



DRY GAS SEAL INSPECTION REPORT

PROJECT: **SAMPLE**

COMPRESSOR: **Mitsubishi**

DATE: **N.A.**

REPORT No: N.A.

SEAL INFORMATION



CARTRIDGE No: **N.A.**

SEAL CODE: **N.A.**

DRAWING No: **N.A.**

FILE REFERENCE: **N.A.**

SHAFT ROTATION: **BD**

COMPRESSOR END: **NOT KNOWN AT TIME OF INSPECTION**

OPERATING CONDITIONS

FLUID:	99.4% ETHYLENE OTHERS	SEAL PRESS:	3.2 barG (DYNAMIC). 13.9 barG (SETTLING OUT).	TEMP:	10.3°C NOR.	SHAFT SPEED:	6985 RPM MCS
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SUMMARY

GENERAL APPEARANCE:

This used seal was returned to John Crane Singapore for refurbishment.
The seal was packed in the wooden case.
Axial movement of the whole cartridge felt normal.

INBOARD STAGE:

Axial movement of the carrier felt normal.
Faint contact marking is visible on the polished surface of the mating ring. (See pic 3).
Faint contact marking is visible on the polished surface of the primary ring. (See pic 6).
Wear marking is visible on the surface of the carrier where the balance diameter polymer ring seals. (See pic 7).

OUTBOARD STAGE:

Axial movement of the carrier felt normal.
Wearing mark is visible at the inner surface of the mating ring. (See pic 12).
Faint contact marking is visible on the polished surface of the primary ring. (See pic 15).
Wear marking is visible on the surface of the carrier where the balance diameter polymer ring seals. (See pic 16).

POLYMER SEALS / 'O'-RINGS

All the polymer seals & O-rings were in good condition.

TYPE 82 SEAL

Both the inboard & outboard bushing segments anti-rotation slot elongated. (See pics 20,21).
Sleeve sealing surface worn. (See pic 22).

INSPECTED BY:

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Do not copy it for any purpose, or disclose its contents to any other person without the written permission of John Crane.

REFURBISHMENT REQUIREMENTS

PROJECT NAME : N.A.
 CARTRIDGE No: N.A.
 DRAWING No: N.A.
 SEAL CODE : N.A.
 FILE REFERENCE : N.A.



REPORT NUMBER : N.A.
 INSPECTION DATE : N.A.

DOR RAISED: CAR RAISED: SUB:

DESCRIPTION	PART CODE / MATERIAL	CORRECT TO LATEST GA	WORK REQUIRED	ADDITIONAL COMMENTS
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ISSUE 4

MATING RINGS			ACQUISITION No:		
INBOARD MATING RING	SILICON CARBIDE	YES	CLEAN RELAP REGROOVE AND REUSE	N.A.	FAINT CONTACT MARKING
OUTBOARD MATING RING	SILICON CARBIDE	YES	CLEAN RELAP REGROOVE AND REUSE	N.A.	WEARING MARK AND LIGHT BAND DISTORTED

PRIMARY RINGS			ACQUISITION No:		
INBOARD PRIMARY RING	28G F1682 004 9028	YES	UNABLE TO KEEP WITHIN CALIBRATION REPLACE	N.A.	FAINT CONTACT MARKING; UNDERSIZED
OUTBOARD PRIMARY RING	28G F1682 004 9028	YES	UNABLE TO KEEP WITHIN CALIBRATION REPLACE	N.A.	FAINT CONTACT MARKING; UNDERSIZED

METAL PARTS			ACQUISITION No:		
RETAINER INNER	PRG F1682 055 0620	YES	CLEAN AND REUSE		GOOD CONDITION
RETAINER OUTER	PRG F1682 056 0620	YES	CLEAN AND REUSE		GOOD CONDITION
SLEEVE	PLG F1682 033 0620	YES	CLEAN AND REUSE		GOOD CONDITION
SPACER SLEEVE	PLG F1682 034 0620	YES	CLEAN AND REUSE		GOOD CONDITION
COLLAR	CLG F1682 028 0620	YES	CLEAN AND REUSE		GOOD CONDITION
INBOARD CARRIER	PDG F1682 004 0814	YES	RECOAT AND REUSE		WEAR MARKING
OUTBOARD CARRIER	PDG F1682 004 0814	YES	RECOAT AND REUSE		WEAR MARKING
RETAINER CLIP I/B	PNG F1682 049 0620	YES	CLEAN AND REUSE		GOOD CONDITION
RETAINER CLIP O/B	PNG F1682 050 1861	YES	CLEAN AND REUSE		GOOD CONDITION
INSTALLATION PLATE	IPG F1682 010 0530	YES	CLEAN AND REUSE		GOOD CONDITION

CONSUMABLES			ACQUISITION No:		
O-RINGS	FLUOROSILICON	YES	REPLACE AS STANDARD		CONSUMABLE
POLYMER SEALS	TFE/CO-CR	YES	REPLACE AS STANDARD		CONSUMABLE
TOLERANCE RING	MONEL K500	YES	REPLACE AS STANDARD		CONSUMABLE
DRIVE KEY	PSG 0000 029 0620	YES	REPLACE AS STANDARD		CONSUMABLE
SPRINGS	HASTELLOY 'C'	YES	REPLACE AS STANDARD		CONSUMABLE
BOLTING	HAST C & HARDENED STEEL	YES	REPLACE AS STANDARD		CONSUMABLE

TYPE 82 SEAL RETURNED YES DOES GA DRAWING SHOW NACE REQUIREMENT NO

ALL PARTS ON THE PARTS ASSEMBLY LIST FOR THIS SEAL HAVE BEEN ACCOUNTED FOR YES

BAY LOCATION:

NEW FLIGHT CASE REQUIRED ? YES

REFURBISHMENT REQUIREMENTS

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ISSUE 4

BUSHING SEGMENT RINGS

INBOARD BUSHING SEGMENT	S/90660 7082	YES	REPLACE	ANTI-ROTATION SLOT ELONGATED
OUTBOARD BUSHING SEGMENT	S/90660 7082	YES	REPLACE	ANTI-ROTATION SLOT ELONGATED

METAL PARTS

SLEEVE	PLG M1600 001 6864	YES	RECOAT AND REUSE	SEALING SURFACE WORN
ADAPTOR	PSG F1682 033 0620	YES	CLEAN AND REUSE	GOOD CONDITION
COLLAR	CLG F1682 014 0620	YES	CLEAN AND REUSE	GOOD CONDITION
SPLIT THRUST RING	TRG F1682 004 0620	YES	CLEAN AND REUSE	GOOD CONDITION
THRUST RING	TRG F1682 005 0620	YES	CLEAN AND REUSE	GOOD CONDITION
INSTALLATION PLATE INNER	IPG M1600 002 0530	YES	CLEAN AND REUSE	GOOD CONDITION
INSTALLATION PLATE OUTER	IPG M1600 001 0530	YES	CLEAN AND REUSE	GOOD CONDITION
BUSHING HOUSING	HSG M1600 001 0620	YES	CLEAN AND REUSE	GOOD CONDITION
CLAMP PLATE	PSG M1600 001 0620	YES	CLEAN AND REUSE	GOOD CONDITION
THRUST PLATE	PDG M1600 001 0620	YES	CLEAN AND REUSE	GOOD CONDITION

CONSUMABLES

O'-RINGS	FLUOROCARBON	YES	REPLACE AS STANDARD	CONSUMABLES
GARTER SPRINGS	STAINLESS STEEL	YES	REPLACE AS STANDARD	CONSUMABLES
SPRINGS	ST.ST.	YES	REPLACE AS STANDARD	CONSUMABLES
BOLTING	HIGH TENSILE STEEL	YES	REPLACE AS STANDARD	CONSUMABLES

INSPECTED BY:

TYPE 82 SEAL RETURNED YES DOES GA DRAWING SHOW NACE REQUIREMENT NO

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BAY LOCATION:

NEW FLIGHT CASE REQUIRED ? YES

DETAILED ASSESSMENT

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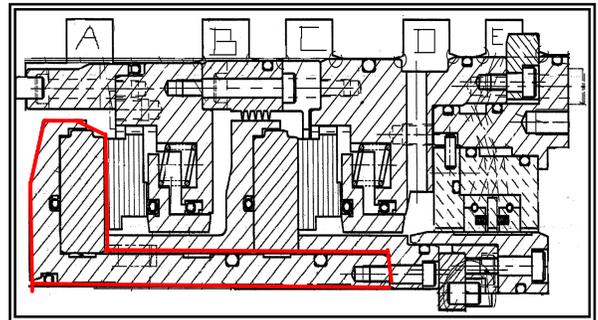
PICTURE 1



Picture 1 shows the inboard mating ring assembly.

The **BLUE** arrows in the pictures on the left match the positions of the **BLUE** arrows in the drawings below

The **RED** in the drawings below indicates the surfaces visible in the pictures on the left.



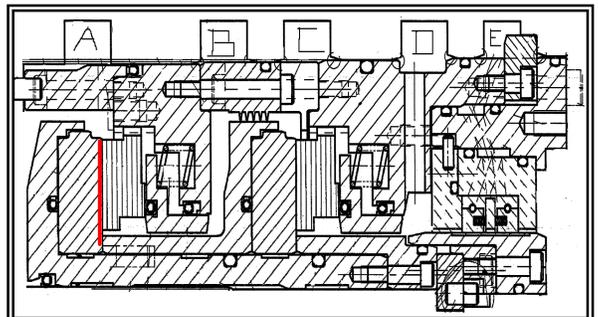
PICTURE 2



Picture 2 shows the inboard mating ring.

PORTING DETAILS

- A = INLET FOR FILTER SEAL GAS
- B = OUTLET FOR PRIMARY SEAL LEAKAGE
- C = INLET FOR BUFFER GAS ;N2 GAS
- D = OUTLET FOR SECONDARY LEAKAGE & INBOARD BUSHING FLOW
- E = INLET FOR BUFFER GAS ;N2 GAS



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PICTURE 3



Picture 3 shows a close up on the inboard mating ring, faint contact marking is visible on the polished surface of the inboard mating ring. An attempt made to remove the marking by polishing was successful without affecting the groove depth. This component requires relapping, repolishing & regrooving.

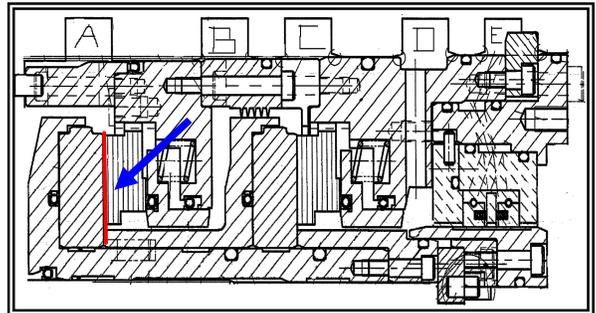
PICTURE 4



Picture 4 shows the inboard retainer assembly. Fibre like particles (suspected to be the material for the seal gas filter) build up at the ID of the inboard retainer clip. Samples were collected for analysis test if required.

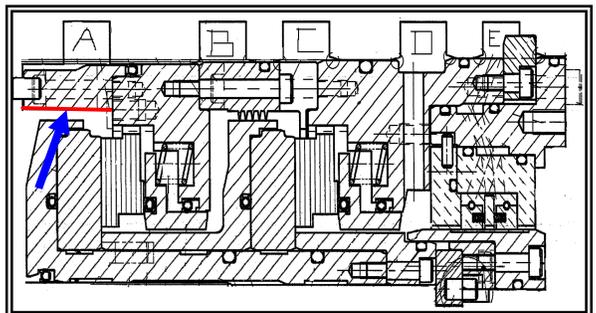
The **BLUE** arrows in the pictures on the left match the positions of the **BLUE** arrows in the drawings below

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PORTING DETAILS

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- D = OUTLET FOR SECONDARY LEAKAGE & INBOARD BUSHING FLOW
- E = INLET FOR BUFFER GAS ;N2 GAS



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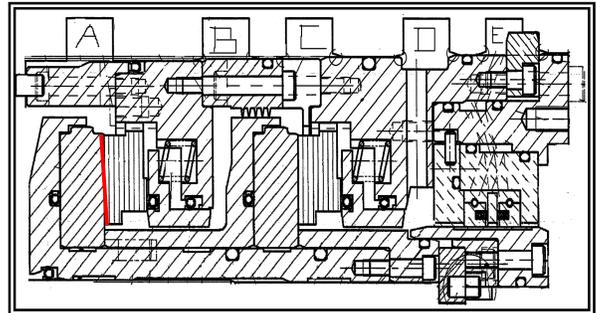
PICTURE 5



Picture 5 shows the inboard primary ring.

The **BLUE** arrows in the pictures on the left match the positions of the **BLUE** arrows in the drawings below

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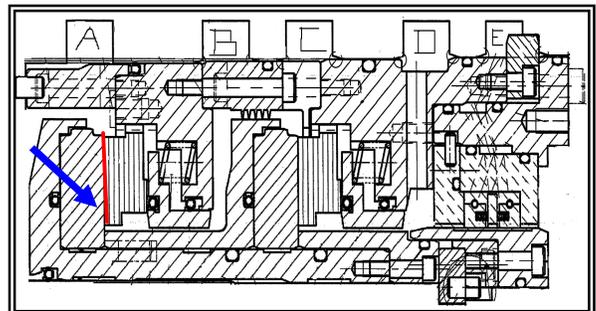
PICTURE 6



Picture 6 shows a close up of faint contact marking is visible on the polished surface of the inboard primary ring. An attempt made to remove the marking by polishing was not successful without affecting the tolerance. **This component requires replacing.**

PORTING DETAILS

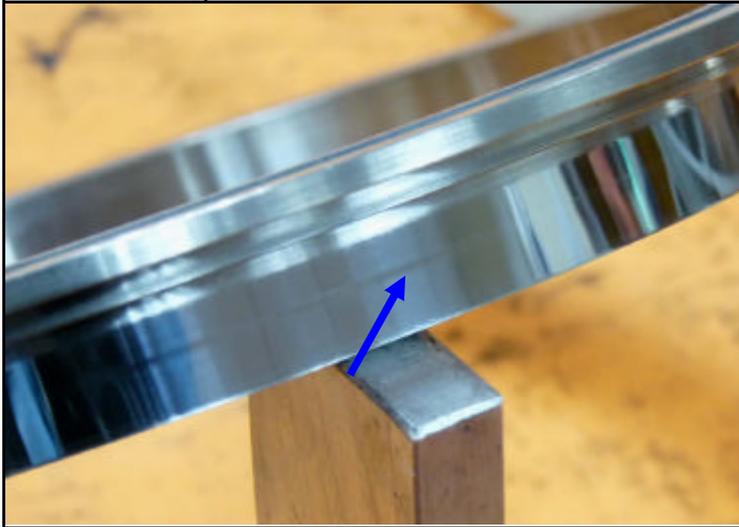
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- E = INLET FOR BUFFER GAS ;N2 GAS



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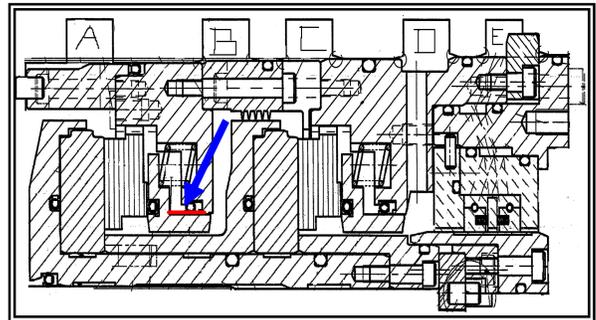
PICTURE 7



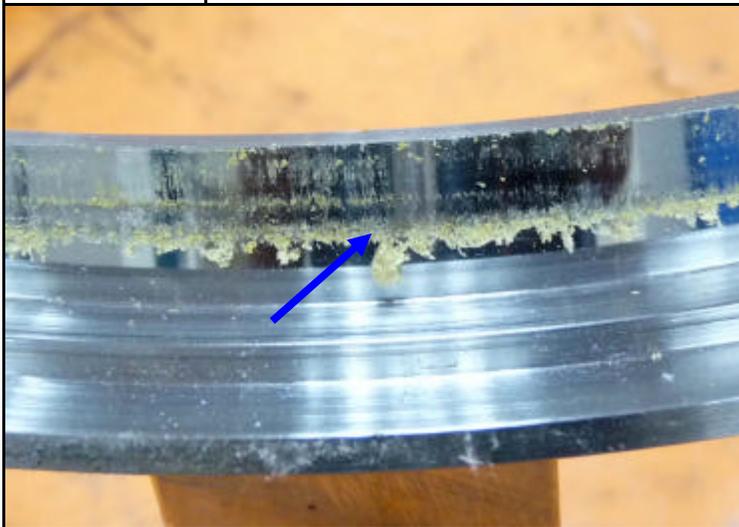
Picture 7 shows after cleaning of the inboard carrier, wear marking is visible on the surface of the inboard carrier where the balance diameter polymer ring seals. This component can be requires recoating.

The **BLUE** arrows in the pictures on the left match the positions of the **BLUE** arrows in the drawings below

The **RED** in the drawings below indicates the surfaces visible in the pictures on the left.



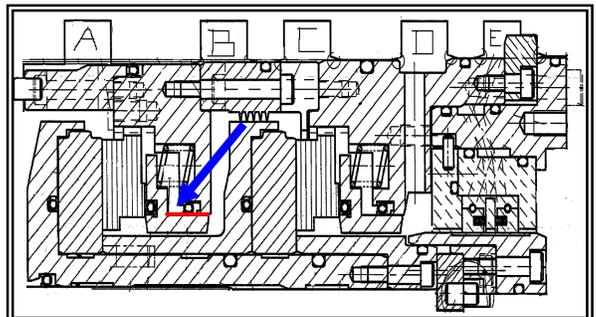
PICTURE 8



Picture 8 shows before cleaning of the inboard carrier, yellow color flakes (suspected to be the product) build up at the surface of the inboard carrier where the balance diameter polymer ring seals. Samples were collected for analysis test if required.

PORTING DETAILS

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- B = OUTLET FOR PRIMARY SEAL LEAKAGE
- C = INLET FOR BUFFER GAS ;N2 GAS
- D = OUTLET FOR SECONDARY LEAKAGE & INBOARD BUSHING FLOW
- E = INLET FOR BUFFER GAS ;N2 GAS



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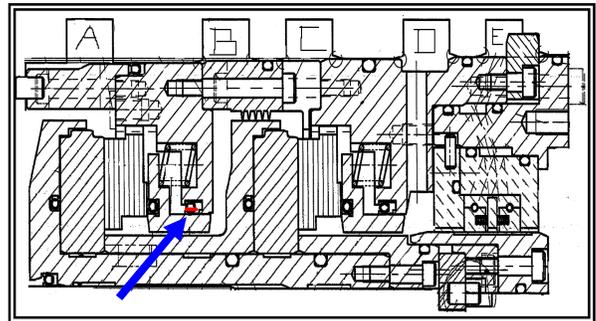
PICTURE 9



Picture 9 shows yellow color flakes (suspected to be the product) build up at the inboard retainer balance diameter polymer ring. Samples were collected for analysis test if required.

The **BLUE** arrows in the pictures on the left match the positions of the **BLUE** arrows in the drawings below

The **RED** in the drawings below indicates the surfaces visible in the pictures on the left.



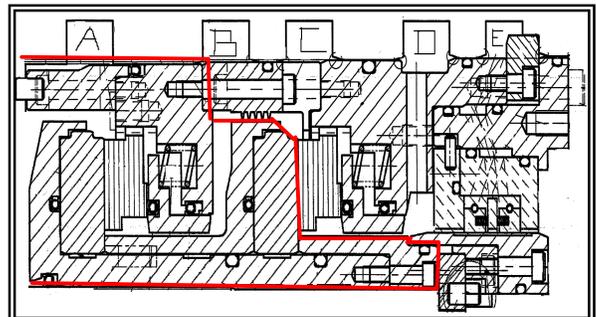
PICTURE 10



Picture 10 shows the outboard mating ring assembly.

PORTING DETAILS

- A = INLET FOR FILTER SEAL GAS
- B = OUTLET FOR PRIMARY SEAL LEAKAGE
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- D = OUTLET FOR SECONDARY LEAKAGE & INBOARD BUSHING FLOW
- E = INLET FOR BUFFER GAS ;N2 GAS



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PICTURE 11



Picture 11 shows the outboard mating ring.

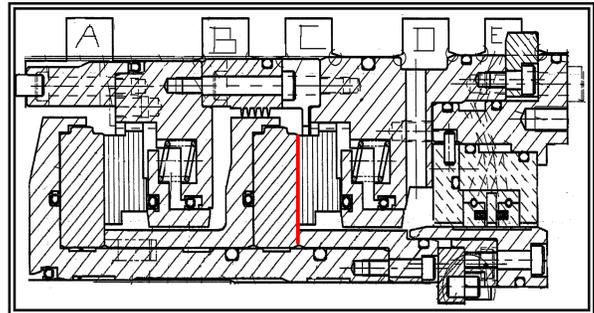
PICTURE 12



Picture 12 shows the outboard mating ring, wearing mark is visible at the inner surface and calibration was checked and showed that the light band had distorted. An attempt made to restore the light band by polishing was not successful without affecting the groove depth. This component requires relapping, repolishing & regrooving.

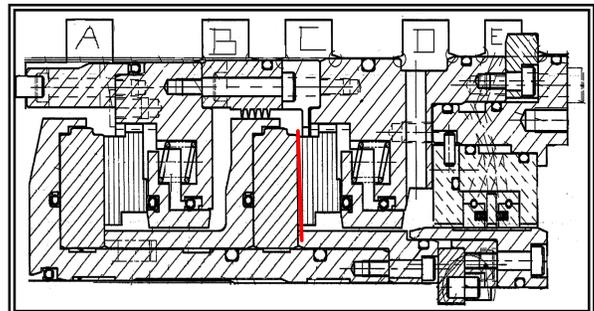
The **BLUE** arrows in the pictures on the left match the positions of the **BLUE** arrows in the drawings below

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PORTING DETAILS

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- E = INLET FOR BUFFER GAS ;N2 GAS



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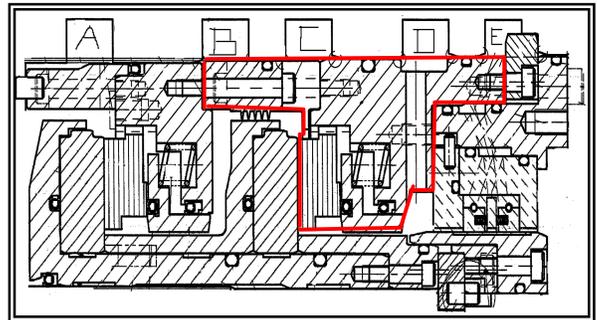
PICTURE 13



Picture 13 shows the outboard retainer assembly.

The **BLUE** arrows in the pictures on the left match the positions of the **BLUE** arrows in the drawings below

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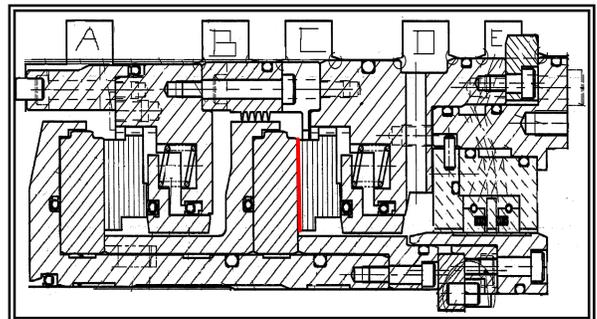
PICTURE 14



Picture 14 shows the outboard primary ring.

PORTING DETAILS

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- E = INLET FOR BUFFER GAS ;N2 GAS



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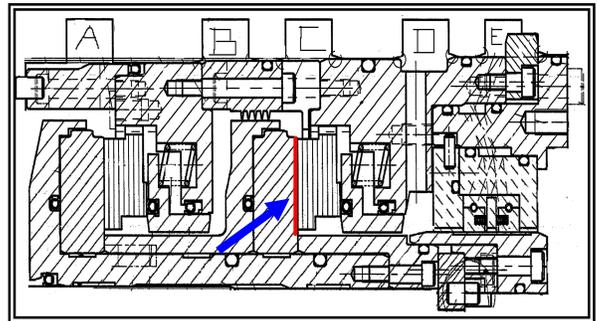
PICTURE 15



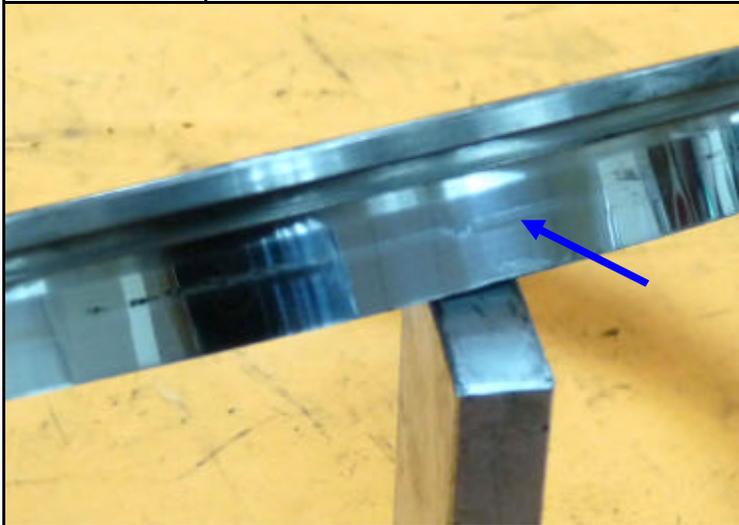
Picture 15 shows a close up of faint contact marking is visible on the polished surface of the outboard primary ring. An attempt made to remove the marking by polishing was not successful without affecting the tolerance. **This component requires replacing.**

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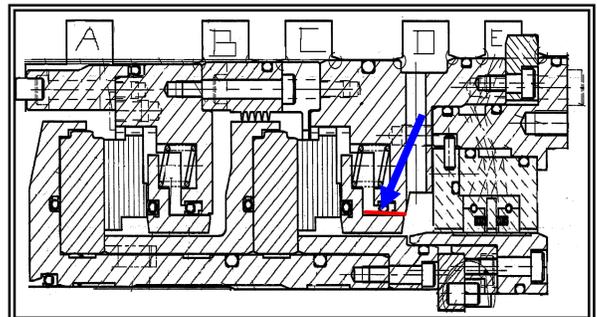
PICTURE 16



Picture 16 shows wear marking is visible on the surface of the outboard carrier where the balance diameter polymer ring seals. This component can be requires recoating

PORTING DETAILS

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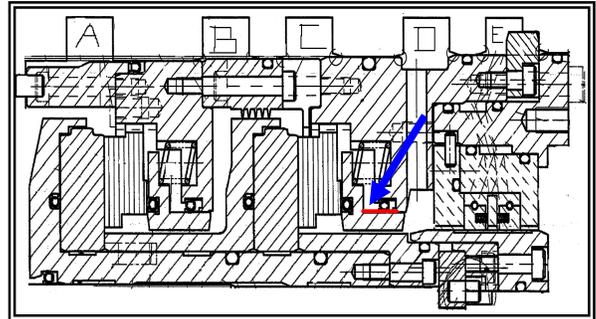
PICTURE 17



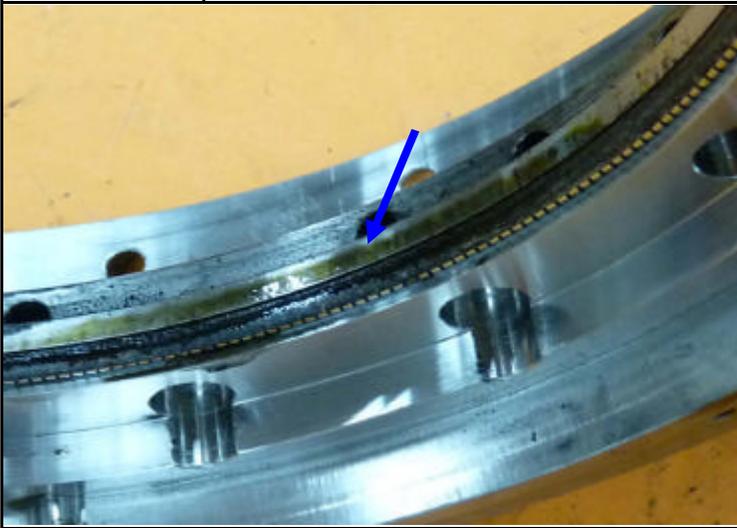
Picture 17 shows a close up of hydrocarbon contaminants build up at the surface of the outboard carrier where the balance diameter polymer ring seals.

The **BLUE** arrows in the pictures on the left match the positions of the **BLUE** arrows in the drawings below

The **RED** in the drawings below indicates the surfaces visible in the pictures on the left.



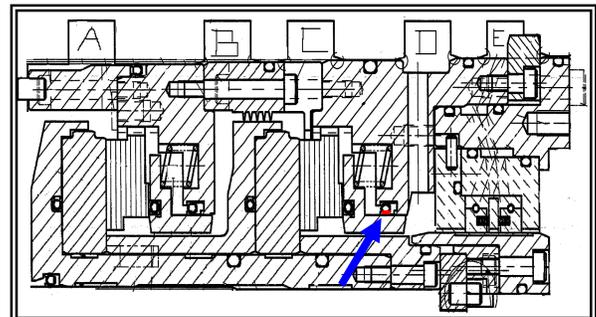
PICTURE 18



Picture 18 shows a close up of wet hydrocarbon contaminants (suspected to be mixture of hydrocarbon & bearing lube oil) is visible at the outboard retainer balance diameter polymer ring.

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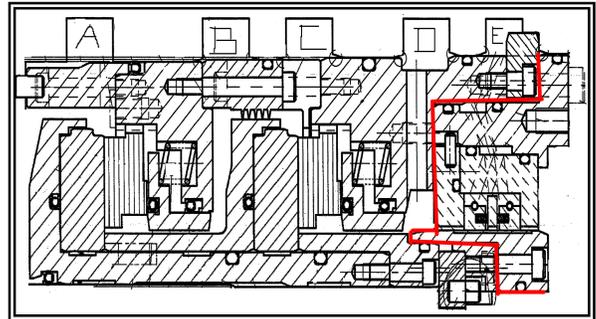
PICTURE 19



Picture 19 shows the T82 barrier seal.

The **BLUE** arrows in the pictures on the left match the positions of the **BLUE** arrows in the drawings below

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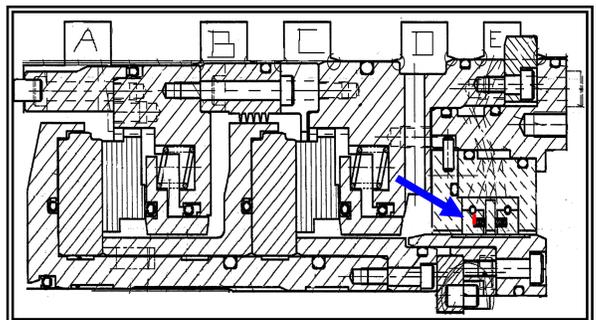
PICTURE 20



Picture 20 shows the inboard bushing segments anti-rotation slot elongated. **This component requires replacing.**

PORTING DETAILS

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- E = INLET FOR BUFFER GAS ;N2 GAS



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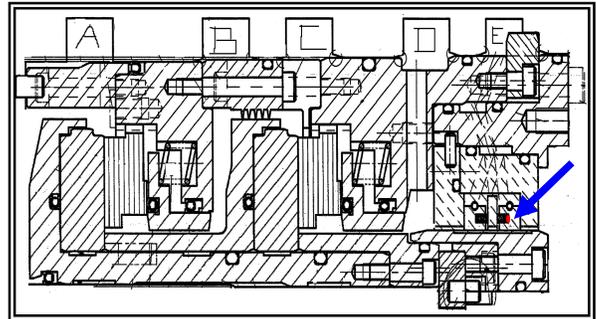
PICTURE 21



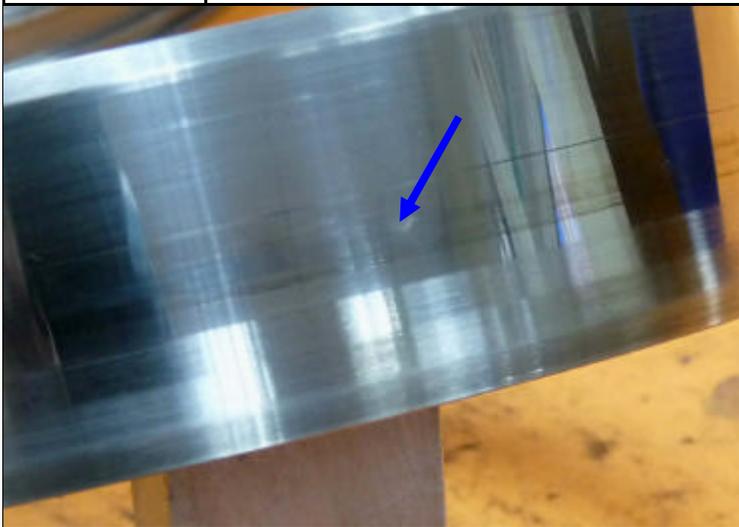
Picture 21 shows the outboard bushing segments anti-rotation slot elongated. This component requires replacing.

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PICTURE 22



Picture 22 shows locking sleeve sealing diameter with wearing marks. This component requires recoating.

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- E = INLET FOR BUFFER GAS ;N2 GAS

