



**BRANO a.s, 747 41 Hradec nad Moravicí**

**The Czech Republic**

tel.:+420/ 553 632 318, 553 632 345

fax:+420/ 553 632 407, 553 632 151

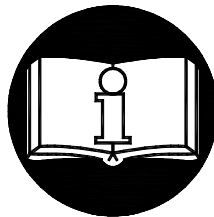
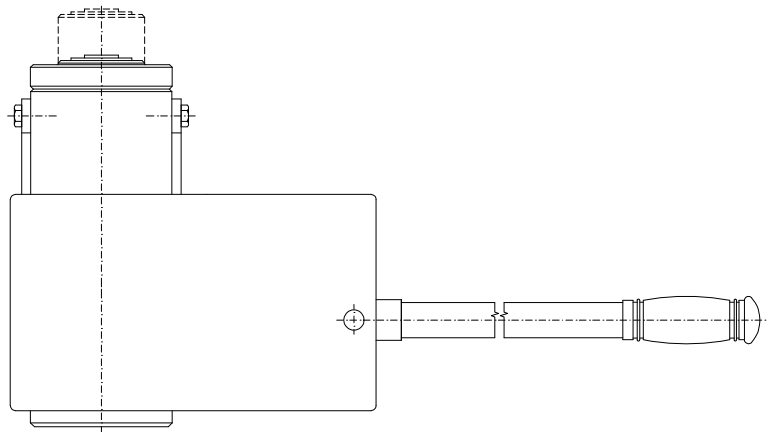
<http://www.brano.eu>

[info@brano.eu](mailto:info@brano.eu)

**SAFETY PRINCIPLES, OPERATION AND MAINTENANCE  
MANUAL  
FOR**

**HYDRAULIC JACK**

**type Z 320, lifting capacity 25t, 50t and 100t**



Read this manual carefully before using this product. The manual contains important safety, installation, operation and maintenance instruction. Make this manual available to all responsible persons.

**Keep for further use!**

Edition 1st

MARCH 2008

Evidence number 1-52231-0-1



# CONTENT

<b>1. DEFINITION</b> .....	<b>3</b>
<b>2. INTENDED PURPOSE</b> .....	<b>3</b>
<b>3. SAFETY PRINCIPLES</b> .....	<b>3</b>
3.1 SAFETY SUMMARY .....	3
3.2 SAFETY PRINCIPLES .....	4
<b>4. PACKING, STORAGE AND MANIPULATION</b> .....	<b>5</b>
4.1 PACKING .....	5
4.2 STORAGE .....	5
4.3 MANIPULATION AND TRANSPORT .....	5
<b>5. MAIN TECHNICAL PARAMETERS</b> .....	<b>6</b>
<b>6. OPERATION ON JACK</b> .....	<b>6</b>
6.1 INSTRUCTION FOR JACK OPERATOR .....	6
6.2 INSPECTION OF THE SUPPORT PLANE .....	6
6.3 POSITION OF JACK DURING LIFTING OR LOWERING .....	6
6.4 LIFTING A LOAD .....	7
6.5 LOWERING A LOAD .....	7
6.6 TEST BEFORE USE .....	7
6.7 INFORMATION FOR OPEARTOR .....	8
<b>7. OPERATION</b> .....	<b>8</b>
7.1 USE OF THE JACK .....	8
7.2 SAFETY WORKING ENVIRONMENT .....	8
<b>8. INSPECTION OF JACK</b> .....	<b>9</b>
8.1 INSPECTION .....	9
8.2 INSPECTION PROCEDURE .....	10
<b>9. TROUBLESHOOTING</b> .....	<b>10</b>
<b>10. LUBRICATION</b> .....	<b>11</b>
10.1 GENERALLY .....	11
10.2 MECHANISMUS OF THE JACK .....	11
<b>11. MAINTENANCE</b> .....	<b>11</b>
11.1 SAFETY PRINCIPLES .....	11
11.2 GENERAL INSTRUCTION .....	11
11.3 EXCHANGE OF PISTON CUP (DISMANTLING OF PISTON) – PIC. 11.3 .....	12
11.4 DISMANTLING OF THE PUMP .....	12
11.5 CHECK .....	12
11.6 REPAIRS .....	13
11.7 TEST .....	13
<b>12. REMOVING FROM OPERATION – LIQUIDATION</b> .....	<b>13</b>
<b>13. RELATED DOCUMENTATION</b> .....	<b>13</b>
<b>14. FINAL REQUIREMENTS OF THE MANUFACTURER TO A CUSTOMER</b> .....	<b>13</b>

## 1. DEFINITION

### **! DANGER**

**Danger:** indicates the presence of a hazard, which will cause death or severe injury if the warning is ignored.

### **! WARNING**

**Warning:** indicates the presence of a hazard, which can cause death or severe injury if the warning is ignored.

### **! CAUTION**

**Caution:** indicates the presence of a hazard, which can cause minor injury if the warning is ignored. Caution can also indicate dangerous practices.

**Lifting capacity (Q):** indicates maximum mass of load (working load limit) the jack is designed to support in general service under conditions given by this manual.

## 2. INTENDED PURPOSE

2.1 Hydraulic jack type Z 320, lifting capacity 25t, 50t and 100t (further only jack) is designed solely for manual lifting, lowering and pulling free and heavy loads in a vertical direction. The mass of load must not exceed nominal lifting capacity.

2.2 Design of the jack meets requirements given by Directive of European parliament and Council 98/37/EC in wording of the Czech technical regulation – government order no. 24/2003 Sb. in valid wording and requirements of harmonised Czech technical standards ČSN EN ISO 12100 - 1 , ČSN EN ISO 12100 - 2, ČSN EN 1050 , ČSN EN 1494.

## 3. SAFETY PRINCIPLES

### 3.1 SAFETY SUMMARY

Danger exists particularly when the jack is not used properly or is poorly maintained. Since an accident or serious injury could result, special safety precaution apply to the operation with the hydraulic during its use, maintenance and inspection.

### **! WARNING**

**NEVER** lift loads near people.

**NEVER** lift more than lifting capacity shown on the jack.

**ALWAYS** make sure the ground is firm enough to support safely fully loaded jack and all lifting operation.

**ALWAYS** let people around to know when lift is about to begin.

**ALWAYS** read the operation manual and safety instructions.

Remember proper rigging and lifting techniques are the responsibility of the operator. Check all applicable national directions, regulations and standards for further information about the safe use of your hydraulic jack.

## 3.2 SAFETY PRINCIPLES

### **! WARNING**

#### 3.2.1 Before use

**ALWAYS** ensure physically strong, qualified and instructed persons elder 18 years of age, knowing this manual and trained in safety conditions and way of work operate the jack.

**ALWAYS** check the jack every day, prior starting the work according to the article 8.2.(1) „Daily inspection“.

**ALWAYS** make sure the lift is sufficient for intended operation.

**ALWAYS** make sure the jack stand on firm ground (see art 6.2).

**ALWAYS** make sure the jack stand vertically.

**NEVER** lift loads firmly fixed or of unknown weight.

**NEVER** use damaged or worn jack.

**NEVER** use jack without visible marking of the lifting capacity on it.

**NEVER** use a jack marked by the label „**OUT OF SERVICE**“.

**ALWAYS** consult use of the jack in non-standard or extreme conditions with manufacturer or the authorised representative.

#### 3.2.2 While operation

**ALWAYS** make sure the load is properly placed on a jack.

**ALWAYS** pay attention not to exceed maximum height of lift marked by the red groove on a piston.

**ALWAYS** secure load against undesirable movement.

**ALWAYS** after lifting a load ensure the piston of the jack by the nut.

**ALWAYS** put away a load if you intend to work yet on it.

**ALWAYS** pay a special attention to a jack, if piston is released to maximum position.

**NEVER** lengthen hand lever.

**NEVER** use the jack for anchoring loads.

**NEVER** allow the load, causes impacts or vibrations.

#### 3.2.3 After use

**NEVER** leave lifted load without attendance.

**ALWAYS** remove from jack impurities (dust, sand, mug etc.)

**ALWAYS** ensure piston of jack by the nut

### 3.2.4 Risk analysis

The analysis of possible risk in light on design, operation and environment of the hydraulic jack application is mentioned in freestanding document "Risk analysis" . This document can be required in service centres.

### 3.2.5 Maintenance

**ALWAYS** let qualified personnel inspect the jack regularly.

Only such interventions can be done when maintaining that are in compliance with requirements of the manufacturer specified in the chapter 11 of this manual.

**It is not allowed** to provide repairs and maintenance in a different way then specified by the manufacturer. It is especially prohibition of use of no original parts or providing changes of product without the agreement of manufacturer.

## 4. PACKING, STORAGE AND MANIPULATION

### 4.1 PACKING

4.1.1 Jacks are supplied assembled with hydraulic liquid, free loaded in transport cases. Every hydraulic jack of standard version is equipped with hand lever.

4.1.2 The following accompanying documentation is a part of the delivery:

- a) Operation Manual
- b) EC Declaration of Conformity
- c) Certificates of Quality and Completeness and Guarantee Card
  - c1) Guarantee period is stated in the Guarantee Card.
  - c2) The guarantee does not apply to defects caused by infringement of the instructions stated in this Operation Manual and defects occurred owing to improper use and unskilled intervention.
  - c3) The guarantee does not apply also to modifications on the product without an approval of the manufacturer.
  - c4) Claim of product defects is carried out according to applicable provisions of commercial code eventually as amended.
- d) List of service centers (for the Czech and Slovak Republics only).

### 4.2 STORAGE

Store jacks in dry and clean stocks free of chemical influences and vapors.

- (1) Remove from jack all dust, water and impurities.
- (2) Push piston into the initial (lowered) position.
- (3) Store the jack so as the piston was in vertical position.
- (4) During further use follow instructions of the article 8.1.4 „ Occasionally used jack“.

### 4.3 MANIPULATION AND TRANSPORT

#### **! CAUTION**

**Draw tight the bolt of the screw plug (5) - pic. 6.4.** The jack must be transported in working position only – piston must stand vertically. Follow the valid technical regulation and standards and standards for work with heavy loads.

The hydraulic jack is not portable by women and persons under 18 years of age.

## 5. MAIN TECHNICAL PARAMETERS

Type	Lifting capacity (t)	Lift (mm)	Operating force (N)	Operating pressure (MPa)	Range of operating temperature	Service fluid (l)	Weight (kg)
Z 320	25	145	310	65	-10°C až +50°C	1	25
	50	145	310	65		2	48
	100	145	310	65		4	95

### 5.1 DATA ON PRODUCT

Every product is fitted with a label with specified data as follows:

<b>Standard design:</b>
Manufacturer's identification
Address of the manufacturer
Type of product
Lifting capacity
Serial number
Year of production
CE marking

## 6. OPERATION ON JACK

### 6.1 INSTRUCTION FOR JACK OPERATOR

#### **! CAUTION**

The jack is supplied with oil fill – low freezing oil OLN-J22. **Loose bolt of the screw plug before starting work** (5) - pic. 6.4., so as the air can penetrate into the tank. With tighten bolt of the screw plug, the underpressure will arise in tank and the pump will not work.

**ALWAYS** check the jack is not damaged before use.

**NEVER** allow the weight of the load or total piston thrust do not exceed nominal lifting capacity.

### 6.2 INSPECTION OF THE SUPPORT PLANE

#### **! WARNING**

**ALWAYS** make sure the plane surface is firm enough to support assumed load for the whole time of manipulation. Installation must not be carried out on the surface we cannot check the loading capacity or is unstable.

**ALWAYS** the user is responsible for positioning of the jack!

### 6.3 POSITION OF JACK DURING LIFTING OR LOWERING

During lifting or lowering the load the bottom of the cylinder of the jack (2) must lay on firm and big enough base, so as the jack will not sink into ground. Between body (1) and surface must be space (x); tank must not contact the ground - see pic. 6.1. Make sure the jack stand upright during lifting. Axes of piston (3) can be deviated from the vertical at max. about 3°.

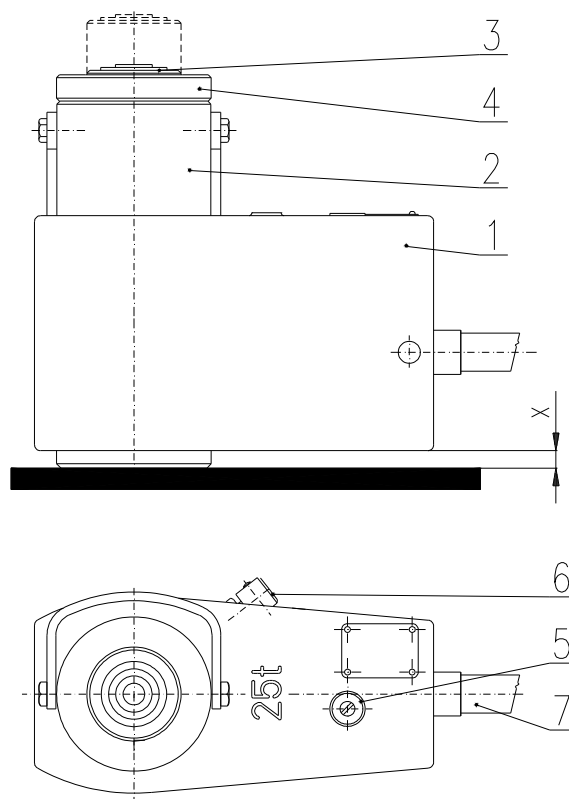
## **! CAUTION**

**ALWAYS** make sure the jack stands vertically during lifting.  
**ALWAYS** pay attention the tank will not sit on ground or support.

### **6.4 LIFTING A LOAD**

Release the screw of the thread plug (5), and unfasten screw of the drain valve (6) about 1 or 2 threads. By the pendulous movements of the lever joint (7) sucked the oil into the pump and its flush. Then tighten the screw of the drain valve (6) by the hand lever (7), by its opening of diameter 6,3 mm put through rounds steel of needed length for making out bigger torsion moment.

Lifting provide by the pendulous movement of the hand lever operating piston of the puma. After finishing of lifting ensure piston by the nut against self drop (4) - see pic 6.4.



**Obr. 6.4**

## **! WARNING**

**ALWAYS** pay attention during lifting so as not exceed maximum height of lift.

**NEVER** lift the piston of jack over the red marked groove, you will find under piston thread.

**ALWAYS** ensure the piston by the matrix after termination of lifting.

**NEVER** lift load a load that is touching or lean ensuring matrix of piston (4)

### **6.5 LOWERING A LOAD**

Before lowering a piston, at first slightly lift up the piston by several pendulum motions of the hand lever and then unscrew the piston matrix to its top position.

Lowering the piston and speed of lowering control by releasing the screw of the drain valve (6) thanks to slide on hand lever. Before lowering the piston in dusty environment we recommend to clean up the surface of the piston.

## **! CAUTION**

**ALWAYS** tighten the drain valve (6) when finishing work with the jack.

### **6.6 TEST BEFORE USE**

## **! CAUTION**

(1) At first, look again at the previous articles and make sure that all steps were done correctly.

- (2) Check the jack and support face visually, whether they are without defects.
- (3) By the move of check the function of the jack without a load.
- (4) Provide several lifting and lowering with a suitable load (10% up 50% lifting capacity). At the same time check the jack, whether during lowering and stop keep the load without a drop of piston.

## **6.7 INFORMATION FOR OPEARTOR**

During longer storage of pump the sticking of balls into seats of valves and thus a malfunction of the pump. In this case release balls by flushing the pump, e.g. by the quick movement of the hand lever. If the balls cannot be released in this way, it is necessary to repair the pump.

### **! CAUTION**

It is necessary to fasten the screw in thread plug of the tank (5) and tight properly the drain valve (6) before the transportation of the pump.

By neglecting the above mention statement there is a risk of oil leakage with the result of pollution of the transport means and possible environment contamination.

## **7. OPERATION**

### **7.1 USE OF THE JACK**

Jack is intended for vertical lifting and lowering of heavy loads under normal condition on workplace. The jack is operated by the delivered hand lever. Can be used by organisation as well as private persons. As work with heavy loads can pose unexpected danger, it is necessary to follow all " Safety principles" according to the chapter 3.

### **7.2 SAFETY WORKING ENVIRONMENT**

#### **! WARNING**

- (1) The operating staff of the hydraulic jack must be demonstrably familiarized with this operation manual, must observe applicable safety and hygienic regulations and must be qualified for operation of this equipment.
- (2) The operating staff should be equipped with protective footwear and gloves for work with the jack.
- (3) The operating staff must have a clear and unobstructed view of the whole working area before starting the work. When it is not possible, one or more persons must help to supervise in the nearby area of the jack.
- (4) The operating staff must check, whether the entire work place is safe and whether there is as possibility of escaping from this area in case of endanger, before starting to operate the jack.
- (5) During the work with the jack the suitable distance of the operating staff from the load must be kept. It is prohibited to lift or lower bulky loads preventing to keep sufficient safety distance.



## **8. INSPECTION OF JACK**

### **8.1 INSPECTION**

#### **8.1.1 Inspection classifications**

(1) Initial inspection: precedes first use. All new or repaired hydraulic jacks shall be inspected by a responsible qualified person to ensure the qualified fulfillment of requirements of this operation manual.

(2) Inspection procedures of hydraulic jacks operated regularly are generally divided into two classifications based on the intervals at which should be performed. The intervals depend on the condition of the critical components of the hydraulic jacks and the degree of the wear and tear, deterioration or malfunction. The two general classifications are herein classed as daily and regular ones. The respective intervals are defined as follows:

**(a) Daily inspection:** visual inspection, carried by the operator, designated by the user.

**(b) Regular inspection:** visual inspection carried out by the qualified person designated by the user.

1) normal operation – once per year,

2) heavy operation – twice per year

3) special or infrequent operation – according to the recommendation of the qualified person at first usage and according to the directions of the qualified person.

#### **8.1.2 Daily inspection**

Regarding parts such as those recommended in the section 8.2(1) „Daily inspection“ verify, whether the girder clamp is without any defect. Provide this inspection also during operation in the interval between regular inspections. Qualified employees will determine whether any defect or damage can constitute a hazard and whether more detailed inspection is necessary.

#### **8.1.3 Regular inspection**

Complete inspections of the hydraulic jack perform as recommended regular inspections. These inspections may be performed with the hydraulic jack in its normal location. Recommended regular inspection specified in the section 8.2(2) shall be performed under the supervision of qualified persons that will determine, whether it is necessary to repair the girder clamp. These inspections shall include the requirements of the daily inspection as well.

#### **8.1.4 Occasionally used hydraulic jack**

(1) Hydraulic jack, which has been idle for a period of one month or longer but less than one year, remit to the inspection conforming to the requirements of the section 8.1.2 before follow-up putting it into operation.

(2) The hydraulic jack, which has been idle for a period of one year, remit to the inspection conforming to the requirements of the section 8.1.3 before follow-up putting it into operation.

#### **8.1.5 Inspection record**

Always keep the record of the performed tests, repairs, inspections and maintenance of the girder clamp. Dated inspection records perform in time intervals specified in the section 8.1.1 (2) (b) and such records store in an accessible place designated by the user.

## 8.2 Inspection procedure

### (1) Daily inspection (carried out by the operating staff or a qualified person)

PART	INSPECTION METHOD	LIMIT/CRITERIA FOR DISCARDING	REMEDY
1. Function of the jack	visually	Lever moves with difficulty or jammed, etc..	Clean and lubricate lever joint
2. Check of piston matrix	by screw	Matrix cannot be screwed up	Clean up thread in matrix and on piston and lubricate
3. Piston	visually	Immediate drop of piston after finishing of lifting	Tighten drain valve
3.1 Pollution of piston	visually	Polluted surface of sliding parts	Move out the piston and clean carefully

### (2) Regular inspection (carried out by the qualified person)

PART	INSPECTION METHOD	LIMIT/CRITERIA FOR DISCARDING	REMEDY
1. Fastenings	visually	Wrong or missing parts	Tighten or exchange
2. Oil check	visually	Lack of oil or its impurity	Fill or exchange of oil
3. Label	visually	Lifting capacity is not legible	Repair or replace by new
4. Piston	visually	Oil leakage around the piston	Exchange of piston cup (see art. 11.3)
5. All parts	visually	Worn or damaged parts  Polluted and unlubricated parts	Replace by new ones  Dismantle, clean, lubricate and assemble again

## 9. TROUBLESHOOTING

SITUATION	FAULT SOURCE	REMEDY
During lifting the piston moves very slowly or it does not move at all. Drop of piston caused by the load does not occur.	Leakage of pump inlet valve (B) or forcing valve (A) of pump or pump cup – see obr.11.3  Stuck piston.	Leakage caused by impurities you can try to remove by flushing of pump e.g. quick pendulum movement of hand lever. If the leakage appear henceforth, dismantle valves and clean up carefully. Exchange the rubber piston cup (see čl. 11.3)  Complete repair necessary.
After finishing of lifting self-acting drop of piston occur.	Leakage of drain valve (poz 1 obr. 11.3)	Tighten drain valve. If the fault lasts, dismantle

		valve and clean up.
Jack does not fulfil its function even after elimination of the above mentioned defects.	The move of the pressed in valve happened due to the neglected manipulation or non-observance of the instruction manual.	Necessary repair of the jack in production plant.

## 10. LUBRICATION

### 10.1 GENERALLY

Remove the old lubricant before application of the new one. Clean parts by the dissolvent and apply a new lubricant. Use the lubricant prescribed by the manufacturer.

### 10.2 MECHANISMUS OF THE JACK

Lubricate lever joint by the grease cup through lubrication plug in pivot by the lubricant PM-A2 or T-K3 or other grease determined for sliding bearings.

**ALWAYS** lubricate more often in corrosive environment than in normal one (salt water, sea climate, acids etc.).

**NEVER** use cleaning liquids on acid basis.

## 11. MAINTENANCE

### 11.1 SAFETY PRINCIPLES

**Maintenance can be carried out only by qualified persons trained in safety and maintenance of these jacks.**

**ALWAYS** use only original parts supplied by the manufacturer.

It is not permitted to perform repairs and maintenance the other way than prescribed by the manufacturer. It concerns especially the forbiddance of using unoriginal parts or carrying out modifications on the product without any approval of the manufacturer.

**ALWAYS** check the function of the jack after maintenance without a load.

**ALWAYS** mark the defective or repaired jack by the suitable label (for example: „OUT OF OPERATION“).

**NEVER** work with a jack, which is under repair!

### 11.2 GENERAL INSTRUCTION

The following instructions give general important information about dismantling, inspection, repair and assembly. If the hydraulic jack was dismantled from any reason, proceed according to the following instructions:

- (1) Provide maintenance in a clean environment.
- (2) **NEVER** dismantle jack more than it is necessary for providing a repair.
- (3) **NEVER** use heat as a means during dismantling parts, if these parts are determined for further use.

**NEVER** use cleaning liquids on acid base.

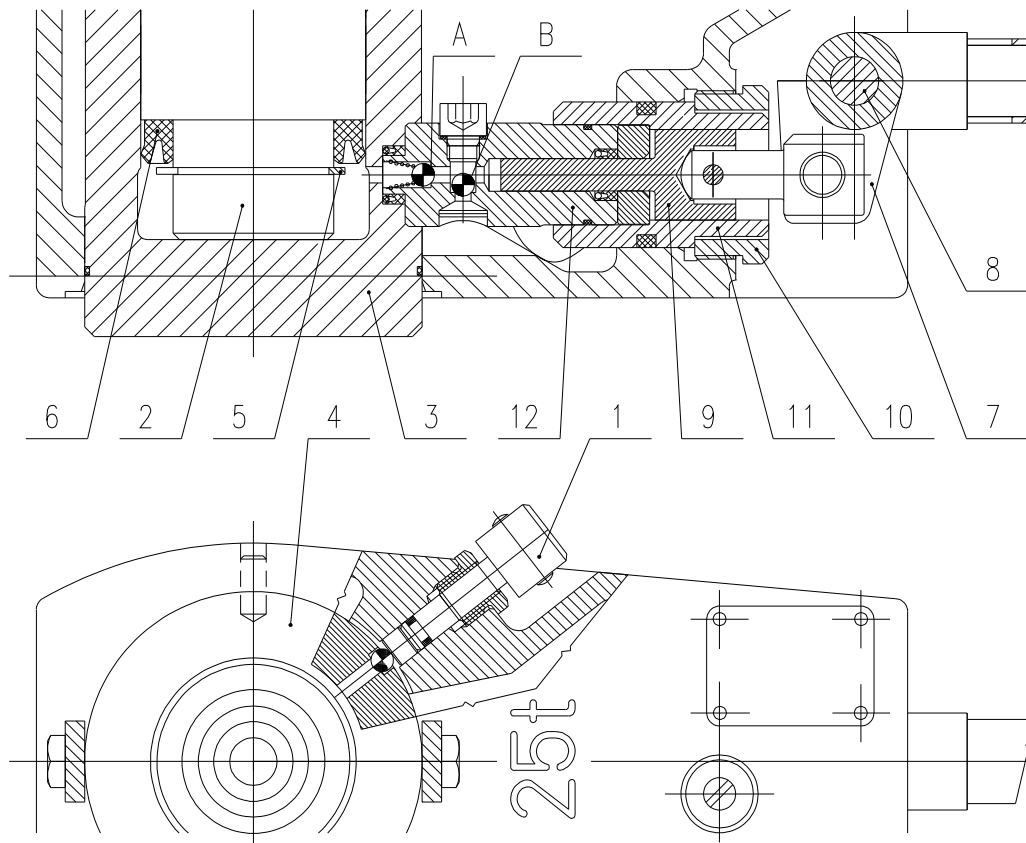
- (4) Keep the workplace clean and without foreign substances that could get onto piston bearing surface or into the inner mechanism of the jack.

(5) If the part is gripped in a vice, ALWAYS use suitable material (leather, copper, piece of wood, etc.) to protect surface of parts.

### 11.3 EXCHANGE OF PISTON CUP (DISMANTLING OF PISTON) – pic. 11.3

1. Release the drain valve (1).
2. Pull the piston (2) out of cylinder (3) together with matrix of piston (4).
3. Remove the retained ring (5) and piston cup (6).
4. After exchange of cup (6) provide assembly in a opposite sequence.

Pay attention so as no jam or scraping of the cup occur during putting piston into the cylinder. Make sure the piston was completely clean.



Obr. 11.3

### 11.4 DISMANTLING OF THE PUMP

1. Release retaining screw on joint lever (7).
2. Pull out pin of joint lever (8).
3. Together with joint lever (7) pull out piston of the pump (9).
4. By the help of socket wrench 55 unscrew matrix of the pump (10), pull out the flange (11) and pump body (12).

All dismantled parts especially inlet valve (B) and forcing valve (A) v body of the pump (12) thoroughly clean with technical benzine.

Pay attention so as all parts during regressive assembly were cleaned.

### 11.5 CHECK

Check all dismantled parts, whether they are suitable for further use.

1. Check all parts, if they are not worn out or do not have scratches or cracks.
2. Check, whether the thread parts does not have damaged thread.

3. Check all seals, especially piston cup.

### **11.6 REPAIRS**

Worn out or damaged parts shall be replaced, as the best in a specialised service. Small surface burns and scratches or other small surface defects remove and smooth by the fine abrasive stone or the abrasive cloth.

### **11.7 TEST**

The loading test shall be done at all repaired jacks by a qualified person or service workshop:

Apply a load not exceeding nominal lifting capacity of the jack. Lift piston about 10 mm and in this normal position should be left for min. 3 minutes (without arrestment of piston by matrix). Then piston is lowered into the origin position.

After this test the correct function of pump, hydraulic cylinder and drain valve is checked. Lifting and lowering must be fluent without sticking and seizure. During load in resting position during specified 3 minutes must not occur to evident drop of piston and oil leakage around piston cup or other seal.

## **12. REMOVING FROM OPERATION – LIQUIDATION**

Before removing the jack from operation dismantle the thread plug drain oil and rinse out the tank of the jack by the degreasing agent (benzine, etc.).

Deleted oil pass over to an authorised and professional firm dealing with petroleum waste category SR (special risk) or give it directly to garbage disposal plant having authorisation to combustion of such a waste. Thus treated jack give you can give to a firm dealing with liquidation of metal scrap.

## **13. RELATED DOCUMENTATION**

13.1 EC declaration of conformity

13.2 The instruction manual was elaborated in accordance with the following technical regulations, technical standards and national regulations:

- Ministerial order No.24/2003 of the Coll. Of Laws as amended (EP and Council directive 98/37/EC)
- ČSN EN ISO 12100 - 1
- ČSN EN ISO 12100 – 2
- ČSN EN ISO 14121-1
- ČSN EN 1494
- ČSN EN 13463 – 1 "

## **14. FINAL REQUIREMENTS OF THE MANUFACTURER TO A CUSTOMER**

**Any changes of the product, eventually use of unoriginal spare parts can be realised only based on approval of the manufacturer.**

**When not observing this condition the manufacturer does not guarantee safety of this product. In such a case the manufacturer warranty does not apply to the product.**



# EC Declaration of conformity



**Manufacturer**                      **BRANO a.s.**  
**747 41 Hradec nad Moravicí, Opavská 1000**  
**The Czech republic**  
**ID No.: 45193363      VAT No.: CZ45193363**

**We declare under our sole responsibility that the product**

<b>Name:</b>	<b>Hydraulic jack</b>
<b>Type:</b>	<b>Z 320</b>
<b>Parameters:</b>	<b>Lifting capacity: 25t; 50t; 100t</b>

**Description and purpose of use:**

Hydraulic jack is device determined for manual lifting and lowering of free loads under normal atmospheric conditions in the workplace upon observance of the maximum lifting capacity with own source of the pressure liquid.

**is in conformity with the following directories and standards:**

NV ČR č. 24/2003 Coll. of laws., RE directive no. 98/37/EC,  
ČSN EN ISO 12100-1:2004 (EN ISO 12100-1:2003), ČSN EN ISO 12100-2:2004  
(EN ISO 12100-2:2003), ČSN EN ISO 14121-1:2008(EN14121-1:2007), ČSN EN  
614-1 :1997, ČSN EN 1037:1997, ČSN EN 349:1994, ČSN EN 294:1994, ČSN EN  
1494:2001

**The following authorized body had a share in conformity  
assessment:**

-----

Hradec nad Moravicí    1.9.2004

Ing. Alena Šimečková

Ing. Zdeněk Pavlíček

Place

Date

Director of SBU ZZ

Manager Q SBU ZZ