V2500 International Aero Engines

V2500 Propulsion System — Nacelle

SERVICE BULLETIN

Date: October 16, 1997

Subject: Transmittal of Revision 3 to Service Bulletin Number V2500-NAC-71-0196

Service Bulletin Revision History:

Event	Date
Basic Issue	Mar. 28/97
Revision 1	Jun. 09/97
Revision 2	Aug. 14/97
Revision 3	Oct. 16/97

Reasons for Issuance of Revision

(1) To change the parts disposition instructions from 'Return to Rohr' to 'Discard'.

Effect on Past Compliance

(1) None.

List of Effective Pages:

Page No.	Rev. No.	Date
1	3	Oct. 16/97
2	2	Aug. 14/97
3 thru 5	Basic	Mar. 28/97
6	1	Jun. 09/97
7 thru 9	Basic	Mar. 28/97
10 thru 14	1	Jun. 09/97
15 thru 18	Basic	Mar. 28/97
19	1	Jun. 09/97
20	Basic	Mar. 28/97
21	2	Aug. 14/97
22	1	Jun. 09/97
23 and 24	3	Oct. 16/97
25	1	Jun. 09/97

V2500 International Aero Engines

V2500 Propulsion System — Nacelle

SERVICE BULLETIN

NACELLE - NOSE COWL - THERMAL ANTI-ICE DUCT INSTALLATION
MODIFICATION OF

MODEL APPLICATION

V2500-D5

BULLETIN INDEX LOCATOR

71-00-00

Compliance Category Code

4

Internal Reference No.

JG/LL 96VN818

March 28, 1997
Revision 3 - October 16, 1997

V2500-NAC-71-0196

NACELLE - NOSE COWL - THERMAL ANTI-ICE DUCT - REPLACEMENT OF

1. Planning Information

A. Effectivity

(1) Aircraft: MD-90

(2) Nacelle: V2500-D5 Nose Cowls serial numbers 0003001 through 0141001.

B. Reason

(1) Condition

The T.A.I. duct-to-nose cowl forward bulkhead coupling nut may loosen which results in hot air leakage in the inlet cowl and subsequent damage to the inlet cowl inner barrel.

(2) Background

Two in-flight incidents have occurred in which a portion of the nose cowl inner barrel came loose and was partially ingested by the engine.

(3) Objective

Provide a re-designed T.A.I. feed pipe to maintain security of the T.A.I. duct-to-inlet cowl installation.

(4) Tests of the new re-designed T.A.I. feed pipe have proven successful.

(5) Impact of Bulletin on Workshop Procedures

Removal/Installation	Affected
Disassembly/Assembly	Affected
Cleaning	Affected
Inspection/Repair	Affected
Repair	Affected
Testing	Affected

(6) Supplemental Information

This Service Bulletin supersedes the necessity and intent of Alert Bulletin V2500-NAC-71-A0193, Service Bulletin V2500-NAC-71-0193, Alert Bulletin V2500-NAC-71-A0196, and AOWs V2500-D5-002, V2500-D5-003, V2500-D5-005, & V2500-D5-006.

C. Description

Instructs the removal of the existing nose cowl T.A.I. duct and provides for rework and installation of a re-designed T.A.I. feed pipe installation.

The nose cowl T.A.I. duct is removed, the existing forward and aft bulkhead fittings are removed, and the nose cowl is reworked to provide for installation of the re-designed T.A.I. duct. The new forward and aft bulkhead fittings and T.A.I. duct are installed.

D. Approval

Incorporation of this Service Bulletin must be accomplished only in conjunction with Douglas Aircraft Company Service Bulletin MD90 71-003 which has received exclusive FAA approval for MD-90 Series aircraft.

E. Compliance

Category Code 4.

Accomplish at the first visit of the nacelle or nacelle component to a maintenance base capable of compliance with the accomplishment instructions regardless of the planned maintenance action for the nacelle or nacelle component.

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	1.00 M/Hrs.
	(b) To rework	8.00 M/Hrs.
	(c) To return to service	1.00 M/Hrs.
	Total	10.00 M/Hrs.

NOTE: After incorporation of this modification, a maximum of 16.0 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 must be submitted to:

Rohr, Inc.
850 Lagoon Drive
Chula Vista, CA. 91910-2098

Attn: Airline Support Manager, Bldg. 107A
Warranty Department
(Ref. Service Bulletin V2500-NAC-71-0196)

G. Material Cost and Availability

The parts to accomplish this Service Bulletin are available from the supplier as kit V2571196-551 at no cost to the operator.

Operators with units listed in Paragraph 1.A should submit a no-charge purchase order for the applicable quantity of kits. The purchase order must specify this service bulletin number and only the parts listed herein. Operators will have 3 months from the issue date of this Service Bulletin to place an order. Fleet-wide incorporation of this Service Bulletin is highly recommended.

Direct Purchase Order to:
Rohr Inc.
850 Lagoon Drive
Chula Vista, CA 91910-2098
U.S.A.
Attn: Airline Support Manager -Bldg. 107A
(Ref. Service Bulletin V2500-NAC-71-0196)

H. Tooling Cost and Availability

The following tool is required to accomplish this Service Bulletin

Tool No.	Qty.	Description	Function
IAE1N20033	1	Wrench-Spanner	Tighten the T.A.I. Duct Nut

I. Weight and Balance

R (1) Weight change .....1.16 LB

(2) Moment arm .....No change

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

.....(Power Plant Station (PPS) 122.71)

J. Electrical Load Data

Not affected.

K. References

	Chapter/Section
MD-90 Aircraft Maintenance Manual	71-11-11
IAE V2500 Standard Practices/Processes Manual (SPP-V2500-1IA)	70-09-00
Overhaul Processes and Consumable Index (PCI-V2500-1IA)	

L. Other Publications Affected

MD-90 Engine Illustrated Parts Catalog (S-V2500-3IA)	71-11-11
MD90/V2500D5 Nose Cowl Component Maintenance Manual (CMM-NC-V2500-3IA)	71-11-11

2. Accomplishment Instructions

A. Pre-requisite Instructions

(1) Remove the fifteen NAS7204U5 bolts and the 290-3183-501 thermal anti-ice (T.A.I.) access panel from the nose cowl. Discard any damaged bolts. Refer to Figure 1.

(2) Open the fan cowl doors. Refer to the MD-90 Aircraft Maintenance Manual, Chapter 71-11-11, page block 201.

B. Modification Procedures

(1) Remove the lockwire and the 290-3085-501 retention bracket from the 290-3257-501 or 290-3096-501 T.A.I. duct coupling nut. Refer to Figure 2 (Sheet 2).

(2) Loosen and disconnect the coupling nut from the forward bulkhead fitting. Use the IAE 1N20033 spanner wrench.

(3) Carefully remove the 290-3254-501 three-piece retainer from around the forward end of the T.A.I. duct. Discard retainers.

NOTE: There are three retainers under the T.A.I. duct nut. Make sure you do not allow the retainers to fall into the Inlet Cowl when you remove the coupling nut or T.A.I. duct.

(4) Disconnect the tubes from the tee on the T.A.I. duct just aft of the rear bulkhead. Then loosen the union and remove the tee. Refer to Figure 2 (Sheet 1).

(5) Disconnect the tube from the anti-ice valve.

(6) Disconnect the electrical connector from the anti-ice valve.

(7) Remove the two couplings, two e-seals and anti-ice valve from the T.A.I duct.

(8) Remove the fifteen NAS6703U8 bolts and AN960C10L washers that attach the T.A.I duct and the 290-3231-501 support bracket to the aft bulkhead. Refer to Figure 2 (Sheet 2).

(9) Pull the T.A.I duct from the nose cowl aft bulkhead far enough to remove the BA7541 seal, 290-3256-501 compression ring, and coupling nut. Refer to Figure 2 (Sheet 2).

(10) Remove the T.A.I. duct aft through the nose cowl aft bulkhead.

(11) Remove the seven NAS6703U3, seven NAS6703U4 bolts, fourteen AN960C10L washers, and the 290-3099-501 forward bulkhead fitting. Discard the forward bulkhead fitting. Cover the opening to make sure no contaminates are allowed to enter. Refer to Figure 3 (Sheet 1).

(12) Remove the seventeen hilite fasteners, eight rivets, 290-3240-501 and 290-3241-501 stiffeners, 290-3237-501 T.A.I. aft bulkhead panel, 290-3247-501 and 290-3248-501 packers, and the 290-3242-501 and 290-3244-501 nutplates from the aft bulkhead. Refer to Figure 3 (Sheet 2).

WARNING: CLEANING SOLVENT (COMAT 01-438) IS CLASSIFIED AS A HAZARDOUS MATERIAL AND 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 RECOMMENDATIONS.

(13) Clean the forward and aft bulkhead mating surfaces with a lint free cloth (CoMat 02-099) and cleaning solvent (CoMat 01-438). Wipe the surfaces dry before the solvent becomes dry.

(14) Remove the tempilabels from the inner surface of the acoustic panel.

(15) Remove the 1500P0160 pressure switch from the aft bulkhead fitting. Keep the pressure switch for later installation.

C. Rework Instructions

R (1) Drill the holes in the 290-3408-501 aft bulkhead panel. Use the 290-3237-501 panel as a template. Refer to Figure 3 (Sheet 2).

R (a) Hold the 290-3237-501 and 290-3408-501 aft bulkhead panels together with clamps. Make sure the panels are aligned.

R (b) Use a number 10 (0.1935 inch (4.91 mm) diameter) or 3/16 inch (4.76 mm) diameter punch to make a mark for the seventeen rivet holes around the perimeter of the panel and the seven bolt attach holes around the cutout in the center of the panel.

R (c) Pilot drill all marked holes with a number 40 (0.098 inch (2.49 mm) diameter) drill. Remove all burrs. Drill the seven bolt attach holes and then the seventeen perimeter rivet holes.

R (d) Drill the fourteen anchor nut attach rivet holes with a 3/32 inch (2.38 mm) diameter drill. Remove the burrs.

R (e) Make the seventeen rivet holes around the perimeter of the panel larger with a 7/32 inch (5.56 mm) diameter drill. Remove the burrs.

R (f) Make the seven bolt attach holes around the center cutout in the center of the panel larger with a 7/32 inch (5.56 mm) diameter drill. Remove the burrs.

WARNING: JOINTING COMPOUND (COMAT 04-005) IS CLASSIFIED AS A HAZARDOUS MATERIAL AND 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 RECOMMENDATIONS.

(2) Install seven NAS1791C3-6 nutplates with fourteen NAS1097AD-3-3 rivets. Wet install the rivets with jointing compound (CoMat 04-005).

(3) Apply jointing compound (CoMat 04-005) to the mating surfaces of the 290-3408-501 aft bulkhead T.A.I. panel, the packers, the stiffeners, the nutplates and the aft bulkhead. Refer to Figure 3 (Sheet 2).

(4) Install the nutplates, the packers, the T.A.I. panel, and the 290-3240-501 and 290-3241-501 stiffeners on the aft bulkhead with four HST12WF-6-2 pins, eleven HST12WF-6-5 pins, two HST12WF-6-6 pins, seventeen HST97DU-6 collars, and eight CR3522-4-6 rivets. Wet install the fasteners with jointing compound (CoMat 04-005). Install all but one of the hi-lite fasteners with the collars on the aft side of the aft bulkhead. Refer to Figure 3 (Sheet 2).

(5) Install one each of the 2.75 inch (69.85 mm) diameter A19791/D D-ring seal in the forward recess on the forward bulkhead fitting and one 2.75 inch (69.85 mm) diameter A19791/A 3-ring seal in the aft recess on the forward bulkhead fitting. Make sure the gaps on the 3-ring seal are not aligned with one another.

(6) Apply jointing compound to the eight NAS6703U3 bolts, the eight NAS6703U4 bolts, and mating surfaces of the 290-3395-503 forward bulkhead fitting and the forward bulkhead. Refer to Figure 3 (Sheet 1).

(7) Install the new 290-3395-503 forward bulkhead fitting with eight NAS6703U3 bolts, eight NAS6703U4 bolts, and sixteen AN960C10L washers. Torque the bolts to 40 in-lbs (4.52 Nm). Refer to Figure 3 (Sheet 1).

(8) Install the 290-3416-501 inner duct and then the 290-3417-503 outer duct on the forward bulkhead. Make sure the seals remain in proper position during duct installation.

NOTE: Make sure the slot at the forward end of the inner duct is at the 12 o'clock position before you install the inner and outer ducts on the forward bulkhead fitting.

(9) Loosely install the P29C43 V-clamp on the forward end of the 290-3417-503 duct and the flange of the forward bulkhead fitting. Position the tightening feature so it is accessible from the access panel opening.

(10) Install the 3.75 inch (95.25 mm) diameter A19792/D D-ring seal (aft most recess on the 290-3394-501 aft outer duct assembly) and 3.75 inch (95.25 mm) diameter A19792/A 3-ring seal,(forward most recess on the outer duct assembly). Refer to Figure 3 (Sheet 3). Make sure the gaps in the 3-ring seal are not aligned with one another.

(11) Install the 2.75 inch (69.85 mm) diameter A19791/D D-ring seal (aft most recess on the 290-3398-501 aft inner duct assembly) and 2.75 inch (69.85 mm) diameter A19791/A 3-ring seal,(forward most recess on the aft inner duct assembly). Make sure the gaps in the 3-ring seals are not aligned with one another.

(12) Apply jointing compound (CoMat 04-005) to the mating surfaces of the 290-3394-501 outer rear bulkhead duct assembly and the 290-3398-501 rear bulkhead assembly. Refer to Figure 3 (Sheet 3).

(13) Put the 290-3394-501 outer rear bulkhead duct assembly on the aft end of the 290-3417-503 duct. Put the 290-3398-501 rear bulkhead assembly on the 290-3416-501 duct. Make sure the attach holes of the two fittings align. Refer to Figure 3 (Sheet 3).

(14) Make sure the inner and outer ducts are properly positioned on both sides of the rear bulkhead fittings.

(15) Apply jointing compound (CoMat 04-005) to the bolts and the mating surfaces of the duct assembly and the aft bulkhead.

(16) Attach the entire aft end of the duct assembly to the aft bulkhead with eleven NAS6703U8 bolts and AN960C10L washers. Torque the bolts to 40 in-lbs (4.52 Nm).

(17) Tighten the P29C43 V-clamp at the forward bulkhead fitting. Torque the set screw to 35-40 in-lbs (3.95-4.52 Nm).

(18) Make sure all unwanted material and tools are removed from inside the nose cowl. If it becomes necessary, the thermal anti-ice outlet panel and grille can be removed to get access to unwanted material or tools which have dropped into the bottom of the nose cowl.

(19) Install the 290-3231-501 support bracket on the rear bulkhead fitting with four NAS6703U8 bolts and AN960C10L washers. Torque the bolts to 40 in-lbs(4.52 Nm). Refer to Figure 3 (Sheet 3).

(20) Install the tee in the T.A.I. duct. Tighten the union to a torque of 200-250 lbfin (23-28 Nm). Refer to Figure 2 (Sheet 1).

(21) Install the tubes on the tee. Tighten the b-nuts of the tubes to a torque of 200-210 lbfin (23-24 Nm).

(22) Install the anti-ice valve, two E-seals and two couplings. Tighten the couplings to a torque of 75-90 lbfin (9-10 Nm).

NOTE: Inspect the e-seals for excessive wear or damage and replace as necessary.

(23) Install the tube on the anti-ice valve.

(24) Install the electrical connector on the anti-ice valve.

(25) Install the pressure switch in the boss on the anti-ice duct. Torque the switch to 60-80 lbfin (6.78-9.04 Nm.). Refer to Figure 3 (Sheet 3).

R (26) Re-identify the nose cowl as follows:

R 290-3000-505 as the 290-3000-509
R 290-3000-507 as the 290-3000-511

R Metal stamp, vibroetch, or electroetch on the nose cowl
R data plate. Refer to the IAE V2500 Standard Practices/
R Processes Manual, Chapter 70-09-00.

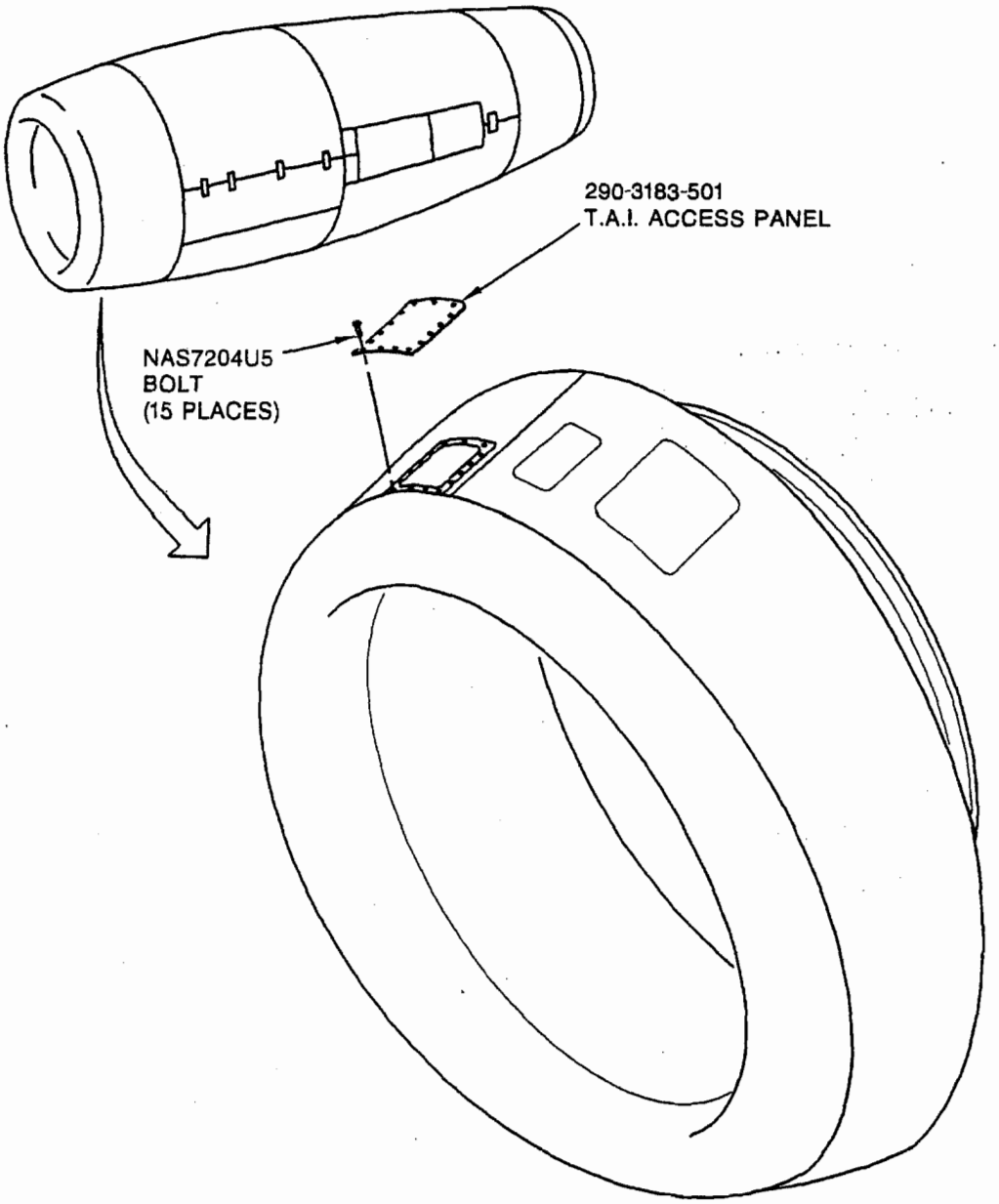
D. Post-requisite Instructions

(1) Install the T.A.I. access cover and fifteen NAS7204U5 attach bolts. Wet install the bolts with jointing compound (CoMat 04-005). Use new bolts if required. Tighten the bolts to a torque of 20-25 lbfin (2.26-2.82 Nm). Refer to Figure 1.

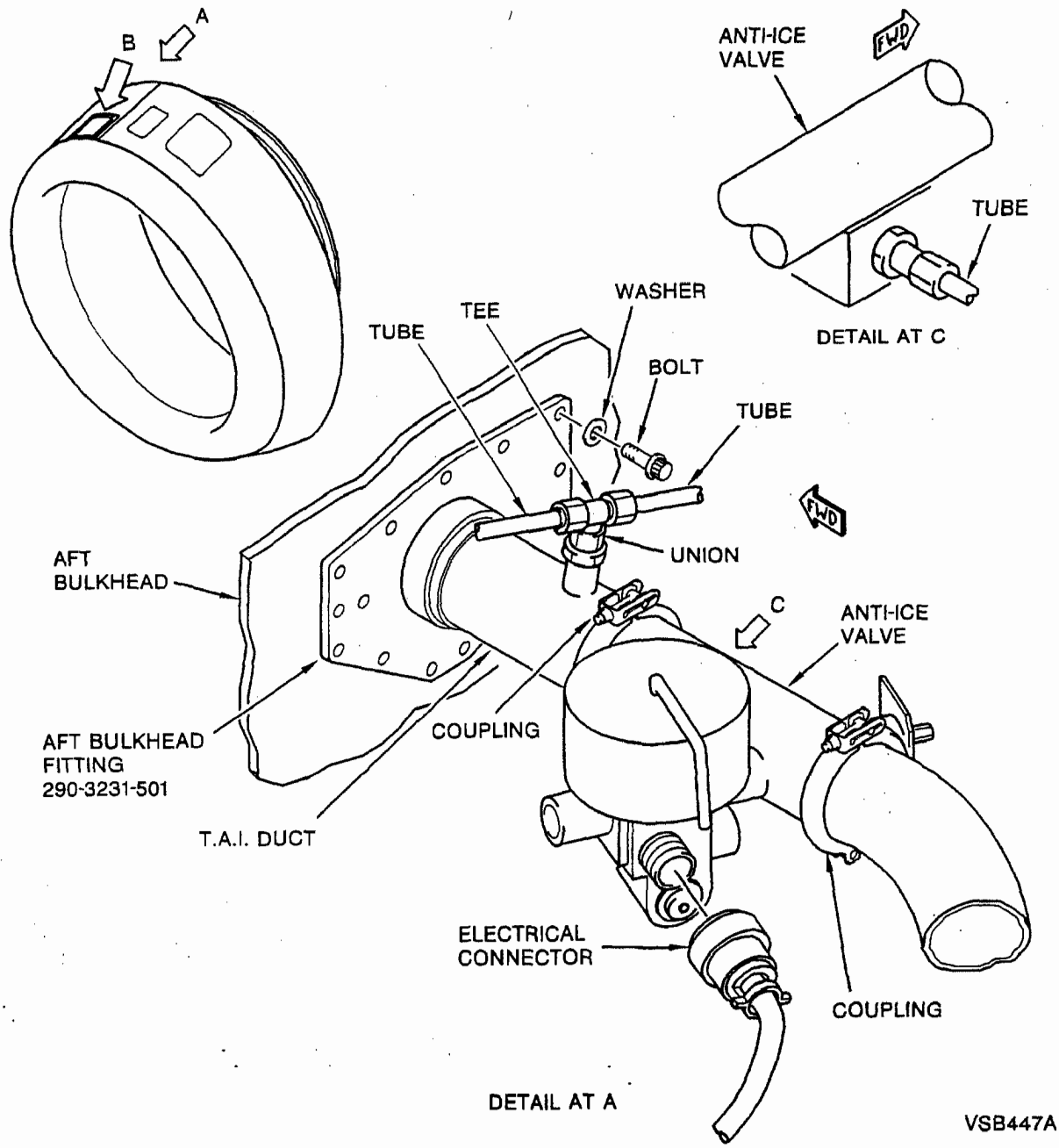
(2) Close the fan cowl doors. Refer to the MD-90 Aircraft Maintenance Manual, Chapter 71-11-01, page block 201.

E. Recording Instructions

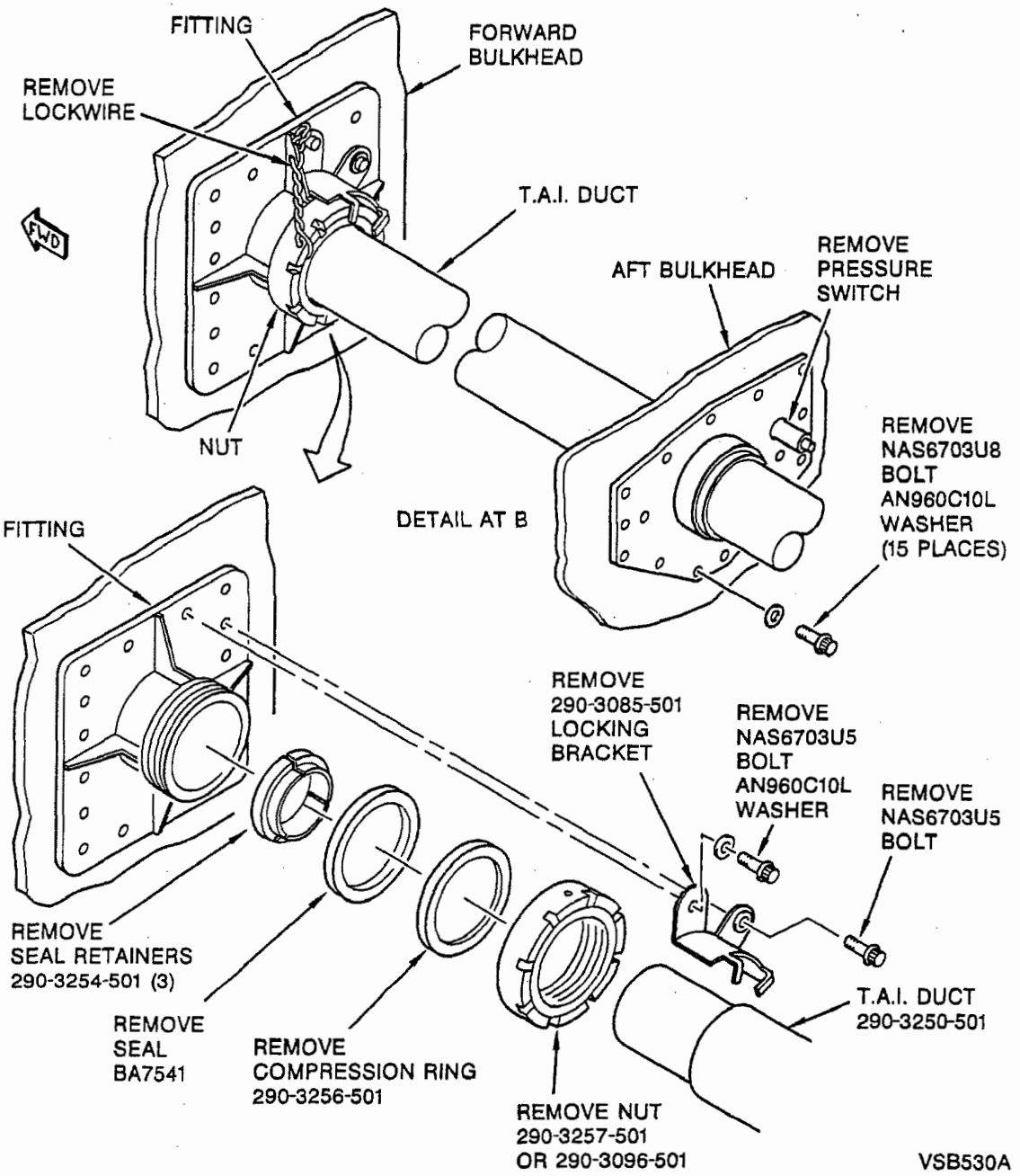
A record of accomplishment is necessary. Metal stamp, vibroetch, or electroetch on the nose cowl data plate and/or write in the applicable records that Service Bulletin V2500-NAC-71-0196 has been done. Refer to the IAE V2500 Standard Practices/Processes Manual, Chapter 70-09-00.



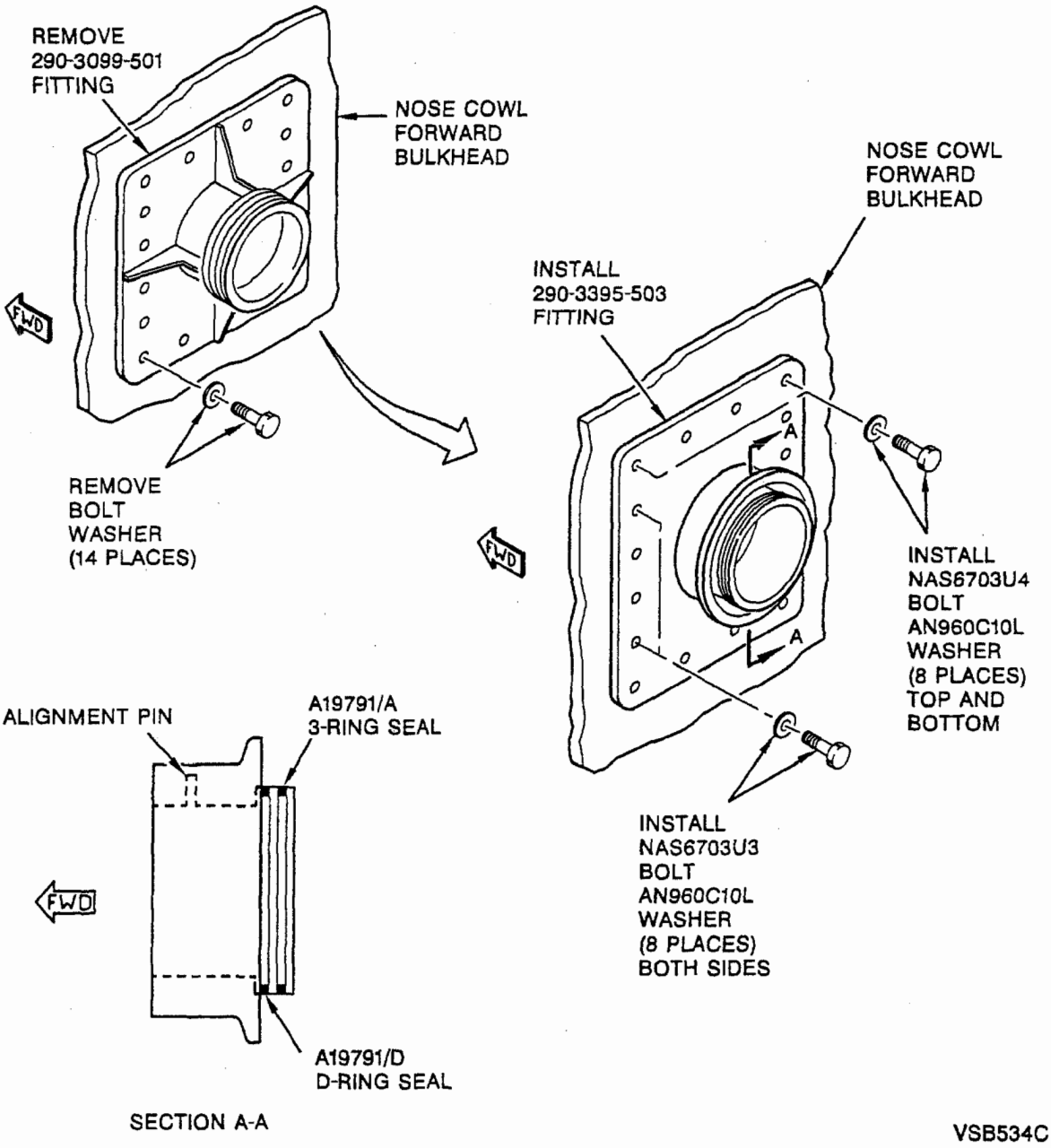
T.A.I. Access Panel Removal/Installation
Figure 1



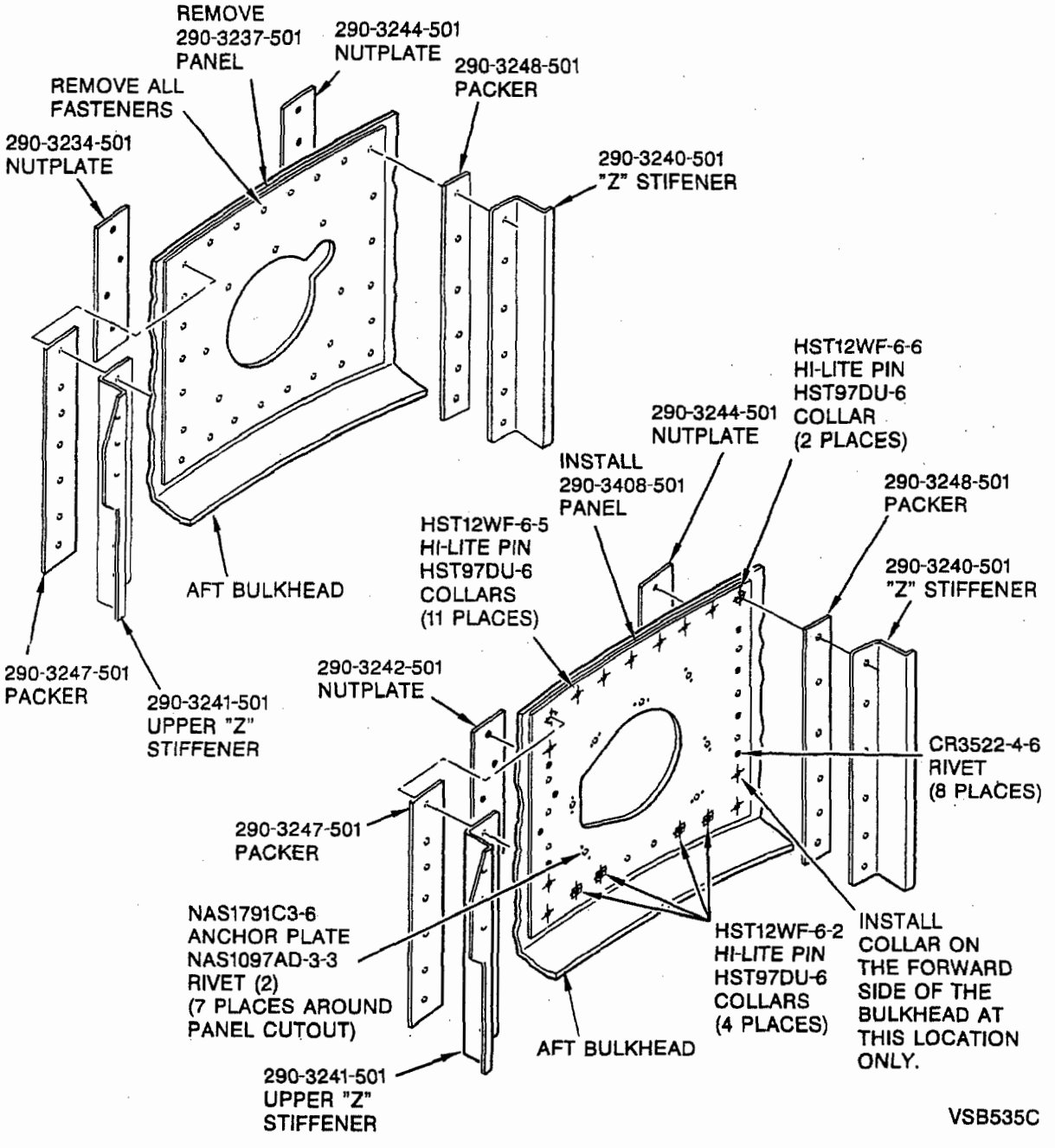
T.A.I. Duct Removal
Figure 2 (SHEET 1)



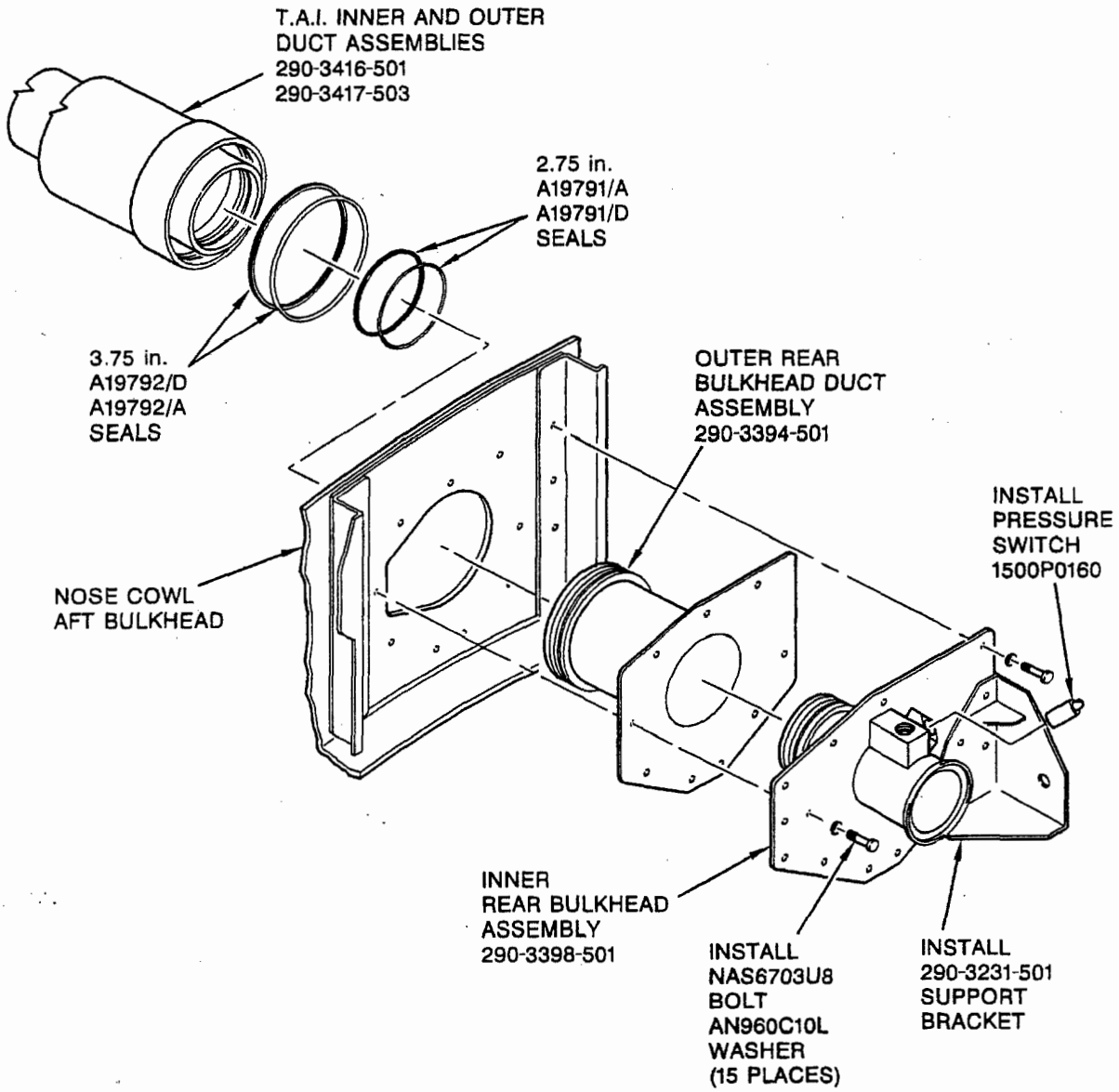
T.A.I Duct Removal
Figure 2 (Sheet 2)



T.A.I. Duct Installation Modification
Figure 3 (Sheet 1)



T.A.I. Duct Installation Modification
Figure 3 (Sheet 2)



T.A.I. Duct Installation Modification
Figure 3 (Sheet 3)

3. Material Information

Applicability: For each V2500-D5 inlet cowl 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
	V2571196-551			Kit		(A)
	Consisting of:					
	290-3394-501	1		Fitting,Outer Rear Duct		
	290-3395-503	1		Fitting,Fwd Bulkhead		
	290-3398-503	1		Fitting,Rear Bulkhead		
	290-3408-501	1		Panel		
	290-3416-501	1		Duct Assy,Inner		
	290-3417-503	1		Duct Assy,Outer		
	A19791/A	2		Ring Pack		
	A19791/D	2		D Ring		
	A19792/A	1		Ring Pack		
	A19792/D	1		D Ring		
	AN960C10L	4		Washer		
	CR3522-4-6	8		Rivet		
	HST97DU-6	17		Collar		
R	HL97DU-6	AR		Collar		
R				(Alternate for		
R				HST97DU-6)		
	HST12WF-6-2	4		Pin		
	HST12WF-6-5	11		Pin		
	HST12WF-6-6	2		Pin		
	NAS7204U5	8		Bolt		

NEW PART NO (ATA NO)	QTY	EST'D UNIT PRICE	KEYWORD	OLD PART NO (IPC NO)	INSTR/ DISPOS
NAS6703U3	2		Bolt		
NAS6703U4	2		Bolt		
NAS6703U8	15		Bolt		
P29C43	1		Coupling		
NAS1791C3-6	7		Nutplate		
NAS1097AD-3-3	14		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
	290-3000-509 (71-11-11)	1		Nose Cowl	290-3000-505 (10-005)	(C)(D) (E)(2D)
	290-3000-511 (71-11-11)	1		Nose Cowl	290-3000-507 (10-005)	(C)(D) (E)(2D)
	--- (71-11-11)	1		Bracket	290-3085-501 (10-080)	(C)(1D)
	--- (71-11-11)	1		Washer	AN96010L (10-083)	(2D)
	--- (71-11-11)	2		Bolt	NAS6703U5 (10-085)	(2D)
R	--- (71-11-11)	1		Duct Assy	290-3250-501 (10-100)	(C)(3D)
	--- (71-11-11)	15		Bolt	NAS6703U8 (10-110)	(2D)
R R	--- (71-11-11)	15		Washer	AN960C10L (10-120)	(2D)

	NEW PART NO (ATA NO)	QTY	EST'D UNIT PRICE	KEYWORD	OLD PART NO (IPC NO)	INSTR/ DISPOS
R	--- (71-11-11)	1		Nut, Coupling	290-3096-501 (10-140)	(1D)
	--- (71-11-11)	1		Ring,CPRSN	290-3256-501 (10-150)	(C)(1D)
	--- (71-11-11)	3		Retainer	290-3254-501 (10-160)	(C)(1D)
	--- (71-11-11)	1		Seal	BA7541 (10-170)	(C)(1D)
R	290-3395-503 ---	1		Fitting	290-3099-501 ---	(1D)
	290-3416-501 (71-11-11)	1		Duct Assy, Inner	--- (10-190)	(B)(D) (S1)
	290-3417-503 (71-11-11)	1		Duct Assy, Outer	--- (10-200)	(B)(D) (S1)
	P29C43 (71-11-11)	1		Coupling	--- (10-210)	(B)(D) (S1)
	A19791/A (71-11-11)	1		Ring Pack	--- (10-220)	(B)(D) (S1)
	A19791/D (71-11-11)	1		D Ring	--- (10-230)	(B)(D) (S1)
	290-3398-501 (71-11-11)	1		Fitting, Rear Bulkhead	--- (10-240)	(B)(D) (S1)
	290-3394-501 (71-11-11)	1		Duct Assy, Outer	--- (10-250)	(B)(D) (S1)

NEW PART NO (ATA NO)	QTY	EST'D UNIT PRICE	KEYWORD	OLD PART NO (IPC NO)	INSTR/ DISPOS
NAS6703U8 (71-11-11)	15		Bolt	--- (10-260)	(B)(D) (S1)
AN960C10L (71-11-11)	15		Washer	--- (10-270)	(B)(D) (S1)
A19791/A (71-11-11)	1		Ring Pack	--- (10-280)	(B)(D) (S1)
A19791/D (71-11-11)	1		D Ring	--- (10-290)	(B)(D) (S1)
A19792/A (71-11-11)	1		Ring Pack	--- (10-300)	(B)(D) (S1)
A19792/D (71-11-11)	1		D Ring	--- (10-310)	(B)(D) (S1)

C. Instructions/Disposition Code Statements:

(A) Kit will be available April 1997.

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

(C) Old part will no longer be available.

(D) New part is currently available.

(1D) Discard part.

(2D) Old part may be used on other aircraft installations.

R

(S1) Parts coded (S1) must be installed in complete sets.

D. Materials Required to Incorporate This Service Bulletin:

CoMat 01-438	Cleaning Solvent
CoMat 02-099	Lint Free Cloth
CoMat 04-005	Jointing Compound
CoMat 08-092	Silicone Sealant (alternate for CoMat 04-005)

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