Project On
Hyper Compressor
HP Packing Assembly

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SCOPE OF THE PROJECT

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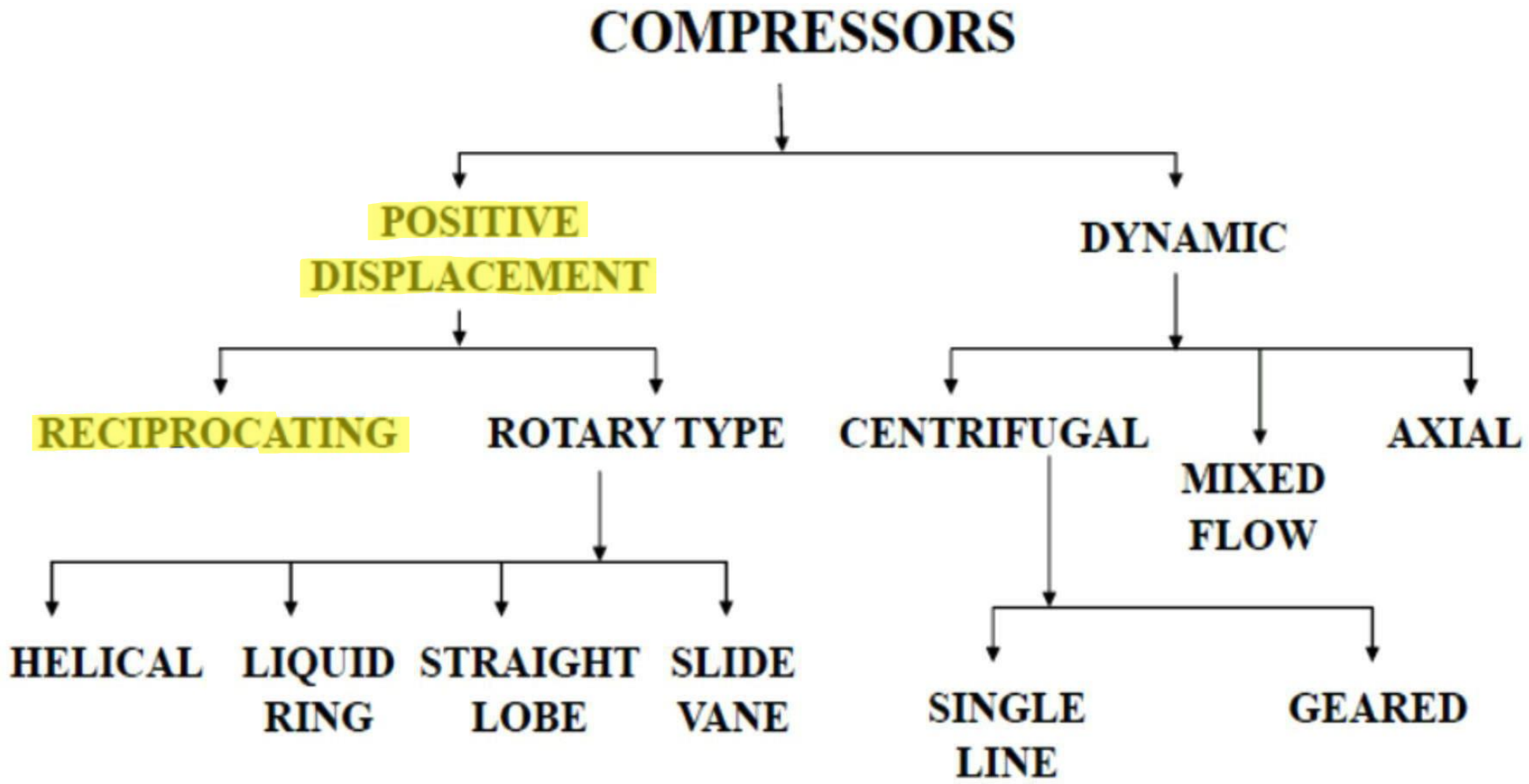
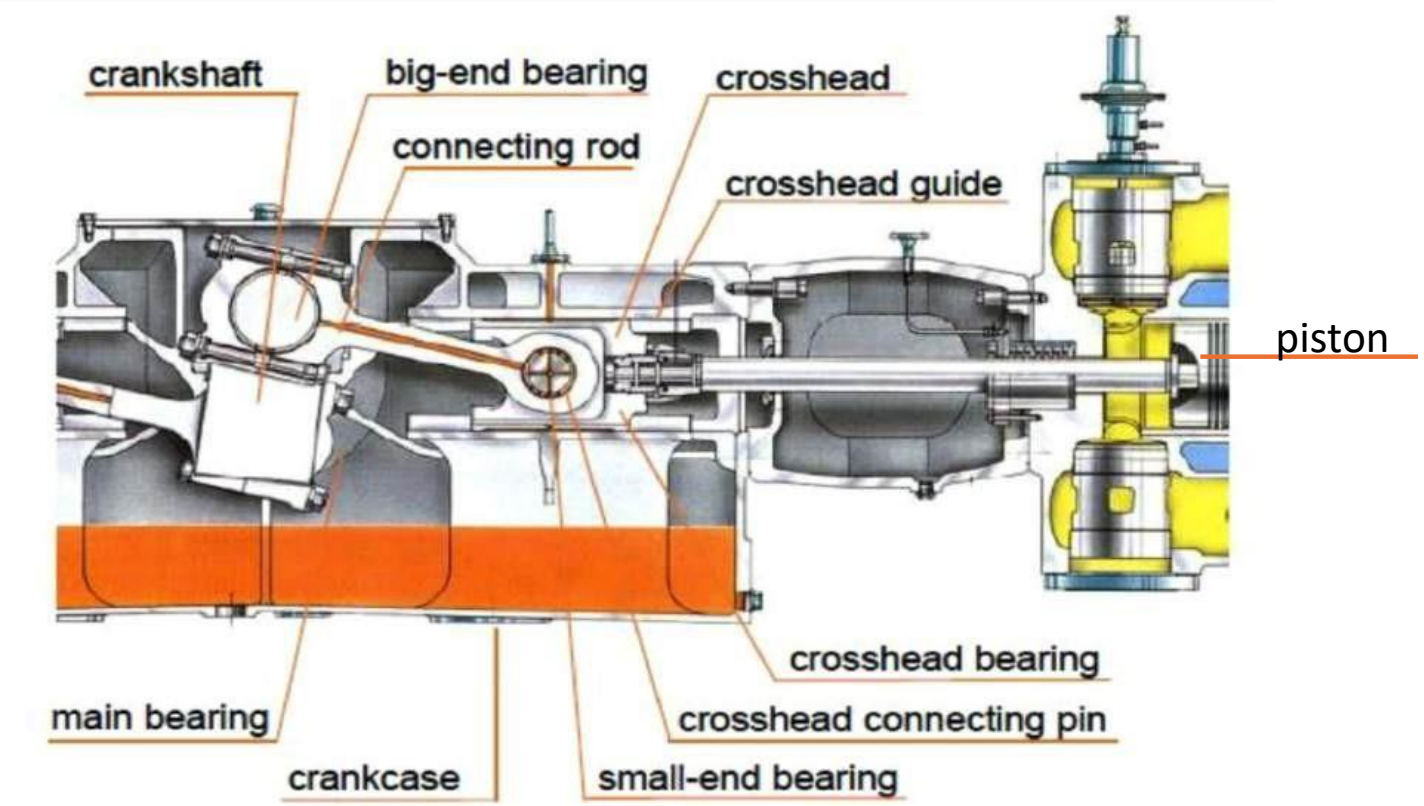
- Compressor Overview
- Drawings & spares required for packing refurbishment.
- Tools, equipments, and procedures for refurbishment.
- Testing Requirement

Compressor Overview



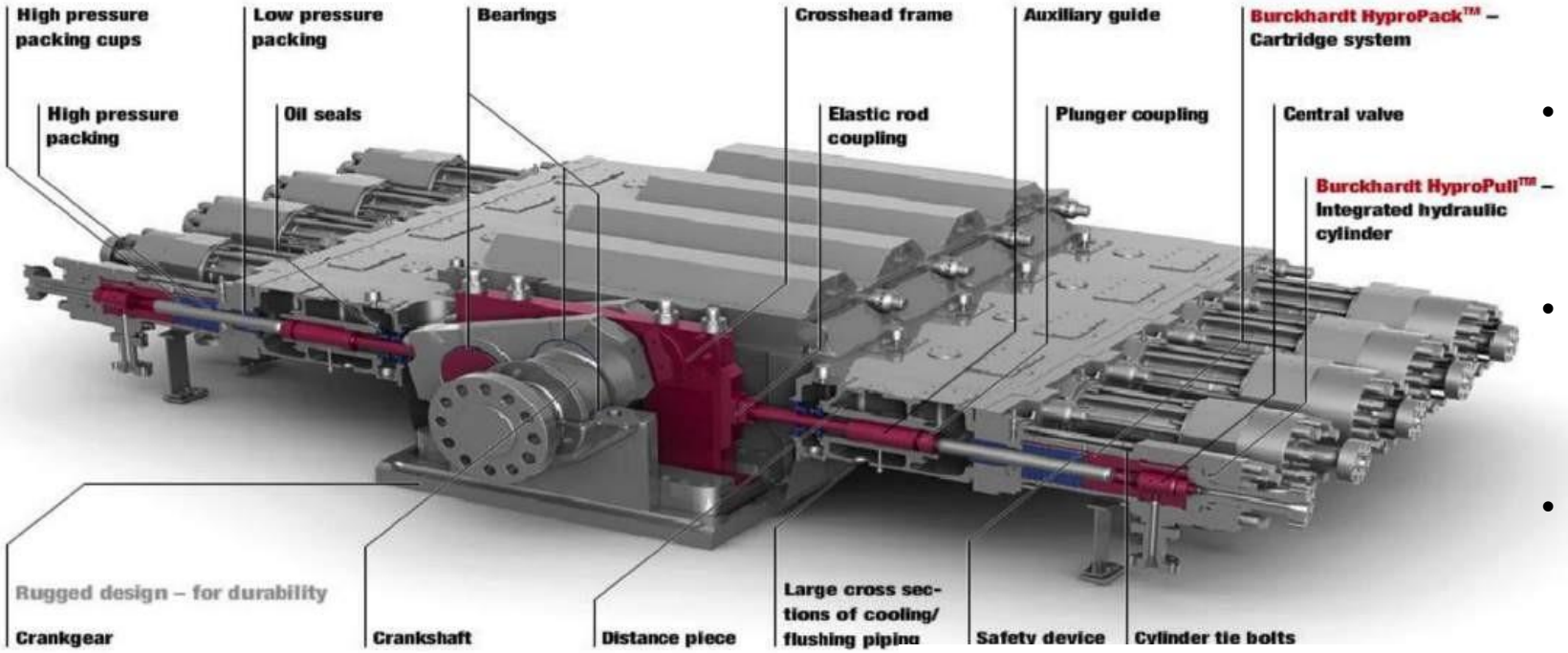
Reciprocating Compressor

These are machines in which compressing element is a generally a piston following a reciprocating (linear) motion in a cylinder.
They operate on a principle of reducing the volume and increasing the pressure of specified quantity of trapped gas in an enclosure and then compressed gas is pushed out of the enclosure.



Major parts of a Reciprocating Compressor

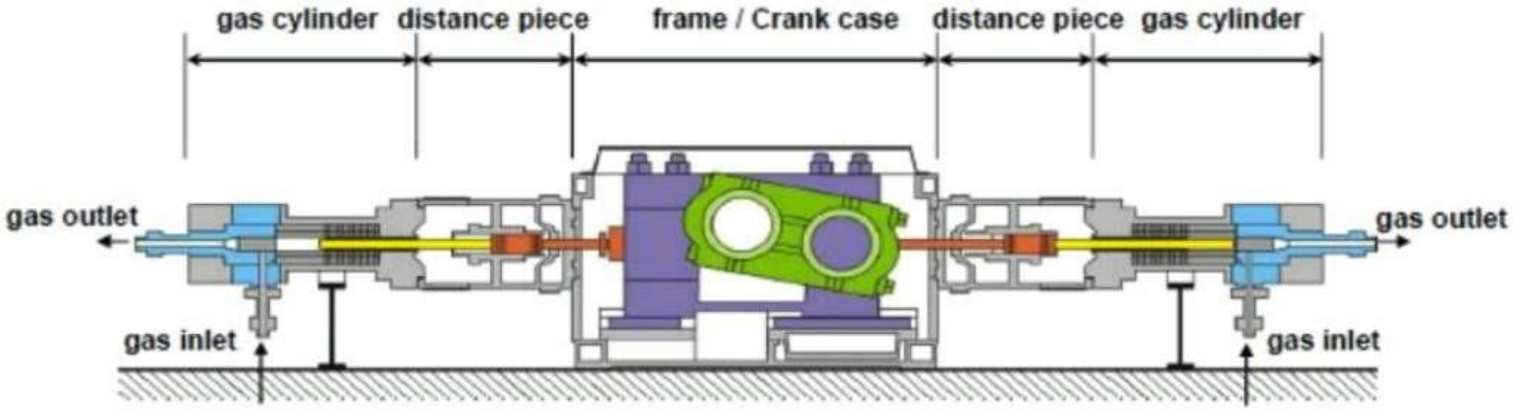
Hyper Compressor: Specifications & Major Parts



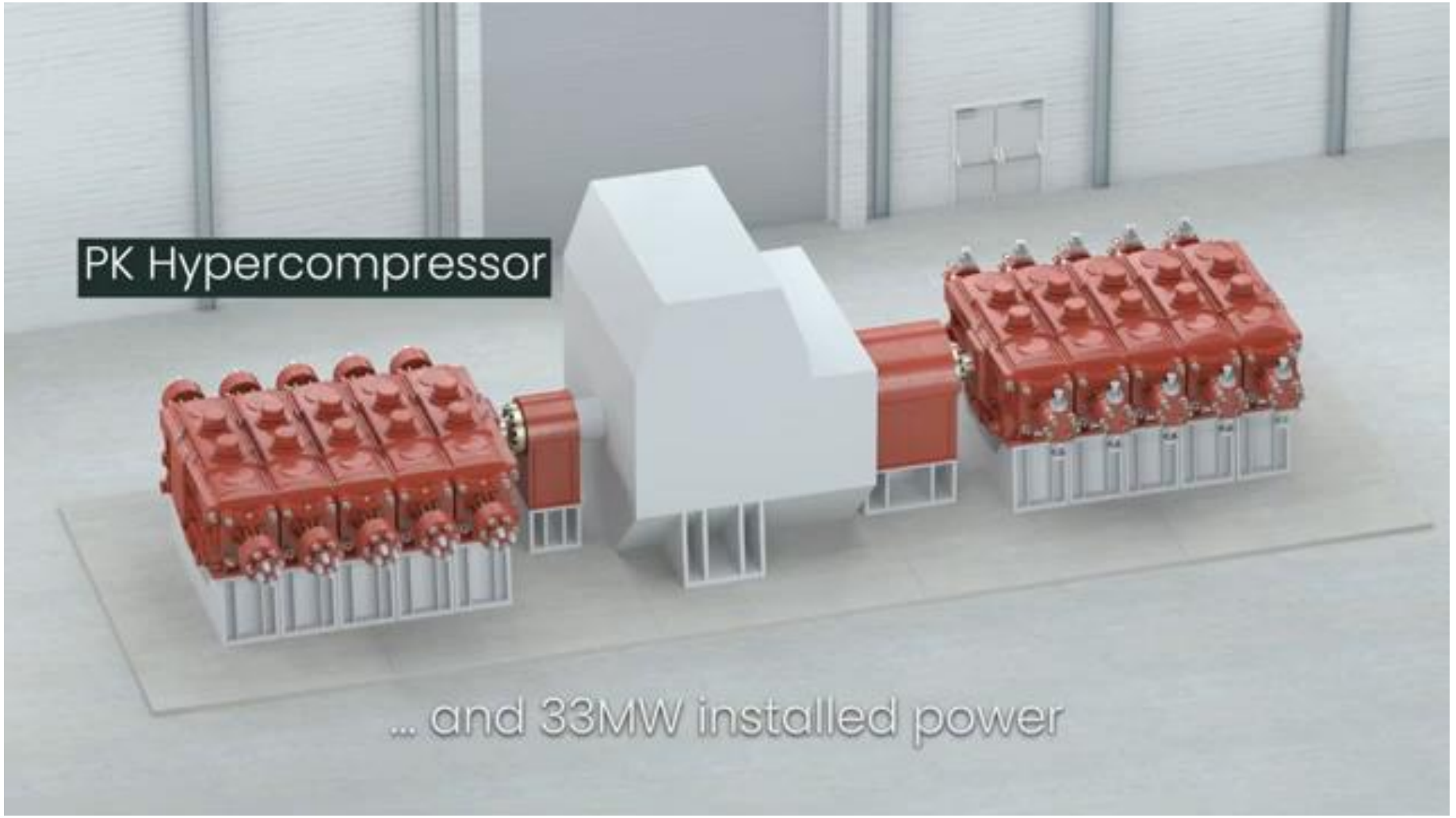
- **Crank Gear** - consists of crankcase, crankshaft with bearings, crosshead frame and connecting rods.
- **Distance Piece** - consists of elastic rod, auxiliary guide, oil seals & plunger coupling.
- **Gas Cylinder** - consists of plunger, central valves, HP & LP packings.

Specifications:

- Tag: 30K03
- Make: Sulzer Burckhardt, Switzerland
- Standard: API 618
- Type: F8-H230 105-C5/E5
- Capacity: 64,000kg/hr
- 1st Stage Suction Pressure & Temp.: 231 bar, 35°C
- 2nd Stage Suction Pressure & Temp.: 892 bar, 35°C
- 1st Stage Discharge Pressure & Temp.: 919 bar, 81.5°C
- 2nd Stage Discharge Pressure & Temp.: 2151 bar, 71.5°C



Hyper Compressor: Working

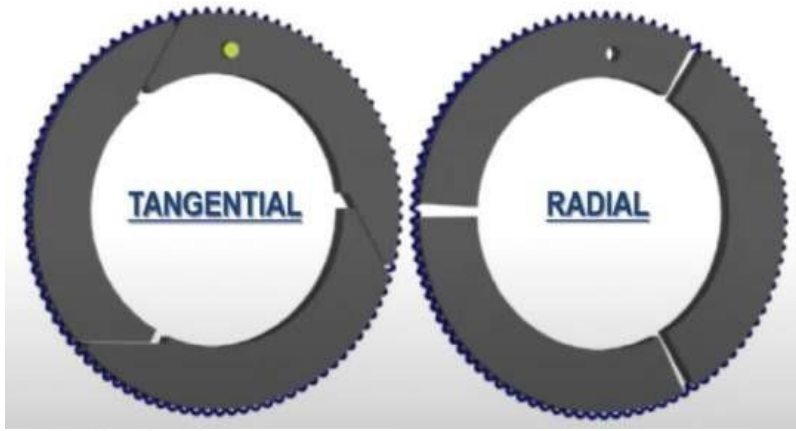


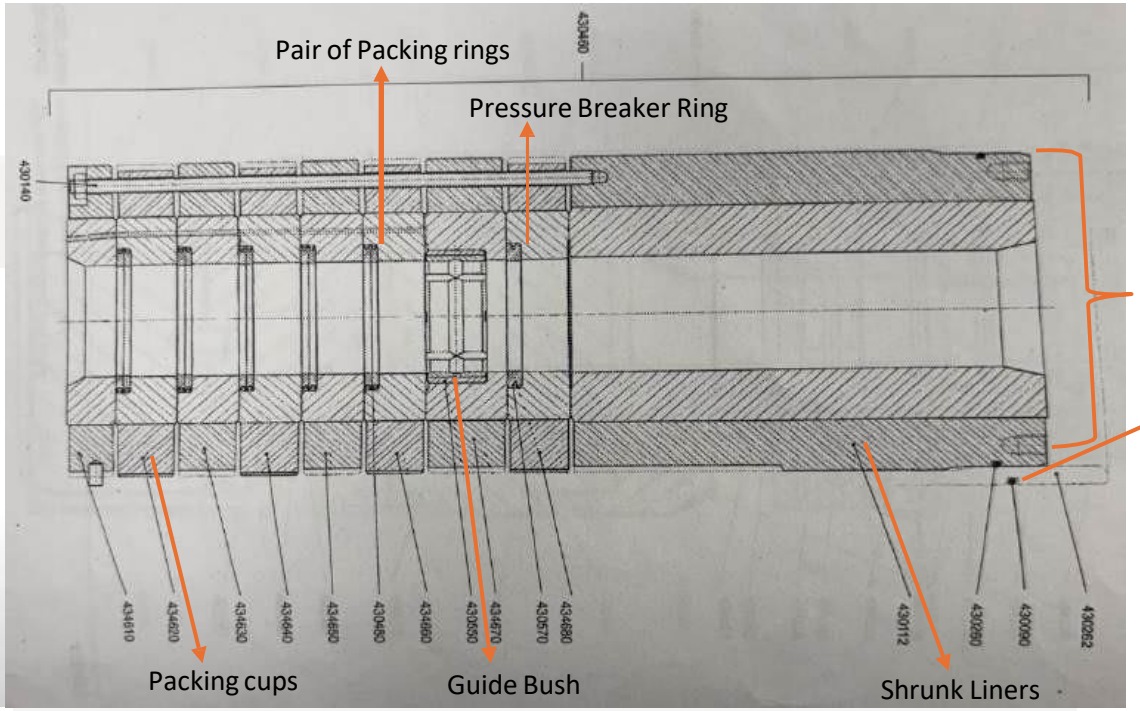
Working of a Hyper Compressor

Spares required for packing refurbishment

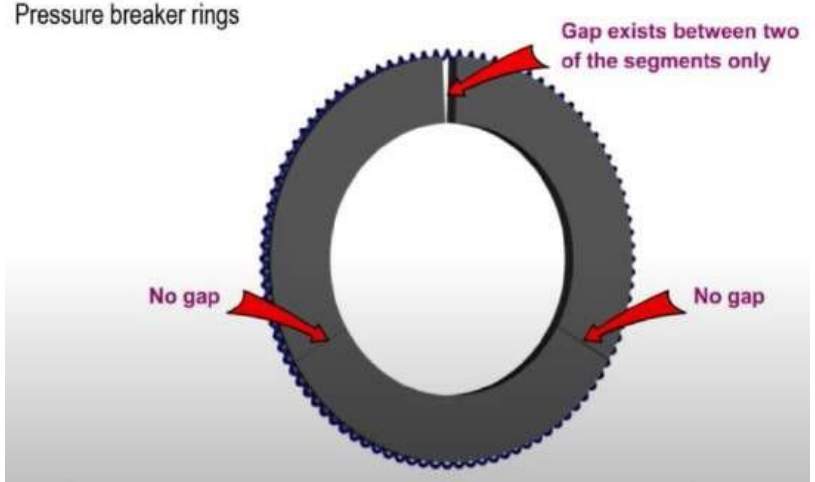
Packing Assembly majorly consists of:

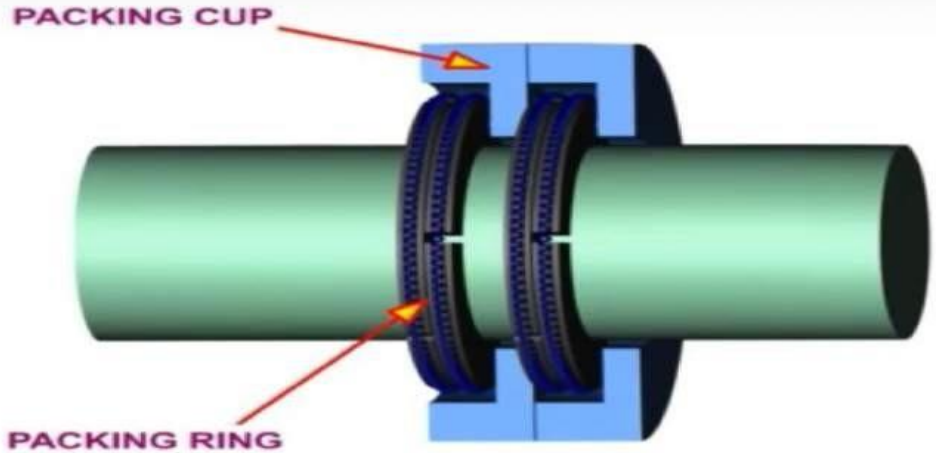
- Packing Rings – Radial , Tangential & Pressure Breaker
- Packing Cups
- O- Rings
- Guide Bush
- Shrunk Liner





Pressure breaker rings





Procedures and Tests required for refurbishment

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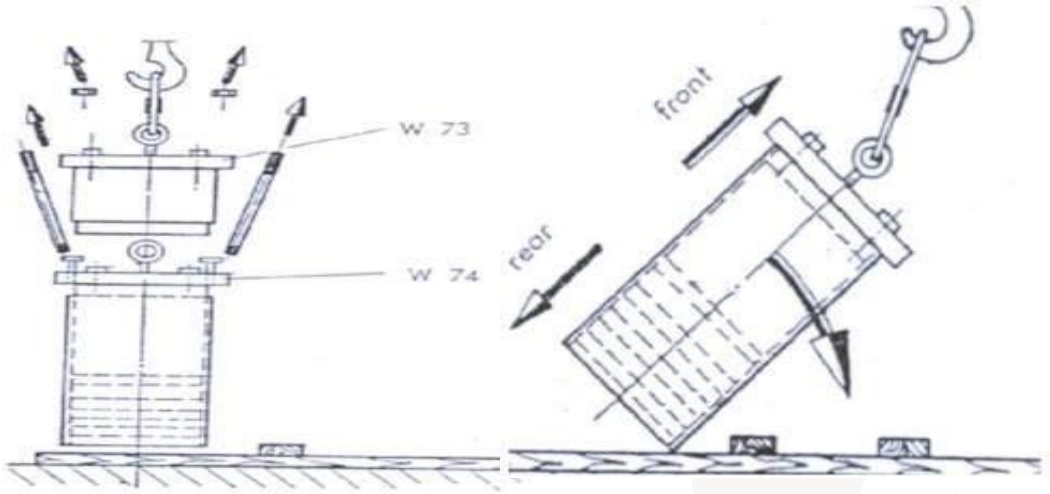
01 Initial Disassembly



The erection plate (W 73) was mounted on the front of the cylinder head core, and the whole insert was lifted. The whole insert was kept such that the head core was in the top position. The nuts were unscrewed, and the cylinder head core was lifted. The cylinder head core was put on a rubber sheet on the floor and covered with a plastic sheet.

- The stud bolts were loosened, and the erection plate (W 74) was mounted on the shrunk liner. The whole assembly was lifted with the help of shackles and slings and shifted to the floor.
- The eye bolts were unscrewed. The erection plate was mounted on the rear end, and the assembly was placed upside down. The whole packing was lifted out of the guiding sleeve and kept on the floor

02 Cleaning and Inspection

Procedures and Tests required for refurbishment

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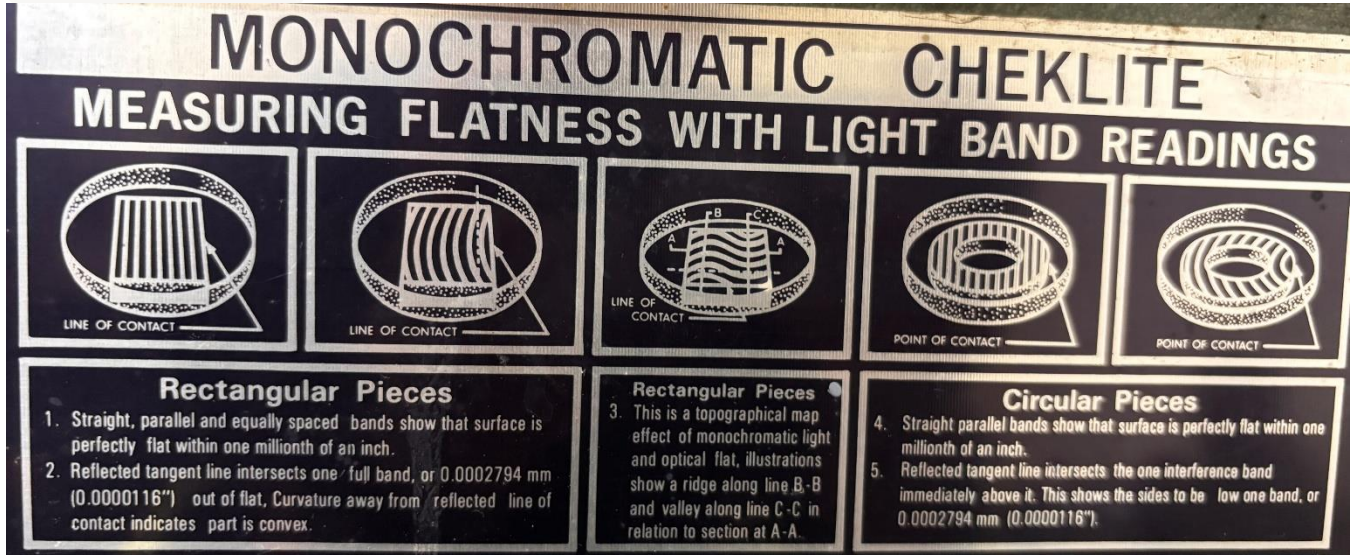
03 *Lapping and Surface Preparation*

Tools & equipments required for refurbishment

- Spanners
- Roughness Meter
- Depth Gauge
- Screw Gauge
- Monochromatic cheklite



Testing outcomes

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ASSEMBLY No.: S-40

Parameter	Standard	Before Lapping	After Lapping
Surface Roughness of the cups	0.2 Ra (micron m)	0.17 – 0.19 Ra (micron m)	0.13 – 0.15 Ra (micron m)

Parameter	Standard	Actual
Thickness of cups	50.5 mm (min)	50.86 mm
Thickness of the packing rings set	11.0 mm	11 mm

Parameter	Standard	Actual			
Depth of cups. (Difference of depth for each cup indicates the parallelism of surface which should be <0.02 mm)	Min. depth	0 degree	90 degree	180 degree	270 degree
	11.17	11.25	11.25	11.25	11.25

Re-assembly and Preservation

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04 *Reassembly of Packing Rings and Cups*

- Applied process oil to packing cup grooves and surfaces, mounted pressure breaker ring and guide bush.

- Assembled radial and tangential rings into cups, ensured correct placement, and checked clearances

05 *Final Assembly and Insertion*

- Lubricated each cup and packing during assembly, maintained cleanliness.

- Tightened cups with the tie rod, inserted the assembled packings into the cylinder sleeve.

06 *Preservation*

Thank You.!