

# MAINTENANCE AND OPERATING INSTRUCTIONS

## HK SERIES WORM JACKS

2 — 100 TONNES



**PLEASE READ PAGE 5 FIRST**

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## **HK SERIES WORM JACKS - OPERATING DATA**

### **CAPACITY**

Rated capacities of Jacks are maximum designed loads based on structural and mechanical strength and should not be exceeded.

These loads assume intermittent and/or low speed operation which will permit dissipation of heat.

When this is not the case the capacity of the Jack can be further limited by heat build-up in the worm wheel nut.

Except for very low speeds Jacks are suitable for continuous operation only at greatly reduced capacity.

Heat build-up in the nut can also become a problem when Jacks having very long screws are traversed through their full stroke in one movement.

### **HIGH SPEED OPERATION**

The maximum recommended input speed for HK series Jacks is 500 RPM unless the Jack is operating for very short intervals and at reduced load.

For short term operation input speeds of up to 1800 RPM are acceptable for loads not exceeding 25% of normal rated capacity.

### **SELF LOCKING**

Hercus HK series Jacks are self locking and will not lower of their own accord under steady load.

Where externally induced vibration is present this does not necessarily apply and the Jack could creep down unless some other form of positive locking is provided.

### **LIFT LIMITATIONS**

For applications where the load screw is under tension the capacity of the Jack is not limited by the length of travel. When the screw is under compression the maximum allowable load is limited by the column strength of the screw.

### **SIDE LOADS**

The HK series of jacks are intended primarily for raising and lowering loads and side thrusts should be avoided or taken by guides wherever possible.

Any side thrust will reduce efficiency and accelerate wear.

## **OPERATING TEMPERATURE**

Load and speed ratings for HK series Jacks are based on ambient temperatures up to 80 deg.C.

The use of high temperature greases will permit this to be raised to 170 deg.C.

## **BACKLASH**

Backlash in Jacks is an accumulation of clearance in the lifting screw, the worm gearing and load bearings and must be sufficient to accommodate lubricant and prevent binding under load.

The backlash present will vary from approximately 0.25mm in HK2T series to approximately 0.50mm in HK20T sizes.

## **CONNECTION IN SERIES**

For Jacks operating in series the number of units which may be connected in line is limited by the torque capacity of the input shaft of the first Jack.

Where Jacks are operating at less than full load the number in series may be increased proportionally.

## **LUBRICATION**

HK Series worm Jacks are despatched packed with grease which under normal conditions should be sufficient for six to eight weeks operation. In regular use the Jack should be lubricated every six to eight weeks using one of the following extreme pressure greases or their equivalent.

Shell Alvania EPI  
Caltex Ultra Duty Grease 2  
Ampol EPCI  
Mobil Mobilux EP2

For very severe conditions the jack should be lubricated weekly with a molybdenum disulphide grease in both the box and on the screw thread.

When Jacks are operating continuously or at high speeds lubrication must be more frequent and it may be necessary to make some alternative arrangement for lubrication of the screw thread.

## **INSTALLATION**

When installing worm Jacks it is essential to ensure that they are securely bolted on rigid mounts with proper support and adequate foundations.

Connection of input shaft and lifting screw should be checked for alignment.

Where mis-alignment is likely to pose a problem the input connection should if possible be made through some type of flexible coupling.

Prior to starting up the installation should be cranked over by hand to ensure freedom from binding.

Power operated installations should where appropriate, have limit switches, visual travel indicators or safety stops to guard against over travel.

In addition a positive stop should be installed to prevent the lifting screw from being ejected from the jack in case of accidental over travel.

When Jacks are to be used under conditions of stalled load a torque limiting clutch or similar mechanism should be incorporated to guard against accidental overloading.

## **MAINTENANCE**

In service, Jacks should be checked regularly for cleanliness, damage and wear.

Load screw threads should be kept clean and lubricated and in dirty conditions it is desirable that they be covered by protective boots.

Dust or grit should not be allowed to accumulate around working parts.

When not in operation Jacks should be left in the closed position if circumstances permit.

Drive connections should periodically be checked to ensure continued alignment.

Linear backlash in the lead screw should be checked periodically for wear in the worm wheel nut.

When wear in the worm wheel nut thread exceeds half of the thread thickness a potential danger of shear failure under full load could exist and the nut should be replaced.

## **OPERATION**

### **CAUTIONS, HAZARDS AND NOTES**

#### ***PLEASE READ FIRST BEFORE OPERATION***

Prior to starting up the installation for the first time you should manually operate the Jack Assembly by hand to ensure freedom from binding.

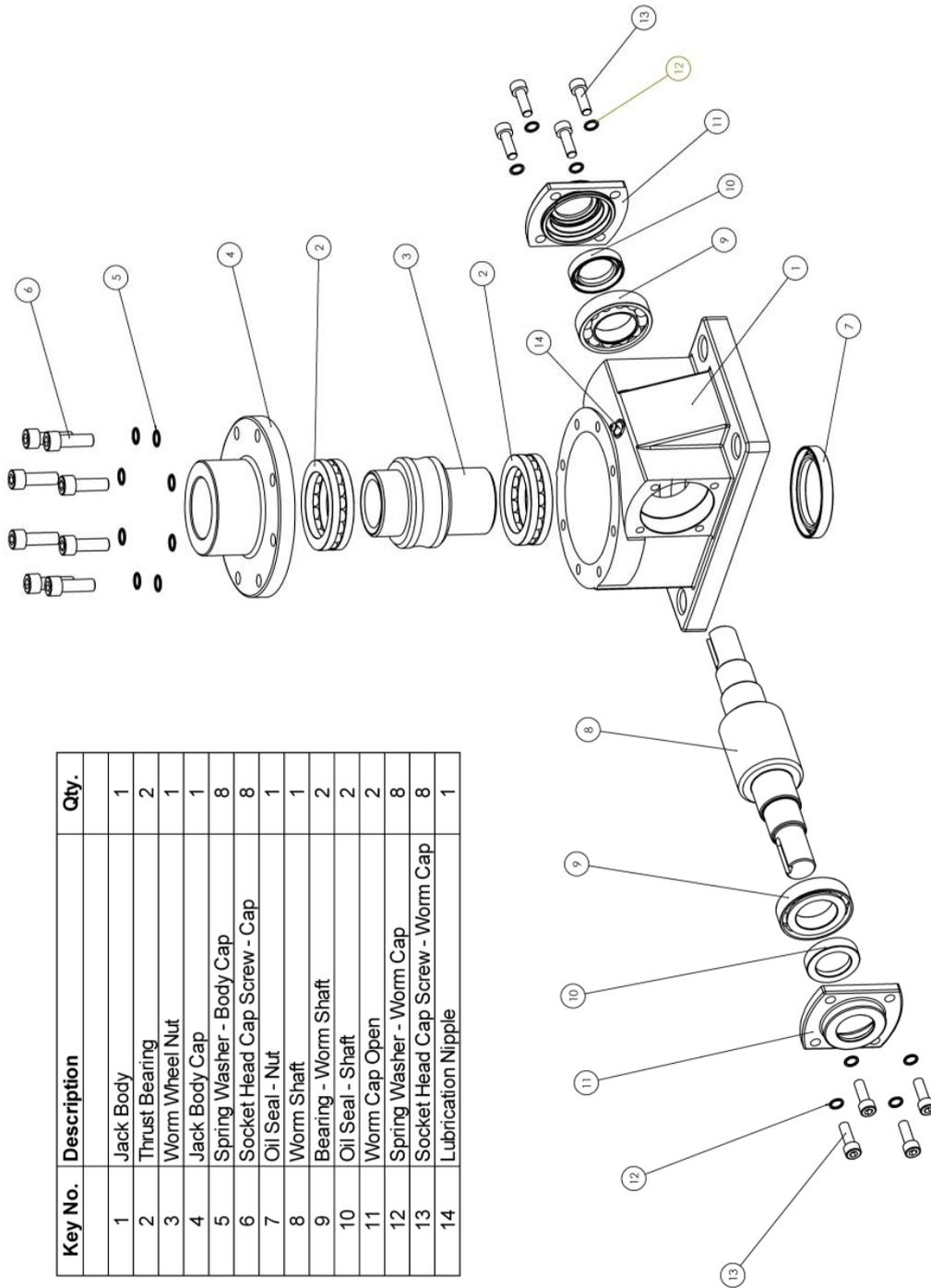
All installations should if possible have end Stop Nuts fitted. These nuts aid as visual travel indicators and prevent the screw from over travel. If the worm screw nut should fail, the stop nuts would prevent the screw from being ejected from the worm jack assembly.

In all automatic and powered installations a positive stop arrangement should be fitted at each end to prevent the stop nuts from making contact with the jack body or jack mounting plates.  
e.g. fitting of limit switches or stroke limiting devices.

When Jacks are to be used under conditions of stalled load a torque limiting clutch or similar mechanism should be incorporated to guard against accidental overloading and screw jack damage.

When self supporting bellows are used, never allow the stop nuts to compress the bellows assembly against the worm jack or mounting plates. Damage will occur to the bellows assembly and normal bellows operation may not be possible. If this situation occurs, check bellows assembly before resuming normal operation of worm jack assembly.

Keep worm jack and screw assemblies well lubricated at all times.



## Part List

The above diagram demonstrates an average assembly, variations will occur between different models.

e.g. 2 and 5 tonne Jacks do not have 'worm cap open' fitted as standard.

## **NOTES**

Information contained in this manual should be used as a guide only.  
Hercus reserves the right to change designs and specifications without notice.

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