P U B L I C A T I O N T R A N S M I T T A L

RR-DERBY

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DATE R Aug. 8/02

V2500-A1/A5/D5 SERIES PROPULSION SYSTEMS SERVICE BULLETIN

This document transmits Revision 1 to Service Bulletin EV2500-72-0411

Document History

Service Bulletin Revision Status	Supplement Revision Status
Initial Issue Dec.2/01	

Bulletin Revision 1

Remove	Incorporate	Reason for change
Pages 1 to 17 of the Service Bulletin	Pages 1 to 18 of the Service Bulletin	To add visual inspection instead of evacuation check for Front Bearing Compartment without the Leak Check Fixture. To add scallop type for the oil drain feature at the side wall of Hydraulic Seal groove for new production.

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

LIST OF EFFECTIVE PAGES

The effective pages to this Service Bulletin following incorporation of Revision 1 are as follows:

	Page	Revision Number	Revision Date
	Bulletin		
R	1	1	Aug.8/02
R	2	1	Aug.8/02
R	3	1	Aug.8/02
R	4	1	Aug.8/02
R	5	1	Aug.8/02
R	6	1	Aug.8/02
R	7	1	Aug.8/02
R	8	1	Aug.8/02
R	9	1	Aug.8/02
R	10	1	Aug.8/02
R	11	1	Aug.8/02
R	12	1	Aug.8/02
R	13	1	Aug.8/02
R	14	1	Aug.8/02
R	15	1	Aug.8/02
R	16	1	Aug.8/02
R	17	1	Aug.8/02
R	18	1	Aug.8/02

ENGINE - LP COMPRESSOR - INTRODUCTION OF HYDRAULIC SEAL WITH REVISED OIL DRAIN FEATURE

1. Planning Information

A. Effectivity

Part 1

(1) Airbus A320

V2500-A1 Engines prior to Serial No.V0214

(2) ATA locator 72-32-00

Part 2

(1) Airbus A319

V2522-A5, V2524-A5, V2527M-A5 Engines prior to Serial No.V11350

(2) Airbus A320

(a) V2500-A1 Engines prior to Serial No.V0214 to V0361

(b) V2527-A5, V2527E-A5 Engines prior to Serial No.V11350

(3) Airbus A321

V2530-A5, V2533-A5 Engines prior to Serial No.11350

(4) Boeing Longbeach Division MD-90

V2525-D5, V2528-D5 Engines prior to Serial No.20286

(5) ATA Locator

72-32-00

B. Concurrent Requirements

None.

C. Reason

(1) Problem

The seal ring at the hydraulic seal is designed to expand and shrink according to the rotor speed. During normal operation, the seal ring expands and attaches into the hydraulic seal groove. When the rotor speed is decreased, the seal ring shrinks, detaches from the hydraulic seal groove and prevents oil leakage to aft portion of the hydraulic seal at engine shutdown. In several field engines, it was revealed that the seal ring adhered on the hydraulic seal groove and was stuck open at engine shutdown.

(2) Background

The sticking open of the seal ring must be prevented because the oil leakage at engine shutdown due to the sticking open is one cause of cabin odour at the next flight. The tear down inspection revealed that the case of the adhesion and sticking open of the seal ring is the degraded oil and carbon build up observed in the seal ring groove. To prevent the degraded oil and carbon build up, improvement of the drain capability of the hydraulic seal is required.

(3) Objective

To introduce improved oil drain feature by scalloping the side wall of the hydraulic seal groove.

(4) Substantiation

Analytically substantiated.

(5) Effect of Bulletin on workshop procedures:

(a) Removal/Installation

Not affected

(b) Disassembly/Assembly

R Affected (See Supplemental Information)

(c) Cleaning

Not affected

(d) Inspection/Check

Not affected

(e) Repair

Not affected

(f) Testing

Not affected

(6) Supplemental Information

R The assembly of the Pre and Post-Service Bulletin configuration requires
R instructions for the visual inspection instead of evacuation check for
R Front Bearing Compartment without the Leak Check Fixture in the Stub Shaft
R and Hydraulic Ring.

D. Description

(1) The changes introduced are as follows:

Part 1

(a) The oil drain feature at the side wall of hydraulic seal groove is
R changed from holes to slots or scallops. Refer to Fig.1.

(b) The numbers of the oil drain feature are not changed. Refer to Fig.1.

Part 2

(c) The oil drain feature at the side wall of hydraulic seal groove is
R changed from holes to slots or scallops. Refer to Fig.1.

(d) The numbers of the oil drain feature are changed from three to six.
Refer to Fig.1.

(2) Existing hydraulic seal can be reworked. Refer to Fig. 4.

(3) For relationship with other Service Bulletins, see 1.K. references and Fig.2 Family Tree.

(4) This Service Bulletin comprises the two parts that follow:

Part 1 - Rework of hydraulic seal of engines not incorporating SB V2500-ENG-70-0172

Part 2 - Rework of hydraulic seal of engines incorporating SB V2500-ENG-70-0172

E. Compliance

Category Code 6

Accomplish when the sub-assembly (i.e. modules, accessories, components, build groups) is disassembled sufficiently to afford access to the affected part and to all affected spare parts.

F. Approval

The part number changes and/or part modifications described in sections 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

Part 1 and Part 2

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

(1) In service

Not applicable.

(2) At overhaul

(a) To embody modification (setup, machine, deburr and visually inspect)

1 hour 15 minutes

(b) Re-identify part

20 minutes

(c) Total

1 hour 35 minutes

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

H. Weight and Balance

(1) Weight Change

None

(2) Moment Arm

No effect

(3) Datum

Engine front mount centreline (Power Plant Station (PPS100)).

I. Electrical Load Data

The aircraft electrical load is not affected by this Service Bulletin.

J. Software Accomplishment Summary

Not applicable.

K. References

R (1) Engineering Change No. 01VJ015 and 02VJ627

(2) V2500 Engine Illustrated Parts Catalog (A1/A5/D5), Chapter/Section 72-32-19

(3) V2500 Engine Manual (EM)(E-V2500-1IA and E-V2500-3IA), Chapter/Section 72-32-19, Cleaning-01, Config-01

(4) V2500 Engine Manual (EM)(E-V2500-1IA and E-V2500-3IA), Chapter/Section 72-32-19, Inspection/Check-01, Config-01

(5) V2500 Engine Manual (EM)(E-V2500-1IA and E-V2500-3IA), Chapter/Section 72-32-19, Repair 003 (VRS1228), Repair 004 (VRS1229) and Repair 006 (VRS1233)

(6) V2500 Standard Practices/Processes Manual (SPM) (SPP-V2500-1IA), Chapter/Section 70-09-00 Marking of Parts

(7) IAE V2500 Service Bulletin

V2500-ENG-70-0172 - Standard Practices - Engine - Information - Engine LP compressor - New hydraulic seal assembly - Category code 7

L. Other Publications Affected

(1) V2500 Engine Illustrated Parts Catalog (A1/A5/D5), Chapter/Section 72-32-19 will be revised to add the new part.

(2) V2500 Engine Manual (EM)(E-V2500-1IA and E-V2500-3IA), Chapter/Section
R 72-32-19, Inspection/Check-01, Config-01 will be revised to add the new part.

R (3) V2500 Engine Manual (EM)(E-V2500-1IA and E-V2500-3IA), Chapter/Section
R 72-32-19, Cleaning-01, Config-01 will be revised to add the new part.

(4) V2500 Engine Manual (EM)(E-V2500-1IA and E-V2500-3IA), Chapter/Section 72-32-19, Repair 003 (VRS1228), Repair 004 (VRS1229) and Repair 006 (VRS1233)

(5) V2500 Engine Manual (EM)(E-V2500-1IA), Chapter/Section 72-32-00,
R Assembly-11, Config-01 and Config-02 will be revised to delete evacuation
R check for Front Bearing Compartment without the Leak Check Fixture in the
R Stub Shaft and Hydraulic Ring.

R (6) V2500 Engine Manual (EM)(E-V2500-1IA), Chapter/Section 72-32-00,
R Assembly-06, will be revised to add the visual inspection instead of
R evacuation check for Front Bearing Compartment without the Leak Check
R Fixture in the Stub Shaft and Hydraulic Ring.

(7) V2500 Engine Manual (EM)(E-V2500-3IA), Chapter/Section 72-32-00,
R Assembly-11, will be revised to delete evacuation check for Front Bearing
R Compartment without the Leak Check Fixture in the Stub Shaft and Hydraulic
R Ring.

R (8) V2500 Engine Manual (EM)(E-V2500-3IA), Chapter/Section 72-32-00,
R Assembly-06, will be revised to add the visual inspection instead of
R evacuation check for Front Bearing Compartment without the Leak Check
R Fixture in the Stub Shaft and Hydraulic Ring.

M. Interchangeability of Parts

Not affected.

2. Material Information

A. Material - Price and Availability

(1) Modification Kit

Modification Kit is not required, existing parts can be reworked

(2) New production

PART NO.	QTY	UNIT PRICE US DOLLARS
5A1865	1	

NOTE: The unit prices, if shown, are an estimate and they are given for the purpose of planning only. For actual prices, refer to the IAE Price Catalogue or contact IAE's spare parts sales department.

B. Industry Support Information

None

C. Kits necessary for this Service Bulletin

None

D. Parts affected by this bulletin:

V2500-A1/A5/D5 Engines

72-32-19

FIG ITEM NO.	NEW PART NO.	QTY	PART TITLE	MAT	OLD PART NO.	INSTR DISP
Part 1						
01100	5A1865	1	Seal, A/O Hydraulic	-	5A0698	(A)(B) (S1)(1D)
Part 2						
01100	5A1865	1	Seal, A/O Hydraulic	-	5A1085	(A)(C) (S1)(1D)

E. Instruction disposition codes:

(A) New part will be made available from June 2002.

(B) Old part is no longer available.

(C) Old part will continue to be supplied until the new part will be available.

(S1) New and old parts are freely and fully interchangeable, both physically and functionally.

(1D) New part can be obtained by rework and re-identification of old part.

F. Tooling - Price and Availability

The tool that follows is required to accomplish this Service Bulletin when reworking the existing hydraulic seal:

Tool Number	Qty	Description	Function	Availability
IAE3J12858	1	Fixture, machining, hydraulic	Fixture at rework of hydraulic seal	(1)

(1) Indicates that tool design aperture card is currently available from IAE for use in the local manufacture of the fixture.

3. Accomplishment Instructions

A. Rework Instructions

(1) Do a modification of 5A0689 (Part 1) or 5A1085 (Part 2) hydraulic seal and identify as follows:

(a) Set up hydraulic seal with the special tool on the machine tool

PROCEDURE	RELATED DATA
(i) Put the hydraulic seal (Part A and Part B) on the special tool	Refer to Fig.4. Use IAE3J12858 fixture machining hydraulic seal
(ii) Adjust position of clamps B to seat clamps B to the hydraulic seal (Part B) and safety the hydraulic seal (Part B) with the four screws C, washers B, clamps B and screws B	
NOTE: Screws C, washers B, clamps B and screws B are part of the IAE3J12858 fixture, machining hydraulic seal	

(iii) Safety the hydraulic seal (Part A) with the screw A, washer A and clamp A	Refer to Fig.4.
NOTE: Screw A, washer A and clamp A are part of the IAE3J12858 fixture, machining hydraulic seal	
(b) Cut out the side wall of groove at six equally spaced positions on circumference of hydraulic seal	Refer to Fig.5. Use standard workshop equipment
NOTE: All existing drain holes have to be removed completely by new cut off areas.	
NOTE: Machining operation is mandatory at area A.	
NOTE: Machining operation is not mandatory at area B.	
(c) Remove all burrs and sharp edges from areas cut out	Refer to Fig.5
(d) Examine dimensions	Refer to Fig.5
(e) Cancel existing part number and identify with new part number adjacent to existing part number	Use vibro-peen method. Refer to Fig.5 and SPM 70-09-00, Marking of Parts, TASK 70-09-00-400-501.

Existing	Re-number
Part 1	
5A0698	5A1865
Part 2	
5A1085	5A1865

B. Assembly Instructions

(1) Install the new 5A1865 hydraulic seal, existing seal ring and hydraulic ring onto the No.3 bearing rotor centre and support assembly. Refer to Engine Manual (EM), 72-32-10, Assembly, Config-01 (A1), 72-32-10, Assembly, Config-02 (A5), or 72-32-10, Assembly (D5).

R Evacuation check for front bearing compartment without the leak check
R fixture in the Stub Shaft Assembly and the Hydraulic Seal is not required.

R (2) Visually inspect the Stub Shaft Assembly, Hydraulic Seal and Hydraulic
R Ring. Refer to following procedure and Figure 6.

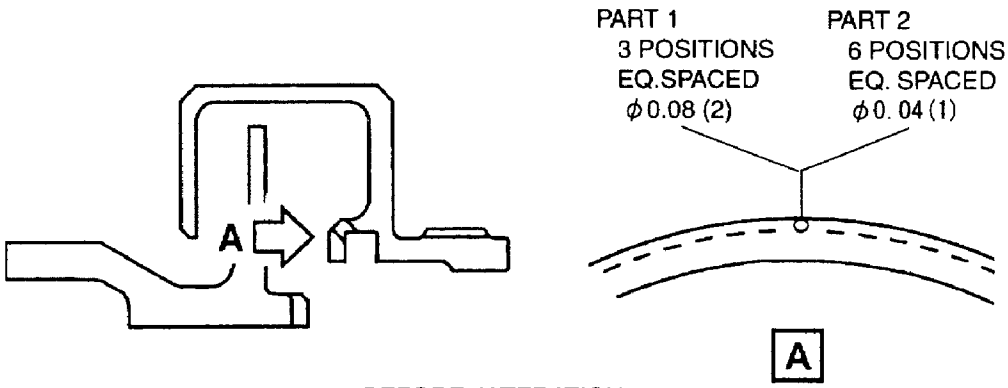
R (a) Make sure the clearance between the Stub Shaft Assembly and the
R Hydraulic Seal is no more than 0.131 in. (3,35 mm.). If the clearance
R is over 0.131 in. (3,35 mm.), reject the module.

R (b) Make sure the Hydraulic Seal is fully seated against Hydraulic Ring.
R If Hydraulic Seal is not seated, adjust position of Hydraulic Ring.
R Refer to EM, 72-32-00, Assembly-06

R (c) Make sure Seal Ring is installed in Hydraulic Seal. If Seal Ring is
R not installed, reject the module.

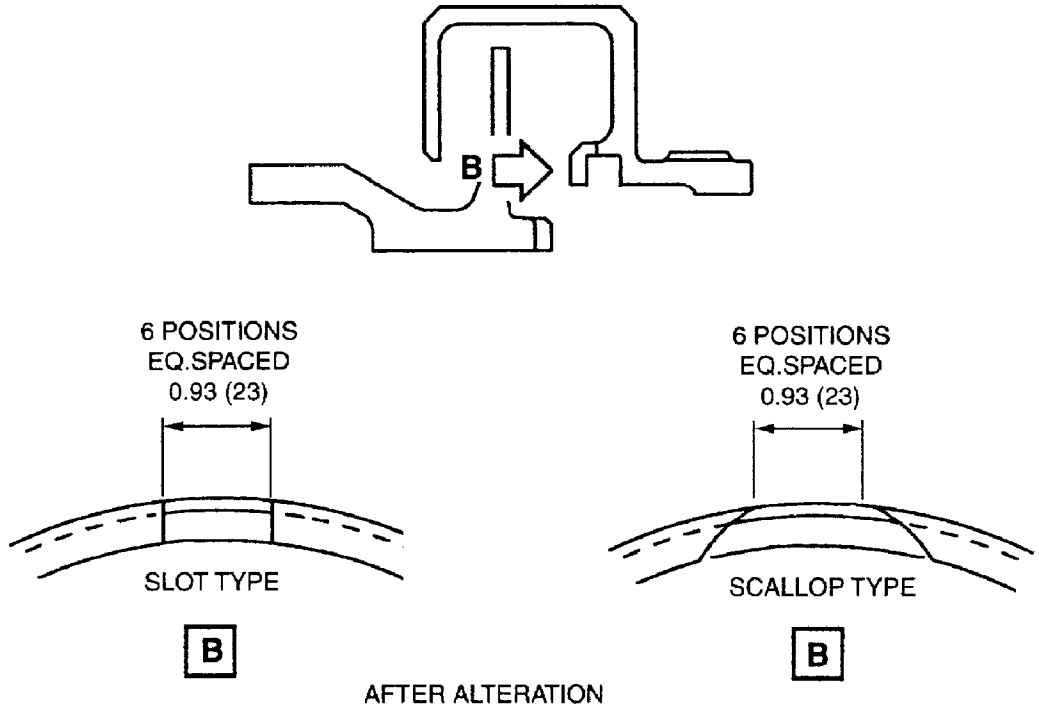
C. Recording Instructions

A record of accomplishment is required.



BEFORE ALTERATION

R



AFTER ALTERATION

NOTE:THERE ARE TWO TYPE, SLOT TYPE OR SCALLOP TYPE
FOR OIL DRAIN FEATURE OF AFETER ALTERAITON

ALL DIMENSIONS ARE IN IN.(MM)

jax0800052a

R Before and after alteration of hydraulic seal
R Fig.1

MODIFICATION	PART NUMBER CHANGE
	For V2500-A1
BASE LINE	5A0698
V2500-ENG-70-0172 ENGINE - LP COMPRESSOR - NEW HYDRAULIC SEAL ASSEMBLY -CATEGORY 7	5A1085
V2500-ENG-72-0411 Part 1 and 2 ENGINE - LP COMPRESSOR - INTRODUCTION OF HYDRAULIC SEAL WITH REVISED OIL DRAIN FEATURE -CATEGORY 6	5A1865

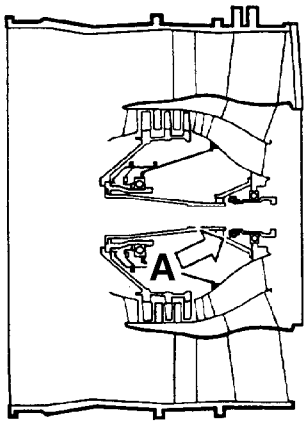
jax0800053

Family tree - Seal, A/0 hydraulic (72-32-19, Fig 01 Item 100)
Fig.2 (Sheet 1 of 2)

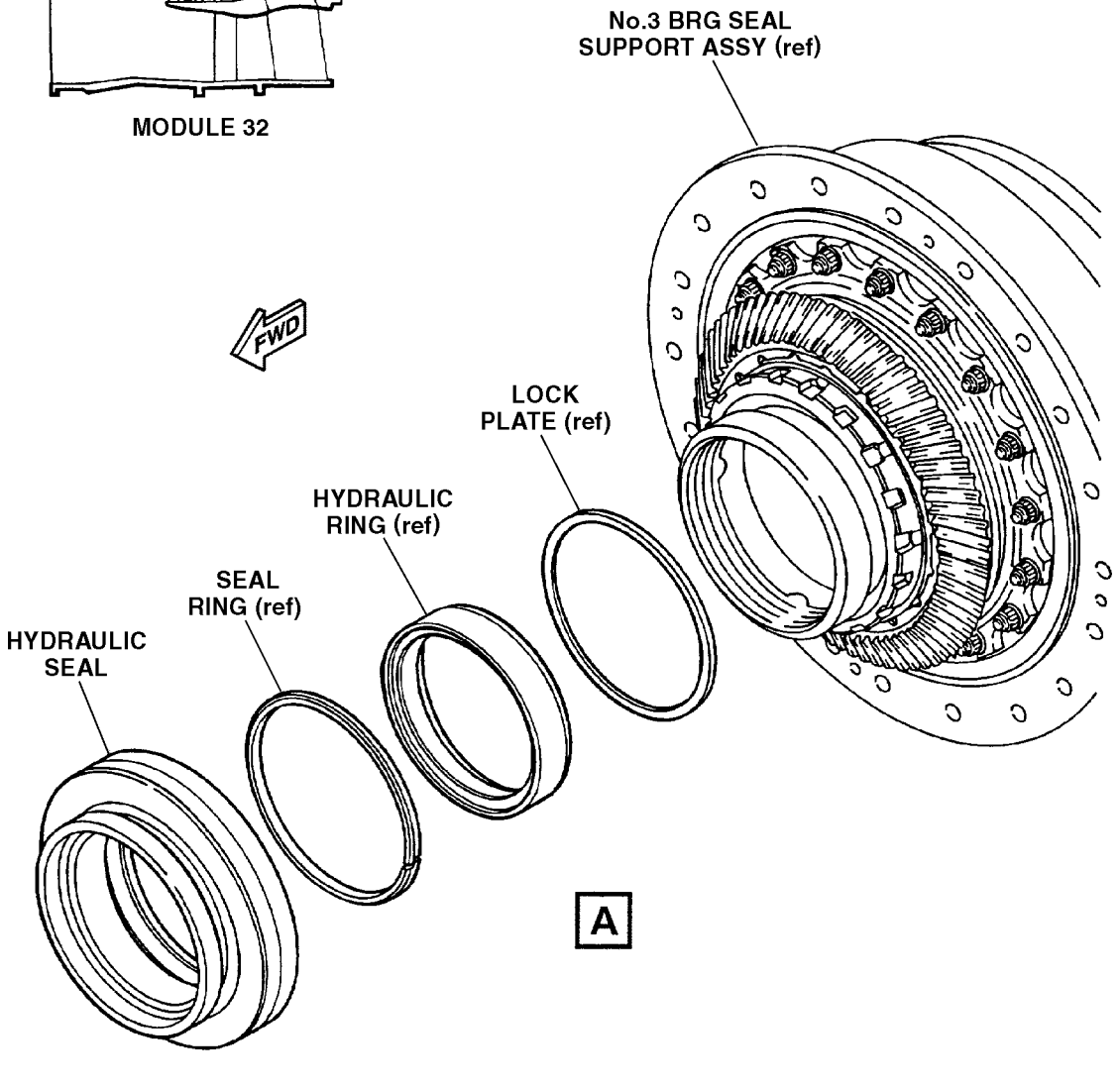
MODIFICATION	PART NUMBER CHANGE
BASE LINE	For V2522-A5, V2524-A5, V2527-A5 V2527E-A5, V2527M-A5, V2530-A5, V2533-A5, V2525-D5 and V2528-D5
V2500-ENG-72-0411 Part 1 and 2 ENGINE - LP COMPRESSOR - INTRODUCTION OF HYDRAULIC SEAL WITH REVISED OIL DRAIN FEATURE -CATEGORY 6	5A1085 → 5A1865

jax0800021

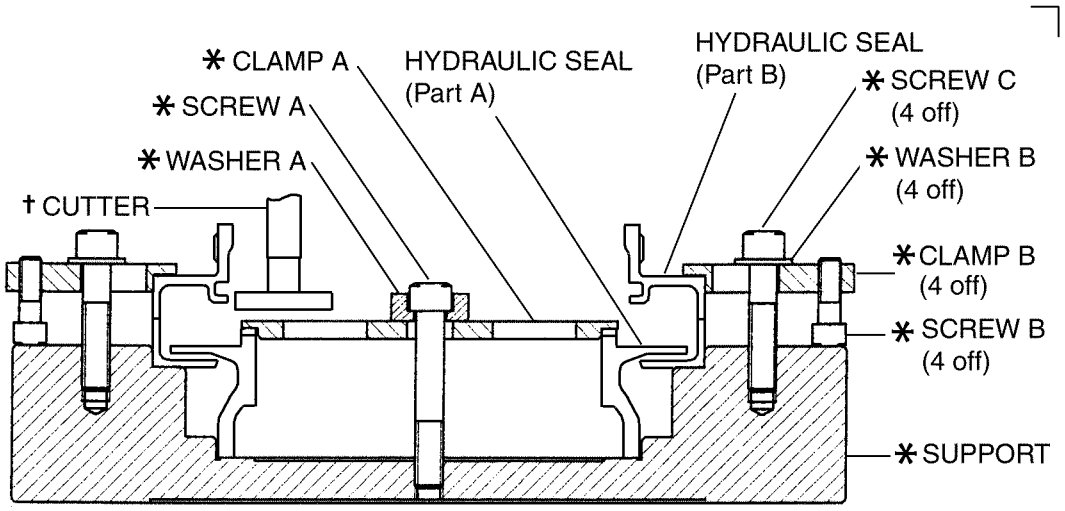
Family tree - Seal, A/O hydraulic (72-32-19, Fig 01 Item 100)
Fig.2 (Sheet 2 of 2)



MODULE 32



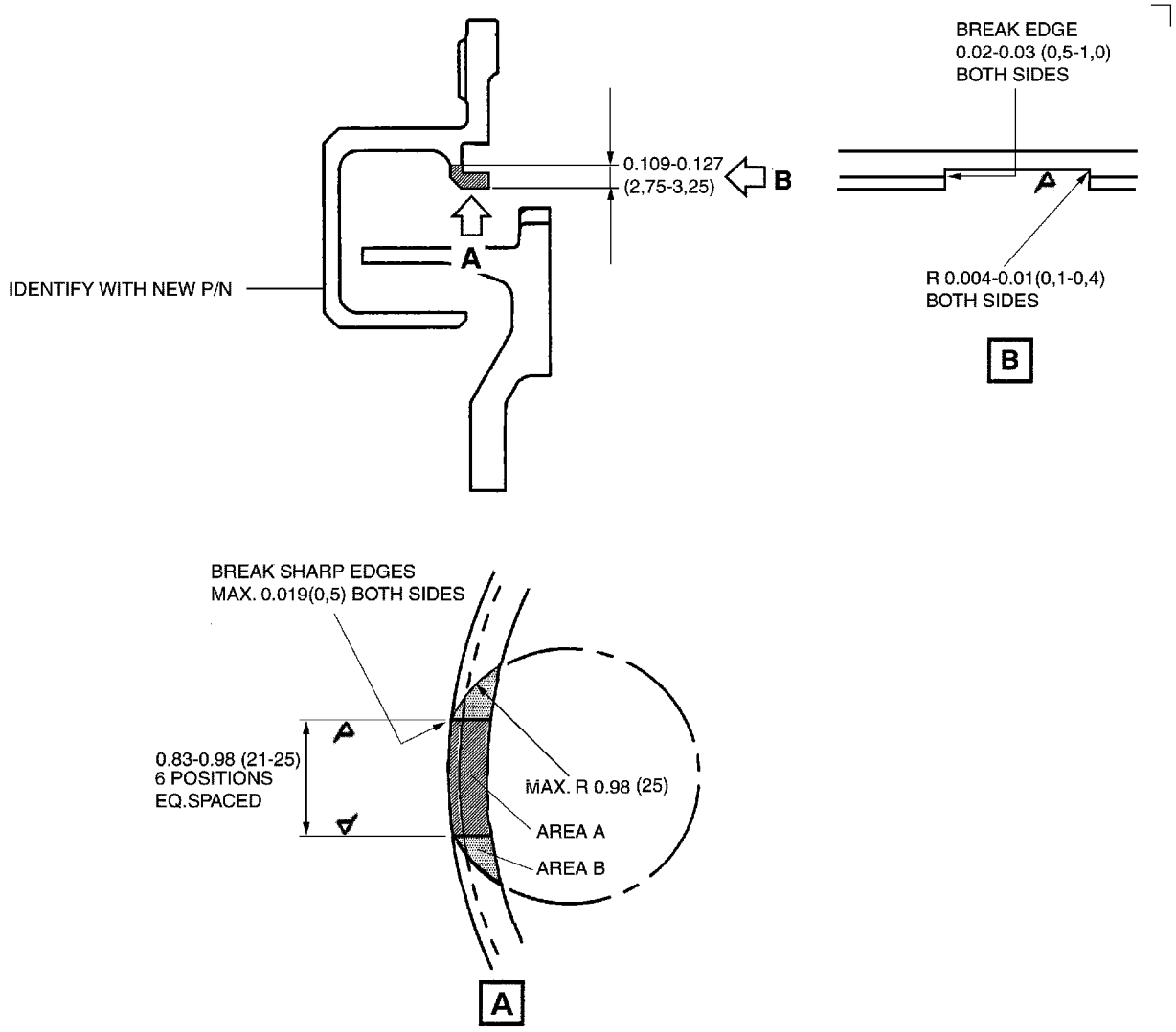
Location of seal, A/0 hydraulic
Fig.3



jax0800020

* Part of the 3J12858 Fixture, Machining-Hdraulic Seal
† Standard Equipment

Installation of hydraulic seal to tool IAE3J12858 fixture, machining hydraulic seal
Fig.4

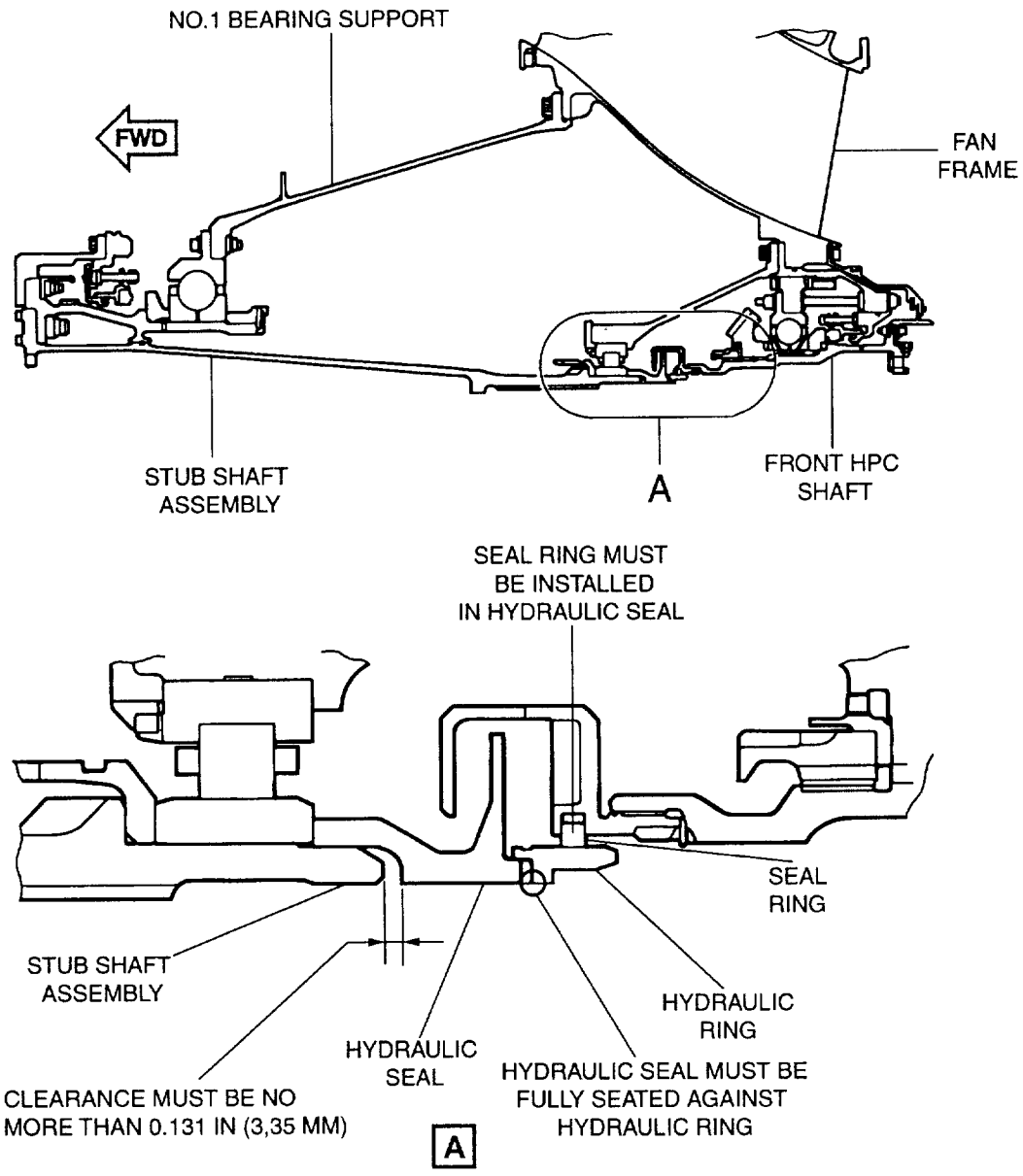


ALL DIMENSIONS ARE IN IN.(MM)
ALL EXISTING DRAIN HOLES HAVE TO BE REMOVED COMPLETELY BY NEW CUT OFF AREAS.
MACHINING OPERATION IS MANDATORY AT AREA A.
MACHINING OPERATION IS NOT MANDATORY AT AREA B.
SURFACE ROUGHNESS WHERE MARKED ✓ TO BE 250 MICROINCHES (6,3 MICROMETER).

jax0800023

Rework and re-identification of seal, A/O hydraulic
Fig.5

R



R Requirements of Visual Inspection
R Fig.6