GRUNDOWINCH

Operating Instructions

Spare Parts List

KW 5000

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GRUNDOWINCH

TT-UK Ltd

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GRUNDOWINCH

Safety Precautions for Pipe Renewal and Cable Grundowinches

1. DO NOT ATTEMPT TO OPERATE the Winch unless you have attended a recognized or manufacturers course of training / instruction on the CORRECT AND SAFE operation of the INDIVIDUAL MODEL / TYPE Grundowinch that you are using.

2. Prior to use make sure you have read the manufacturers operating instruction manual carefully to familiarize yourself with its operation before using the Grundowinch.

3. ONLY ONE PERSON TO CARRY OUT ANY FUNCTION OF THE INITIAL ROPE PULL OUT PROCEDURE.

4. Danger of Entrapment DO NOT place hands in any part /or near any moving components or devices.

5. Always ensure that all safety guards, covers, panels and ALL other safety devices are correctly in place on the Grundowinch BEFORE starting or commencing any part of the winching operation.

6. DO NOT remove safety devices or disengage safety guards throughout any part of the operation of the winching operation.

7. NO LOOSE CLOTHING or any loose jewellery to be worn whilst operating the GRUNDOWINCH. Long Hair to be tied up or kept free from any moving parts of the Winch.

8. Before Commencing any part of the winching operation make sure all operating controls and safety devices are functioning correctly (IF ANY FAULTS ARE FOUND REPORT TO AGENT/SUPERVISOR IMMEDIATLEY AND DO NOT USE WINCH)

9. TT UK Grundowinches are designed for HORIZONTAL pulls only. DO NOT USE for ANY other application without consulting TT UK in the first instance.

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GRUNDOWINCH

10. Make sure that no other personnel are involved or loitering round the winch or the working pit whilst winch is in operation. AT NO POINT DURING THE WINCHING OPERATION IS ANYONE TO STAND ON OR ACROSS OR NEAR THE WINCH ROPE-ESPECIALLY WHEN UNDER TENSION

11. Barrier off any excavations securely and DO NOT enter them during any part of the winching operation.

12. Locate the GRUNDOWINCH in such a way that it does not interfere with normal traffic flow or public walkways. If necessary ensure all the correct barriers, signs and warning devices are in place.

13. Please ensure that ANY shackles used during the winching operation are certified and are clearly marked with the CORRECT SAFE WORKING LOAD.

14. A SWIVEL MUST BE USED AT ALL TIMES, when the Grundowinch is being used for Cable Pulling Operation. Please ensure that it is the CORRECT LOAD RATED SWIVEL and is fitted in line at all times clearly marked with the SAFE WORKING LOAD.

15. After the days work, shut down engine and secure the winch against accidental movement, remove ignition key(s)

16. Any Diesel spills or Hydraulic/ Engine oil spills that happen when using the GRUNDOWINCH are to be dealt with IMMEDIATLEY and correctly according to your own companies COSHH regulations.

17. Carry out any maintenance and repair works with the winch out of commission and the engine turned off and ignition key(s) removed from winch completely.

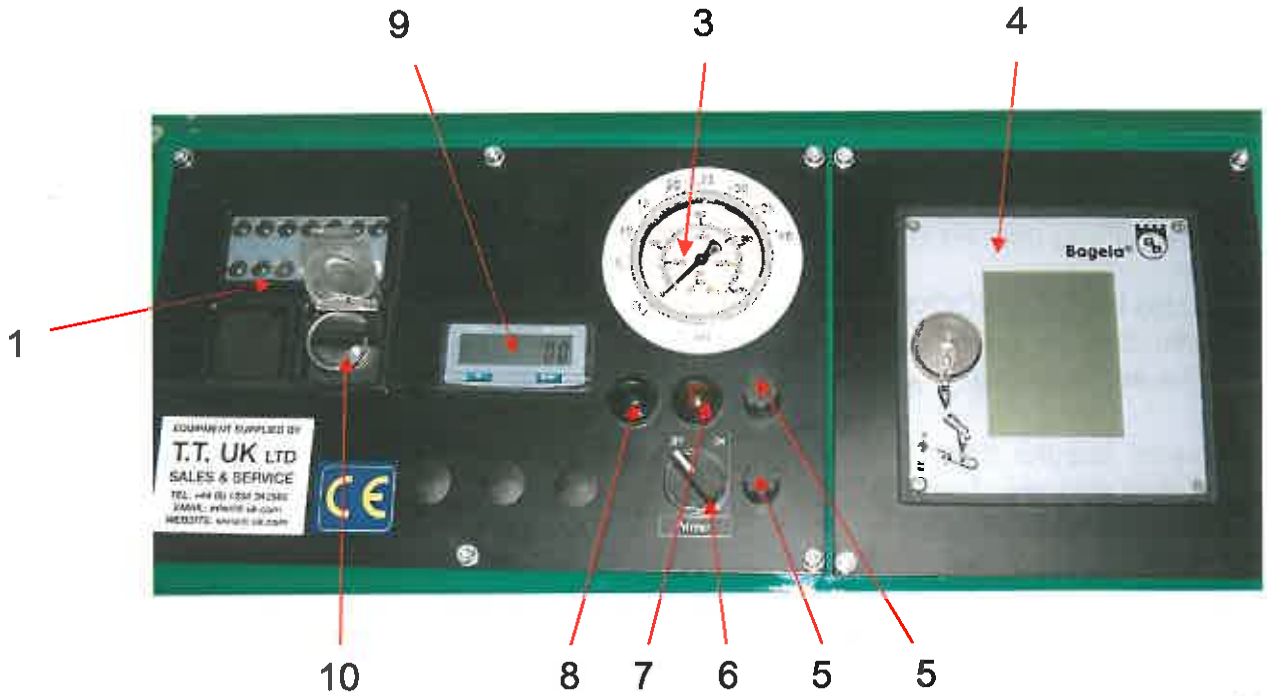
18. After any maintenance make sure all guards and safety devices are correctly refitted to GRUNDOWINCH.

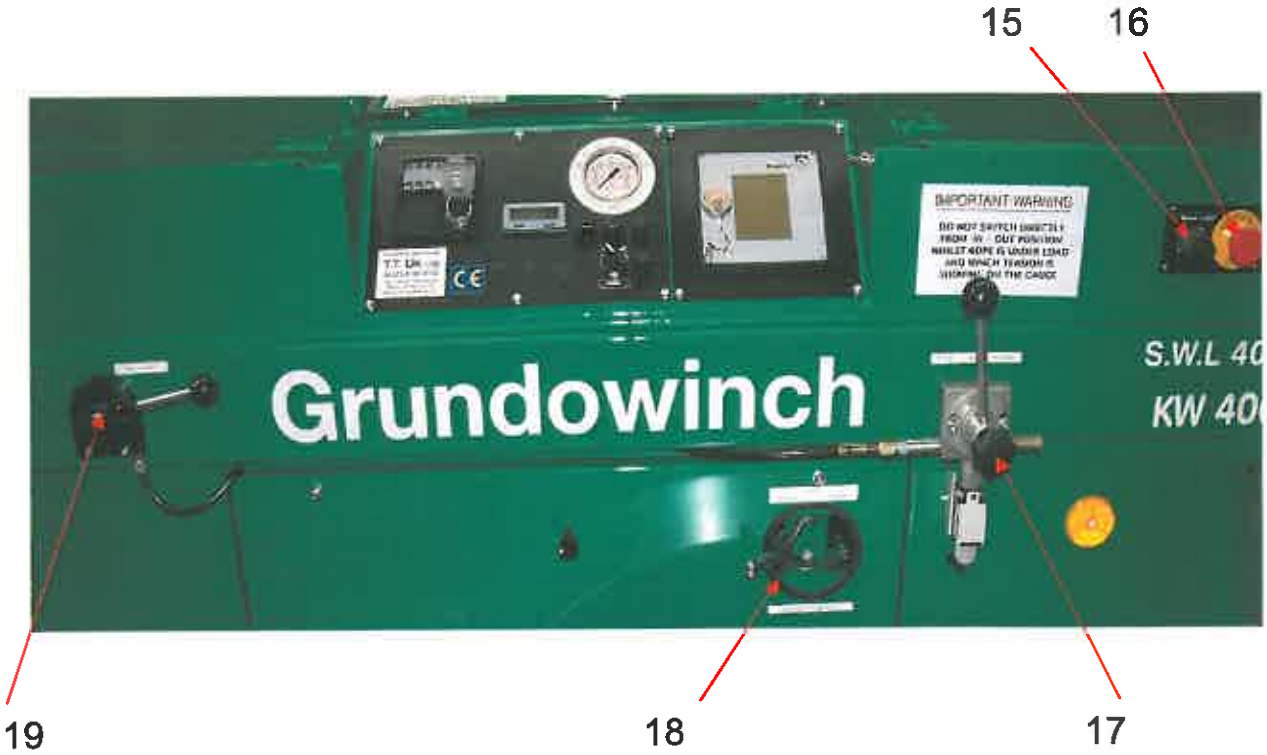
19. Make sure the GRUNDOWINCH is fully inspected, tested, checked and serviced according to manufacturer's specifications at least once a year by our specialist Grundowinch technicians at TT UK.

20. THE WINCH SHOULD ALWAYS BE CONNECTED TO THE TOWING VEHICLE OR AN IMMOVABLE OBJECT TO PREVENT PULLING FORCE BEING TRANSMITTED THROUGH THE TOWBAR.

AT THE END OF EACH PULL INSPECT WINCH ROPE FOR CABLE FRAYS OR DAMAGE.

GRUNDOWINCH





1	Control board
3	Oil pressure gauge
4	Printer
5	Fuse
6	Printer In – Out
7	Printer control
8	Operation control
9	Meter counter
10	Ignition lock
15	Flange socket
16	Emergency – Stop
17	Rope In – Out
18	Line speed selection
19	Accelerator lever

GRUNDOWINCH

1 Operating Instruction – Short Version

Setting up the winch

- The winch should always be connected to the towing vehicle or an immovable object to prevent pulling force being transmitted through the towbar.
- Apply the parking brake
- Pull out the rear props, press them firmly into the ground and secure them in that position

Starting the engine

- Set the winching – control lever to neutral position
- Start the engine as described in engine manufacturers manual

Winching out (payout)

- Set line speed selector to range 2 (maximum speed)
- Set the winching – control lever to OUT
- Increase engine speed and pull out the rope.
- The rope will continue to pay out when pulled.
- Rope pay out stops when no longer pulled or when the winching – lever is set in neutral position.

Winching in

- Set line speed selector to the required pulling force (range 1 – maximum pulling force)
- Pre-select the trip value at the printer according to the permitted pulling force of the cable (not fitted to all winches)
- Slowly increase the winching lever to IN
- The line speed increases the further the lever is turned to the left.

- When operating the winch, the remote control or dummy plug must always be connected to the appropriate socket to ensure the failsafe function of the hydraulic system.
- If the winching operation does not work check that the emergency stop button is out and that the green system light is illuminated.

2 General Description

There is an extended range of fully enclosed portable hydraulic winches for a wide range of applications.

Each winch consists of three major parts: twin capstan assembly, wire-rope storage drum and the engine or electric motor driven hydraulic power pack

The winch is mounted, depending on the type, on a sturdy single or double axle (tandem) trailer with rubber suspension, rigid or height-adjustable towing bar, overrun and automatic reversing brake.
All winches may be delivered without trailer as a type to mount it onto a wide range of vehicles.

All steel parts are primed and finished.

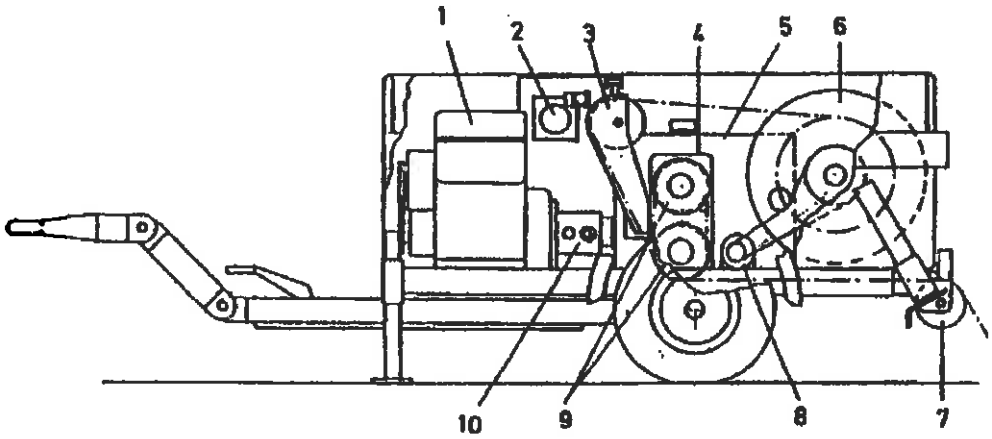
The frame mounted winch is fully protected by steel-sheet sides and top. After being secured against movement it is ready for immediate use. Several models of winches are internally lined with sound-proofing material which reduces operating noise to a minimum.

3 Winch Construction

3.1 The main components of the winch

Diagrammatic section of the winch

1 engine
2 chart recorder/printer
3 wire-rope layering arm
4 twin capstan assembly
5 hydraulic oil tank
6 rope storage drum
7 tail pulley
8 storage drum motor
9 capstan sheaves
10 hydraulic pump



3.2 Capstan assembly

The capstans are of equal diameter and each single driven by a hydraulic motor. These capstans generate the entire pull on the load, the rope being moved in grooves of the capstans. The capstans are made of low-wear, case-hardened steel and run on ball or self-aligning roller bears.

3.3 Rope storage drum

Irrespective of the line pull exerted, the rope is wound with moderate take-up tension onto the rope storage drum which is driven by a separate hydraulic motor. The rope is neatly stacked on the drum by an automatic spooling mechanism. The take-up tension is about 3% of the line pull, which prevents undue chafing of the rope on the drum.

3.4 Hydraulic power pack and drive

The hydraulic power is generated by an axial piston pump which is driven by an IC engine or electric motor. The hydraulic flow of the pump determines the line speed which is infinitely variable by a throttle valve with hand wheel or an electronically activated proportional control valve. All cable laying winches of type KW are controlled by a winching lever.

All winches are equipped with a selector for two speed ranges, with which the line speed required for the job in hand may be preselected. In both speed ranges the line speed can be varied from zero to maximum, although in the second speed range the winch will develop only half its rated line pull.

3.5 Function of the hydraulic system

3.5.1 Cable laying winches

The pulling direction, winching-in or winching-out is controlled by a winching lever which is moved either to the left or to the right. The more the lever is moved outwards, as more the hydraulic oil flow increases from the pump this determines the line speed. The pressure in the closed hydraulic circuit is controlled automatically depending on the load to be pulled.

In order that the engine power determines the winch performance, the operator should set the winching lever in such a position to keep a balanced ratio that pulling force bears to line speed.

3.5.2 Pipe renewal winches with "automatic hold-on" system

When pulling out the rope the pump needs to generate a minimum oil flow in the system, for which the line pull preselector has to be set to about half of the maximum line pull. When, in process of pulling the load, the preselected line pull is reached, the pump will automatically reduce the oil flow to a minimum rate, just enough to make up the internal leakage in the various hydraulic components. While doing so, the preselected line pull on the rope is maintained. As soon as the pull resistance slackens or when the preselector is set to a higher line pull, the pump will increase the oil flow accordingly, and the rope will start pulling again gently and without jerks.

4 Operation of the Winch

In general, operating the winch should not pose any problems, but the potential operator is advised to familiarise himself with the various functions of the winch before starting his job in order to avoid any trouble during the pulling process.

4.1 Setting up the winch

The winch should always be connected to the towing vehicle or an immovable object to prevent pulling force being transmitted through the towbar.

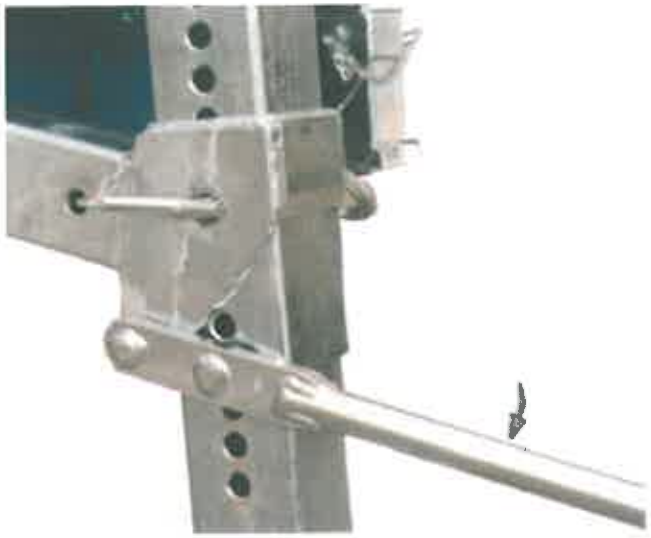
To avoid lateral movement or lifting of the towbar during operation, the winch must be secured with ropes, chains or lashing straps at the front anchor points of the winch (see picture below).

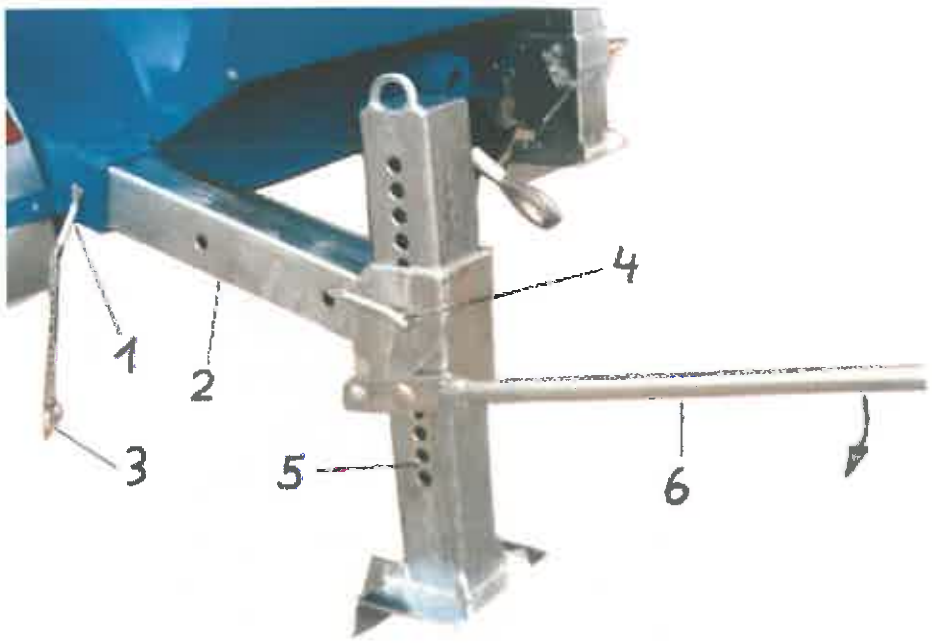
- Apply the parking brake of both, towing vehicle and winch.
- Pull out the rear props, press them firmly into the ground and secure them in that position (see picture below).
- Turn down the jack at the towing bar.

Pull out the rear props

Front anchor points

4.1.1 Propping up the winch (not all winch types)





- remove fixing pin (1)
- pull out horizontal propping beam (2) as far as required
- re-insert fixing pin (1) when bores are in line and secure (3) in place
- remove fixing pin (4) of prop (5) holding it to prevent it from falling
- let prop (5) slip down to ground
- insert jacking-up wrench (6) with its front pin into the pivoting bore and its second pin into the upper prop bore
- press wrench (6) down until fixing pin (4) fits into next upper bore
- insert fixing pin (4) and remove jacking-up wrench, repeat jacking-up procedure as required
- secure fixing pin (4) in place

4.2 Before starting the winch

Check the contents of the fuel tank and, if necessary fill with petrol or diesel fuel as required.
Check the engine oil and hydraulic oil levels and top up if necessary (for the type of oil to be used see Technical Specification)
Put the winching lever to neutral position (0) (cable laying winch type KW)
Turn the hand wheel of line speed control to "0" or on proportionally controlled winches turn control to "0"
Make sure that the remote control or dummy plug is connected to the winch!

NOTE :

- Make sure that the control panel and all controls are unobstructed and freely accessible!
- Check whether the rope is properly bedded in all pulley grooves, in particular the tail pulley.

4.2.1 Starting the engine

Observe the engine manufacturers instruction

4.3 Winching out (payout)

- Set the line speed selector to range 2 (maximum line speed).
- Set the engine speed control lever to maximum.
- Push winching lever to "OUT" or press "OUT" button.
- Turn line-speed control hand wheel to maximum or control to 10 (only winches Type RW and RKW)
- The rope pays out as long as it is pulled, but stops when no longer pulled or when the winching lever is set to neutral or when the "stop" button is pressed.

ATTENTION !

- Take care that a new winch or a winch fitted with a new wire rope does not pay-out the rope automatically although there is no pull on the rope.
  Otherwise the winch hydraulic must be readjusted to make sure that the rope will not shape loops which may cause damages to it. .
- Stop pulling out any more rope when the red-painted length appears, which indicates that no more than one layer of rope is left the drum
- After the required length has been pulled out, put the winching lever back to neutral position or press the "stop" button. Turn the hand wheel to "0" (RW and RKW)

4.4 Winching in

- Put the line-speed preselector to range 1 or 2
  put the line-pull preselector to required pulling force (only pipe renewal winches type RW /RKW).
- Push the winching lever on "IN" or press the button "IN".
  Turn the line-speed hand wheel slowly until the rope pulls tight. (only RW or RKW)
- The line speed may now increase in relation to the line pull up to maximum

Remember though that within the line speed range 2 the winch will pull only up to half of its rated line pull. As a general rule of thumb: the higher the line-pull the lower will be the line-speed

ATTENTION !

- Never pull the thimble at the end of the rope into the tail pulley of the winch

See point 3 of Safety Precautions on page 1

NOTE :

- During pulling reduce the engine speed to a level where a good balance is kept between line speed and required line pull. This will save fuel and will further reduce the noise level of the sound-proofed winch. Where only low line pull and low line speed are required, the engine will do quite well in the lower to medium speed range.
- The line pull is indicated on the hydraulic oil pressure gauge or on the electronic printer, if fitted.

  The scale of the metal ring around the pressure gauge dial is calibrated for the speed range 1. When working in speed range 2, the indicated values is only half as shown on the scale.
- The electronic printer records the pulling forces, length of rope which has been pulled and the line-speed during operation. A record may be printed out as a bar diagram.
- Some printers are fitted with a switch-off contact which stops winching immediately as soon the preselected pulling force has been exceeded. (For detailed information see manual of the printer).

NOTE :

- The exact value of pulling force is indicated at the printer only.
- There may be a discrepancy between the indicated pulling force on the pressure gauge and the printer and depends on increasing temperature of the oil during operation.
- The preselected line pull should be regarded as a guiding value only for basic setting.

4.5 Stopping winch operation

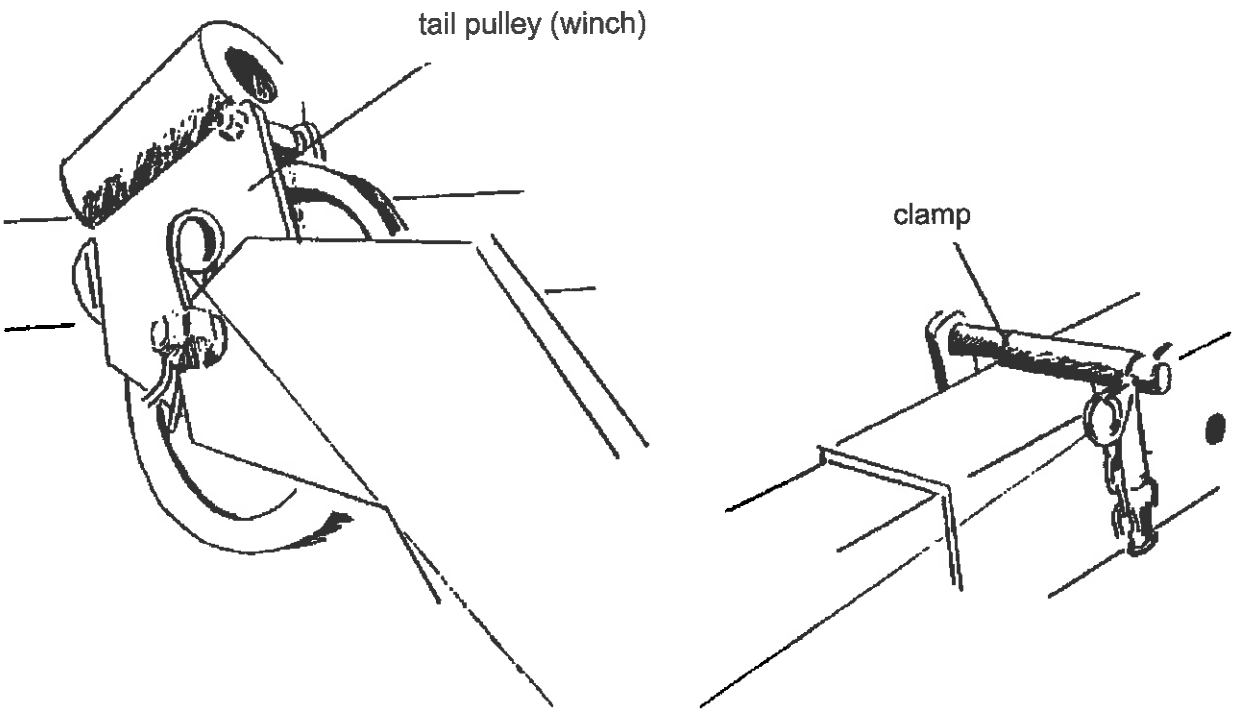
At the end of winching, push the winching lever to neutral (or press the "0" button). Turn line speed control hand wheel (or electronic control) to zero in order to avoid the thimble being inadvertently pulled into the tail pulley upon a restart (pipe renewal winches RW/RKW only).
Set the engine speed to zero and switch off the ignition key.

See point 10 of Safety Precautions when operating with the winch boom.

4.6 Operation with the deflection boom

For some underground pipe renewal jobs a deflection boom will be required. Such a boom may be ordered as an extra accessory. The working depth of the boom is variable in several steps.

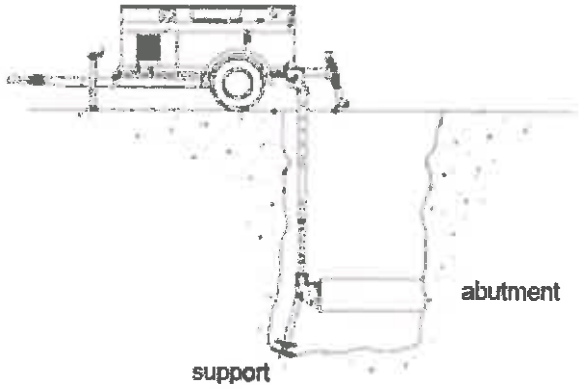
Connect the deflection boom to the tail pulley of the winch and secure it with the appropriate spring pin. Extend it to the required working depth and secure it in that position with the two appropriate clamps.



The deflection boom bottom should be secured against lateral movement. The thrust plate of the boom must bear at the end of the main or an abutment plate fitted to the main.

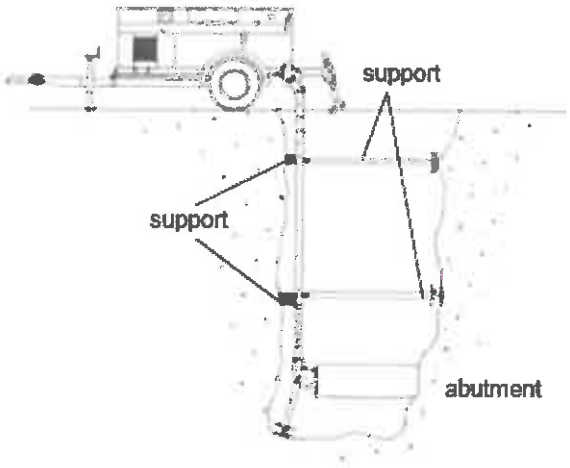
Break off the ends of the main as squarely as possible to give maximum bearing area for the thrust plate. Long jagged projections will brake off under load and may cause the boom to jerk.

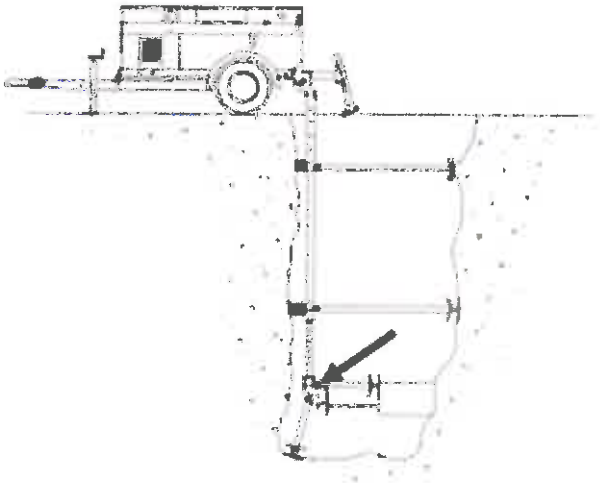
GRUNDOWINCH



During renewal jobs using deflection booms up to 2.50 m operation length there is need of additional supports. They just have to be supported at the bottom of the manhole.

Deflection booms of more than 2,50 m length have to be supported laterally at the manhole walls so that buckling stress is reduced



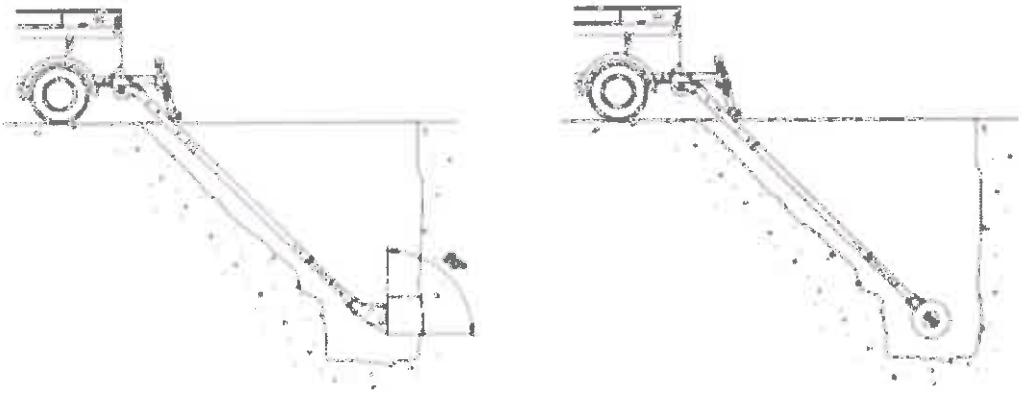


ATTENTION:

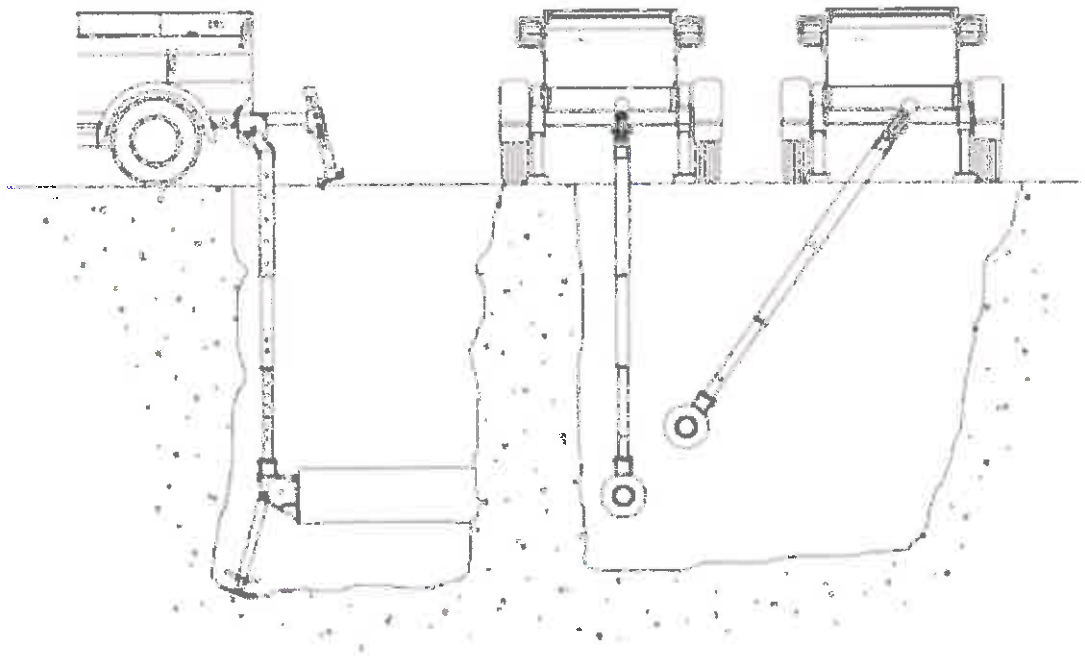
Never pull without abutment, risk of collapse!

4.6.1 Possible applications of the deflection boom

Possible applications of the deflection boom

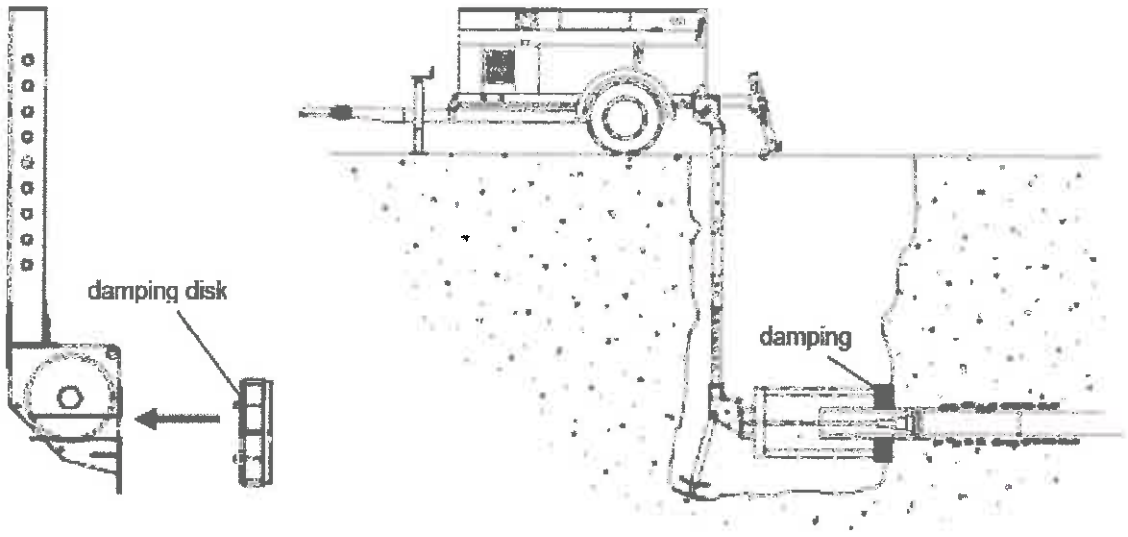


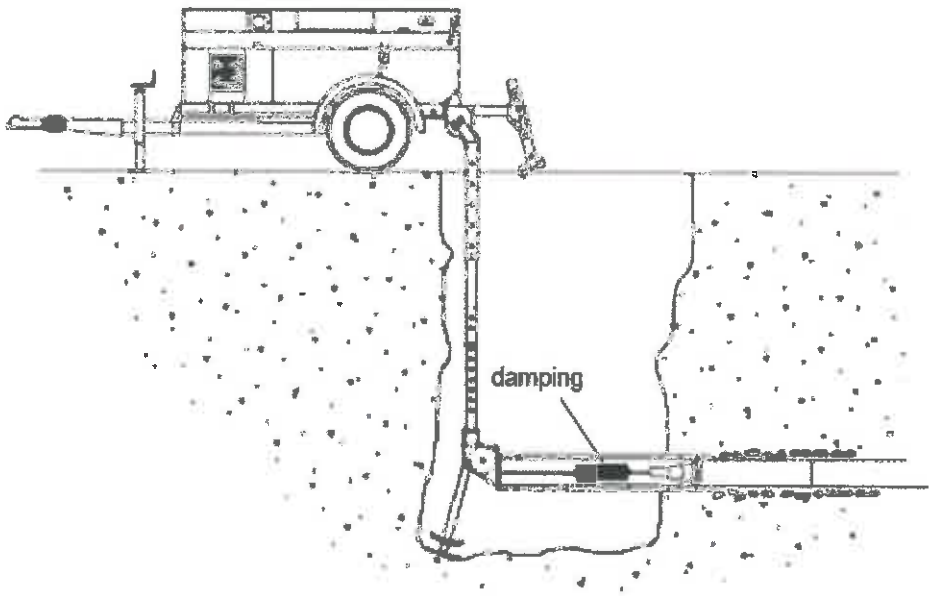
The end of the mains should be roughly at the right angle to the axis of the main.



Attention!

During pipe-cracking jobs never work without damping device





4.7 Parking the winch

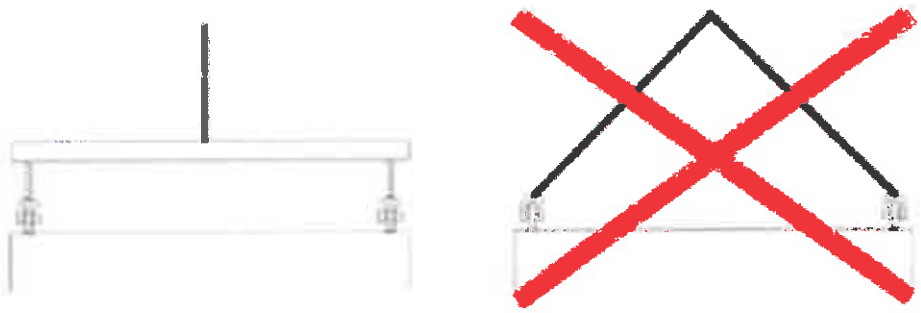
On level grounds simply apply the parking brake of the winch before uncoupling it from the towing vehicle.

In down-hill positions apply the parking brake of the winch and put the chocks (held on the side of the winch) in front of both wheels.

In up-hill position allow the towing vehicle to roll back far enough to let the brake system engage into reverse mode, apply parking brake and put the chocks behind both wheels.

4.8 Lifting the Winch

For lifting the winch by crane, use the two lifting eyes on top of the winch. Use a lifting beam to ensure that the lifting eyes are stressed only vertically.



correct incorrect

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5 Towing the Winch – Always ensure the towing vehicle meets the requirement for towing the Winch.

It is the user's responsibility to ensure that the trailer-mounted winch, its running gear, rear lights, tow bar and coupling as well as all electrical connections meet the statutory regulations of the country in which the winch is to operate.

The standard design of winches meets the relevant EU Regulations.

However, upon the user's request the carriage, lighting and brakes will be designed to meet local regulations. Winches which are ordered without lighting and overrun brakes are not permitted to be towed on public roads.

advice sheet

*keeping **you** in touch with industry developments*

Correct Attachment of Breakaway Cables Braked Trailers (up to 3500kg GVW)

Where a designated attachment point is provided on the towbar:

Either:

a) Pass the cable through the attachment point and clip it back on itself (Fig. 1),

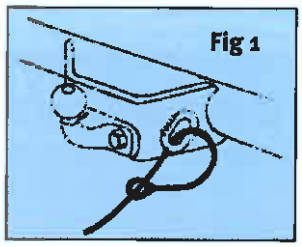
Fig 1

Or:

b) Attach the clip directly to the designated point (Fig. 2). This alternative must be specifically permitted by the trailer manufacturer since the clip may not be sufficiently strong for use in this way.

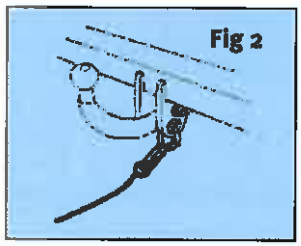
Fig 2

Where no designated attachment point has been provided on the towbar:

Fixed ball
Loop the cable around the neck of the towball. If you fit the cable like this, use a single loop only. See Figs. 3A and 3B.

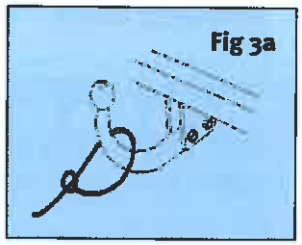
Fig 3a

Detachable ball
You must seek guidance on procedure from the towbar manufacturer or supplier.

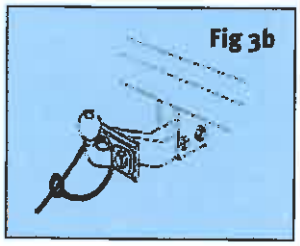
Fig 3b

For other means of attachment see overpage

This advice is supported by:

National Caravan Council Limited

NTA

The Caravan Club

The Camping and Caravanning Club

The Motor Industry SMMT

Other means of attachment:

In some instances it may be possible to attach the cable assembly:

Either:

a) to a permanent part of the towbar structure, as long as this meets the approval of the towbar manufacturer/supplier,

Or:

b) to an accessory sold for the specific purpose of breakaway cable attachment.

Correct procedure for use:

- Regularly check the cable and clip for damage. If in doubt, contact your dealer or your service agent.
- Make sure the cable runs as straight as possible and goes through a cable guide underneath the trailer coupling.
- Determine whether or not the towbar has a designated attachment point (i.e. a part specifically designated by its manufacturer for a breakaway cable).

When the breakaway cable is attached, check to ensure:

a) that the cable cannot snag in use on the trailer coupling head, jockey wheel, or any accessory e.g. a stabiliser, bumper shield, cycle carrier, etc.

b) that there is sufficient slack in the cable to allow the towing vehicle and trailer to articulate fully without the cable ever becoming taut and applying the brakes.

Note: For peace of mind you might wish to check the state of the cable by positioning the trailer and towing vehicle at extreme angles before setting off.

c) that it is not so slack that it can drag on the ground. If left loose, the cable may scrape along the ground and be weakened so that it subsequently fails to do its job. The cable may also be caught on an obstacle when in motion thus engaging the trailer brakes prematurely.

Having followed this advice, should you feel that a satisfactory coupling arrangement cannot be achieved, consult your trailer or towbar supplier or service agent.

This is the Law

UK LAW requires that all trailers with brakes built on or after 1st October 1982 (e.g. caravans, horse boxes, flat bed car trailers etc.) are fitted with a safety device to provide protection in the unlikely event of the separation of the main coupling while in motion. A device referred to as a "breakaway cable" fulfils this requirement and when fitted to a trailer its use is mandatory.

Trailer and/or towbar manufacturers should supply advice on the correct use of these cables. In the absence of such information, the following guidance should be noted.

Purpose of a Breakaway Cable

To apply a trailer's brakes if it becomes separated from its towing vehicle. Having done this, the cable assembly is designed to part, allowing the trailer to come to a halt away from the towing vehicle.

Construction

Usually a thin steel cable, possibly plastic coated, and fitted with a means of attachment for connection to the towing vehicle.

Operation

In the event of the main coupling of the trailer separating from the towing vehicle, the cable should be able to pull tight, without any hindrance, engaging the trailer's brakes.

Note: The breakaway cable should never become taut during normal use.

THIS ADVICE DOES NOT APPLY TO UNBRAKED TRAILERS UP TO 750kg GVW which are required by law to have the use of a SECONDARY COUPLING. A secondary coupling should keep the trailer ATTACHED to its towing vehicle even if its main coupling becomes separated.

The guidance set out in this leaflet is provided for general guidance purposes only, and does not purport to be legal advice or a definitive interpretation of the law.

This document has been produced by the National Caravan Council on behalf of the supporting organisations overleaf.
National Caravan Council, Catherine House, Victoria Road, Aldershot, Hampshire GU11 1SS. www.thecaravan.net

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6 Rope Handling

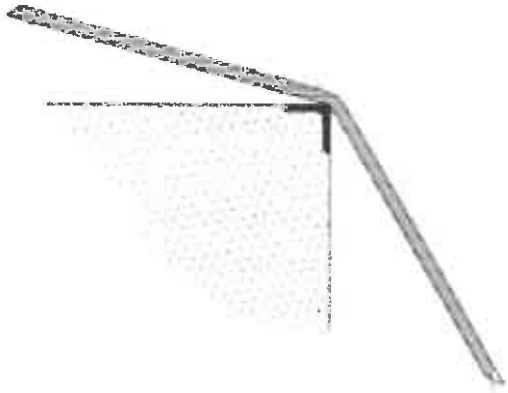
Incorrect uncoiling/unreeling of wire ropes will cause stresses in the lay of the rope and may eventually affects its structure. Moreover, kinks may have developed which will make rope handling more difficult.

incorrect

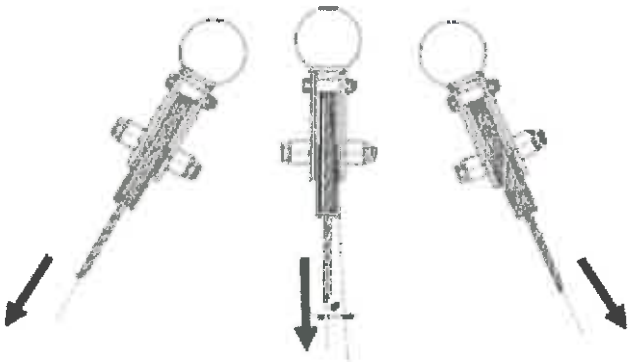
correct

Do not pull the rope over fixed objects or edges to prevent the strands from untwisting

incorrect



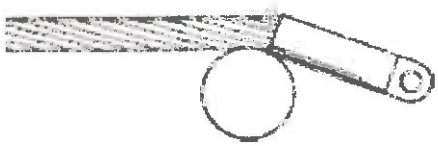
Always adjust rope pulleys in line with the pulling direction!



Max. deflection angle 4°!

Do not pull rope clamps over sharp angles or narrow bends to avoid tearing rope strands out of the pressing.

incorrect



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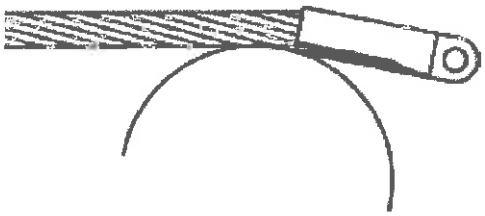
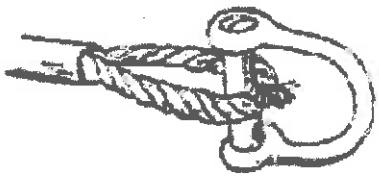
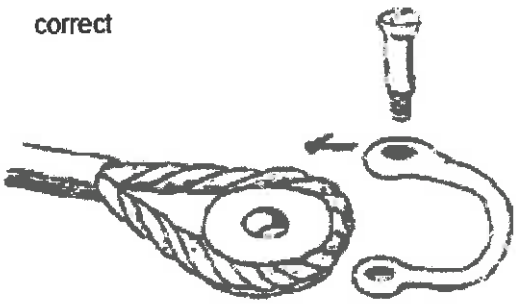


Rope loops should be laid around circular fittings to prevent sharp bending and eventually breakage of the single wire strands.

incorrect



correct



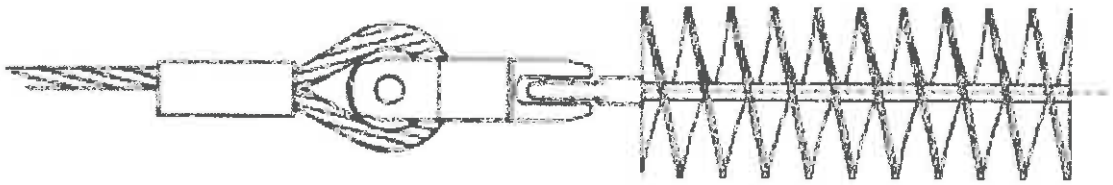
Rotating tools (such as duct brushes and the like) should be connected with a swivel joint in between. Make sure that the rotating tool connected (via swivel joint) tends to twist the rope tighter, i.e. that the direction of the rotation corresponds to the lay of the pulling rope!

correct

right-laid winded rope swivel joint left-spiralled brush

A rotation of the tool against the direction of the lay of the pulling rope will tend to untwist the rope strands in spite of the swivel joint and thus impair the tensile strength of the rope.
Attention: Breaking!

incorrect



right-laid winded rope swivel joint right spiralled brush

To make sure that no rotation will be caused from the rope, a non-rotating rope should be used.

However, every rotating tool will tend to transmit a slight twist to the rope, even with the use of a good swivel joint and a tool whose rotation corresponds to the lay of the rope strands. Hence, the rope may develop small loops which should be untwisted by hand before the rope is pulled in, but shrink into kinks which, when passing forcibly through narrow passages (guiding pulley etc.), may damage the rope badly.

incorrect

Pull out the rope only at its end, if possible use an anti-twist swivel. Lay down the rope on the ground always flat in-line.
Never allow the rope to lay down in loops! Otherwise loops could be pulled into the winch and damage the rope!

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Always adjust pulleys in line with the direction of pull. Max. deflection angle 4°

The diameter of external pulleys should not be smaller than the tail pulley of the winch!

incorrect

incorrect

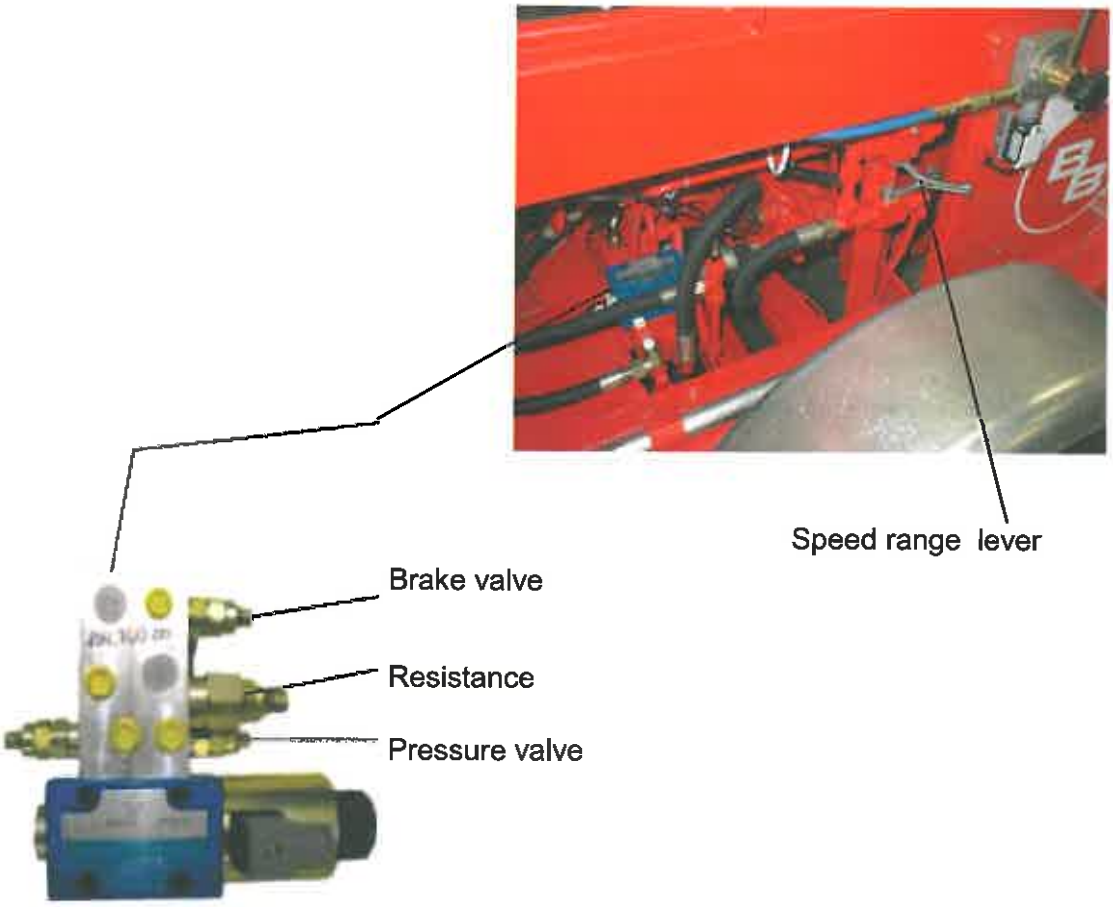
7. Trouble Shooting

Trouble observed	Possible cause	Correction
Engine stalls	Line speed setting too high	First set line speed zero and increase slowly in proportion with line pull
	Hydraulic pump defect	Replace pump
Rope can not be pulled in or out No hydraulic pressure on the gauge Green control lamp on panel board is out. Capstans do not revolve	„Emergency-stop" button has been pressed	Engage „emergency-stop" button
	Remote control socket is unplugged	Put remote control or dummy plug to the socket
	Poor contact of electrical wires	Fit the cables of the solenoid valve directly to the battery
	Coupling has become loosen and is off the pump shaft	Refit the pump from the engine, replace the coupling and secure it
	Pivot pin of the pump will not be pushed by the bowden cable of the line-pull selection	Adjust bowden cable as per instruction
	Pump control unit defect	Replace pump
Rope does not pull out	Controls not properly set	Set controls as per operating instruction
Rope pulls out very slowly	Engine speed to low	Increase engine speed
	Line speed control not at max.	Set line speed control to max.
	Line pull selection lever at stage 1	Set line pull selection lever to stage 2
	Line pull selection lever is set too low	Set the line pull selection lever to a higher value
Rope drum overruns when rope is pulled out	Brake pressure too low	Increase brake pressure at the brake pressure valve
Winch stops at low line pull and line speed	Resistance in oil flow to capstan motors too low	At low line pull and line speed the speed selection lever should be in stage 1
	Grease on the rope	Clean the rope or use a new rope
Winch stops although preselection lever is set in range 2	Resistance in oil flow to capstan motors too low	Readjust resistance valve by turning the socket screw 1 or 2 turns into housing
Winch does not develop full line pull	Hydraulic pressure too low	Increase pressure at pressure valve -preselector
	Pump defect	Replace pump

Trouble Observed	Possible Cause	Correction
Winch does not pull (capstans turning)	Controls not properly set	Set controls as per operation instruction
	Rope drum blocked by foreign Object.	
		Remove foreign object that ma block or brake rope drum
	Driving chain broken or seized	Replace chain
	Oil motor has no advance	Increase advance at the resistance valve
	Oil motor of rope drum defect	Replace oil motor
Winch does not pull, oil pressure increases	Rope twisted on capstans capstan covering worn out	Repair or replace capstan covering
	Oil motor of capstan defect	Repair or replace capstan motor
Line pull indicator and preselector differ widely	Bowden cable has become loosen or out of adjustment	Turn setting screw of bowden cable to exact position as per line pull indicator
At stage 2 winch pulls normally but at stage 1 full line pull is not reached	3-way ball valve defective: leakage between ball and housing; test by disconnecting pipe at ball cock; if ball lies loose in the housing, cock defective	Replace ball valve
Winch does not pull, no hydraulic pressure in low line speed range	Capstan motor defective: oil leakage due to mechanical failure; test by measuring leakage oil; disconnect leakage line on upper motor and close line to tank with a plug; connect hose to leakage oil socket and hold it into a receptacle; start winch and pull rope in under load; leakage oil flow should not exceed 0,5 l/min; repeat check with lower capstan motor	Replace oil motor

7.1 Place of the valves

7.1.1 Cable laying winch type KW

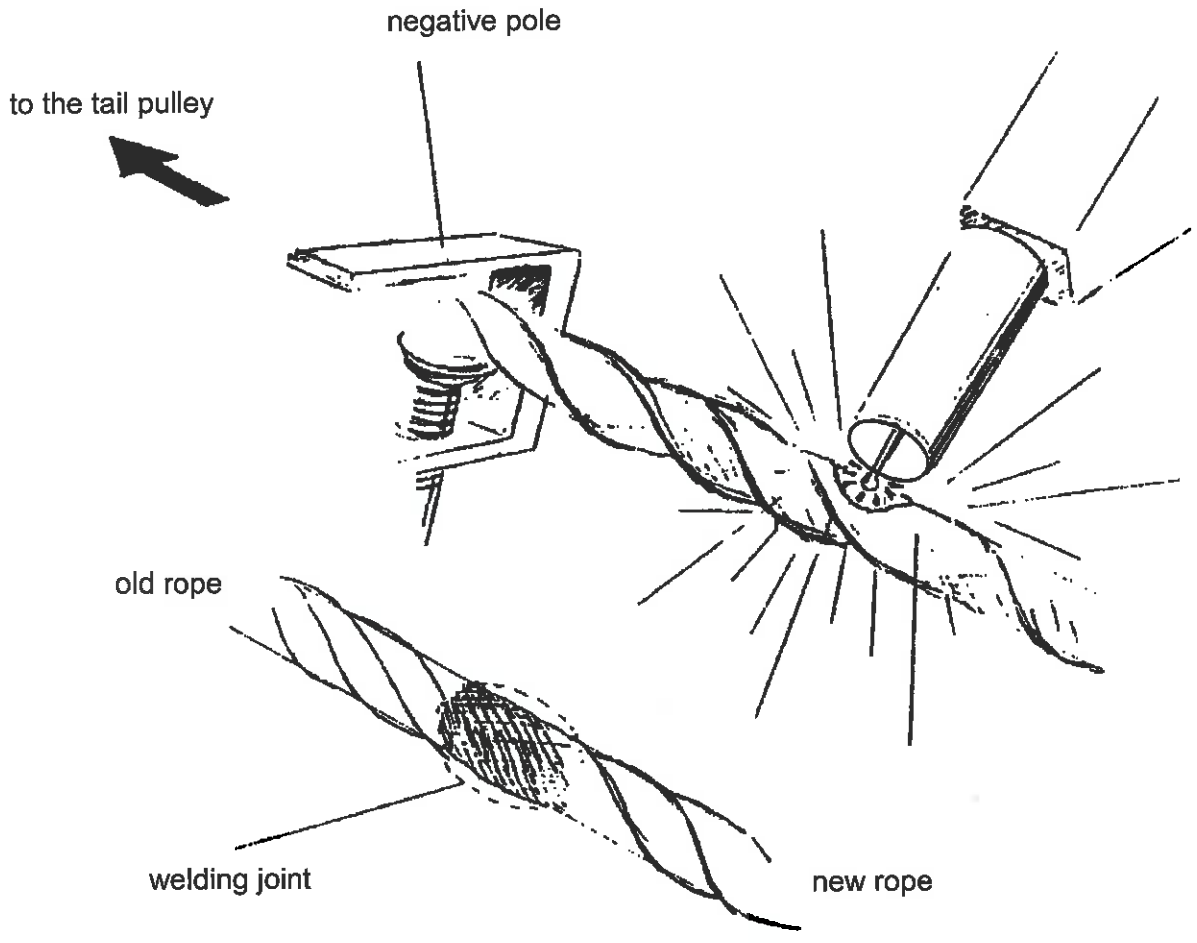


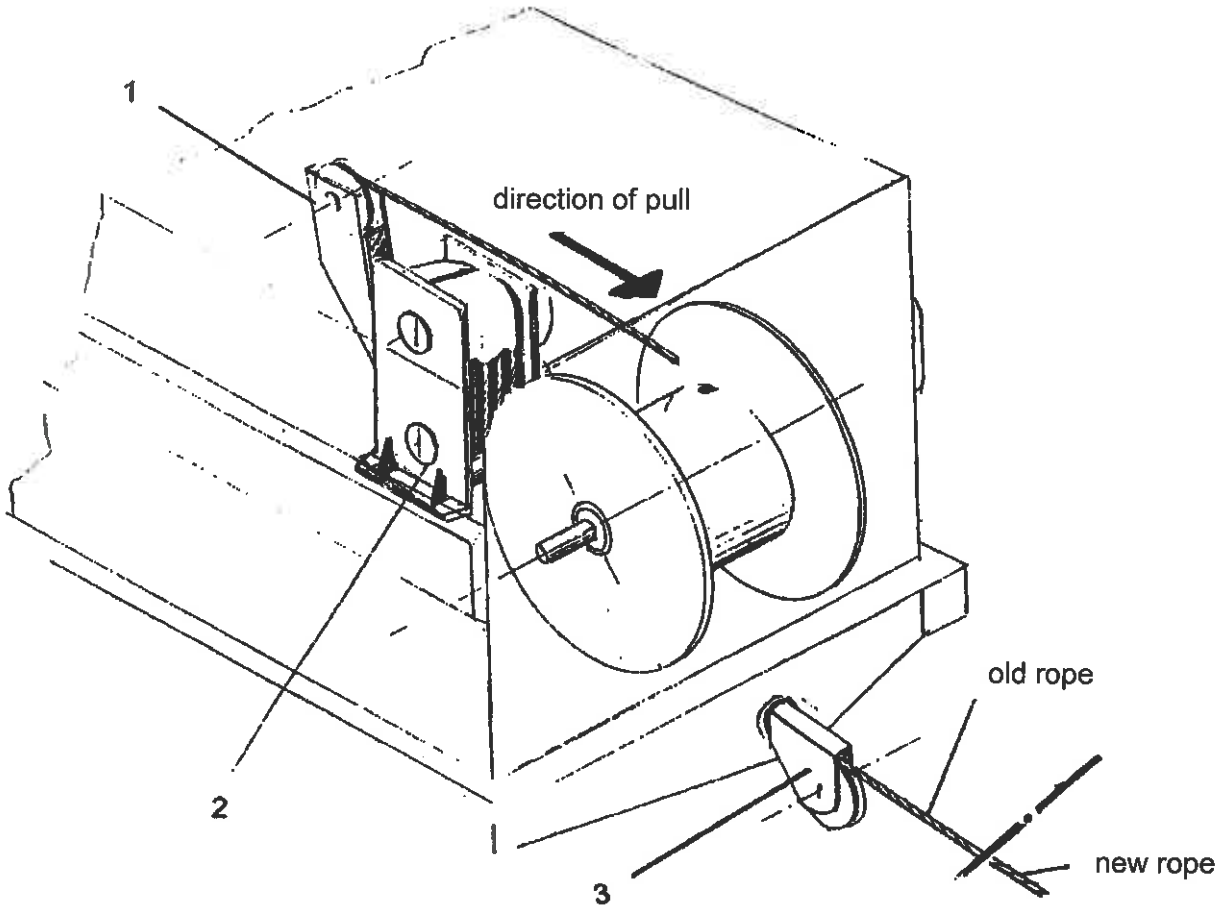
7.1.1 Pipe renewal winch type RW/ RKW

8. Replacement of a Damaged Rope

Before replacing a damaged rope, take off the rear flap of the winch to be able to observe the uncoiling of the rope.

- Start engine (follow the manufacturer's operation manual)
- Put the line speed preselector to range 2
- Push the winching lever to "OUT", or press the "OUT" button
- Turn the hand wheel to maximum (RW/RKW)
- Pull out the rope until only five windings are left on the drum
- Stop winching out, set the winching lever to "0" or press the "Stop" button.
- The rope should be cut off approximately 1-2 meters behind the tail pulley (3) of the winch, which should preferably be done with an electric welder.
- Adjust the welding generator to a high current and connect the negative pole to the rope (not to the winch chassis!) In the cutting process the ends of the wires in the strands are welded together.





- Weld the end of the new and old rope together and grind the welding joints down to the original rope diameter by using an angle grinder.
- Start "winching-in" and stop as soon as five windings of the new rope are wounded onto the drum.
- Turn the storage drum by hand in opposite direction, disconnect the rope from the drum and cut off the end of the old rope.
- Insert the end of the new rope into the hole of the drum core, and wind the new rope slowly and evenly onto the drum. The first layer of the rope should be marked with red paint in order to signal the winch operator, when he pulls out the rope that only one layer is left on the drum.
- Pull in the new rope and close the flap.

9. Maintenance of the Winch

The winch needs only the minimum of maintenance, but carry out checks regularly as required to ensure trouble free and safe operation of the winch.

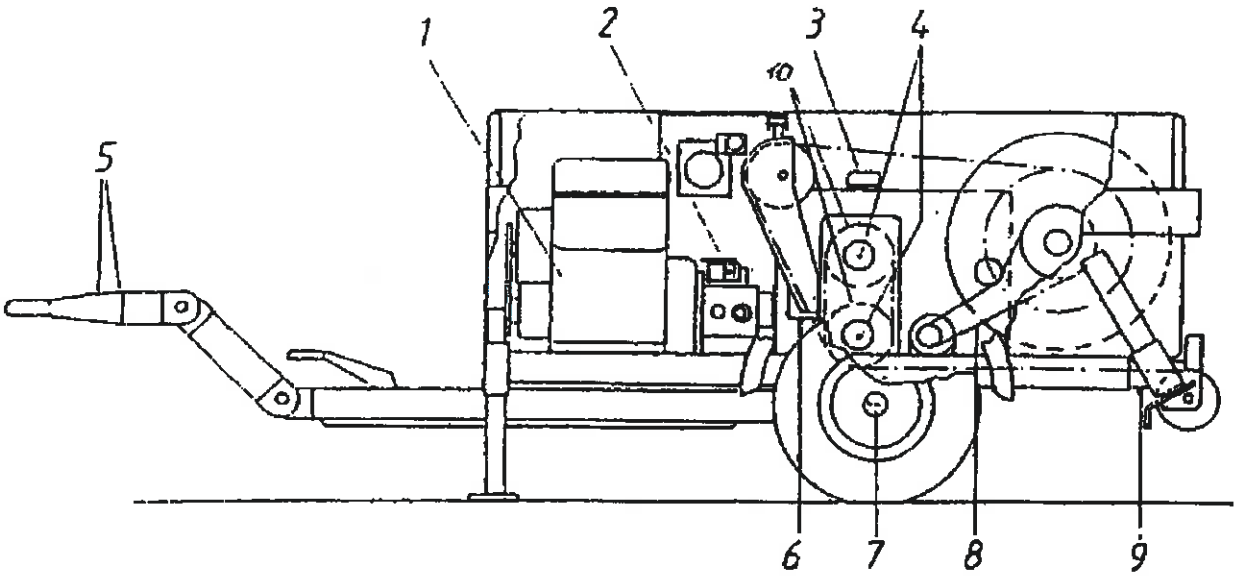
Regularly checks and works:

Re-lubricate according to lubrication chart
Regularly check the hydraulic oil level and top up if necessary.
Check the hydraulic system for good performance and oil leaks, retighten the hydraulic connections.
Before operating the winch, check the engine oil level, top up if necessary.
Take care of the engine according engine manufacturer's manual.
Check tyre pressure regularly.
Lubricate moving parts of the overrunning brake according to manufacturer's instruction.

Recommended lubricants:

Hydraulic oil:	HLP-Oil ISO VG 46 (SHELL TELLUS 46) or ISO VG 68
Motor oil:	see engine manufacturer's instruction.
Gear oil:	Hypoid gear oil (SHELL Spirax MB 90)
Grease:	multi-purpose grease

GRUNDOWINCH



Lubrication Chart

1	Engine	Check daily	Motor oil
		Change as per engine manufacturer's instruction	
2	Pump control lever	Re-grease every 3 month	Multi-purpose grease
3	Hydraulic oil	Check every month	Hydr.oil 46 cSt or Hydr.oil 68 cSt
		Change once a year	
4	Capstan bearings	Re-grease every 3 month	
5	Overrunning brake	Re-grease every 3 month	Multi-purpose grease
6	Rope stacking arm	Re-grease every 3 month	Multi-purpose grease
7	Wheel bearings	Re-grease once a year	Multi-purpose grease
8	Driving chains	Re-grease every 3 month	Multi-purpose grease
9	Tail pulley	Re-grease every 3 month	Multi-purpose grease
10	Gear box	Re-grease every 3 month	Hypoid gear oil
		Change once a year	
11	Spindle	Re-grease once a week	Multi-purpose grease

Attachment

I. Certificate of Conformity

II. Test Sheet

III. Technical Data

IV. Diagram of the hydraulic system

V. Diagram of the engine electric

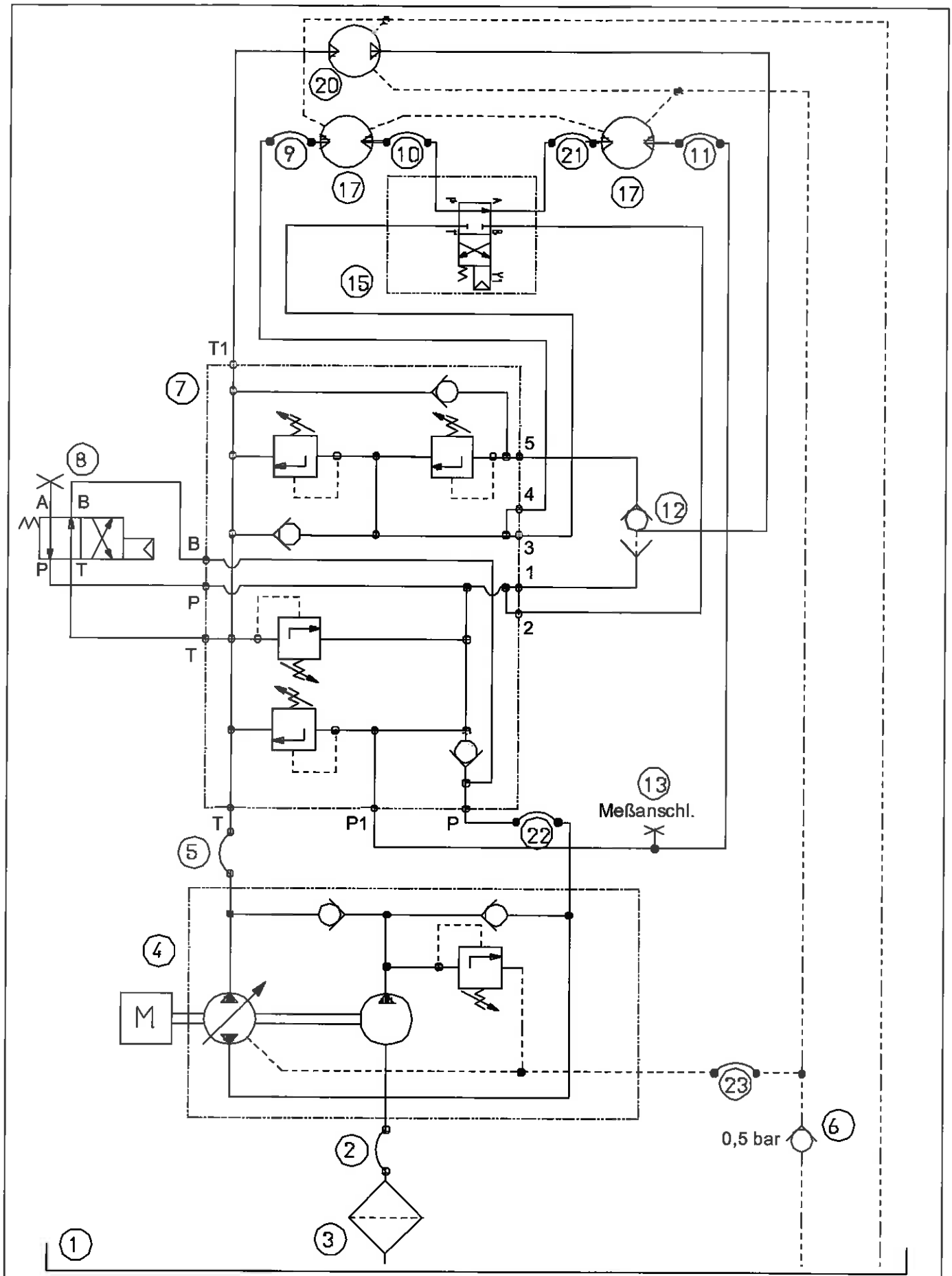
VI. Diagram of the winch electronic

VII. Diagram of the lighting system

VIII. Care and maintenance of the brake system

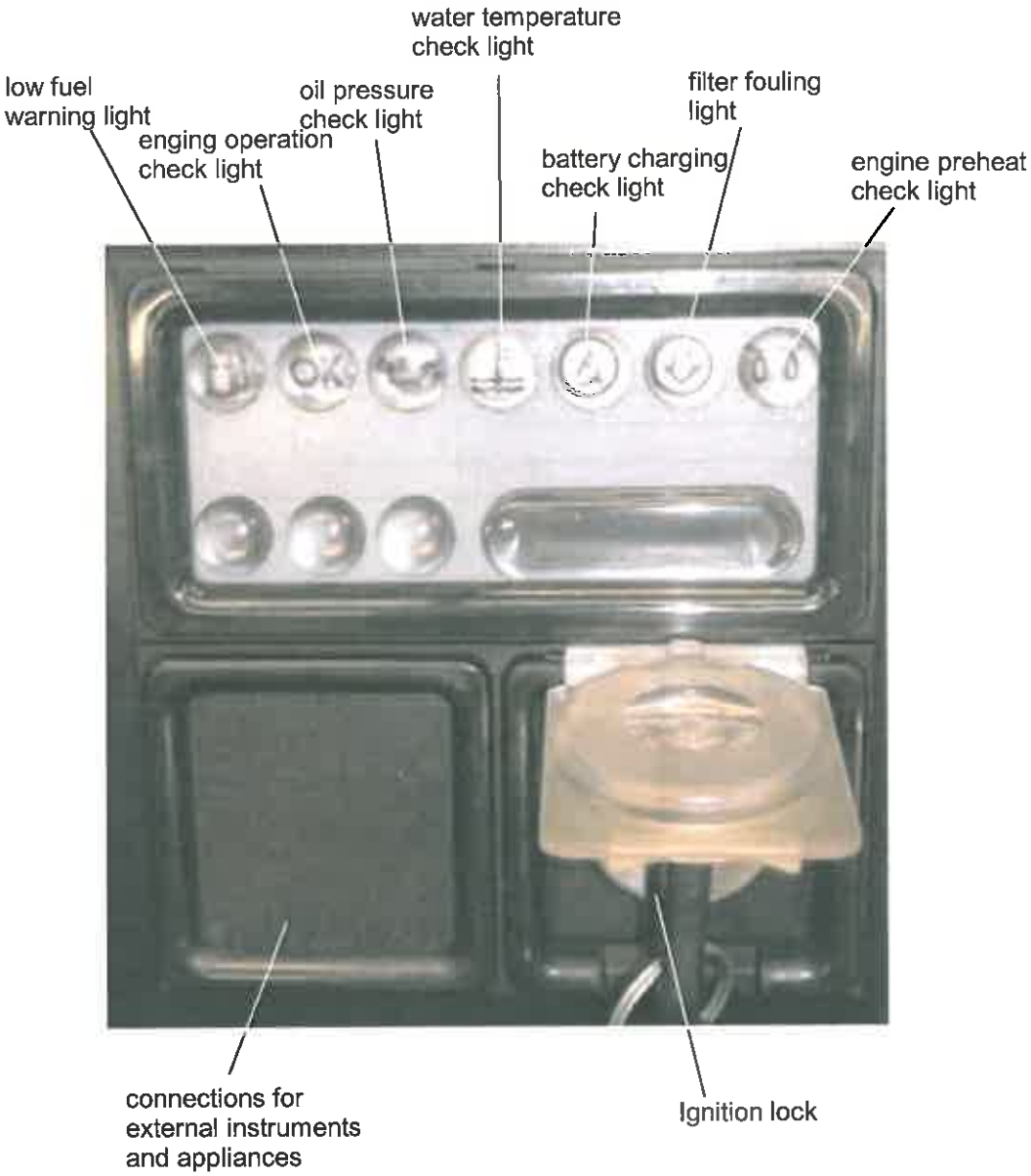
IX. Operation manual of the electronic printer

X. Programming of the meter counter



	Benennung Hydraulikplan für KW mit Steuerblock und E-Stufenschaltung	Mundt	25.02.09
		Maßstab	KW 2-10
		Zeichnungs-Nr. 03-570.04	

Control Board
for
LDW 1003 & LDW 1404

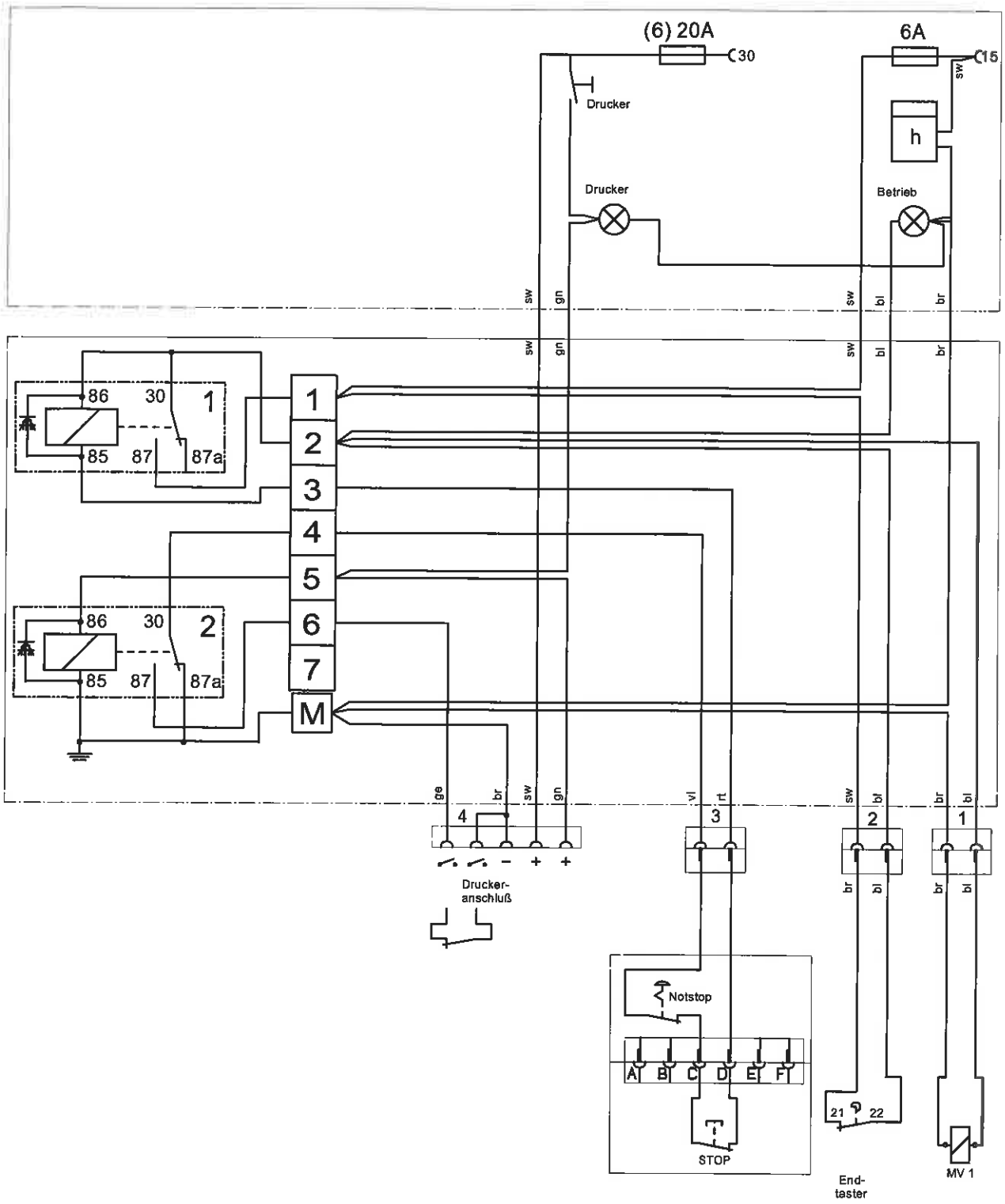


Do not start the cold engine before the yellow glow plug control lamp goes off.

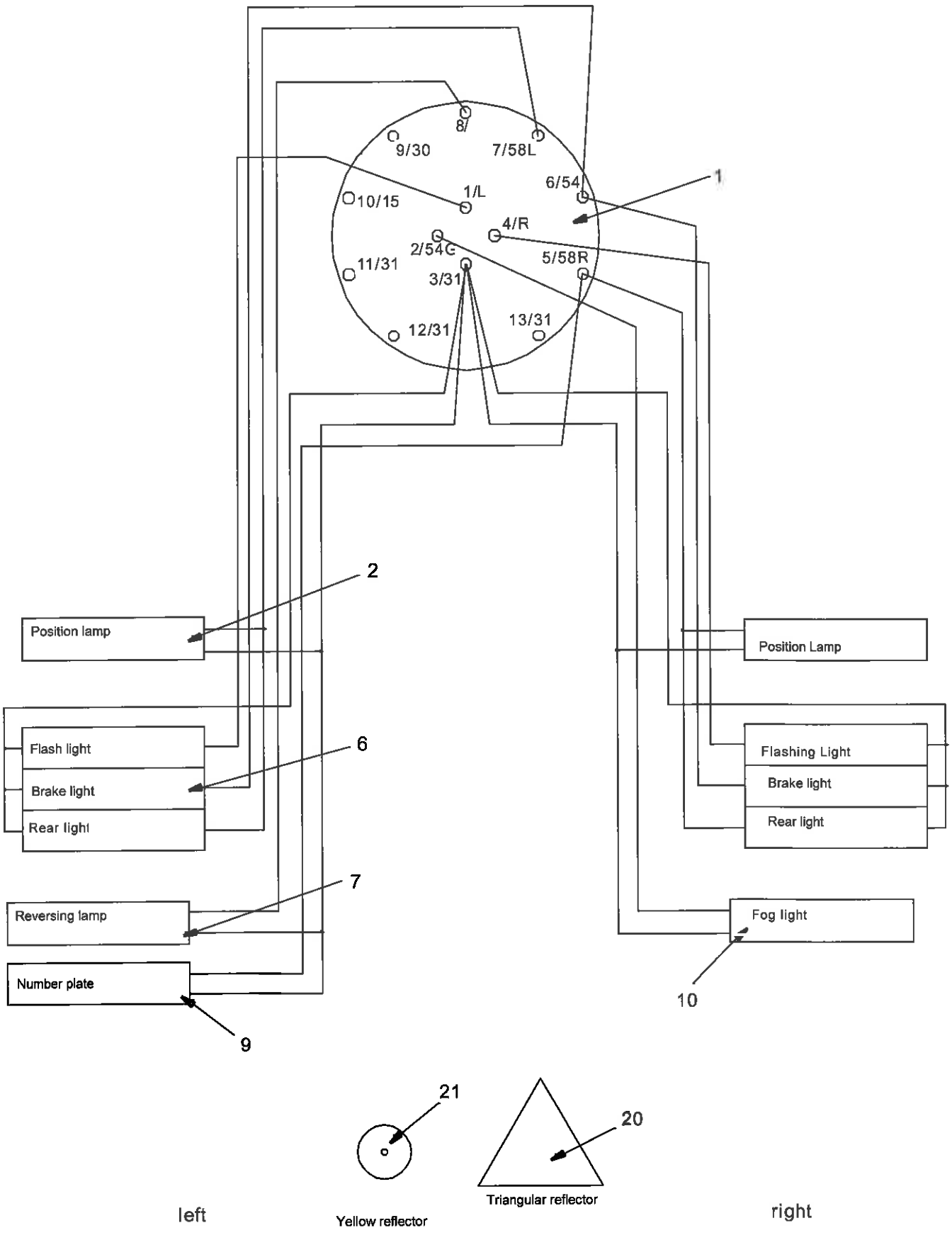
Increase the engine speed until the red battery charging check light goes off the green engine operation check light goes on.

If the red air filter check light goes on, clean the air filter or replace it. Subsequently press the little red button at the transmitter behind the air filter to extinguish the check light.

Carry out regular maintenance work according to the engine manufacturer's operating instructions.



	Rev.2: 19.02.08 Mu	Mundt	13.07.04
	Benennung	Maßstab	KW
	Schaltplan mit Drucker	Zeichnungs-Nr.	003.173.02



			23.09.09
	Lighting System GB 12V 13pin		003.014.31

Maintenance and care of the braking system

The following maintenance work should be carried out as and when required or after six months at the latest by a duly qualified mechanic (chassis manufacturer or service station).

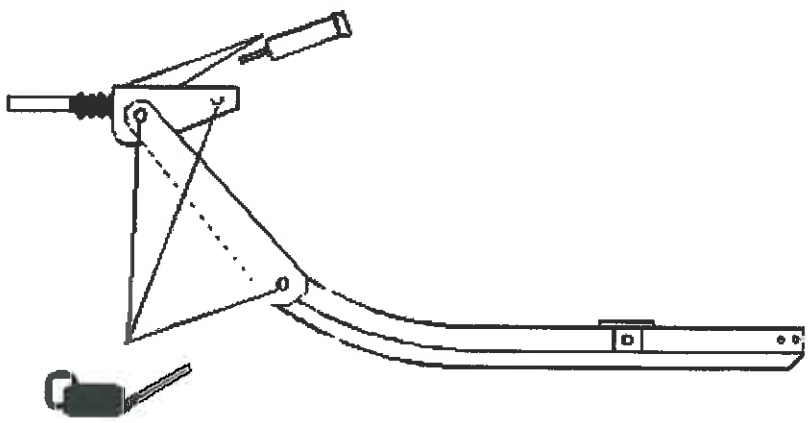
Overrunning brake system

Checking of the pulling tube:

- Take off the transmission mechanism between the adjustment parts either from the upper or the lower reversing lever. After pushing in the pulling tube, it should come out on its own. If it does not or if it can be pushed in by hand easily, the damper will be defective and should be replaced.
- Check the brake ropes and replace them if necessary.

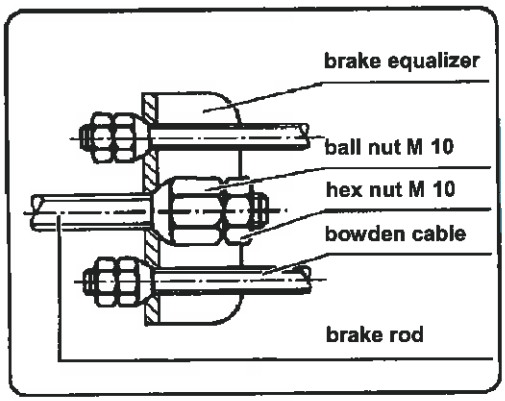
Lubrication plan:

- Lubricate the pulling tube at the points indicated.
- Lubricate all gliding areas with a multi-purpose grease according to DIN 51825 KTA 3K
- If the towing bar is permanently adjusted to a fixed height, rust may develop between the contact areas with the result that the toothed disk gets stuck. To avoid such contact rusting, clean the tooth disk regularly (at least every 6 months) and apply water-repellent grease. This will also prevent dropping out of rusty from the draw bar.
- Use a multi-purpose grease according to DIN 51502 KPF 2C
- Lubricate all other links and movable parts with oil.

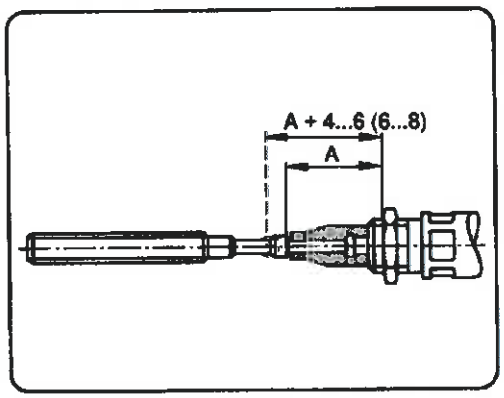


Maintenance and care of the braking system

Adjustment of wheel brakes



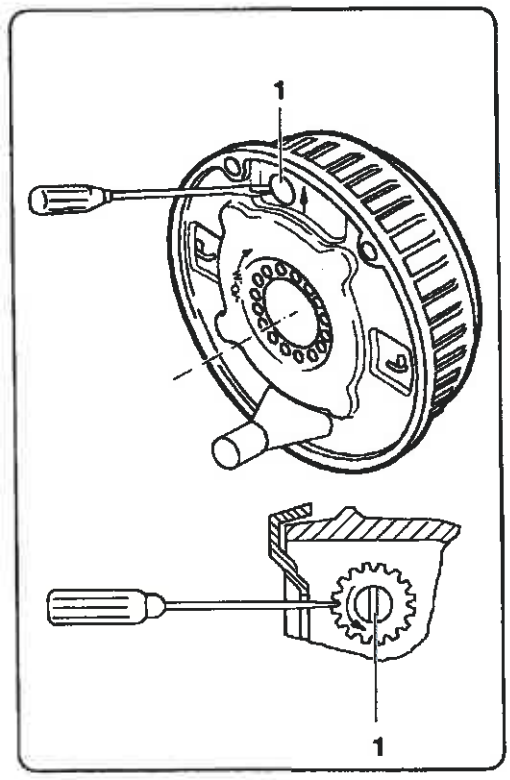
- Raise the trailer on a car lift
- Pull out the towing tube against its stop and release parking brake.
- Loosen the brake rod and equalizer completely (ball and hex nuts).
- Check the clearance in the wheel brake; it should stay equal after two or four brake applications.



Check the clearance in the wheel brake.

It should stay equal after two or four brake applications.

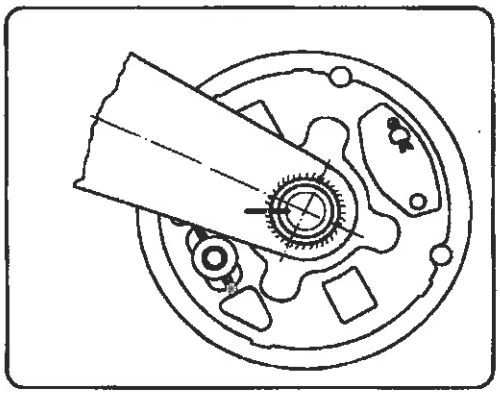
Recommended clearance: 6-8 mm, measured at Bowden cable



- Adjust/readjust the wheel brake only at position (1); tighten or loosen the wheel brake respectively in or against the direction of the arrow.
- Reconnect the brake rod with the equalizer and vigorously apply hand brake lever several times in order to allow the brake system to settle itself. By tightening the ball nut apply a slight pretension to the Bowden cable. i. e. pull it out 1-2 mm.
- Grease the contact areas of the ball nut and lock it when in place.

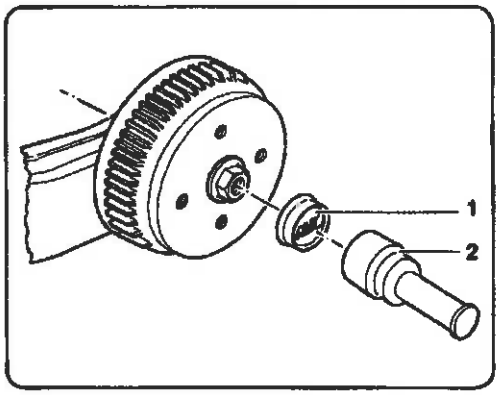
Maintenance and care of the braking system

Maintenance of the wheel brake



Dismantling of wheel brake

- Unscrew the wheel
- Mark the position of the plastic cap on the swing axle bracket by means of a felt-tip pencil in order to detect and correct any turning of the axle stub.



- Remove cap (1) with hammer and blunt chisel. Afterwards refit new cap (1) and d rive home with appropriate punch.
- Remove the flanged nut. Afterwards refit a new self-locking flange nut.

⚠ **Attention: Apply appropriate torque to the flange nut to ensure easy turning of the wheel (280-300 Nm)**

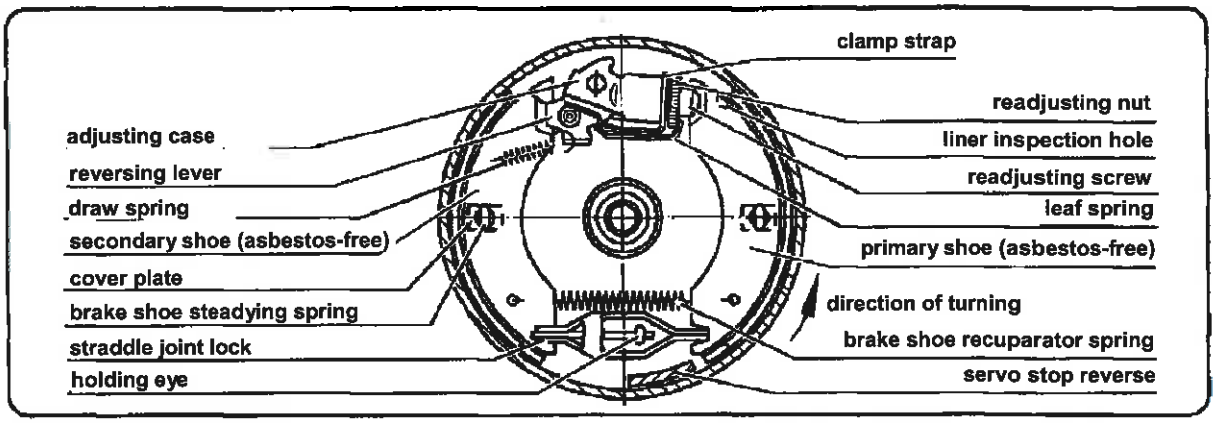
- Pull out the towing tube against its stop and fully release the hand brake lever; loosen the adjusting nut, if required.
- Turn the brake drum slightly and pull it off; if it will not come off readily, apply, slight blows with rubber mallet to the cooling fins.

⚠ **Attention: Brake drums must not be turned out!**

- Replace worn-out (scored) or severely corroded brake drums.

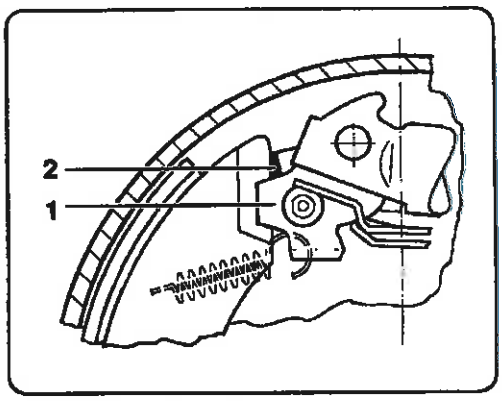
Maintenance and care of the braking system

Visual checks



- Check the condition of the brake liners.

  The wear of the brake liners is most serve at the inspection hole. In a simplex brake the primary shoe is pressed against the drum, whereas the secondary shoe is pressed away from it. This causes unbalanced wear of the pair of brake liners.



- The reversing lever (1) should press against the back of the readjusting case (2).

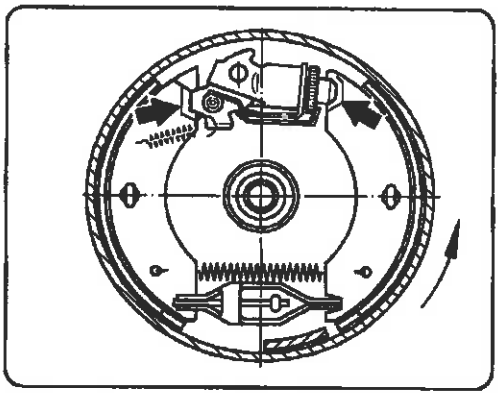
Functional check

- Check the bearing of the straddle joint lock, the readjusting nut and the reversing lever for easy movability.
- Check whether the leaf spring has enough tension and engages with the readjusting nut.
- Check the tension of the brake shoe steadying springs.

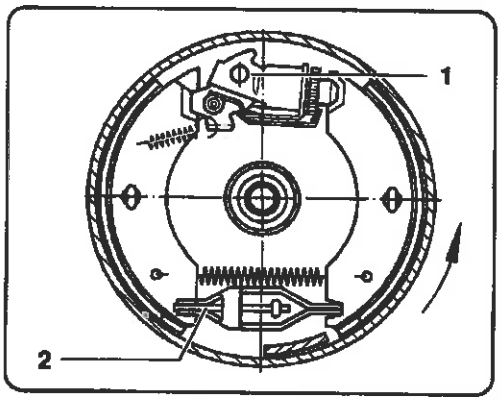
Maintenance and care of the braking system

Replacement of the brake shoes

- For dismantling parts from the wheel brake, loosen the Bowden cable from the equalizer and remove at the straddle joint lock.
- Replace the brake shoe if the liner has worn down to less the 2 mm thickness
- Replace also the brake shoe steadying springs.



- preferably replace also the brake shoe recuperator spring



Straddle joint lock

- Re-lubricate jammed bearings of the straddle joint locks.
- Replace straddle joint locks with corroded bearings.
- Ensure correct refitting:
  straddle joint (2) relative to reversing lever (1).

⚠ **Attention: Any confusion may affect the brake application stroke and hence deteriorate the braking efficiency!**

Brake shoe recupator springs
- Replace fatigued or damaged brake shoe recupator springs.

Reversing lever
- Replace jammed reversing levers and re-grease bearings.
- Replace corroded reversing levers including bearing bolt.
- If the lever does not press against the back of the adjusting case replace the drawing spring.

Readjusting nut
- Re-grease jammed readjusting nuts.
- Unscrew the nut and re-grease thread.
- Replace corroded readjusting screw including nut.

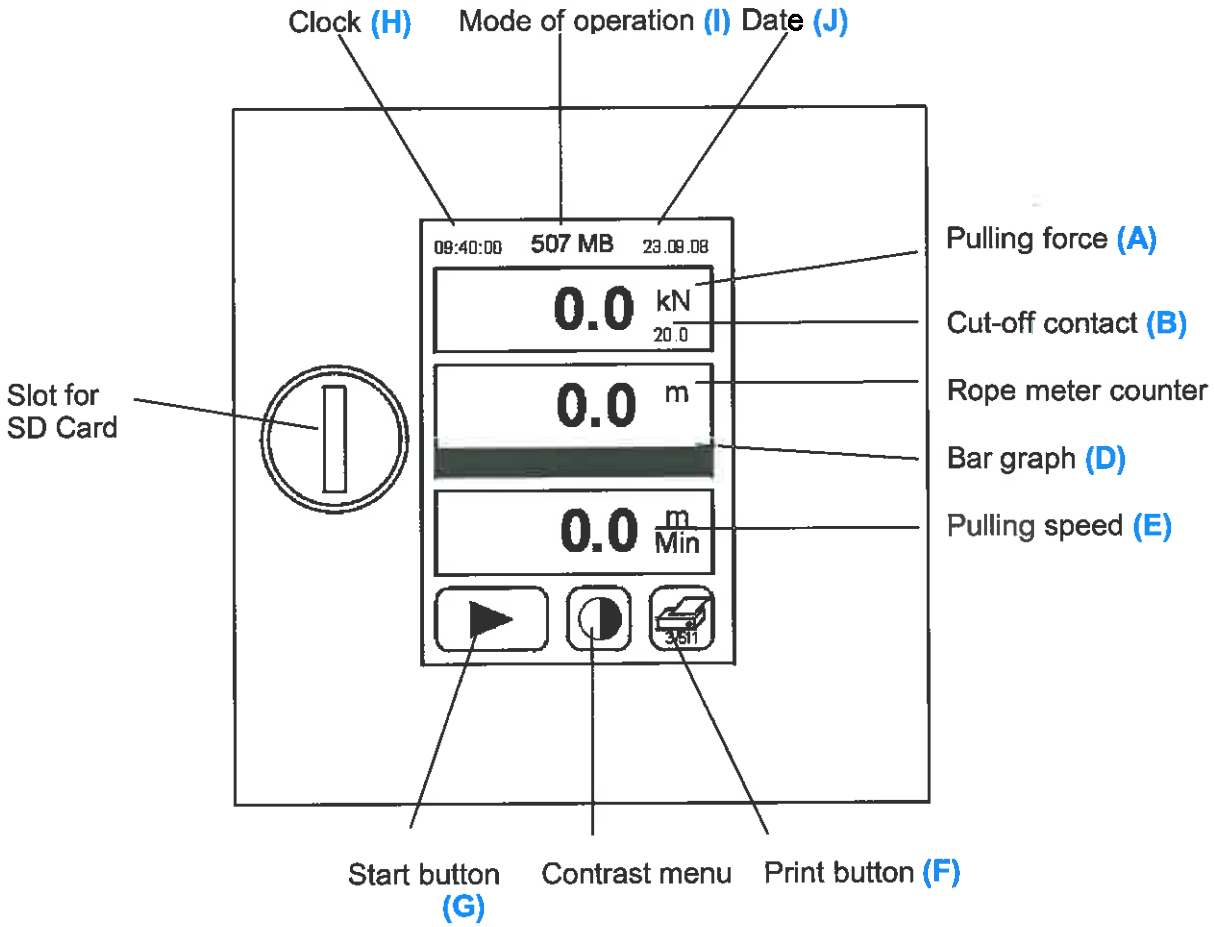
Leaf spring
- Replace fatigued leaf springs.

⚠ **Lubricate all gliding areas with Wolfracoat C, No. 099 113**

Capstan Winch

Operating instruction for winch control and monitoring

1 Display and control elements



2 Workings

2.1 Switch on winch control

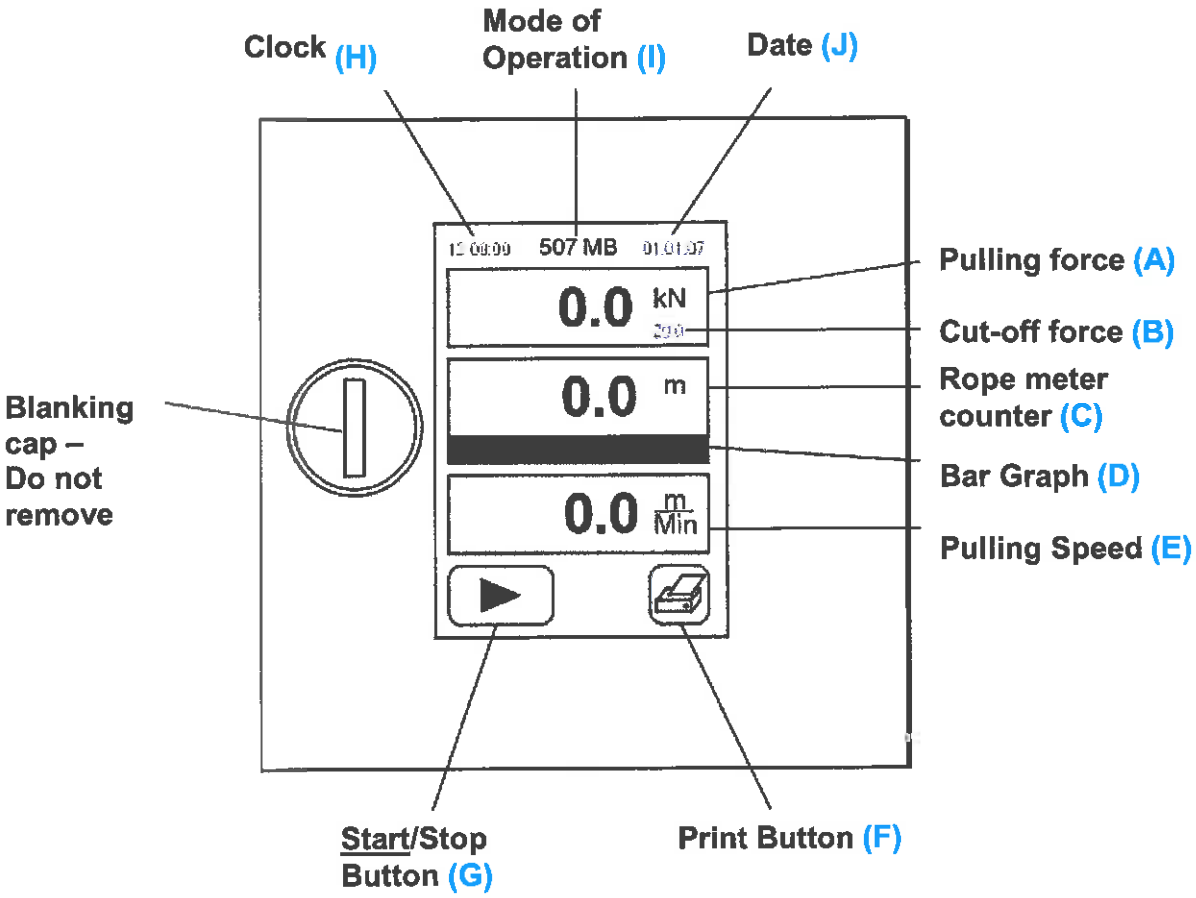
When switching on the winch control the devices checks if a SD card is inserted.
If no card is in the slot the mode of operation shows: “no card” and the start and print button do not appear in the display.

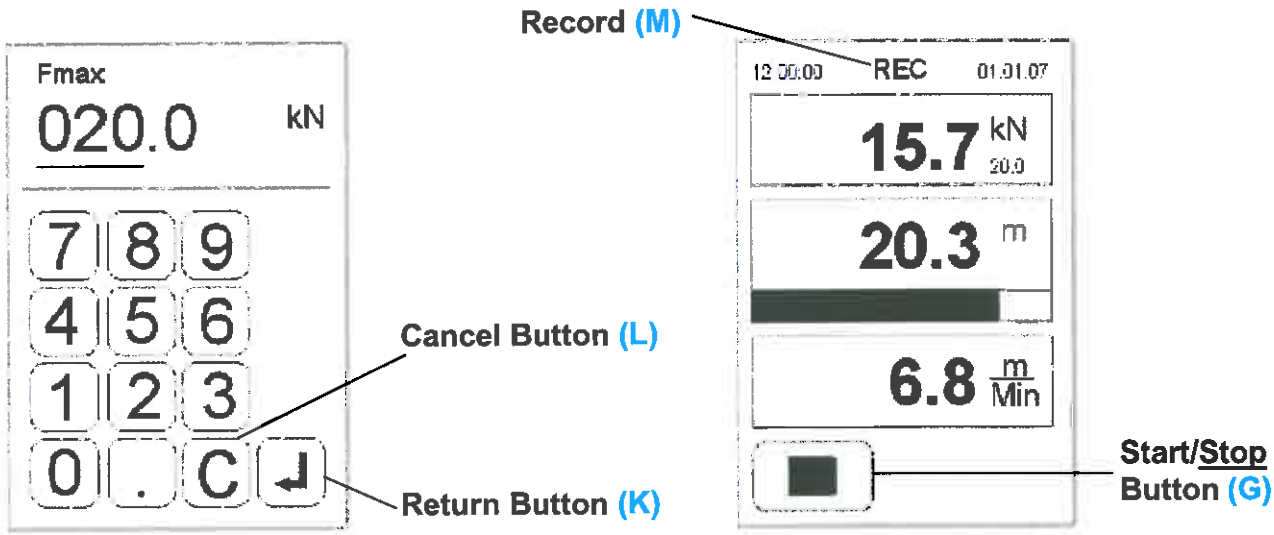
GRUNDOWINCH
PC 210 PRINTER PROGRAMMING/OPERATING INSTRUCTIONS

1. START WINCH AS PER THE MANUFACTURER'S OPERATING MANUAL
2. PULL OUT THE ROPE TO RECEIVE PIT
3. NOW TURN THE PRINTER ON AND PULL OUT THE ROPE TO THE REQUIRED LENGTH, I.E. TO START PIT (A MINIMUM ROPE LENGTH OF 10 METRES IS REQUIRED FOR THE PRINTER TO REGISTER)
4. **NOTE: THE ROPE LENGTH IN THE MIDDLE WINDOW** (ON PRINTER SCREEN) – **ITEM (C)**
5. NOW PRESS THE START BUTTON ON THE SCREEN  - **ITEM (G)**
6. ENTER THE REQUIRED LOAD IN kN USING ALL DIGITS, INCLUDING THE DECIMAL POINT, I.E:
   10.0kN = 1 TONNE
   15.0kN = 1.5 TONNES
   20.0kN = 2 TONNES
   25.0kN = 2.5 TONNES ETC.
7. ENSURE THE CORRECT LOAD READING (CUT-OFF FORCE) IN SMALL DIGITS IS SHOWN UNDER THE kN SIGN IN THE TOP WINDOW – **ITEM (B)**
8. NOW PRESS THE RETURN BUTTON  – **ITEM (K)**
9. THE WORD 'REC' IS SHOWN ABOVE THE TOP WINDOW - **ITEM (M)** (THE PRINTER BUTTON WILL DISAPPEAR AND THE START BUTTON WILL CHANGE INTO A STOP BUTTON)
10. NOW CARRY OUT THE WINCHING OPERATION. THE CENTRE WINDOW WILL SHOW THE ROPE LENGTH IN ASCENDING FIGURES (**ITEM (C)**) AND THE BAR GRAPH WILL DECREASE (**ITEM (D)**), INDICATING THE LENGTH OF PULL WHEN YOU START THE WINCHING OPERATION
11. WHEN THE WINCHING OPERATION IS COMPLETED, PRESS THE STOP BUTTON ON THE PRINTER DISPLAY  - **ITEM (G)** (**NOTE: THE WINCH WILL NOT STOP AUTOMATICALLY, YOU HAVE TO CENTRE THE WINCHING LEVER TO THE STOP POSITION**)
12. NOW PRESS THE PRINT BUTTON  – **ITEM (F)**
13. A NEW SCREEN APPEARS. ✓ TICK THE FOLLOWING SYMBOLS:
    ▲L ✓
    F ✓
    V ✓
    T BLANK
     ✓
    (LEAVE THE 'T' BLANK)
14. CHOOSE THE WINCHING OPERATION (THE CURRENT WINCHING OPERATION IS ALREADY HIGHLIGHTED, I.E. '**PROT' 002 TXT**)
15. REMOVE THE PRINTER FROM UNDER THE FRONT BONNET USING LIFTING STRAP (NEAR SIDE)
16. NOW PRESS THE PRINT BUTTON  – **ITEM (F)** (THE PRINT BUTTON WILL NOW GO DARK)
17. WHEN THE PRINTER HAS FINISHED, PRESS THE CANCEL BUTTON  (**ITEM (L)**) AND REPLACE PRINTER BACK IN HOLDER.
18. NOW TURN THE PRINTER OFF AT THE SWITCH ON THE CONTROL PANEL TO RESET.

GRUNDOWINCH
PC 210 PRINTER PROGRAMMING/OPERATING INSTRUCTIONS

Display and Control Elements





Capstan Winch

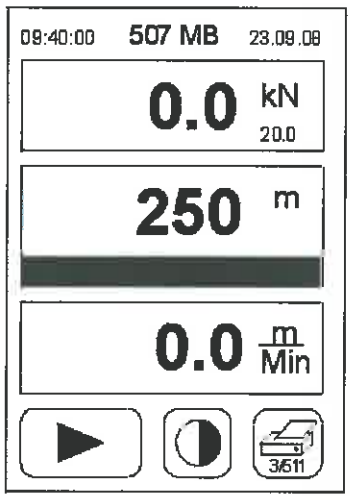
Operating instruction for winch control and monitoring

2.2 Pulling out the rope

Do not program the winch control unit for pulling out the rope! When pulling out the top display field shows the actual pulling force on the rope. The middle display field shows the pulled length in ascending order. The upper display field shows the actual line speed. All display fields show a decimal place until 99.9 has been reached. From 100 no decimal place is indicated.

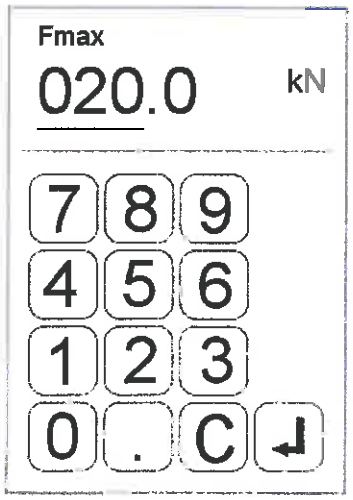
2.3 Pulling in the rope

To start a record for pulling in the device must be programmed.



Press start button

The display change to the next step



0 – 9 und .

Set the cut-off value and the metering range with button 0-9

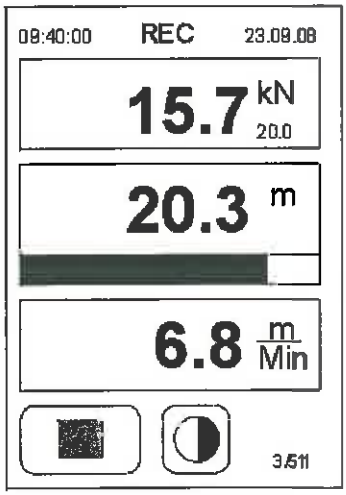
C

Press "C" button if the pre-selected value should be deleted. (L)

Press "enter" button to save the pre-selected value. (K)

Capstan Winch

Operating instruction for winch control and monitoring



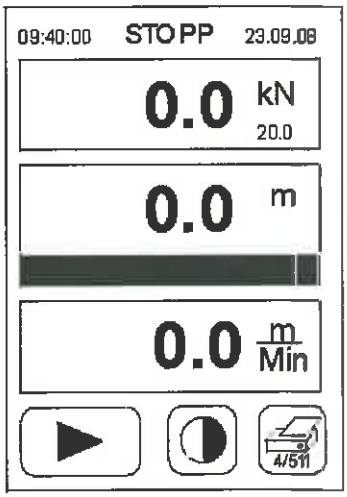
The record mode has been started. The mode of operation shows: "REC". The "print button" disappears and the "start button" changes into a "stop button"

The top display field shows the actual pulling force. The small numbers below

The middle display field indicates the length of the rope being pulled in. The bar below the meter shows the status of pulling process in per cent due to the length of the rope being pulled out

The bottom display field shows the actual line speed.

Press the "Stop button" to stop the record **(G)**



When the recording has finished. The display will change into the "start mode"

A record may be printed out or the next pulling job could be started

2.4 Cut-off when pulling in

When the pre-selected value of the limit switch has been achieved the winch stops. As long as the actual pulling force at the rope is higher or the same with the pre-selected value it will be shown in the display in a large frame. Continue pulling in when the faults have been cleared. A re-programming of the winch control is not needed.

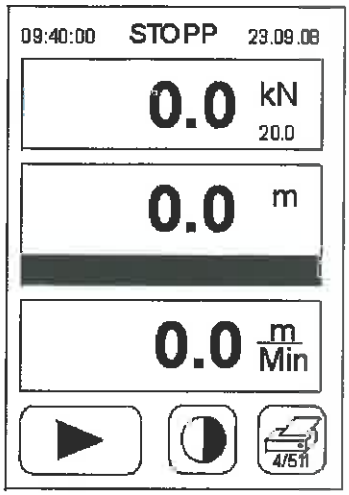
Caution!

Switch off the unit when the pulling process is finished!

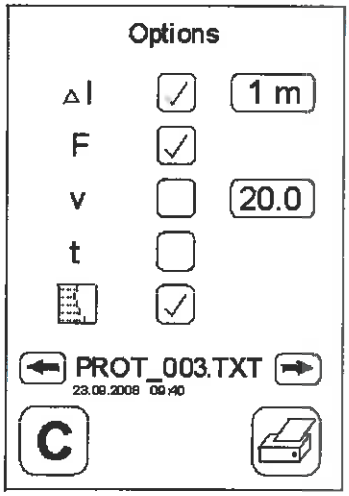
Capstan Winch

Operating instruction for winch control monitoring

2.5 Print out



Record print: out
Press the "print" button



This display view allows the adjusting of the record print due to customer's option.

Press to start a print out.

Press to change back to the "start" display view

Activate to print out the length. Select the meter range for print out

Activate to print out the pulling force

Activate to print out the line speed Scale of the line speed print out

Activate to print out the time (not available for graphic print out)

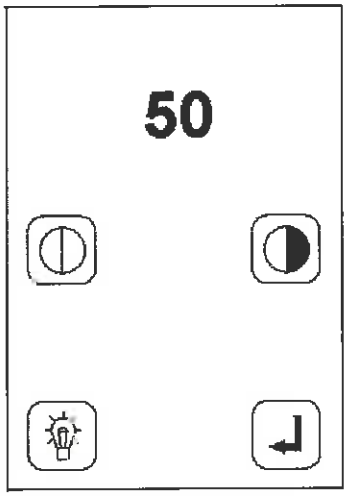
Activate for a graphic print out (if not selected print out a schedule)

Select a stored record (the newest record appears firs)

Capstan Winch

Operating instruction for winch control and monitoring

2.6 Adjusting the contrast



Press icon

Intensify contrast

reduce contrast

switch on/off background lighting

home

2.7 Transmit the data to a PC

The saved recordings on the SD card could be transmitted to a PC for storage.
Push onto the SD card to unlock it from the slot and pull it out. Insert the card into a SD card reader of a PC. Each record is saved as a "reader" file ("PROT_001.TXT" ... "PROT_511.TXT") and may be copied or deleted on the PC. The measuring values of the records are separated in the reader file by a blank. They may be imported into appropriate schedule calculating programs for individual use.

Caution!

Do not delete the "HEAD.TXT" file on the card! This file includes all basic data of the winch which are obligatory required for monitoring and recording!

Capstan Winch

Operating instruction for winch control and monitoring

3 Replacing the paper roll

For replacing the paper roll open upper cover.

The small flap unlocks the cover to open it.

Insert the new paper roll in the box and guide the end of the paper to the outside.(see picture)

The printer requires a special thermographic paper!

Close the cover.

Press the key down left for form feed if necessary.

Caution!

Keep the printer unit always protected against moisture! Keep the engine hoods closed when raining. Change the paper reel or the ink ribbon only in dry area!

Spare Parts List

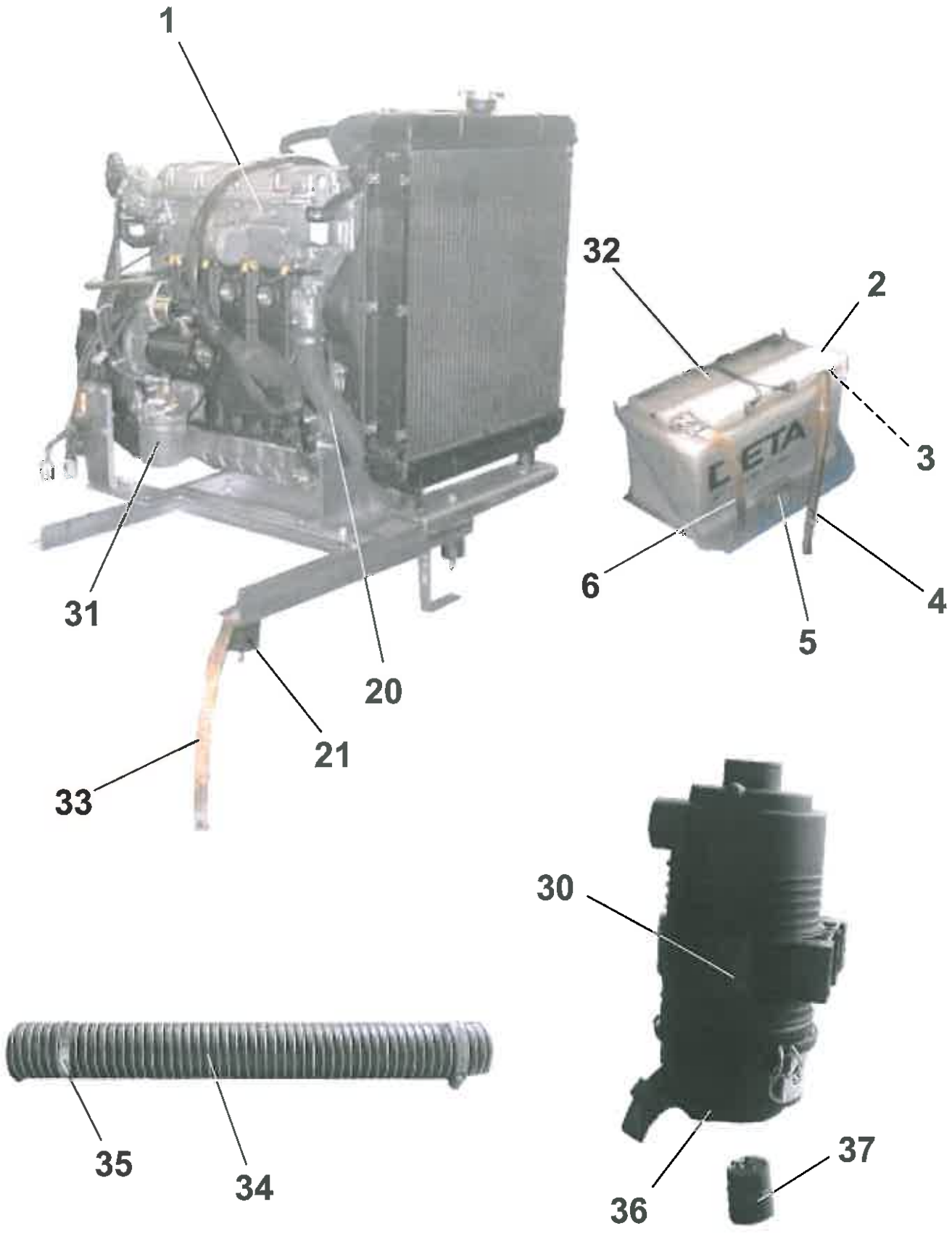
Attention! If you order spare parts, please indicate Serial Number!

Table of contents

Type: **KW 5000**

Serial No: **W09W05101CKB**

Driving Assembly



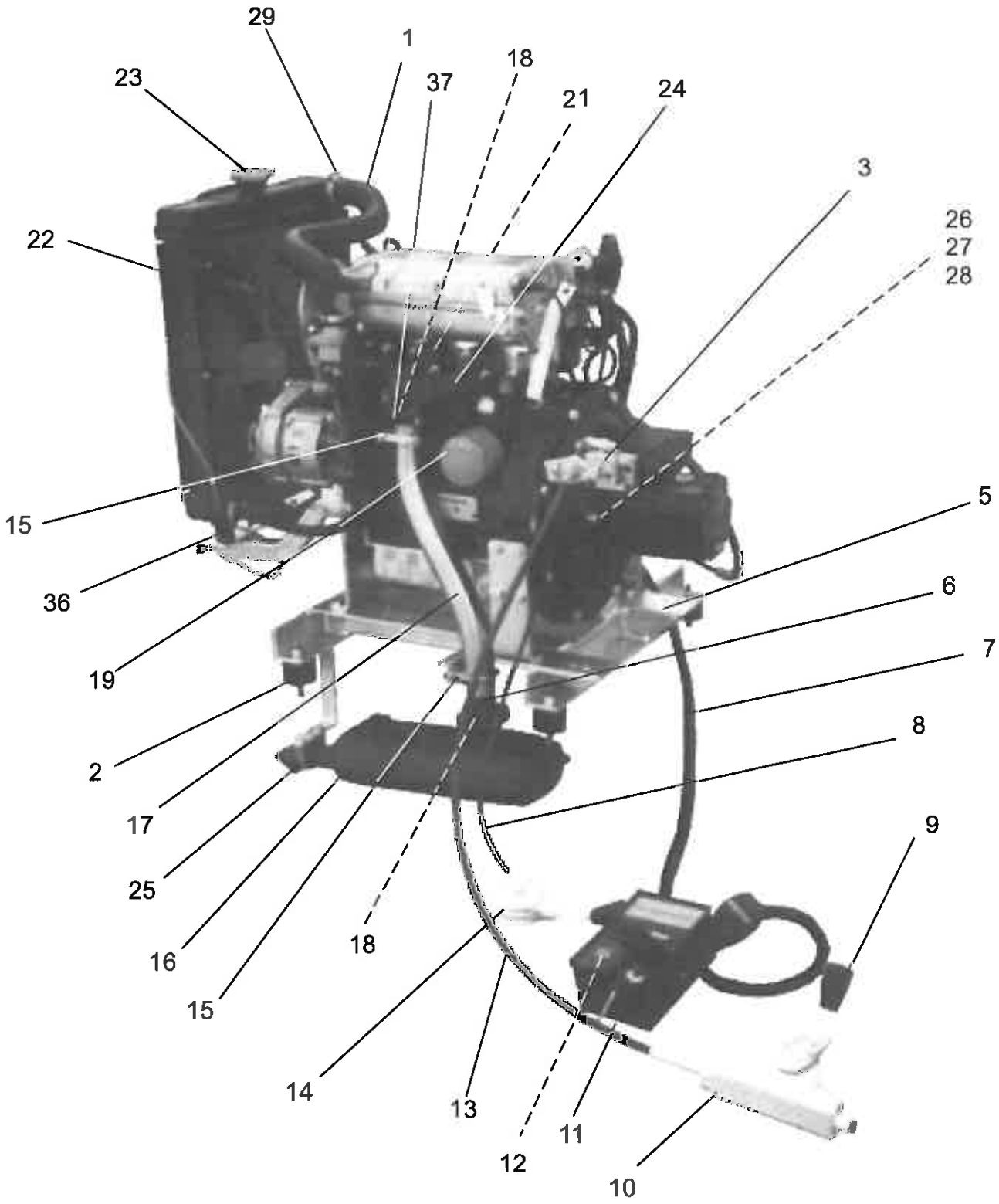
A0202312

Driving Assembly – Spare Parts List

Attention! If you order Spare Parts, please indicate the Serial-Number!

Pos	Description	Part Number
1	Lombardini diesel LDW 1404	102.580.00
2	Pole cover	122.142.00
3	Bridge connector + left	122.007.00
4	Battery cable, 750mm	121.020.04
5	Battery clamp	006.222.00
6	Battery earthing strap	122.026.00
20	Radiator tube below LDW 903 / 1204	102.500.16
21	Rubber	126.040.00
30	Air cleaner, LDW 1404 / 1204 TB	102.580.02
31	Fuel filter Lombardini 903/1204	102.500.03
32	Battery, 12V 88 Ah	122.004.00
33	Engine ground strip	122.010.00
34	Spiral hose	124.801.00
35	Hose clamps	122.440.10
36	Outer air filter inset	102.550.20
	Inner air filter inset	102.550.21
37	Air cleaner control	102.500.27

Driving Assembly



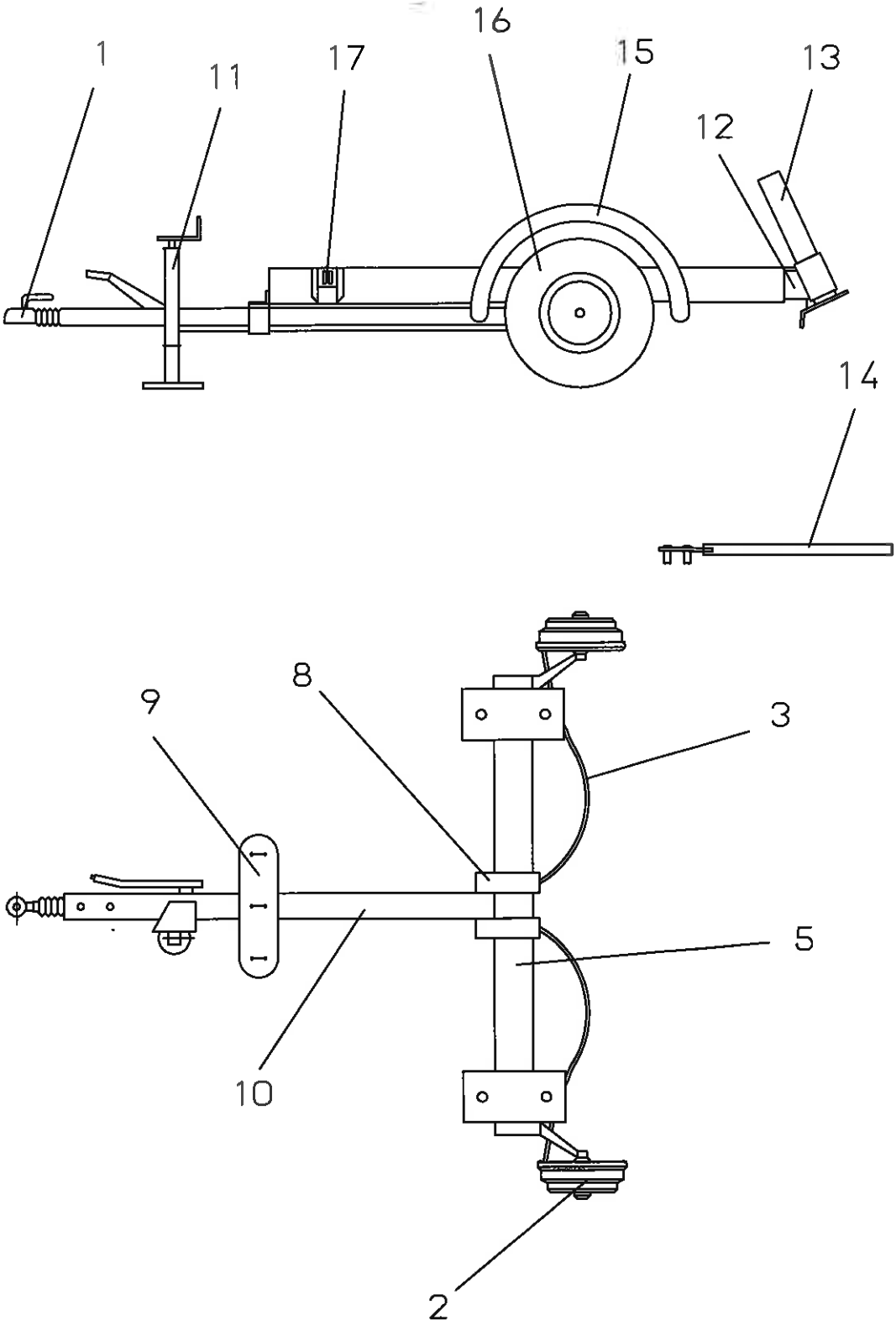
A020213X

Driving Assembly – Spare Parts List

Attention! If you order Spare Parts, please indicate the Serial-Number!

Pos	Description	Part Number
1	Radiator tube above LDW 903/1204	102.500.15
2	Rubber	126.040.00
3	Pump adjustment lever f.APVC 20	001.795.02
5	Engine support universal	001.182.10
6	Exhaust flange LDW 903/1204	001.182.07
7	Connecting cable 14d LDW 903/1204	102.500.11
8	Engine throttle cable H1300/1500	122.238.04
11	Ignition key 14644 (M516)	122.020.04
12	Fuse	122.351.02
13	Operating device	119.100.00
14	Engine accelerator lever	122.209.00
15	Clamp fitting	122.188.00
16	Exhaust silencer LDW 903/1204	102.500.12
17	Flexible exhaust pipe LDW 903/1204	133.207.02
18	Gasket flange LDW 903/1204	102.500.22
19	Oil filter LDW 1204	102.550.07
21	Manifold gasket	102.500.20
22	Radiator LDW 903/1204	102.500.13
23	Radiator sealing cap LDW 903/1204	102.500.14
24	Manifold LDW 1204 FOCS	102.550.16
25	Clamp fitting	122.187.00
26	Coupling	131.019.10
27	Coupling flange	131.036.02
28	Pump fitting flange	131.039.01
29	Hose clamps	122.440.10
36	Vibration damper	102.500.17
37	Exhaust flange LDW 903/1204	001.182.15

Undercarriage



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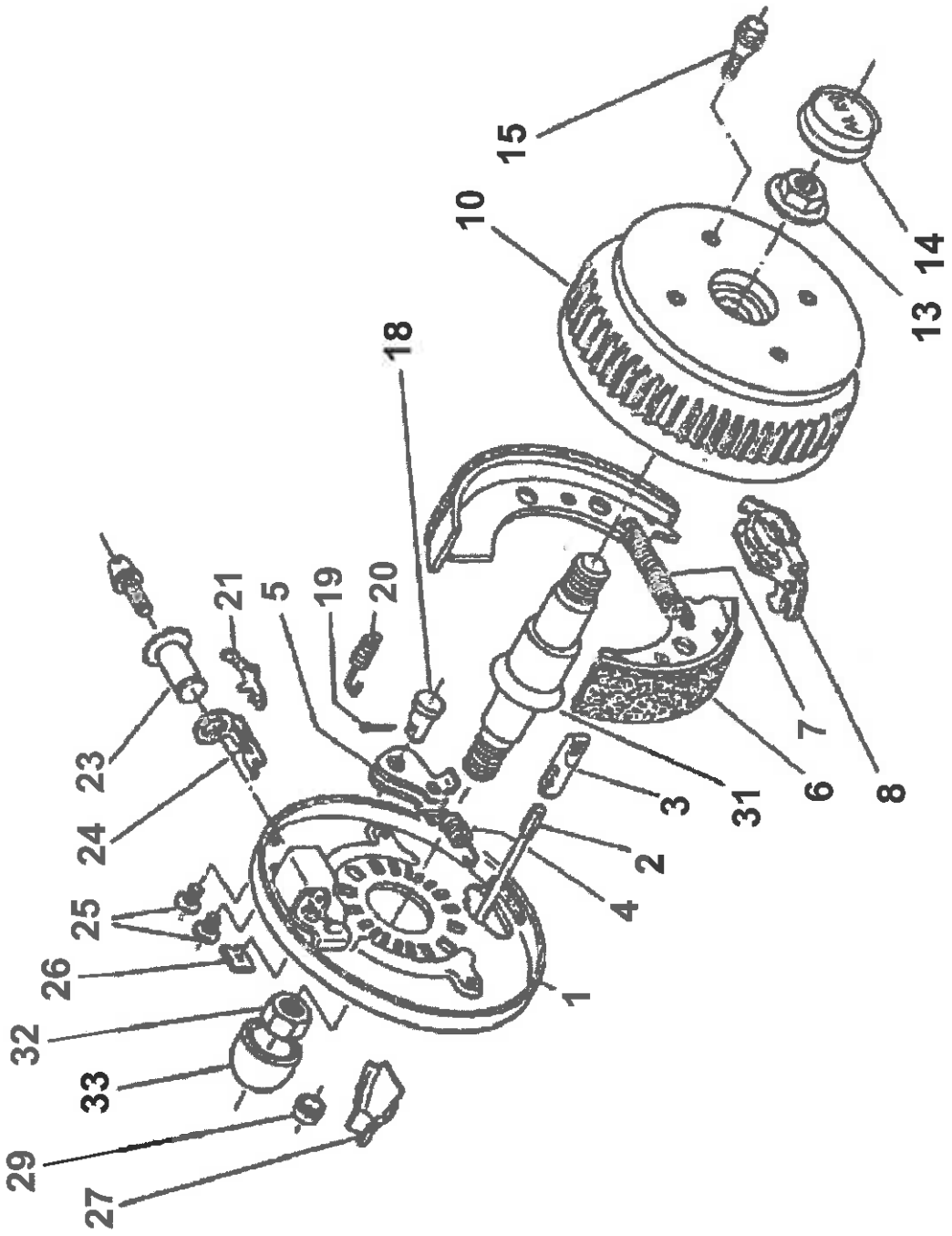
Undercarriage – Spare Parts List

Attention! If you order Spare Parts, please indicate the Serial-Number!

Pos	Description	Part Number
1	GB ring eye	223.350.12
	Overrun brake	223.329.14
3	Brake cable front EL 980/770	123.794.10
5	Front axle	223.650.00
8	Towbar – axle clamps	223.735.00
9	Support	223.643.01
10	Towbar complete	223.329.13
11	Fixing bolt	001.090.03
	Deep groove ball thrust bearing	116.654.00
	Supporting jack	123.142.00
	Propping jack	123.376.01
	Cranking for supporting jack	123.376.50
12	Propping pin 20 x 100mm	014.576.00
	Support right RW2-5000	001.173.10
	Support left RW2-5000	001.173.11
13	Safety chain 250mm	133.015.03
	Lynch pin Ø6mm	123.173.00
	Rear prop leg right + left RW / KW 5000	001.1776.00
	Propping pin 20 x 100mm	014.576.00
14	Propping wrench	001.177.00
	Securing chain	122.069.00
15	Mudguard galvanized	123.036.00
16	Tyre 195 R14 C 6 PR	124.131.00
	Wheel complete with rim 195 R14 C 6PR ri	124.131.50
	M5 1/2 J x 14 1453	124.214.00
17	Wheel chock	123.058.00
	Chock carrier	123.063.00

Wheel Brake

2361 ETI 811.136



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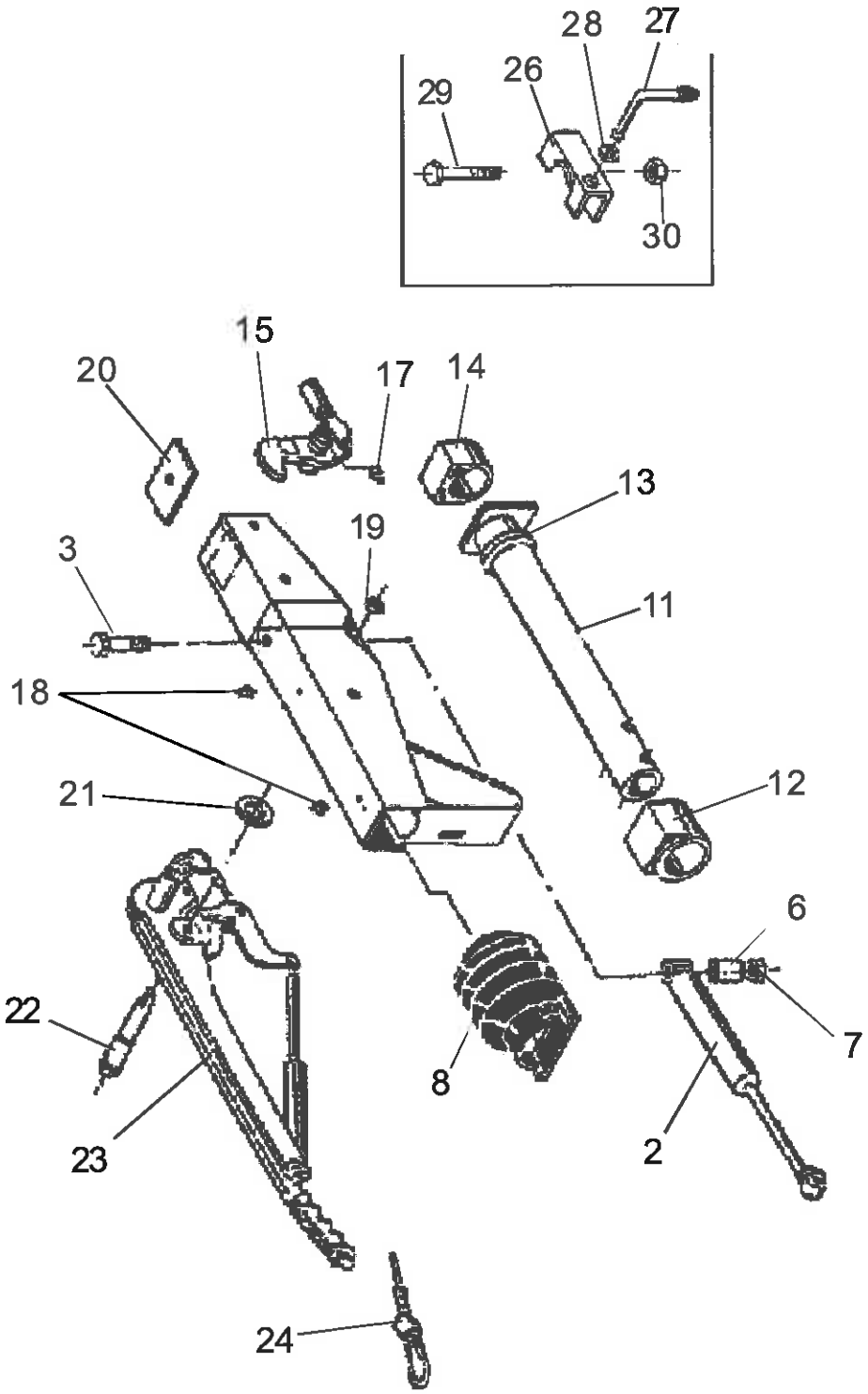
Wheel Brake – Spare Parts List

Attention! If you order Spare Parts, please indicate the Serial-Number!

Pos	Description	Part Number
1	Brake blade, welded, right	223.268.01
	Brake blade, welded, left	223.268.00
3	Insert coupling	223.250.08
4	Tension spring	123.861.00
5	Recoil blocking lever, left	223.268.02
	Recoil blocking lever, right	223.268.03
6	Brake clip set	223.261.01
7	Tension spring	123.851.00
8	Expanding joint lock	223.268.04
10	Brake drum complete	223.268.05
13	Flange nut	223.268.06
14	Cap	223.268.07
15	Wheel bolt ball 12 x 1,5	223.236.00
18	Bearing bolt	223.240.00
19	Splint pin	223.570.00
20	Pressure spring	123.855.00
21	Plate spring	223.243.00
23	Adjustment nut	223.245.00
24	Pressure bow	223.246.00
25	Plug	223.094.00
26	Protection plate	223.248.00
27	Shell	223.249.00
29	Cap	223.271.02
31	Axle stub	223.268.08
32	Nut, self-securing	223.268.09
33	Protection cap	223.268.10

Overrun Device

251 S ETI 811.295

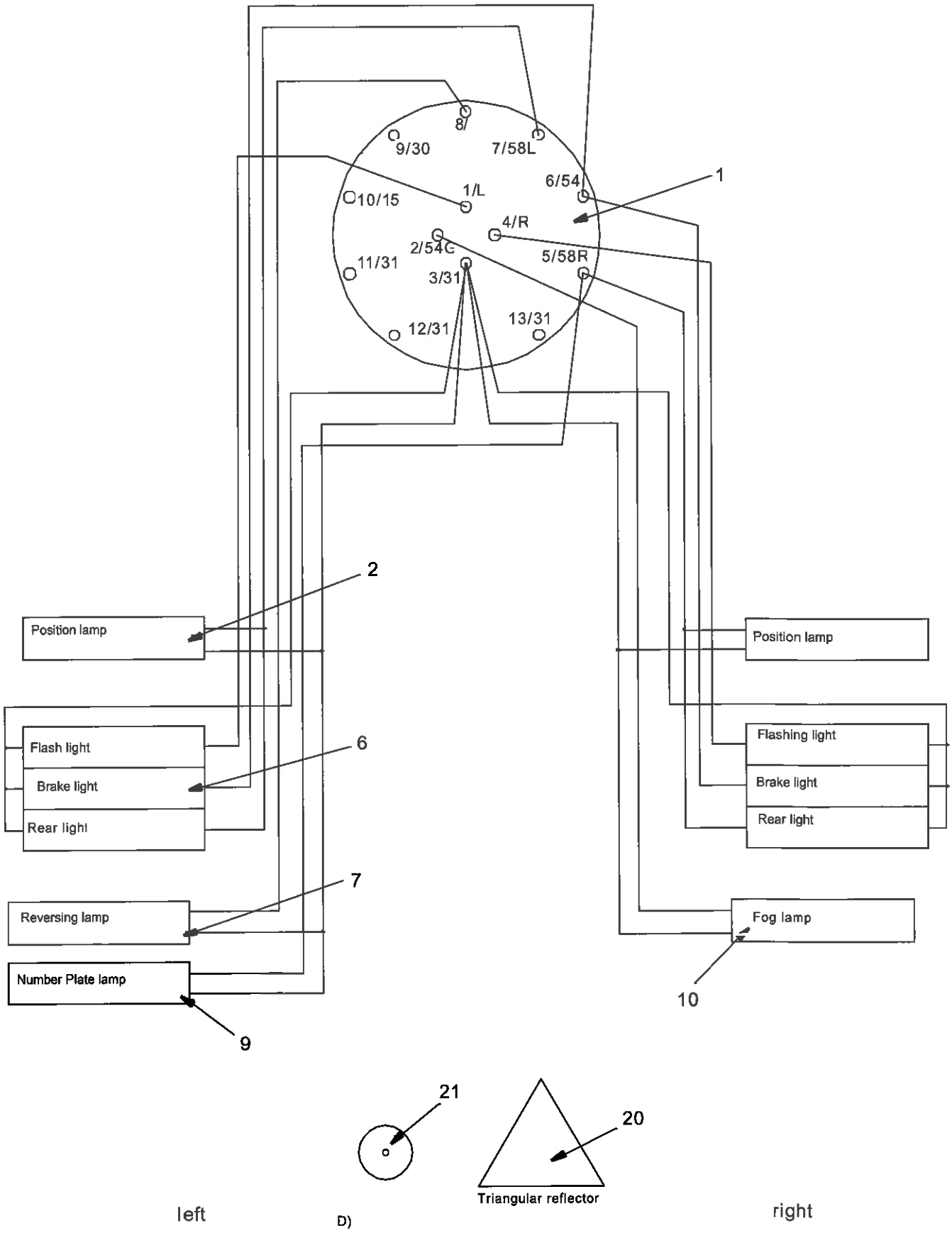


BE2951.99

Overrun Device – Spare Parts List

Attention! If you order Spare Parts, please indicate the Serial-Number!

Pos	Description	Part Number
2	Shock absorber	223.410.22
3	Hexagonal screw	125.174.12
6	Space holder	223.336.02
7	Pent. Bolt fixing piece M12	125.187.05
8	Bellow	223.305.00
11	Pulling tube	223.336.25
12	Bushing set	223.360.01
13	Rubber buffer	223.500.04
14	Bushing set	223.360.01
15	Reversing lever	223.336.26
17	Lubricating nipple	223.311.00
18	Lubricating nipple	223.337.02
19	Pent. Bolt fixing piece M12	125.187.05
20	Plate	223.336.08
21	Washer	223.335.14
22	Bearing bolt	223.335.10
23	Handbrake lever	223.335.12
24	Breaking cable 950mm	123.815.00
26	Clamp	223.336.09
27	Adjusting toggle complete	223.336.10
28	Washer	223.308.00
29	Hexagonal Bolt M8	125.172.07
30	Nut M8	223.336.07



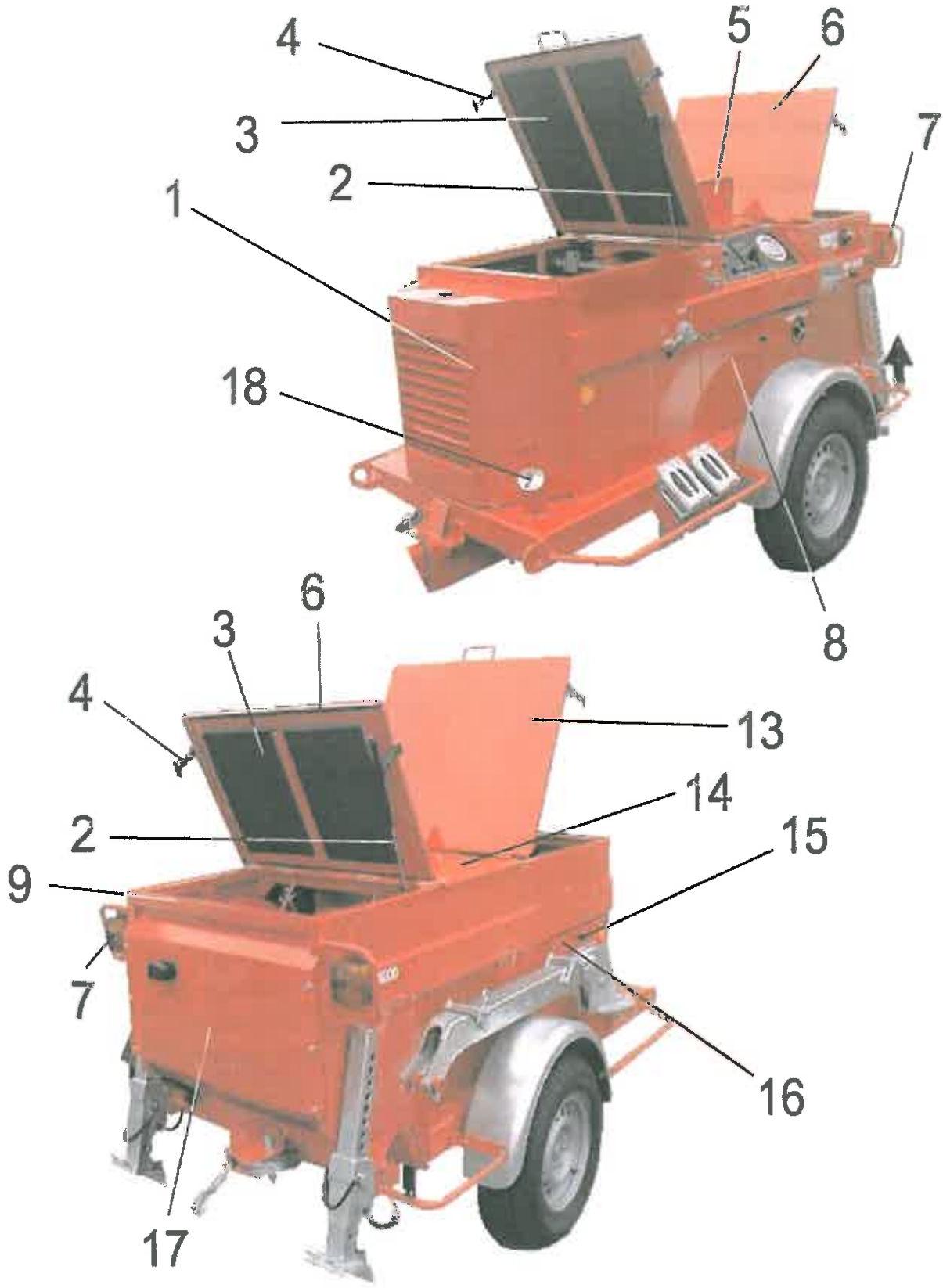
			23.09.09
	Lighting System GB 12V 13pin		003.014.31

Lighting System – Spare Parts List

Attention! If you order Spare Parts, please indicate the Serial-Number!

Pos	Description	Part Number
1	13 channel connection cable	123.067.50
	13 channel plug	122.090.00
	Socket base	122.087.51
	13 channel socket	122.087.50
2	Linolite lamp. 12V 5W	122.098.00
	Marker light	122.129.00
	Flex. Reflector carrier	123.074.01
	Linolite lamp, 24V 5W	122.098.01
6	Rear light cover glass	122.100.00
	Brake = flash indicator lamp	122.085.00
	Ball bulb 12V 21W	122.095.00
	Ball bulb 24V 21W	122.095.01
	Ball bulb 12V 10W	122.096.00
	Ball bulb 24V 10W	122.096.01
7	Cap lamp	122.137.51
	Lamp	122.137.50
9	Linolite lamp 12V 5W	122.098.00
	Number plate lamp	122.106.00
	Linlite lamp, 24V 5W	122.098.01
10	Ball bulb 12V 21W	122.095.00
	Ball bulb 24V 21W	122.095.01
	Rear fog light	122.137.00
	Cap for rear fog light	122.137.01
20	Triangular reflector	122.094.00
	Flex, reflector carrier	123.074.00
21	Yellow reflector	122.093.00

Shell / Covering



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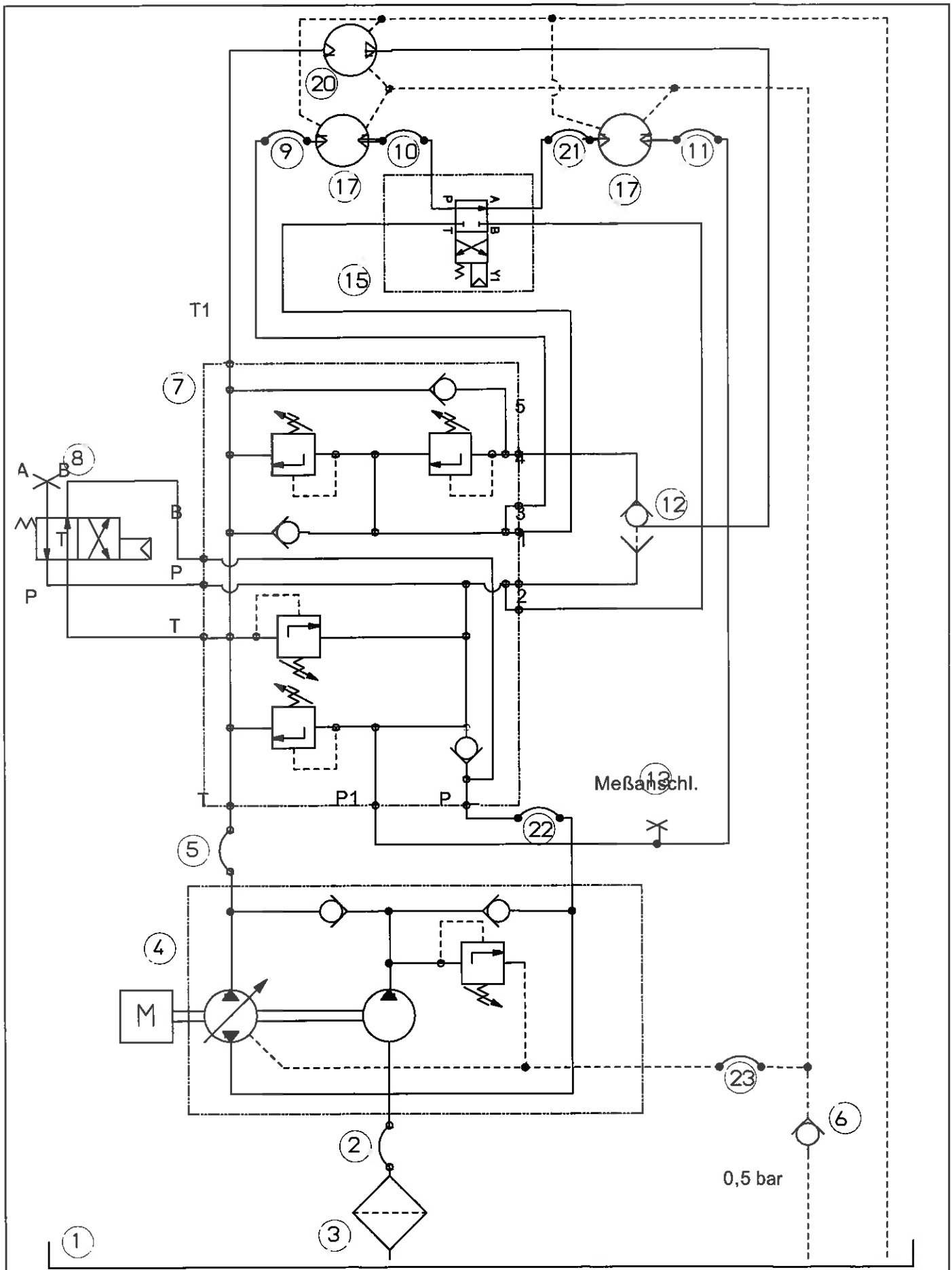
Shell / Covering – Spare Parts List

Attention! If you order Spare Parts, please indicate the Serial-Number!

Pos	Description	Part Number
1	Engine paneling	001.478.00
2	Gas pressure cylinder	122.076.00
3	Sound proofing material	126.022.00
4	Flexible rubber latch complete	122.070.00
5	Control panel cover	001.113.05
	Stop buffer	126.059.00
6	Rope storage drum cover	001.112.00
7	Rear light stirrup left	002.196.00
	Rear light stirrup right	002.196.01
8	Side flap left	001.123.00
9	Rear frame stretcher	001.031.02
13	Cover plate engine	001.111.00
14	Cover plate capstan	001.114.05
15	Button	119.331.00
16	Side flap, right	001.453.00
17	Rear hatch	001.118.00
18	Tank cap, 60mm	122.063.00
	Tank cap, lockable, 60mm	122.063.01



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25.02.09

KW 2-10

Hydraulic Plan

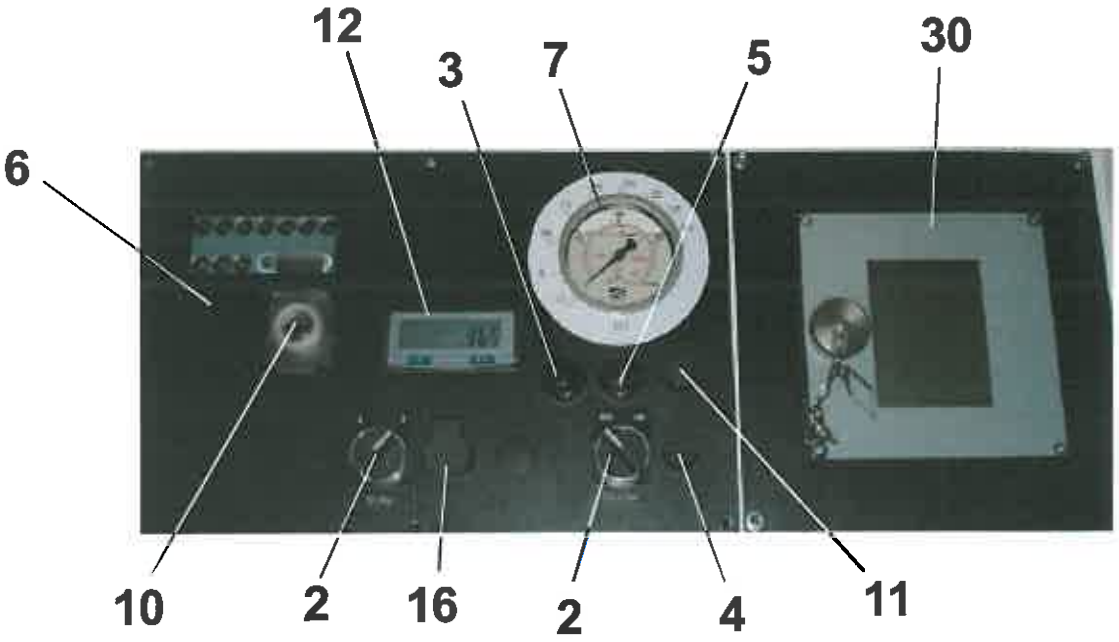
03-570.04

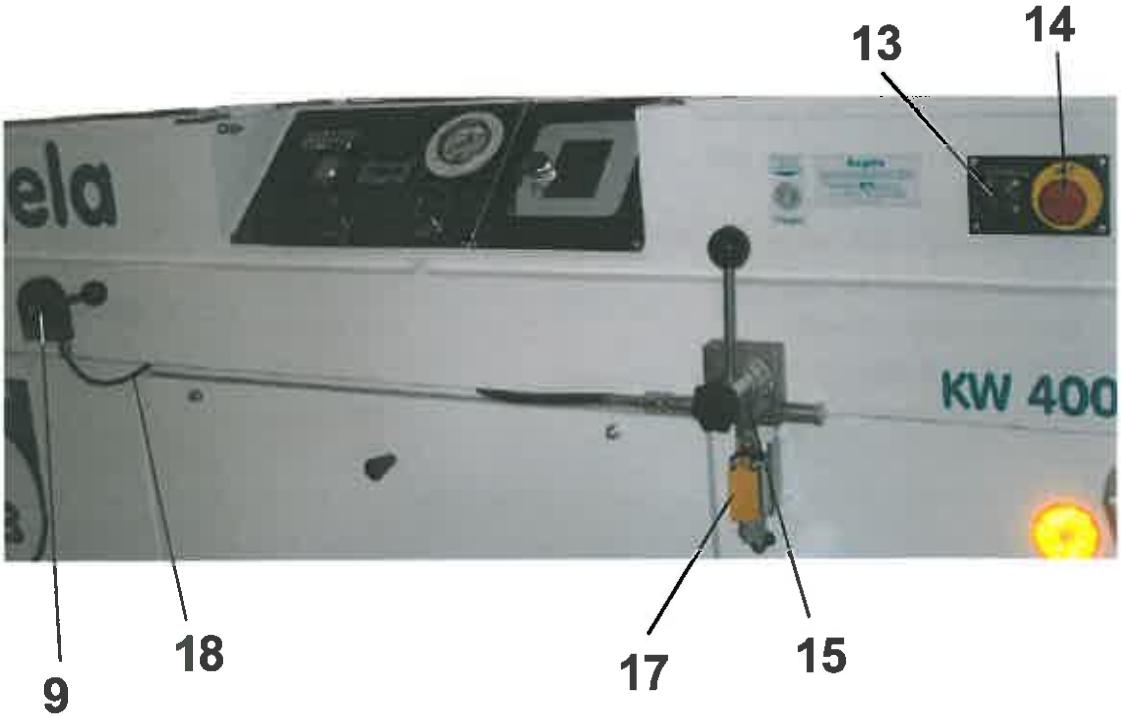
Hydraulic System – Spare Parts List

Attention! If you order Spare Parts, please indicate the Serial-Number!

Pos	Description	Part Number
1	Hydraulic oil tank	001.290.00
	Tension band – hydraulic oil tank	001.290.01
	Filling and venting screw	119.003.00
2	Suction hose	114.037.00
3	Suction filter	104.015.00
4	Hydraulic pump APVC 20	104.230.00
5	Hydraulic hose 15, 600 length	114.049.00
6	Back pressure valve	114.693.01
7	Control block	104.760.00
8	Directional control valve	104.202.00
12	Shuttle valve 12S	104.225.00
13	Pressure gauge connector	114.822.00
	Oil pressure gauge 400 bar Ø100	104.087.10
	Oil pressure gauge 400 bar Ø63	104.086.00
15	Directional control valve	104.459.50
17	Hydraulic motor SAI GM05-110+PG161	104.128.51
20	Hydraulic motor SAI GM05-75	104.192.50
	Sprocket wheel, 12 teeth	112.278.01
22	High pressure hose 15, 500	114.019.02
23	High-pressure hose 15, 500	114.019.02

Operating Elements





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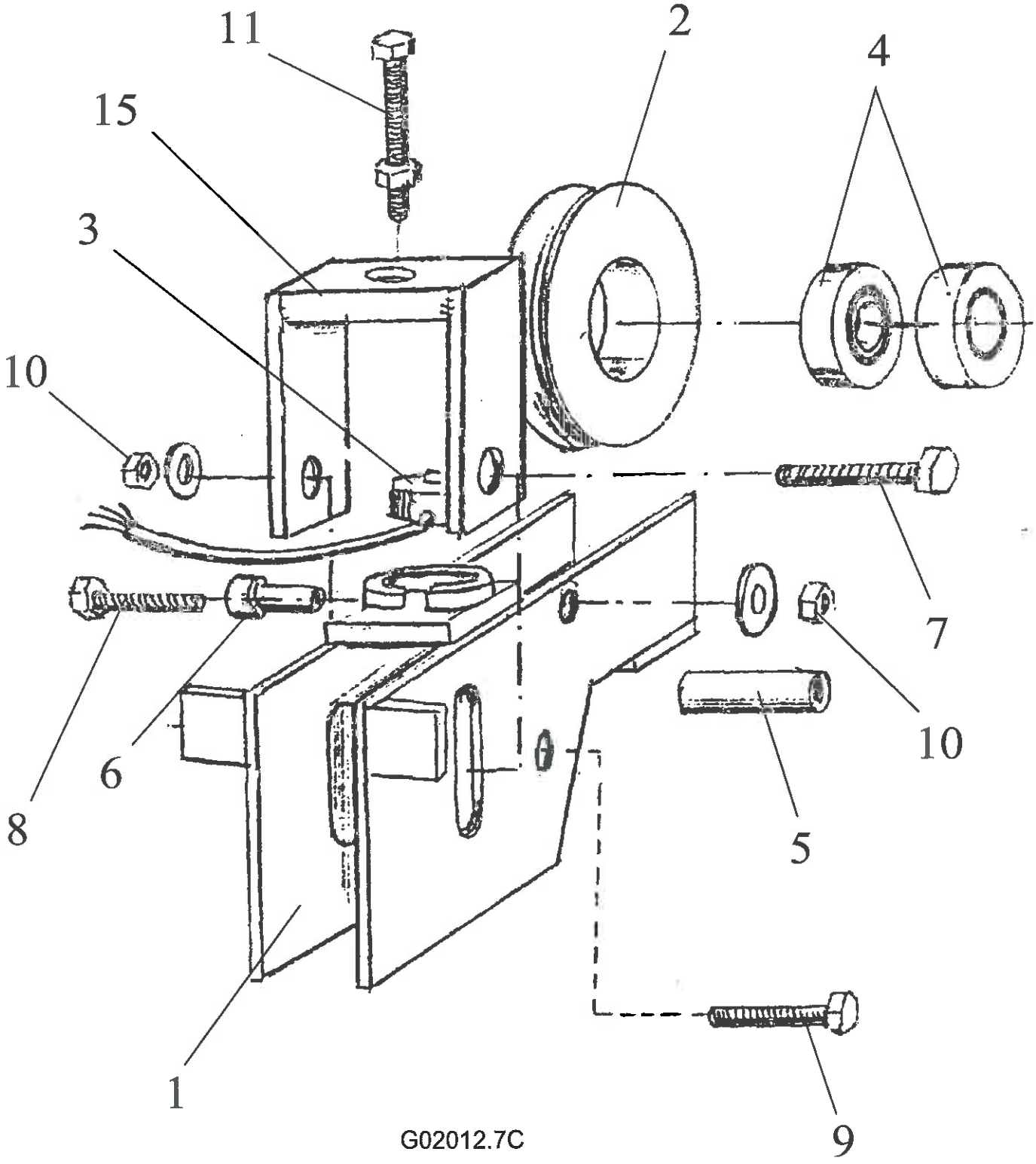
Operating Elements – Spare Parts List

Attention! If you order Spare Parts, please indicate the Serial-Number!

Pos	Description	Part Number
2	Selector switch	121.490.00
3	Pilot lamp, green	122.018.00
	Bulb 12V 1.2W	122.323.00
4	Fuse holder	121.342.00
	Fuses 6A	121.590.00
5	Pilot lamp, yellow	122.019.00
	Bulb 12V 1.2W	122.323.00
6	Switchboard Lombardini	102.501.01
7	Oil pressure gauge 250 bar Ø63	104.080.00
	Oil pressure gauge 400 bar Ø63	104.086.00
9	Engine accelerator lever	122.209.00
10	Ignition key 14644 (M516)	122.020.04
	Ignition starter Lombardini	122.020.10
11	Fuses 15A	121.590.04
12	Digital Meter Counter	110.089.50
13	Socket complete for emergency stop	121.371.01
14	Emergency-stop button	121.481.00
15	Operating device	119.100.00
16	Socket	122.728.00
17	Stop button	121.496.00
18	Engine throttle cable H1300/1500	122.238.04
20	Emergency stop cable	003.069.00
21	Plug for remote control	121.356.00
	Pin contact	121.366.00
22	Push button, red	121.412.00
	Rubber cap, red	121.419.00
	Fixed handlebar grip	122.254.00
23	Blind connector for remote control	121.356.01
30	Paper roll for thermal printer	110.201.00
	Winch monitoring unit PC 210	110.510.00
	Installable thermal printer	110.515.00

Measuring Cassette



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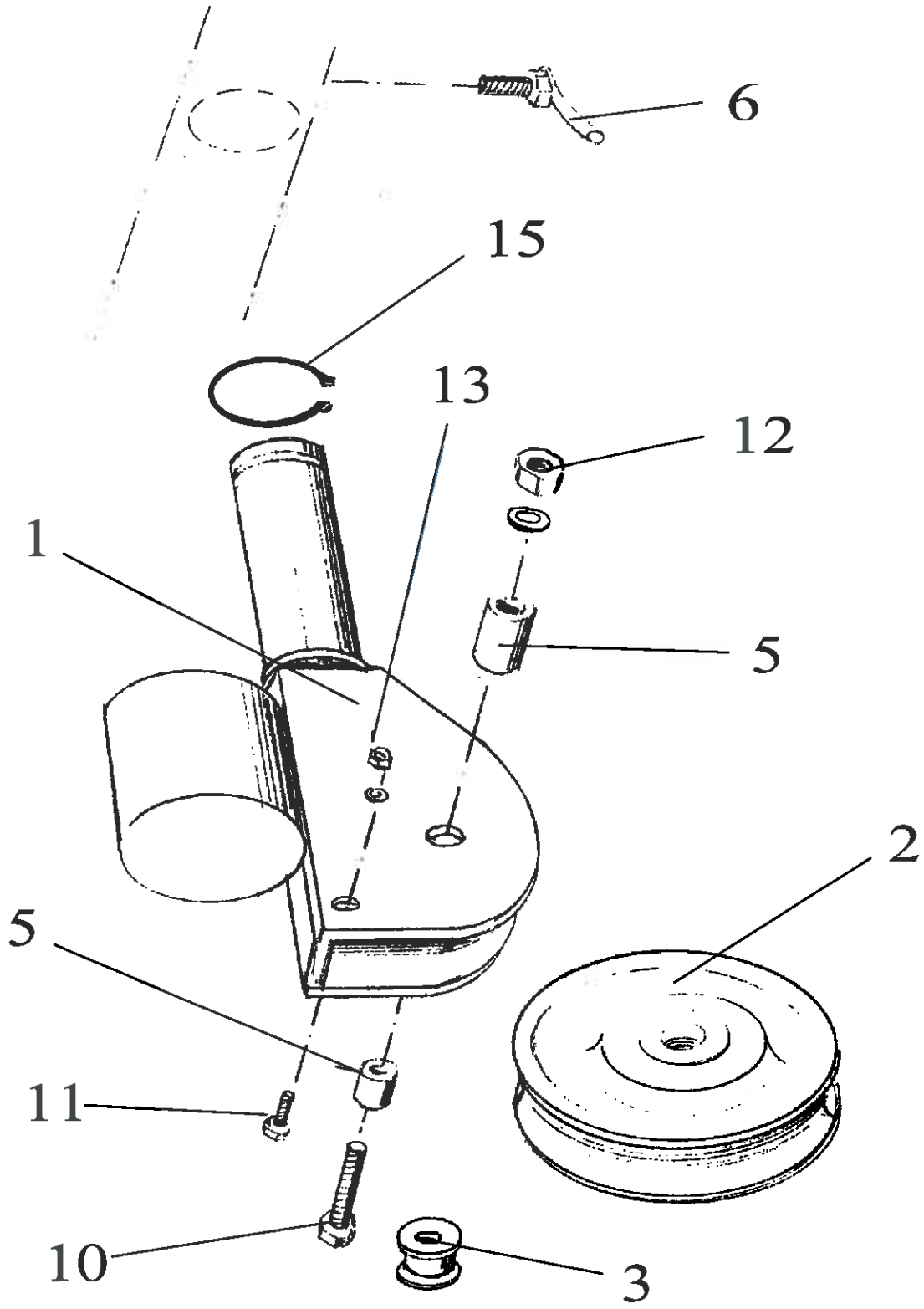
Measuring Cassette – Spare Parts List

Attention! If you order Spare Parts, please indicate the Serial-Number!

Pos	Description	Part Number
1	Measuring cassette, complete	001.413.00
	Frame of measuring cassette	001.413.01
2	Rope guiding roller complete	004.097.10
	Rope guiding roller	004.097.00
3	Miniature force transducer 20kN	110.081.01
	Miniature force transducer 10kN	110.080.01
4	Deep groove ball bearing	116.389.00
5	Roller axle of measuring cassette	001.416.00
6	Measuring roller axle of meas. Cass	001.417.00
7	Hexagonal screw M12 x 70	125.174.06
8	Hexagonal screw	125.174.04
9	Hexagonal screw	125.174.10
10	Hexagonal nut	125.186.11
11	Hexagonal nut	125.193.09
	Hexagonal screw	125.431.27
15	Bow of measuring cassette	001.415.00

Tail Pulley



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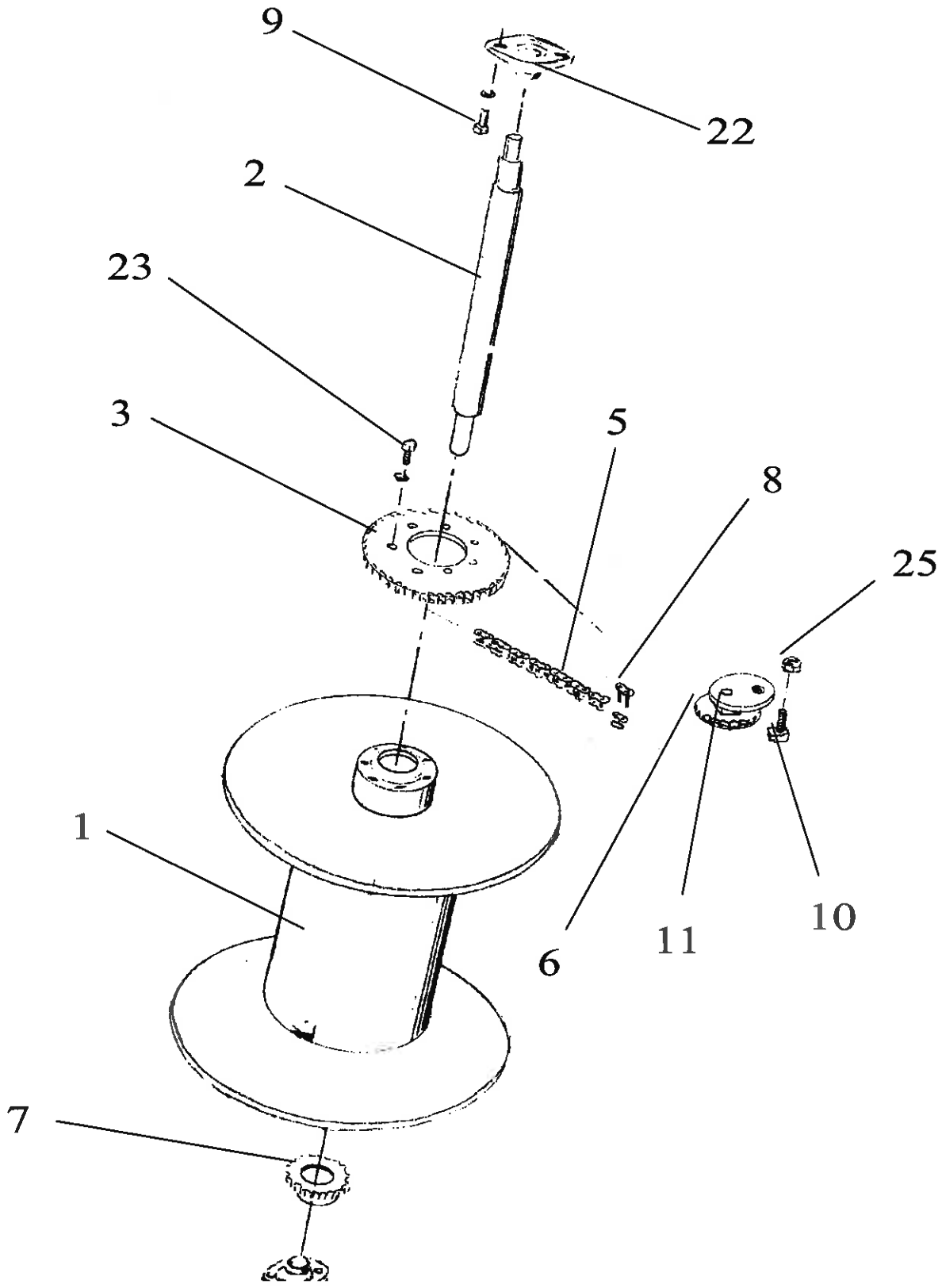
Tail Pulley – Spare Parts List

Attention! If you order Spare Parts, please indicate the Serial-Number!

Pos	Description	Part Number
1	Swivel roll holder, complete	001.224.00
	Swivel roll holder	001.224.01
2	Rope pulley RW 2-5	107.001.10
3	Roller	001.090.01
5	Bushing	001.263.00
6	Fixing bolt	001.090.03
10	Hexagonal screw	125.178.09
11	Hexagonal screw	125.174.06
12	Hexagonal nut	125.186.15
13	Hexagonal nut	125.186.11
15	Securing ring	125.110.04

Rope Storage Drum



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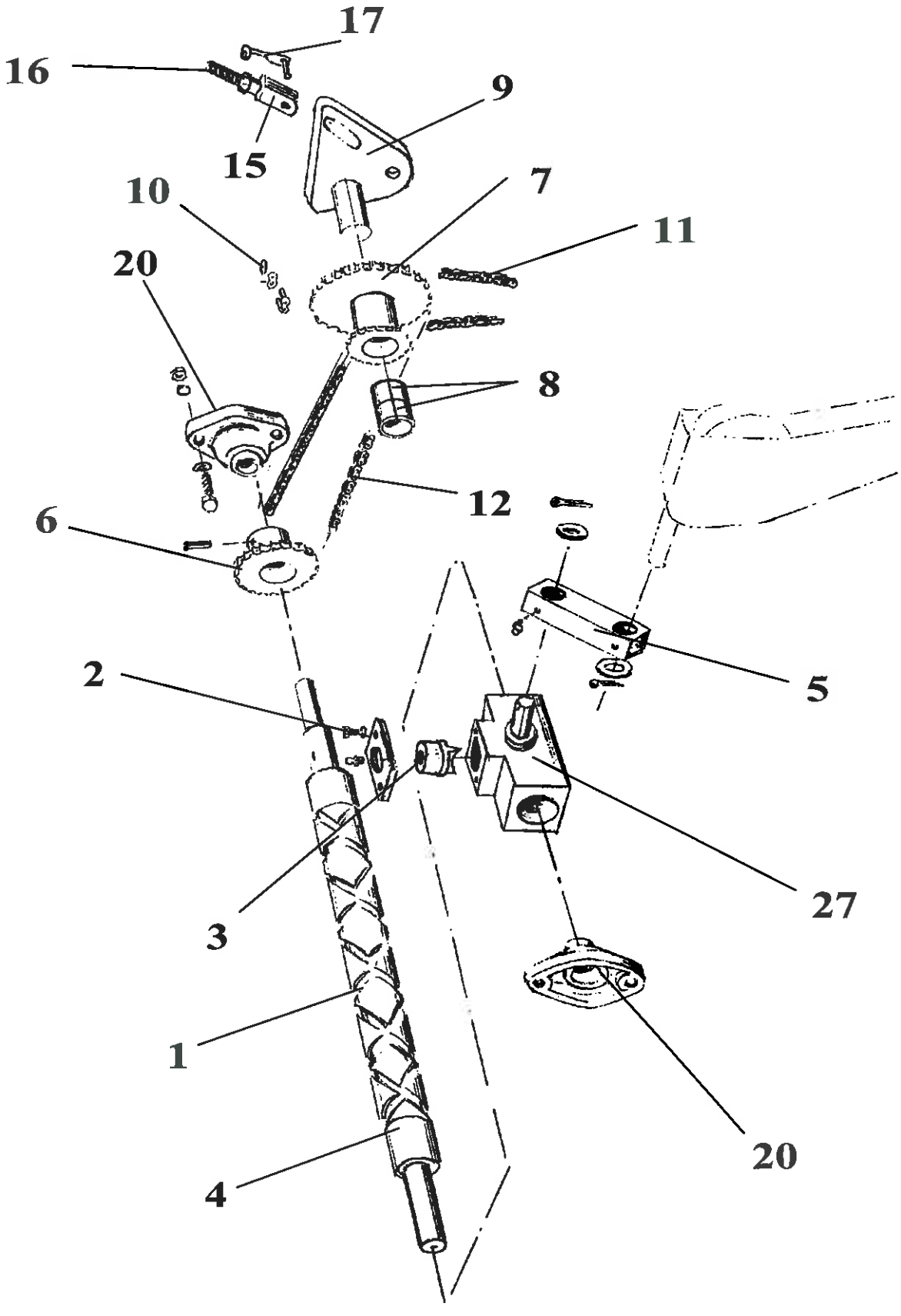
Rope Storage Drum – Spare Parts List

Attention! If you order Spare Parts, please indicate the Serial-Number!

Pos	Description	Part Number
	Steel rope galv. Ø12mm	107.113.01
	Steel rope galv. Ø12mm	107.113.00
1	Rope storage drum	001.158.00
2	Storage drum axel	001.225.00
3	Sprocket wheel, 45 teeth	112.321.01
5	Roller chain 1475mm ¾"	112.274.01
6	Chain tension sprocket, 15 te.	112.276.00
7	Sprocket wheel w. hub and bore, 17t.	112.408.01
8	Chain connection pin	112.275.00
9	Hexagonal screw	125.162.09
10	Clamp bolt	005.177.00
11	Chain tensioning sprocket	005.178.00
22	Flange bearing	116.006.00
23	Hexagonal bolt	125.161.06
25	Hexagonal nut	125.186.13

Cross Groove Spindle



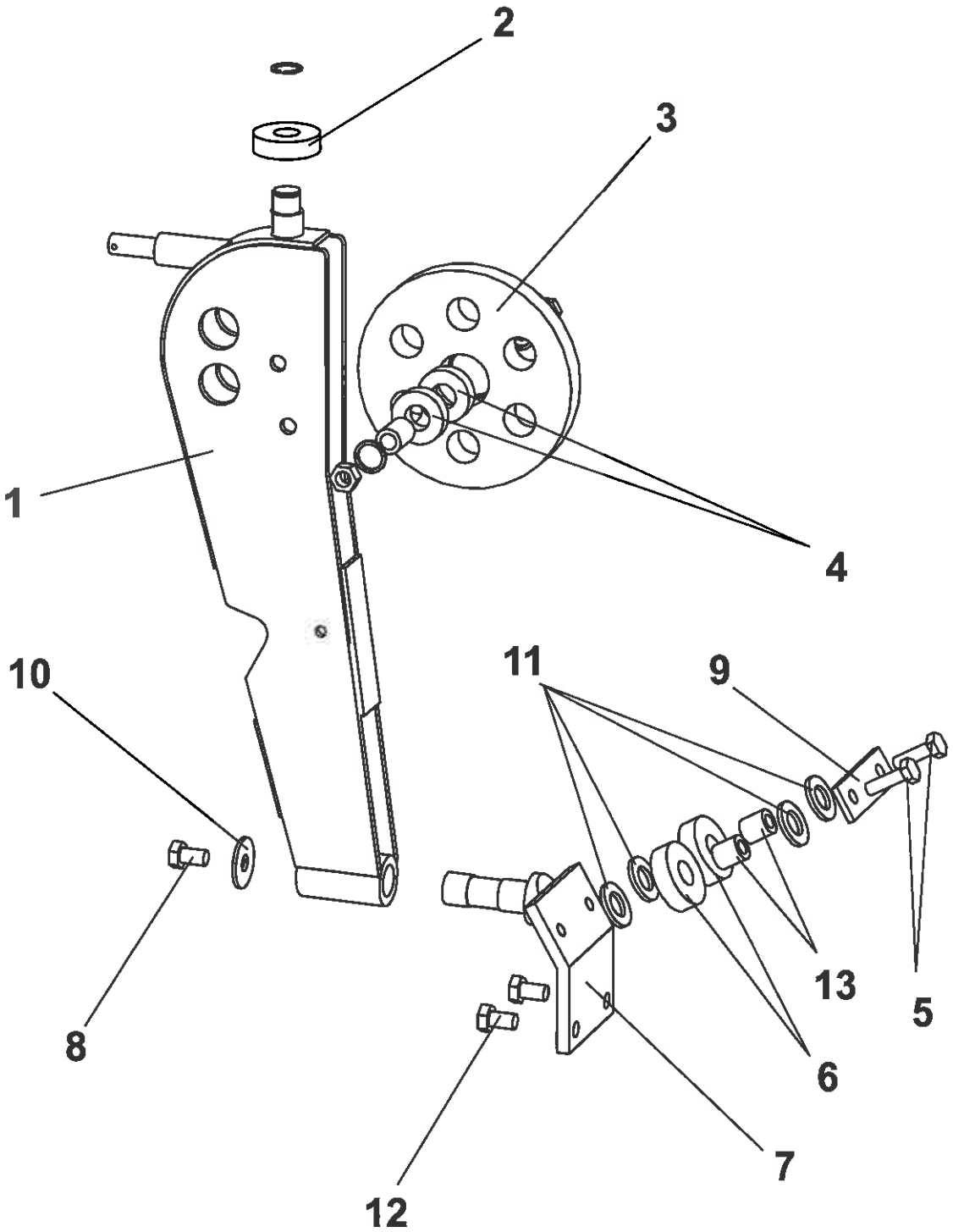
I020612X

Cross Groove Spindle – Spare Parts List

Attention! If you order Spare Parts, please indicate the Serial-Number!

Pos	Description	Part Number
1	Cross groove spindle	001.609.10
2	Cover for guiding nut	001.932.02
3	Shuttle	001.611.00
4	Deviation box	001.610.00
5	Guiding arm cross groove spindle	001.619.00
6	Sprocket wheel with hub, 21 teeth	112.412.01
	Sprocket wheel with hub, 26 teeth	112.417.01
	Sprocket wheel with hub, 25 teeth	112.416.01
	Sprocket wheel with hub, 24 teeth	112.415.01
	Sprocket wheel with hub, ½" Z23	112.414.01
	Sprocket wheel with hub, 22 teeth	112.413.01
	Sprocket wheel with hub, 19 teeth	112.410.01
	Sprocket wheel with hub, 18 teeth	112.409.01
	Chain wheel ½" with hub Z17	112.408.02
	Chain wheel with hub Z16	112.407.01
	Chain wheel ½" with hub Z15	112.406.01
	Sprocket wheel with hub ½" Z27	112.418.01
	Sprocket wheel with hub, 20 teeth	112.411.01
7	Chain intermediate wheel	001.618.00
8	Permaglide bushing	116.492.00
9	Clamping plate	001.615.00
10	Chain connection pin	112.351.00
11	Roller chain, ½" , length 750	112.350.02
12	Roller chain 2175mm ½"	112.350.01
15	Fork joint	119.257.00
16	Pulling piece for chain tensioner	001.635.00
17	Bolt for fork joint	119.257.01
20	Flange bearing unit	116.004.00
27	Guiding nut complete with cover	001.932.10

Swivel Arm



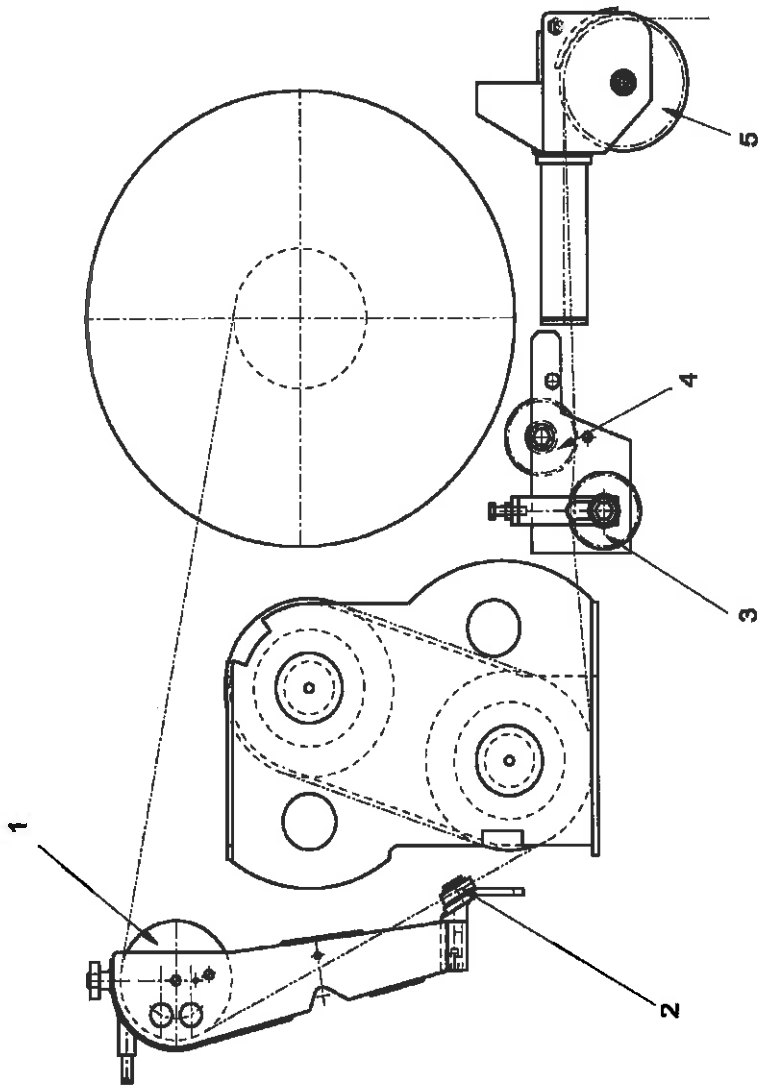
I021019Y

Swivel Arm – Spare Parts List

Attention! If you order Spare Parts, please indicate the Serial-Number!

Pos	Description	Part Number
1	Swivel arm complete with roller	001.408.00
	Swivel arm	001.408.01
2	Guide roller	116.214.00
3	Rope disc, complete with bearing	001.473.01
4	Ball bearing	116.067.00
5	Hexagonal bolt	125.161.08
6	Ball bearing	116.410.00
7	Swivel arm holder	001.086.00
	Swivel arm holder with bearings	001.086.01
8	Hexagonal screw	125.162.05
9	Security plate	001.086.02
10	Washer M12	125.253.08
11	Washer M20	125.190.16
12	Washer M12	125.190.12
	Hexagonal screw	125.162.04
13	Bushing	001.086.05

Rope Guide Pulley



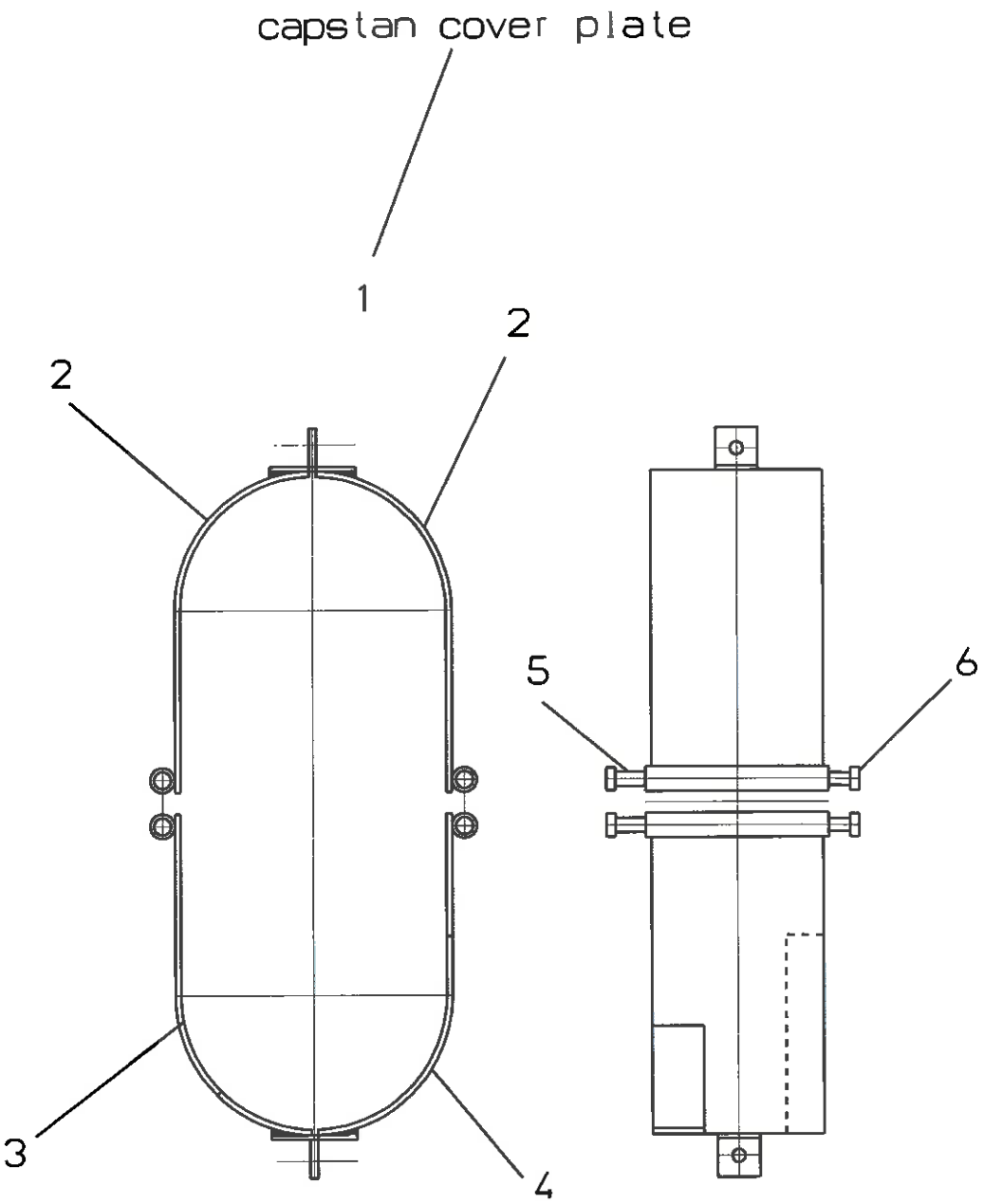
I0220134

Rope Guide Pulley – Spare Parts List

Attention! If you order Spare Parts, please indicate the Serial-Number!

Pos	Description	Part Number
1	Rope disc, complete with bearing	001.473.01
2	Ball bearing	116.410.00
3	Rope guiding roller complete	004.097.10
4	Rope guiding roller complete	004.097.10
5	Rope pulley RW 2-5	107.001.10

Spill Capstan



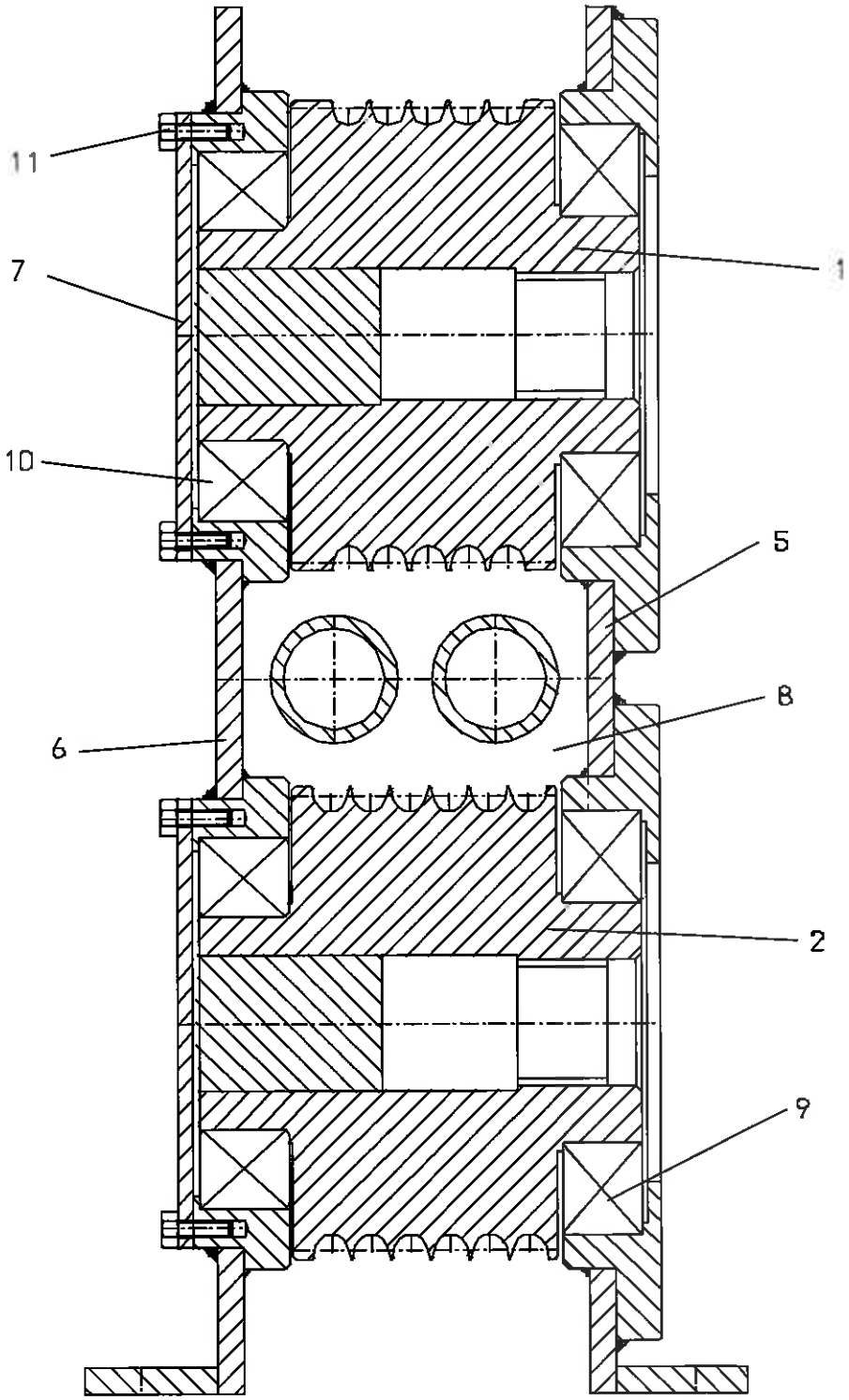
K020525Y

Spill Capstan – Spare Parts List

Attention! If you order Spare Parts, please indicate the Serial-Number!

Pos	Description	Part Number
1	Capstan cover plate complete	001.077.00
2	Capstan covering , top front / rear	001.077.01
3	Capstan covering, below rear	001.077.02
4	Capstan covering, below front	001.077.03
5	Hexagon screw M10 x 190	125.173.19
6	Hexagonal nut M10	125.186.10
	Spring washer M10	125.189.10

Spill kompl.
capstan cpl. 0



K02054.5B

Spill Capstan – Spare Parts List

Attention! If you order Spare Parts, please indicate the Serial-Number!

Pos	Description	Part Number
0	Capstan system RW 5000 complete	001.154.02
1	Rope pulley upside RW 5000	001.038.01
2	Rope pulley downside RW 5000	001.037.01
5	Capstan side part, right with flange	001.151.00
6	Capstan side part, left with flange	001.152.00
7	Securing disk	001.074.00
8	Capstan distance holder RW 5	001.153.00
9	Ball bearing	116.123.00
10	Spherical roller bearing	116.271.00
11	Hexagon screw	125.158.07
	Spring washer M6	125.189.07

Zubehör / accessories

RV.2 020606 Gr.

Mundt | 130901

Maßstab 1:12,5 | RW 2-5

U-Baum m. Drehgelenk
Telescopic deflection boom

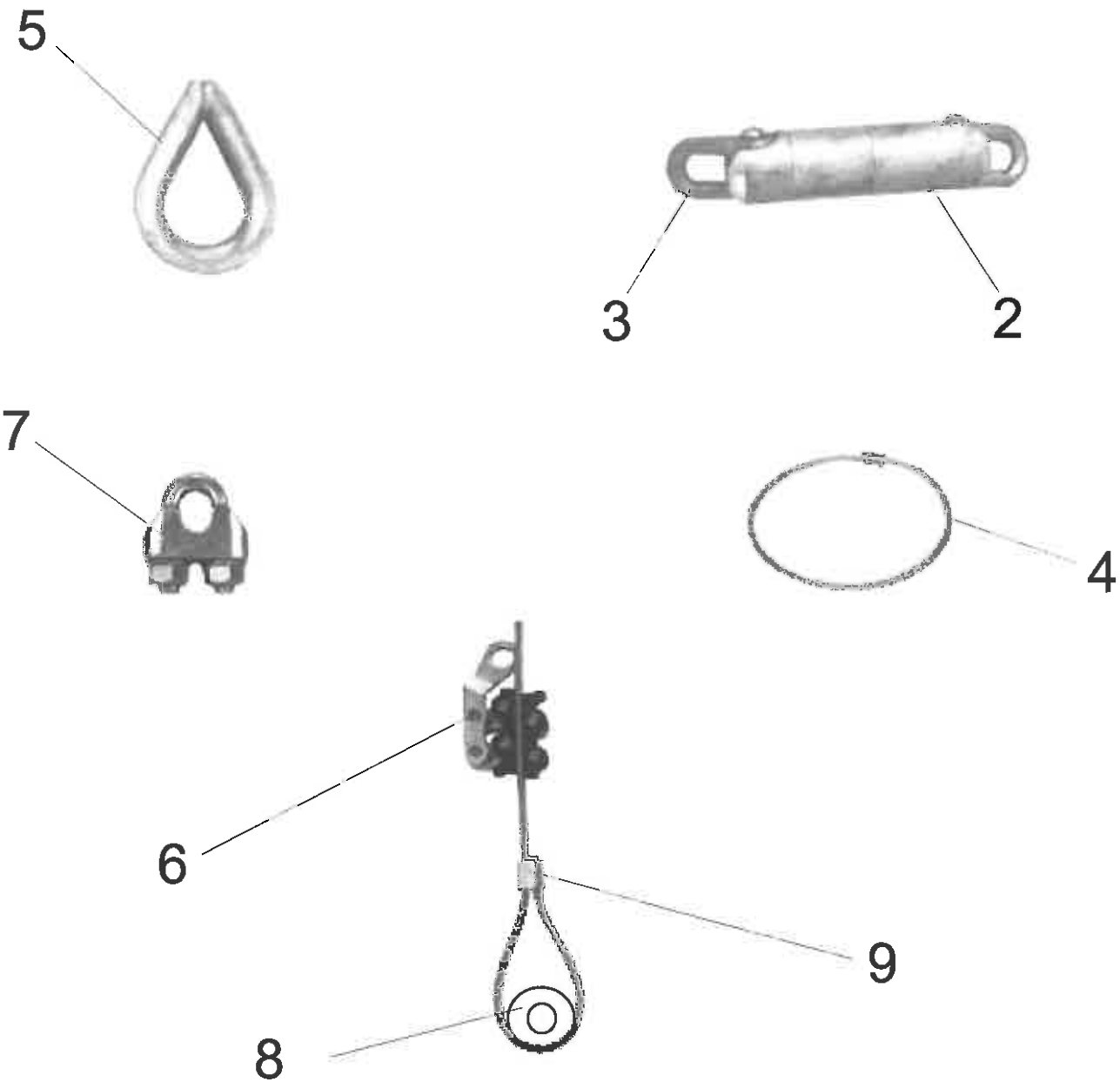
Zeichnungs-Nr.
L0202152

Capstan – Spare Parts List

Attention! If you order Spare Parts, please indicate the Serial-Number!

Pos	Description	Part Number
1	Rope pulley KW 2-5	107.001.10
	Spring washer M20	125.189.16
	Spring washer M12	125.189.11
	Hexagonal nut	125.186.15
	Hexagonal nut	125.186.11
	Hexagonal screw M12 x 70	125.174.06
	Deflection boom bottom part	004.017.11
	Deflection boom bottom part	004.017.01
	Hexagonal screw	125.178.03
2	Deflection boom top part	004.016.00
	Spring pin Ø8mm	123.073.00
	Hexagonal screw	125.174.11
3	Dumping plate RW5002	004.204.00
	Buffer	126.039.01
4	Reinforcing spindle for deflection boom	004.074.00
	Spindle nut	004.074.03
	Tube spindle	004.074.02
	Spindle	004.074.01
5	Deflection boom girder 600mm	004.018.02
6	Cre-rope disk galvanized	107.001.01
	Bushing for tope sheave	107.001.03
	Bearing for lower rope disc 2-5 ton	116.274.00
	Securing ring	125.110.03
7	Fixing clamp for deflection boom	004.011.00
	Spring pin D5	123.070.00

Machine Accessories



Please Note: Accessories are not included in standard delivery!

Accessories – Parts List

Attention! If you order Spare Parts, please indicate the Serial-Number!

Pos	Description	Part Number
2	Anti-twist swivel 60 kN Ø45mm	009.568.20
3	Shackle for anti-twist swivel	107.071.00
4	Rope sling Ø6mm / 200mm	107.130.00
5	Rope thimble galv. NG 10	107.143.00
	Rope thimble galv. NG 12	107.144.00
6	Rope clamp 8 - 16mm	107.422.02
	Rope clamp 5-10mm	107.422.00
7	Rope clamp 8mm	107.401.00
	Rope clamp 12mm	107.403.00
8	Rope guiding ring rope dia. 10mm	107.266.08
	Rope guiding ring rope dia. 12mm	107.266.10
9	Pressed sleeve for rope-Ø12mm	107.207.00
	Pressed sleeve for rope-Ø8mm	107.201.00
	Pressed sleeve for rope-Ø10mm	107.203.00
	Pressed sleeve for rope-Ø11mm	107.205.00