

### 1. Receiving instructions.

Visually inspect all components for shipping damage. If shipping damage is found, notify carrier at once. Shipping damage is not covered by warranty. The carrier is responsible for all repair or replacement costs resulting from damage during shipment.

### 2. Preliminary procedure.

Read all instructions carefully before attempting to assemble or to operate your hydraulic equipment. Most malfunctions of new equipment are the result of improper operation and/or assembly.

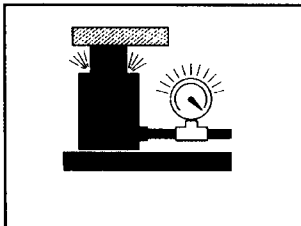
### 3. User safety and protection.

3.1 In setting up systems to fit your operations, care must be taken to select the proper components and design to ensure appropriate integration with your operations and existing equipment. Be sure that all safety measurements have been taken to avoid the risk of personal injury and property damage from your application or system.

3.2 ENERPAC can not be held responsible for damage or injury caused by unsafe product use, lack of maintenance or incorrect product and system applications. Contact ENERPAC for guidance when in doubt as to the proper safety precautions to be taken in designing and setting up your applications.

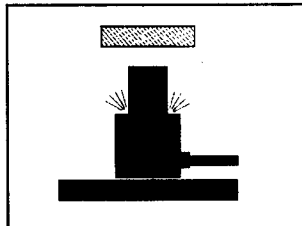
### 4. Warning.

DO NOT OVERLOAD CYLINDER



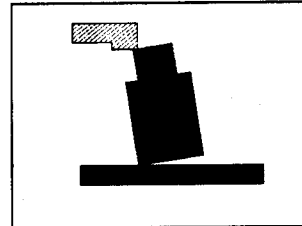
Be aware of clamping forces and DO NOT exceed them. Overloading causes equipment failure and possible personal injury.

DO NOT OVEREXTEND CYLINDER



Do not operate cylinder beyond limits of its rated stroke, it will cause unnecessary strain to the cylinder.

DO NOT APPLY OFF-CENTRE LOADS



Off-centre loads produce unnecessary strain on cylinders. Avoid point loading. Distribute evenly across the entire plunger surface.

#### RECOMMENDATION.

Use hydraulic gauges to indicate safe operating loads in each hydraulic system.

DO NOT exceed the safe limits of the lowest rated component within your system.

Use high pressure hoses and fittings in high cycle applications.

Start power pumps in open or neutral position to prevent uncontrolled movements of hydraulic components.

### 5. Product description.

5.1 Principle of MPFS-, WPFS-, MPTS- and WPTS-cylinder models is a wedge construction with a small angle which is self-locking. After the plunger is hydraulically locked into position, the system must be depressurized. The plunger will remain locked. To release the plunger the cylinder has to be pressurized on a different oilport. The plunger extends by means of a spring.

5.2 LOCKING SYSTEM. The holding force of the lock (wedge) system is proportional with the locking pressure as shown in the illustrations 1, 4 and 7.

To achieve optimal safety, limit the time of building up locking pressure in the 100- and 200-models to a maximum of two seconds and keep this pressure on for minimal two seconds. For the 450-models limit the time of building up the locking pressure to a maximum of two seconds and keep this pressure on for minimal five seconds. Read paragraph 7.

5.3 RETRACTION DURING LOCKING PRESSURE. Applying locking pressure creates an internal elastic deformation, the plunger retracts into the base. When locking pressure is released the internal elastic deformation is terminated. The plunger will be

locked in the original position. The plunger retraction during the locking pressure is shown in illustrations 2, 5 and 8.



**Important: Do not keep pressure on locking system during machining to avoid inaccuracy.**

TO PROTECT YOUR WARRANTY, USE ONLY **ENERPAC** HYDRAULIC OIL.

POUR PROTÉGER VOTRE GARANTIE, UTILISEZ EXCLUSIVEMENT L'HUILE HYDRAULIQUE **ENERPAC**.

UM IHRE GAGANTIE ZU GEWÄHRLEISTEN, VERWENDEN SIE NUR **ENERPAC** HYDRAULIKÖL.

PER PROTEGGERE LA VOSTA GARANZIA, USATE UNICAMENTE OLIO **ENERPAC**.

PARA PROTEGER SU GARANTIA, UTILICE EXCLUSIVAMENTE ACEITE HIDRÁULICO **ENERPAC**.

## 7. Operation.

7.1 SEQUENCE. MPFS-, WPFS-, MPTS- and WPTS- cylinders function the same. Each oilport activates a specific cylinder function as shown in illustrations 1A and 1B.

### 7.2 Sequence of operation:

- step 1: Install the workpiece on the support cylinder. The plunger position will adjust to the weight and contour of the workpiece.
- step 2: Pressurize oilport #1. The plunger will be locked in the supporting position and will retract as shown in illustrations 2, 5 and 8.
- step 3: Depressurize oilport #1. The plunger retraction (illustrations 2, 5 and 8) will be neutralized and will extend exactly into the supporting position. The cylinder must be depressurized to avoid inaccuracy.
- step 4: Pressurize oilport #3. The plunger will be unlocked. When the workpiece is removed the plunger will extend into its original position by means of a spring.

### 7.3 Operating conditions:

- Pressure on oilport #3 equal or higher than on oilport #1.
- Maximum time for building up the pressure in the locking system (oilport #1): 2 seconds.
- Minimum time for keeping pressure in the locking system (oilport #1): 2 seconds for 100 and 200-models.  
5 seconds for 450-models.

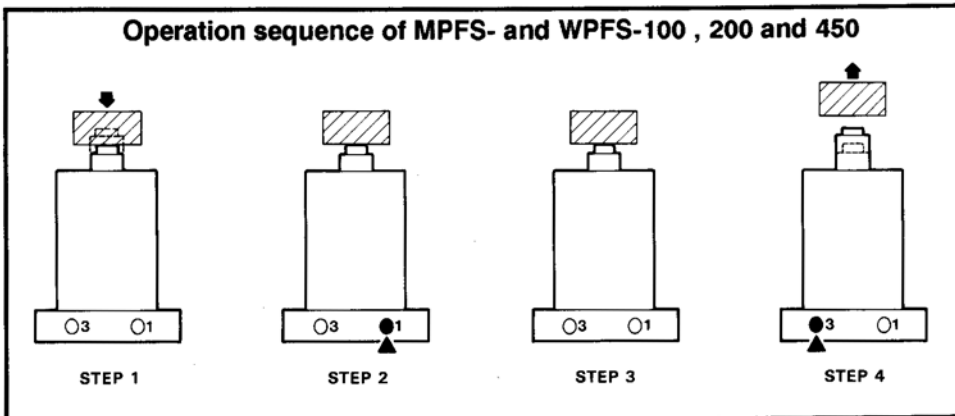


Illustration 1A.

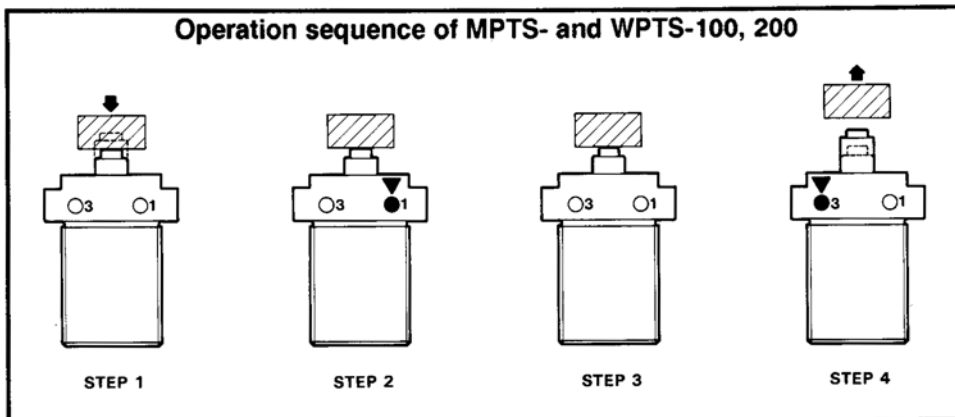


Illustration 1B.

## 8. Service.

Enerpac offers ready-to-use spare parts kits for repairs and/or replacements. Repair Parts Sheets are also available. Contact your nearest ENERPAC representative for more details.

## 9. Trouble shooting.

PROBLEM	POSSIBLE CAUSE	PROBLEM	POSSIBLE CAUSE
1. Cylinder will not advance	A. Broken spring B. Damaged plunger	5. Cylinder leaks oil	A. Worn or damaged plunger B. Leaking or loose connection
2. Cylinder advances partly	A. Spring too weak B. Cylinder plunger binding	6. Cylinder will not lock or unlock	C. Internal leakage D. Damaged seals
3. Cylinder advances in spurts	A. Spring too weak B. Cylinder plunger binding		A. Partially blocked hydraulic line B. Cylinder damaged internally or externally C. Damaged plunger
4. Plunger deflection too high	A. Use larger sized support cylinder		

## 6. Application.

6.1 POWER SOURCES. ENERPAC Collet Lock Work Support cylinders should be used with electric or air driven hydraulic pumps. Always check pump specifications to ensure adequate flow and pressure ratings. Cylinder specifications are mentioned in table 1 and 2. For applications demanding a different flow or pressure contact your ENERPAC representative.

Cylinder Model	Maximum Flow l/min (in <sup>3</sup> /min)	Minimum Pressure bar (psi)	Maximum Pressure bar (psi)	Temperature Range °C (°F)	Minimum Weight At Supporting Point N (lbs)	Flange Mountings
MPFS-100	10 (610)	100 (1450)	350 (5075)	5 - 60 (41-140)	20 (4.5)	---
WPFS-100						---
MPTS-100						---
WPTS-100						AW-95
MPFS-200	10 (610)	100 (1450)	350 (5075)	5 - 60 (41-140)	35 (7.9)	---
WPFS-200						---
MPTS-200						MAW-35
WPTS-200						AW-90
MPFS-450	10 (610)	100 (1450)	350 (5075)	5 - 60 (41-140)	300 (67.5)	---
WPFS-450						---

**Table 1.** Cylinder specifications and attachments.

6.2 ACCESSORIES AND INSTALLATION. Install support cylinders by threading them into fixtures or mounted flanges. ENERPAC support cylinders can be mounted in any position. For accessories such as flange mountings see table 1.

Cylinder Model	Oil Port Connections	Stroke mm (in)	Locking System Displacement		Viscosity Range cSt	Oil Type
			lock cm <sup>3</sup> (in <sup>3</sup> )	unlock cm <sup>3</sup> (in <sup>3</sup> )		
MPFS-100	G 1/4"	10 (.40)	4 (.24)	4 (.24)	15-250	HLP 32 ISO 3448-1975
WPFS-100	SAE #4 7/16"-20 UNF					
MPTS-100	G 1/8"					
WPTS-100	SAE #2 5/16"-24 UNF					
MPFS-200	G 1/4"	10 (.40)	6 (.37)	6 (.37)	15-250	HLP 32 ISO 3448-1975
WPFS-200	SAE #4 7/16"-20 UNF					
MPTS-200	G 1/8"					
WPTS-200	SAE #2 5/16"-24 UNF					
MPFS-450	G 1/4"	20 (.787)	18 (1.098)	18 (1.098)	15-250	HLP 32 ISO 3448-1975
WPFS-450	SAE #4 7/16"-20 UNF					

**Table 2.** Cylinder specifications.

6.3 DEFLECTION. Applying a load on the total construction results in an elastic deformation. When the external force on the plunger increases the plunger retracts more in the base. This deflection is shown in illustrations 3, 6 and 9..

The deflection is measured on top of the plunger when the cylinder will be under load, without pressure on the oilports. If the expected load on the plunger is higher than allowable a larger sized support cylinder should be used.

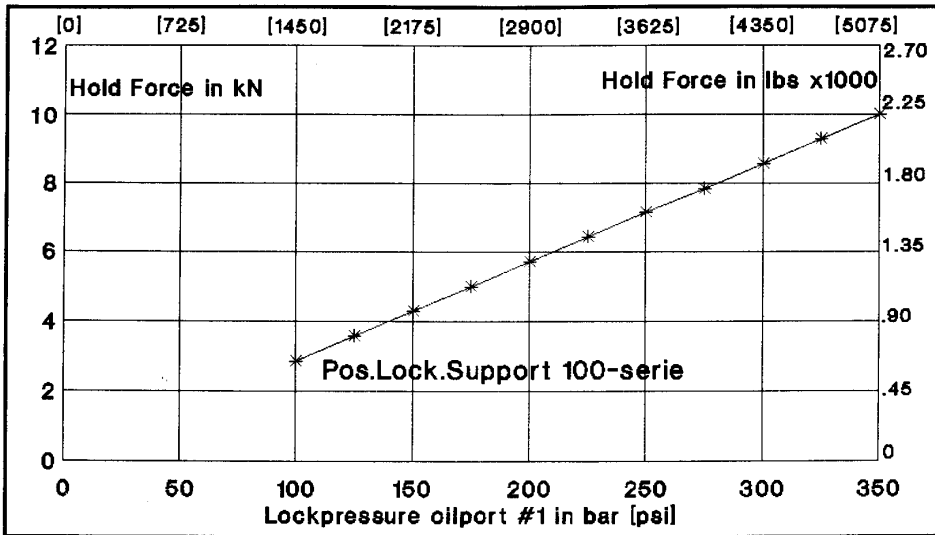


Illustration 1. Maximum Hold Force of MPFS-, WPFS-, MPTS- and WPTS-100.

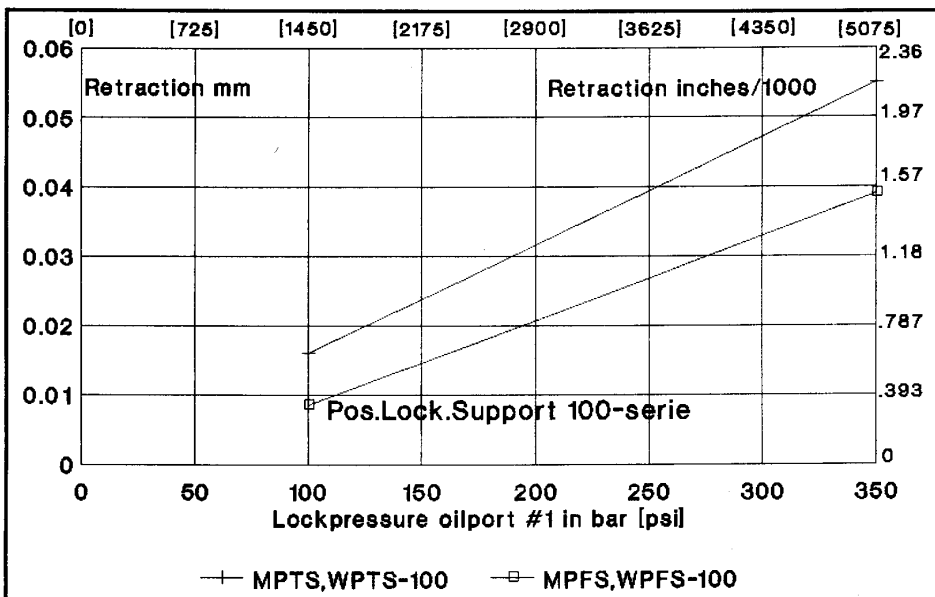


Illustration 2. Plungerend-retraction during locking of MPFS-, WPFS-, MPTS- and WPTS-100.

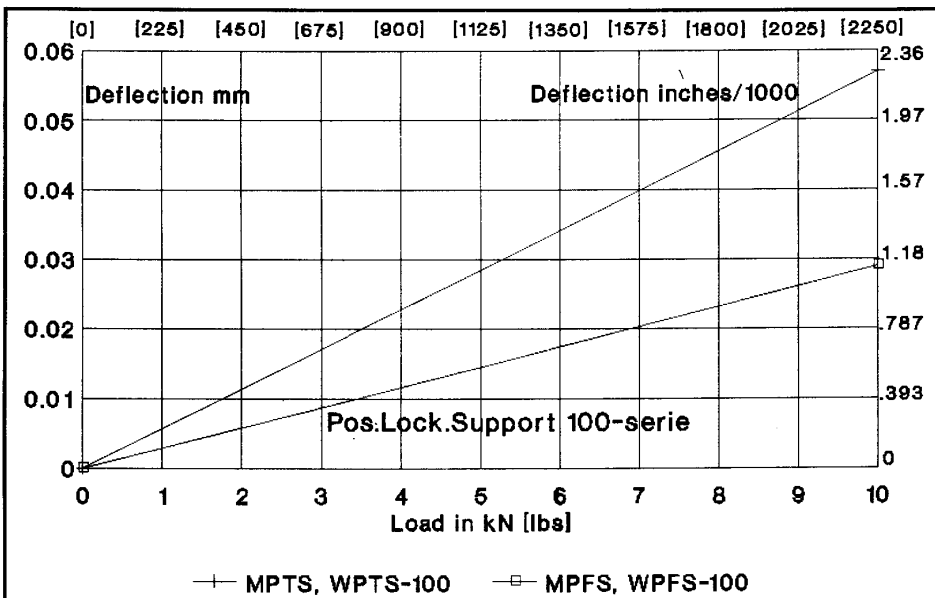


Illustration 3. Deflection of MPFS-, WPFS-, MPTS- and WPTS-100. No pressure on oilports.

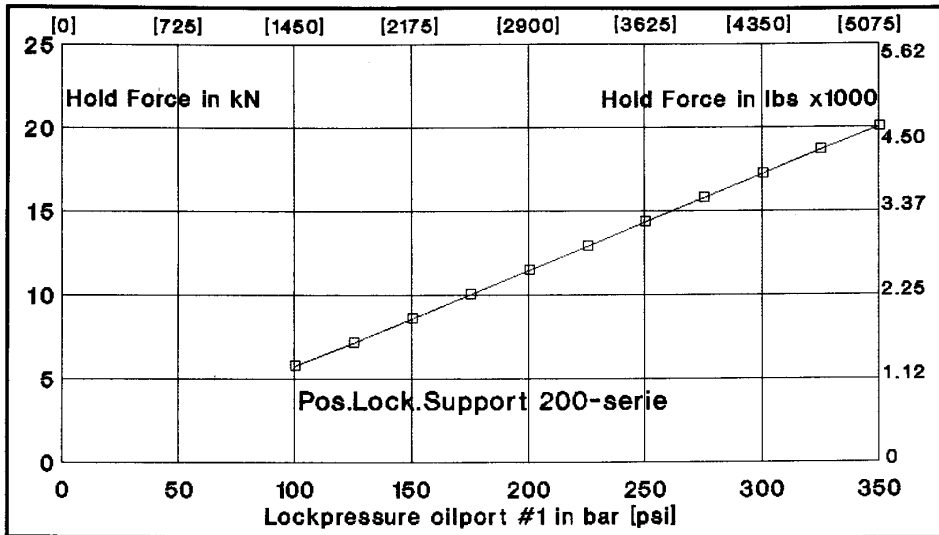


Illustration 4. Maximum Hold Force of MPFS-, WPFS-, MPTS- and WPTS-200.

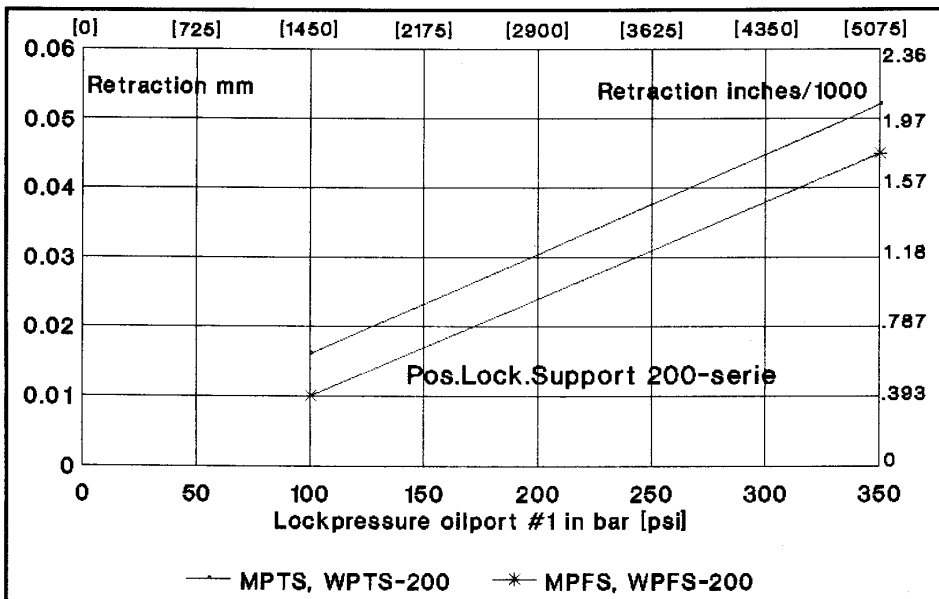


Illustration 5. Plungerend-retraction during locking of MPFS-, WPFS-, MPTS- and WPTS-200.

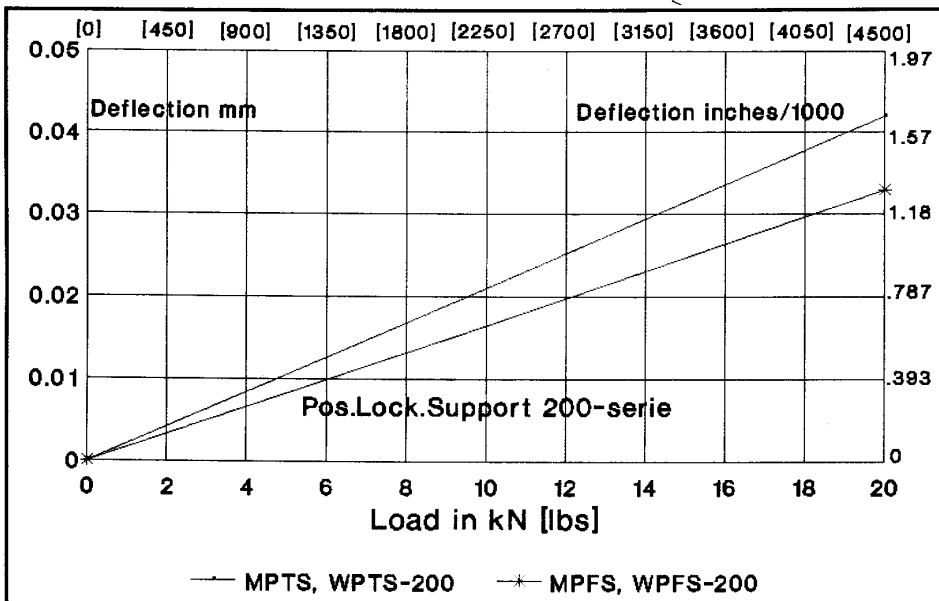


Illustration 6. Deflection of MPFS-, WPFS-, MPTS- and WPTS-200. No pressure on oilports.

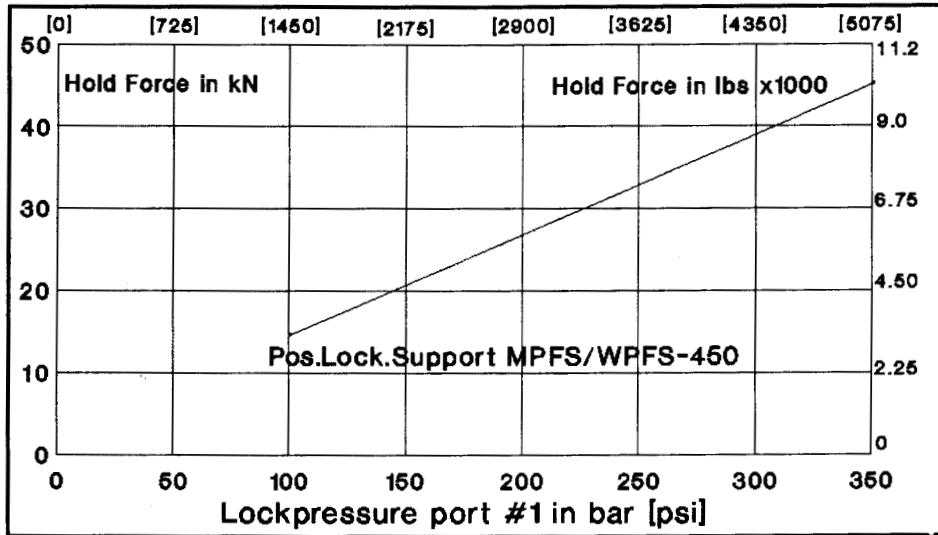


Illustration 7. Maximum Hold Force of MPFS-, WPFS-, MPTS- and WPTS-450.

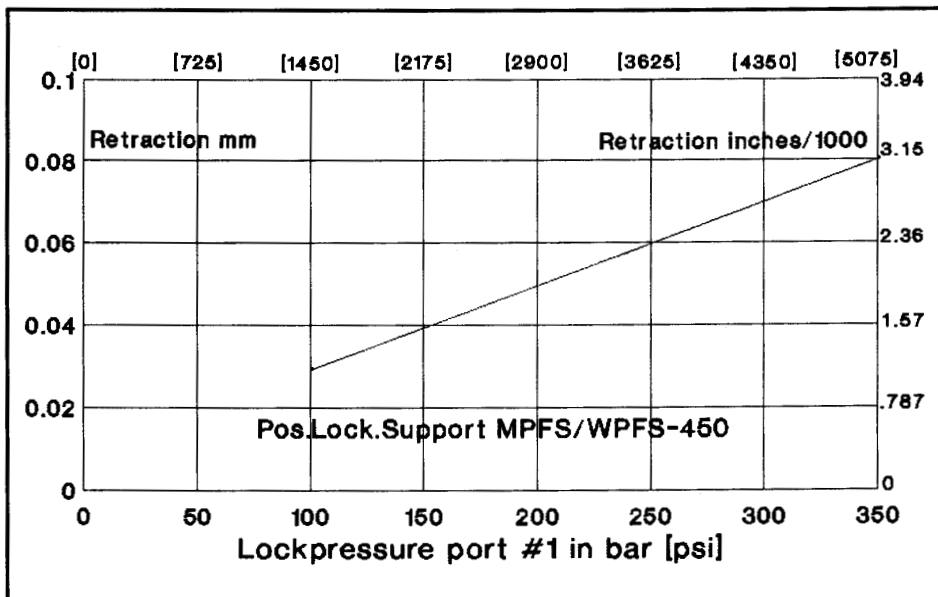


Illustration 8. Plunger end-retraction during locking of MPFS-, WPFS-, MPTS- and WPTS-450.

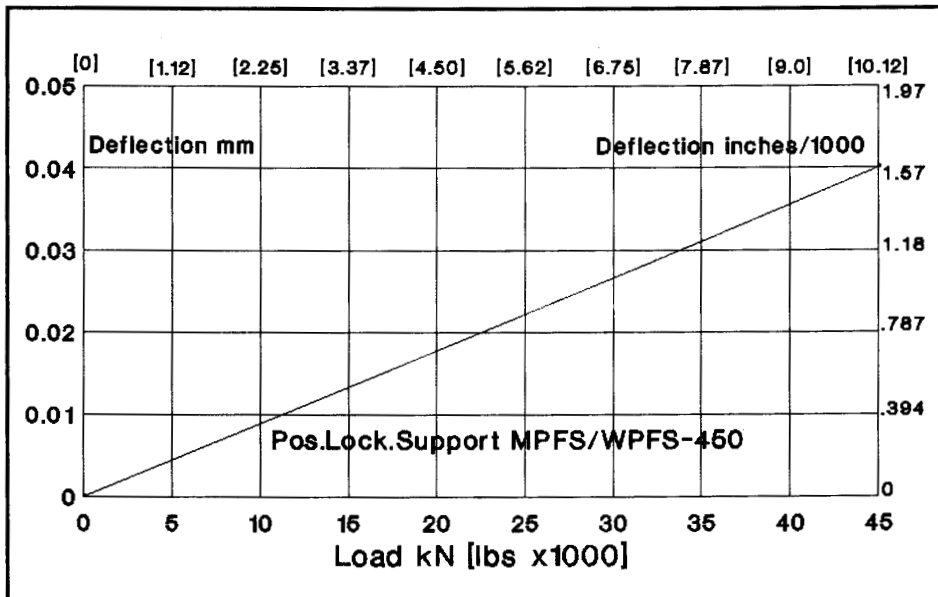


Illustration 9. Deflection of MPFS-, WPFS-, MPTS- and WPTS-450. No pressure on oilports.

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