V2500 International Aero Engines

V2500 Propulsion System — Nacelle

SERVICE BULLETIN

NACELLE - NOSE COWL - FORWARD BULKHEAD ANTI-ICE DUCT CONNECTION - ADDITION OF POSITIVE RETENTION FEATURE

MODEL APPLICATION

V2500-D5

BULLETIN INDEX LOCATOR

71-00-00

Compliance Category Code

4

Internal Reference No.

JG 96VN806

April 26, 1996

V2500-NAC-71-0193

NACELLE - NOSE COWL - FORWARD BULKHEAD ANTI-ICE DUCT CONNECTION
ADDITION OF POSITIVE RETENTION FEATURE

1. Planning Information

A. Effectivity

(1) Aircraft: MD-90

(2) Nacelle: V2500-D5 Nose Cowls serial numbers 0003001 through 0056002.

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

One in-flight incident has occurred in which a portion of the nose cowl inner barrel came loose and was partially ingested by the engine fan.

(3) Objective

Provide a positive retention feature to prevent loosening of the T.A.I. duct-to-inlet cowl coupling nut.

(4) Tests of the new positive retention feature installation have proven successful.

(5) Impact of Bulletin on Workshop Procedures

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

(6) Supplemental Information

This Service Bulletin replaces Alert Bulletin V2500-NAC-71-A0193.

C. Description

Part 1

Instructs the examination of the nose cowl T.A.I. duct-to-forward bulkhead fitting for correct installation. If found correct the operator is instructed to do Part 2 of this Service Bulletin. If found incorrect, the operator is instructed to do Part 3 of this Service Bulletin.

Part 2

For nose cowls on which the T.A.I duct-to-forward bulkhead fitting connection is found to be correct.

The lockwire is removed from the nose cowl T.A.I duct-to-forward bulkhead coupling nut, the nut is removed from the forward bulkhead fitting, anti-seize compound is applied to the threads of the nut and bulkhead fitting, the nut is torqued, the new locking bracket assembly is installed with two bolts, and the nut is safetied with lockwire.

Part 3

For nose cowls on which the T.A.I duct-to-forward bulkhead fitting connection is found to be incorrect.

The nose cowl T.A.I. duct is removed, the forward bulkhead connection parts are properly arranged, the nose cowl T.A.I. duct is installed, anti-seize compound is applied to the threads of the nut and the forward bulkhead fitting, the coupling nut is torqued, the locking bracket assembly is installed with two bolts, and the nut is safetied with lockwire.

D. Approval

Incorporation of this Service Bulletin must be accomplished only in conjuction with Douglas Aircraft Company Service Bulletin MD90-71-002 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
Part 1		
(1) In Service		
(a)	To gain access	0.75 M/Hrs.
(b)	To rework	0.00 M/Hrs.
(c)	To return to service	0.75 M/Hrs.
	Total	1.50 M/Hrs.

Part 2

(1) In Service

(a)	To gain access	0.00 M/Hrs.
(b)	To rework	1.50 M/Hrs.
(c)	To return to service	0.00 M/Hrs.
	Total	1.50 M/Hrs.

Part 3

(1) In Service

(a)	To gain access	0.00 M/Hrs.
(b)	To rework	3.00 M/Hrs.
(c)	To return to service	0.00 M/Hrs.
	Total	3.00 M/Hrs.

NOTE: After incorporation of this modification, a maximum of 1.5 or 3.0 manhours for labor, as applicable to Part 2 or Part 3, 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 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-71-0193)

G. Material Cost and Availability

The parts to accomplish this Service Bulletin are available from the supplier as kit V2571193-551 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 herin. Operators will have one year from the issue date of this Service Bulletin to place an order. After one year, kits will no longer be available and Operators will have to order parts individually at catalog prices, if they desire to incorporate the change.

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-71-0193)

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

(1) Weight change .....None

(2) Moment arm .....None

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

.....(Power Plant Station (PPS) 100.00)

J. Electrical Load Data

Not affected.

K. References

	Chapter/Section
MD-90 Aircraft Maintenance Manual	78-11-01
IAE V2500 Standard Practices/Processes Manual (SPP-V2500-1IA)	70-09-00 70-42-05
Overhaul Processes and Consumable Index (PCI-V2500-1IA)	

L. Other Publications Affected

MD-90 Engine Illustrated Parts Catalog (S-V2500-3IA)	78-11-01
MD90/V2500D5 Nose Cowl Component Maintenance Manual (CMM-NC-V2500-3IA)	78-11-01

2. Accomplishment Instructions

A. Pre-requisite Instructions

(1) Remove the bolts and the 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 71-11-01, page block 201.

B. Examine the Nose Cowl T.A.I Duct-to-Forward Bulkhead Connection - Modification Procedures - Part 1

(1) If you can see the retainers behind the T.A.I. duct nut, the installation is incorrect, and you must do Part 3 of this Service Bulletin. Refer to Figure 2.

(2) If you cannot see the retainers behind the T.A.I. duct nut, the installation is correct, and you must do Part 2 of this Service Bulletin. Refer to Figure 2.

C. Modification Procedures - Part 2

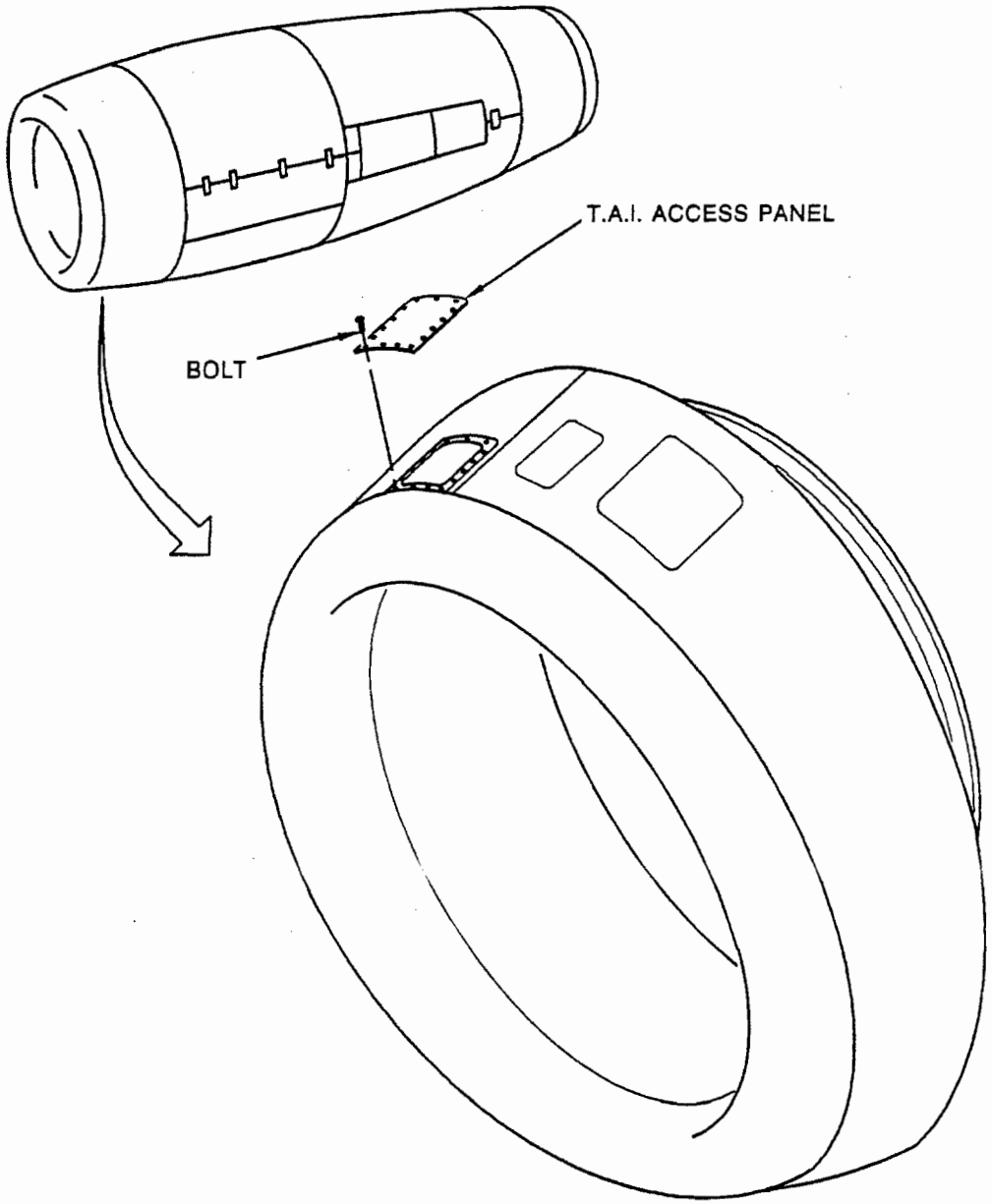
(1) Remove the safety wire from the T.A.I. duct nut. Refer to Figure 3 (sheet 2).

(2) Disconnect the T.A.I. duct nut from the forward bulkhead fitting.

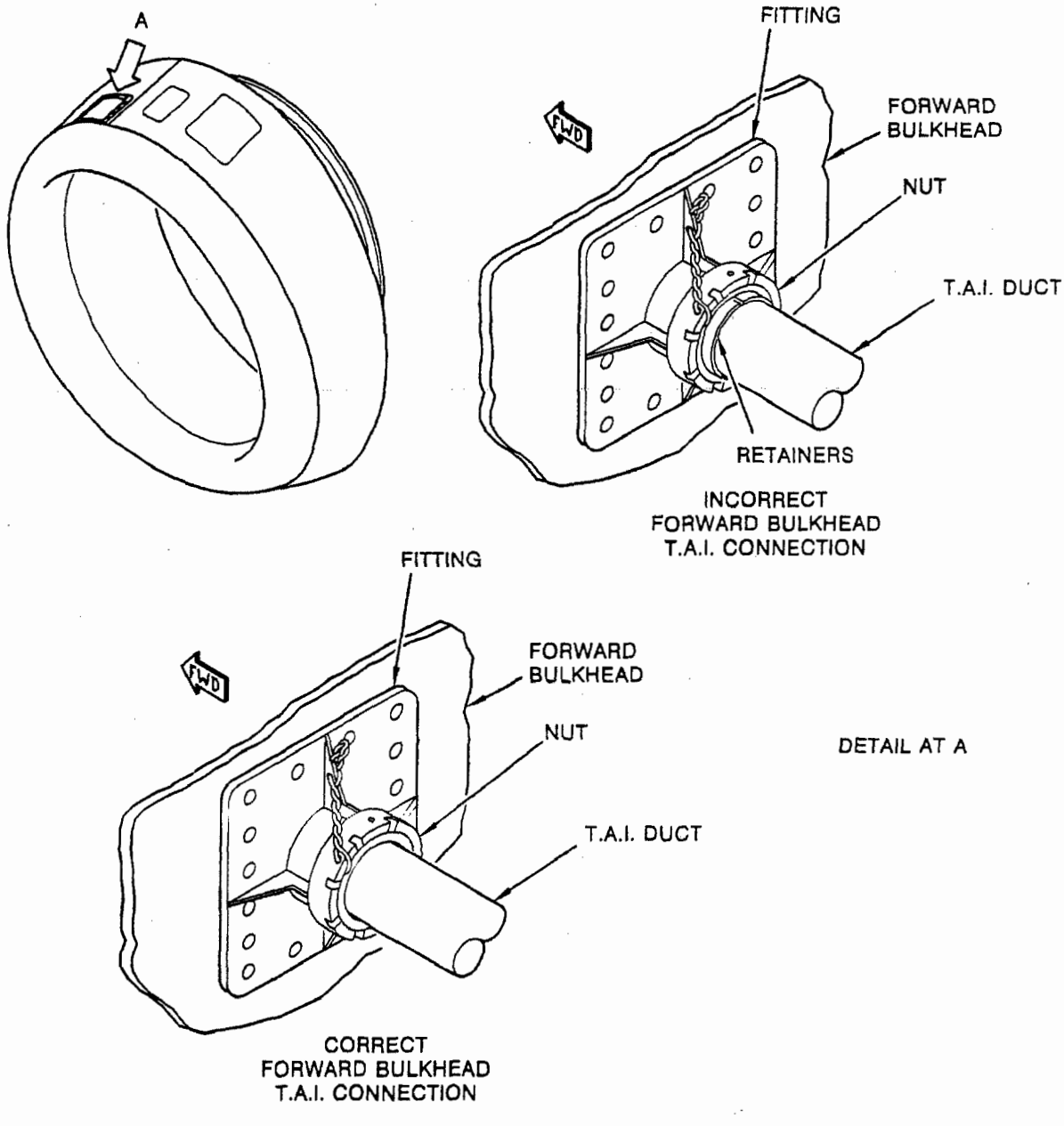
(3) Make sure the threads of the T.A.I. duct nut and the bulkhead fitting are clean.

(4) Apply a thin, even layer of anti-seize compound (CoMat 10-085) to the threads of the T.A.I. duct nut and the bulkhead fitting.

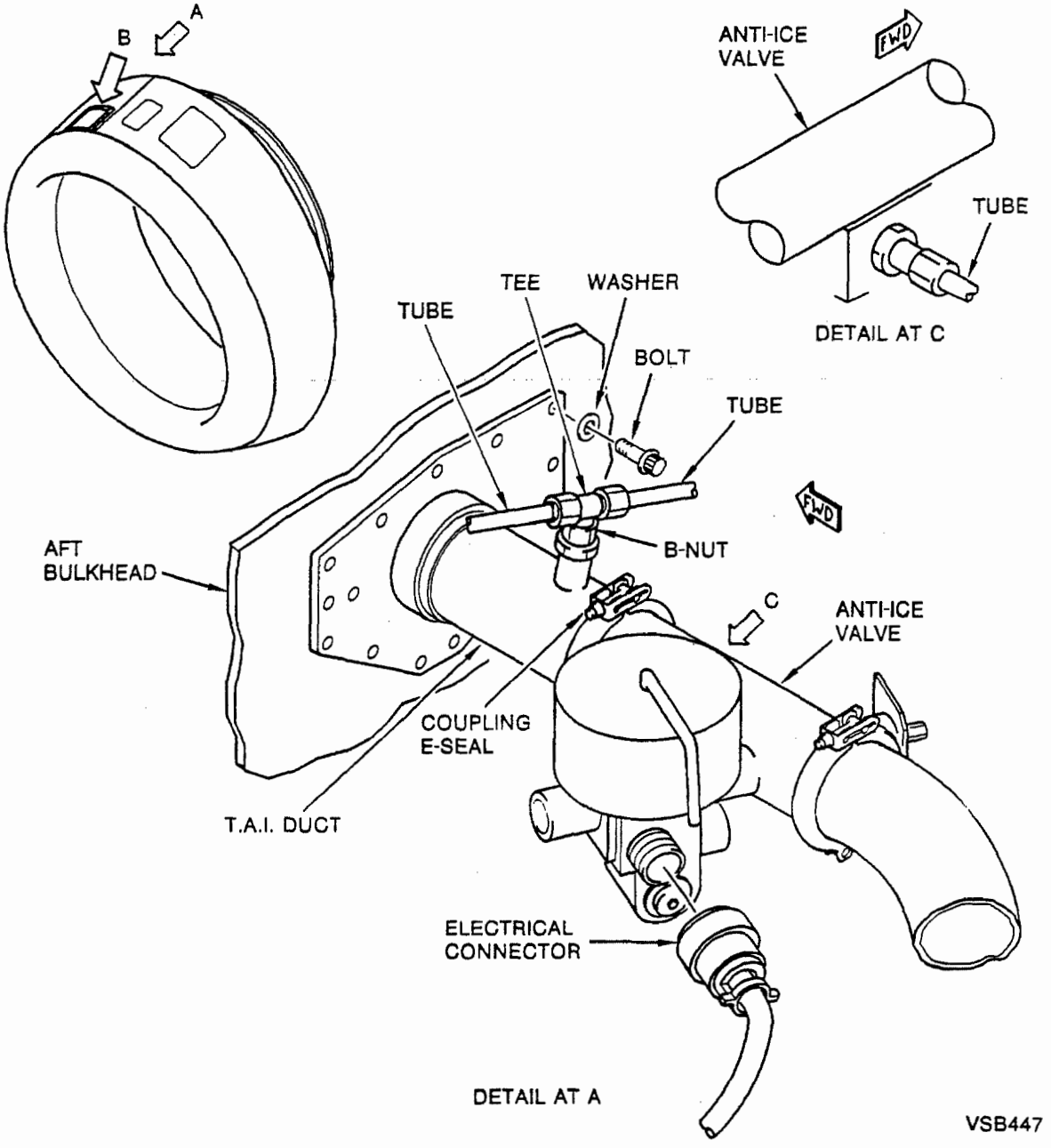
(5) Install the T.A.I. duct nut on the forward bulkhead fitting. Tighten the nut by hand until no bulkhead fitting threads are visible forward of the nut.



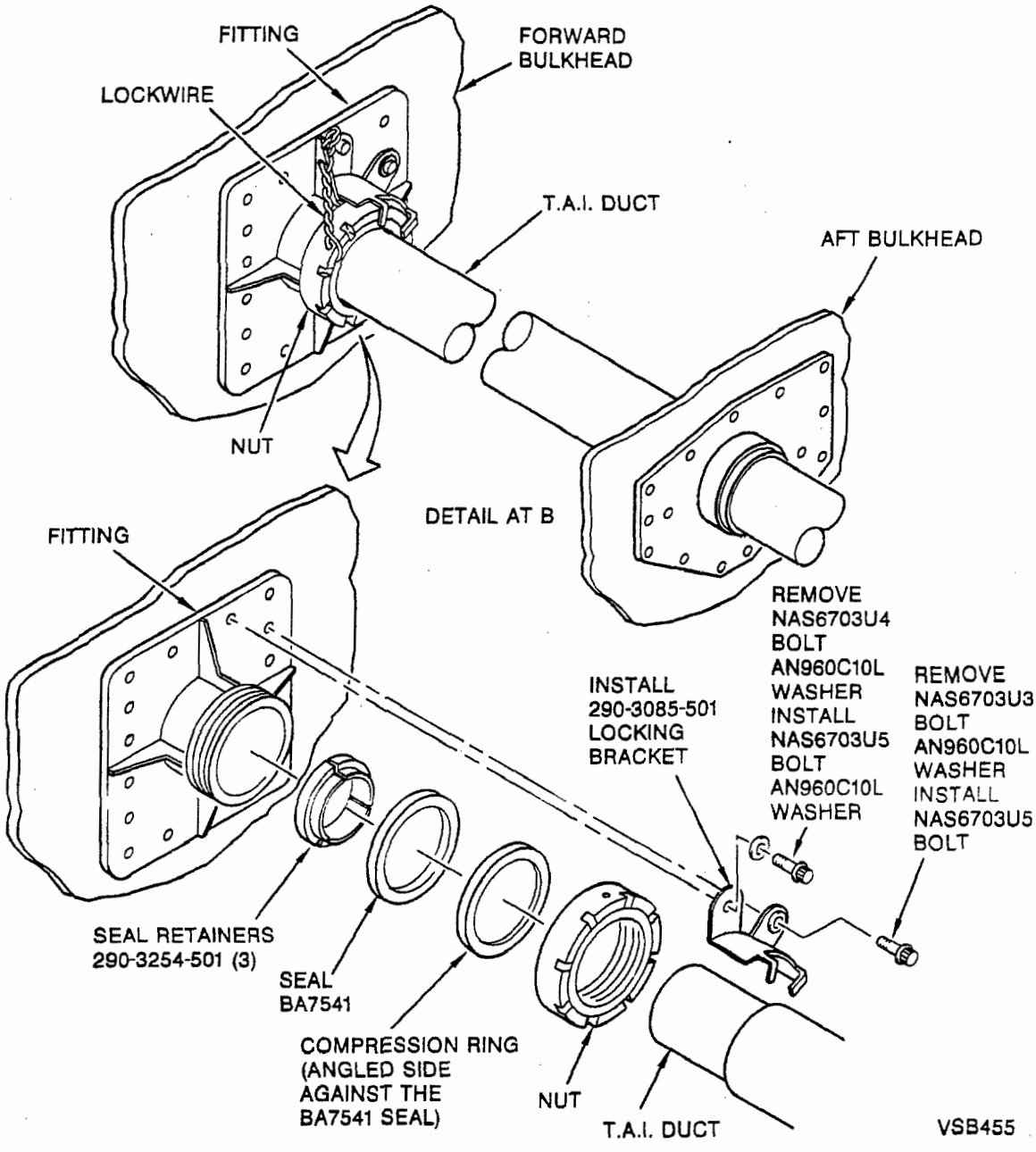
T.A.I. ACCESS PANEL REMOVAL/INSTALLATION
FIGURE 1



Nose Cowl T.A.I Duct-to-Forward Bulkhead Connection Inspection
Figure 2



T.A.I. DUCT REMOVAL/INSTALLATION
FIGURE 3 (SHEET 1)



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

NOTE: It is necessary to make sure no bulkhead fitting threads are visible forward of the T.A.I. duct nut before you Torque the nut. This ensures proper seal compression and nut engagement. It may be necessary to lightly shake the T.A.I duct while you hand tighten the nut to get full engagement.

(6) Torque the T.A.I. duct nut to 45 ftlbs (540 inlbs). You must use the IAE1N20033 spanner wrench and torque wrench as shown in Figure 4 to properly torque the nut. The actual indication on the gage of your torque wrench will depend upon the torque wrench length. Use the following formula to determine the proper torque wrench indication:

$$AT = \frac{L\ (OT)}{L + A}$$

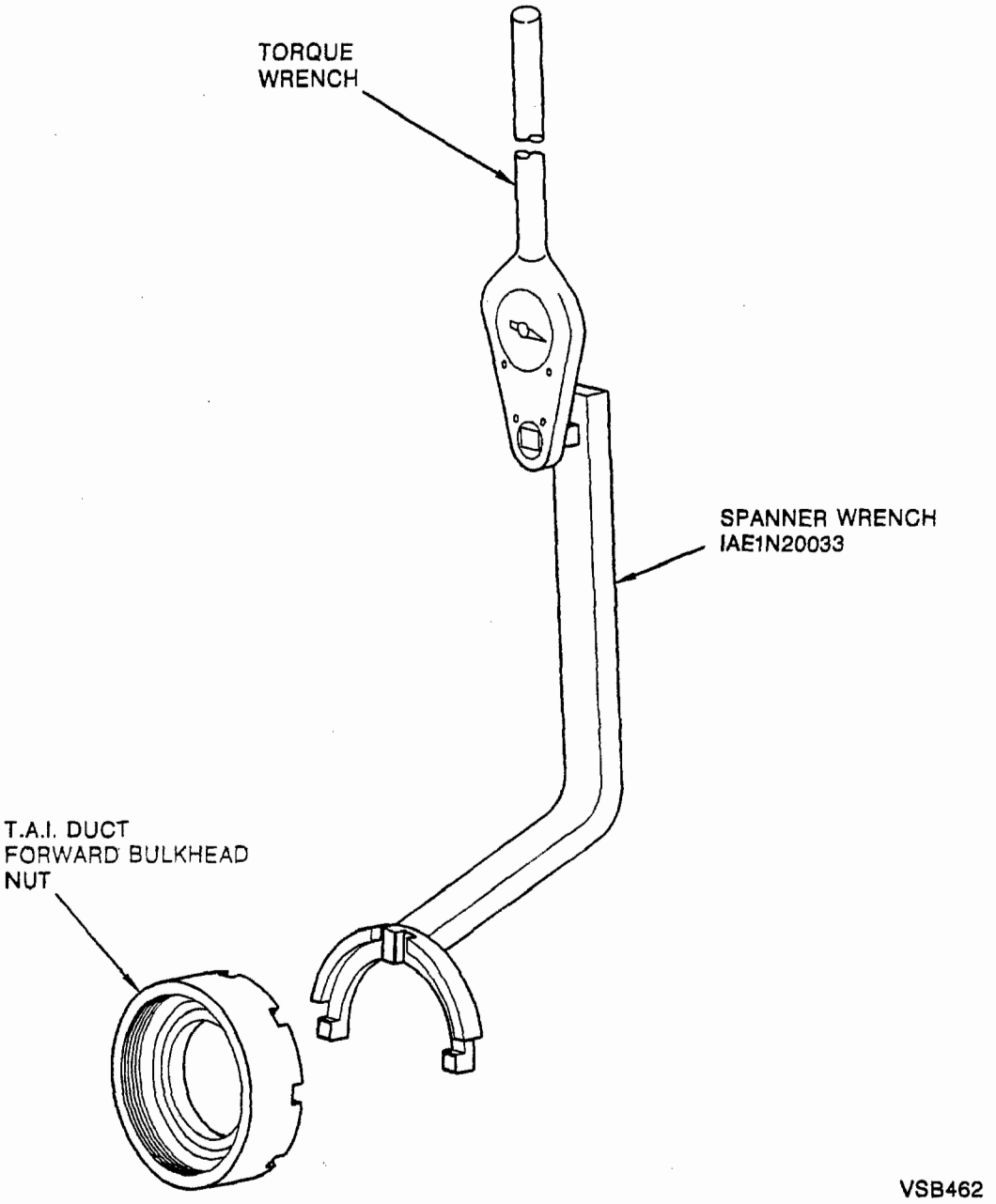
Where: AT = Adjusted torque setting

A = 10 inches; the distance from the center of the square drive hole in the IAE1N20033 spanner wrench to the centerline of the T.A.I. duct forward bulkhead coupling nut.

L = Distance from the centerline of the torque wrench drive to the center of the operators hand. Refer to Figure 4.

OT = Original Torque (expressed in inlbs.)

(7) Remove the NAS6703U3 and NAS6703U4 bolts and two AN960C10L washers from the forward bulkhead fitting as shown in Figure 3 (Sheet 2). Discard the bolts. Keep one washer for installation.



T.A.I. Duct Forward Bulkhead Nut Spanner Wrench
Figure 4

WARNING: 463-6-27 BASE, X337 CONVERTER, AND TL52-66 THINNER ARE FLAMMABLE AND VAPOR IS HARMFUL. INHALATION OF SPRAY MIST MAY CAUSE SERIOUS BODILY HARM. AVOID SOURCES OF IGNITION. USE ONLY IN AREAS WITH ADEQUATE VENTILATION. WORK PERFORMED IN CONFINED AREA REQUIRES THE USE OF ADDITIONAL FORCED MECHANICAL VENTILATION. AVOID BREATHING OF VAPOR AND CONTACT WITH SKIN AND EYES. MAY CAUSE IRRITATION TO SKIN AND EYES. SEVERE OVEREXPOSURE MAY CAUSE FATIGUE, WEAKNESS, CONFUSION, HEADACHE, DIZZINESS, DROWSINESS, AND IMPAIRED JUDGMENT. USE REGULATORY AGENCY APPROVED RESPIRATORY PROTECTION FOR SPRAY APPLICATIONS. THIS PRODUCT CONTAINS LEAD, A CUMULATIVE POISON. WASH HANDS WELL BEFORE EATING, DRINKING, OR SMOKING. PROTECTIVE GLOVES SHOULD BE WORN DURING MIXING APPLICATION. PROLONGED OR REPEATED CONTACT WITH THIS EPOXY PRIMER MAY RESULT IN A PERMANENT SKIN ALLERGY TO 463-6-27 BASE AND X337 CONVERTER. PRIOR TO USE OF THIS PRODUCT, CAFEFULLY READ THE "MATERIAL SAFETY DATA SHEET" AND FOLLOW ALL LISTED SAFETY AND HEALTH PRECAUTIONS.

(8) Mix the primer base (CoMat 07-071), primer converter (CoMat 07-067), and thinner (CoMat 07-066). Refer to the manufacturer's instructions.

(9) Install the 290-3085-501 locking bracket with the two NAS6703U5 bolts and one AN960C10L washer. Wet install the bolts with the primer mix. If necessary, use the spanner wrench and torque wrench to turn the T.A.I. duct nut in the tightening direction until the slots on the nut align with the locking bracket (not to exceed 50 ftlb (600 inlbs.) of torque) (refer to step (6) to find the actual torque wrench indication). Tighten the bolts to a torque of 34-44 lbfin (3.84-4.97 Nm).

(10) Safety the T.A.I. duct nut with 0.036 inch diameter or thicker lockwire (CoMat 02-128). Install the lockwire with a minimum 45 degree wrap in the tightening direction. Refer to Figure 3 (Sheet 2).

(11) Identify the nose cowl as the 290-3000-505 nose cowl. Metal stamp, vibroetch, or electroetch on the nose cowl data plate. Refer to the IAE V2500 Standard Practices/Processes Manual, Chapter 70-09-00.

C. Rework Instructions - Part 3

(1) Disconnect the tubes from the tee on the T.A.I. duct. Then loosen the b-nut and remove the tee. Refer to Figure 3 (Sheet 1).

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

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

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

(5) Remove the bolts and washers that attach the T.A.I duct to the aft bulkhead.

(6) Remove the lockwire from the T.A.I. duct nut. Refer to Figure 3 (sheet 2).

(7) Disconnect the T.A.I. duct nut from the forward bulkhead fitting.

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

(8) Pull the T.A.I duct from the nose cowl aft bulkhead far enough to remove the 290-3254 seal retainers, BA7541 seal, compression ring, and T.A.I. duct nut from the T.A.I. duct.

(9) Put the T.A.I. duct nut, compression ring, BA7541 seal, and 290-3254 seal retainers on the T.A.I. duct as shown in Figure 3 (sheet 2). For ease of installation, put the three retainers between the seal and the duct to hold them in place.

(10) Move the T.A.I. duct forward into position on the forward bulkhead fitting.

(11) Make sure the threads of the T.A.I. duct nut and the bulkhead fitting are clean.

(12) Apply a thin, even layer of anti-seize compound (CoMat 10-085) to the threads of the T.A.I. duct nut and the bulkhead fitting.

(13) Loosely install the T.A.I. duct nut on the forward bulkhead fitting. Do not tighten the nut at this time.

(14) Install the washers and bolts that attach the T.A.I. duct to the aft bulkhead. Tighten the bolts to a torque of 20-25 lbfin (2.26-2.82 Nm).

(15) Tighten the T.A.I. duct nut by hand until no bulkhead fitting threads are visible forward of the nut.

NOTE: It is necessary to make sure no bulkhead fitting threads are visible forward of the T.A.I. duct nut before you Torque the nut. This ensures proper seal compression and nut engagement. It may be necessary to lightly shake the T.A.I duct while you hand tighten the nut to get full engagement.

(16) Torque the T.A.I. duct nut to 45 ftlbs (540 inlbs). You must use the IAE1N20033 spanner wrench and torque wrench as shown in Figure 4 to properly torque the nut. The actual indication on the gage of your torque wrench will depend upon the torque wrench length. Use the following formula to determine the proper torque wrench indication:

$$AT = \frac{L\ (OT)}{L + A}$$

Where: AT = Adjusted torque setting

A = 10 inches; the distance from the

center of the square drive hole in the IAE1N20033 spanner wrench to the centerline of the T.A.I. duct forward bulkhead coupling nut.

L = Distance from the centerline of the torque wrench drive to the center of the operators hand. Refer to Figure 4.

OT = Original Torque (expressed in inlbs.)

(17) Remove the NAS6703U3 and NAS6703U4 bolts and two AN960C10L Washers from the forward bulkhead fitting. Discard the bolts. Keep one washer for installation.

(18) Install the 290-3085-501 locking bracket with the two NAS6703U5 bolts and one AN960C10L washer. Wet install the bolts with primer mix. If necessary, use the spanner wrench and torque wrench to turn the T.A.I. duct nut in the tightening direction until the slots on the nut align with the locking bracket (not to exceed 50 ftlb (600 inlbs.) of torque) (refer to step (16) to find the actual torque wrench indication). Tighten the bolts to a torque of 34-44 lbfin (3.84-4.97 Nm).

(19) Safety the T.A.I. duct nut with 0.036 inch diameter or thicker lockwire (CoMat 02-128). Install the lockwire with a minimum 45 degree wrap in the tightening direction. Refer to Figure 3 (Sheet 2).

(20) Install the tee in the T.A.I. duct. Tighten the b-nut to a torque of 200-250 lbfin (23-28 Nm). Refer to Figure 3 (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, e-seals and couplings. Tighten the couplings to a torque of 75-90 lbfin (9-10 Nm).

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

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

(25) Identify the nose cowl as the 290-3000-505 nose cowl. Metal stamp, vibroetch, or electroetch on the nose cowl data plate. Refer to the IAE V2500 Standard Practices/Processes Manual, Chapter 70-09-00.

C. Post-requisite Instructions

(1) Install the T.A.I. access cover and NAS7204U5 attach bolts. Wet install the bolts with primer mix. Use new bolts if required. Tighten the bolts to a torque of 33-44 lbfin (3.84-4.97 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.

H. 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-71-0193 has been done. Refer to the IAE V2500 Standard Practices/Processes Manual, Chapter 70-09-00.

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
V2571193-551 Consisting of:			Kit		(A)
290-3085-501	1		Bracket		
NAS6703U5	2		Bolt		
NAS7204U5	15		Bolt		

B. Parts affected by this Bulletin:

NEW PART NO (ATA NO)	QTY	EST'D UNIT PRICE	KEYWORD	OLD PART NO (IPC NO)	INSTR/ DISPOS
290-3000-505 (71-11-01)	1		.Nose Cowl	290-3000-503 (01-010)	(C)(D) (E)
290-3085-501 (71-11-01)	1		..Bracket	- - - (01-XXX)	(B)
NAS6703U5 (78-11-11)	2		..Bolt	- - - (10-085)	(B)
- - - (78-11-11)	1		...Bolt	NAS6703U4 - - -	(1D)

NEW PART NO (ATA NO)	QTY	EST'D UNIT PRICE	KEYWORD	OLD PART NO (IPC NO)	INSTR/ DISPOS
- - - (78-11-11)	1		...Bolt	NAS6703U3 - - -	(1D)

C. Instructions/Disposition Code Statements:

(A) Kit will be available April 1996.

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

(C) Old and new parts are freely and fully interchangeable.

(D) Old part will no longer be available.

(E) New part is currently available.

(1D) Old part may be used on other aircraft installations.

D. Materials Required to Incorporate this Service Bulletin:

CoMat 02-128	Lockwire
Comat 07-066	Thinner
CoMat 07-067	Primer Base
CoMat 07-071	Primer Converter
CoMat 10-085	Anti-Seize Compound

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