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WINTER/SPRING 2017

# in the NEWS

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## 25 years of perfect fits

**Happy birthday to us!** Thanks to you, Hercules Sealing Products Canada celebrates its 25th anniversary! We've provided cylinder seals, kits and more since our inaugural year, 1991.

Actually, the late, visionary Donald Rueger founded Hercules in 1962 as a regional Florida distributor. By 1983 his multi-region company was purchased by a British holding company, Britmar Corporation, and added two more U.S. facilities. In 1991 Hercules ultimately consolidated into one national Clearwater business operation.

A veteran in the Canadian seal industry, Bob Moloney, convinced Britmar to expand to Barrie, ON. As part owner he also jointly purchased a seal distributor in Dorval, QC, establishing Hercules Hydraulics Canada. By 1996, Hercules was purchased by a London, UK-based holding company, Diploma PLC.

Today Hercules' two Canadian facilities in Barrie and Dorval have over 35,000 sq. ft. space and 40 employees. But, the real key to our success is our customers. Every one of us thanks you and looks forward to serving you for decades to come.



## WHAT'S NEW?

LEARN THE LATEST AT  
OUR CONEXPO/IFPE BOOTH



March 7-11  
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Experience the latest in innovation and industry expertise for the fluid power industry – 2500+ exhibitors, 2,500,000 square feet, and over 150 education sessions, including asphalt, aggregates, concrete, earthmoving, lifting, mining, utilities and more.



## WEB SPECIAL

6" Hercules Caliper \$25.00 net

Quality caliper is able to measure up to 6" (150 mm). A push of a button changes from inches to mm. These calipers come in a sturdy, padded plastic case with instructions and a spare battery.

When ordering online, go to [www.HerculesCA.ca](http://www.HerculesCA.ca) and use part number HH-CALIPER-6-PROMO

## "Must read" new 2017 catalogs are here!

*It is with great excitement that we announce the release of the 2017 Seal and 2nd Edition Industrial Product Catalogs.*

The Seal Catalog contains over 900 pages of priced listings of metric and inch hydraulic and pneumatic seals and related repair products. It also includes helpful technical information and user-friendly charts. Many new items have been added since our last edition, including a line of metal mobile cylinder repair parts such as glands, caps and pistons. New pricing becomes effective January 16, 2017. The catalog supersedes previous editions.

Repair kits for industrial cylinder and fork lifts can be found in our new 2nd Edition Industrial Products catalog. This publication contains priced listing of seal kits used on many popular brands of in-plant cylinders such as Parker, Miller, Hydro-line, Atlas, Sheffer and many more. It also includes repair kits for fork lifts that are used on Toyota, Raymond, Caterpillar-Towmotor, TCM, Cascade, Nissan and other popular makes.

Also available is our 2016 Mobile Kit catalog that will remain valid through 2017. This publication contains over 950 pages of priced listings of our OEM quality hydraulic/pneumatic seal kits used on popular brands of mobile equipment such as Caterpillar, John Deere, Komatsu, Case, Hitachi and many more. OEM part numbers and cross-reference information are shown for easy identification. Visit our website or contact our customer service department for free copies of either catalog.

*Don't wait to discover even more new product releases in our future publications. Instead, find them when they first appear in our interactive Webstore at our website. You can also download these publications as PDFs at [www.Herculesca.ca](http://www.Herculesca.ca).*



## [www.HerculesCA.ca](http://www.HerculesCA.ca) Our new website, inspired by your insights

If it seems like our new website is so intuitive that you might have designed it, you did! We went to the best authorities for input – our customers.

### New customer-convenience features.

**Single page, instant reference checkout** – Everything you need to know now appears in a one user-friendly page. At a glance you'll see all address information, shipping options and a shopping cart recap. If your business deals with multiple locations, just fill in the address book.

**Pre-login product availability status** – This convenient feature lets you preview product availability, part substitution and estimated arrival dates prior to logging into the Hercules website.

**Quick order enhancements** – Our quick order feature lets you save your session, for future additions or corrections. It's even more convenient by displaying price, availability, substitution options and estimated date of arrival.

**Search options** – Finding exactly what you're looking for is quick and easy with our advanced search feature. Keywords are matched to all Hercules and Bulldog products, including any

portion of an OEM or competitor part number, dimensional information or product description.

**Cross-platform accessibility** – Hercules' website is completely compatible with all ordering platforms, including laptops, tablets and smart phones. No matter when or where you are, Hercules puts you in charge of your product searches, order status, shipping information and product ordering.

**Fast!** Time is money, and you'll notice the speed advantage immediately with the new Hercules website. The Excel Upload feature handles large uploads quickly.

### We've kept all your old favorite features.

Hercules' website is the only one in the industry with real-time inventory, customer-specific pricing, part substitutions and expected dates.

### Go live.

For assistance, email [sales@herculesca.ca](mailto:sales@herculesca.ca) or call the numbers provided on the back page of this newsletter.

**Be our guest! Visit [www.HerculesCA.ca](http://www.HerculesCA.ca)**

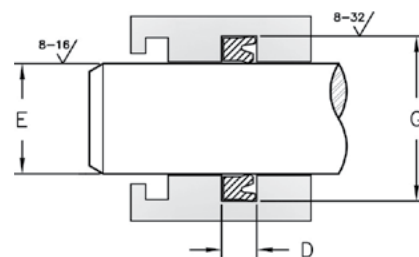
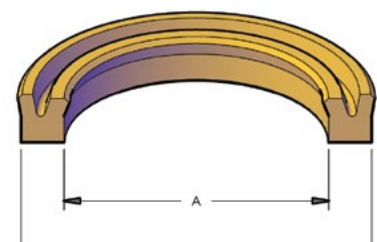
## New Product

# New MRU-KYB Rod U-seals – special sizes for special machines

Hercules now offers new seals to meet unique, specialized needs in the industry. The MRU-KYB Rod U-seals are available in non-traditional sizes to meet the specifications for special machinery. These seals are made to a Kayaba-equivalent design, which is commonly used within Caterpillar, Deere/Hitachi and Volvo cylinders. See the technical data on this page.

| SEAL INFORMATION  |                  |
|-------------------|------------------|
| Material          | Urethane         |
| Temperature Range | -49° F to 212° F |
| Pressure Range    | 0 to 5000 PSI    |
| Speed 3 ft/sec    | 3 ft/sec         |

| Part Number        | A Nom. ID | B Nom. OD | C Nom. Ht | D Groove Width    | E Rod Diameter       | G Housing Diameter | List Price \$ |
|--------------------|-----------|-----------|-----------|-------------------|----------------------|--------------------|---------------|
| MRU-80X100X12-KYB  | 80        | 100       | 12        | 13.00 +0.30 -0.00 | 80.00 -0.030 -0.076  | 100.00 +0.14 +0.00 | 25.88         |
| MRU-85X105X12-KYB  | 85        | 105       | 12        | 13.00 +0.30 -0.00 | 85.00 -0.036 -0.090  | 105.00 +0.14 +0.00 | 25.88         |
| MRU-90X110X12-KYB  | 90        | 110       | 12        | 13.00 +0.30 -0.00 | 90.00 -0.036 -0.090  | 110.00 +0.14 +0.00 | 22.77         |
| MRU-95X115X12-KYB  | 95        | 115       | 12        | 13.00 +0.30 -0.00 | 95.00 -0.036 -0.090  | 115.00 +0.14 +0.00 | 27.67         |
| MRU-100X120X12-KYB | 100       | 120       | 12        | 13.00 +0.30 -0.00 | 100.00 -0.036 -0.090 | 120.00 +0.14 +0.00 | 30.36         |
| MRU-105X125X12-KYB | 105       | 125       | 12        | 13.00 +0.30 -0.00 | 105.00 -0.036 -0.090 | 125.00 +0.16 +0.00 | 36.97         |
| MRU-110X130X12-KYB | 110       | 130       | 12        | 13.00 +0.30 -0.00 | 110.00 -0.036 -0.090 | 130.00 +0.16 +0.00 | 42.17         |
| MRU-115X135X12-KYB | 115       | 135       | 12        | 13.00 +0.30 -0.00 | 115.00 -0.036 -0.090 | 135.00 +0.16 +0.00 | 39.76         |
| MRU-120X140X12-KYB | 120       | 140       | 12        | 13.00 +0.30 -0.00 | 120.00 -0.036 -0.090 | 140.00 +0.16 +0.00 | 48.50         |
| MRU-125X145X12-KYB | 125       | 145       | 12        | 13.00 +0.30 -0.00 | 125.00 -0.043 -0.106 | 145.00 +0.16 +0.00 | 45.18         |
| MRU-130X150X12-KYB | 130       | 150       | 12        | 13.00 +0.30 -0.00 | 130.00 -0.043 -0.106 | 150.00 +0.16 +0.00 | 45.86         |
| MRU-140X160X12-KYB | 140       | 160       | 12        | 13.00 +0.30 -0.00 | 140.00 -0.043 -0.106 | 160.00 +0.16 +0.00 | 56.96         |



MRU-KYB rod u-seals are made to a Kayaba-equivalent design which is commonly used within Caterpillar, Deere/Hitachi and Volvo cylinders.

## New cylinder repair kits for Komatsu machines

Hercules has these new kits in stock:

- **Crawler Dozers** – Models D39EX-23, D39PX-23, D65EX-17, D65PX-17 and D65WX-17
- **Excavators** – Models PC138USLC-10, PC228USLC-10, PC88MR-8 and PC88MR-10

**Order yours today!**



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shop talk

## Sealing ins & outs – contamination prevention

We all know seals are crucial in preventing fluid from escaping the hydraulic system. But they must also prevent contaminants from entering the system. Contaminants can defeat the seal's function and ultimately lead to system failure.

There are several products and techniques that prevent contaminant ingress or there can be costly tradeoffs. For example, redundant sealing systems or innovative material choices may improve exclusion, but may also add friction to the system or may not perform well under all conditions. The better choice may be as simple as customizing the exclusionary seal that's in use.

### Requirements on sealing systems.

Seals must meet a variety of requirements and any flaw may impair the hydraulic system. For example, an exclusionary seal (or "wiper") not only must prevent ingress, but also allow a minute oil film to remain on the rod to re-enter the cylinder. (In fact, oil that's scraped off the rod by the wiper is often mistaken as system leakage. Ingress of dirt, metal particles or even fibers can interrupt the continuous sealing bead at the cylinder's main rod seal.

Aggressive exclusionary sealing can increase friction and heat. Sealing systems can also affect desired system movement and forces, like smooth motion control and precise positioning. Friction and stick-slip are caused by a jump between hydrodynamic lubrication (two surfaces separated by a thin film of oil) and boundary lubrication (two surfaces mostly in contact). These must be minimized for smooth and consistent performance.

These are key design considerations, yet the best way to ensure the seal's leak-free operation and service life is keeping sealing interfaces clean.

### Problems and solutions.

High-pressure cylinder sealing systems normally consist of four elements: wiper, rod (or main) seal, buffer (or secondary seal) and the wear (or guide) bands.

**Wear bands** – While the wear band is not intended for exclusion, it often captures the internal debris suspended in the oil, causing leakage. Contaminants can also scratch the rod, creating a leak path. During assembly or fluid replenishment eliminate internal contamination, including:

1. Ensure that each component is clean (especially the fluid) before installation
2. Thoroughly flush the entire hydraulic system
3. Provide an adequate filtration system

**Buffer seals** – These act as "sacrificial barriers" to prevent fluid at high pressures from reaching the main seal. Typically, a buffer seal is only exposed to internal contaminants, such as metal chips or other fluid contaminants. Contaminants in the buffer seal and piston rod interface can magnify the

wear element because the pressure that the buffer isolates from the main seal is transferred to where the contaminant is trapped, damaging the rod surface.

**Main (primary) seals** – The main (or rod) seal resists deformation, wear and friction generation. It is not for exclusion. However, sometimes a beaded heel is machined or molded onto the main seal to reduce overall friction at lower pressures. A secondary purpose is to block contamination, however without a buffer seal, it's limited due to high pressure exposure.

Ideally, the main seal rides on a minute film of oil between the seal and shaft. When the piston extends, the oil film leaves the cylinder, then re-enters during stroke retraction. Many seals feature a clearance between the heel and rod to allow this "pump-back." However, a beaded heel impedes pump-back and may scrape off oil so pressure builds between the main seal and the wiper seal cavity, thus requiring special venting type exclusionary seals.

Since the heel acts as a wiper, contaminant abrasion can occur at the bead-rod interface. However, without pressure the bead simply holds the contaminants in place. Without a buffer, high system pressure can cause the seal to suffer complete collapse onto the shaft. The abrasive effects are amplified, likely resulting in rod damage.

**Wipers** – The wiper is the most effective means of preventing contamination. Wipers come in many forms, each with different benefits. Regardless, there are just three primary design elements: 1.) The wiper lip design; 2.) the load used to create the wiping effect; and 3.) the material used to resist wear. Wiper materials include:

- Rubber for low contamination at moderate speeds
- Urethane for high contamination at moderate speeds
- PTFE for light contamination at high speeds
- Metals (brass or bronze) for extremely heavy contamination at low speeds

The material and the design affect the load. Also, all design subtleties at the wiper and rod contact point are critical. For example, if a stiff component applies a heavy load to a small area with a sharp contact point, a good scraping action is created. However, this interface may not allow a fluid film back into the system. On the other hand, if a flexible component applies a light load to a wide area with a round contact point, it will allow the oil film back into the cylinder, but will lose some exclusionary capabilities.

Most applications require a compromise between these two situations. A wiper is designed to remove as much contamination from the rod as possible, while maintaining a thin film of fluid on the rod.

**Questions? Call the experts at Hercules – BARRIE, ON 800.665.7325 DORVAL, QC 800.565.6534**



An exclusionary seal with a sharp point will not allow oil back into the system, which shows up as leakage. Adversely, as the contact point radius is increased, dust invasion increases. (Metal-cased double lip wiper seal used as an example.)