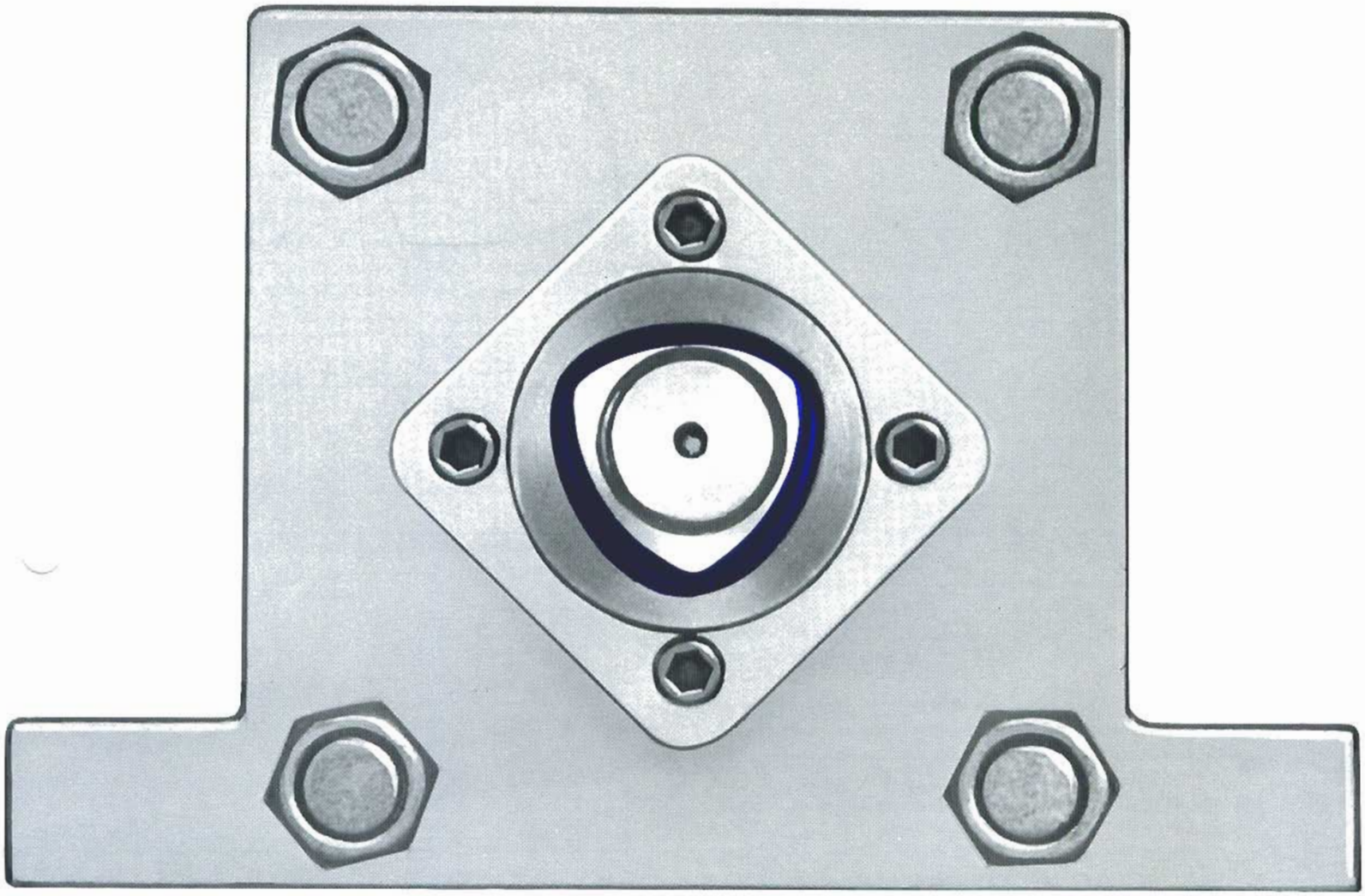
NOPAK®

NON-ROUND ROD CYLINDERS



THIS POSITIVE NON-ROTATING CYLINDER:

ELIMINATES OUTRIGGER RODS
ELIMINATES INTERNAL SPLINES
HIGHEST TORQUE CARRYING CAPACITY
INCORPORATES CONVENTIONAL COMPONENTS INCLUDING ROD PACKING

GALLAND HENNING NOPAK, Inc.

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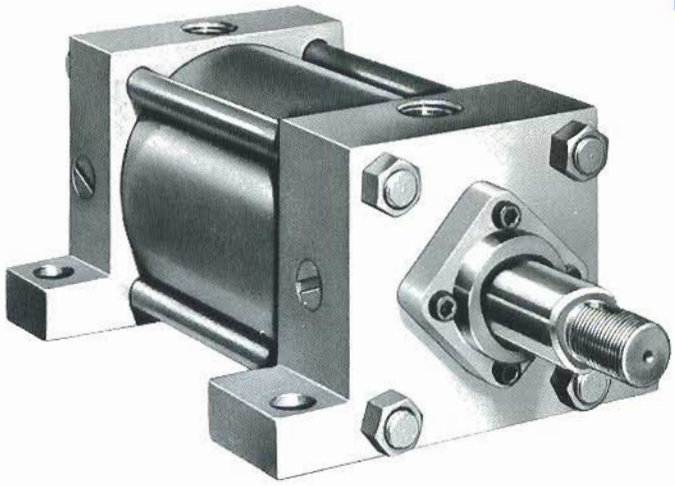
THE NOPAK NON-ROUND ROD *



The purpose of this design is to create a cylinder which has a rod free to reciprocate, but is rigidly prevented from rotating. In the past this has been accomplished by rather expensive and cumbersome assemblies employing outrigger guides of one sort or another, or by having the basic rod with an internal spline with the other end of this spline permanently attached to the blind-end head of the cylinder.

A cylinder with a rod restrained from rotating means that the machine designer can rely completely on the cylinder for both the movement and the guiding, whereas with presently available equipment, the machine designer has to provide his own guiding. Instances where guiding is required would be on a press used for broaching or on a press where embossing or imprinting is done and where the pattern has to be in a fixed position each time.

This new cylinder with the non-round rod will be commonly called The NOPAK Non-Round-Rod Cylinder. It cannot be called a non-rotating rod because the industry many years ago applied the non-rotating rod term to all cylinders generally. At that time, the object was to differentiate cylinders which normally were not built for continuous rotating duty and to separate them from cylinders with internal bearings and other special features where the rod is actually driven at a fixed continuous RPM.

The profile of the rod is a 3-sided oval or similar to a rounded off triangle. This is a mathematically calculated profile which can be mechanically reproduced and which has the following advantages:

(a) It has the highest percentage of surface contact thereby reducing the unit loading to a minimum.

(b) The profile is easy to manufacture with the correct equipment, and results in a better fit between the rod and the guiding gland.

(c) The torque carrying capacity of the profile is a function of the shaft diameter and not of a key spline or other similar old-fashioned devices. The larger the non-round rod, the greater the torque resistance.

(d) The Non-Round contour is obtained by grinding, thereby providing the best possible surface finish after heat-treating.

(e) The Non-Round profile has no sharp corners of any kind thereby eliminating stress concentration and automatically increasing the torsional strength of the rod.

The profile of the Non-Round rod is such that conventional seals adapt themselves to this profile and seal much as if they were sealing in the round conventional manner.

Because the Non-Round profile is a mathematically developed one, the torsional resistance values of this profile can be easily and accurately calculated. Knowing the torque that the rod has to resist, it is easy to accurately select the correct bearing material for the gland to keep the bearing loads at a satisfactory level.

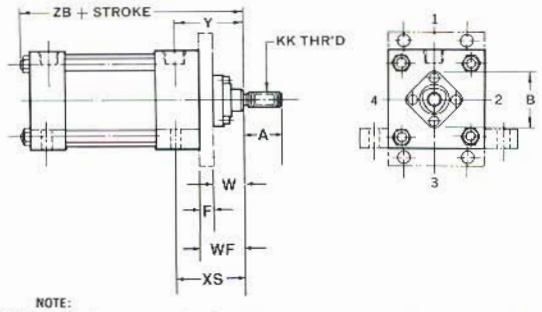
A non-rotating fixed connection at the rounded portion of the rod is obtained by a keyway or other similar means. This feature can be varied to suit the needs of the customer.

The use of this Non-Round profile rod to replace splines and keyways is not new. To the contrary this is a well-proven design, having been used for many years. However, the novel feature here is the incorporation of a rod of this type as an integral part of a cylinder, thereby advancing the achievement of satisfactory sealing of the rod at the same time.

Non-Round Cylinder Class #3

Nominal Rod Dia.	Maximum Angular Clearance	Rated Torsional Moment	A	B	KK	Cyl. Dia.	F	W	Y	WF	XS	ZB	Max. Stroke Inches
1"	0°-30'	5000 in lbs.	1⅛	2⅜	¾-16	2	⅜	¾	2 7/16	1⅜	1⅞	6½	18
						2½	⅜	¾	2 7/16	1⅜	2 1/16	6¾	18
2"	0°-14'	15000 in lbs.	2¼	4	1½-12	3¼	¾	⅞	3	1⅝	2 5/16	7⅞	27
						4	⅞	⅞	3⅛	1¾	2⅝	8¼	27
						5	⅞	⅞	3⅛	1¾	2⅝	9	27

SEE CATALOG 103 FOR ALL OTHER DIMENSIONS.



NOTE:
1. Dim. "W" Pertains to Model D & DD Cylinder Assembly.
2. Dim. "XS" Pertains to Model A Cylinder Assembly.
3. Dim. "WF" Pertains to All Other Model Cylinder Assemblies.

Non-Round Rod Cylinder Class #6

Nominal Rod Dia.	Maximum Angular Clearance	Rated Torsional Moment	A	B	KK	Cyl. Dia.	F	W	Y	WF	XS	ZB	Max. Stroke Inches
1"	0°-30'	5000 in lbs.	1⅛	2⅜	¾-16	2½	⅜	¾	2 1/16	1⅛	1½	5 3/16	18
						3¼	⅜	¾	2½	1⅜	1⅞	6 1/16	18
2"	0°-14'	15000 in lbs.	2¼	4	1½-12	4	⅝	⅞	2⅜	1½	2	6 1/16	27
						5	⅝	⅞	2⅜	1½	2 1/16	6½	27
						6	¾	⅞	2 13/16	1⅝	2 1/16	7 3/16	27
						8			2 13/16	1⅝	2 1/16	7⅞	27
						10			2 15/16	1⅝	2½	8¼	27

SEE CATALOG 106 FOR OTHER DIMENSIONS.

Refer to NOPAK Catalogs 103 and 106 for all other cylinder dimensions.
On 2" dia. rod size only, consult factory for strokes longer than 27".

For prices consult your NOPAK distributor.

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