

# HSR HIGH-SECURITY COMPRESSOR VALVE RESTRAINTS

*Multi-stud design provides stronger, more secure valve retention with less torque*

*Protect valves, cages, and cylinders while improving sealing effectiveness with HSR High-Security valve restraints.*

## SUPERIOR DESIGN

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.

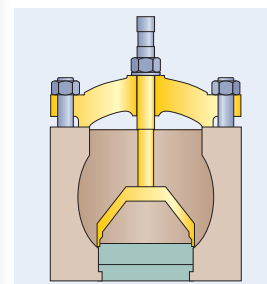
## MULTIPLE STUDS DISTRIBUTE LOAD; IMPROVE SEALING

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 —

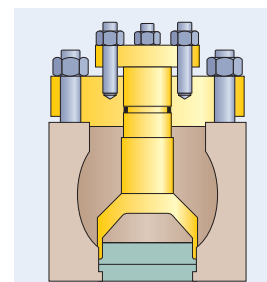
combined with lower torque requirements — simplifies maintenance, drastically reduces fugitive emissions, and all but eliminates safety concerns.

## ADVANTAGES

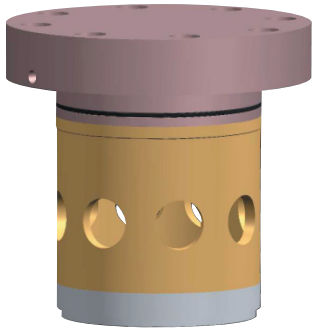
- Multi-stud design reduces torque requirements by 50% or more
- Allows easy, accurate loading of cage and valve
- Reduces risk of damage to valve, cage, and cylinder
- Reliable o-ring seals control emissions better than gaskets or lead washers
- Easy, economical field retrofit to most compressors
- 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



### COMPLETE CONVERSION TO O-RING COVERS

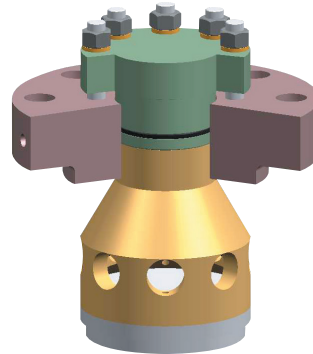
Uses a direct-loading design in which an O-ring bore is machined in the cylinder. Cover studs seat the valve gasket and no other loading devices are required.

#### 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.

*To find out how HSR High-Security valve restraints will improve reliability and safety in your compressors, contact your local Cook Compression representative.*

ADVANCING  
PERFORMANCE  
+ RELIABILITY  
+ EFFICIENCY

