the reference kit. Operators will have one year from service bulletin issue date to place an order for the parts in applicable quantities. After one year operators will be required to purchase parts at the current catalog price, if they desire to incorporate this change.

Direct purchase order to:
Rohr, Inc.
850 Lagoon Drive
Chula Vista, CA 91910-2098
Attn: Airline Account Manager, MZ 107A
(Ref. Service Bulletin No. V2500-NAC-78-0119)

H. Tooling -Cost and Availability

Not applicable.

I. Weight and Balance

(1) Weight change ..... No effect

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

(3) Datum ..... Front Engine Mount Centerline

..... (Power Plant Station (PPS) 95.1)

J. Electrical Load Data

Not Applicable.

K. References

MD-90 Aircraft Maintenance Manual	78-32-00
IAE V2500 Standard Practices/Processes Manual (SPP-V2500-1IA)	70-09-00
Overhaul Processes/Consumable Index (PCI-V2500-1IA)	

L. Other Publications Affected

MD-90 Engine Illustrated Parts Catalog (S-V2500-3IA)	78-32-10
MD90/V2500D5 Common Nozzle Component Maintenance Manual (CMM-CN-V2500-3IA)	78-32-10
MD90 Structural Repair Manual	54-40-00

2. Accomplishment Instructions

A. Pre-requisite Instructions

None.

B. Rework or Modification Instructions

NOTE: Do this modification on both sides of the CNA. It is not necessary to do this modification on areas of the CNA on which repair VRS2240 has already been done.

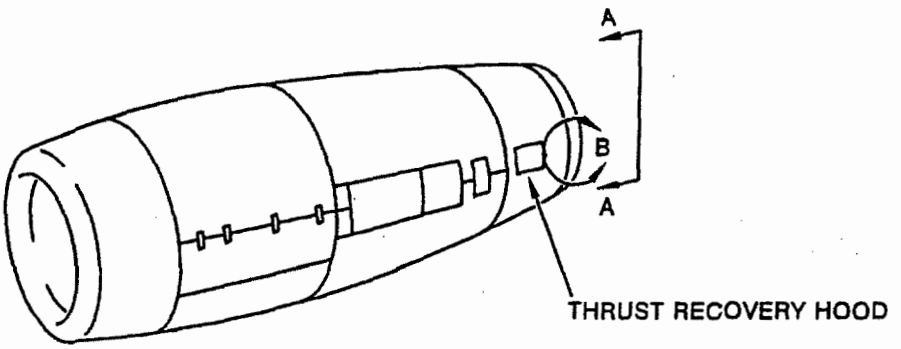
WARNING: SOLVENT (COMAT 01-438) IS CLASSIFIED AS A HAZARDOUS MATERIAL WHICH MAY CAUSE INJURY OR ILLNESS IF NOT PROPERLY USED. THIS PRODUCT SHOULD BE USED ONLY IN ACCORDANCE WITH THE MANUFACTURER'S SPECIFIC SAFETY AND HEALTH RECOMMENDATIONS. PRIOR TO USE OF THIS PRODUCT, CAREFULLY READ THE APPLICABLE "MATERIAL SAFETY DATA SHEET" AND FOLLOW ALL LISTED SAFETY AND HEALTH PRECAUTIONS.

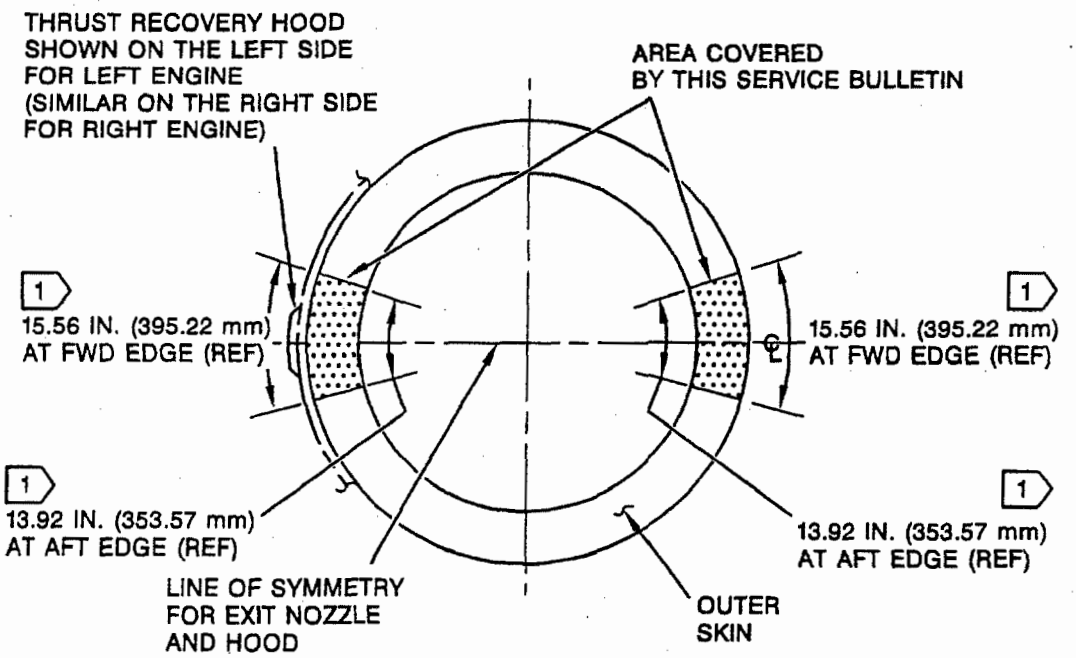
(1) Clean the damaged area with the solvent (CoMat 01-438) and a lint free cloth (CoMat 02-099). Wipe the surface dry before the solvent evaporates. Refer to Figure 1.

(2) Find the center line of symmetry. Measure approximately 7.78 inches (197.61 mm) along the circumference on each side of the centerline at the forward edge of the outer skin, and mark the skin. At the aft edge, measure 6.96 inches (176.78 mm) along the circumference on each side of the centerline, and mark the skin. Refer to Figure 1.

(3) Make sure the marks are half way between existing fasteners at the forward and aft edges of the outer skin. Adjust the marks if necessary. Connect the marks to show the cutout area.

(4) Find and drill out all existing rivets in the marked area. Deburr. Do not damage the rivet holes. (If rivet holes are damaged, use oversize rivets when you install the repair parts. Refer to Figure 2 for rivet and countersink specifications).

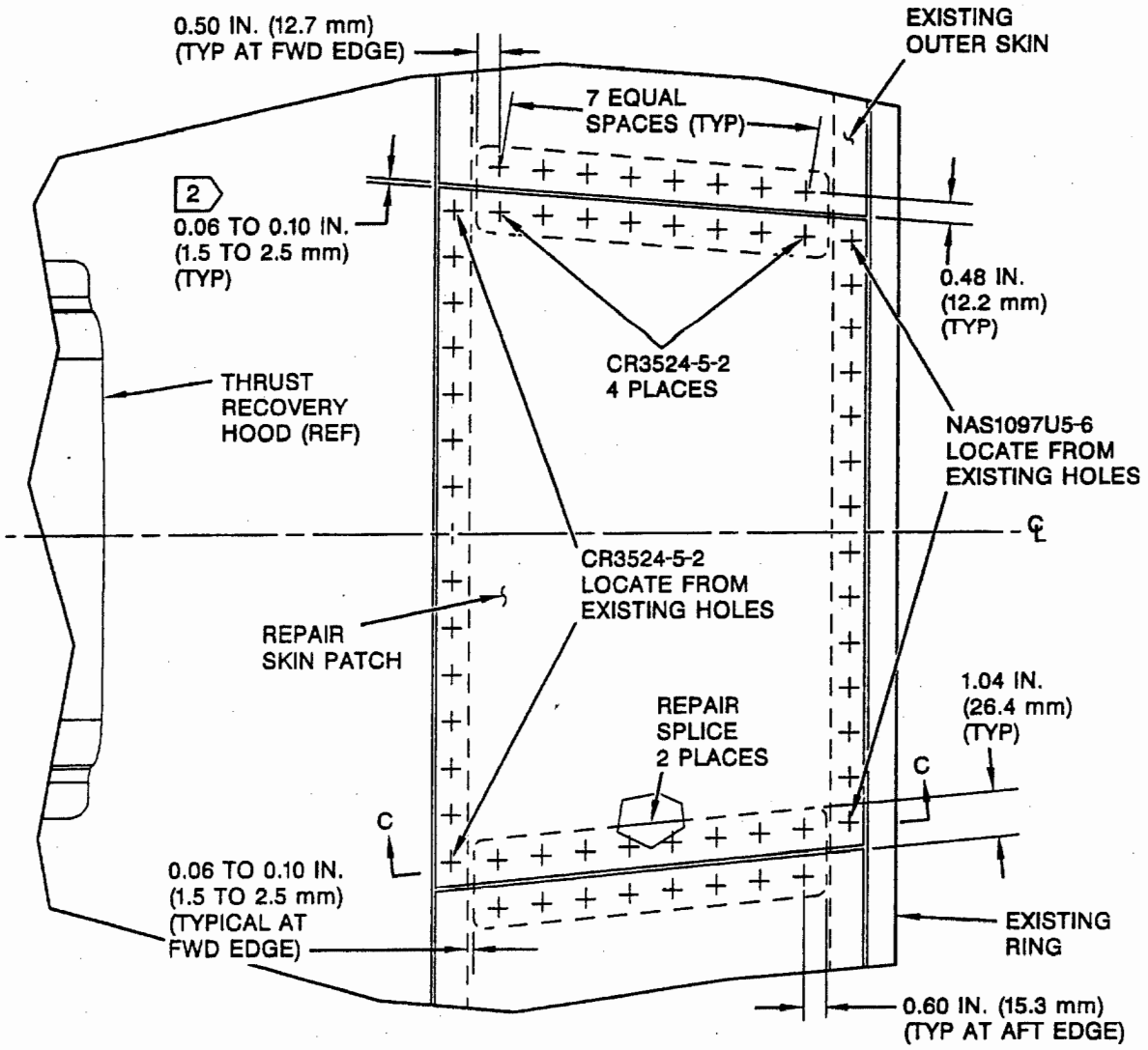




VIEW A-A
LOOKING FWD AT EXIT NOZZLE
(LEFT ENGINE INSTALLATION SHOWN, RIGHT ENGINE SIMILAR)

VSB499

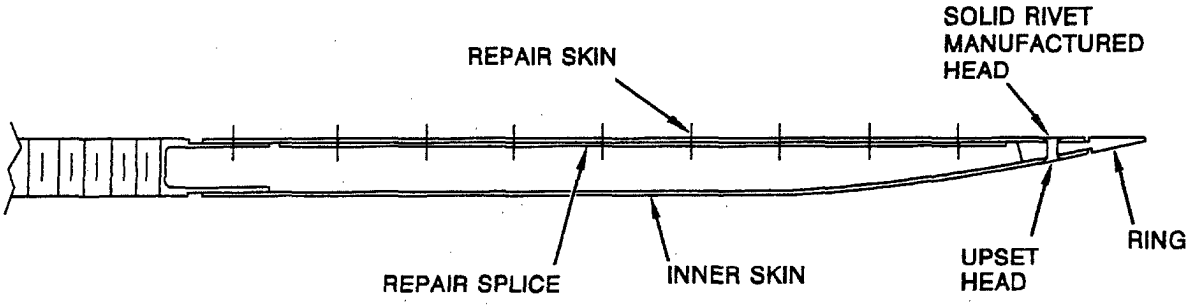
CNA Exit Nozzle Outer Skin Modification
Figure 1 (sheet 1)



DETAIL B
VIEW SHOWING THE COMPLETED REPAIR

VSB500

CNA Exit Nozzle Outer Skin Modification
Figure 1 (sheet 2)



SECTION C-C
ROTATED 3° CW

NOTES:

1. THESE DIMENSIONS ARE ALONG THE CURVED SURFACE OF THE OUTER SKIN, OR THE FORMED REPAIR SKIN, AND ARE FOR REFERENCE ONLY. REPAIR SKIN SHALL BE FITTED INSIDE THE CUTOUT AREA.
2. FILL ALL EXTERNAL GAPS WITH SEALANT. REFER TO TEXT FOR INSTRUCTIONS.

VSB501

CNA Exit Nozzle Outer Skin Modification
Figure 1 (sheet 3)

NOTE: The existing holes along the aft edge of the outer skin are perpendicular to the outer surface. When you drill rivets out of these holes, drill from the outer side. (See Figure 1, Sheet 3, Section C-C.)

(5) Remove the area of the outer skin as marked. Protect the underlying structure with a protective plate. Deburr the edges of the cutout. Remove the protective plate.

(6) Find and mark applicable new hole patterns on the repair skin, splices, and the outer skin.

(7) Hold the splices in place. Drill new holes through the outer skin and splices as marked. Refer to Figure 2 for hole sizes. Install temporary fasteners to hold the splices in place.

(8) Put the repair skin in position. Use a hole finder to find and mark the existing forward and/or aft holes on the repair skin. Match drill applicable diameter holes in marked locations. Deburr.

NOTE:
1. Alternate methods may be used to transfer the existing hole pattern onto the repair skin.
2. The existing holes along the aft edge of the outer skin are perpendicular to the outer surface. Drill the matching holes on the repair skin perpendicular to the outer surface.

(9) Use temporary fasteners in the forward and aft holes to hold the repair skin in place. Drill new holes through the repair skin and the splices. Refer to Figure 2 for hole sizes. Deburr.

(10) Examine the holes for damage. If a hole is damaged, enlarge to oversize diameter and install an oversize rivet when you install the repair parts. Refer to Figure 2.

(11) Countersink all rivet holes on the air wetted surfaces of the outer skin and the repair skin. Refer to Figure 2. Deburr.

NOTE: The existing holes along the aft edge of the outer skin are perpendicular to the outer surface. Countersink these holes perpendicular to the outer surface.

FASTENER	HOLE DIAMETER	100° COUNTERSINK DIAMETER
CR3524-5 NAS9309M5 NAS1097U5 NAS1200M5	0.160 TO 0.164 IN. (4.06 TO 4.17 mm)	0.240 TO 0.246 IN. (6.10 TO 6.25 mm)
CR3555-5	0.176 TO 0.180 IN. (4.47 TO 4.57 mm)	0.214 TO 0.218 IN. (5.43 TO 5.53 mm)

TABLE 1. HOLE AND COUNTERSINK DIAMETERS

VSB502

Hole and Countersink Diameters - Table 1
Figure 2

(12) Use aluminum oxide abrasive paper (CoMat 05-074) to remove sharp edges from the modification parts, exposed edges of the outer skin, holes, and countersinks.

(13) All exposed aluminum surfaces (drilled, cut, sanded, etc.) shall be water break free surfaces. Do a water break free test on these surfaces as instructed in the Structural Repair Manual Volume IV, Section 54-02-00. If necessary, use scotchbrite pads (CoMat 05-128) to polish affected surfaces to obtain water break free surfaces.

NOTE: A water break free test is used to determine if any residual oils or greases remain on a particular surface. A water break free surface is a surface that can maintain a continuous film of water for 30 seconds.

NOTE: Areas that are oxidized or previously conversion coated shall be made rough with aluminum oxide abrasive paper (CoMat 05-074) and then polished with scotchbrite pads (CoMat 05-128).

CAUTION TO PREVENT CONTAMINATION, USE LINT FREE GLOVES (COMAT 02-097) WHEN YOU TOUCH THE CLEANED OR TREATED SURFACES THROUGHOUT THE TASK. DO NOT SOLVENT CLEAN THE FASTENERS. SOME FASTENERS MAY BE LUBRICATED; LUBRICANT MUST NOT BE REMOVED.

(14) Clean the modification parts, the affected areas, and the tested surfaces with the solvent (CoMat 01-438) and a lint free cloth (CoMat 02-099). Wipe the surfaces dry before the solvent evaporates.

WARNING: CONVERSION COATING (COMAT 07-106) IS CLASSIFIED AS A HAZARDOUS MATERIAL WHICH MAY CAUSE INJURY OR ILLNESS IF NOT PROPERLY USED. THIS PRODUCT SHOULD BE USED ONLY IN ACCORDANCE WITH THE MANUFACTURER'S SPECIFIC SAFETY AND HEALTH RECOMMENDATIONS. PRIOR TO USE OF THIS PRODUCT, CAREFULLY READ THE APPLICABLE "MATERIAL SAFETY DATA SHEET" AND FOLLOW ALL LISTED SAFETY AND HEALTH PRECAUTIONS.

(15) Use a nylon brush or a lint free cloth (CoMat 02-099) to apply conversion coating (CoMat 07-106) to the tested, exposed aluminum surfaces. Do not

allow the solution to dry on the surface. Keep the surfaces wet with fresh solution for 2 to 5 minutes.

NOTE: It is acceptable to use the alternate conversion coating (CoMat 07-028). However, because the alternate coating is not colorless, its use on the exterior surfaces is not recommended.

(16) Flush the surfaces thoroughly with demineralized water and air dry for 30 minutes. The coated surfaces shall be colorless with no visible difference between coated parts. (If alternate conversion coating (CoMat 07-028) is used, the coated surfaces will have golden color.

WARNING: PRIMER BASE (COMAT 08-093), CONVERTER (07-115), AND THINNER (COMAT 07-116) ARE CLASSIFIED AS HAZARDOUS MATERIALS WHICH MAY CAUSE INJURY OR ILLNESS IF NOT PROPERLY USED. THESE PRODUCTS SHOULD BE USED ONLY IN ACCORDANCE WITH THE MANUFACTURER'S SPECIFIC SAFETY AND HEALTH RECOMMENDATIONS. PRIOR TO USE OF THESE PRODUCTS, CAREFULLY READ THE APPLICABLE "MATERIAL SAFETY DATA SHEET" AND FOLLOW ALL LISTED SAFETY AND HEALTH PRECAUTIONS.

(17) Mix the the primer base (CoMat 08-093), converter (CoMat 07-115), and thinner (CoMat 07-116). Refer to the manufacturer's instructions. Let the mixture stand for 30 minutes.

NOTE: Primer base (CoMat 08-093) must be used with converter (CoMat 07-115) and thinner (CoMat 07-116). Alternate primer base (CoMat 07-126) must be used with) converter (CoMat 07-127, and thinner (CoMat 07-128). Do not mix the two primer systems.

(18) Apply the primer mixture to the interior surfaces of aluminum parts in the affected area. Cure until tack free.

WARNING: ADHESIVE (COMAT 08-078) IS CLASSIFIED AS A HAZARDOUS MATERIAL WHICH MAY CAUSE INJURY OR ILLNESS IF NOT PROPERLY USED. THIS PRODUCT SHOULD BE USED ONLY IN ACCORDANCE WITH THE MANUFACTURER'S SPECIFIC SAFETY AND HEALTH RECOMMENDATIONS. PRIOR TO USE OF THIS PRODUCT, CAREFULLY READ THE APPLICABLE "MATERIAL SAFETY DATA SHEET" AND FOLLOW ALL LISTED SAFETY AND HEALTH PRECAUTIONS.

(19) Mix the adhesive (CoMat 08-078). Refer to the manufacturer's instructions.

(20) Apply a thin layer of the adhesive mixture to the mating surfaces of the splices and the outer skin. Put the splices in place, and install the fasteners that attach the splices to the skin. Wet install the rivets with the adhesive mixture.

NOTE: Primer mixture may be used as an alternate for wet installation of the rivets in this repair.

(21) Apply a thin layer of adhesive mixture to the mating surfaces of the repair skin and the underlying structure. Put the repair skin in place and install the fasteners that attach the patch to the splices and the underlying structure.

NOTE: Install the solid rivets along the aft edge of the outer skin with the manufactured head on the outer surface. Trim the upset heads so they are -0.002 to +0.005 inch (-0.05 to + 0.13 mm) above or below the adjacent surface. Do not undercut the parent material.

(22) Remove unwanted adhesive from the previous step. Use a plastic tool to carefully remove most of the existing sealant from the gaps in the repair area.

(a) Use scotchbrite pads (CoMat 05-126) soaked in solvent (CoMat 01-438) to remove the remaining sealant from the gaps in the repair area. Clean with a lint free cloth (CoMat 02-099). Wipe the surfaces dry before the solvent becomes dry.

(23) Use masking tape (CoMat 02-178) to make a border along both sides of the gaps in the repair area.

(24) Apply a thin layer of primer (CoMat 08-032) to the gaps between the masking tapes. Refer to the manufacturer's instructions.

(25) Allow the primer to dry at room temperature. The primer may form a dull finish or dusty chalk on the surface.

WARNING: SEALANT (COMAT 08-033) IS CLASSIFIED AS A HAZARDOUS MATERIAL WHICH MAY CAUSE INJURY OR ILLNESS IF NOT PROPERLY USED. THIS PRODUCT SHOULD BE USED ONLY IN ACCORDANCE WITH THE MANUFACTURER'S SPECIFIC SAFETY AND HEALTH RECOMMENDATIONS. PRIOR TO USE OF THIS PRODUCT, CAREFULLY READ THE APPLICABLE "MATERIAL SAFETY DATA SHEET" AND FOLLOW ALL LISTED SAFETY AND HEALTH PRECAUTIONS.

(26) Mix the sealant (CoMat 08-033). Refer to the manufacturer's instructions.

(27) Apply the sealant to the gaps between the pieces of masking tape. Remove unwanted sealant. Sealant shall be even with to 0.010 inch (0.25 mm.) below the adjacent surface.

(28) Cure the sealant for 10 hours at room temperature. Sealant will be tack free in 1 hour.

NOTE: Cure of the sealant may be eliminated under repair conditions. The uncured sealant is structurally and functionally acceptable.

(29) Remove the masking tape.

(30) Reidentify the 290-1201-503 common nozzle assembly as the 290-1201-513. Use metal stamp, vibroetch or electroetch method. Refer to the IAE V2500 Standard Practices/Processes Manual, Chapter 70-09-00.

C. Post-requisite Instructions

None.

D. Recording Instructions

A record of accomplishment is necessary. Write in the engine log and metal stamp , vibroetch, of electroetch on the CNA data plate that Service Bulletin V2500-NAC-78-0119 has been done. Refer to the IAE V2500 Standard Practices/ Processes Manual, Chapter 70-09-00.

3. Material Information

Applicability: For each V2500-D5 CNA to incorporate this Bulletin:

A. Kits associated with this Bulletin:

NEW PART NO (ATA NO)	QTY	EST'D UNIT PRICE	KEYWORD	OLD PART NO (IPC NO)	INSTR/ DISPOS
V2578119-551 Consisting of:			Kit		(A)
290-1201-1K	2		Repair skin		
290-1201-3K	4		Repair splice		
NAS1097U5-6	40		Rivet		
CR3524-5-2	94		Blind rivet		

B. Parts affected by this Bulletin:

NEW PART NO (ATA NO)	QTY	EST'D UNIT PRICE	KEYWORD	OLD PART NO (IPC NO)	INSTR/ DISPOS
290-1201-513 (78-11-11)	2		Common nozzle assembly	290-1201-503 (01-005)	
290-1201-1k (78-11-11)	2		Repair skin	---	(B)
290-1201-3K (78-11-11)	4		Repair splice	---	(B)
NAS1097U5-6 (78-11-11)	40		Rivet	---	(B)
CR3524-5-2 (78-11-11)	94		Blind rivet	---	(B)

C. Instructions/Disposition Code Statements:

(A) Kit will be available August 1997.

(B) Part is supplied as a detail of the kit.

D. Materials Required to Incorporate this Service Bulletin:

CoMat 01-438	Solvent
Comat 02-097	Lint Free Gloves
Comat 02-099	Lint Free Cloth
Comat 02-178	Masking Tape
CoMat 05-074	Aluminum Oxide Abrasive Paper
CoMat 05-126	Scotchbrite Pad
CoMat 07-028	Chromate Conversion Coating for Aluminum (alternate for CoMat 07-106)
CoMat 07-106	Chromate Conversion Coating 1000 for Aluminum
CoMat 07-115	Primer Converter
CoMat 07-116	Thinner
CoMat 07-126	Primer Base (alternate for CoMat 08-093)
CoMat 07-127	Primer Converter (alternate for CoMat 07-115)
CoMat 07-128	Thinner (alternate for CoMat 07-116)
CoMat 08-021	Adhesive (alternate for CoMat 08-078)
CoMat 08-032	Primer
CoMat 08-033	Sealant
CoMat 08-078	Adhesive
CoMat 08-093	Primer Base

Note: To identify the consumable materials, refer to the Overhaul Processes and Consumable Index PCI-V2500-1IA.