

# Instruction manual

## Hydraulic tensioner for *LIEBHERR* crane



## Content

Introduction	3
1. Preparation	3
2. Calculation of traction force	3
3. Pressure and traction force adjustment	3
4. Operational set-up	4
5. Test run	4
6. Traction operation	4
7. Safety instructions	5
8. Maintenance	6
9. Prevent malfunction	6
10. EC Declaration of Conformity	7
11. Drawing	8
12. Pressure-force-diagram	9
13. Accessory	10
14. Schematic view	11

## Introduction

You have acquired a highly sophisticated Bolt Puller System. If you use the system properly, within its design limits, and assure proper and clean storage, the tool's life span and accurate performance will be according to the technical advantages of all PLARAD Bolt Puller Systems.

Traction Force +/- 2 %.

## 1. Preparation

- 1.1 Clean all surfaces where puller cylinders will be placed for operation. Set up area and bolt lateral axis have to be at an absolute right angle.
- 1.2 Threaded puller bolts which have been supplied by the customer have to be cleaned and greased (M05 2). Apply grease sparsely and evenly.



## 2. Calculation of traction force

- 2.1 The operation manual contains a diagram showing ratio of pressure force which fits the puller element shipped. You can use this list to determine the pressure required for a specific traction force.
- 2.2 You can also use the following formula to calculate the required pressure:

$$p = F / (10 \times A)$$

p = pressure [bar]  
 F = force [N]  
 A = piston area [cm<sup>2</sup>]

## 3. Pressure and traction force adjustment

- 3.1 Disconnect high pressure hose and switch pump on with remote control switch, until adjustments have been made. Adjust pressure by rotating the pressure adjustment valve knob until the pressure indicator shows the desired value. Comparison of the pressure indicated on the pump and the listed values in the manual assure an accurate setting of the tractive force.
- 3.2 **ATTENTION**  
Make sure that the indicator needle on pressure gauge shows ZERO when pump is running and remote switch is not being pressed. Should the needle point above or below ZERO, the pressure gauge might be defective and has to be exchanged. This is an accident hazard!
- 3.3 When the desired pressure is reached, push the OFF-switch on the remote control. The pump's motor stops.
- 3.4 When adjusting the pressure make sure that the traction values shown in the diagram are not extended. Otherwise the puller bolts might break.



## 4. Operational set-up

- 4.1 Screw puller bolt into the thread of the cone bolt which is to be pulled.  
The thread engagement has to be at least 0.8 to 1 of the thread diameter.
- 4.2 Put the hydraulic traction element over the puller bolt using an appropriate support tube and guide sleeve. Use hex nut (supplied by customer) to secure the support tube until it is flush.
- 4.3 Connect hydraulic hose between hydraulic puller and hydraulic pump.

## 5. Test run

- 5.1 The maximum piston travel is 20 mm. In order to use all of this distance, the piston has to be retracted completely. Basically, this is done a stack of springs which provide an automatic piston return when a hose is connected and the pump is pressure less.
- 5.2 The maximum travel is restricted by the cylinder cover.
- 5.3 After retraction of the piston to the base position, make sure that the Support tube is still flush. If not, tighten the hex nut.

## 6. Traction operation

After having completed steps 1 to 5 above:

- 6.1 Unscrew hex nut and lock nut on the other end of the cone bolt.  
Use a torque wrench. Do not remove hex nut completely.
- 6.2 Apply pressure to the puller element by switching the hydraulic pump ON and pressing the ON/ADVANCE-button on the remote control..
- 6.3 The cone bolt must come out of the cone sleeve.
- 6.4 Press OFF-button on the remote control of the pump. The motor stops and the piston retracts automatically to the ZERO-position.
- 6.5 After having removed the hex nut completely, the puller element can be taken off the bolt and be prepared for next operation.

## 7. Safety instructions

### Attention

- 7.1 When operating hydraulic traction systems the safety procedures as outlined by the authorities have to be followed strictly. The operating personnel has to be protected accordingly.
- 7.2 While a cylinder is under pressure, nobody must stand in direct pulling axis of the tool (**HAZARD OF ACCIDENT**).
- 7.3 Any safety pre-cautions have to be adjusted to the specific operational circumstances and the user is responsible for them.
- 7.4 The pump includes a safety valve which is set to the max. allowable pressure. **DO NOT CHANGE THE ADJUSTMENT !**
- 7.5 Observe the appropriate regulations for electric connections. Authorized electricians only are allowed to check electric power components.
- Pull the main plug before any maintenance.
- 7.6 Make sure that all hose connections are properly seated.  
**ATTENTION**  
Improperly made-up hose connections can be a cause of malfunction of the System. They are also a **SAFETY HAZARD !**
- 7.7 Do not twist or bend high pressure hoses. Do not pull them over sharp edges. Do not subject to temperatures higher than 70 degrees C (158° F).
- Regularly inspect hoses for damage. If there are any leaks during operation, the unit should be switched off immediately. Exchange hoses and couplings even if they show damage on the outside only.
- Protect the System from being thrown or pushed around. Do not remove covers and safety devices from pump.
- 7.8 Make sure all connections between puller element and bolt are secure and properly tightened. Recheck the accurate position of the puller cylinder during operation.



## 8. Maintenance

- 8.1. Maintenance of the hydraulic puller is limited to the outer appearance of the tool, such as corrosion prevention and painting.
- 8.2. Other than that, the traction cylinder is maintenance-free. It may be necessary to stock a spare set of seals in case an exchange of seal has to be done.

## 9. Prevent malfunction

Observe the following precautions to prevent malfunctions of your bolt puller system:

### Power Unit :

1. Make sure that the electric connection is done according to the regulations.
2. Make sure that the oil level in the reservoir is at or close to the maximum mark.
3. Make sure that pressure gauge and valves cannot be damaged.
4. Do not exceed the maximum operating pressure.  
Do not readjust pre-set valves.
5. Switch pump off when oil temperature shows more than 70 degrees C (150° F).  
Install oil cooler if necessary.



### Puller element :

1. Traction force to be adjusted according to included diagram. Do not exceed the maximum operational pressure, even if the pump could do it.
2. Do not twist or bend hoses and couplings. Keep hose connections clean.
3. Do not alter any components of the bolt-puller element.  
Do not remove any sealed fasteners.



### Epilog :

If you should have additional questions, then our service personnel or Technicians in the factory will certainly be able to help you.

## 10. EC Declaration of Conformity

It is, hereby, declared by the manufacturer,

Company:	Maschinenfabrik Wagner GmbH & Co. KG
	Birrenbachshöhe 17
	53804 Much

that the product,

Designation of machine/system:	Hydraulic tensioner
Type designation:	See data sheet
Serial no.:	See data sheet
Year of manufacture:	See data sheet

is in conformity with all applicable provisions of the EC Machinery Directive 2006/42/EC as well as with those provisions set out in the following EC Directives

### Name and address of the person authorized to prepare the technical documents according to Annex VII A:

Mr. Rüssmann

- Name -

Birrenbachshöhe 17, 53804 Much

- Address -

### Information about the signatory:

Mr. Rüssmann, Chief Designer

Name, Position

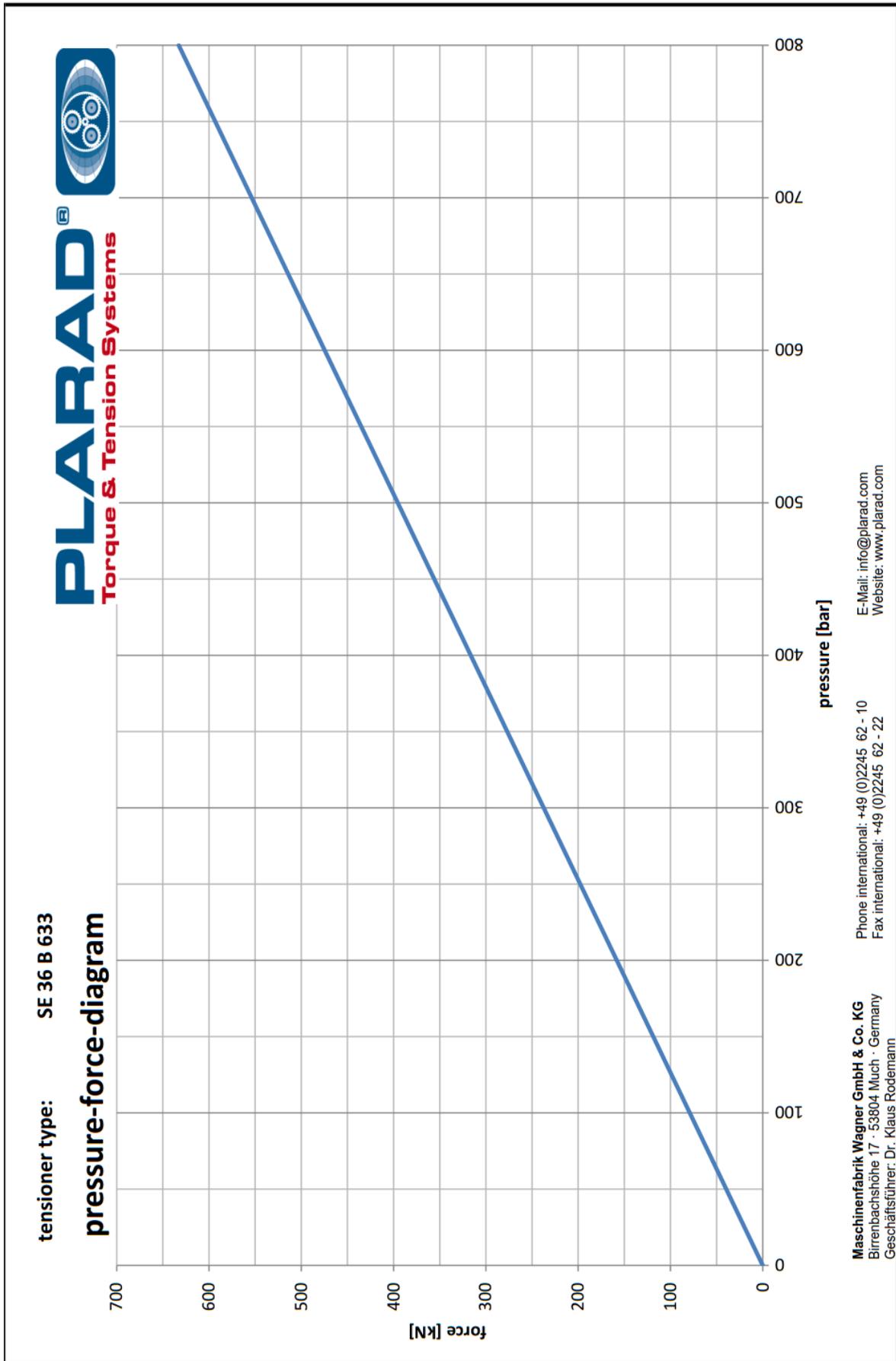
Much, 02/10/2014

Place, Date, Signature

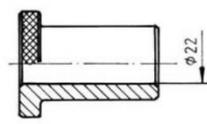
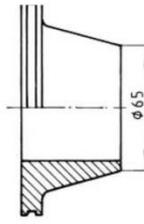
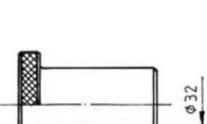
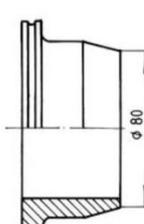
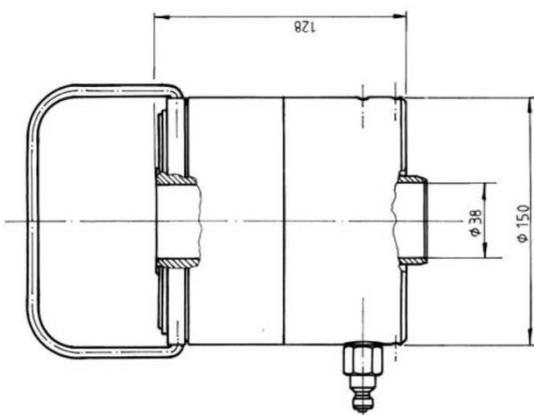
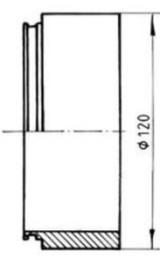




## 12. Pressure-force-diagram

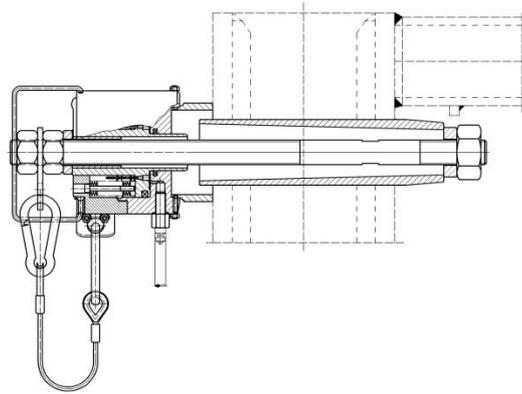


### 13. Accessory

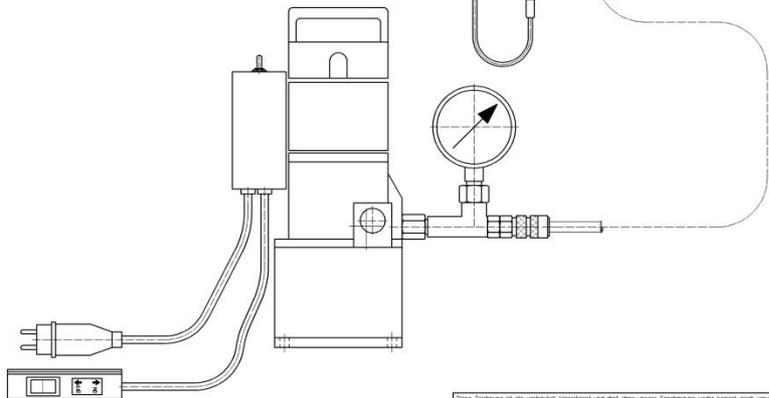
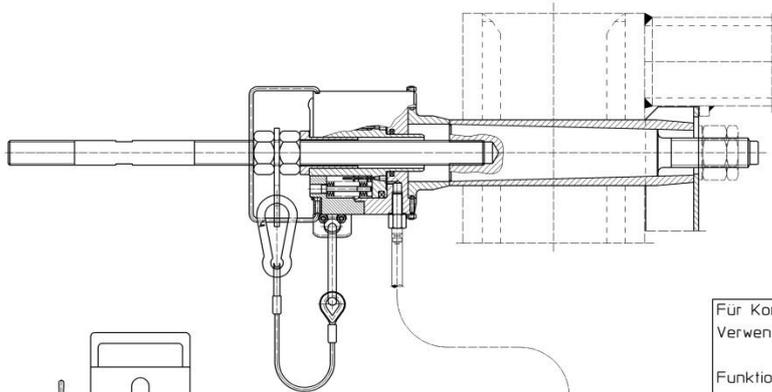
<p>crane system 200 IC</p>		<p>guide sleeve F02-713-3-00901</p>	<p>+</p>	<p>basic configuration</p>	<p>+</p> 	<p>bridge F02-713-3-00701</p>
<p>crane system 355 HC 500 HC 24 HC 1000 1250 HC</p>		<p>guide sleeve F02-713-3-01001</p>	<p>+</p>	<p>basic configuration</p>	<p>+</p> 	<p>bridge F02-713-3-00601 to pull out the conical bolt</p>
<p>crane system 24 HC 1250 2000 HC 3150 HC</p>				<p>basic configuration</p>	<p>+</p> 	<p>bridge F02-713-3-00501</p>
<p>basic configuration</p>		<p>Hydraulic tensioner (utilizable for all crane systems) G02-713-0-00202</p>	<p>tech. data: max. tracing force: 633 kN max. pressure: 800 bar stroke: 20mm</p>	<p>bridge to pull out the conical bolt (utilizable for all crane systems)</p>	 <p>bridge F02-713-3-0080</p>	

# 14. Schematic view

Hülse ziehen



Bolzen ziehen



Für Konus-Bolzendemontage nach außen.  
Verwendung ab 200 IC Turmstück.

Funktionshinweise für Bolzenzugzylinder  
und Aggregat siehe Bedienungsanleitung.

For taper pin disassembly outwards.  
Use from 200 IC tower section.

Function note for tensioning cylinder and  
hydraulic unit see instruction manual.

Diese Zeichnung ist ein wertvolles Know-how und darf ohne unsere Genehmigung weder kopiert, noch vervielfältigt, noch Dritten zugänglich gemacht werden. Zuwiderhandlungen verpflichten zu Schadenersatz und sind bei Verstoß strafbar.  
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Material/Material		Gewicht/Weight (kg)		Ritzzeit-Nr./Place en trou (R)	
Allgemeintoleranz Tolerancias generales General tolerances		Maßstab/Escaleta Scale		Schweißsymbole/Symbols de soudure/Swelding symbols	
ISO 2768-m				Für die Herstellung gelten die Anforderungen der Normen Para la producción de piezas se aplican las normas de producción For the production the current standards apply	
DIN EN ISO 9001		Datum Date		Name Name	
Geändert/Modificado/Changed		Geprüft/Verificado/Inspected		<b>A1</b> <b>LIEBHERR</b> LIEBHERR-WERK DIERACH GMBH	
Freigegeben/Released					
Bezeichnung/Description				Artikel-Nr./Part No.	
BOLZENZUGGERÄT					
Zeichnungs-Nr./Drawing No.		Blatt 1 von 1		Index	
				Artikelcode/Código part	



... a successful  
connection!

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Last update: 02/2017

D02-713-1-02100

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