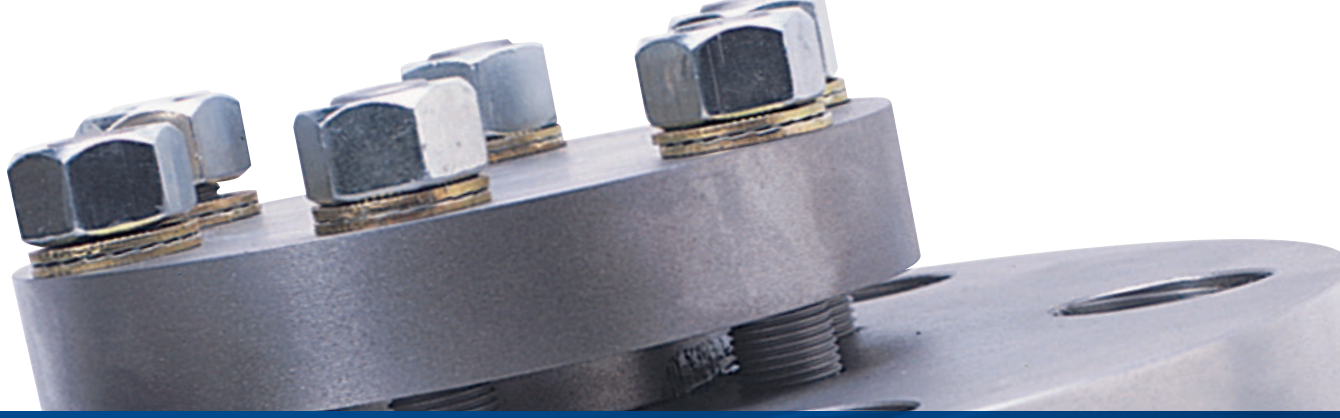


HSR High-Security Compressor Valve Restraints

Protect valves, cages and cylinders while improving sealing effectiveness. HSR High-Security valve restraints are a reliable, economical solution to the problems of ordinary single-bolt (jack bolt) designs.

Single-bolt restraints require extreme torque to install and often loosen during operation. This creates a dilemma: continuing to increase torque can distort the valve cover gasket, allowing gas leaks or causing damage to the valve cage or cylinder gasket shelf. However, continued operation with a loose assembly can also damage studs, cages, valves, or cylinders. Even worse, debris from failed components can enter the cylinder, resulting in catastrophic cylinder component failures and serious safety issues.

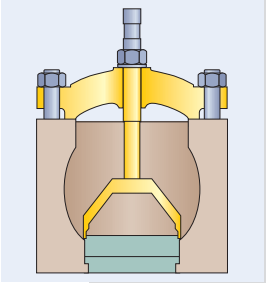
MULTIPLE STUDS DISTRIBUTE LOAD, IMPROVE SEALING

HSR restraints distribute load over multiple studs for reliable, long-lasting valve retention. Each stud requires less than half the torque of single-bolt designs, so installation is easier and loading on valves is more accurate. Just as important, HSR restraints stay tight without the need for periodic tightening.

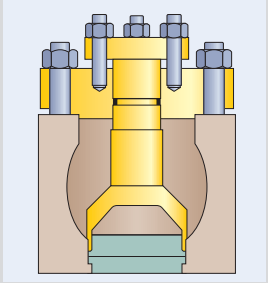
HSR restraints have O-ring seals, which contain gases much better than thread seals, gaskets, or obsolete lead washers. The O-ring seal design, combined with lower torque requirements, simplifies maintenance, drastically reduces fugitive emissions, and all but eliminates safety concerns.

ADVANTAGES

- Multi-stud design reduces torque requirements by 50% or more
- Allows easy, accurate loading of cage and valve
- Reduces risk of damage to valve, cage, and cylinder
- Reliable O-ring seals control emissions better than gaskets or lead washers
- Easy, economical field retrofit to most compressors
- Optional configurations offer flexibility and economy
- Flanged retainer design improves safety by preventing the retainer from backing out under pressure
- Available with pneumatic unloader assemblies



Single-bolt (jack bolt) valve restraint



HSR assembly

COOK COMPRESSION

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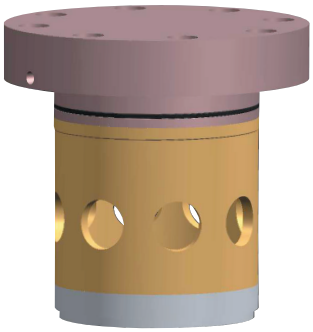
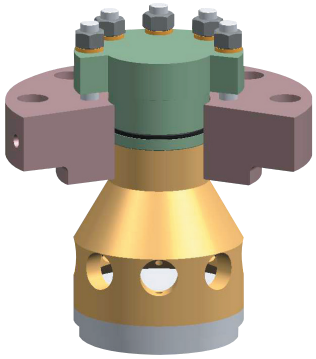
DOVER PRECISION COMPONENTS





COMPLETE CONVERSION TO O-RING COVERS

Uses a direct-loading design in which an O-ring bore is machined in the cylinder. Cover studs seat the valve gasket and no other loading devices are required.

Advantages

- Completely eliminates the gasket seal
- Uses existing cylinder studs to seat the valve gasket
- Eliminates one of the two cover seals

Requirements

- Cylinder must be machined to achieve the concentricity and finish required to seal the O-ring
- Requires replacement of the cover and cage
- Cylinder studs often need to be redesigned to avoid damaging the valve shelf area
- Cylinder should be hydrotested prior to use

HSR DESIGN WITH EXISTING CAGE

Uses a set of multiple studs and an O-ring seal in place of the jack bolt, but uses the existing cage. The cover seats on the cylinder with the cover gasket remaining intact.

Advantages

- Reduces costs by using the existing cage
- Requires no machining on the cylinder itself
- Dramatically reduces torque values needed for proper installation
- Assembly remains tight (similar to an O-ring cover), eliminating jack bolt loosening problems
- If existing cylinder covers are steel (not cast), they can be machined for reuse to further reduce costs

Requirements

- Requires new cover, cage (if necessary), HSR cover, set of studs and restrainer
- Retains existing cover gasket

FLEXIBLE, ECONOMICAL CONFIGURATIONS

HSR restraints are quickly and economically field-retrofitted to most compressors without machining or cylinder modification. Optional configurations are available to adapt to your existing cage or cylinder cover for greater economy. For a complete engineering analysis and recommendations, contact Cook Compression.

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