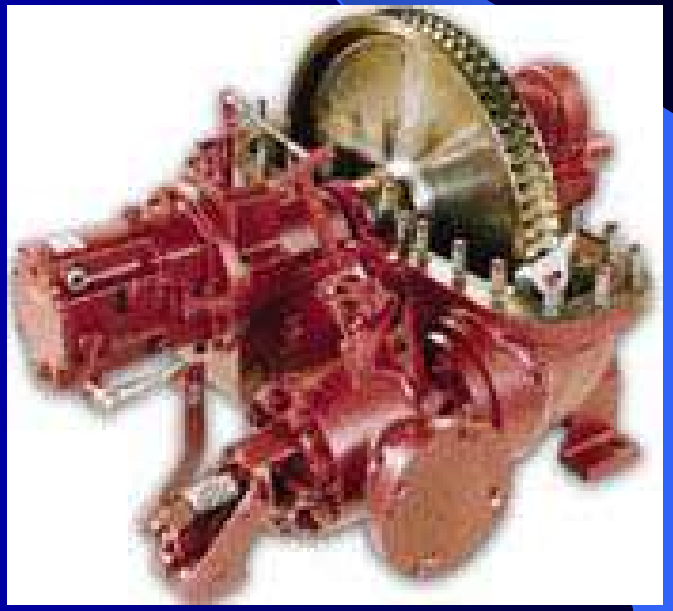
ISOMAG

TURBINE SEALS

LUBRICATION AND BEARING PROTECTION FOR STEAM TURBINES



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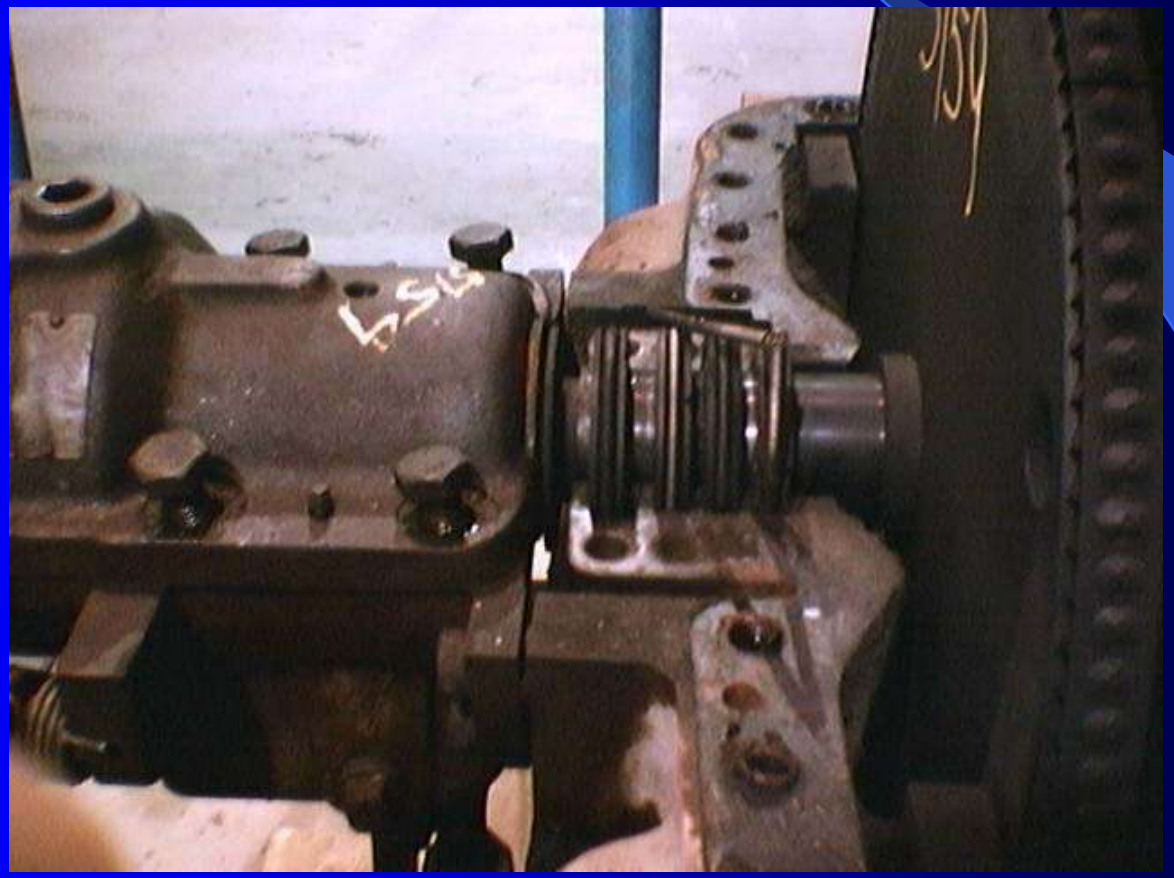
IS LEAKING STEAM GETTING INTO YOUR TURBINE OIL ?

HOW FREQUENTLY DO YOU NEED TO DRAIN WATER FROM YOUR TURBINE OIL ?

DO CARBON BOXES EVER LEAK STEAM ?



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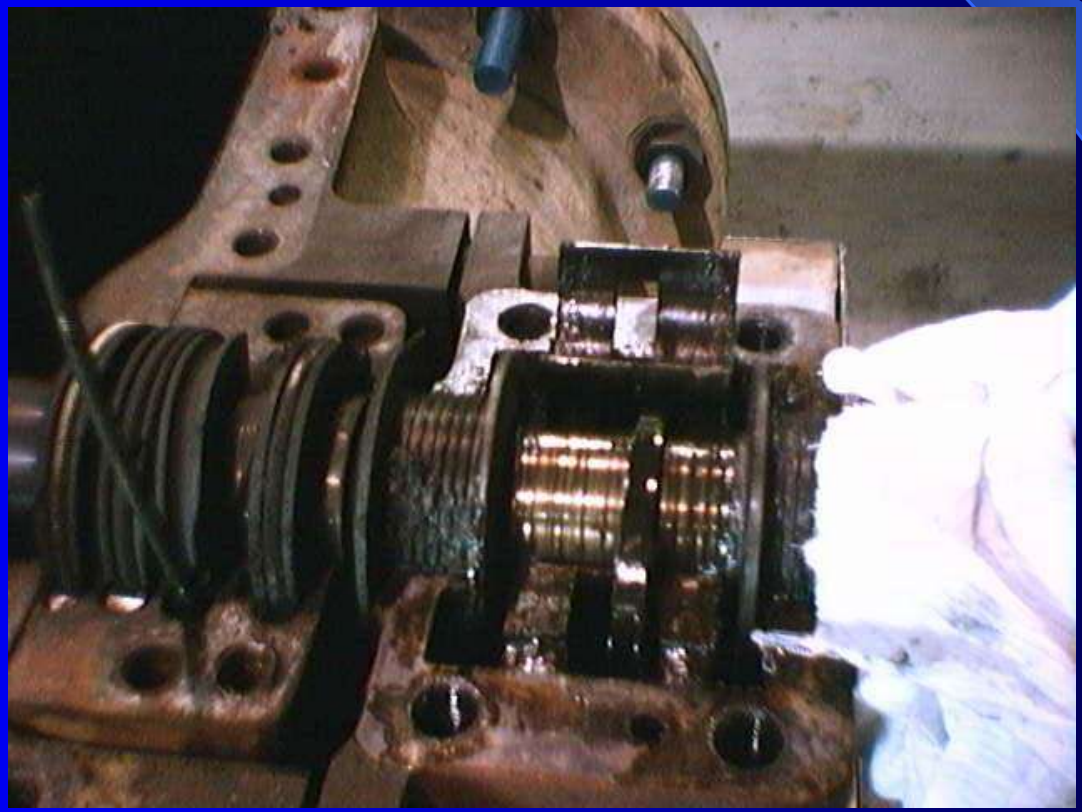
LABYRINTH SEALS RESTRICT STEAM FROM YOUR OIL

LABYRINTH SEALS DO NOT SEAL STEAM FROM YOUR OIL



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WOULD TURBINE BEARINGS LAST LONGER WITHOUT STEAM & WATER CONTAMINATION ?

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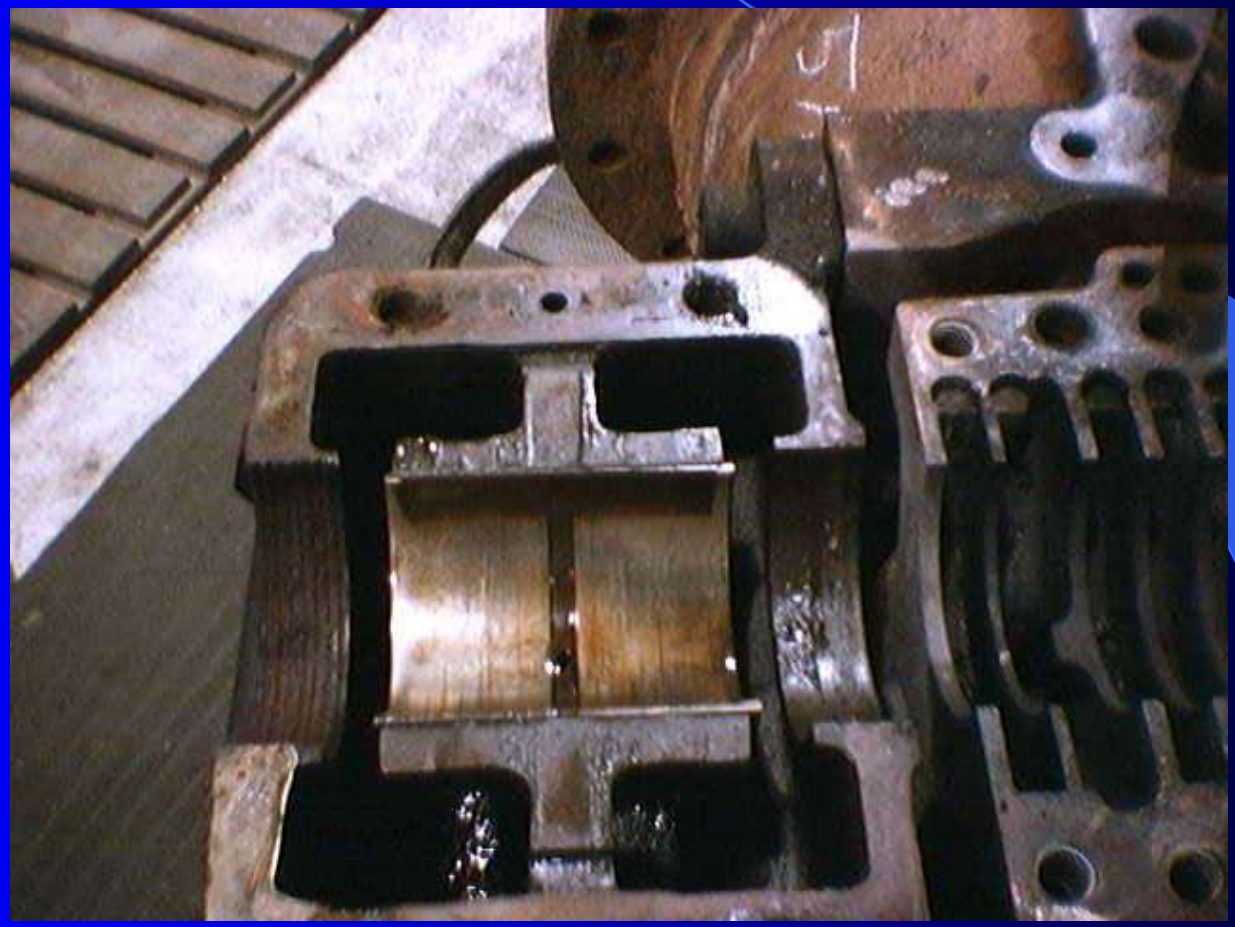
H_2O + OIL = SLUDGE



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CONTAMINATING TURBINE OIL

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THE PROBLEM

High pressure steam is trying to escape past the carbon rings in the carbon boxes.

Carbon rings wear and progressively leak more.

Leaks from the carbon box are adjacent to and directed at the labyrinths.

Labyrinth bearing seals only slow down the leaking steam, they will not stop it.

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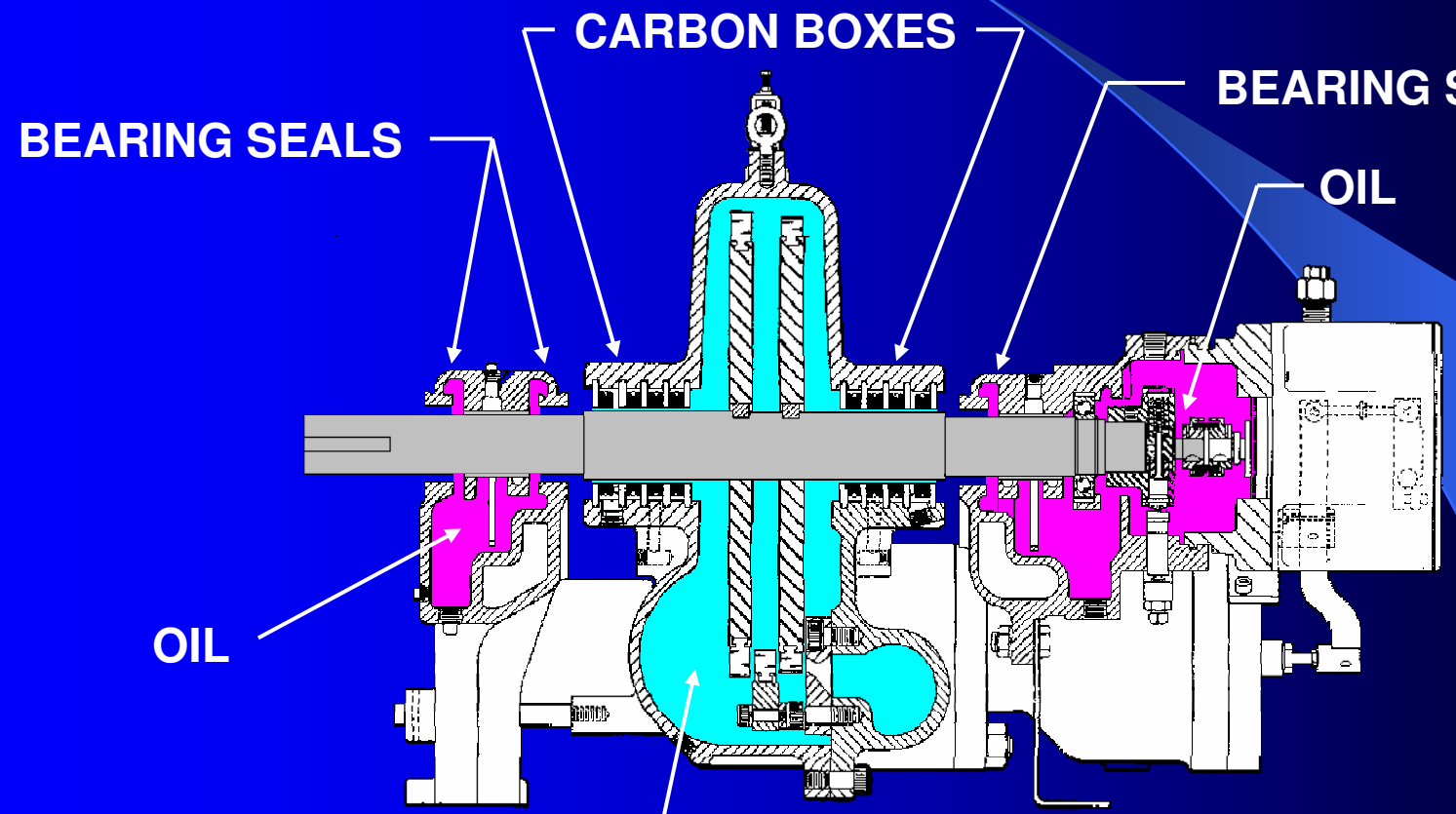
TYPICAL TURBINE



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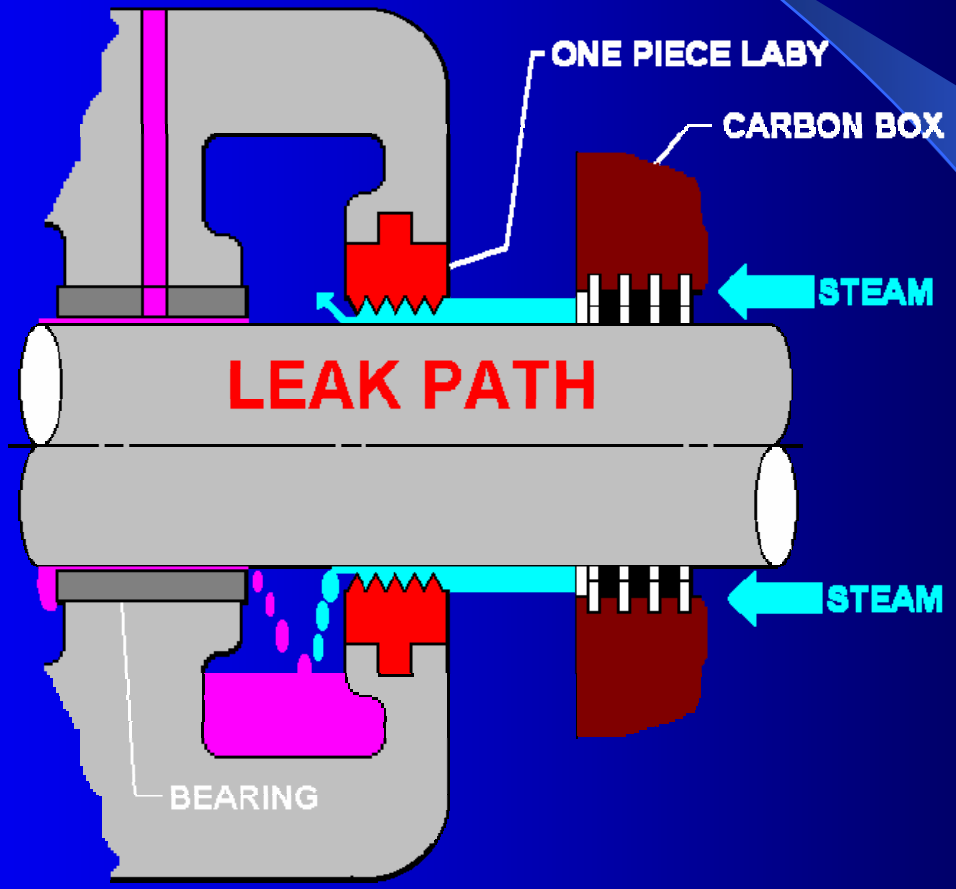
TYPICAL I.D. ONE PIECE OEM LABYRINTH



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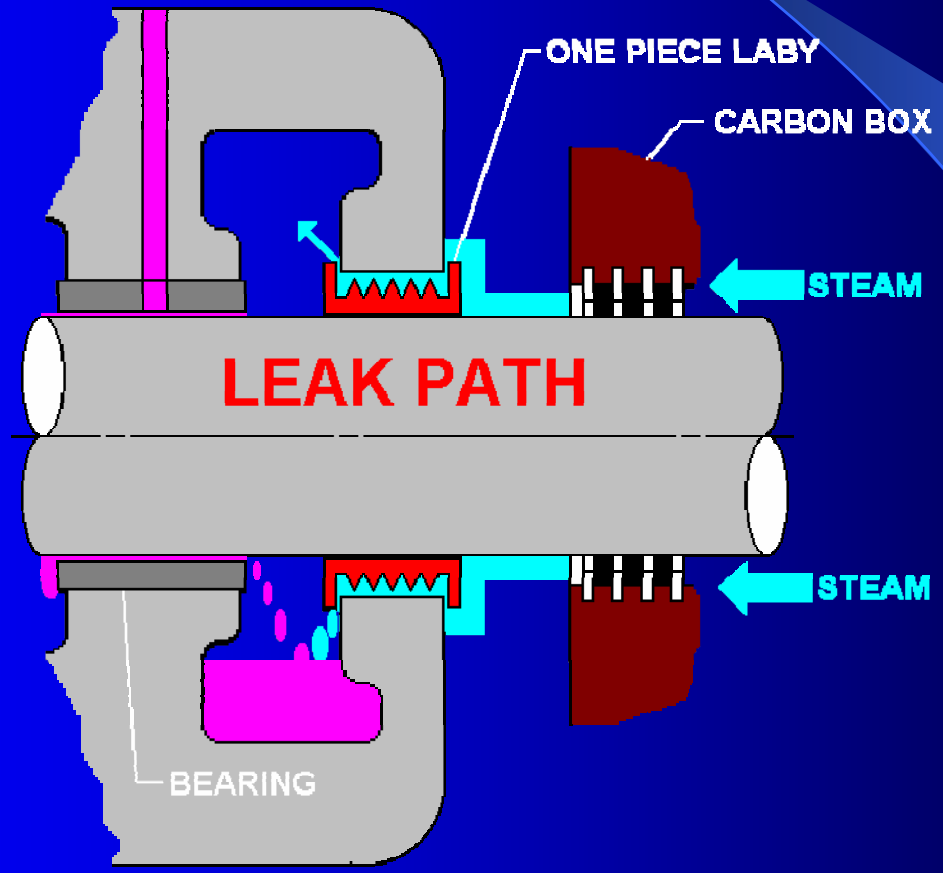
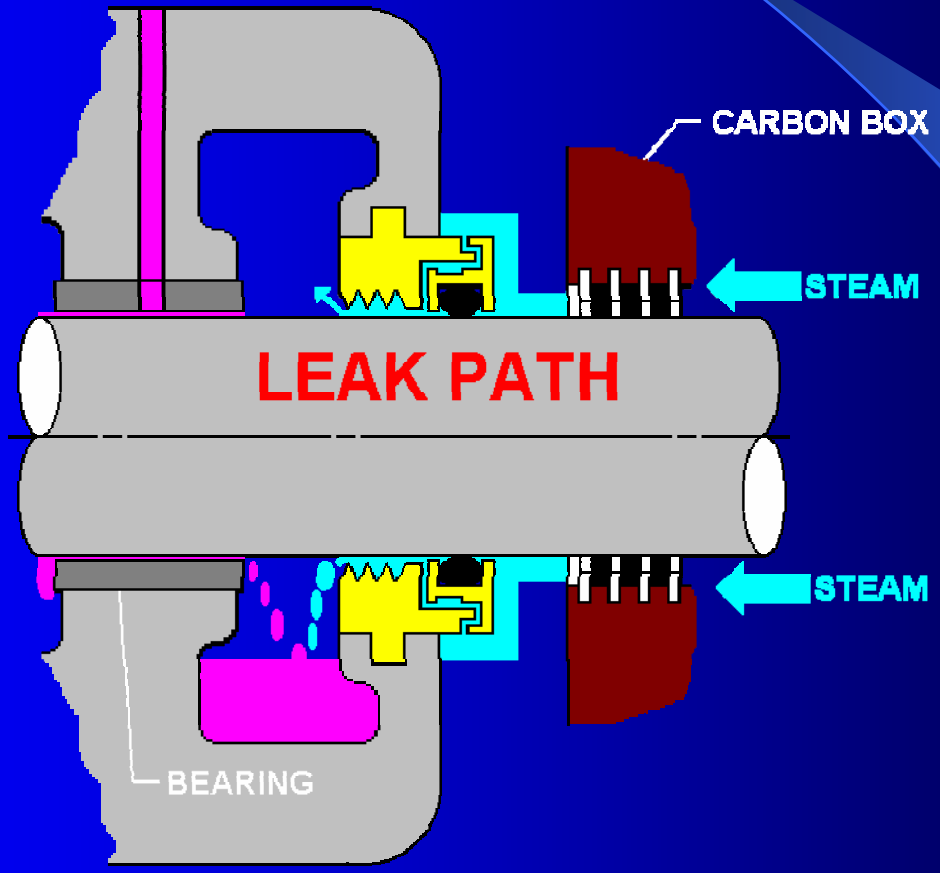
TYPICAL O.D. ONE PIECE OEM LABYRINTH



ISOMAG

TYPICAL TWO PIECE REPLACEMENT LABYRINTH



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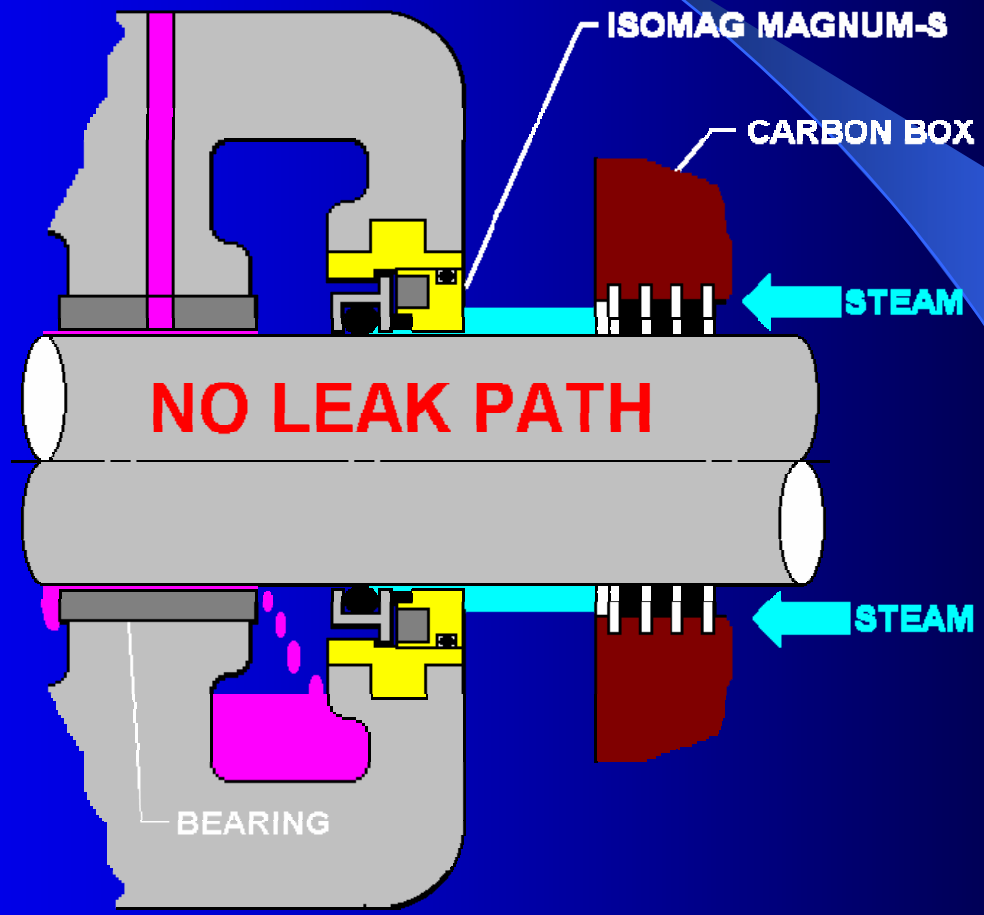
FLAT FACE MECHANICAL SEAL



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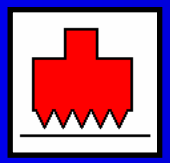
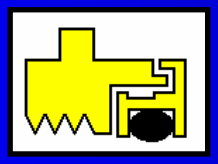
SEALING CHOICES

ONE PIECE LABYRINTH



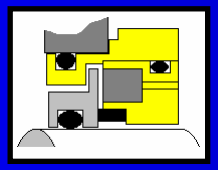
OPEN LEAK PATH

TWO PIECE LABYRINTH



OPEN LEAK PATH

MECHANICAL SEAL



NO LEAK PATH
TOTALLY SEALED

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FLAT FACE MECHANICAL SEALS

PROVEN TECHNOLOGY

PRECISION LAPPED SEALING FACES

HERMETIC SEALING

LOW FRICTION

NO SHAFT FRETTING

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Technology leader in precision flat face sealing and protection of industrial bearing and lubrication systems

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HOW TO SELECT TURBINE SEALS

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TYPICAL HORIZONTAL SPLIT CASE TURBINE

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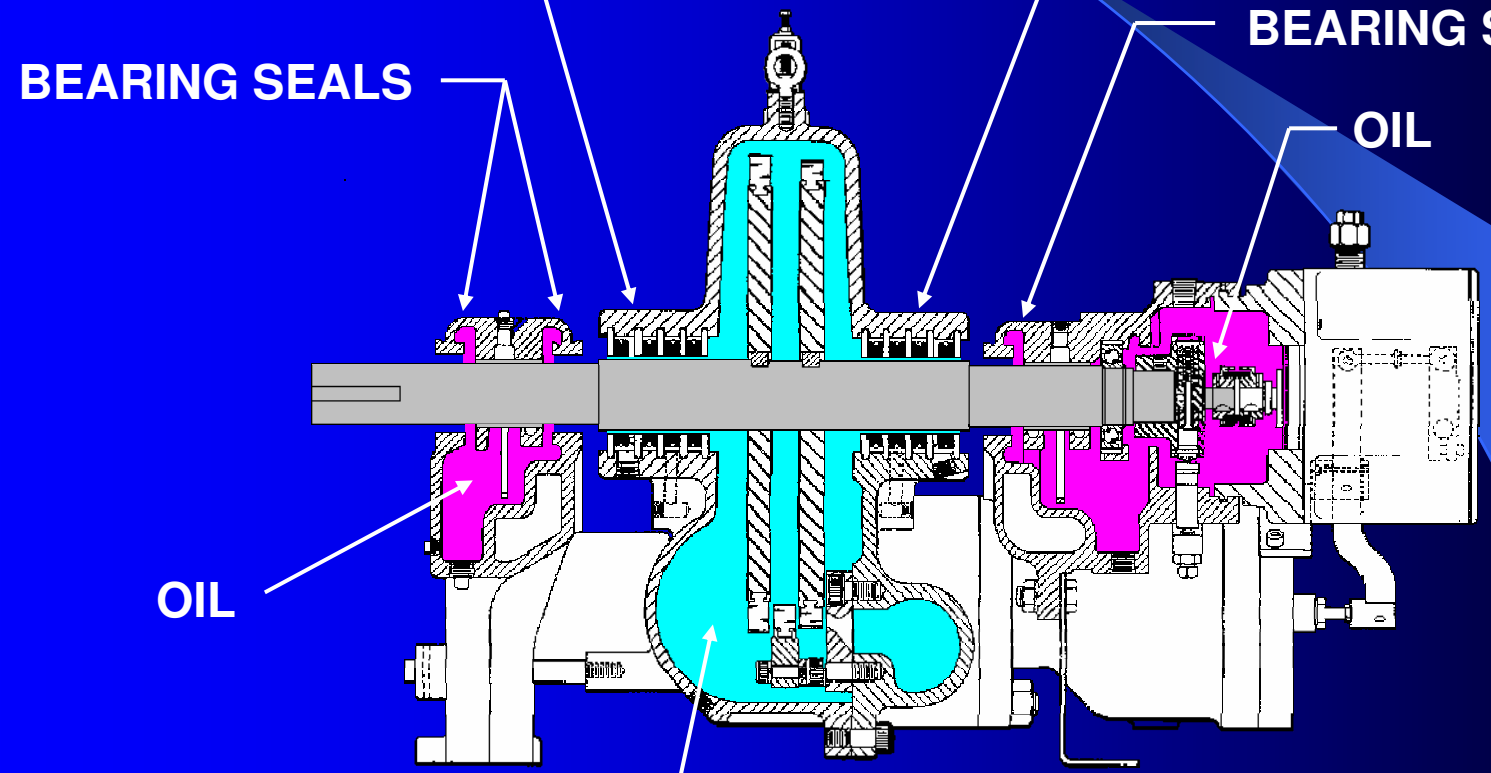
NEEDS 3 SEALS



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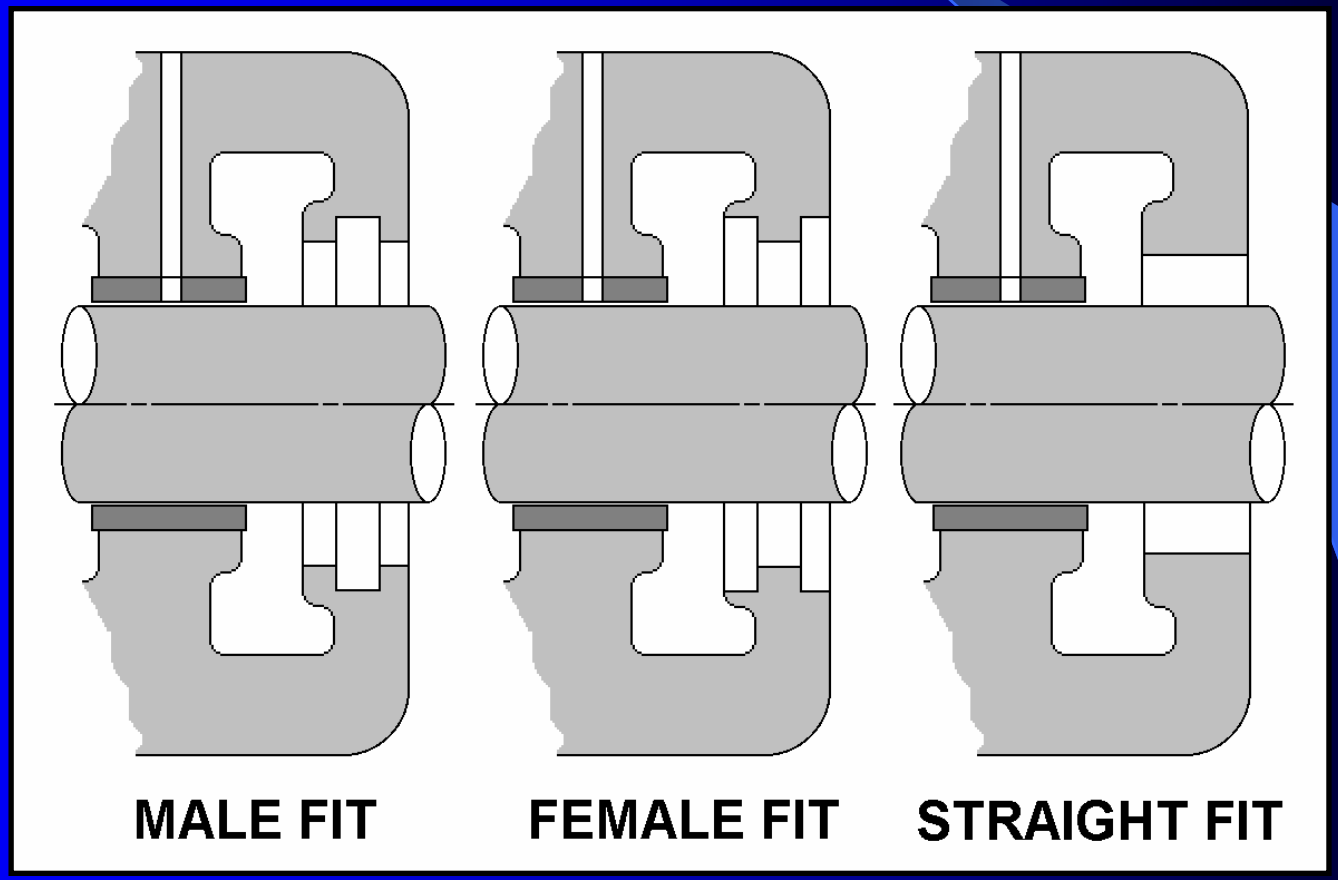
1. Drive end “OUTBOARD”
2. Drive end “INBOARD”
3. Governor end “INBOARD”

Different turbine housings

3 most common configurations



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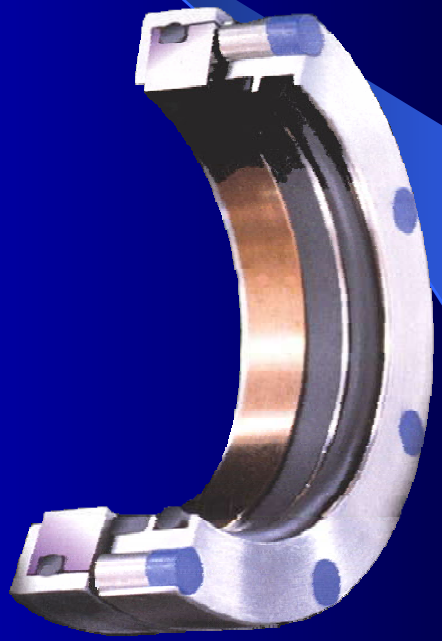
MAGNUM-S

CARTRIDGE SEAL



RSA

COMPONENT SEAL

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MAGNUM–S Cartridge Seal

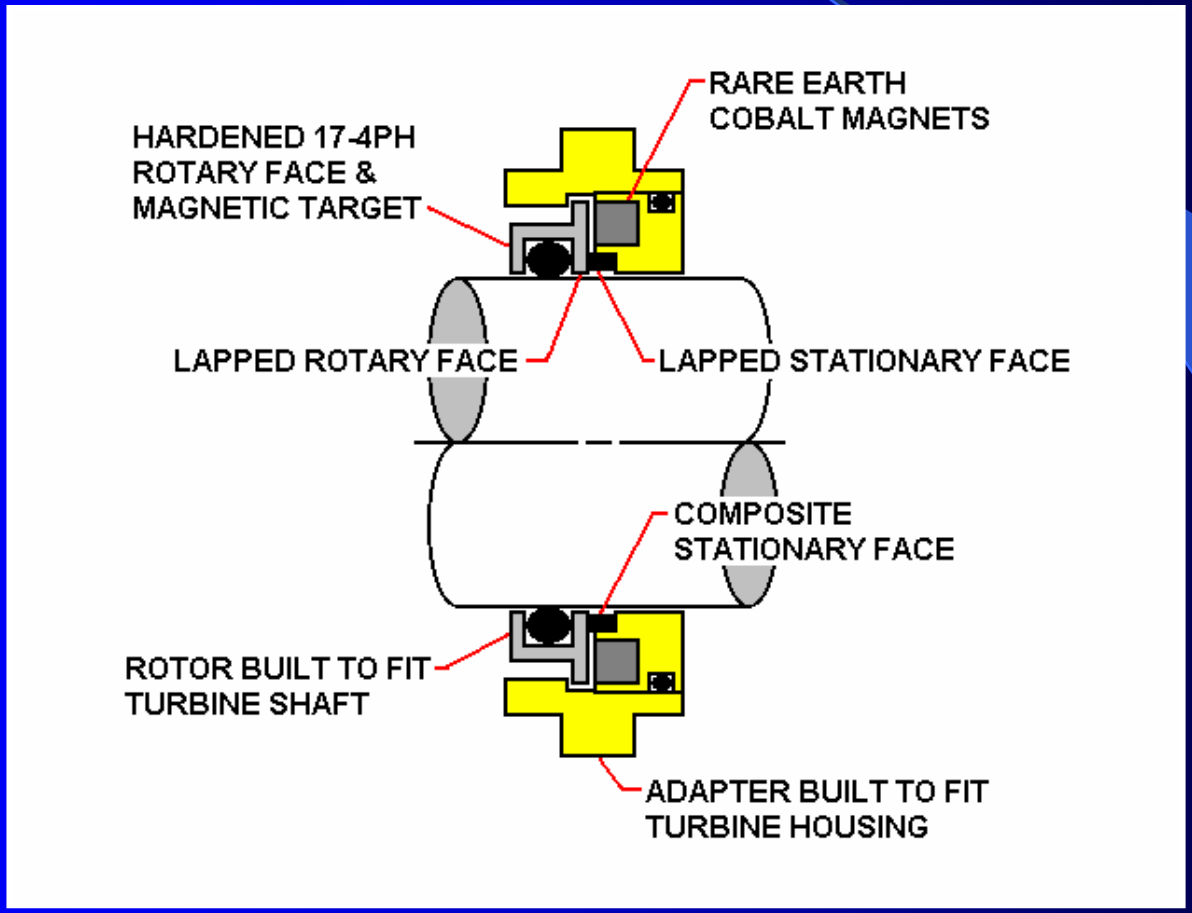
Built to fit “MALE” & “FEMALE” turbine housings and standard cross section straight “STRAIGHT” housings.

RSA Component Seal

Compact cross section for narrow cross section “STRAIGHT” housings.

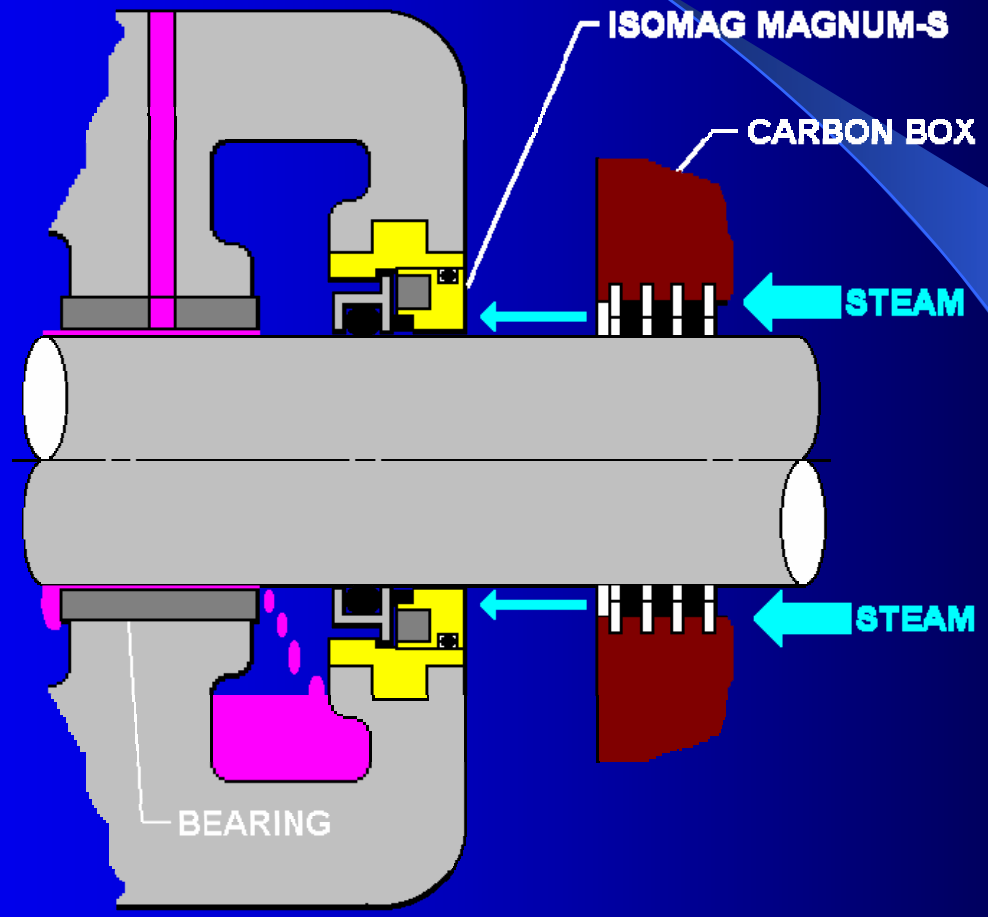
ISOMAG

INSIDE THE MAGNUM-S CARTRIDGE SEAL



ISOMAG

MAGNUM - S MALE FIT



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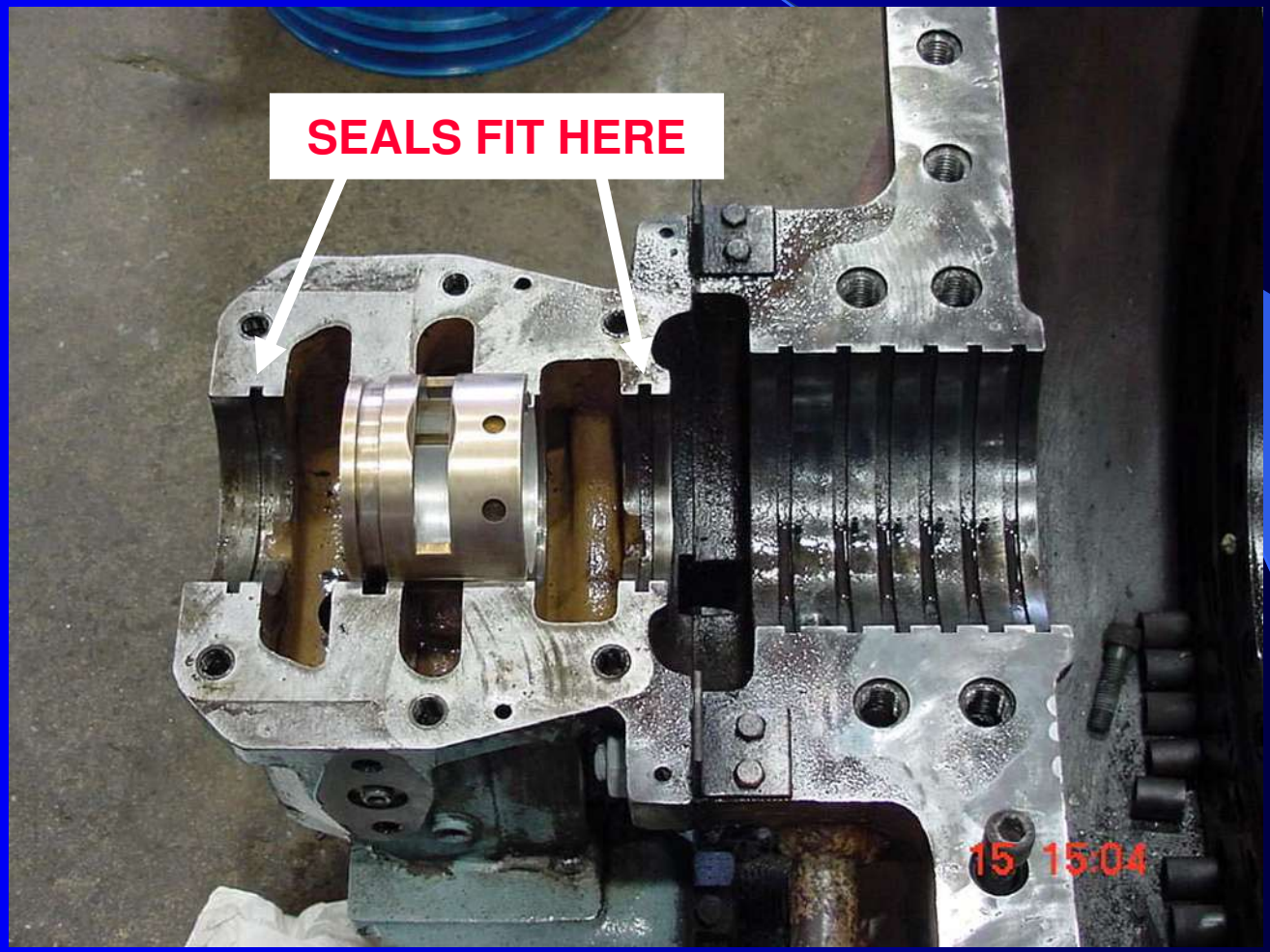
MALE HOUSING



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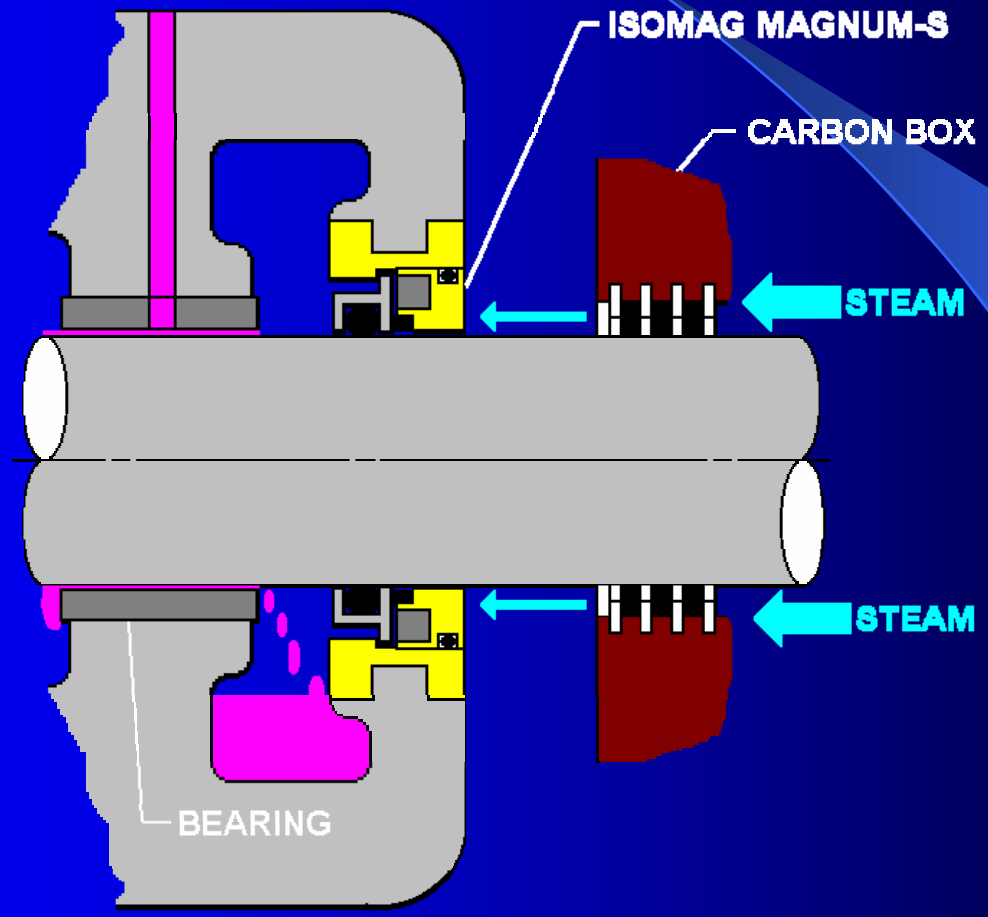
MAGNUM - S FEMALE FIT



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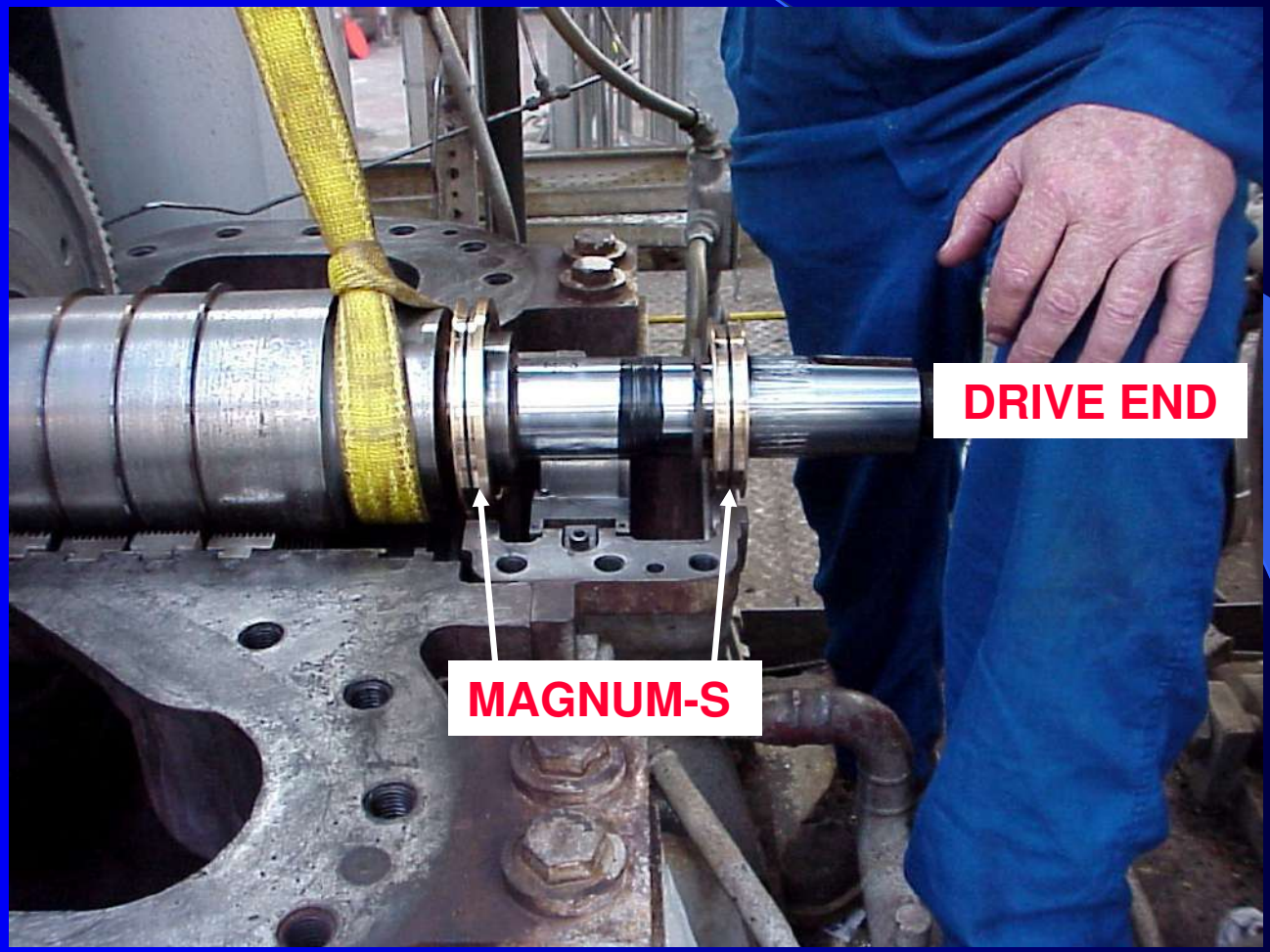
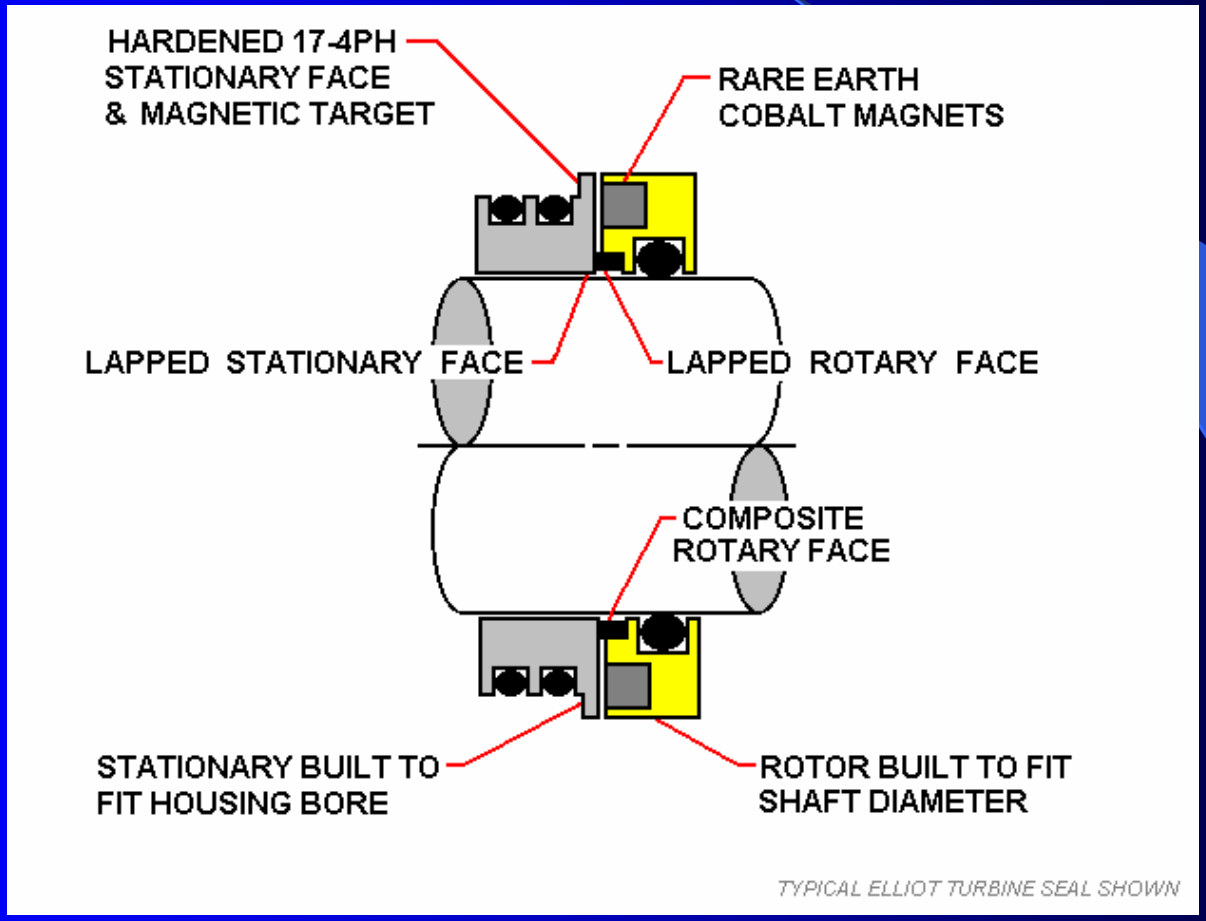
MAGNUM - S FEMALE FIT



ISOMAG

INSIDE THE RSA



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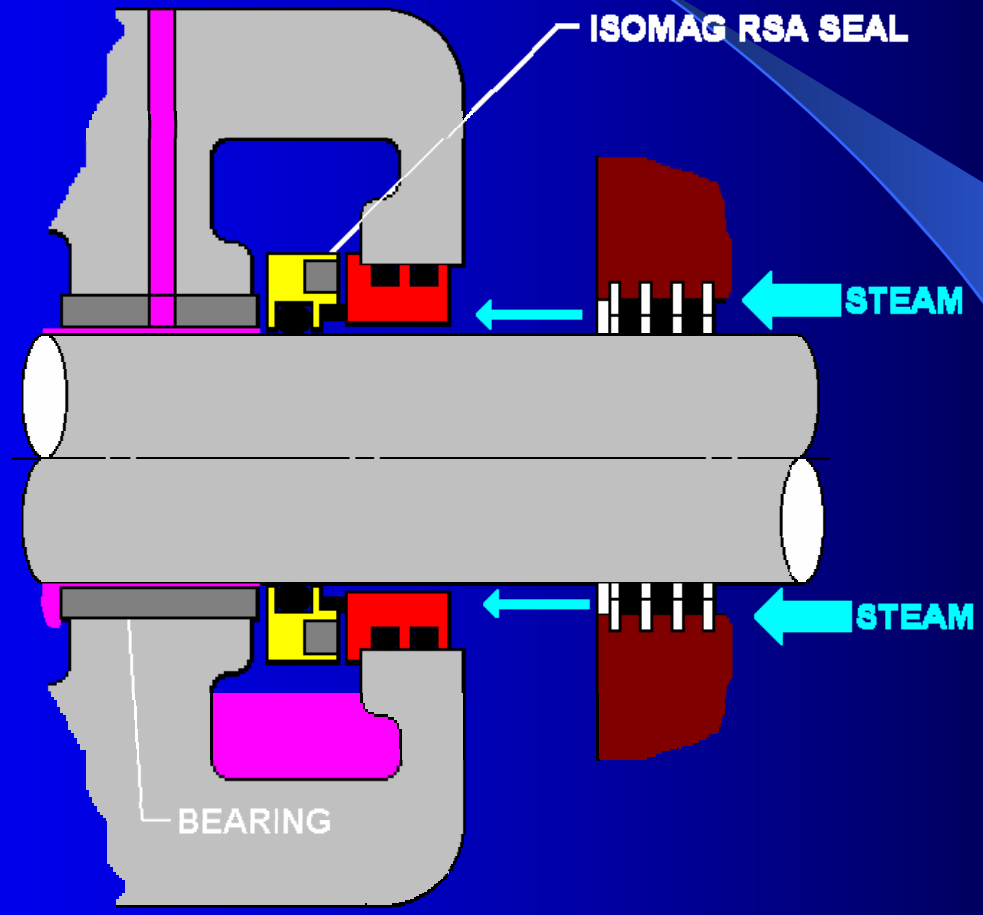
RSA INSIDE FIT



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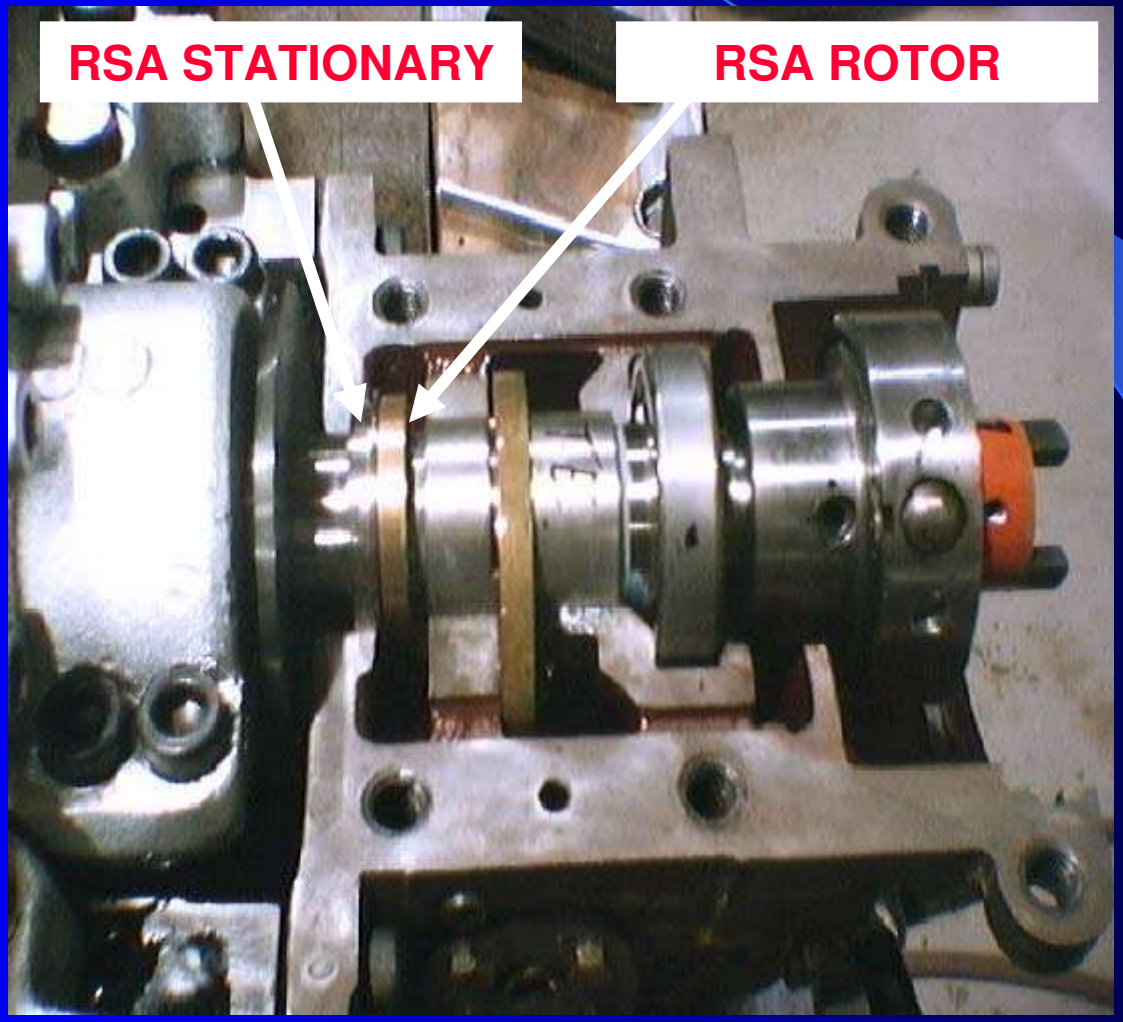
RSA INSIDE FIT



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STRAIGHT HOUSING

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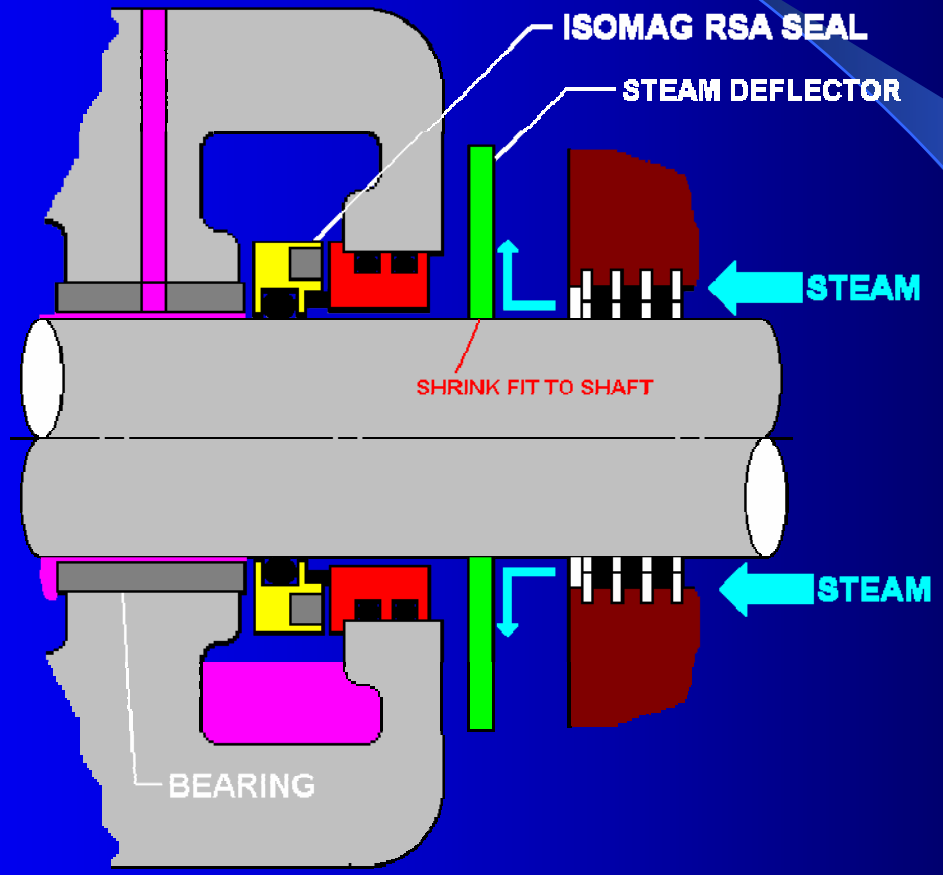
RSA with STEAM DEFLECTOR



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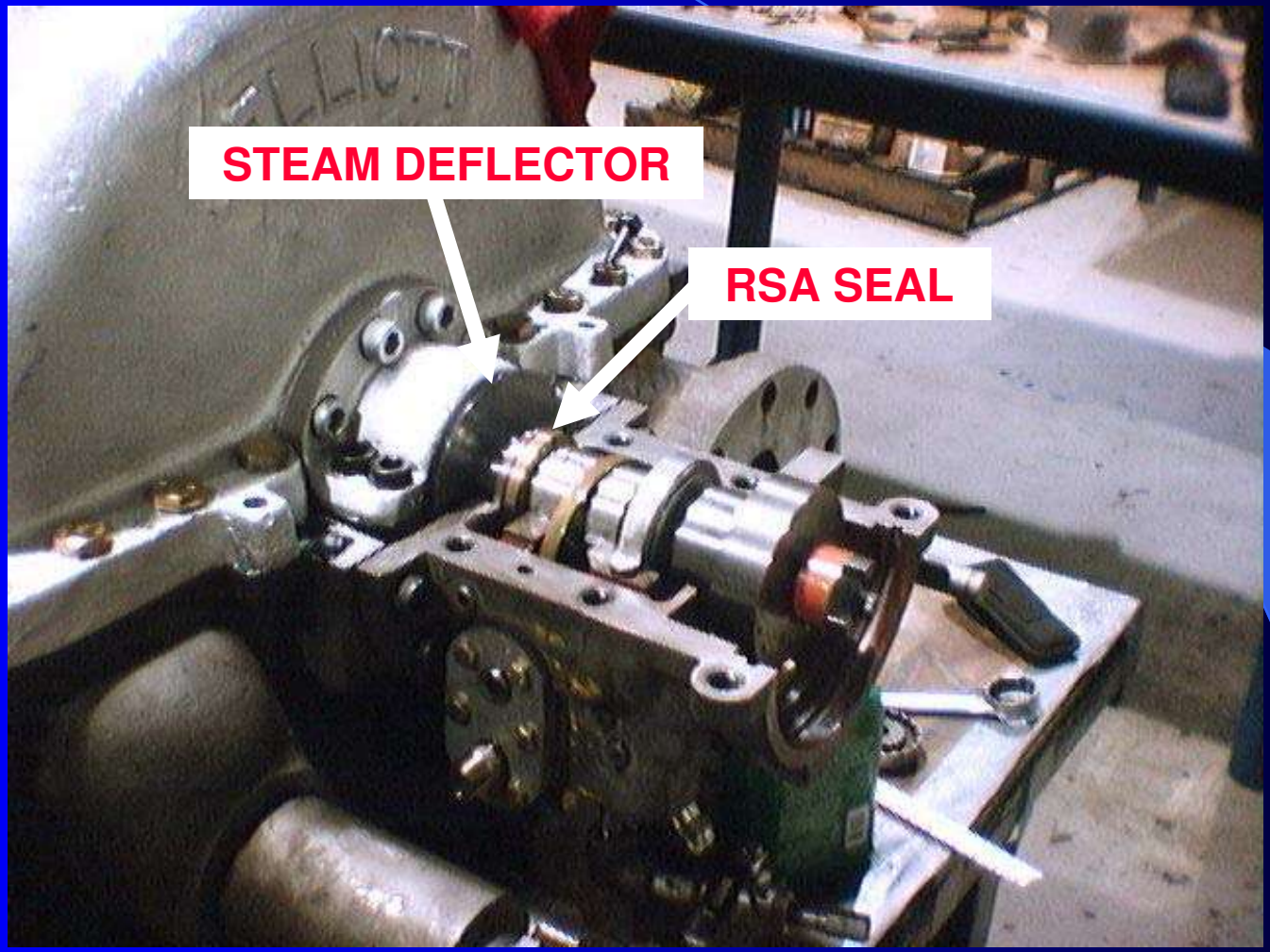
RSA & STEAM DEFLECTOR



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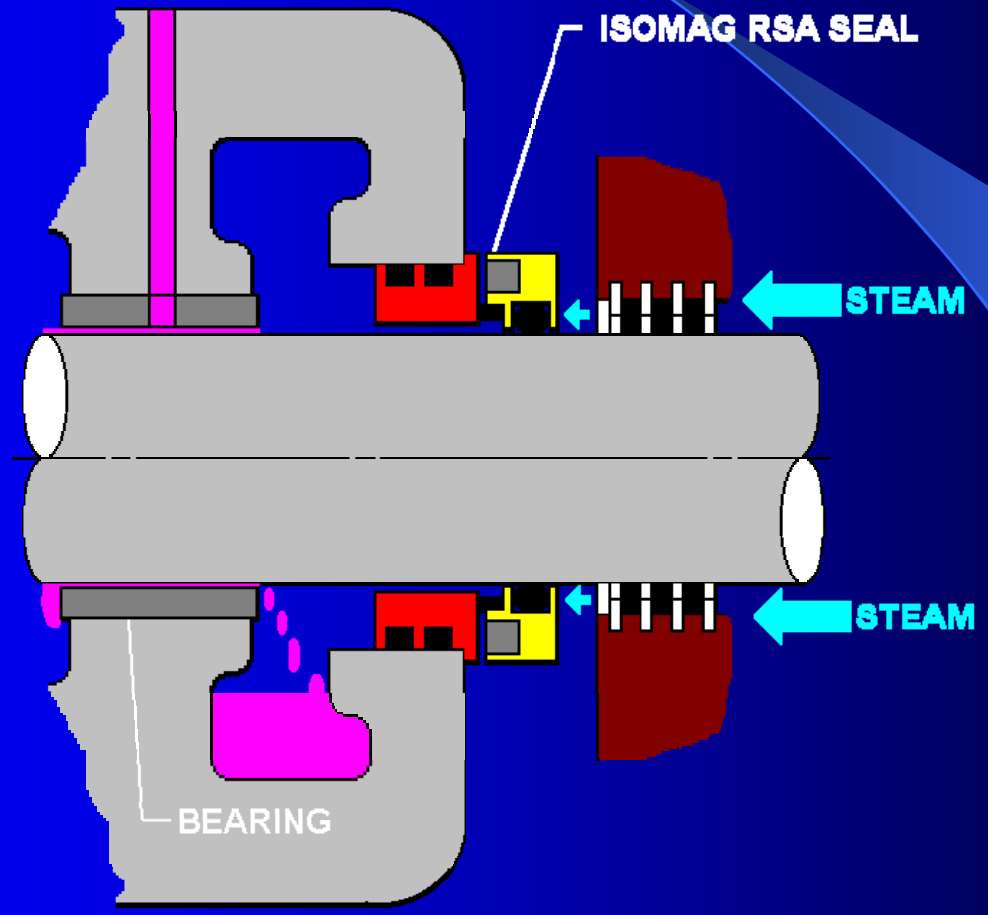
RSA OUTSIDE FIT



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STEAM DEFLECTORS

A steam defector is a metal disc attached to the shaft and located between the carbon box and the seal. It is normally constructed of 416 or 17-4ph low expansion stainless steel. The deflector is manufactured to heat shrink to the turbine shaft with an inside diameter .002” to .003” smaller than the shaft diameter.

Use a steam deflector when the steam leaking from the carbon box is in excess of 300 degrees F.

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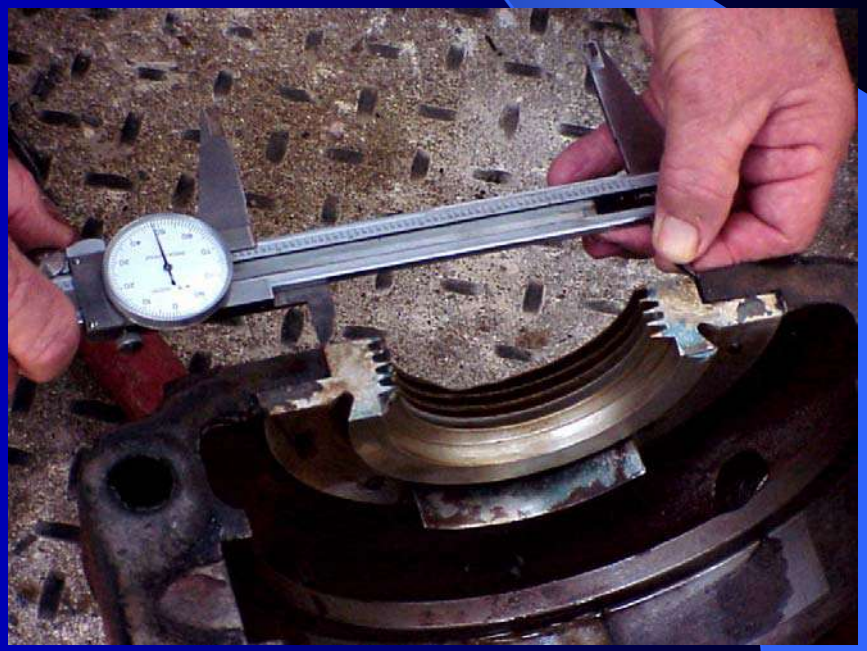
MEASURE IT RIGHT

3 DECIMAL PLACES

.001 INCH



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RECORD THE DIMENSIONS

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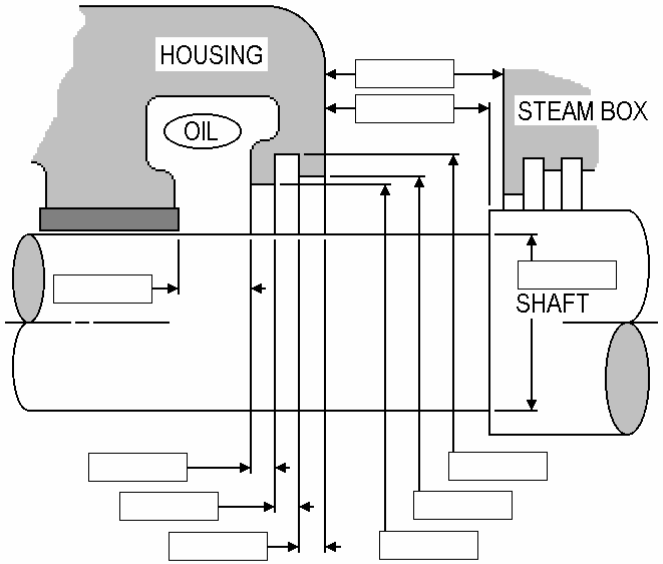
MALE TURBINE DATA FORM



MAKE:_____ MODEL: _____

SEAL POSITION:

DRIVE END OUTBOARD ☐
DRIVE END INBOARD ☐
GOV. END INBOARD ☐

STEAM DEFLECTOR REQUIRED

YES ☐ NO ☐

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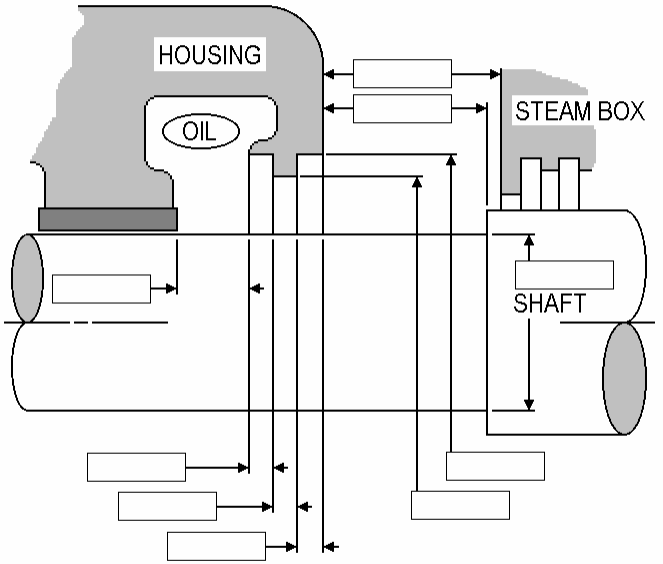
FEMALE TURBINE DATA FORM



MAKE:_____ MODEL: _____

SEAL POSITION:

DRIVE END OUTBOARD ☐
DRIVE END INBOARD ☐
GOV. END INBOARD ☐

STEAM DEFLECTOR REQUIRED

YES ☐ NO ☐

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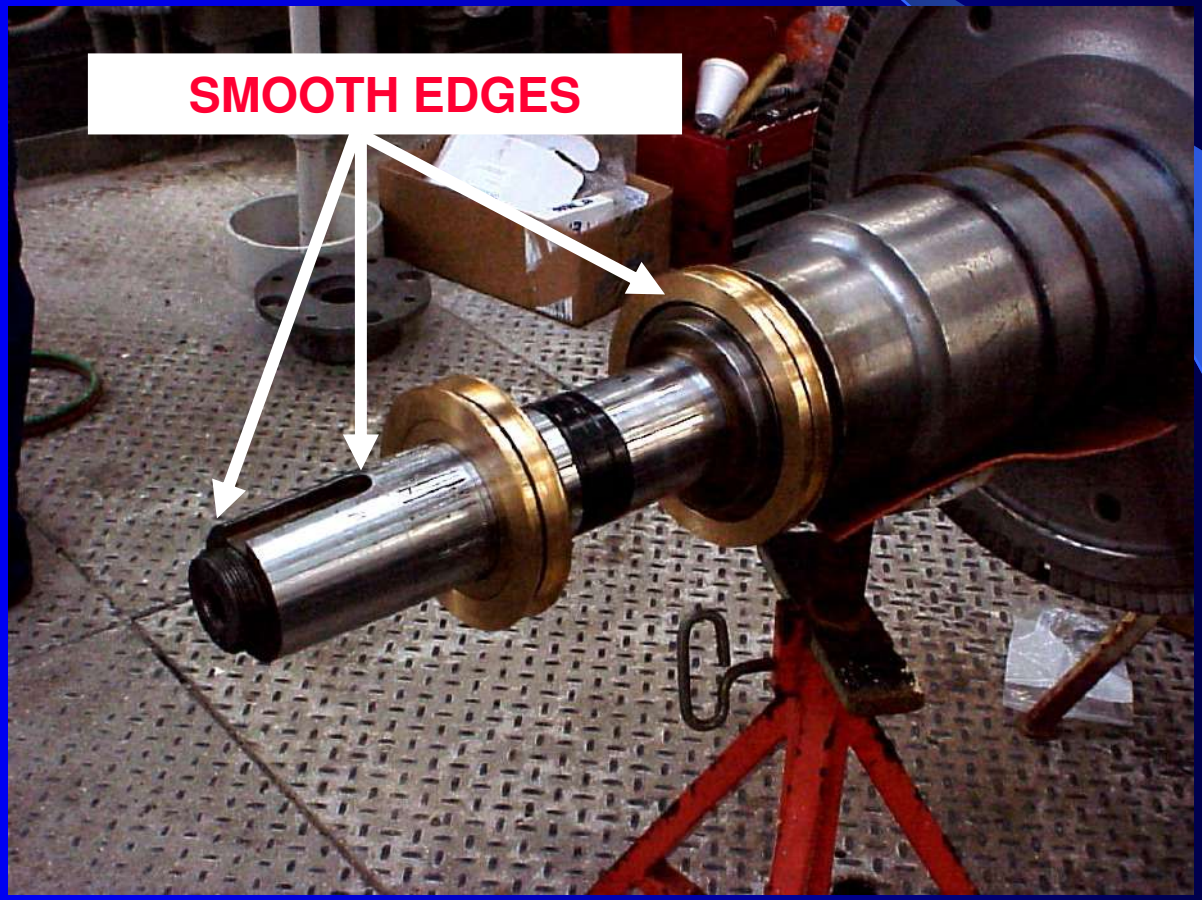
ISOMAG

HOW TO INSTALL TURBINE SEALS

1. Smooth sharp edges from keyways and steps.
2. Lightly lubricate rotor o-ring.
3. Slide seals into position on shaft.



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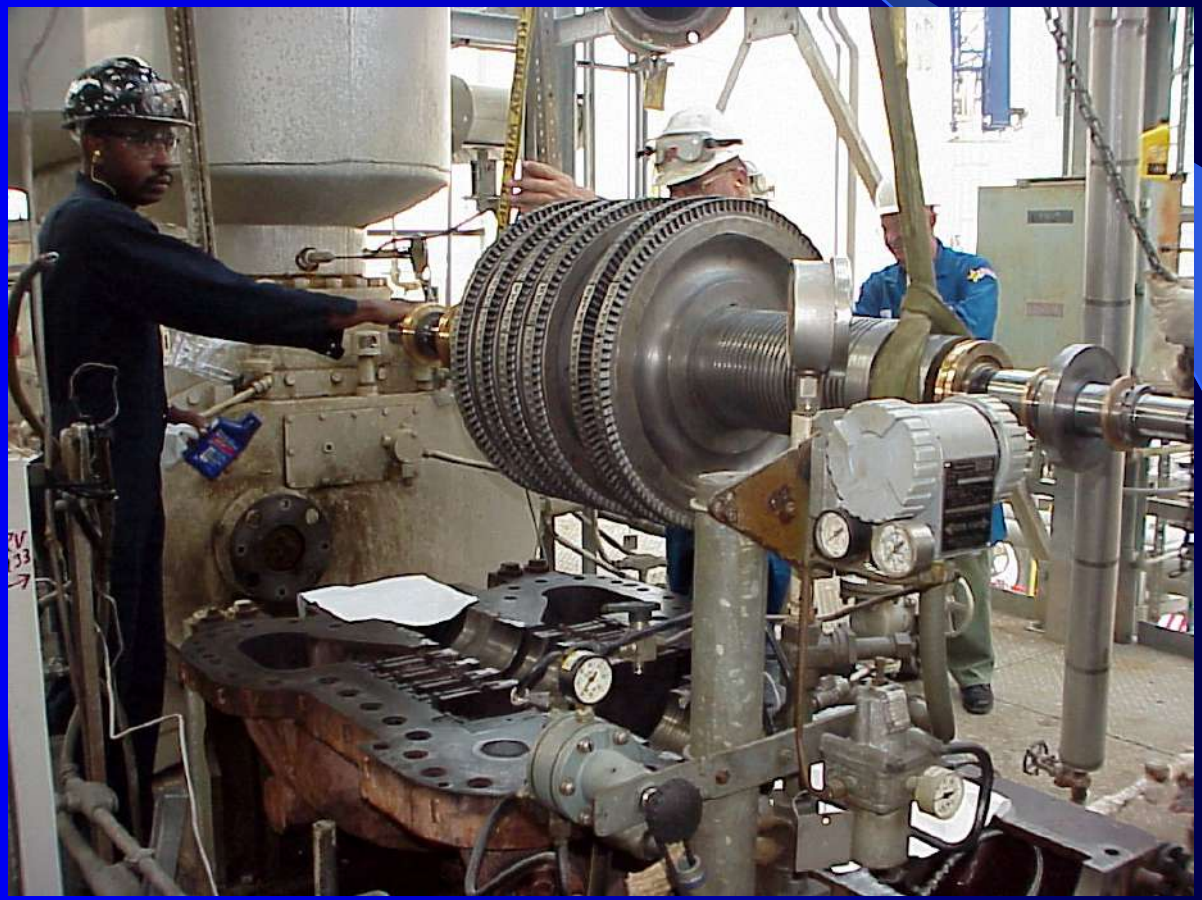
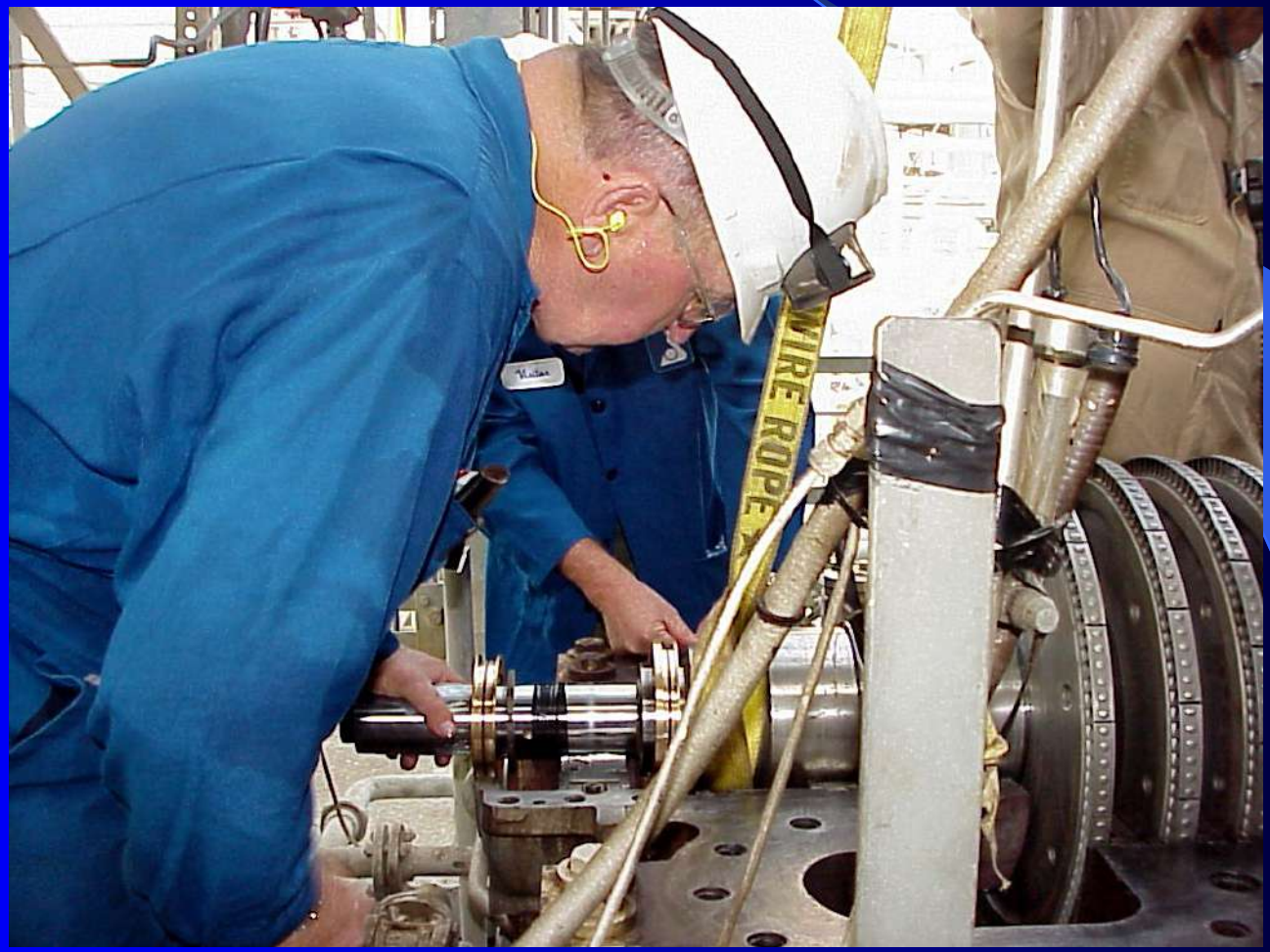
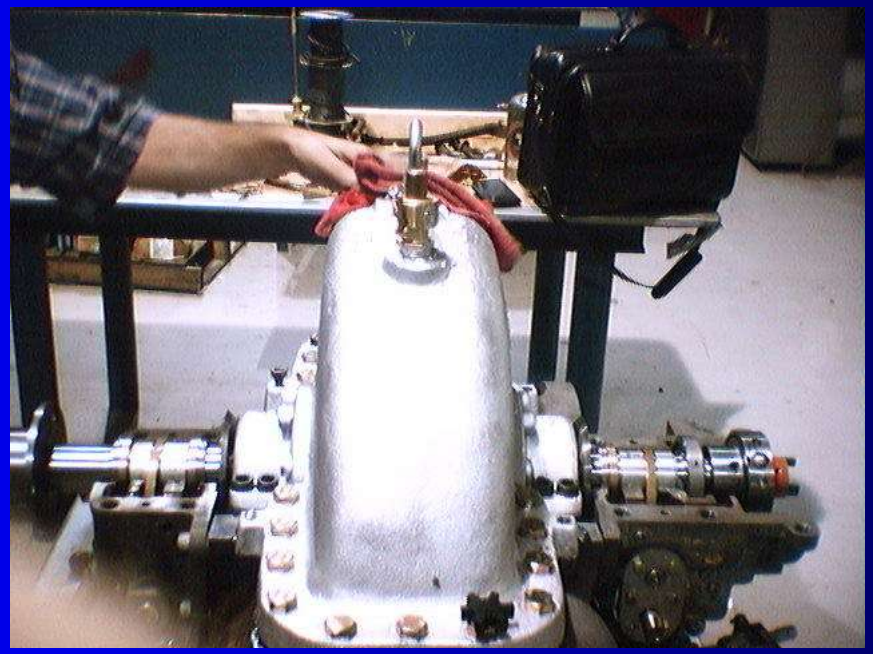
4. Lift rotating assembly
5. Lower rotating assembly into lower housing … while…



6. Guiding seals into position



7. RSA seal only, gently push rotor up to the stationary (you will feel the magnets pull the rotor and stationary together)
8. Finish turbine assembly
9. You are finished



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- Seals Out Contaminants
- Seals In Lubrication
- Stops thermal cycle aspiration of air and vapor into bearings

Maximum Sealing = Maximum Protection

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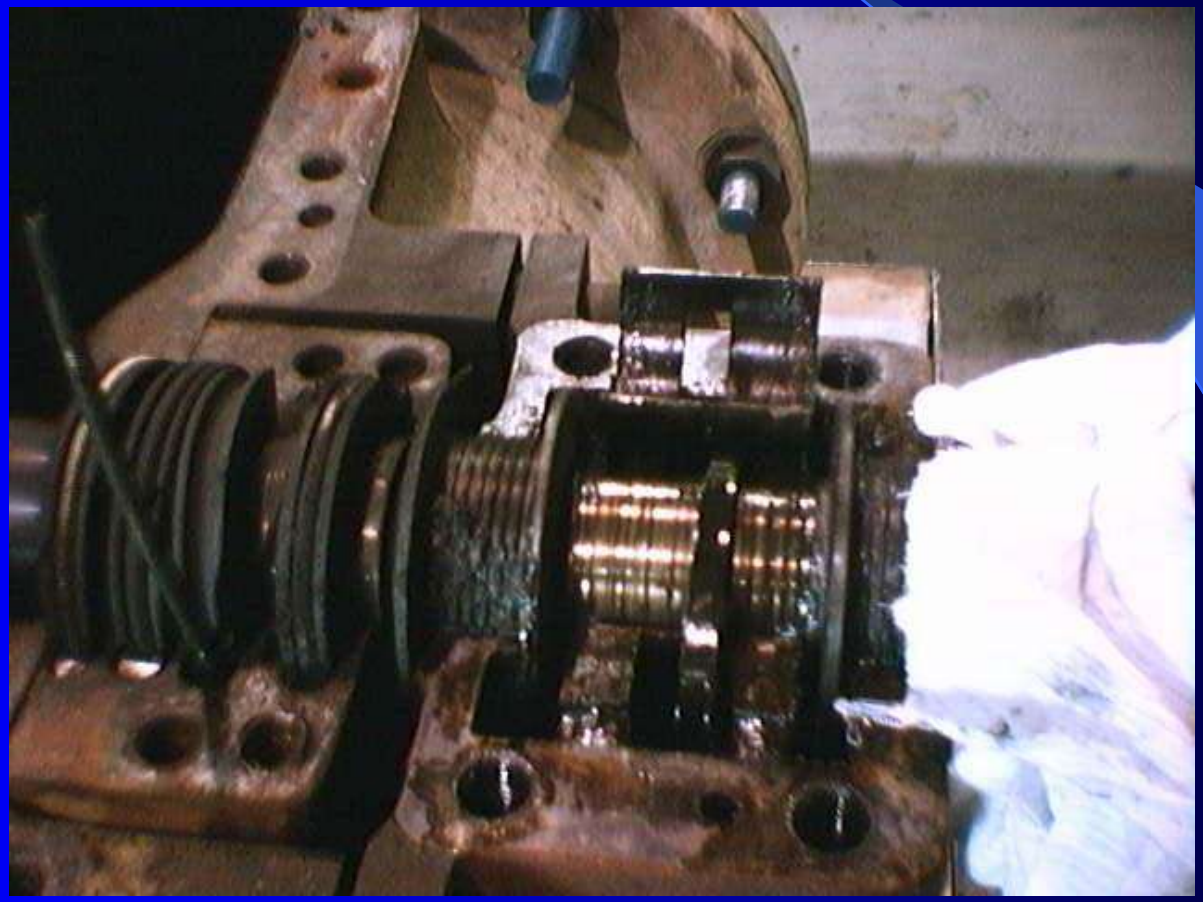
Turbines do not have to look like this



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