Installing and Maintaining Cook Rod Rings and Packing Cases

Cook's free-floating rings are furnished in a variety of designs and materials to suit all operating conditions of reciprocating compressors and engines. It is not the purpose of this guide to cover a particular design, but rather to explain the general characteristics common to most assemblies.

Figure 1 is an exploded view of a typical cup packing case with the various parts in proper order and each part named to familiarize an operator with the functions and the terms used.

Figures 2-5 are common rod rings as they appear on the rod and in their disassembled state.

The rod rings depicted are representative of some of the most common rings available from Cook Compression. Please visit www.CookCompression.com for contact information to learn about the many other rings available.

The packing case comes assembled, ready for bolting into the compressor. It carries a serial number stamped on the flange face. This serial number, when given to a Cook Compression representative, will facilitate the identification of proper replacement parts.

If installing a new set of rod rings in an existing packing case, the case parts need to be inspected for wear.

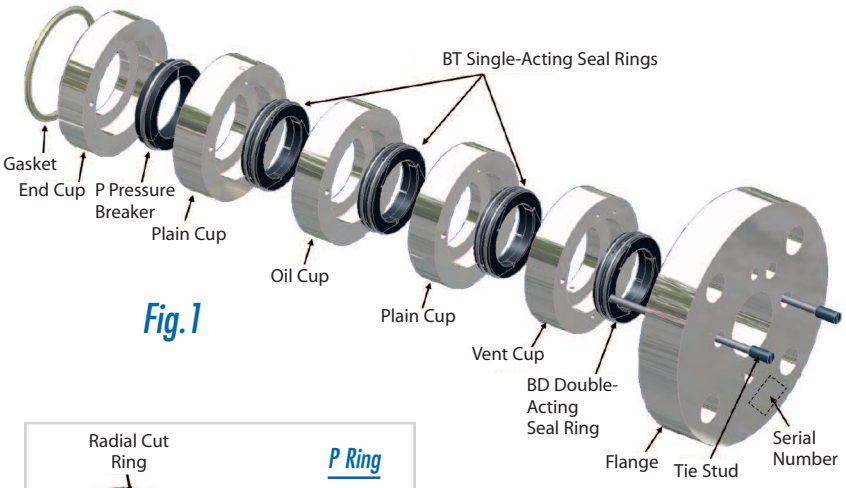

Fig. 1

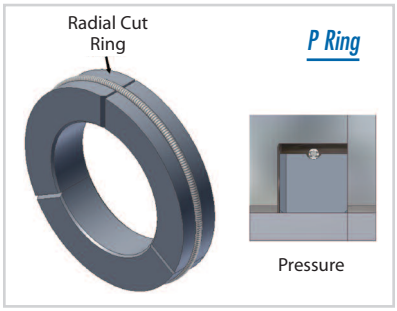

Fig. 2

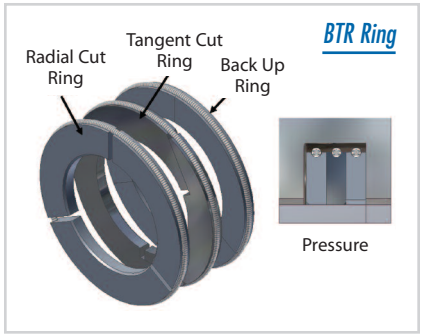

Fig. 3

Cups should be smooth and flat on the back side where the rod rings must seal. If the cups or grooves have worn concave or tapered, they should be reground or relapped. It is rarely necessary to alter the crosshead side of the cups. However, if this is found necessary, care must be taken so that the correct groove depth for the renewal rings is not destroyed.

Installation

In most compressors, it is possible to bolt the packing case into the stuffing box, after which the rod can be inserted with the aid of a bullet-nosed sleeve over its threaded end. Before a case is installed, it should always be disassembled and thoroughly cleaned in an appropriate solvent for the intended service.

Make sure that each rod ring and cup is properly positioned. For lubricated service, ensure that rings are liberally coated with a clean lubricant before reassembly. For non-lubricated service, no oil should be used. Examine all parts for unusual nicks or burrs which might interfere with the free floating of the rod ring in the cups. Particular care should be taken with rod rings made of soft materials such as PTFE. It is extremely important that wiper rings be handled and installed so as to prevent damage to the scraping edges.

Where it is necessary to install the packing case on a piece-by-piece basis over the rod end, the case parts should be laid out on a work bench so that they can be installed progressively with each in its correct position and the rod rings with their proper faces toward the pressure. Note that all rod ring segments are carefully

lettered and must be assembled accordingly. This is most important in order to ensure proper sealing. After the packing case has been assembled in the stuffing box and its tie studs tightened, the rod should be connected at the crosshead, after which the packing case must be carefully aligned with the rod before bolting tightly into position. Alignment is readily accomplished by the use of feelers to maintain a uniform clearance all around between the case bore and the rod.

Connect all tubing for lube, vent, cooling water and/or purge as indicated. If a packing case has two or more lube inlets, each should be connected separately to individual lubricating pump plungers because pressure differentials within the packing body would result in all lubrication going into an outer point. For lubricated applications, after all connections are made, the packing case should be flooded by hand operation of the lubricating plungers to make sure lines are not air bound.

This same operation should be repeated each time a compressor is started because oil lines may have been bled during down time.

For new installations, care must be given to the cleaning of all accumulated dirt in the lines and compressors because foreign material may lodge in the packing and become destructively abrasive.

Prior to installing the packing case into the stuffing box, the end cup gasket should be replaced with a new one.

Uncut Ring Installation

Some new rod ring designs contain uncut rings. Two examples of these are the 'P1U' (Figure 4) pressure breaker and the 'BTUU' (Figure 5) seal ring. Obviously, these rings cannot be roped onto the rod, but a further requirement for these rings is that the rod must have 'necked-down' threads. The reason for this is the inside diameter of these uncut rings is very close to the rod diameter. So close, in fact, that the entering sleeve for a rod with threads the same diameter as the rod will not pass through.

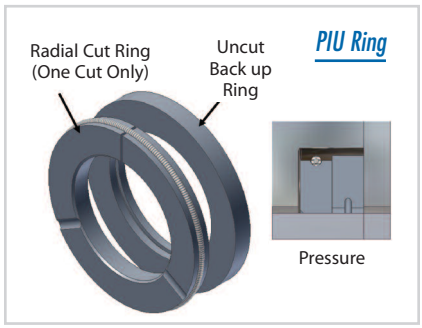

Fig. 4

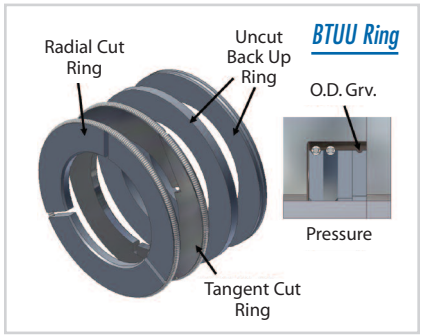

Fig. 5

Lubrication

If the packing case is lubricated, all lube lines should be fitted with a check valve at the case inlet. The selection of a proper lubricant will depend on the service involved, especially on high-pressure work or whenever there are elements in the gas stream which may be destructive to ordinary lubricants.

Vent Connections

Most packing cases are equipped with a vent for safety reasons. This is usually connected by a separate line to atmosphere or to some point in the system where the back pressure does not exceed 15 psig. In all back pressure vents, a check valve should be provided so that there is no flow from the vent line to the packing case. The vent back pressure should not exceed 35 psig.

Purge/Buffer Systems

A purge/buffer system in a packing case provides a protective static gas seal downstream of the vent. The normal pressure utilized is 15-20 psi above the vent line pressure. This pressure differential ensures that the vent line is the path of least resistance for any leakage coming down the rod and that any such leakage will be forced into the vent line for proper disposal or collection.

Cooling

In some services, the packing case will require cooling to help extend the life of the rod rings. The Vortex® cup is the most common cooling system used by Cook Compression and utilizes series flow. The Vortex® cup is easily identified by the pipe plugs visible on the outside diameter of the cup. The connections for the Cool In and Cool Out are usually located within 90° of each other if it is a Vortex® case. However, on older cooling systems that utilize parallel flow, the connections will probably be 180° apart.

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