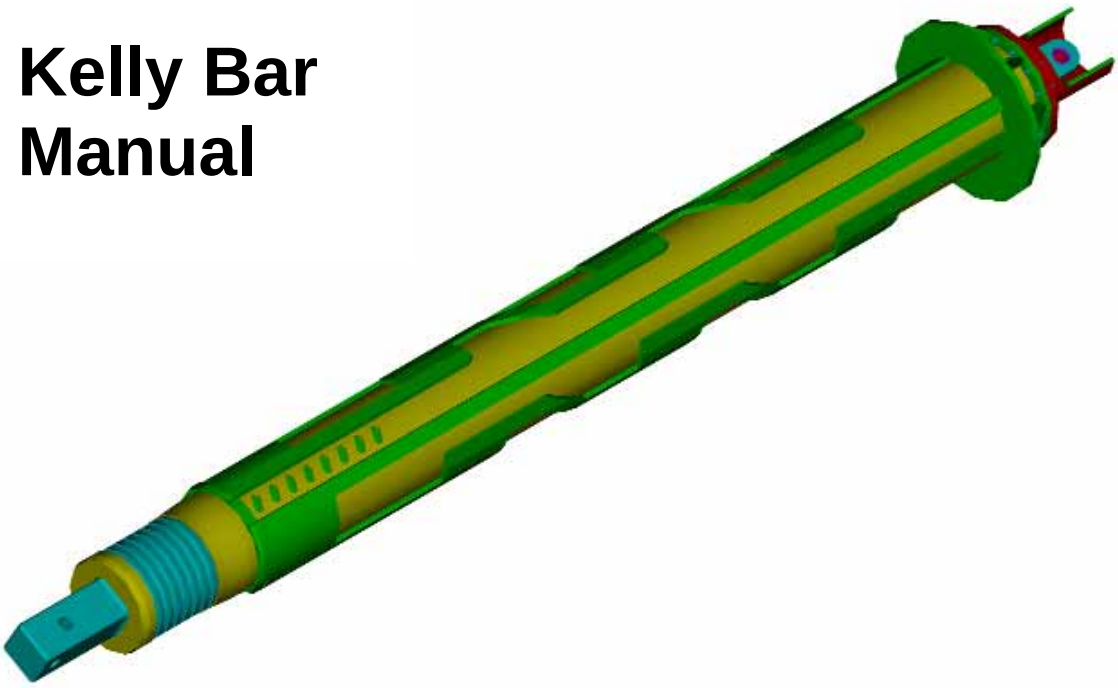
Kelly Bar Manual



Contents

1. Instruction

The purpose of Kelly-Bars is to transfer torques and pressures onto the drilling-tool.

Handle with care and notice the maximaum allowed strenghts. Please pay attention to the following points, otherwise guaranty will be finished:

- Don‘t immerse Kelly-Bar into fluid concret. Kelly-Bar may be ruined.

- Use Kelly-Bars only for drilling. Earthmoving (levelling), conveying or hammering are not allowed.

- Don‘t use Kelly-Bars to bring drilling tools or casings into alignment.

- With inserted Kelly-Bars do not make any readjustments. Only if the mast is displaced, due to the working forces readjustment is necessary.

- During drilling pay attention that the sections are properly locked together, otherwise the wear ist excessiv or Kelly will be damaged. (only for interlocking typ)

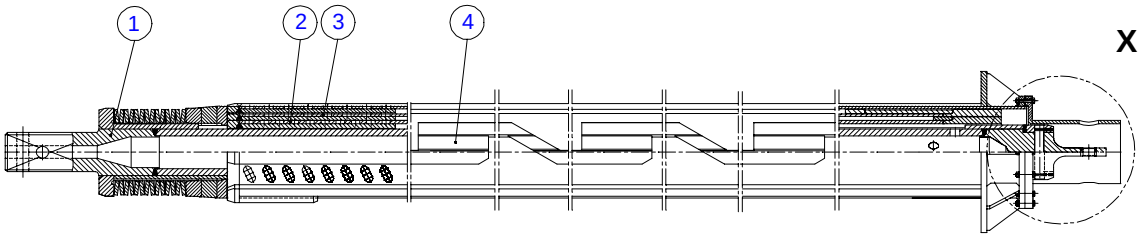
- Deep boreholes or great bore-diameters make necessary teeth and chisels in good working order.

- During drilling in hard material it is necessary to use drilling tools with 2 cutting lipps.

- During pulling back keep an eye on the outermost kelly-section. If it lifts from the rotary drive stop immediately. By interlocking Type one of the inner sections is not unlocked. Reinsert Kelly-Bar to the borehole-bottom and rotate left hand. Pull once more by the main winch and retract properly all sections. By „Friction-Type“ the inner sections are pinch together by soil.

- If the winch-load and tool depth is indicated by a monitor you can see, if sections unlock properly. This method allows also a diagnose which section is not unlocking or pinching.

2. Disassemble of kelly bar



Pict. 1

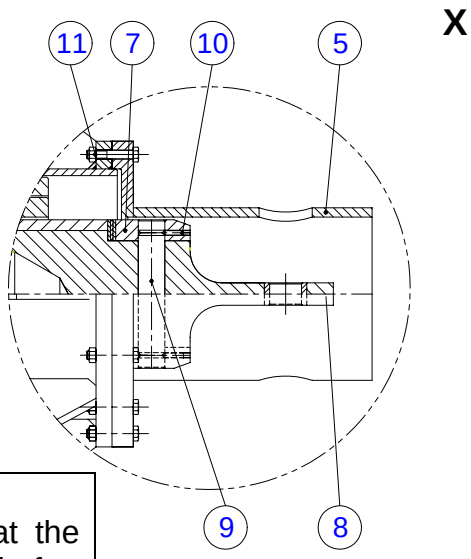
(1) Loosen the screws (item. 11) at the cover – with protecttube for Kellywhirl - (item. 5) and remove it.

(2) Screw off the pin (item. 10) at the stop nut (item. 7) from the kelly eye (item. 8) and push out the bolt (item. 9).

(3) Pull up the stop nut (item. 7).

(4) Pull up the complete Inner Kelly (item. 1) to the down

(5) Pull up the complete Middle Kelly (item. 2, 3) to the top



Pict. 2

Attention for assemble of kelly bar !!!
When pushing together kelly tubes make sure that the position of the tubes to one other is the same as befor. The tubes have a marking on the top (pict. 3) . Use it for help! If the assemble is not correct, it could be, that the kelly bar doesn't work.

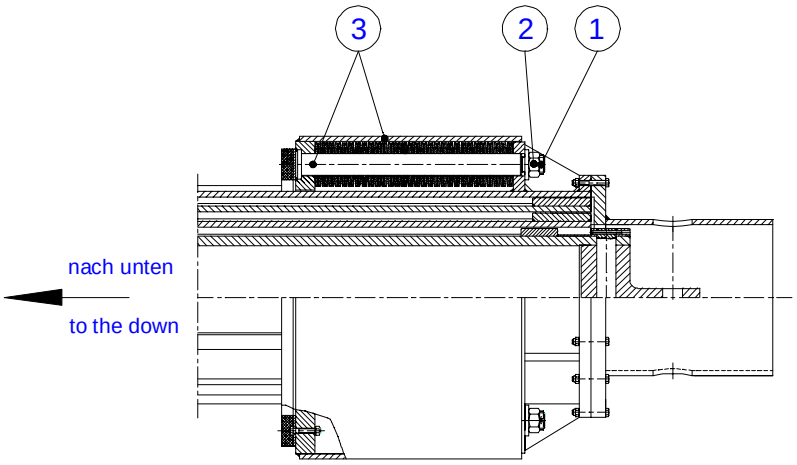
For kelly bar with shock absorber on the top

Disassemble shock absorber on the top

(1) Remove splint (item 1)

(2) Screw off castellated nut (item 2)

(3) Push the complete shock absorber (item 3) to the down



Pict. 3

3. Prescribed Services

Pay attention for the prescribed intervals in the list. They help detecting a beginning damage and save the user for excessive repair.

The wearing depends on the soil- and rock conditions. So following intervals are fixed:

prescribed intervals for 2- u. 3-fach telescopeically kelly-bar	soil- and rock conditions		
	- 3	4 - 5	6 -
1st inspection after	400-700 h	200-350 h	100-150 h
subsequent inspection every	1000-1200 h	500-600 h	250-300 h

Tab. 1

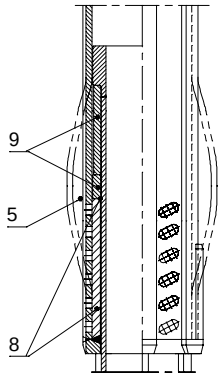
Explanation of soil- and rock conditions:

condition 1-3: easy soluble soil
condition 4-5: heavy soluble soil
condition 6 and higher : easy to heavy soluble rock

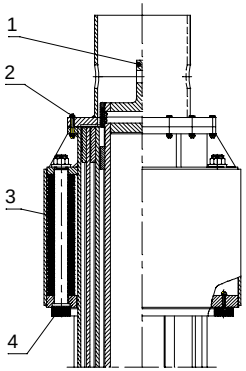
Pay attention to the soil- and rock condition. Also consider if you make vertical or oblique drillings. For Vertical drillings take the upper limiting value of the times given in Tab. 1. For opligue drillings you must take an earlier inspection. Don't exceed the lower limiting value of the times given in Tab1. Check regular the shock absorber on the top of Kelly bar or on the rotary drive.
When inspecting pay special attention to the following damages (Tab. 2). Check all welds for cracks and bolts that they are properly in place and firm.

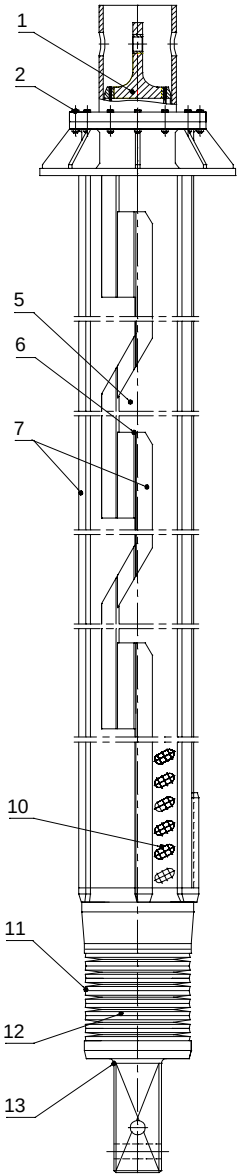
The following list gives a few of typical damages and how they could repair

sketch



Shock absorbers on top of Kelly





Item.	Damage	Repair
1	kelly eye cracked, bent	exchange kelly eye in Workshop (pay attention to welding instructions) (2)
2	screws are loose, broken	pull up screws or replace with new screws (pay attention of screw formness)
3	spring worn out, smashed	replace with new springs
4	rubber bumpers worn down absent	replace with new
5	tube cracked, deformed. Especially at the locking recesses and on the end of tube.	Cut of damaged tubing in a workshop and replace with new. (pay attention to welding instructions) (1)
6	Edges of recesses worn down	rebuilt by welding (pay attention to welding instructions) (2)
7	Drive gibs cracked or burrs	Gring, repair by welding (pay attention to welding instructions) (2)
8	Drive shell worn down	rebulit by welding (pay attention to welding instructions) (2)
9	Impact and wear ring worn down	replace with new. (see welding instructions) (2)
10	welds area cracked	repair by welding (pay attention to welding instructions) (2)
11	spring are jolted, cracked, broken	replace with new
12	Square-shaped tool joint weld cracked	Cut of square shaped tool joint and renew the weld. (pay attention to welding instructions) (1)
13	Square-shaped tool joint cracked	replace with new tool joint (see welding instructions)

Tab. 2

(1) - Chapt. 4 Page 6 "Welding-Instructions"

(2) - Chapt. 6 Page 11 "Replacing the Kelly Tool Joint, Kelly eye"

4. Welding instruktions

Consider the following welding instruktions:

- when the repair is of more complicated kind, consult EMDE – Service for advice

- welding repairs may be done only by trained and qualified personnal.

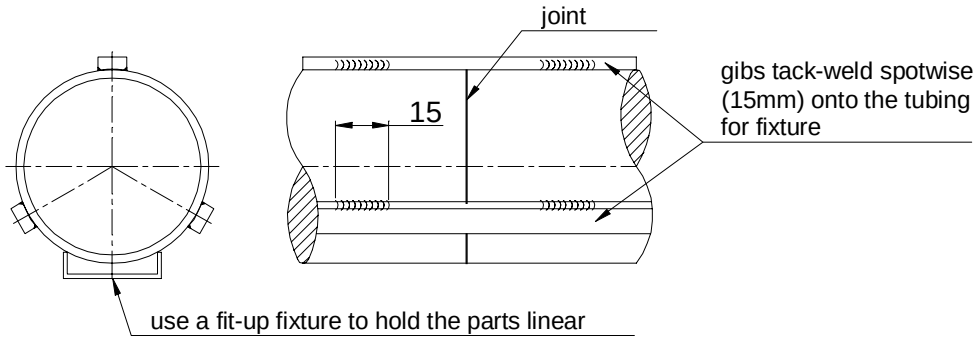
- surfaces to be joined must be clean and free of grease.

- determine what material the parts are made from

- replace brocken section with new tubing

  - grind welding chamfers

  - keep linear alignment (pict. 4)

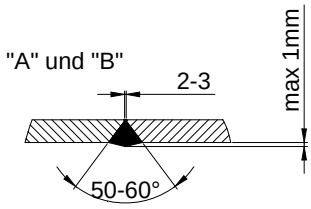


Pict. 4

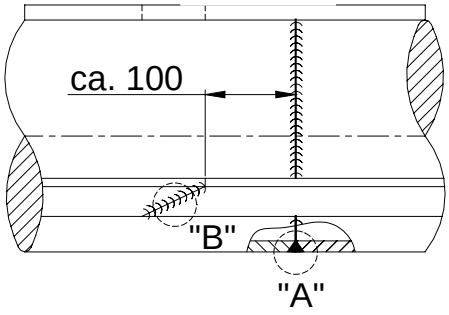
- welding (pict. 5-6)

Attention !!!

- ➢ parts must be linear
- ➢ a gab of 2-3 mm must be provided for fusion at the root
- ➢ max. leg length of weld 1mm
- ➢ welded root pass should not protrude beyond the tubing



Pict. 5

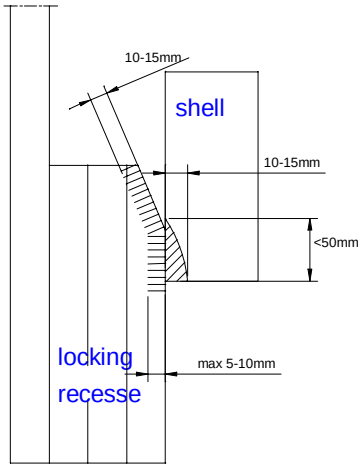


Pict. 6

After welding, grind all seams smooth and flush.

- rebuilt drive gibs, shells and edges of recesses by welding

- rebuilt drive gibs, shells and edges of recesses when:
  - ➢ wear exeed 10-15 mm



Rebuilt by welding is prescribed to prevent functional failure.

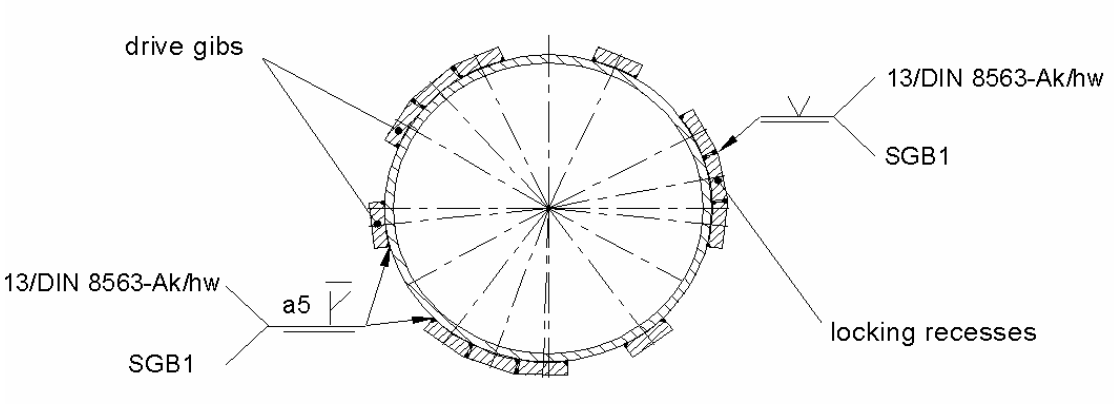
Pict. 7

- new gibs welding

Only use original EMDE-Gibs

Locking pocket size are biult with gibs profiled steel.

Pay attention for welding instruktions in pict. 8 !

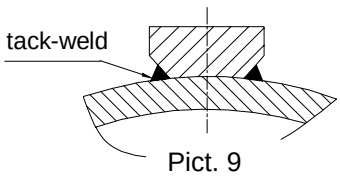


Attention !!!

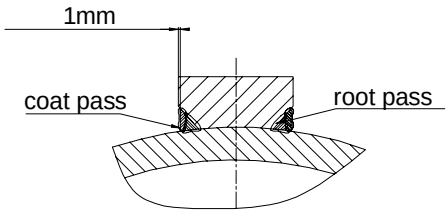
- keep linear alignment of gibs ans tack-weld spotwise 25mm length

ict. 8

- Weld-on gibs with double-pass weld. Coat pass 1mm deeper than gib (pict. 10)



Pict. 9

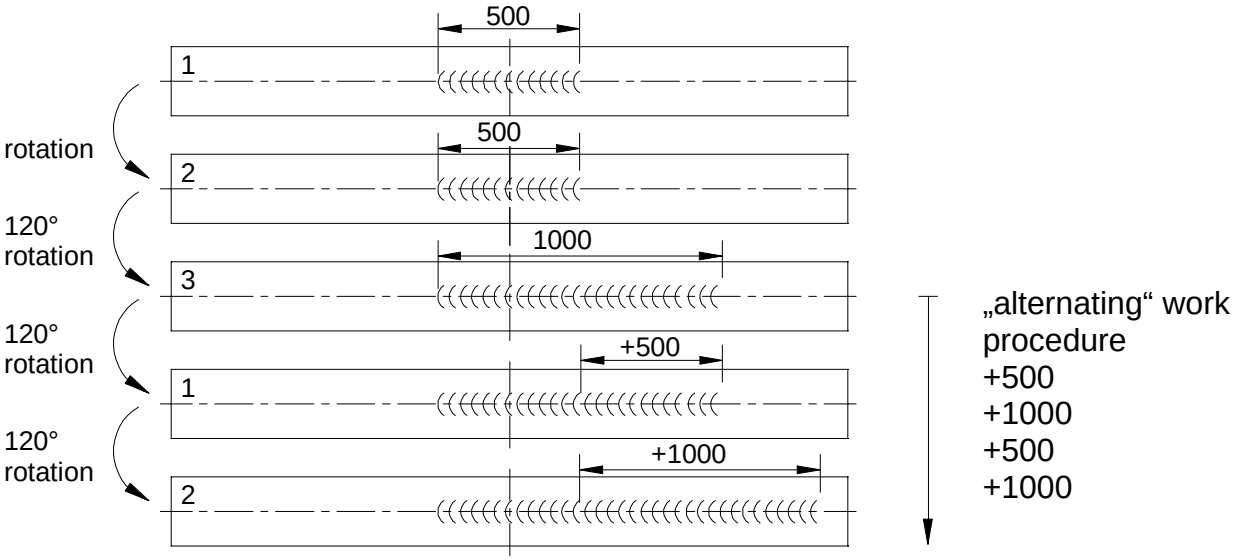


Pict. 10

- welding sequence

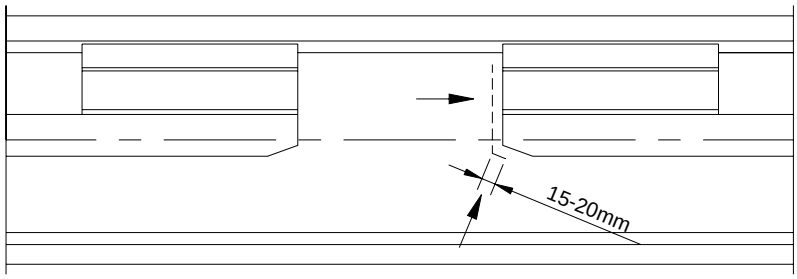
To balance the temperature of the bar, we recommend the following „alternating“ work procedure.

Start in the middle of the kelly bar and work towards the ends (pict. 11)



Pict. 11

Do not weld at recesses in zone between arrows marked „_ _ _ _“ (pict. 12)



Pict. 12

5. Welding Rod Specifikation

Welding Process		Welding Rod		Rod- and wire electrode dia.	Application according list 2.
		Denomination	Chemical properties		
arc-welding method	shielded-arc welding MAG	DIN 8559 : SG B1 CY 4254 DIN EN 758:T 42 4 B C 3/T42 4 BM3 AWS/ASME-SFA-5.20: E 70 T-5	C = 0.05 % Si = 0.35 % Mn =1.40 %	1.0 mm 1.2 mm	item. 5 – item. 10
		DIN EN 758: T 46 5 MM 1 AWS/SFA 5.20: E 71 T-5	C = 0.045% Si = 0.60 % Mn: 1.60 %	1.0 mm 1.2 mm	item. 5 – item. 10
		DIN 8556: SG X 15 Cr Ni Mn 18 8 Werkstoff-Nr. : 1.4370	C = < 0.15 % Si = 0.40% Mn = 7.00 %	1.0 mm 1.2 mm	item. 1; item. 12,13
		DIN 8559 : SG 3 C 57 32 AWS A5.18 : ER 70S-6	C = 0.05-1 % Si = 0.6-0.9% Mn = 1.0-1. 5%	1.0 mm 1.2 mm 3.25 mm 4.0 mm	item. 5 ; Item. 7; item. 9-10
	metallic-arc welding	DIN 1913: E 5143 B(R) 10 ISO 2560 : E51.4 B (H) AWS A5.1 : E 7016	C = 0.06 % Si = 0.65 % Mn = 1.05%	2.5 mm 3.25 mm 4.0 mm	item. 1-13

6. Replacing the kelly tool joint, kelly eye

6.1 replacing kelly tool joint

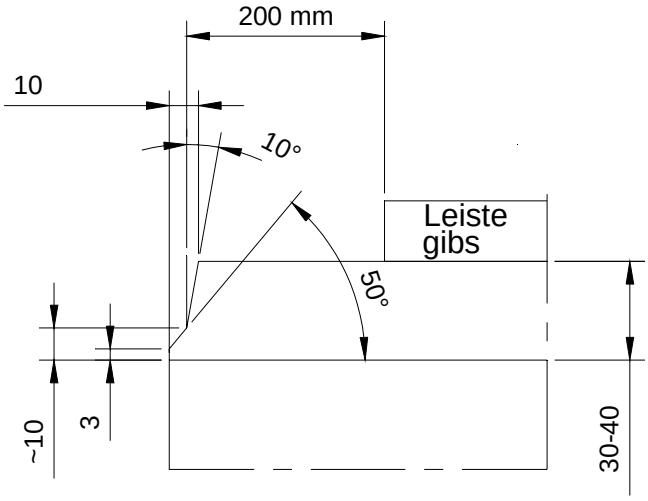
Two different types of kelly-tool joints are described in the following:

a) tool joint with guiding ring b) tool joint with guiding ring

Before start welding contact EMDE for welding procedure specification

General:

- cut off old kelly-tool joint with guiding ring
- remove gibs at the welded zone
- grind welding chamfers at the end of tube (pict.13)



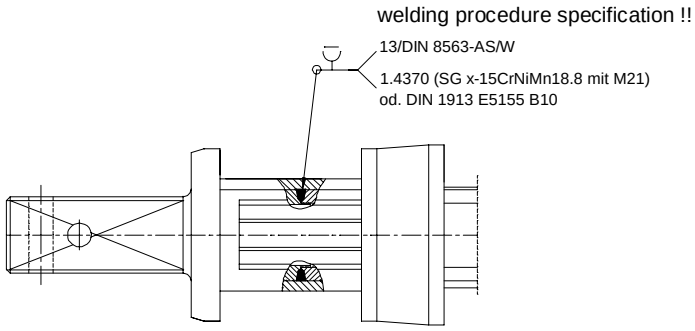
Pict. 13

- align kelly-tool joint and fix it by tack-welding

a) Kelly tool joint with guiding ring

Attention ! - Kelly-tool joint greater than outside diameter of inner kelly
First push guiding ring above inner kelly , than attach kelly-tool joint.
Keep an eye on linear alignment of kelly-tool joint .

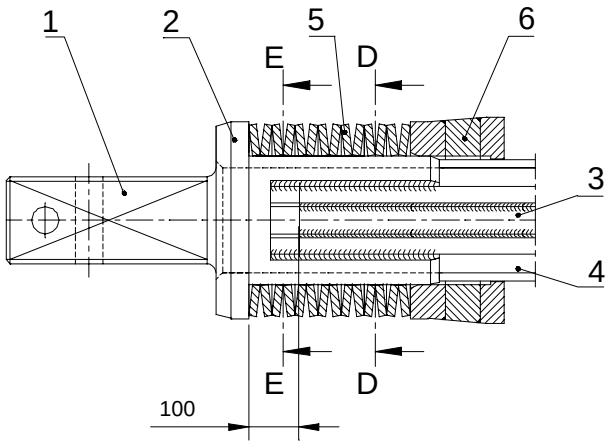
- welding kelly-tool joint (item. 14)



Pict. 14

- welding guiding ring

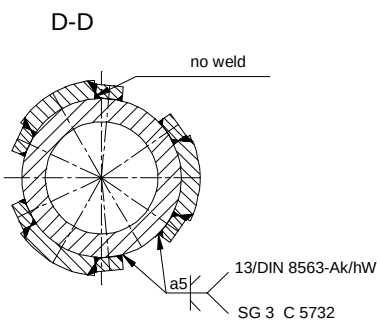
Pay attention to welding instructions according section “D-D“ and “E-E“



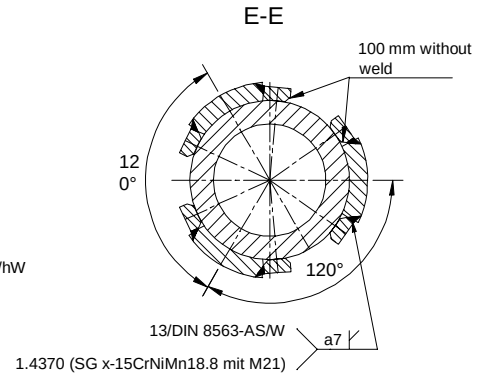
1. kelly tool joint
2. guiding ring
3. inner kelly
4. gib
5. disk spring
6. pressure flange

Pict. 15

Weld gibs onto tubing until a distance of 100 mm before flange of guiding ring (pict. 15)



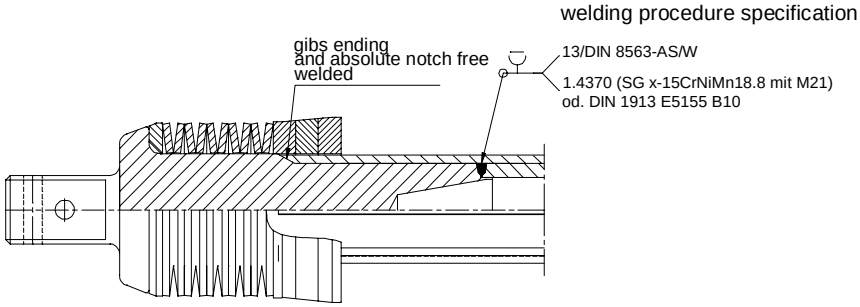
Pict. 16



Pict. 17

guiding ring only welded together with gibs along the provided chamfers

b) Kelly tool joint without spring flange



Pict. 18

6.2 Replacing kelly eye

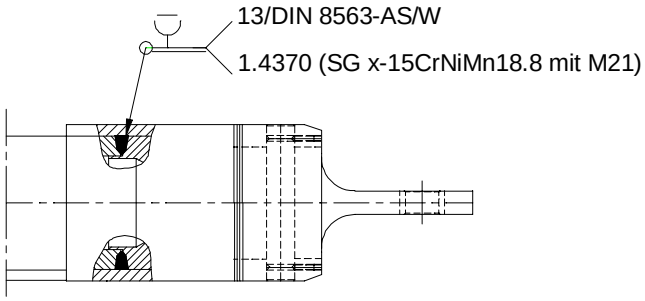
a) cut off old kelly eye

b) grind welding chamfers at the end of tube (pict. 13)

c) align kelly eye linear to tube and fix it by tack-welding

d) welding kelly eye (pict. 19)

welding procedure specification !!



Pict. 19

6.3 Replacing wearing ring

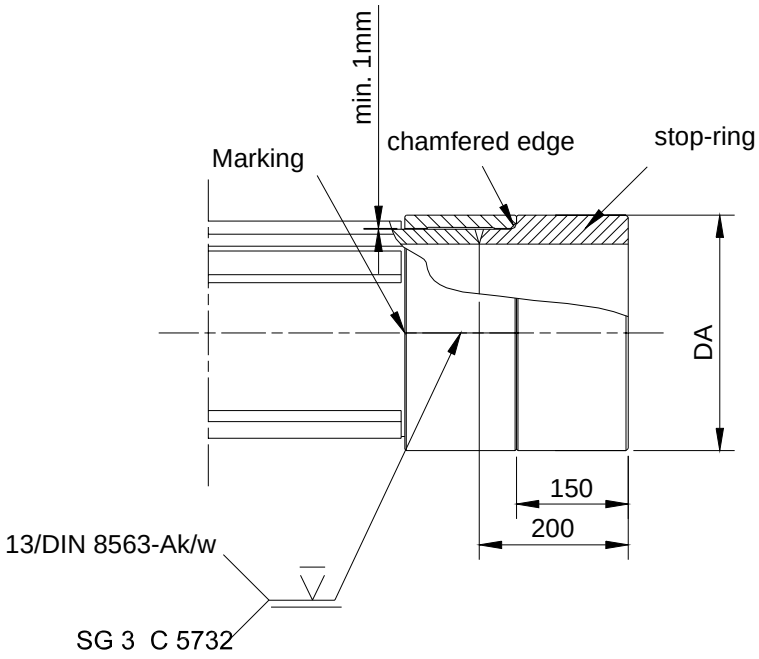
a) cut off the worned out ring in to two parts

b) place and aligne the two parts of the new wearing ring and fix it by tack-welding

c) weld the two parts of wearing ring together

Pay attention !!!

- Take care that the position of the two parts of the wearing ring, are placed correctly. (The parts are marked at the surface. Use it for help! Pict. 20)
- the chamfered edge of the wearing ring must be placed to the stop ring (Pict. 20)
- the outer diameter DA (consult EMDE-Service for advice) is not allowed to exceed (Pict. 20)
- the distance between the wearing ring and the kelly-tube must be at least. 1mm (Pict. 20)



Pict. 20

6.4 Replacing strengthening ring

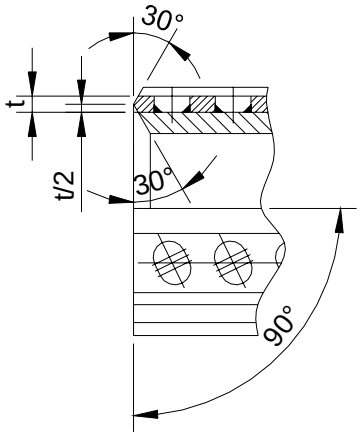
a) cut off the damaged strengthening ring

b) shape the separating cut at the kelly-tube. Grind welding chamfers (Pict. 21). Take care that the cut at the kelly-tube is right-angled to the centre line of the tube (Pict. 21).

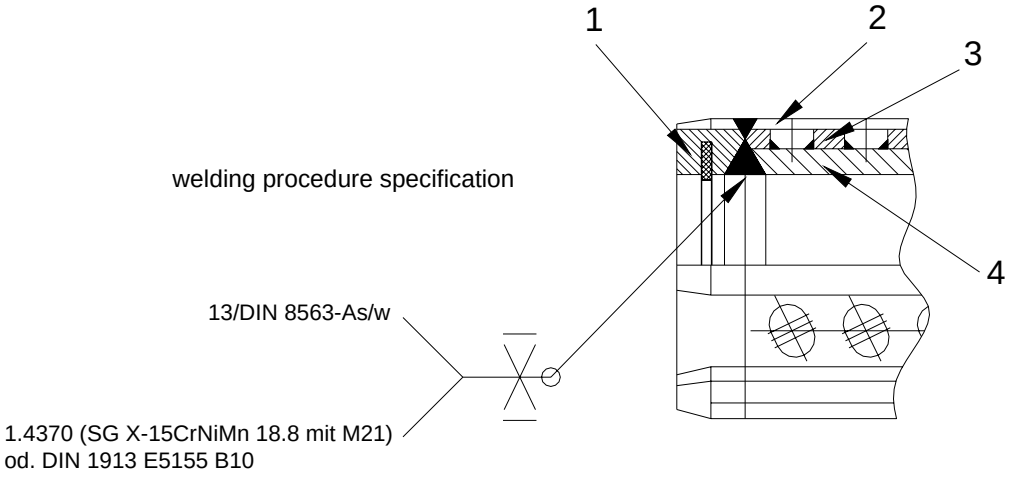
c) place and aligne the new strengthening ring and fix it by tack-welding

d) weld on the strengthening ring (Pict. 22)

e) if it is necessary, adjust the shape of the strenghtening ring to the shape of the drive-shells by grinding



Pict. 21

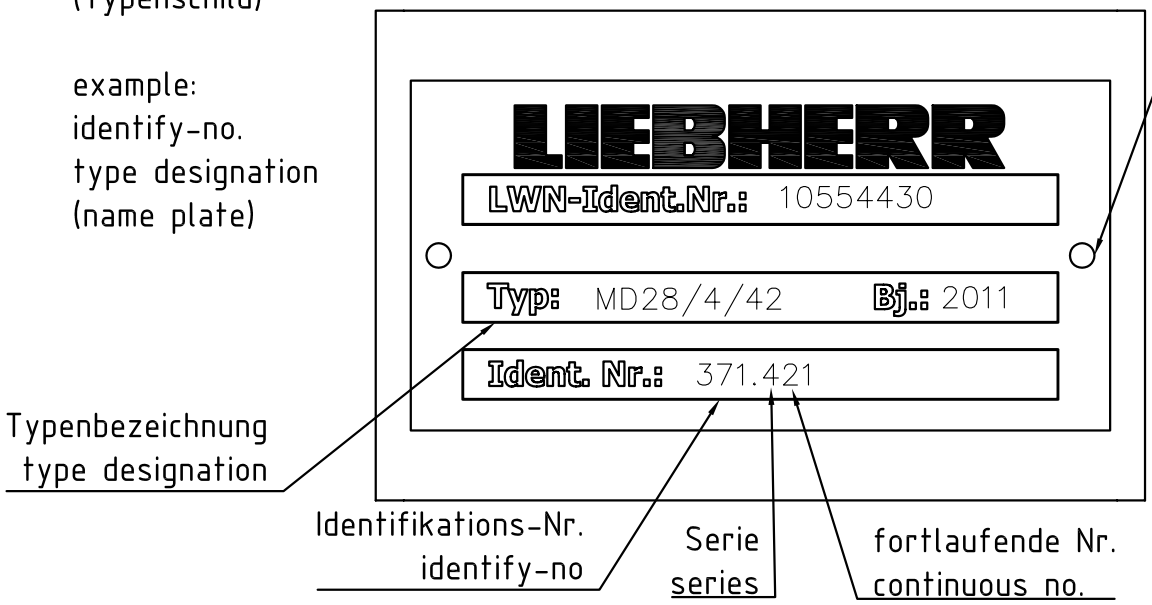


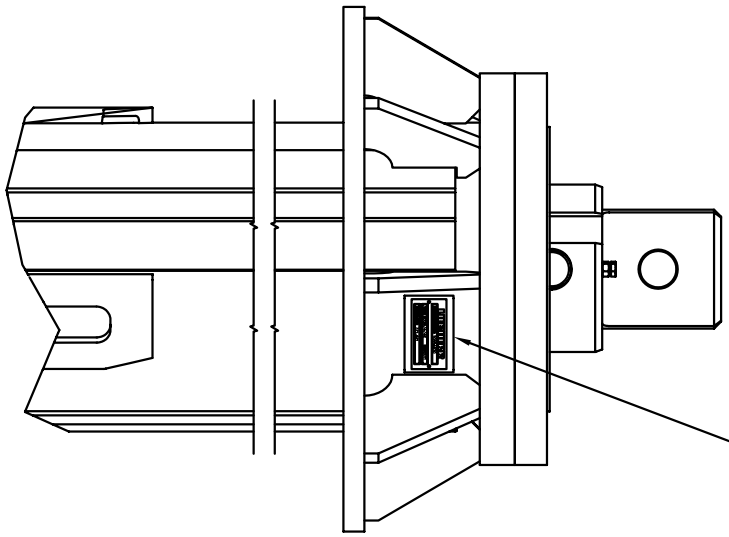
1. strengthening ring
2. gib
3. kelly -tube
4. drive-shell

Pict. 22

Beispiel:
Identifikation-Nr.
Typenbezeichnung
(Typenschild)

example:
identify-no.
type designation
(name plate)





Kommission/Commission		Allgemeintoleranz DIN ISO 2768-1 m (mittel) general tolerances DIN ISO 2768-1 m (medium)	Oberfläche DIN ISO 1302 Reihe 2 Surface DIN ISO 1302 series 2	Maßstab/Scale	Gewicht/Weight
				Werkstoff/Nr. materlal/No.	Projektion/projection
				Halbzeug semi product	
		Datum/Date	Name/Name	Artikel-Nr. part-no.	
Schutzvermerk nach DIN 34 beachten! Copyright reserved!		Bearb. Drawn	25.11.2009	Schoenberger	Benennung / Designation
		Gepr. Reviewed by			Kelly Ident-Nr./Typenbez. kelly ident-no./type designation
Index	Änderung/Revision	Datum Date	Bearb. Drawn		

EMDE Industrie-Technik G,bH
Lahnstraße 32-34 D-56412 Nentershausen
Tel. +49(0)6485/18704-0
Fax +49(0)6485/18704-33
bohrtechnik@emde.de www.emde.de

Zeichn.-Nr. / Drawing-no.	Blatt/page
371.10.9841.0	1
	von/of 1
CAD R:\Konstr\T\7(KELLY)\1\20-115700\20-115700neu geändert.idw	