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DATE: Nov.25/08

V2500-A1/A5 PROPULSION SYSTEM SERVICE BULLETIN

This document transmits the Revision 1 of Service Bulletin V2500-ENG-72-0391

Document History

Service Bulletin Revision Status

Initial Issue Jul. 5/02

Service Bulletin Initial Issue

Remove	Incorporate	Reason for change
All pages of the Service Bulletin	Pages 1 to 39 of the Service Bulletin	To add the P/N 4W0027 of ATA 72-32-41 Fig-Item 01-268 and 01-320 in the Material Information section and incorporate the requirements of EC 06VJ013.

V2500-ENG-72-0391

CHECK THAT ALL PREVIOUS TRANSMITTALS HAVE BEEN INCORPORATED
If any have not been received please advise Customer Data Services, Rolls-Royce plc, Derby, England

International Aero Engines

SERVICE BULLETIN

ENGINE - LP COMPRESSOR - INTRODUCTION OF STEEL/ALUMINIUM NO.1 BEARING SUPPORT

1. Planning Information

A. Effectivity

(1) Airbus A319

V2522-A5, V2524-A5 Engines before Serial Number V11276 except V11220 to V11250 and V11275

(2) Airbus A319CJ

V2527M-A5 Engines before Serial Number V11276 except V11220 to V11250 and V11275

(3) Airbus A320

(a) V2500-A1 Engines before Serial Number V0362

(b) V2527-A5, V2527E-A5 Engines before Serial Number V11276 except V11220 to V11250 and V11275

(4) Airbus A321

V2530-A5, V2533-A5 Engines before Serial Number V11276 except V11220 to V11250 and V11275

B. Concurrent Requirements

This Service Bulletin must be incorporated subsequent to accomplishment of the Service Bulletin that follows: V2500-ENG-72-0132 (V2500-A1 Engine Only).

C. Reason

(1) Problem

Supply of titanium material is liable to be less controlled, and it will be possible to escalate the cost. There will be the possibility to change the material of No.1 bearing support from titanium. Change of material of No.1 bearing support from titanium to steel and aluminium will maintain the reasonable cost of the No.1 bearing support.

(2) Evidence

See (1) Problem

(3) Substantiation

Structural integrity of the new steel/aluminium support is substantiated by analysis, showing that structural integrity at fan blade off event is better than or equivalent to the titanium support. Dynamic behaviour of
R the new design is also checked analytically, vibration survey on
R development engine 804/20 was accomplished successfully.

(4) Objective

To maintain controlled supply condition and reasonable cost of the No.1 bearing support. Change the material of No.1 bearing support from titanium to steel and aluminium as fastening assembly.

Front and rear support are bolt jointed and o-ring sealed.

R To compensate for the different axial thermal expansion of the titanium
R support and to keep the same gaps between rotor and stator in Fan and LPC at maximum rating, total axial length of the steel/aluminium bearing support is reduced by 0,47 mm.

(5) Effect of Bulletin on:

(a) Operation

Not affected.

(b) Maintenance

Not affected.

(c) Overhaul

Affected.

(d) Repair Schemes

Affected.

(e) Interchangeability

Affected.

(f) Fits and Clearances

Affected.

D. Description

Replace the No.1 Bearing Support Assembly and related hardware at the applicable Locations. New No.1 Bearing Front/Rear Support Assembly and related hardware will be available for replacement purposes.

(1) For relationship with other Service Bulletins, see 1.N. References.

(2) The removal/installation procedure of No.1 bearing support assembly are changed.

(3) Fits and Clearances requirements are changed.

E. Compliance

Category Code 7

Accomplish when supply of superseded parts has been depleted.

F. Approval

The part number changes and/or part modification 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 Models listed.

G. Manpower

The estimated man-hours shown below are applicable only to Sub-division 1 and 3 of this Service Bulletin.

(1) In service - Not applicable

(2) At overhaul - 2 hours, 25 minutes (Sub-divisions 1 and 3 only)

Total 2 hours, 25 minutes

NOTE: The parts affected by this Service Bulletin are accessible at overhaul.

H. Material Price and Availability

Modification kit not required; parts supplied as single line items.

For prices and availability of future spares see 2. Material Information.

I. Tooling Price and Availability

Special tools are not required.

J. Industry Support Information

None.

K. Weight and Balance

(1) Weight Change

Plus 5.02 lbs (2,17Kg)

(2) Moment Arm

None.

(3) Datum

Engine front mount centreline (Power Plant Station PPS 100).

L. Electrical Load Data

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

M. Software Accomplishment Summary

Not applicable.

N. References

(1) IAE V2500 Engine Manual (E-V2500-1IA), 72-32-00

(a) Assembly-06

(b) Assembly-08 Config-1, Config-2, Config-3

(c) Assembly-09 Config-1

(d) Assembly-11 Config-1, Config-2

(e) Assembly-12 Config-1, Config-2, Config-3

(2) IAE V2500 Engine Manual (E-V2500-1IA), 72-32-40, Assembly

(3) IAE Overhaul Process and Consumable Index

(4) IAE Standard Practices/Procedures Manual

(5) IAE Service Bulletin V2500-ENG-72-0132:

Engine - LP Compressor - Removal of Stage 6 Buffer Air System.

R (6) Engineering Change Number 99VJ013, 99VJ013-01, 99VJ013-02, 99VJ013-03,
R 01VJ024 and 06VJ013.

(7) ATA Locator 72-32-00

R (8) Airbus Aircraft Modification No. 32209.

0. Other Publications Affected

(1) IAE V2500 Engine Illustrated Parts Catalog (S-V2500-1IA), 72-32-00 and 72-32-41, to add new parts.

(2) IAE V2500 Engine Illustrated Parts Catalog (S-V2500-2IA), 72-32-00 and 72-32-41, to add new parts.

(3) IAE V2500 Engine Illustrated Parts Catalog (S-V2500-2IB), 72-32-00 and 72-32-41, to add new parts.

(4) IAE V2500 Engine Illustrated Parts Catalog (S-V2500-5IA), 72-32-00 and 72-32-41, to add new parts.

(5) IAE V2500 Engine Illustrated Parts Catalog (S-V2500-5IB), 72-32-00 and 72-32-41, to add new parts.

(6) IAE V2500 Engine Illustrated Parts Catalog (S-V2500-6IA), 72-32-00 and 72-32-41, to add new parts.

(7) IAE V2500 Engine Illustrated Parts Catalog (S-V2500-6IB), 72-32-00 and 72-32-41, to add new parts.

(8) IAE V2500 Engine Illustrated Parts Catalog (S-V2500-7IA), 72-32-00 and 72-32-41, to add new parts.

(9) IAE V2500 Engine Illustrated Parts Catalog (S-V2500-7IB), 72-32-00 and 72-32-41, to add new parts.

(10) IAE V2500 Engine Manual (E-V2500-1IA), 72-32-00

(a) Disassembly-09 Config-2, Config-3

(b) Disassembly-11

(c) Assembly-05

(d) Assembly-07 Config-2, Config-3

(e) Assembly-10 Config-1, Config-2

(f) Assembly-13 Config-1, Config-2

(g) Assembly-14 Config-1, Config-2

(11) The following Disassembly/Assembly procedures will be incorporated to include new parts, No.1 Bearing Front Support Assembly (P/N 5W2323) and No.1 Bearing Rear Support Assembly (P/N 5W2325), introduced by this Service Bulletin.

IAE V2500 Engine Manual (E-V2500-1IA), 72-32-41 Disassembly and Assembly.

(12) IAE V2500 Engine Manual (E-V2500-1IA), 72-32-41 Cleaning, Inspection/Check and Repair.

P. Interchangeability of Parts

It is recommended that the parts introduced by this Service Bulletin are introduced as a set.

2. Material Information

A. The kit required consists of the following parts:

None

B. New production parts:

	PART No.	QTY	UNIT PRICE US Dollar
R	4W0411	21	20.80
R	5W2328	1	35,090.00
R	5W2329	1	239.00
R	5W2323	1	15,580.00
R	5W2325	1	19,050.00
R	NAS1198-4-8	2	2.48
R	MS124656	4	1.88

C. Parts affected by this Bulletin:

V2500-A1 Engines Post SBE72-0132 and V2500-A5

72-32-00

FIG ITEM NO.	NEW PART NO.	QTY	PART TITLE	MAT	OLD PART NO.	INSTR DISP
02116	MS9321-10	21	Washer	-	-	(S1)(A)
02120	4W0411	21	Bolt	-	4W0168	(S1)(B)
02181	MS9321-11	42	Washer	-	-	(S1)(A)

V2500-A1 Engines Post SBE72-0132 and V2500-A5

72-32-41

	FIG ITEM NO.	NEW PART NO.	QTY	PART TITLE	MAT	OLD PART NO.	INSTR DISP
	01240	5W2328	1	No.1 Bearing Support Assembly	-	5W2088	(S1)(C)
	01250	4W2328	4	Screw	-	-	(S1)(A)
	01255	4W0001	4	Nut	-	-	(S1)(A)
	01260	MS9321-09	4	Washer	-	-	(S1)(A)
	01262	-	2	Rivet	-	NAS1198-4-6	(S1)(E)(F)
	01264	-	1	Bracket	-	5W2054	(S1)(E)(F)
R	01268	-	18	Nut, Self Locking Shank	-	4W0027	(S1)(E)(F)
	01270	5W2329	1	O-Ring	-	-	(S1)(B)

	FIG ITEM NO.	NEW PART NO.	QTY	PART TITLE	MAT	OLD PART NO.	INSTR DISP
	01300	5W2323	1	No.1 Bearing Front Support Assembly	-	-	(S1)(B)
R	01320	4W0027	18	Nut, Self Locking Shank	-	-	(S1)(A)
	01400	5W2325	1	No.1 Bearing Rear Support Assembly	-	-	(S1)(B)
	01420	NAS1198-4-82		Rivet	-	-	(S1)(B)
	01430	5W2327	1	Bracket	-	-	(S1)(B)
	01440	RLA21SM4	4	Press Washer	-	-	(S1)(A)
	01450	MS124656	4	Helical Coil Insert	-	-	(S1)(B)

D. Instructions disposition codes:

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

(A) New part is currently available for sale

(B) Part will be available from April 2002.

(C) Old parts will no longer be available.

(E) Old parts will continue to be available.

(F) Redundant.

3. Accomplishment Instructions

A. Rework Instructions for V2500-A1 SBE 72-0132 Engines

None.

B. Assembly Instructions for V2500-A1 SBE 72-0132 Engines

(1) Assemble the No.1 Bearing Support Assembly if required, See Figure 1

CAUTION: DO NOT TOUCH THE HOT PARTS WITHOUT PROTECTIVE GLOVES.

HOT PARTS CAN CAUSE REDDENING AND BLISTERING OF THE SKIN IF THE HANDS ARE NOT PROTECTED.

IMMERSE THE CONTACTED AREA IN COLD WATER FOR 10 MINUTES IF THE SKIN IS BURNED. IMMEDIATELY GET MEDICAL ATTENTION IF THE PAIN OR BLISTERING PERSISTS.

(a) Increase the temperature of the new P/N 5W2323 No.1 Bearing Front Support Assembly to 302 deg F (150 deg C) with an oven.

(b) Install the new P/N 5W2329 O-Ring to the new P/N 5W2325 No.1 Bearing Rear Support Assembly.

(c) Align the four bolt hole of the No.1 Bearing Front Support Assembly rear flange and the four bolt hole of the No.1 Bearing Rear Support Assembly front flange.

(d) Lower the No.1 Bearing Front Support Assembly until the rear flange of the No.1 Bearing Front Support Assembly touches front flange of the No.1 Bearing Rear Support Assembly.

(e) Install the new P/N 4W2328 four Screws, the new P/N MS9321-09 four Washers and the new P/N 4W0001 four Nuts.

(f) Torque the nut to 36 to 45 lbfin (4 to 5 Nm).

(g) After 1 hour, re-check the torque of four nuts.

(2) Install the No.1 Bearing Support Assembly

(a) Reference Fits and Clearances of the No.1 Bearing Support and Fan Frame at Location 0304 by the approved procedure given in reference (1), Engine Manual (E-V2500-1IA), 72-32-00, Assembly-05.

(b) Turn the Fan Frame vertical with the front end up by the approved procedure given in reference (1), Engine Manual (E-V2500-1IA), 72-32-00, Assembly-05.

(c) Install the new 5W2328 (1 off) No.1 bearing support assembly to the fan frame assembly. See Figure 2.

(i) Put the No.1 bearing support assembly on a work bench with the front end down.

(ii) Lubricate 5A5397 (1 off) ring with CoMat 10-077 approved engine oils. Install the ring into the groove in the No.1 bearing support assembly.

(iii) Lubricate AS43013-110 (2 off) rings with CoMat 10-077 approved engine oils. Install them on the oil feed tube assembly in the No.1 bearing support assembly.

(iv) Increase the temperature of the mounting flange of the Fan Frame Assembly to 212 deg F (100 deg C) with a hot air gun.

(v) Install the three aligning pins (part of IAE 1J12507 aligning pin set 1 off) into three of the 42 threaded holes in the mounting flange. The three aligning pins must be installed at approximately 120 degrees apart from each other.

(vi) Install the No.1 bearing support assembly to the fan frame assembly.

CAUTION: THE OIL FEED TUBE AND HOLE C IN THE SUB OIL DISTRIBUTOR MUST BE ALIGNED. INCORRECT ALIGNMENT CAN CAUSE A DETERIORATION OF THE OIL AND OIL FILTER CLOGGING.

(1) Lift and move the No.1 bearing support assembly adjacent to the mounting flange.

(2) Align the 42 bolt holes in the No.1 bearing support assembly rear flange with the three aligning pins and the 39 threaded holes in the mounting flange.

(3) Make sure that the oil feed tube of the No.1 bearing support assembly and the hole C in the sub oil distributor on the fan frame are aligned.

(4) Lower the No.1 bearing support assembly on to the fan frame assembly.

(5) Make sure that the oil feed tube is installed in hole C.

(vii) Remove the three aligning pins from the threaded holes in the mounting flange.

(viii) Attach the No.1 bearing support assembly with the 70315-5-8 (18 off) bolts, the 70315-5-4 (24 off) bolts and the MS9321-11 (42 off) washers. Torque the 70315-5-4 bolts and 70315-5-8 bolts to 180 to 220 lbfin (20,00 to 25,00 Nm).

NOTE: You must identify the 70315-5-8 bolt and the 70315-5-4 bolt by their length. The 70315-5-8 bolt is longer than the 70315-5-4 bolt.

(d) Turn the Fan Frame Assembly to the Horizontal by the approved procedure given in reference (1), Engine Manual (E-V2500-1IA), 72-32-00, Assembly-05.

(e) Do an Air Flow Check for Oil Feed Tubes of the Front Bearing Compartment Horizontal by the approved procedure given in reference (1), Engine Manual (E-V2500-1IA), 72-32-00, Assembly-05.

(3) Install the LP Shaft, No.1 and No.2 Bearing Assembly by the approved procedure given in reference (1), Engine Manual (E-V2500-1IA), 72-32-00, Assembly-06.

(4) Install the No.1 Bearing Front Seal Support and the No.1 Bearing Compartment Scavenge Oil Tube.

(a) Turn the Fan Frame Assembly Vertical with the Front End Up by the approved procedure given in reference (1), Engine Manual (E-V2500-1IA), 72-32-00, Assembly-07, Config-2.

(b) Install the 5W2078 (1 off) No.1 Bearing Front Seal Support to the 5W2328 (1 off) No.1 Bearing Support. See Figure 3.

(i) Attach the 5W2078 (1 off) No.1 Bearing Front seal support to the No.1 bearing front oil seal.

(1) Lubricate AS3209-279 (1 off) packing with the CoMat 10-077 approved engine oils.

(2) Install the packing into the groove in the No.1 bearing front oil seal.

(3) Lubricate 5A5396 (1 off) sealing ring with the CoMat 10-077 approved engine oils.

(4) Install the sealing ring in to the groove in the No.1 bearing support.

(5) Align the top of the No.1 bearing front seal support with top of the No.1 bearing front oil seal. Make sure that three of 15 scallops in the No.1 bearing front seal support are aligned with the three lugs of the seal holder.

NOTE: The seal holder is installed to the No.1 bearing front oil seal in TASK 72-32-50-440-001 (72-32-50, ASSEMBLY-01, Page 1001).

(6) Lower the No.1 bearing front seal support on to the No.1 bearing front oil seal.

(7) Attach the No.1 bearing front seal support with the AS21013 (18 off) bolts and the MS9321-10 (18 off) washers. Torque the AS21013 bolts to 85 to 105 lbfin (10,00 to 12,00 Nm).

(ii) Replace the three bolts (part of the seal holder) with the three guide pins (part of IAE 1J12442 guide pin set 1 off).

NOTE: Hold the weight of the No.1 bearing front seal support and the No.1 bearing front oil seal by your hands during steps b., c.(i) and c.(ii).

(iii) Install the No.1 bearing front seal support on to the No.1 bearing support.

(1) Align the bolt holes in the No.1 bearing front seal support with the bolt holes in the No.1 bearing support.

(2) Slowly lower the No.1 bearing front seal support on to the No.1 bearing support.

(3) Attach the No.1 bearing front seal support with the 4W0411 (21 off) bolts, MS9321-10 (42 off) washers and 4W0002 (21 off) nuts. Tighten the bolts lightly.

(iv) Remove the six screws (part of the seal holder) which attach the seal holder to the LP shaft, No.1 and No.2 bearing assembly. Remove the seal holder.

(v) Remove the three guide pins from the No.1 bearing front oil seal.

(vi) Torque the 4W0411 (21 off) bolts to 85 to 105 lbfin (10,00 to 12,00 Nm).

(c) Install the No.1 Bearing Compartment Scavenge Oil Tube, Fig 72-32-00-990-084 (Fig 1005)

(5) Install the LP Compressor Bleed Duct, the Booster Stage Bleed Valve and Actuating Mechanism and the Right and Left Rod Assembly by the approved procedure given in reference (1), Engine Manual (E-V2500-1IA), 72-32-00, Assembly-08, Config-1 or Config-2.

(6) Install the LP Compressor Stage 2.5 Vanes by the approved procedure given in reference (1), Engine Manual (E-V2500-1IA), 72-32-00, Assembly-09, Config-1.

(7) Install the LP Compressor Booster Stage Assembly

(a) Prepare the Fan Frame Assembly by the approved procedure given in reference (1), Engine Manual (E-V2500-1IA), 72-32-00, Assembly-10, Config-1.

(b) Measure the Interface Dimensions for the Installation of the LP Compressor Booster Stage Assembly. See Figure 4.

(i) Install IAE 1J12457 measuring stretch 1 off on to the stub shaft.

(1) Make sure that the curvic teeth on the stub shaft and the measuring stretch are clean. Clean the teeth with a clean cloth made moist with CoMat 01-124 isopropyl alcohol if they are not clean.

(2) Engage the curvic teeth of the measuring stretch with the curvic teeth of the stub shaft.

(3) Safety the measuring stretch with the four set screws (part of the measuring stretch). Tighten the set screws.

(ii) Calibrate the dial gauge (part of the measuring stretch).

(1) Install the dial gauge on to the base pin on the measuring stretch.

(2) Calibrate the zero position of the dial gage.

(iii) Put the clocking pin on to the front end of the case of the stage 2.5 vanes through the measuring stretch hole.

NOTE: Do steps C to F at 12, 3, 6 and 9 o'clock positions.

(iv) Measure the dimension XF with the dial gauge. Remove the clocking pin.

(v) Use the following formula to calculate the dimension AE.

AE = F - XF - H

(vi) Make sure that the dimension AE is between 11.5713 and 11.6047 in. (293,91 and 294,76 mm).

(vii) Remove the four set screws which attach the measuring stretch to the stub shaft. Remove the measuring stretch.

(c) Apply Jointing Compound to the Mating Faces on the LP Compressor Stage 2.5 Vanes (Stage 2.5 Vanes), by the approved procedure given in reference (1), Engine Manual (E-V2500-1IA), 72-32-00, Assembly-10, Config-1.

(d) Prepare the LP Compressor Booster Stage Assembly (LPC Assembly) for Installation of it to the Rotor Center Shaft and the Stage 2.5 Vanes, by the approved procedure given in reference (1), Engine Manual (E-V2500-1IA), 72-32-00, Assembly-10, Config-1.

(e) Install the LP Compressor Booster Stage Assembly (LPC Assembly) to the Rotor Center Shaft and the LP Compressor Stage 2.5 Vanes (Stage 2.5 Vane), by the approved procedure given in reference (1), Engine Manual (E-V2500-1IA), 72-32-00, Assembly-10, Config-1.

(8) Install the Fan Case, the Oil Seal Tube, the No.1, 2, 3 Bearing Scavenge Tube, the Hot Vent Tube, the Brush Seal and the PTO Shaft by the approved procedure given in reference (1), Engine Manual (E-V2500-1IA), 72-32-00, Assembly-11, Config-1.

(9) Install the Fan Case Liner Panels, the Panel Rubber Seals, the Fan Exit Guide Vanes, the Acoustic Linings and the Rear Fairing Shaft by the approved procedure given in reference (1), Engine Manual (E-V2500-1IA), 72-32-00, Assembly-12, Config-1 or Config-2.

(10) Install the Fan Outlet Inner Vane Assembly

(a) Apply Jointing Compound to the Mating Faces on the LP Compressor Front Case by the approved procedure given in reference (1), Engine Manual (E-V2500-1IA), 72-32-00, Assembly-13, Config-1.

(b) Install the Fan Outlet Inner Vane Assembly (Vane Assembly) to the LP Compressor Front Case (Front Case) by the approved procedure given in reference (1), Engine Manual (E-V2500-1IA), 72-32-00, Assembly-13, Config-1.

(c) Install the Measuring Stretch by the approved procedure given in reference (1), Engine Manual (E-V2500-1IA), 72-32-00, Assembly-13, Config-1.

(d) Turn the Fan Frame and Fan Case Assembly Vertical with the Front End Up by the approved procedure given in reference (1), Engine Manual (E-V2500-1IA), 72-32-00, Assembly-13, Config-1.

(e) Measure the Module Interface Dimension for the Installation of the LP Compressor (Fan) Module. See Figure 5.

(i) Read the tool dimensions C and H identified on the clocking pin C (part of IAE 1J12457 measuring stretch 1 off) and the measuring stretch.

(ii) Install the clocking pin C on to the inner ring of the fan outlet inner vane assembly through the measuring stretch hole.

NOTE: Do steps B. to E. at 12, 3, 6 and 9 o'clock positions.

(iii) Measure the dimension XC with the dial gage (part of the measuring stretch). Remove the clocking pin C.

(iv) Use the following formula to calculate the module interface dimension AA.

AA = C - XC - H

(v) Make sure that the dimension AA is between 0.805 and 0.871 in. (20,43 and 22,13 mm).

(f) Turn the Fan Frame and Fan Case Assembly Horizontal with the No.1 Strut Up by the approved procedure given in reference (1), Engine Manual (E-V2500-1IA), 72-32-00, Assembly-13, Config-1.

(g) Remove the Measuring Stretch by the approved procedure given in reference (1), Engine Manual (E-V2500-1IA), 72-32-00, Assembly-13, Config-1.

(11) Install the Front Fairings, the No.1 and No.6 Strut Fairing Panels, the Fan Exit Pressure Boss and the Block

(a) Apply the Jointing Compound to the Mating Faces on the Brackets by the approved procedure given in reference (1), Engine Manual (E-V2500-1IA), 72-32-00, Assembly-14, Config-1.

(b) Install the Front Fairings on the Brackets by the approved procedure given in reference (1), Engine Manual (E-V2500-1IA), 72-32-00, Assembly-14, Config-1.

(c) Measure the Module Interface Dimension for the Installation of the HP System Module. See Figure 6.

(i) Read the tool dimension K identified on IAE 1J12508 measuring stretch 1 off.

(ii) Install the measuring stretch on the fan frame assembly.

(1) Put the two blocks (part of the measuring stretch) on the fan frame rear flange at 12 and 6 o'clock positions

(2) Put the measuring stretch on the blocks

(3) Install the two wing bolts, two nuts and the four washers which attach the measuring stretch to the fan frame rear flange. Tighten the wing bolts.

(iii) Measure the dimensions J1 and L1 at 12 and 6 o'clock positions with the depth micrometer (part of the measuring stretch).

NOTE: Make sure that the shaft is at fully end position of axial play when you measure the dimension J1

(iv) Use the following formulas to calculate the dimensions AB and AD at the two positions.

AB = J1 - K

AD = L1 - K

(v) Make sure that the dimensions AB are 6.4582to 6.4766in. (164,036 to 164,508 mm).

(vi) Make sure that the dimensions AD are 0.9410 to 0.9606in. (23,900 to 24,400 mm).

(vii) Remove the measuring stretch from the fan frame rear flange

(1) Remove the two wing bolts, two nuts and the four washers which attach the measuring stretch and the two blocks to the fan frame rear flange

(2) Remove the measuring stretch and blocks from the flange.

(viii) Measure the dimensions J1 and L1 and make sure of the dimensions AB and AD at 3 and 9 o'clock positions

(1) Do step B to install the blocks and the measuring stretch at 3 and 9 o'clock positions

(2) Do steps C to G to measure the dimensions J1 and L1 and make sure of the dimensions at 3 and 9 o'clock positions.

(d) Install the Fan Exit Pressure Boss onto the Fan Case by the approved procedure given in reference (1), Engine Manual (E-V2500-1IA), 72-32-00, Assembly-14, Config-1.

(e) Install the Block onto the Fan Case by the approved procedure given in reference (1), Engine Manual (E-V2500-1IA), 72-32-00, Assembly-14, Config-1.

(f) Install the Fire Shields to the No.1 Strut Fairing Panel by the approved procedure given in reference (1), Engine Manual (E-V2500-1IA), 72-32-00, Assembly-14, Config-1.

(g) Apply Jointing Compound to the Mating Faces on the Panel Supporting Brackets by the approved procedure given in reference (1), Engine Manual (E-V2500-1IA), 72-32-00, Assembly-14, Config-1.

(h) Install the No.1 Strut Fairing Panel on to the Fan Frame and the Fan Case, by the approved procedure given in reference (1), Engine Manual (E-V2500-1IA), 72-32-00, Assembly-14, Config-1.

(i) Install the No. 6 Strut Fairing Panel onto the Fan Frame Assembly and the Fan Case by the approved procedure given in reference (1), Engine Manual (E-V2500-1IA), 72-32-00, Assembly-14, Config-1.

(j) Install the Stopper on the Fan Frame Assembly by the approved procedure given in reference (1), Engine Manual (E-V2500-1IA), 72-32-00, Assembly-14, Config-1 for post SBE 72-0150.

(k) Apply Sealant to the Mating Faces on the Corner Fillers by the approved procedure given in reference (1), Engine Manual (E-V2500-1IA), 72-32-00, Assembly-14, Config-1.

(l) Install the Corner Strut Fillers and the Panel Corner Fillers on to the Struts and the Strut Fairing Panels by the approved procedure given in reference (1), Engine Manual (E-V2500-1IA), 72-32-00, Assembly-14, Config-1.

(m) Fill the Recesses in the Corner Strut Fillers with Sealant by the approved procedure given in reference (1), Engine Manual (E-V2500-1IA), 72-32-00, Assembly-14, Config-1.

(n) Turn the LP Compressor/Intermediate Case Module Vertical with the Rear End Up by the approved procedure given in reference (1), Engine Manual (E-V2500-1IA), 72-32-00, Assembly-14, Config-1.

(o) Install the Six Bolts into the Threaded Holes in the No.5 and No.7 Struts by the approved procedure given in reference (1), Engine Manual (E-V2500-1IA), 72-32-00, Assembly-14, Config-1.

C. Recording Instructions for V2500-A1 SBE72-0132 Engines

Record of accomplishment is necessary.

D. Rework Instructions for V2500-A5 Engines

None.

E. Assembly Instructions for V2500-A5 Engines

(1) Assemble the No.1 Bearing Support Assembly if required, See Figure 1

CAUTION: DO NOT TOUCH THE HOT PARTS WITHOUT PROTECTIVE GLOVES.

HOT PARTS CAN CAUSE REDDENING AND BLISTERING OF THE SKIN IF THE HANDS ARE NOT PROTECTED.

IMMERSE THE CONTACTED AREA IN COLD WATER FOR 10 MINUTES IF THE SKIN IS BURNED. IMMEDIATELY GET MEDICAL ATTENTION IF THE PAIN OR BLISTERING PERSISTS.

(a) Increase the temperature of the new P/N 5W2323 No.1 Bearing Front Support Assembly to 302 deg F (150 deg C) with an oven

(b) Install the new P/N 5W2329 O-Ring to the new P/N 5W2325 No.1 Bearing Rear Support Assembly.

(c) Align the four bolt hole of the No.1 Bearing Front Support Assembly rear flange and the four bolt hole of the No.1 Bearing Rear Support Assembly front flange.

(d) Lower the No.1 Bearing Front Support Assembly until the rear flange of the No.1 Bearing Front Support Assembly touches front flange of the No.1 Bearing Rear Support Assembly.

(e) Install the new P/N 4W2328 four Screws, the new P/N MS9321-09 four Washers and the new P/N 4W0001 four Nuts.

(f) Torque the nut to 36 to 45 lbfin (4 to 5 Nm).

(g) After 1 hour, re-check the torque of four nuts.

(2) Install the No.1 Bearing Support Assembly

(a) Reference Fits and Clearances of the No.1 Bearing Support and Fan Frame at Location 0304 by the approved procedure given in reference (1), Engine Manual (E-V2500-1IA), 72-32-00, Assembly-05.

(b) Turn the Fan Frame vertical with the Front End Up by the approved procedure given in reference (1), Engine Manual (E-V2500-1IA), 72-32-00, Assembly-05.

(c) Install the new 5W2328 (1 off) No.1 bearing support assembly to the fan frame assembly. See Figure 2.

(i) Put the No.1 bearing support assembly on a work bench with the front end down.

(ii) Lubricate 5A5397 (1 off) Ring with CoMat 10-077 approved engine oils. Install the ring into the groove in the No.1 Bearing Support Assembly.

(iii) Lubricate AS43013-110 (2 off) rings with CoMat 10-077 approved engine oils. Install them on the 5A0995 (1 off) Oil feed tube assembly in the 5W2328 No.1 bearing support assembly.

(iv) Increase the temperature of the mounting flange of the Fan Frame Assembly to 212 deg F (100 deg C) with a hot air gun.

(v) Install the three aligning pins (part of IAE 1J12507 aligning pin set 1 off) into three of the 42 threaded holes in the mounting flange. The three aligning pins must be installed at approximately 120 degrees apart from each other.

(vi) Install the No.1 Bearing Support Assembly to the Fan Frame Assembly.

CAUTION: THE OIL FEED TUBE AND HOLE C IN THE SUB OIL DISTRIBUTOR MUST BE ALIGNED. INCORRECT ALIGNMENT CAN CAUSE A DETERIORATION OF THE OIL AND OIL FILTER CLOGGING.

(1) Lift and move the No.1 bearing support assembly adjacent to the mounting flange.

(2) Align the 42 bolt holes in the No.1 bearing support assembly rear flange with the three aligning pins and the 39 threaded holes in the mounting flange.

(3) Make sure that the oil feed tube of the No.1 bearing support assembly and the hole C in the sub oil distributor on the fan frame are aligned.

(4) Lower the No.1 bearing support assembly on to the fan frame assembly.

(5) Make sure that the oil feed tube is installed in hole C.

(vii) Remove the three aligning pins from the threaded holes in the mounting flange.

(viii) Attach the No.1 bearing support assembly with the 70315-5-8 (18 off) bolts, the 70315-5-4 (24 off) bolts and the MS9321-11 (42 off) washers. Torque the 70315-5-4 bolts and 70315-5-8 bolts to 180 to 220 lbfin (20,00 to 25,00 Nm).

NOTE: You must identify the 70315-5-8 bolt and the 70315-5-4 bolt by their length. The 70315-5-8 bolt is longer than the 70315-5-4 bolt.

(d) Turn the Fan Frame Assembly to the Horizontal by the approved procedure given in reference (1), Engine Manual (E-V2500-1IA), 72-32-00, Assembly-05.

(e) Do an Air Flow Check for Oil Feed Tubes of the Front Bearing Compartment Horizontal by the approved procedure given in reference (1), Engine Manual (E-V2500-1IA), 72-32-00, Assembly-05.

(3) Install the LP Shaft, No.1 and No.2 Bearing Assembly by the approved procedure given in reference (1), Engine Manual (E-V2500-1IA), 72-32-00, Assembly-06.

(4) Install the No.1 Bearing Front Seal Support and the No.1 Bearing Compartment Scavenge Oil Tube.

(a) Turn the Fan Frame Assembly Vertical with the Front End Up by the approved procedure given in reference (1), Engine Manual (E-V2500-1IA), 72-32-00, Asembly-07, Config-3.

(b) Install the 5W2078 (1 off) No.1 Bearing Front Seal Support to the 5W2328 (1 off) No.1 Bearing Support. See Figure 3.

(i) Attach the 5W2078 (1 off) No.1 bearing front seal support to the No.1 bearing front oil seal.

(1) Lubricate AS3209-279 (1 off) packing with the CoMat 10-077 Approved engine oils.

(2) Install the packing in to the groove in the No.1 bearing front oil seal.

(3) Lubricate 5A5396 (1 off) sealing ring 1 off with the CoMat 10-077 approved engine oils.

(4) Install the sealing ring in to the groove in the No.1 bearing support.

(5) Align the top of the No.1 bearing front seal support with top of the No.1 bearing front oil seal. Make sure that three of 15 scallops in the No.1 bearing front seal support are aligned with the three lugs of the seal holder.

NOTE: The seal holder is installed to the No.1 bearing front oil seal in TASK 72-32-50-440-001 (72-32-50, ASSEMBLY-01, Page 1001).

(6) Lower the No.1 bearing front seal support on to the No.1 bearing front oil seal.

(7) Attach the No.1 bearing front seal support with the AS21013 (18 off) bolts and the MS9321-10 (18 off) washers. Torque the AS21013 bolts to 85 to 105 lbfin (10,00 to 12,00 Nm).

(ii) Replace the three bolts (part of the seal holder) with the three guide pins (part of IAE 1J12442 guide pin set 1 off).

NOTE: Hold the weight of the No.1 bearing front seal support and the No.1 bearing front oil seal by your hands during steps B., C.(1) and C.(2).

(iii) Install the No.1 bearing front seal support on to the No.1 bearing support.

(1) Align the bolt holes in the No.1 bearing front seal support with the bolt holes in the No.1 bearing support.

(2) Slowly lower the No.1 bearing front seal support on to the No.1 bearing support.

(3) Attach the No.1 bearing front seal support with the 4W0411 (21 off) bolts, MS9321-10 (42 off) washers and 4W0002 (21 off) nuts. Tighten the bolts lightly.

(iv) Remove the six screws (part of the seal holder) which attach the seal holder to the LP shaft, No.1 and No.2 bearing assembly. Remove the seal holder.

(v) Remove the three guide pins from the No.1 bearing front oil seal.

(vi) Torque the 4W0411 bolts (02-120) to 85 to 105 lbfin (10,00 to 12,00 Nm).

(c) Install the No.1 Bearing Compartment Scavenge Oil Tube by the approved procedure given in reference (1), Engine Manual (E-V2500-1IA), 72-32-00, Asembly-07, Config-3.

(5) Install the LP Compressor (LPC) Bleed Duct, the Booster Stage Bleed Valve and Actuating Mechanism, LP Compressor Stage 2.5 Vane and the Right and Left Rod Assemblies by the approved procedure given in reference (1), Engine Manual (E-V2500-1IA), 72-32-00, Assembly-08, Config-3.

(6) Install the LP Compressor Booster Stage Assembly

(a) Reference Fits and Clearances of the LP Compressor Booster Stage Disk and the Rotor Center Shaft at Location 0108 by the approved procedure given in reference (1), Engine Manual (E-V2500-1IA), 72-32-00, Assembly-10, Config-2.

(b) Turn the Fan Frame to the Vertical with the Front End Up by the approved procedure given in reference (1), Engine Manual (E-V2500-1IA), 72-32-00, Assembly-10, Config-2.

(c) Measure the Interface Dimensions for the Installation of the LP Compressor Booster Stage Assembly. See Figure 4.

(i) Install the IAE 1J12530 measuring stretch 1 off on to the stub shaft

(1) Make sure that the curvic teeth on the stub shaft and the measuring stretch are clean. Clean the teeth with a clean cloth made moist with CoMat 01-124 isopropyl alcohol if they are not clean.

(2) Install the set master (part of measuring stretch) to the stub shaft.

(3) Engage the curvic teeth of the measuring stretch with the curvic teeth of the stub shaft.

(4) Attach the measuring stretch with the four set screws (part of the measuring stretch). Tighten the set screws.

(5) Remove the two eye bolts (part of measuring stretch).

(ii) Calibrate the depth gauge

(1) Install the depth gauge (part of the measuring stretch) to the set master (part of the measuring stretch).

(2) Calibrate the zero position of the depth gauge.

(3) Remove the depth gauge from the set master of the measuring stretch.

(iii) Measure the dimension AE1 with the depth gauge.

(iv) Make sure that the dimension AE1 is between 13.5398 and 13.5677in. (343,91 and 344,62 mm).

(v) Remove the measuring stretch from the stub shaft

(1) Install the two eye bolts to the measuring stretch.

(2) Remove the four bolts which attach the measuring stretch to the stub shaft. Remove the measuring stretch.

(d) Apply Jointing Compound to the Mating Faces on the LP Compressor Stage 2.5 Vanes (Stage 2.5 Vanes) by the approved procedure given in reference (1), Engine Manual (E-V2500-1IA), 72-32-00, Assembly-10, Config-2.

(e) Prepare the LP Compressor Booster Stage Assembly (LPC Assembly) for Installation of it to the Rotor Center Shaft and the Stage 2.5 Vanes, by the approved procedure given in reference (1), Engine Manual (E-V2500-1IA), 72-32-00, Assembly-10, Config-2.

(f) Install the LP Compressor Booster Stage Assembly (LPC Assembly) to the Rotor Center Shaft and the LP Compressor Stage 2.5 Vanes (Stage 2.5 Vane) by the approved procedure given in reference (1), Engine Manual (E-V2500-1IA), 72-32-00, Assembly-10, Config-2.

(7) Install the Fan Case, the Centre Bearing Housing, the Oil Seal Tube, the No.1, 2, 3 Bearing Scavenge Tube, the Hot Vent Tube, the Seal and the PTO Shaft by the approved procedure given in reference (1), Engine Manual (E-V2500-1IA), 72-32-00, Assembly-11, Config-2.

(8) Install the Rear Fairing, the Fan Exit Guide Vanes, the Panel Rubber Seals, the Rear Liner Panels, the Middle Liner Panel and the Front Liner Panels by the approved procedure given in reference (1), Engine Manual (E-V2500-1IA), 72-32-00, Assembly-12, Config-3.

(9) Install the Inlet Guide Vane

(a) Apply Jointing Compound to the Mating Faces on the LP Compressor Front Case by the approved procedure given in reference (1), Engine Manual (E-V2500-1IA), 72-32-00, Assembly-13, Config-2.

(b) Install the Inlet Guide Vane to the LP Compressor Front Case (Front Case) by the approved procedure given in reference (1), Engine Manual (E-V2500-1IA), 72-32-00, Assembly-13, Config-2.

(c) Install the Measuring Stretch by the approved procedure given in reference (1), Engine Manual (E-V2500-1IA), 72-32-00, Assembly-13, Config-2.

(d) Turn the Fan Frame and Fan Case Assembly Vertically with the Front End Up by the approved procedure given in reference (1), Engine Manual (E-V2500-1IA), 72-32-00, Assembly-13, Config-2.

(e) Measure the Module Interface Dimension for the Installation of the LP Compressor (Fan) Module. See Figure 5.

(i) Calibrate the depth gauge.

(1) Install the depth gauge (part of measuring stretch) to the set master (part of measuring stretch).

(2) Calibrate the zero position of the depth gauge.

(3) Remove the depth gauge from the set master of the measuring stretch.

(ii) Measure the dimension AA1 with the depth gauge.

(iii) Make sure that the dimension AA1 is between 0.852 and 0.945in. (21,63 and 24,01 mm).

(f) Turn the Fan Frame and Fan Case Assembly Horizontal with the No.1 Strut Up by the approved procedure given in reference (1), Engine Manual (E-V2500-1IA), 72-32-00, Assembly-13, Config-2.

(g) Remove the Measuring Stretch by the approved procedure given in reference (1), Engine Manual (E-V2500-1IA), 72-32-00, Assembly-13, Config-2.

(10) Install the Splitter Fairing, the No.1 and No.6 Strut Fairing Panels, the Fan Exit Pressure Boss and the Block

(a) Apply the Jointing Compound to the Mating Faces on the Splitter Fairing by the approved procedure given in reference (1), Engine Manual (E-V2500-1IA), 72-32-00, Assembly-14, Config-2.

(b) Install the Splitter Fairing on to the LP Compressor Assembly by the approved procedure given in reference (1), Engine Manual (E-V2500-1IA), 72-32-00, Assembly-14, Config-2.

(c) Measure the Module Interface Dimension for the Installation of the HP System Module. See Figure 6.

(i) Read the tool dimension K identified on IAE 1J12508 measuring stretch 1 off.

(ii) Install the measuring stretch to the fan frame

(1) Put the two blocks (part of the measuring stretch) to the fan frame rear flange at 12 and 6 o'clock positions

(2) Put the measuring stretch on the blocks

(3) Install the two wing bolts, two nuts and the four washers which attach the measuring stretch to the fan frame rear flange. Tighten the wing bolts.

(iii) Measure the dimensions J1 and L1 at 12 and 6 o'clock positions with the depth micrometer (part of the measuring stretch).

NOTE: Make sure that the shaft is at fully rear end position of axial play when you measure the dimension J1.

(iv) Use the following formulas to calculate the dimensions AB and AD at the two positions:

AB = J1 - K

AD = L1 - K

(v) Make sure that the dimensions AB are 6.4524 to 6.4732in. (163,89 to 164,42 mm).

(vi) Make sure that the dimensions AD are 0.941 to 0.961in. (23,90 to 24,40 mm).

(vii) Remove the measuring stretch from the fan frame rear flange

(1) Remove the two wing bolts, two nuts and the four washers which attach the measuring stretch and the two blocks to the fan frame rear flange

(2) Remove the measuring stretch and blocks from the flange.

(viii) Measure the dimensions J1 and L1 and make sure of the dimensions AB and AD at 3 and 9 o'clock positions

(1) Do step B to install the blocks and the measuring stretch at 3 and 9 o'clock positions

(2) Do steps C to G to measure the dimensions J1 and L1 and make sure of the dimensions at 3 and 9 o'clock positions.

(d) Install the Pressure Boss and the Block onto the Fan Case by the approved procedure given in reference (1), Engine Manual (E-V2500-1IA), 72-32-00, Assembly-14, Config-2.

(e) Install the Fire Shields on the No.1 Strut Fairing Panel by the approved procedure given in reference (1), Engine Manual (E-V2500-1IA), 72-32-00, Assembly-14, Config-2.

(f) Apply Jointing Compound to the Mating Faces on the Panel Supporting Brackets by the approved procedure given in reference (1), Engine Manual (E-V2500-1IA), 72-32-00, Assembly-14, Config-2.

(g) Install the No.1 Strut Fairing Panel on to the Fan Frame and the Fan Case by the approved procedure given in reference (1), Engine Manual (E-V2500-1IA), 72-32-00, Assembly-14, Config-2.

(h) Install the No.6 Strut Fairing Panel onto the Fan Frame Assembly and Fan Case by the approved procedure given in reference (1), Engine Manual (E-V2500-1IA), 72-32-00, Assembly-14, Config-2 for PRE SBE 72-0175.

(i) Install the No.6 Strut Fairing Panel onto the Fan Frame Assembly and the Fan Case by the approved procedure given in reference (1), Engine Manual (E-V2500-1IA), 72-32-00, Assembly-14, Config-2 for POST SBE 72-0175.

(j) Install the Stopper on the Fan Frame by the approved procedure given in reference (1), Engine Manual (E-V2500-1IA), 72-32-00, Assembly-14, Config-2.

(k) Apply Sealant to the Mating Faces on the Corner Fillers by the approved procedure given in reference (1), Engine Manual (E-V2500-1IA), 72-32-00, Assembly-14, Config-2.

(l) Install the Corner Strut Fillers and the Panel Corner Fillers on the Struts and the Strut Fairing Panels by the approved procedure given in reference (1), Engine Manual (E-V2500-1IA), 72-32-00, Assembly-14, Config-2.

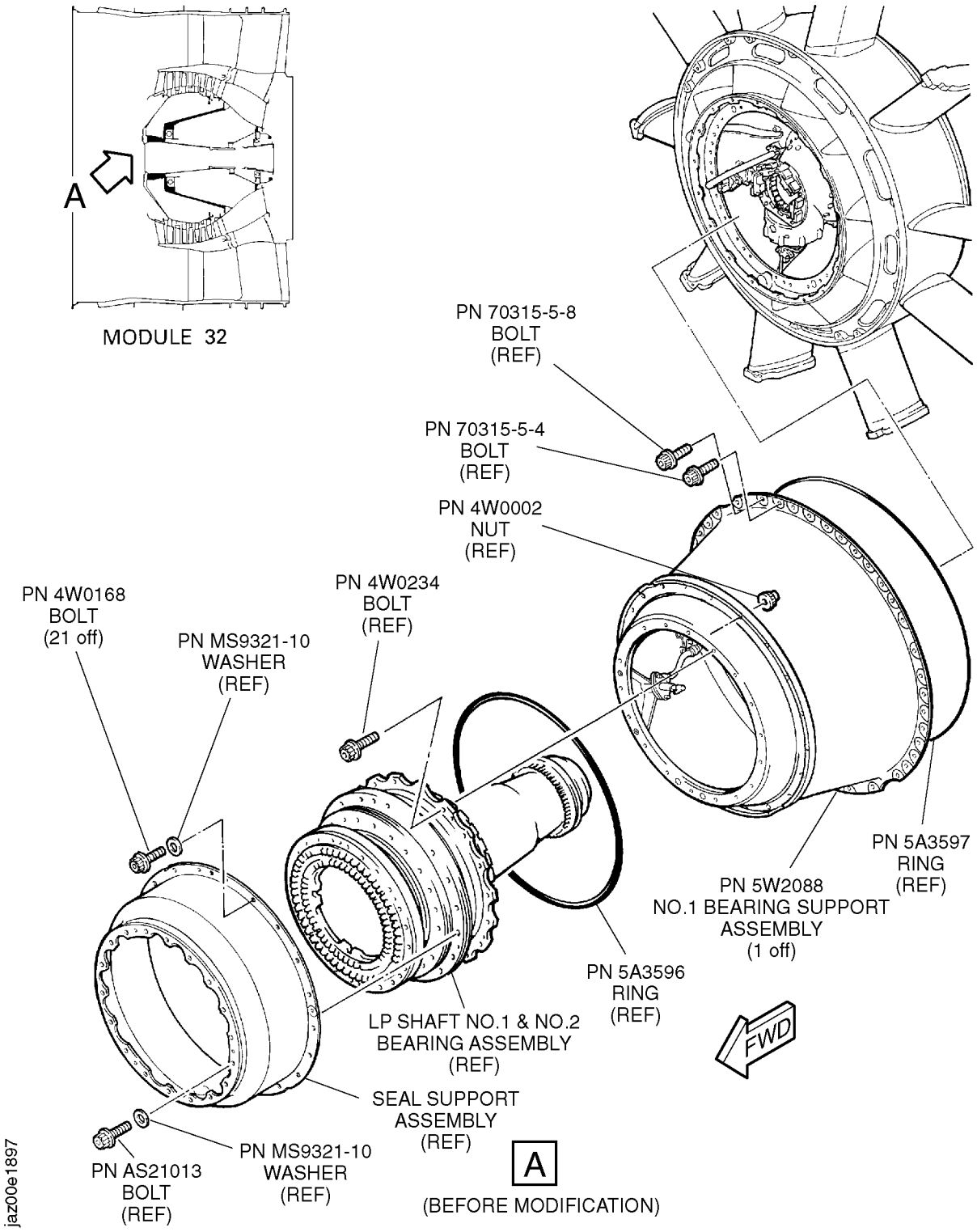
(m) Fill the Recesses in the Corner Strut Fillers with Sealant by the approved procedure given in reference (1), Engine Manual (E-V2500-1IA), 72-32-00, Assembly-14, Config-2.

(n) Turn the LP Compressor/Intermediate Case Module Vertical with the Rear End Up by the approved procedure given in reference (1), Engine Manual (E-V2500-1IA), 72-32-00, Assembly-14, Config-2.

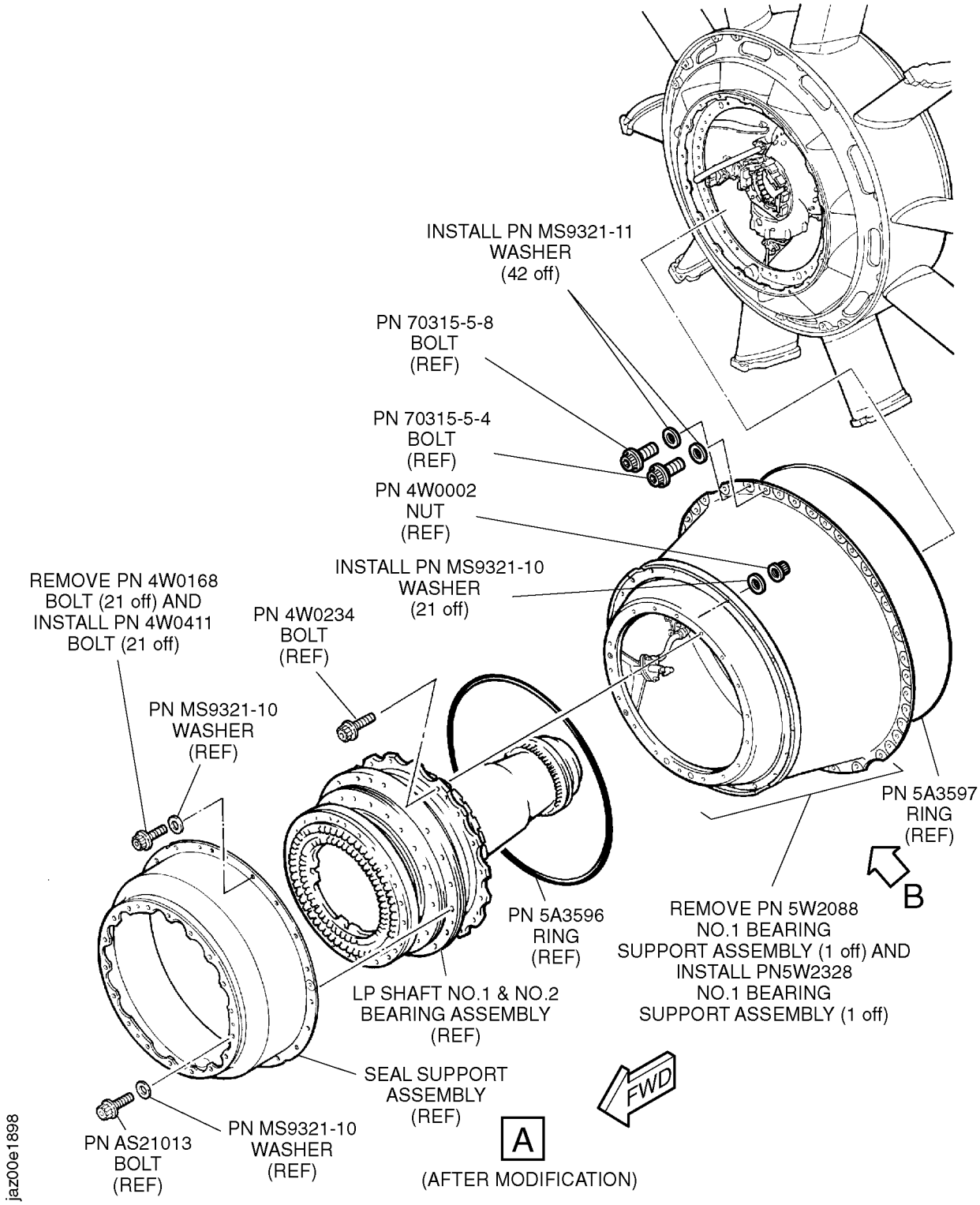
(o) Install the Six Bolts into the Threaded Holes in the No.5 and No.7 Struts by the approved procedure given in reference (1), Engine Manual (E-V2500-1IA), 72-32-00, Assembly-14, Config-2.

F. Recording Instructions

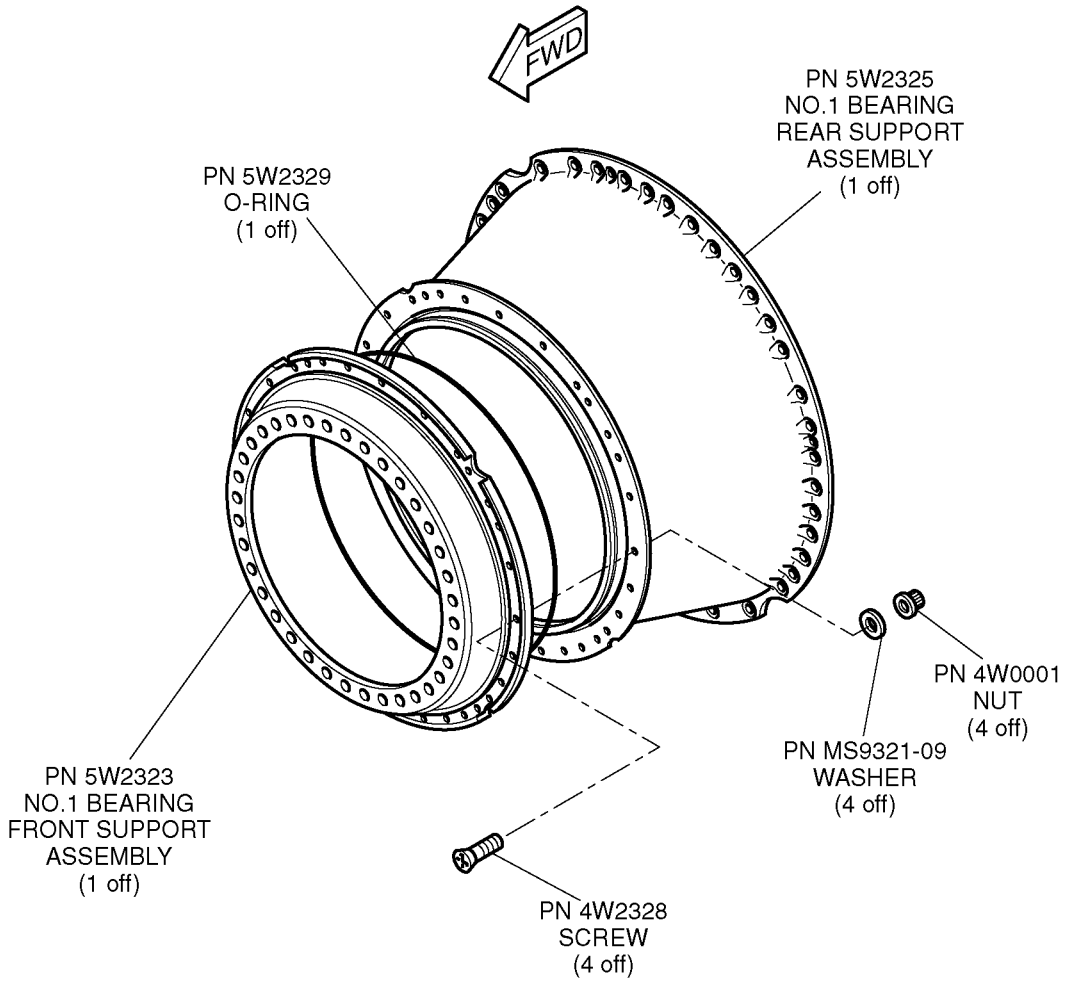
Record of accomplishment is necessary.



Before and after modification of the No.1 bearing support assembly
Figure 1 (Sheet 1 of 3)



Before and after modification of the No.1 bearing support assembly
Figure 1 (Sheet 2 of 3)



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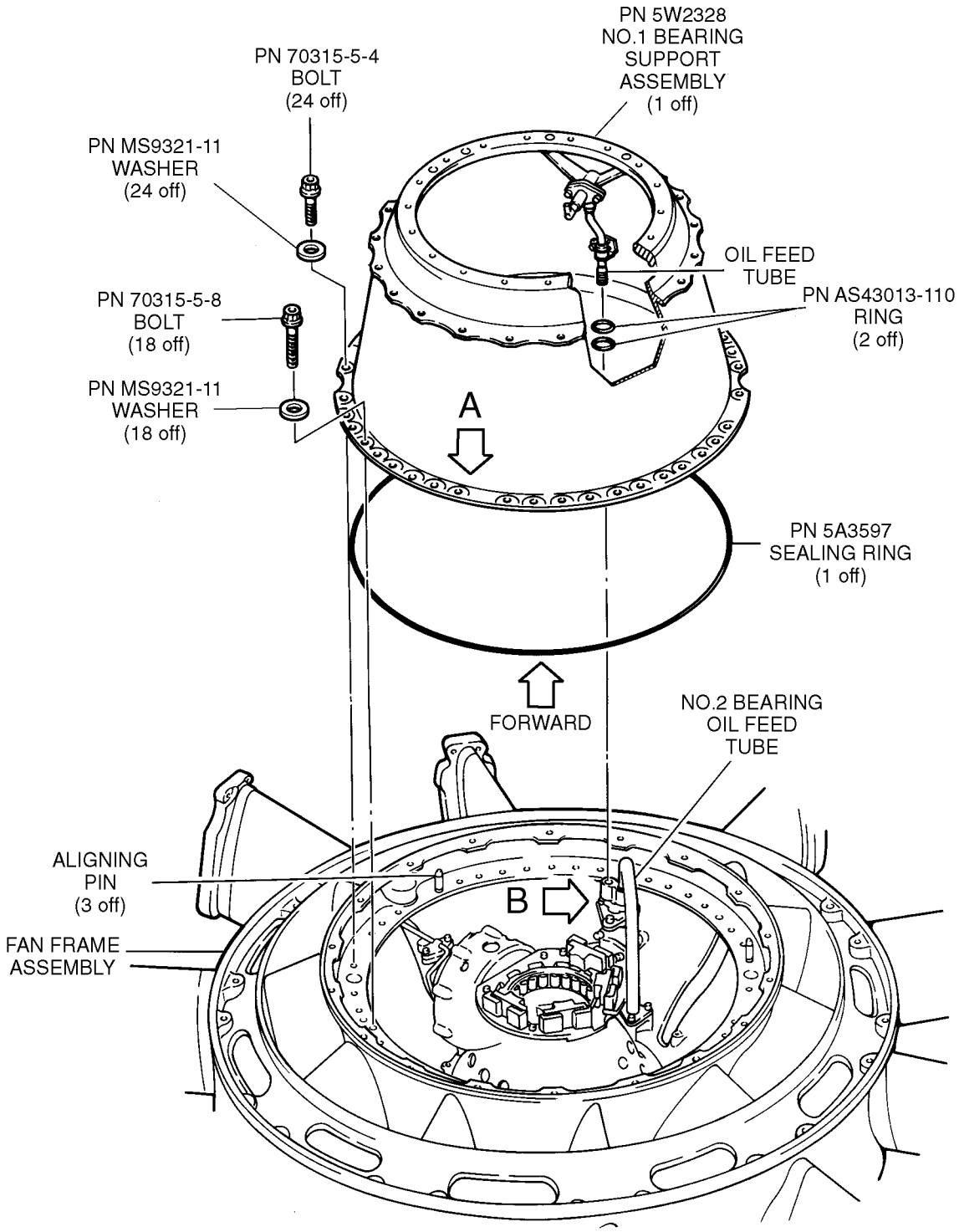
Before and after modification of the No.1 bearing support assembly
Figure 1 (Sheet 3 of 3)



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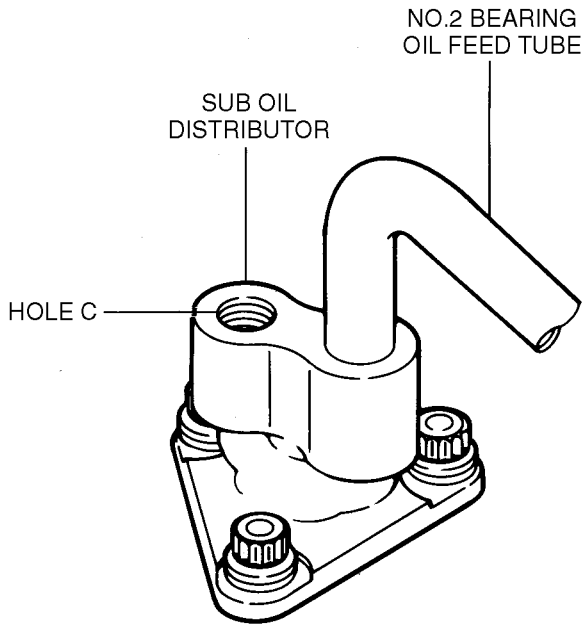
Install the No.1 bearing support assembly to the fan frame assembly
Figure 2 (Sheet 1 of 3)



B

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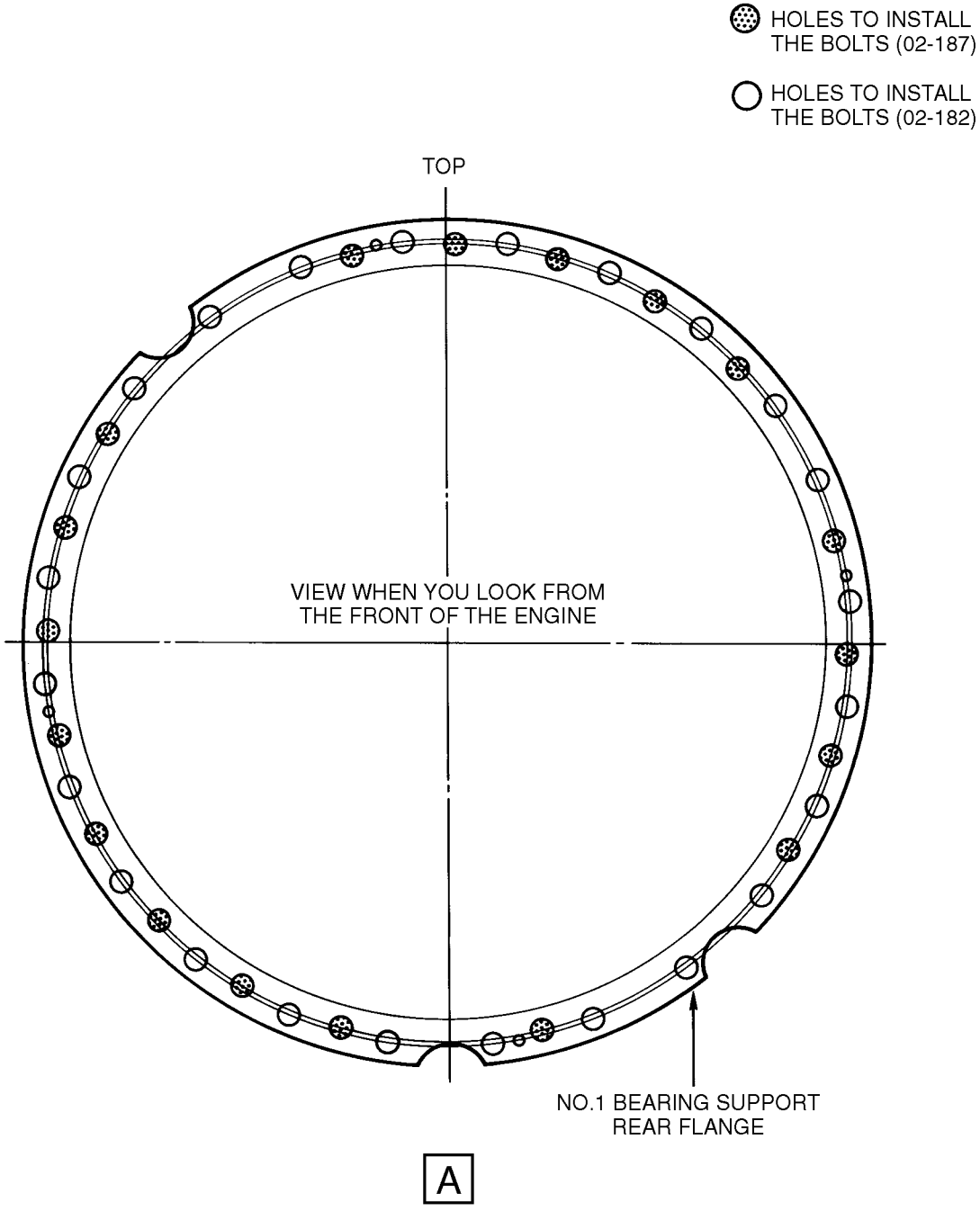
Install the No.1 bearing support assembly to the fan frame assembly
Figure 2 (Sheet 2 of 3)



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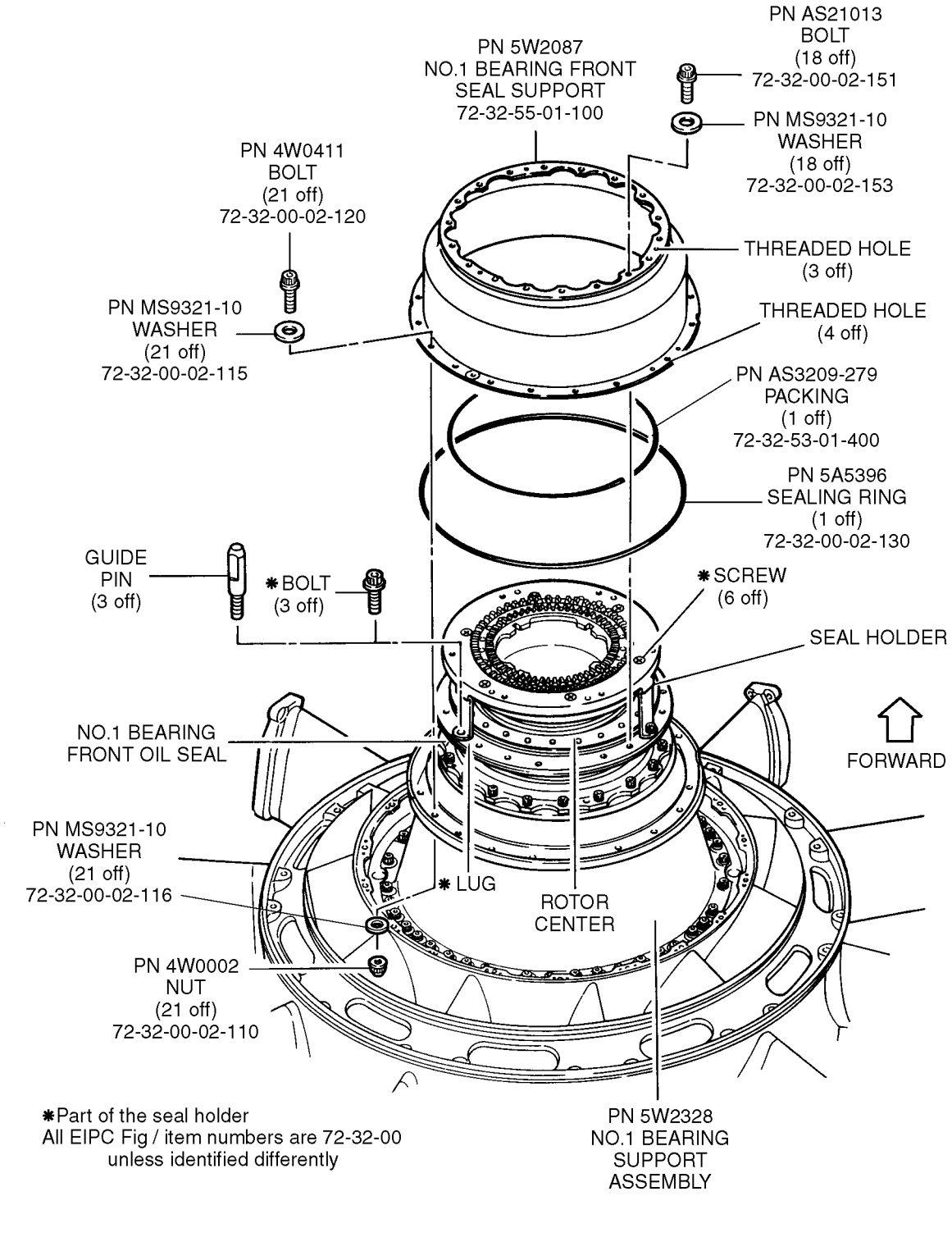
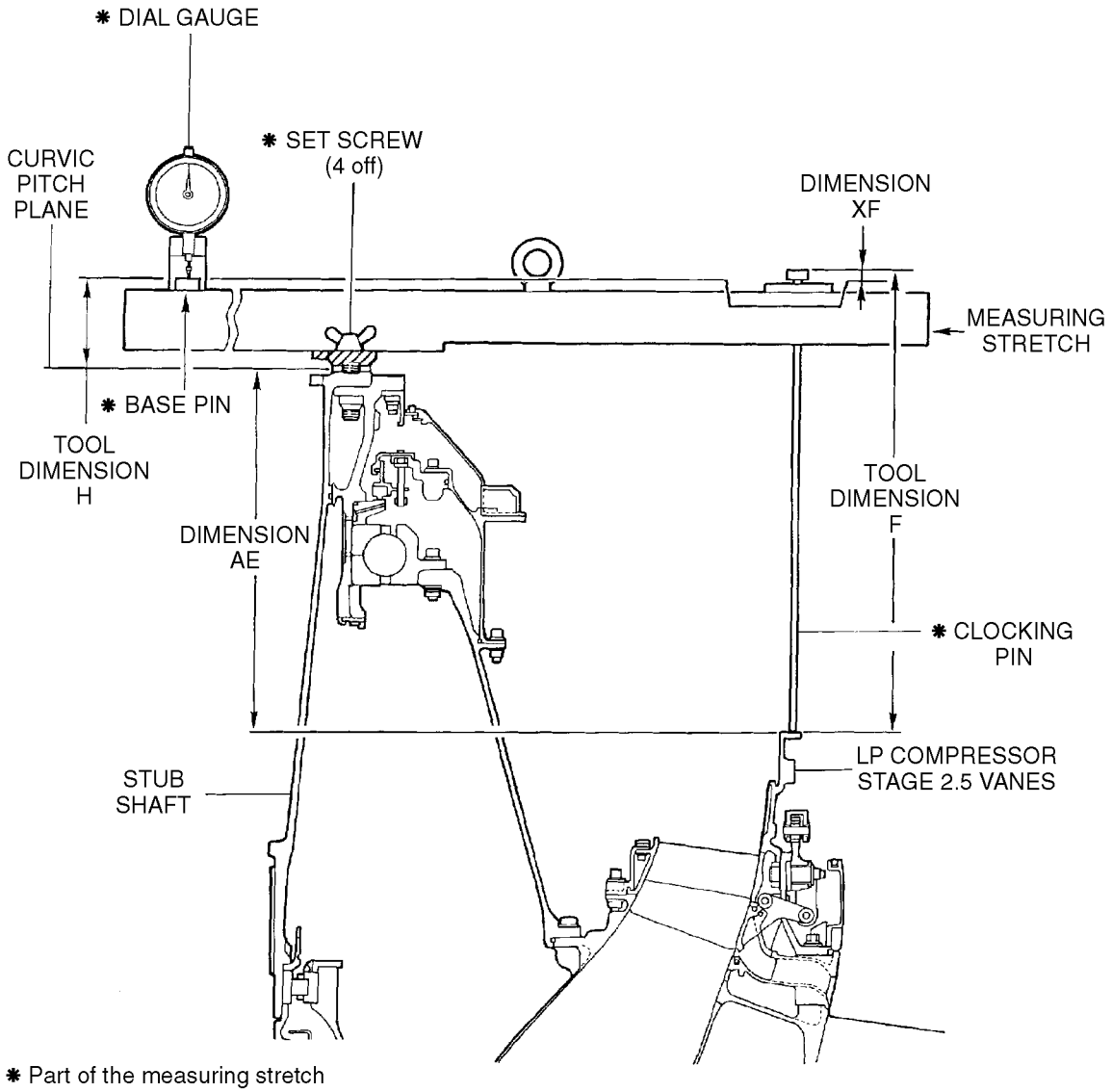
Install the No.1 bearing support assembly to the fan frame assembly
Figure 2 (Sheet 3 of 3)



Install the No.1 bearing front seal support and the air feed brackets on the No.1 bearing support
Figure 3

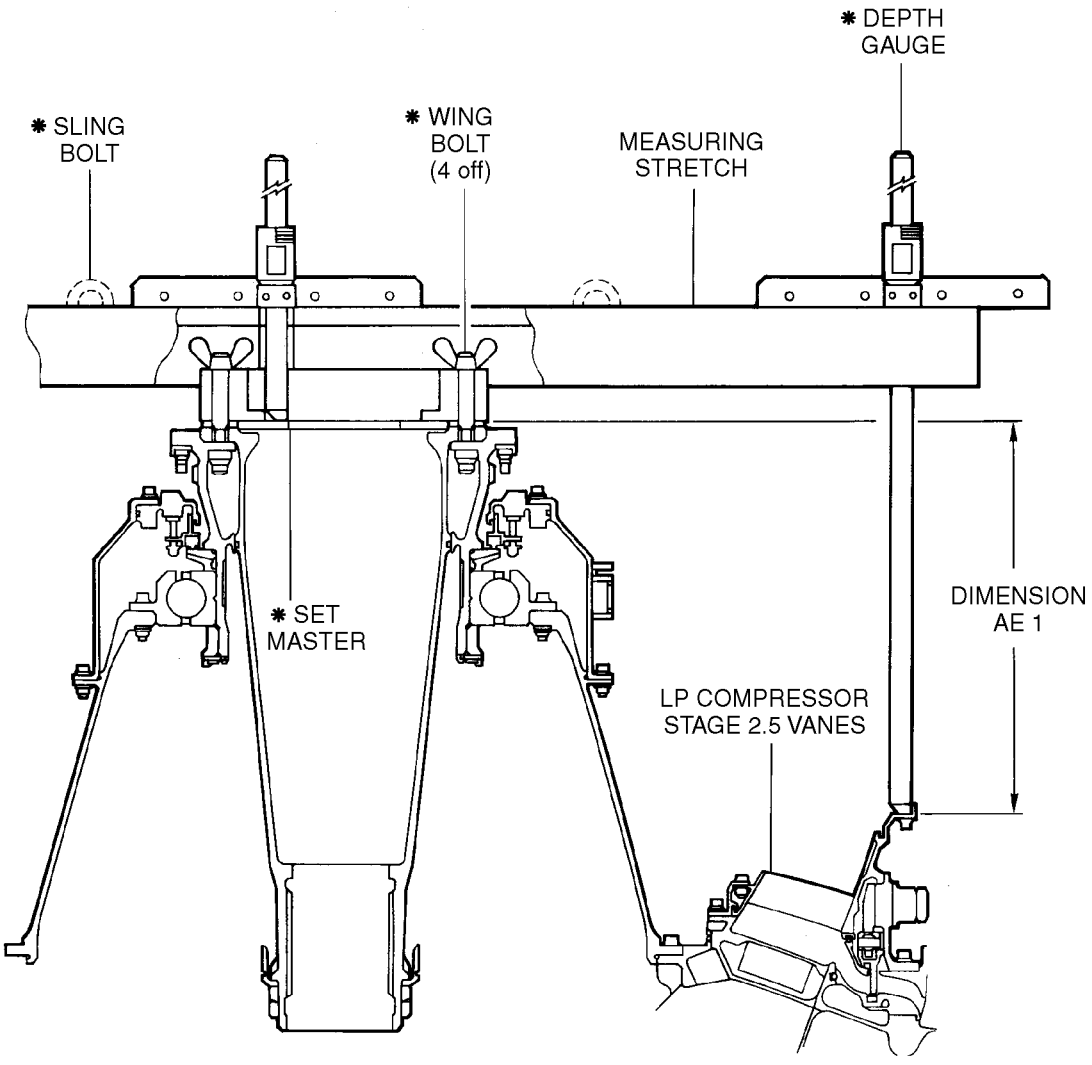
Read dimension H identified on the measuring stretch
Read dimension F identified on the clocking pin
Measure dimension XF
Calculate dimension AE
AE = F - XF - H



* Part of the measuring stretch

jaz00e1904

Measure the interface dimensions for the installation of the LP compressor booster stage assembly
Figure 4 (Sheet 1 of 2)

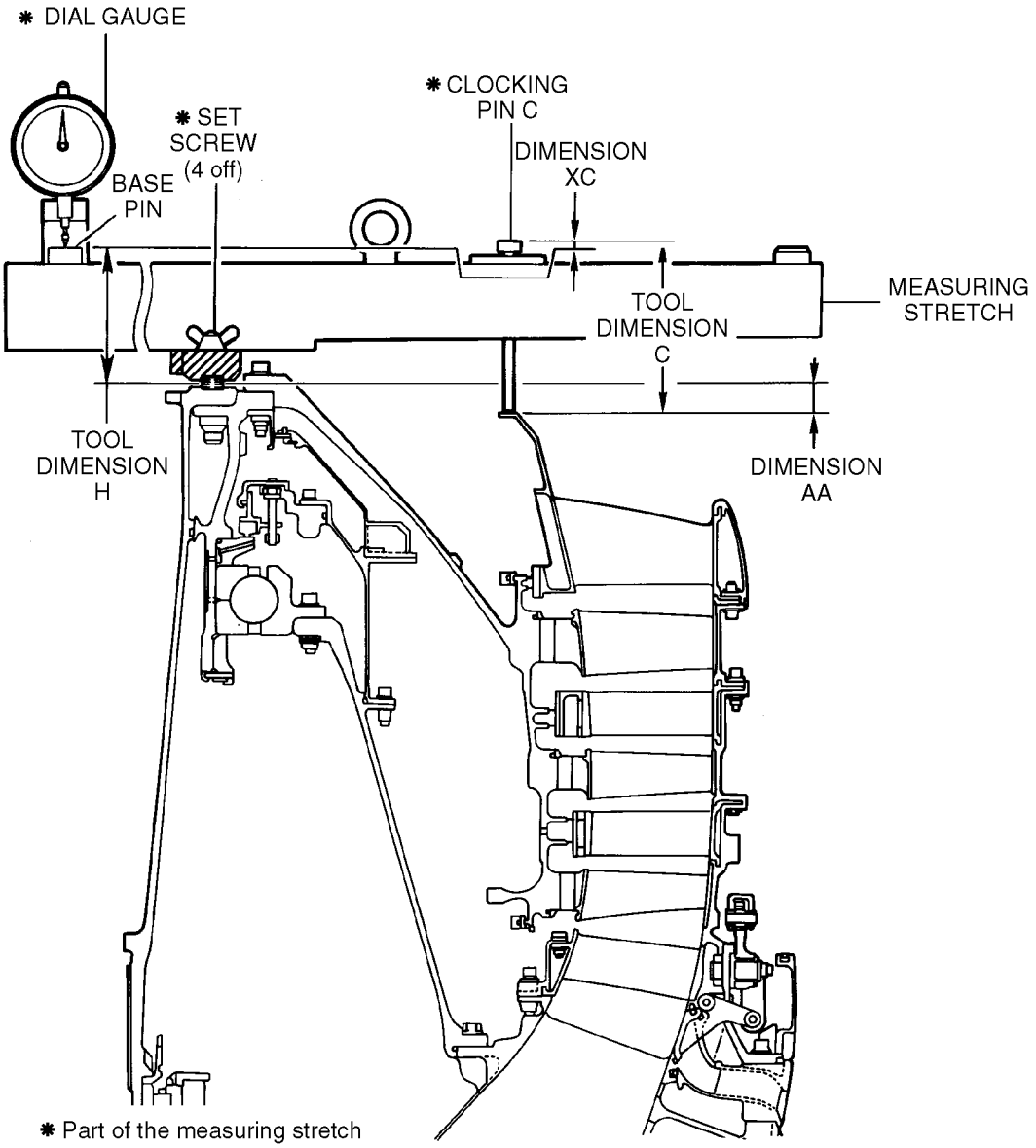


* Part of the measuring stretch

jaz00e1905

Measure the interface dimensions for the installation of the LP compressor booster stage assembly
Figure 4 (Sheet 2 of 2)

Read the dimension H identified on the measuring stretch
Read the dimension C identified on the clocking pin
Measure the dimension XC
Calculate the dimension AA
AA = C - XC - H



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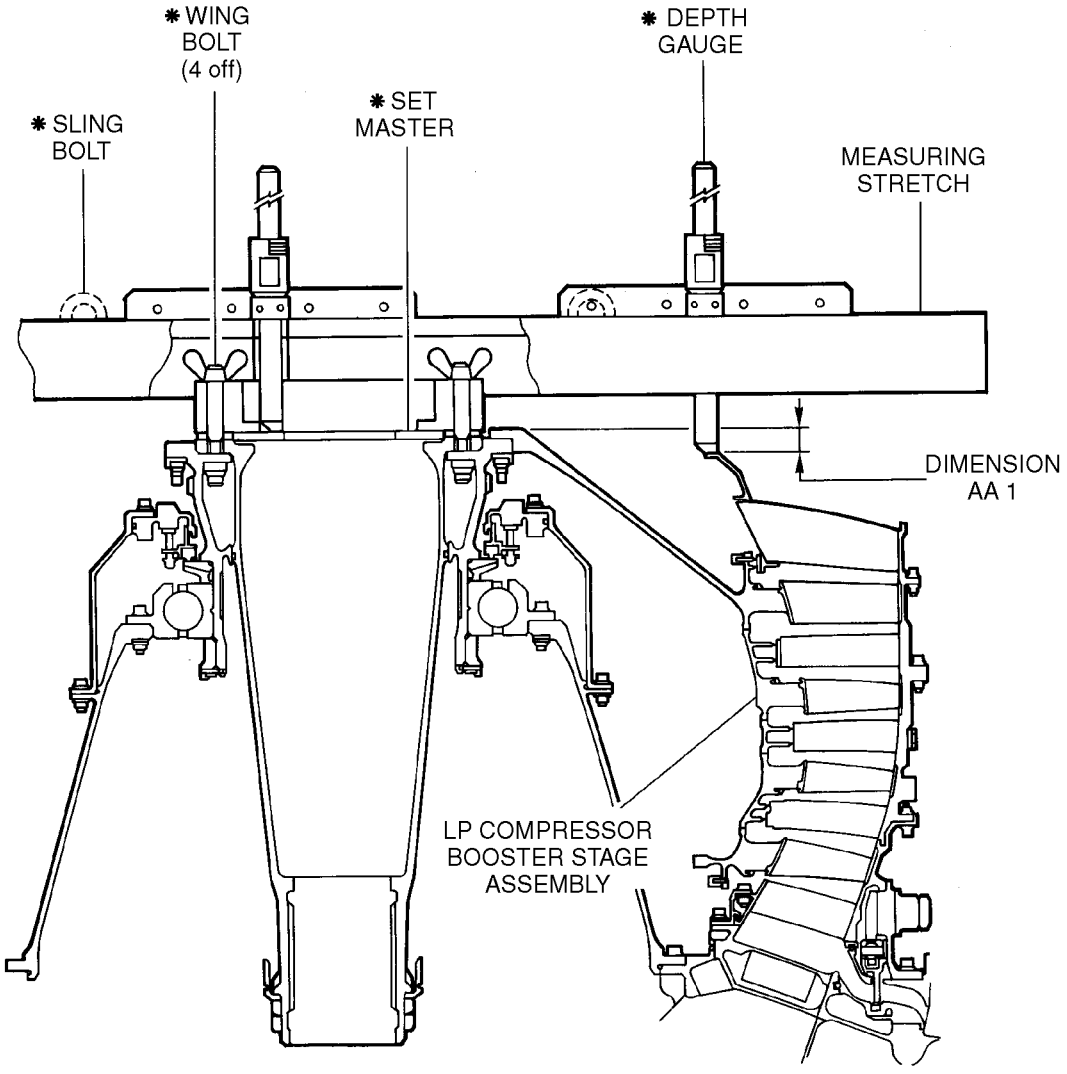
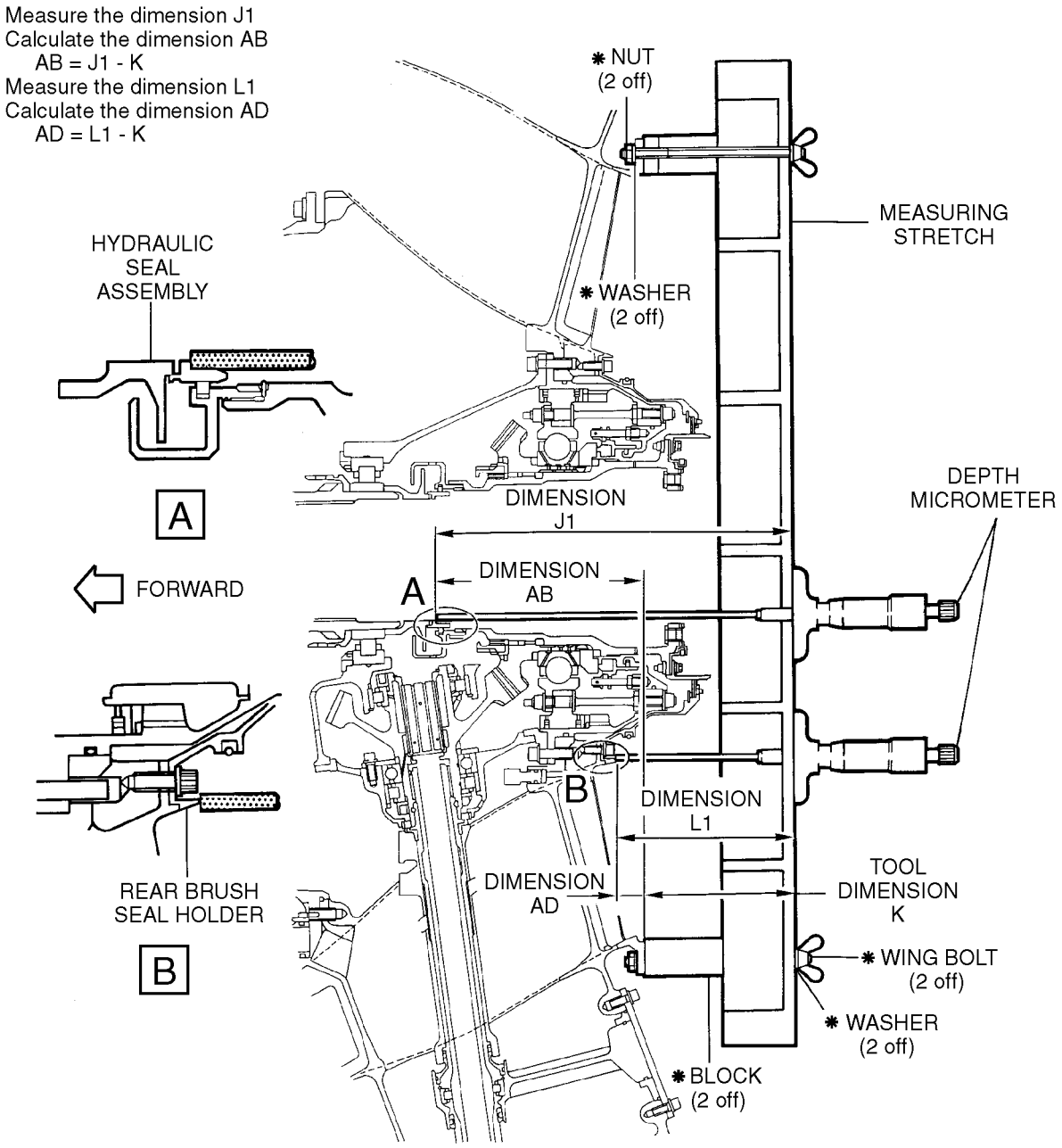
Measure the module interface dimension for the installation of the LP compressor (fan) module for V2500-A1
Figure 5 (Sheet 1 of 2)



* Part of the measuring stretch

jaz00e1907

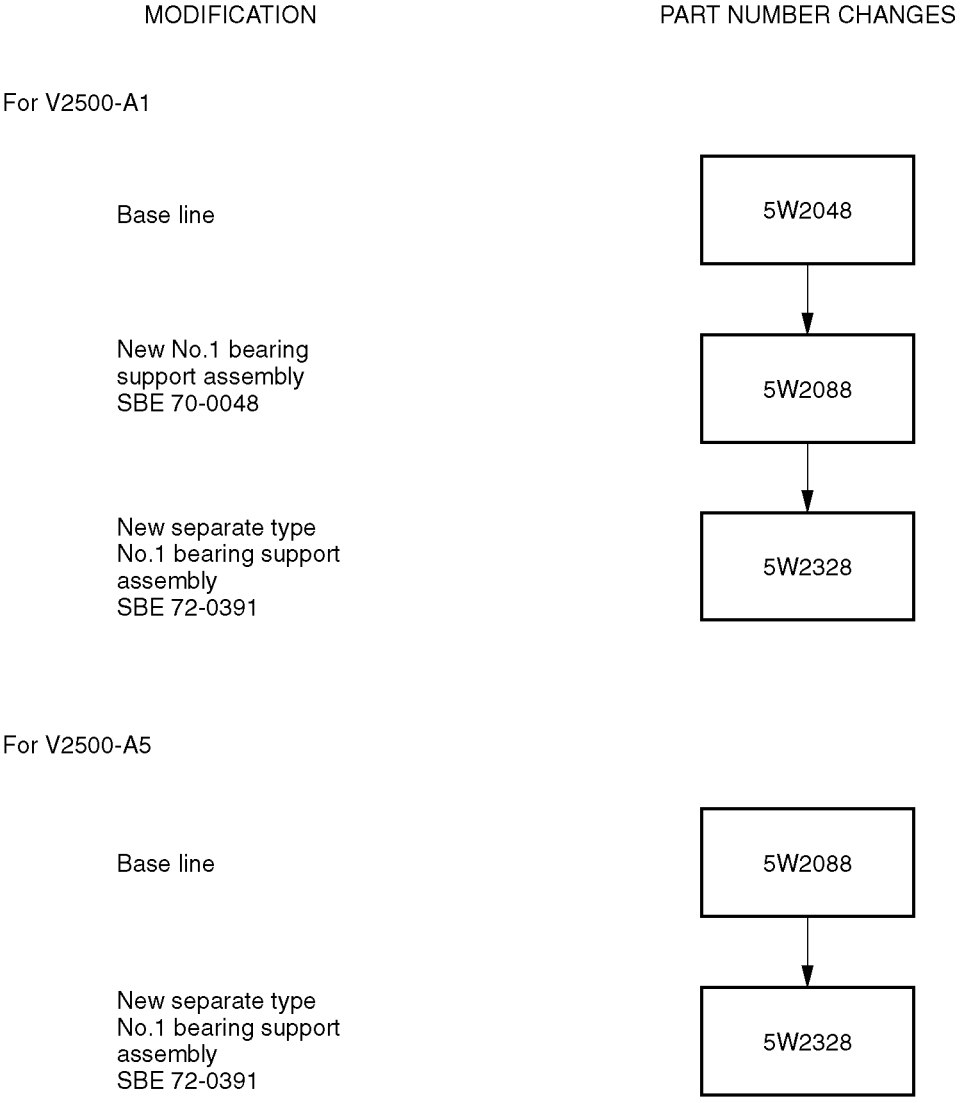
Measure the module interface dimension for the installation of the LP compressor (fan) module for V2500-A5
Figure 5 (Sheet 2 of 2)



* Part of the measuring stretch

jaz00e1908

Measure the module interface dimensions for the installation of the HP system module
Figure 6



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Family Tree No.1 Bearing Support Assembly for V2500-A1 and V2500-A5 Ref. Catalogue Sequence No. 72-32-41 Fig.01 Item 240
Figure 7