ENGINE - LP COMPRESSOR - LPC BLEED VALVE LINKAGE SYSTEM WITH IMPROVED DURABILITY - CATEGORY CODE 8 - MOD.ENG-72-0133

1. Planning Information

A. Effectivity

(1) Aircraft: (a) Airbus A320

(2) Engine: (a) V2500-A1 Engines before Serial Number V0266

B. Reason

(1) Condition

Wear has been observed on pins and bushes of LPC bleed valve linkages.

(2) Background

This condition has been noted on the development engine during strip inspection. An analysis of bleed valve linkage system has shown the necessity of stiffened linkage connecting parts and the linkage support.

(3) Objective

The changes introduced by this Service Bulletin is intended to improve durability of the LPC bleed valve linkage system.

(4) Substantiation

Substantiation testing is not necessary.

(5) Effects of Bulletin on workshop procedure:

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

(6) Supplemental Information

(a) Engine Manual will be revised to show the Assembly/Disassembly procedures of the bushes added to the Sychronizing ring.
(b) Engine Manual will be revised to show the new Inspection procedures.
(c) Engine Manual will be revised to show the Repair procedures.

C. Description

(1) The changes introduced by this Service Bulletin are as follows;

(a) Additional mid-supports are fabricated in around the Support Ring A/O to increase the stiffness of the Bleed Valve Mechanism. (See Figure 1)

(b) Pins and Nuts which connect the Bleed Valve to the Link Arm have been changed to improve linkage system durability. (See Figure 4 Sheet 2)

(c) Additional bushes are fitted on the Synchronize Ring. (See Figure 4 Sheet 6)

(d) The Synchronize Ring Guides and the Guide Pins have been changed to increase the diameter.

(e) The procedures for adjusting the Actuating Rods are changed.

(2) Old Part Number 5A3703, Support Ring A/O can be reworked to the new configuration. (See Figure 2, Sheet 1, 2, 3 and 4)

(3) Old part number 5A3724, Synchronizing Ring can be reworked to the new configuration. (See Figure 3, Sheet 1, 2, 3 and 4)

D. Approval

The 'Compliance' statement and procedures described in Sections 2 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 8

Accomplish based upon experience with the prior configuration.

F. Manpower

Estimated Man-hours to incorporate the full intent of this Bulletin:

Venue	Estimated Man-hours
(1) In service..	Not applicable

Note: (2) At overhaul (The parts affected by this Service Bulletin are accessible at overhaul).

(a) Rework the Support Ring ..... 3 hours 35 minutes

(b) Rework the Synchronizing Ring ..... 2 hours 40 minutes

(c) Assemble the new configuration ..... Not affected

TOTAL : 6 hours 15 minutes

G. Material - Price and Availability

Not applicable

H. Tooling - Price and Availability

The following new special tools are required to accomplish this Service Bulletin when reworking the existing Support Ring and Synchronizing Ring.

Tool No.	Qty	Description	Function	Avail
IAE3J12747	1	Assembly Fixture	Rework Support Ring	1)
IAE3J12784	1	Locating Fixture	Rework Support Ring	1)
IAE3J12748	1	Riveting Fixture	Rework Support Ring	1)
IAE3J12782	1	Clearance Guage	Rework Support Ring	1)
IAE3J12790	1	Machining Fixture	Rework Synchronizing Ring	1)

1) Indicates that Tool Design Aperture Card is currently available from IAE.

I. Weight and Balance

(1) Weight change .. .. .. Plus 3.9 lb. (1,76 kg)

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

(3) Datum .. .. Engine front mount centerline (Power Plant Station (P.P.S.) 100)

J. Electrical Load Data

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

K. References

(1) Internal Reference No.

EC90VJ045

(2) Other References

V2500 Engine Manual

V2500 Engine Illustrated Parts Catalog

V2500 Standard Practices/Processes Manual 70-09-00 Marking of Parts, 70-38-00 Surface Treating, 70-39-00 Machine Riveting, and 70-41-00 Torque Tightening.

Facilities Equipment Manual, Section 5 and 6.

Illustrated Tool and Equipment Manual

L. Other Publications Affected

(1) V2500 Engine Illustrated Parts Catalog, Chapter/Section 72-32-00, 72-32-70, 72-32-71, 72-32-72 and 72-32-73.

(2) V2500 Engine Manual, Chapter/Section 72-32-00, Disassembly, Assembly-08, and 72-32-70, Disassembly and Assembly-01

2. Accomplishment Instructions

A. Rework Instructions

(1) Do a modification on 5A3703 Support Ring and install the 5A1387 Mid Support to the 5A3703 Support Ring (Ref 72-32-71,Fig/Item No.01/600 and 01/670) reidentify as follows :

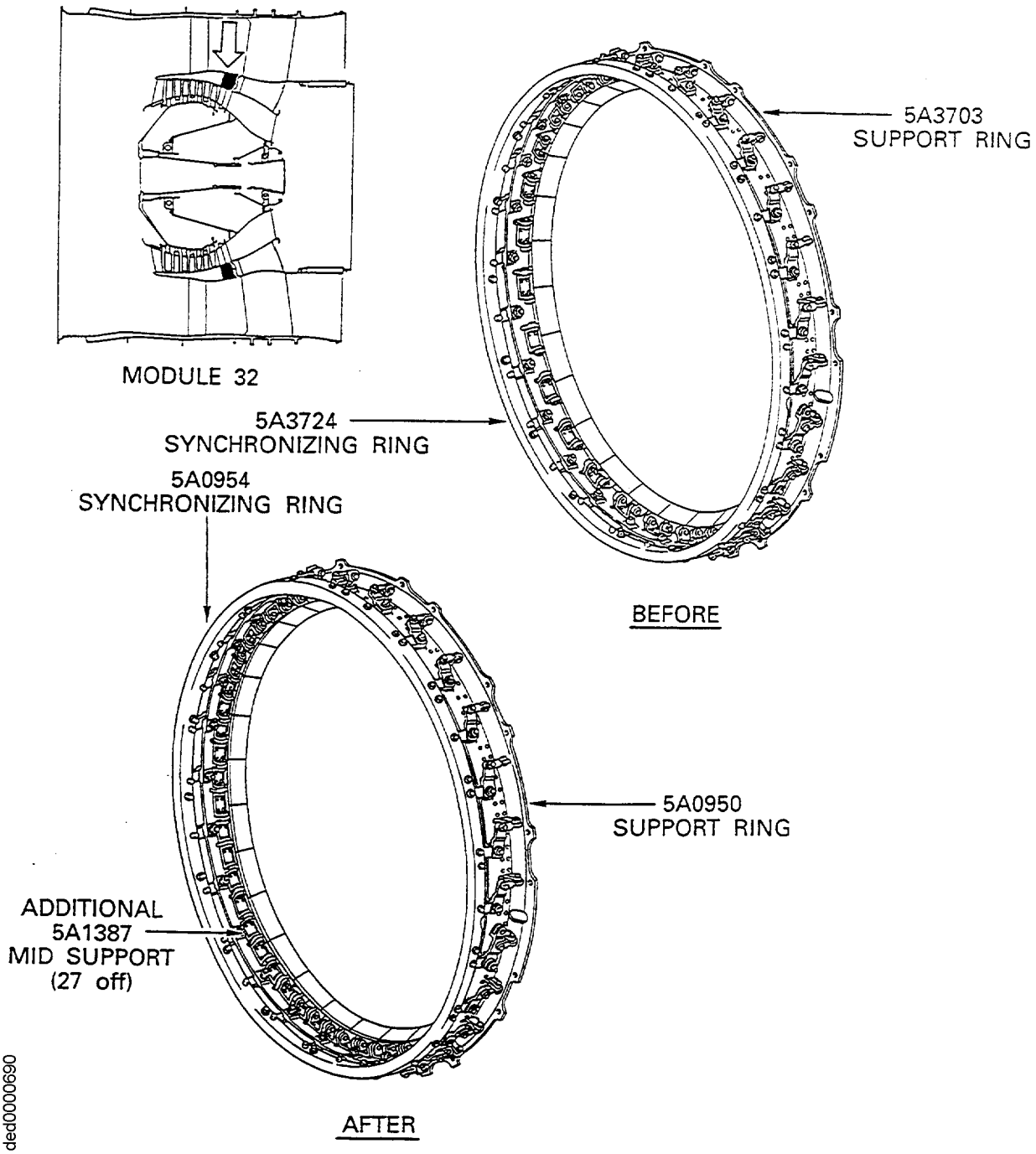
	Procedure	Supplementary Information
(a)	Set the Support Ring on to the Fixture.	Use IAE 3J12747 Assembly Fixture. Refer to Figure 2 (Sheet 1)
(b)	Locate the Support Ring in the Fixture, Set up and secure to the face plate of the Horizontal Boring Mill.	Refer to Reference (4)
(c)	Drill the hole for one position (four holes in each) and do modification at the 27 positions (108 holes total).	Refer to Figure 2 (Sheet 1 and 2)
(d)	Remove the Support Ring from the Horizontal Boring Mill and the Fixture.	
(e)	Do an anodize touch up coating to all surfaces of 108 holes Use the brushing method.	Refer to Reference (3) Control No./TASK No. 70-38-02-300-503
(f)	Visually and dimentionally examine each hole on the Support Ring.	Refer to Figure 2 (Sheet 1 and 2)
(g)	Put the 27 new Mid Support in around the Support Ring and then use the Fixture through the pin hole of both Support and Mid Support, The two bolts are installed through the Mid Support and Support Ring with washers and nuts temporarily into the two positions.	Use IAE 3J12784 Locating Fixture. Refer to Figure 2 (Sheet 3)
(h)	Install the two AS16135, Rivets first in to the position through the Mid Support and Support Ring use the Fixture.	Use IAE 3J12748 Riveting Fixture. Refer to Figure 2 (Sheet 3) and Reference (3) Control No./TASK No. 70-39-00-390-501
(i)	Remove the bolts, nuts and washers from the Mid Support and Support Ring.	

(j)	Do again same procedure for the other two rivets.	Refer to Figure 2 (Sheet 3 and 4)
(k)	Do again step (a), (b), (c) and (d) for the other 26 positions.	Refer to Figure 2 (Sheet 3 and 4)
(l)	Examine the clearances between new Mid Support and Support on the Support Ring Assembly for 54 positions.	Use IAE 3J12782 Clearance Gauge The formed rivet and rivet head must be tight and must have no crack or sign of bursting at the periphery. Refer to Figure 2 (Sheet 4)
(m)	Mark the re-number adjacent to the existing part number. Use the Vibration Peening Method.	Existing Renumber 5A3703 5A0950 Refer to Figure 2 (Sheet 3) and Reference (3) Control No. /TASK No. 70-09-00-400-001

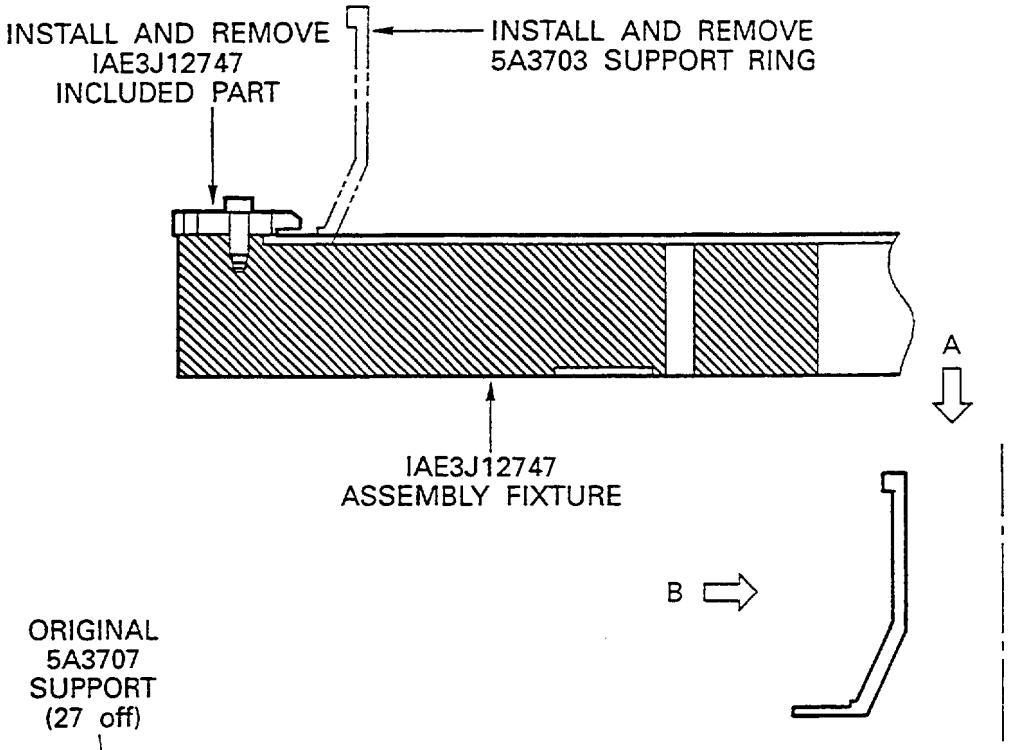
(2) Do a modification on 5A3724, Synchronizing Ring and reidentify to the new part number 5A0954 as follows:

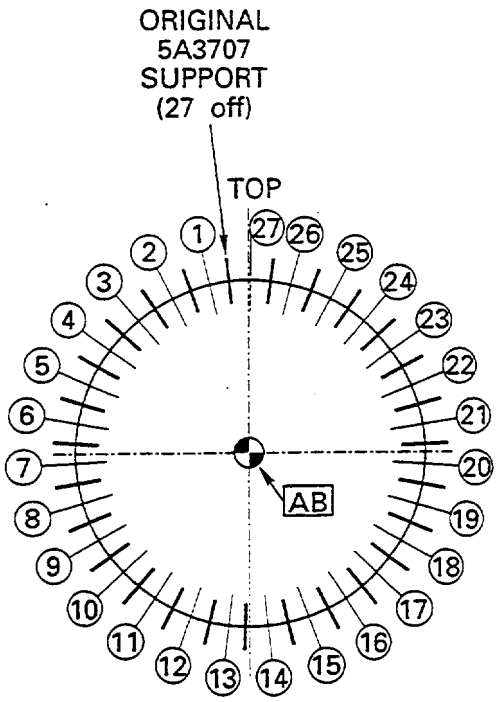
	Procedure	Supplemental Information
(a)	Remove the 5A3699, Guide, A/O and MS15795, Washer from the Synchronizing Ring. Discard the Guide, but hold the Washer for reinstallation.	Refer to Reference (1), Chapter/Section 72-32-73, Repair 002, VRS1336.
(b)	Set a Turn Table onto the Horizontal Boring Mill.	Refer to Reference (4).
(c)	Put the support equipment IAE 3J12790, Machining Fixture onto the Turn Table.	Refer to Reference (5).
(d)	Set the support equipment by the Plane A and the Dia B.	Refer to Figure 3 (Sheet 1).
(e)	Set and clamp the 5A3724, Synchronizing Ring in the open side down onto the IAE3J12790, Machining Fixture. Make sure that there is no clearance between the Synchronizing Ring and the Plane A of Machining Fixture at each clamp position.	Refer to Figure 3 (Sheet 1).

(f)	Find a 'Top' marking and two scallops on the Synchronizing Ring, and adjust the zero degree of the Turn Table to the center of hole 'C'.	Refer to Figure 3 (Sheet 3 and 4)
(g)	Enlarge 25 holes on the Synchroniging Ring with a drill. Make sure that the drill center aligns with each existing hole.	Refer to Figure 3 (Sheet 4).
(h)	Remove the Synchronizing Ring from the Machining Fixture.	
(i)	Make chamfer on the outside edge of each hole. Break the sharp edge on the inside edge of each hole.	Refer to Figure 3 (Sheet 4).
(j)	Do an anodize touch up coating to all surfaces of 25 holes.	Refer to Reference (3), Control No./TASK No. 70-38-02-300-503.
(k)	Install the 5A0956, Guide, A/O and the MS15795-809, Washer onto the Synchronizing Ring.	Refer to Figure 3 (Sheet 5). Refer to Reference (1), Chapter/Section 72-32-73, Repair 002, VRS1336.
(k)	Mark the re-number adjacent to the existing part number of Synchronizing Ring in the Vibration Peening Method.	Existing Re-number 5A3724 5A0954 Refer to Reference (3) Control No./TASK No. 70-09-00-400-001.
(1)	Visually and dimentionally examine the formed Guide, A/O.	Refer to Figure 3 (Sheet 5)



LPC Bleed Valve Linkage System - Before and After Alteration
Fig.1





No.	FROM TOP POSITION (ADDITIONAL MID SUPPORT)	No.	FROM TOP POSITION (ADDITIONAL MID SUPPORT)
1	12° 20'	15	199° 0'
2	25° 40'	16	212° 20'
3	39° 0'	17	225° 40'
4	52° 20'	18	239° 0'
5	65° 40'	19	252° 20'
6	79° 0'	20	265° 40'
7	92° 20'	21	279° 0'
8	105° 40'	22	292° 20'
9	119° 0'	23	305° 40'
10	132° 20'	24	319° 0'
11	145° 40'	25	332° 20'
12	159° 0'	26	345° 40'
13	172° 20'	27	359° 0'
14	185° 40'		

VIEW ON A

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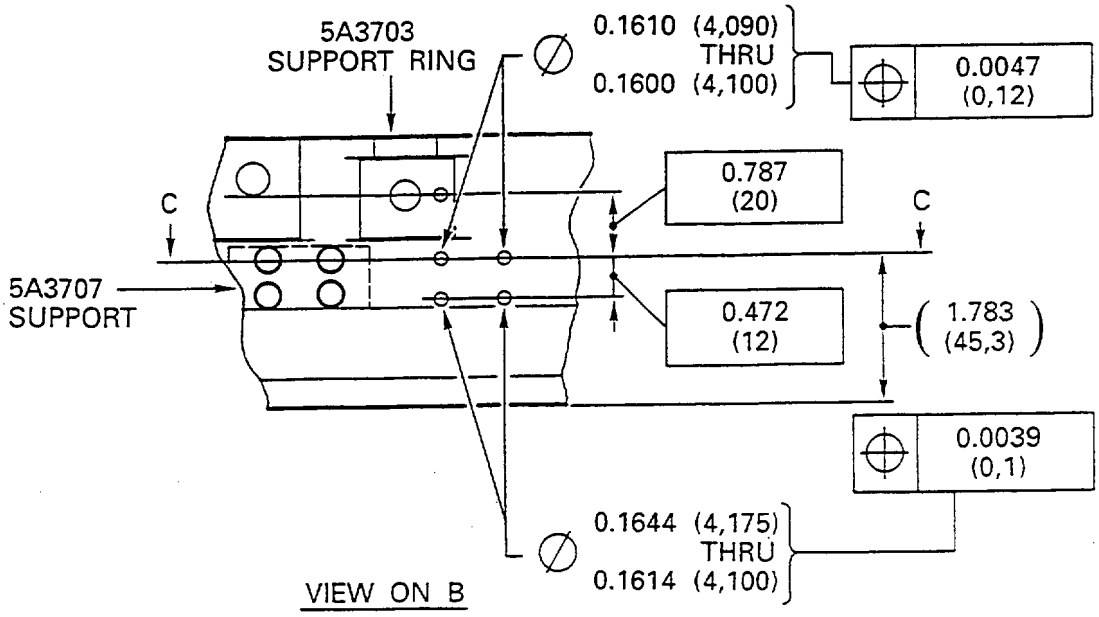
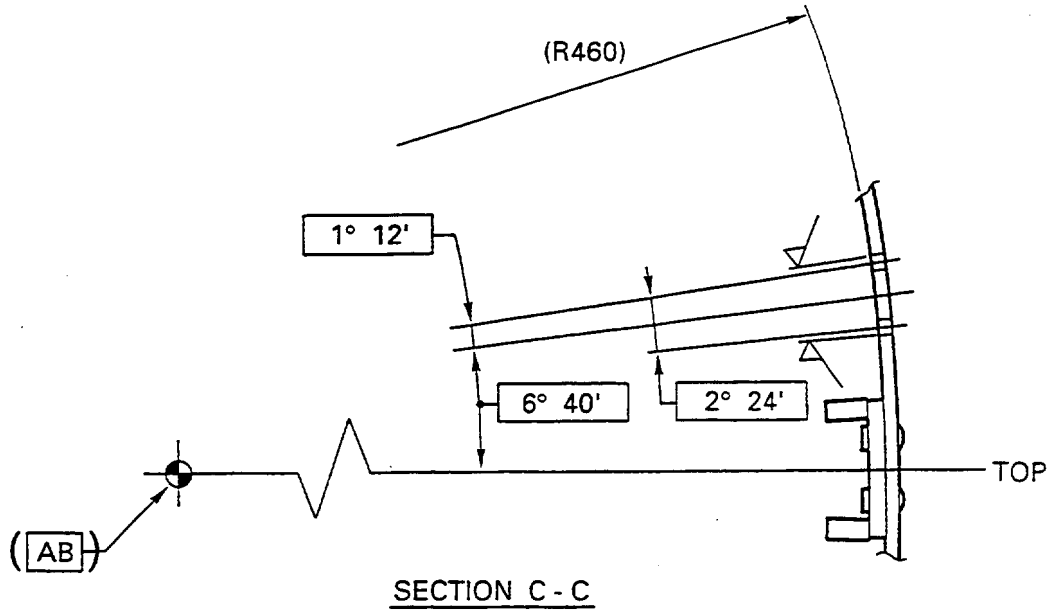
Modification of Support Ring Assembly
Fig.2 (Sheet 1)





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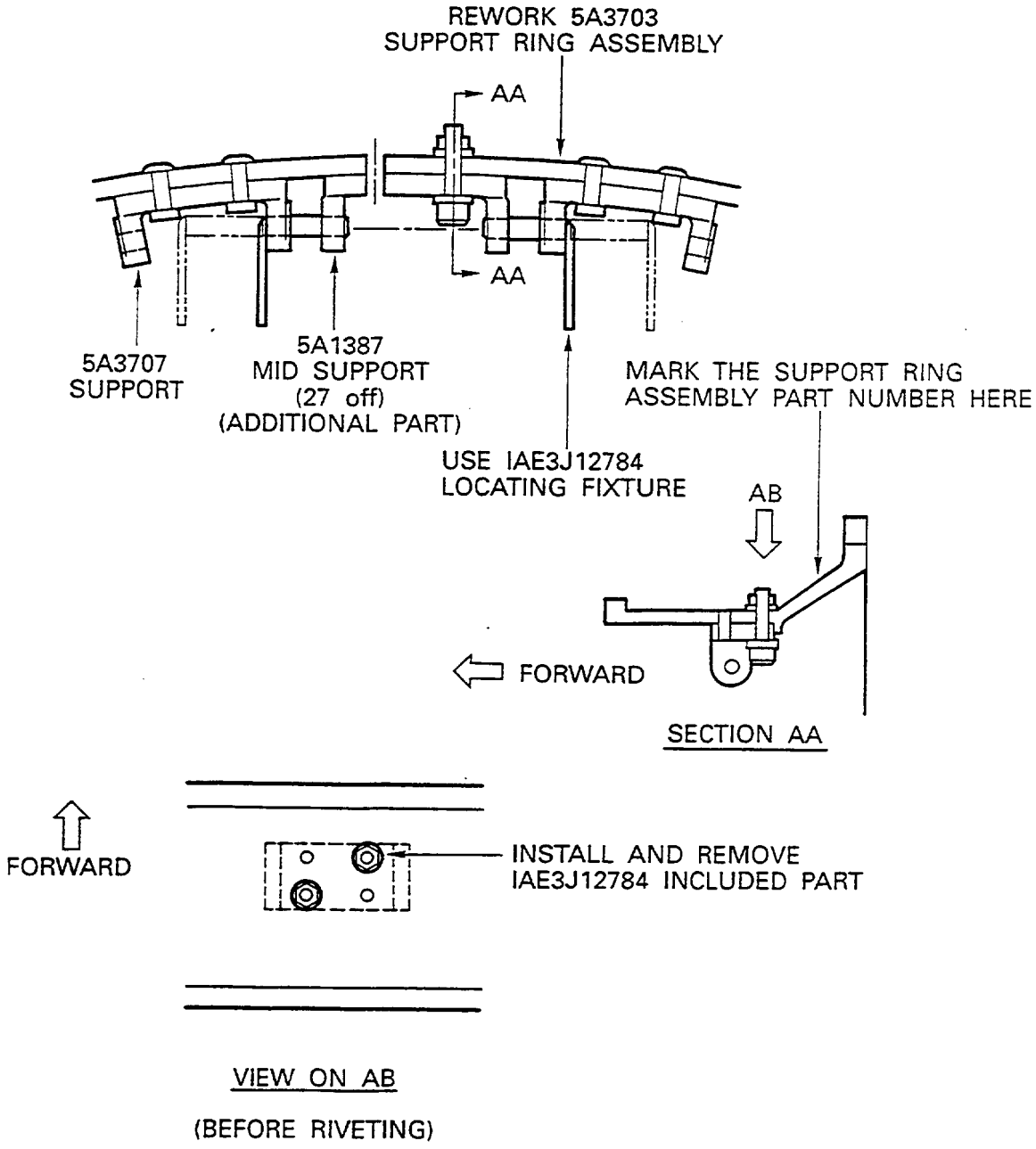
Modification of Support Ring Assembly
Fig.2 (Sheet 2)



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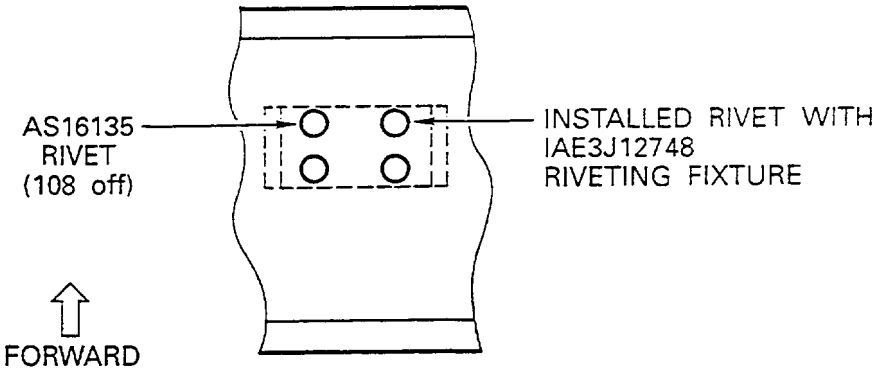
Modification of Support Ring Assembly
Fig.2 (Sheet 3)



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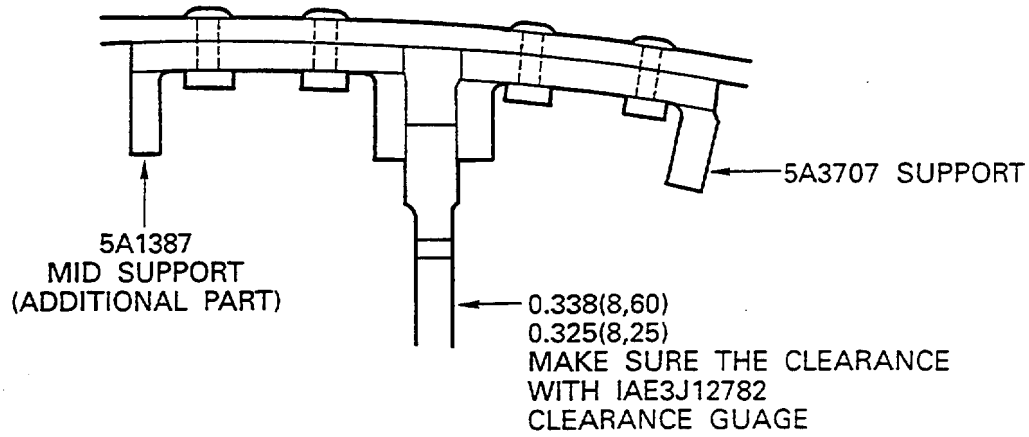

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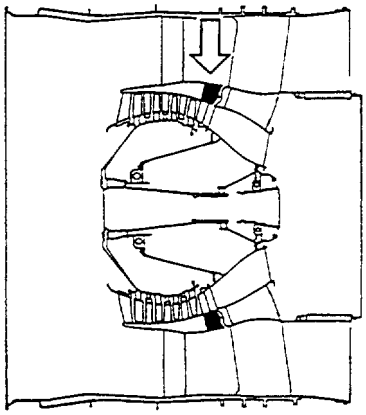
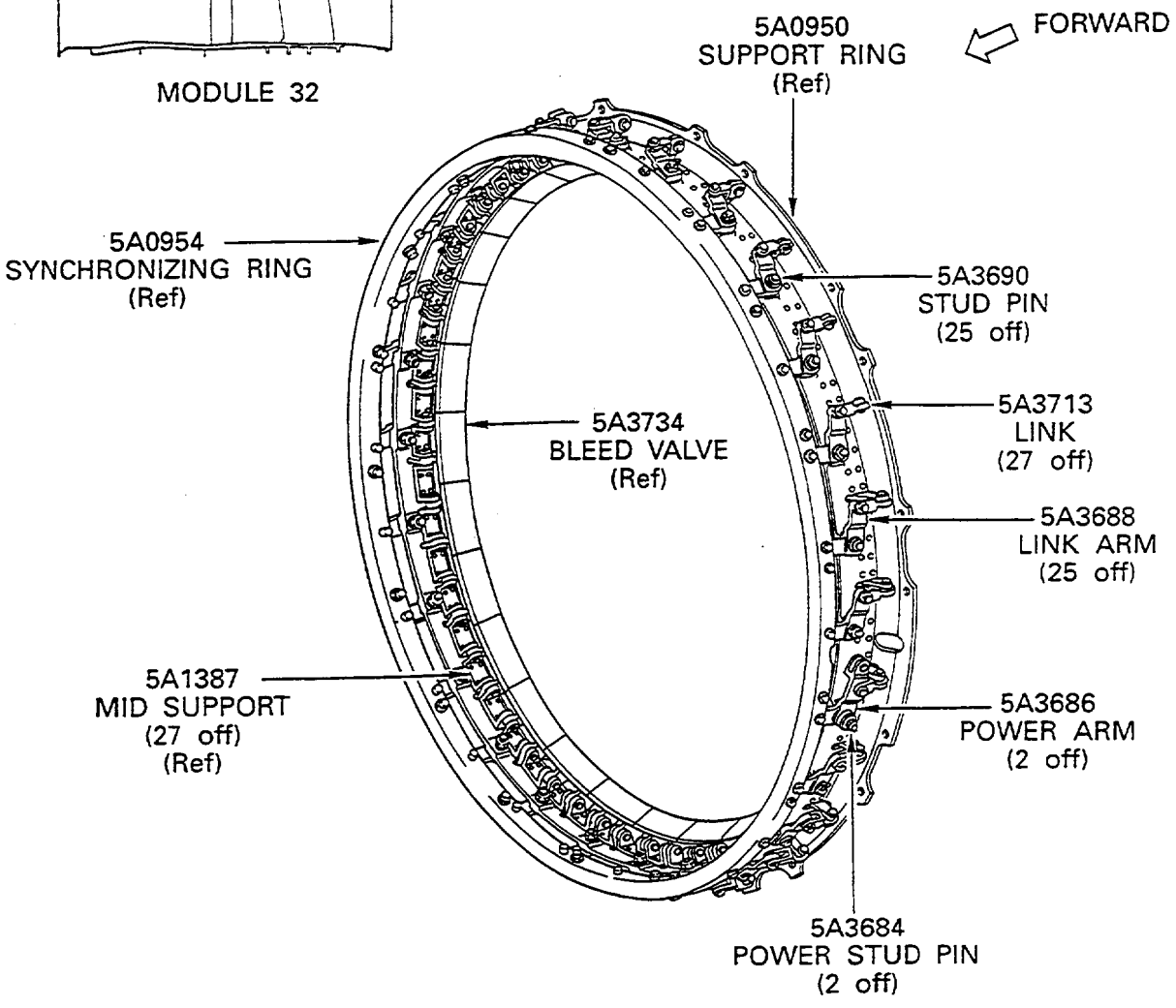
Modification of Support Ring Assembly
Fig.2 (Sheet 4)



MODULE 32



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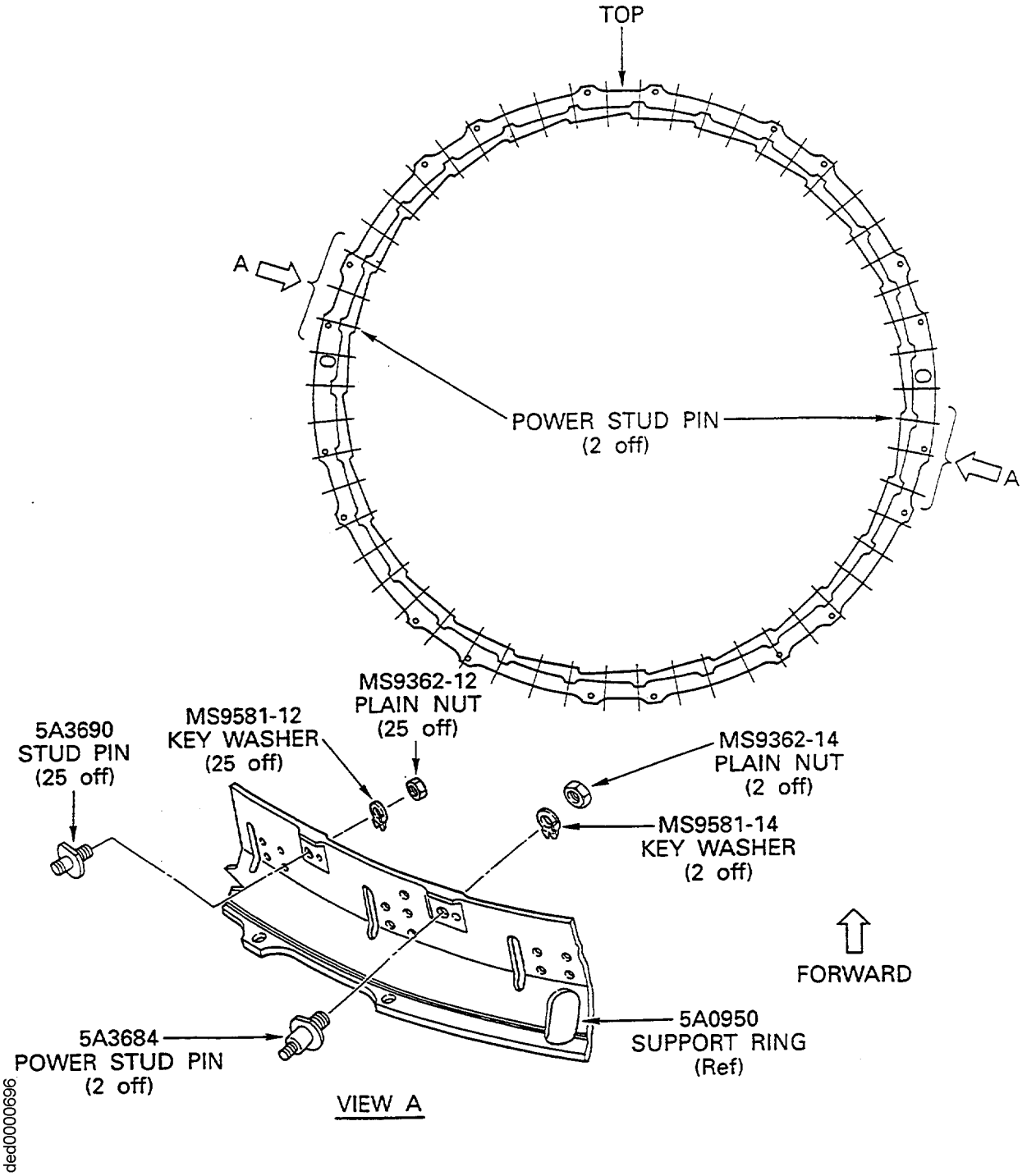
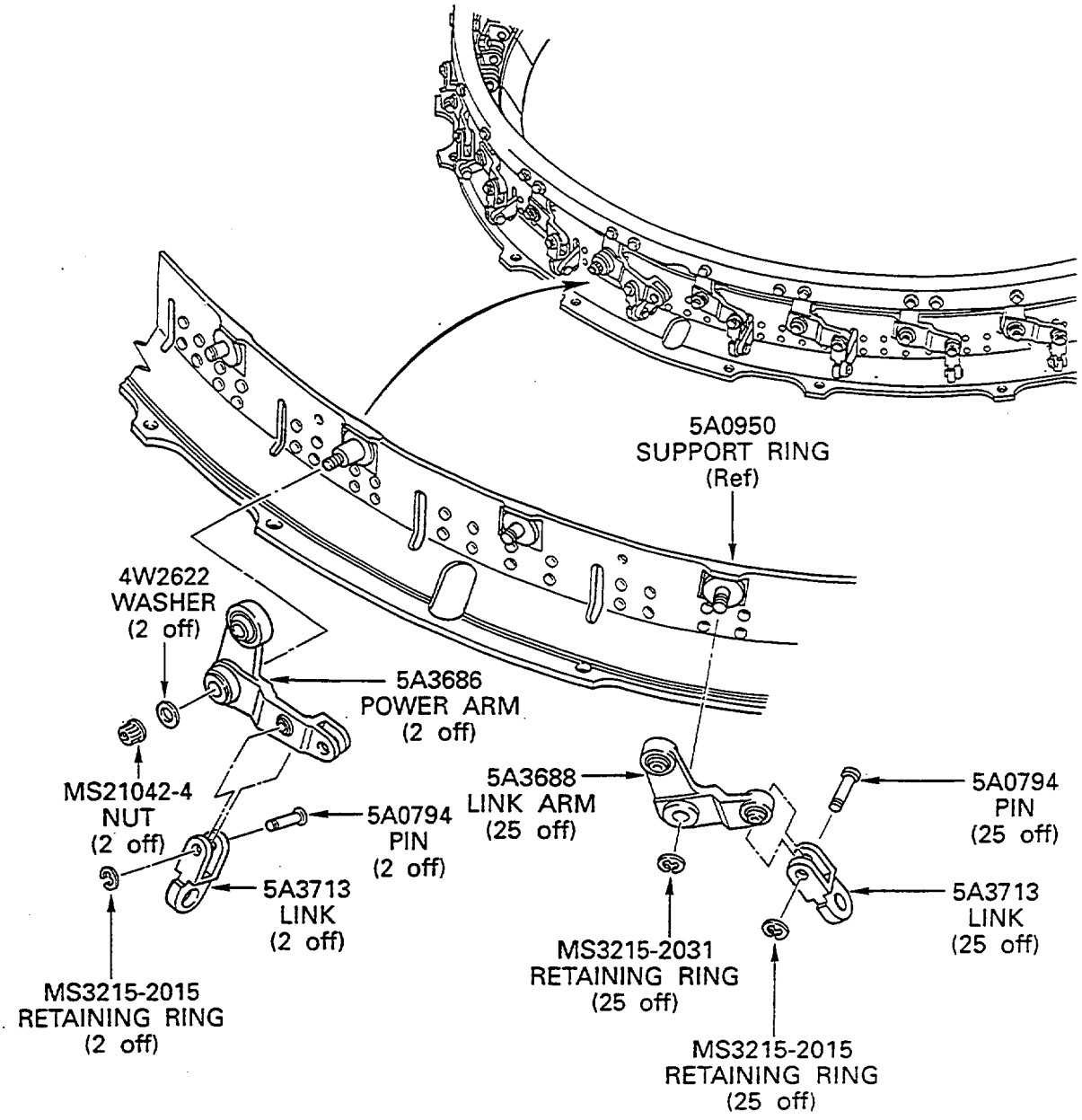
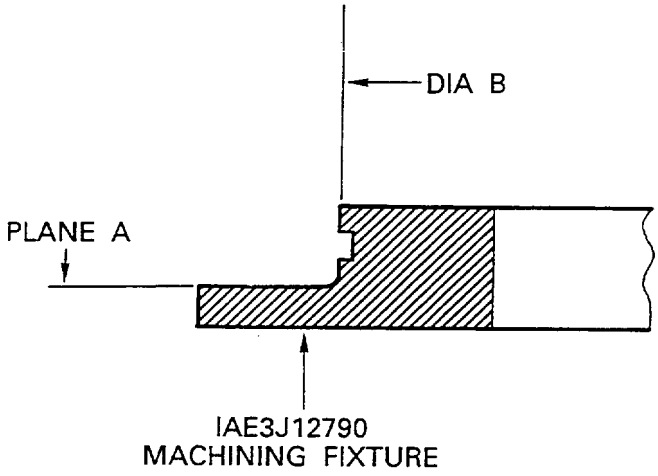
A view of the booster stage bleed and actuating mechanism and Install the power stud pins and stud pins
Fig.3 (Sheet 1)

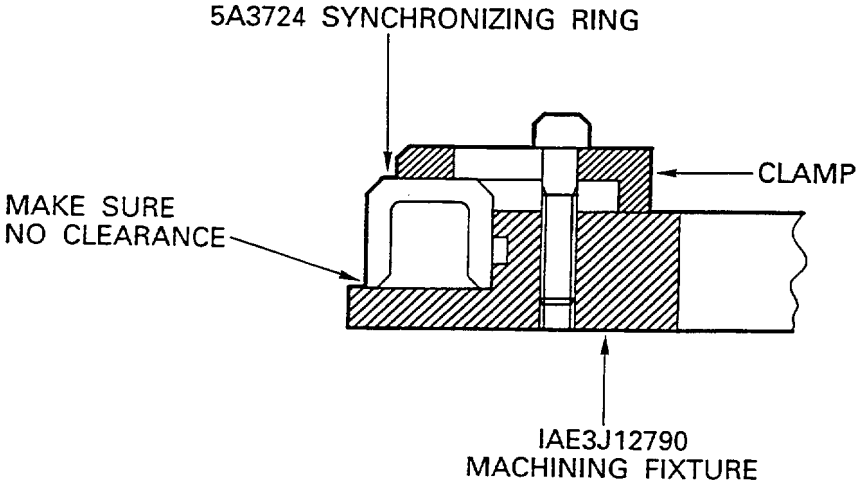


Install the power stud pins and the stud pins
Fig.3 (Sheet 2)



Install the power arms, the link arms and the links
Fig.3 (Sheet 3)





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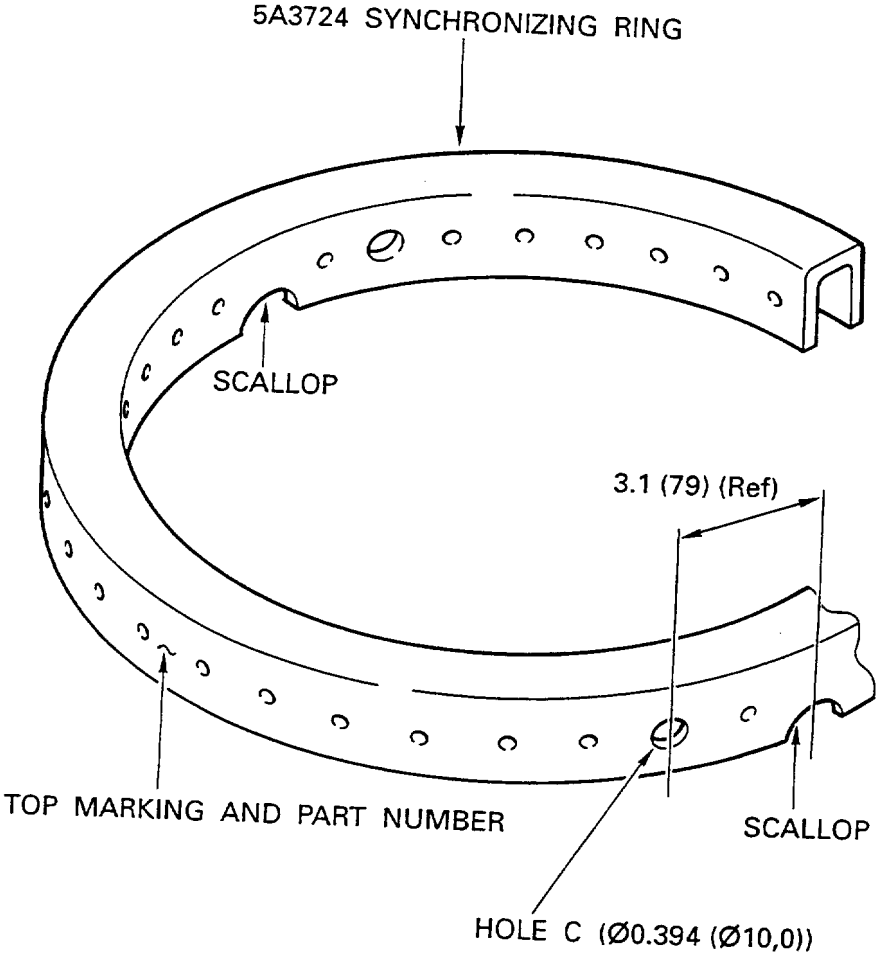
Set the Synchronizing Ring onto Machining Fixture
Fig.3 (Sheet 1)



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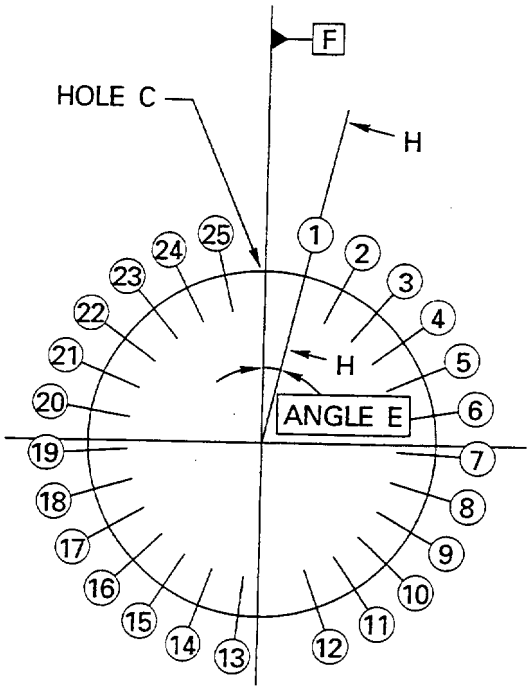
Top Marking and Scallops on the Synchronizing Ring
Fig.3 (Sheet 2)



5A3724 SYNCHRONIZING RING

No.	ANGLE E	No.	ANGLE E
1	13° 20'	13	186° 40'
2	26° 40'	14	200° 00'
3	40° 00'	15	213° 20'
4	53° 20'	16	226° 40'
5	66° 40'	17	240° 00'
6	80° 00'	18	253° 20'
7	93° 20'	19	266° 40'
8	106° 40'	20	280° 00'
9	120° 00'	21	293° 20'
10	133° 20'	22	306° 40'
11	146° 40'	23	320° 00'
12	160° 00'	24	333° 20'
		25	346° 40'

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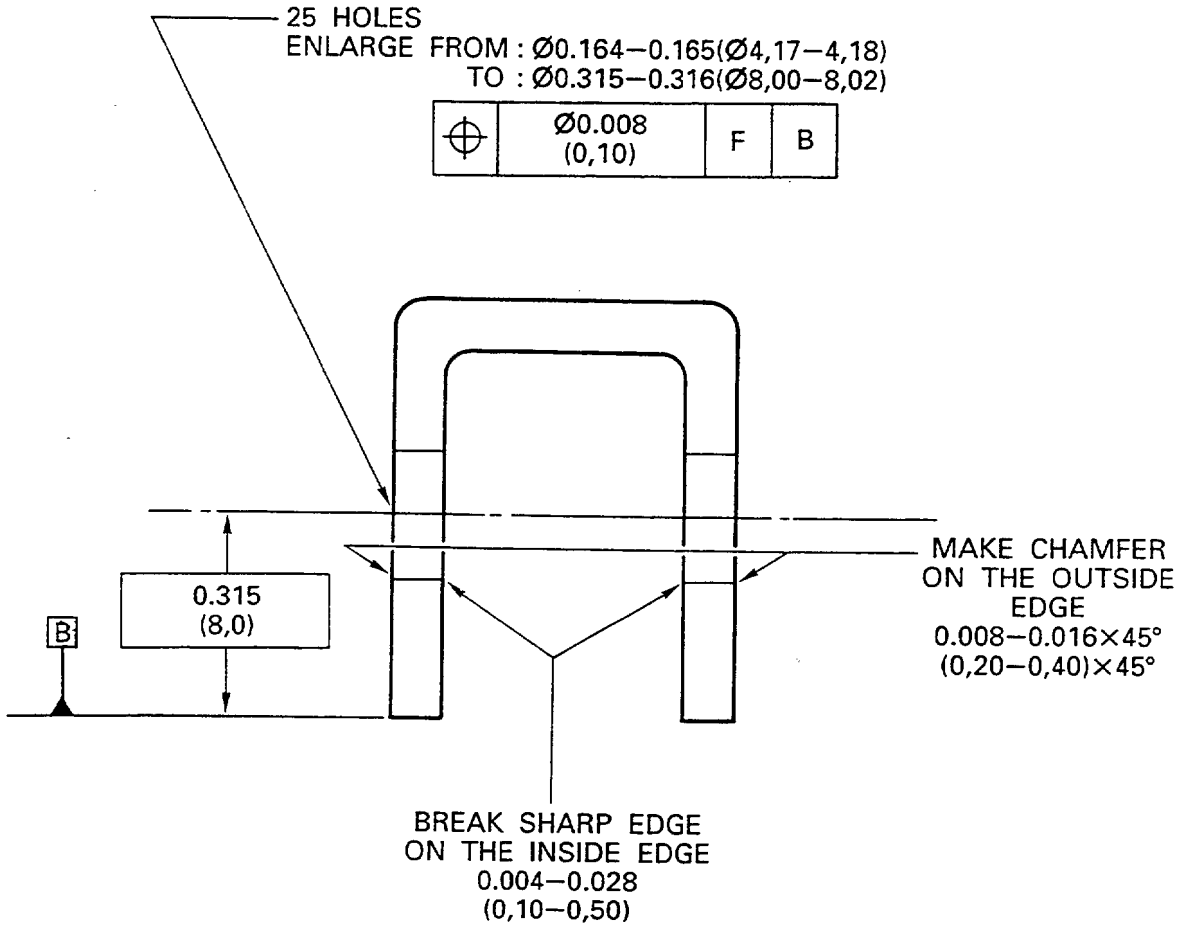
Hole Positions on the Synchronizing Ring
Fig.3 (Sheet 3)



SECTION H-H
SYNCHRONIZING RING

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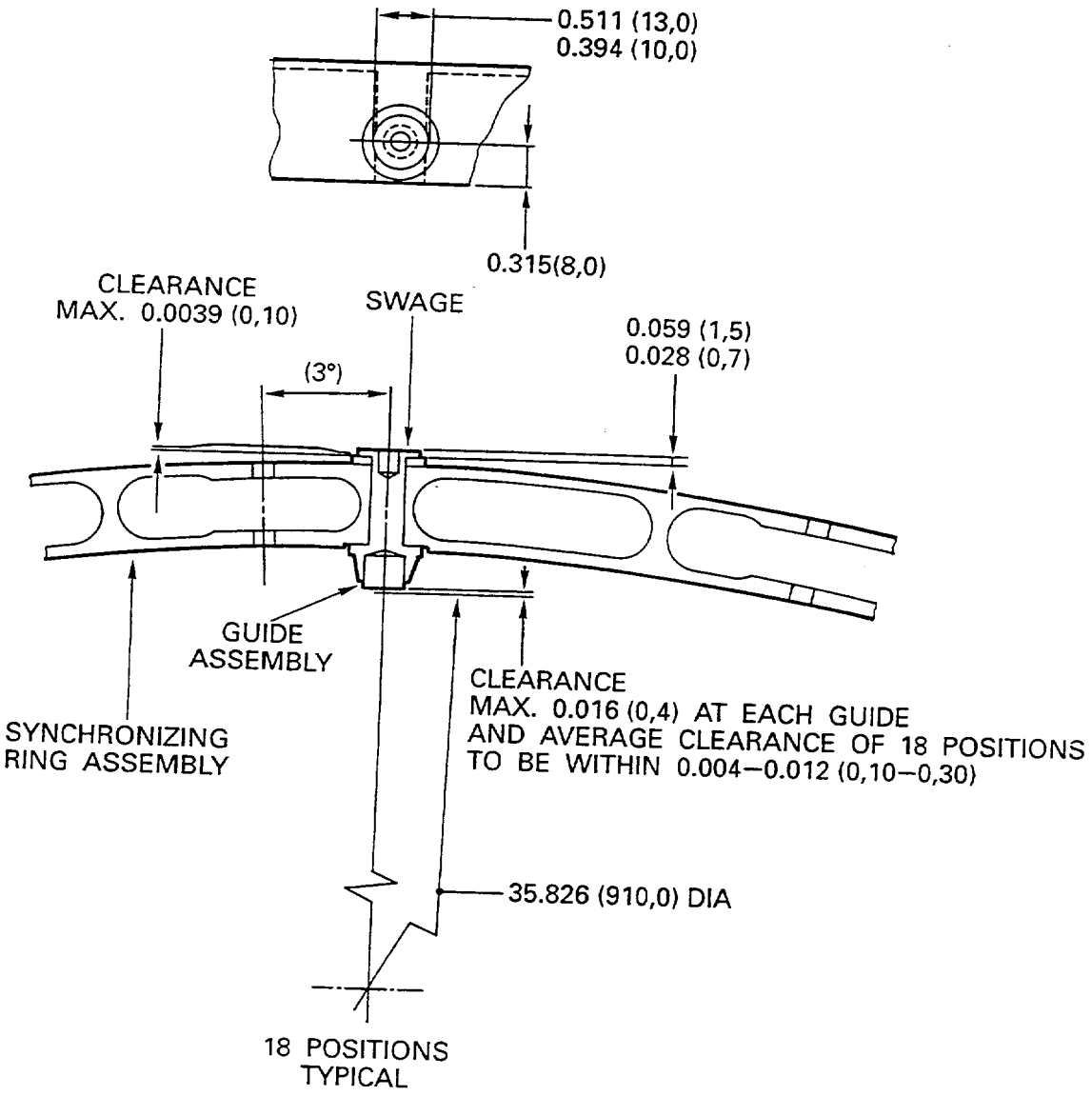
Enlarge 25 Holes on the Synchronizing Ring
Fig.3 (Sheet 4)



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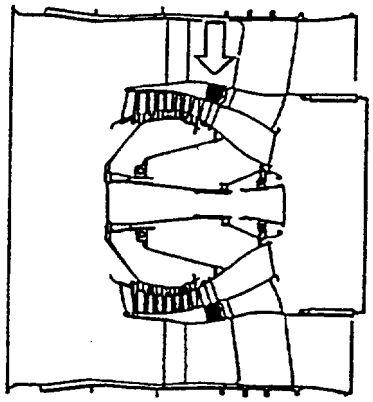
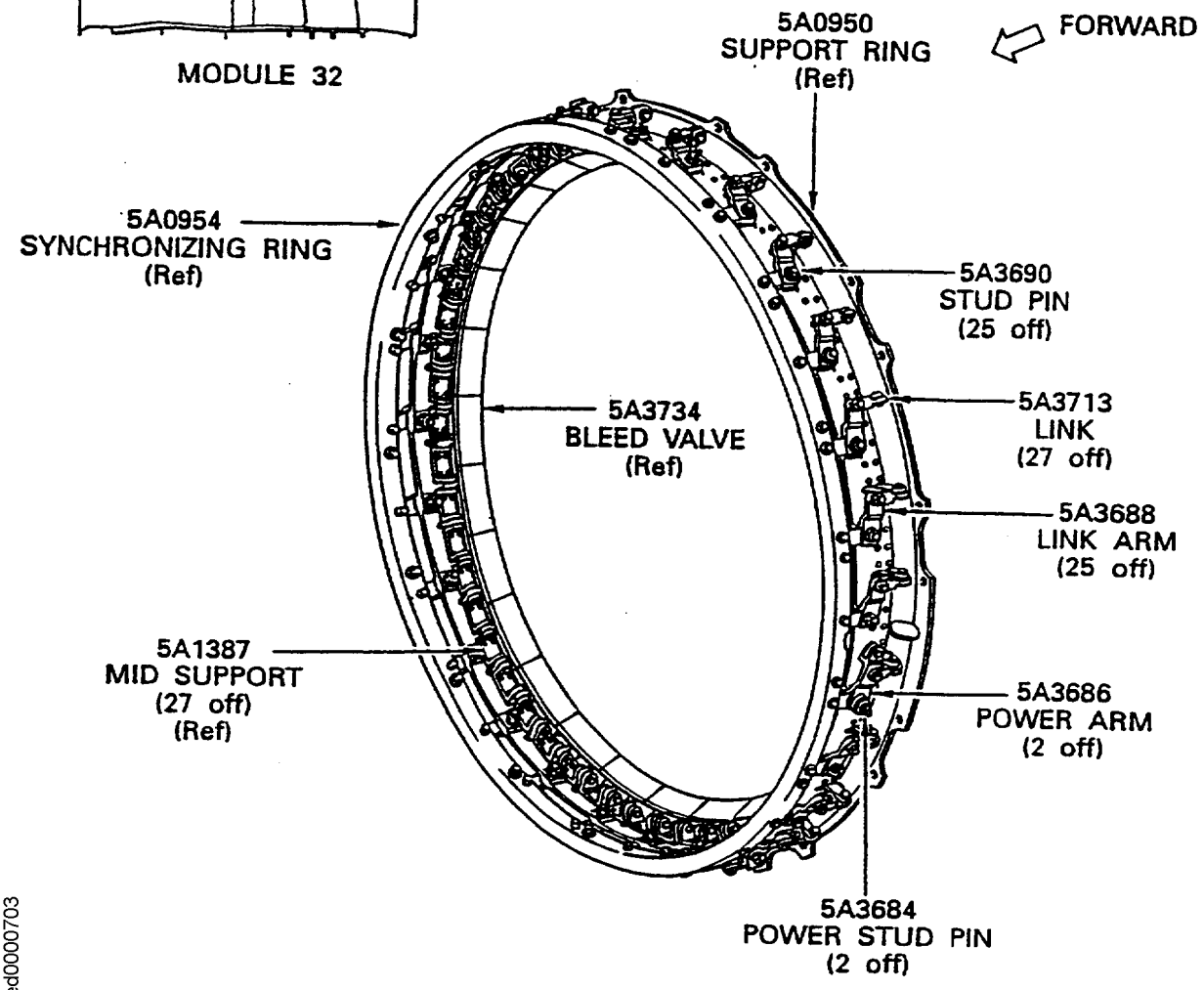
Installation of the Guide onto the Synchronizing Ring
Fig.3 (Sheet 5)



MODULE 32



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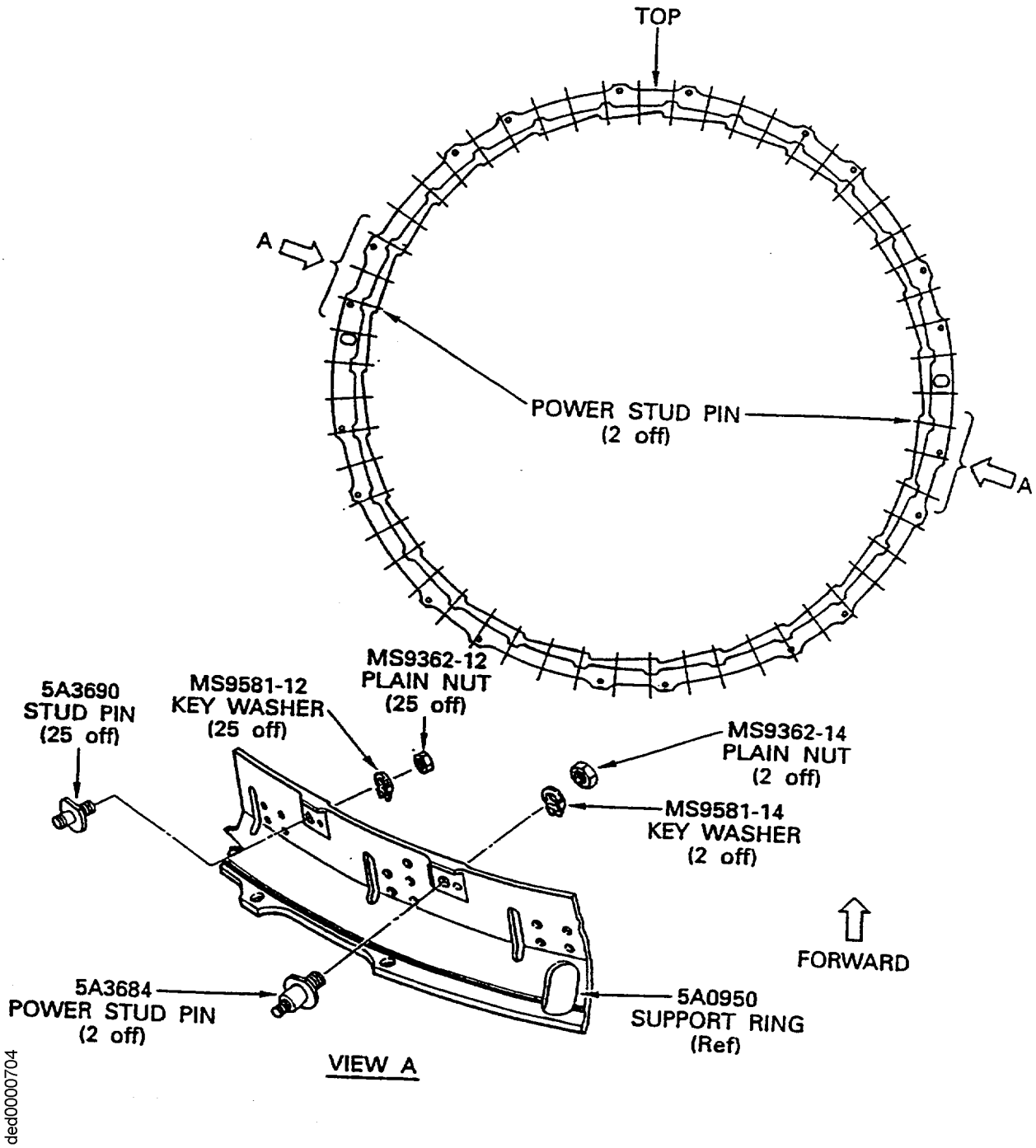
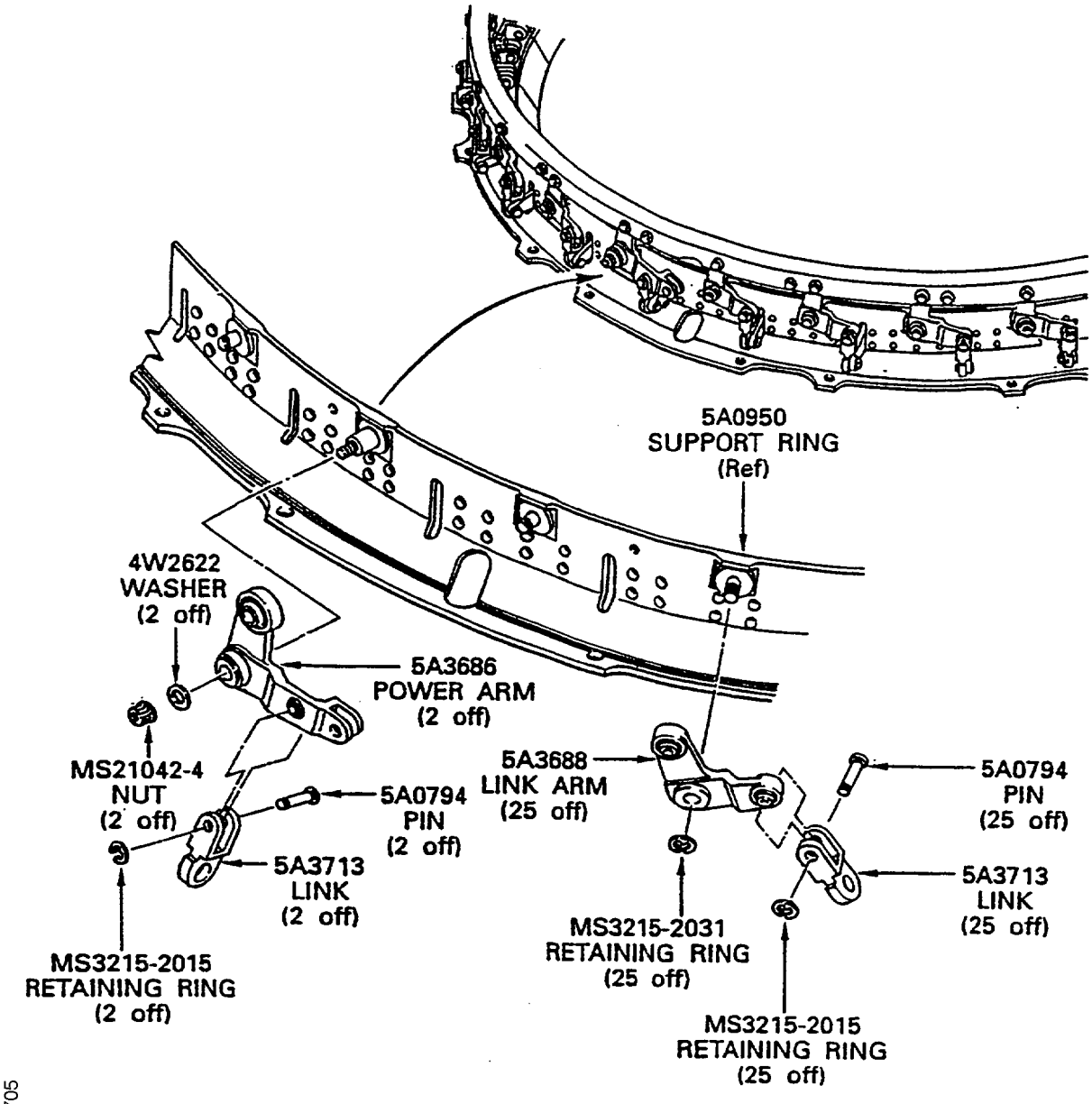
A view of the Booster Stage Bleed and Actuating Mechanism and install the Power Stud Pins and Stud Pins
Fig.4 (Sheet 1)



Install the Power Stud Pins and the Stud Pins
Fig.4 (Sheet 2)



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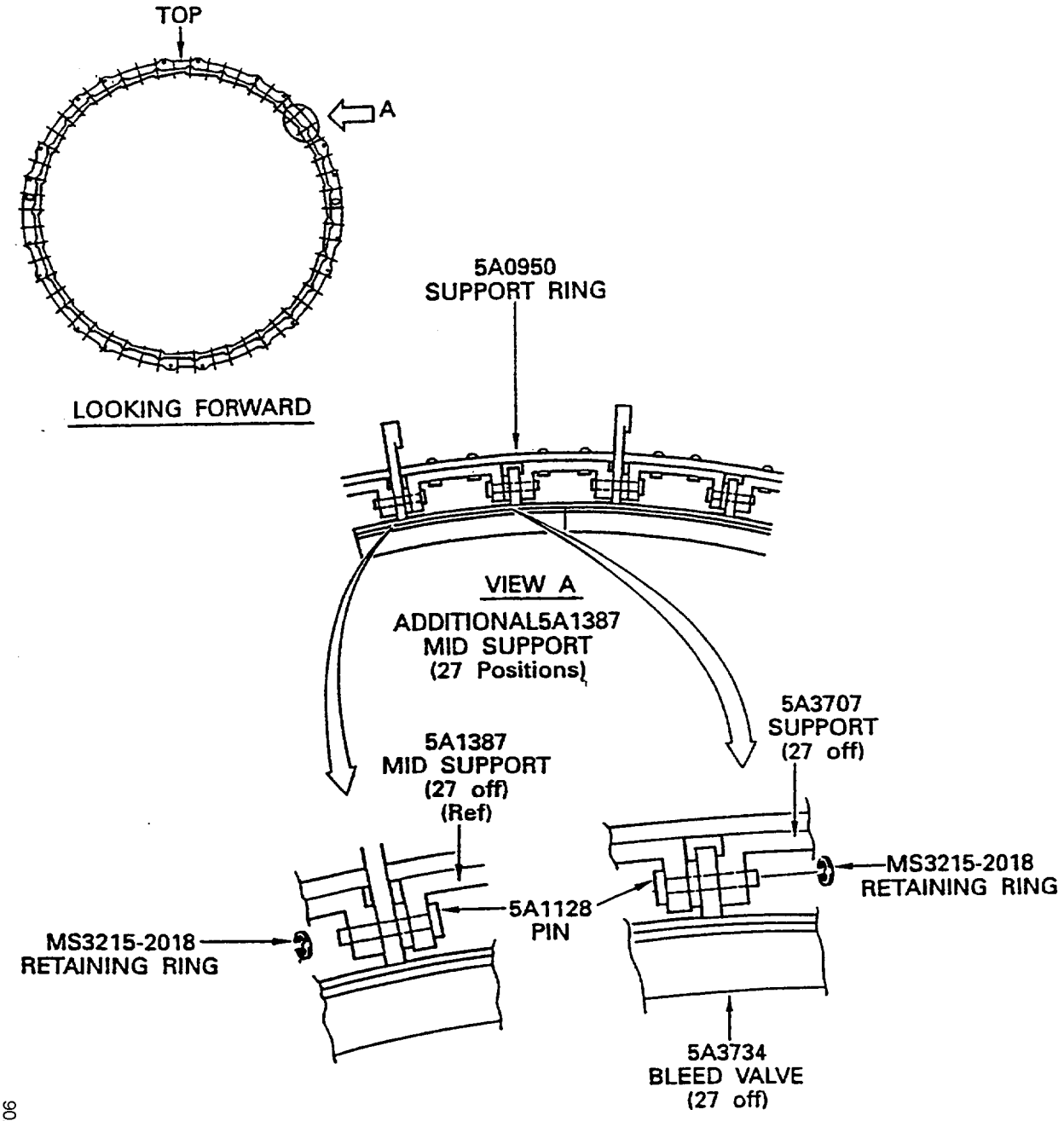
Install the Power Arms, the Link Arms and the Links
Fig.4 (Sheet 3)



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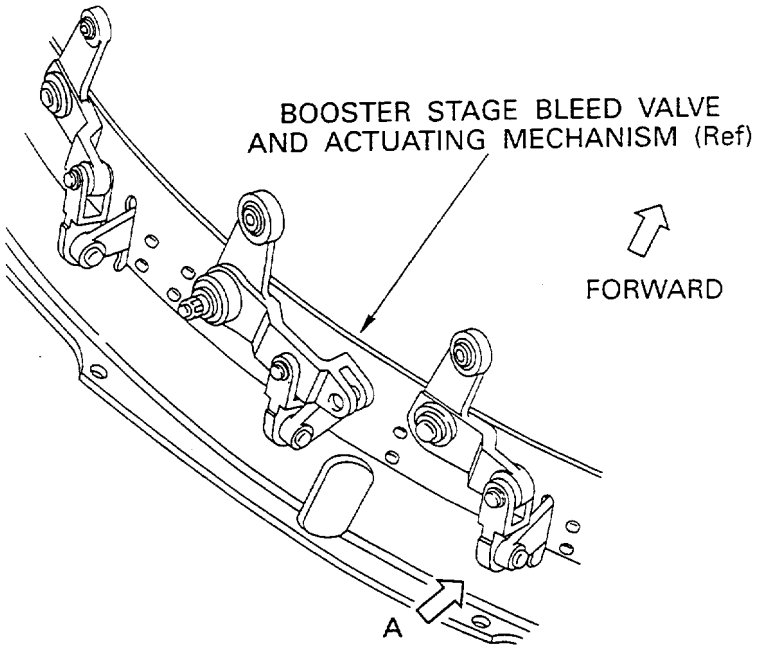
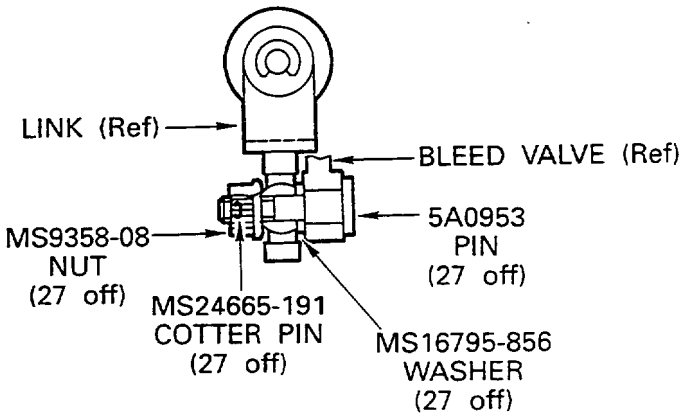
Install the Bleed Valves
Fig.4 (Sheet 4)





VIEW A

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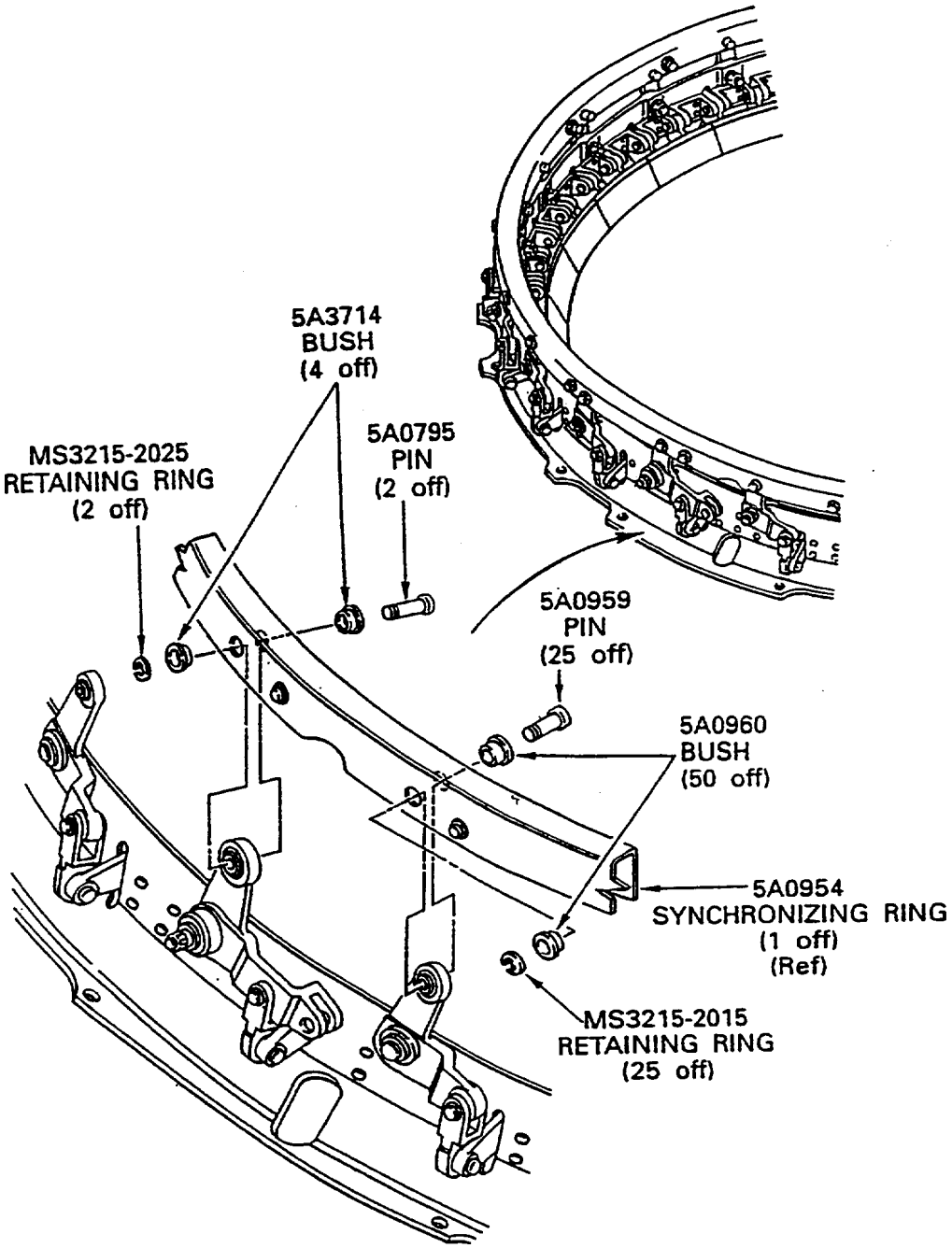
Install the Bleed Valves
Fig.4 (Sheet 5)



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Install the Bleed Valves
Fig.4 (Sheet 6)

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
5A0793 (72-32-00)	2	23.20	.Pin	5A3716 (01-720)	(A)(B)(S1)
5A0959 (72-32-70)	25	21.00	.Pin	5A3710 (01-140)	(A)(B)(S1)
5A0960 (72-32-70)	50	26.00	.Bush	- (01-145)	(A)(2D)(S1)
5A0795 (72-32-70)	2	25.90	.Pin	5A3709 (01-180)	(A)(B)(S1)
MS9358-08 (72-32-70)	27	4.04	.Nut, Castellated	MS3215-2015 (01-220)	(A)(B)(S1)
5A0953 (72-32-70)	27	35.50	.Pin	5A3711 (01-240)	(A)(B)(S1)
5A1128 (72-32-70)	54	21.00	.Pin	5A3708 (01-280)	(A)(B)(S1)
5A0794 (72-32-71)	25	21.00	.Pin	5A3710 (01-230)	(A)(B)(S1)
5A0794 (72-32-71)	2	21.00	.Pin	5A3710 (01-430)	(A)(B)(S1)
5A0950 (72-32-71)	1	16,970.00	.Ring, A/0 Support	5A3703 (01-600)	(A)(B)(S1) (1D)
5A1387 (72-32-71)	27	147.00	..Support, Mid	- (01-670)	(A)(2D)(S1)
AS16135 (72-32-71)	108	0.62	..Rivet, Solid Universal HD	- (01-680)	(A)(2D)(S1)
MS24665-153 (72-32-72)	27	0.03	.Pin, Cotter	- (01-215)	(A)(2D)(S1)
MS24665-191 (72-32-72)	Ref		.Pin, Cotter	- (01-215)	(C)(S1)
MS15795-856 (72-32-72)	27	0.18	.Washer	- (01-230)	(A)(2D)(S1)
5A0954 (72-32-73)	1	7,959.00	.Ring, A/0 Synchronized	5A3724 (01-150)	(A)(B)(S1) (1D)
5A0956 (72-32-73)	18	45.80	..Guide, A/0	5A3699 (01-180)	(A)(B)(S1)

C. Instruction/Dispostion Code Statements:

(A) New part is currently available.

(B) Old part will continue to be available.

(C) Part is alternate to MS24665-153.

(S1) New parts coded (S1) must replace Old parts coded (S1) as a COMPLETE SET per engine.

(1D) Old part can be reworked and reidentified to the new part number.

(2D) Additional Part.

NOTE: The estimated 1996 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.