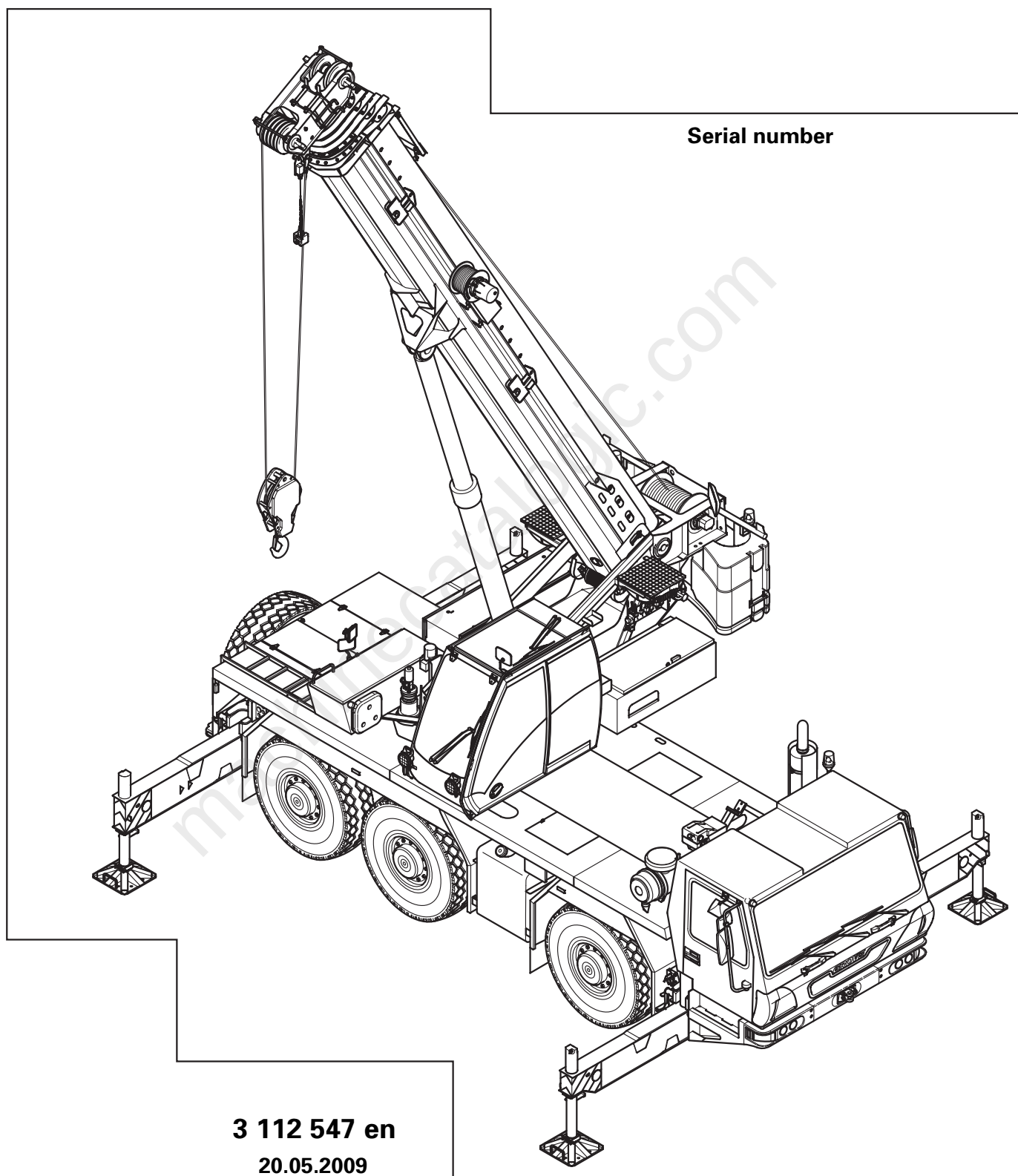


GROVE **GMK 3055/3050-1**

Maintenance manual



Grove

Manitowoc

National Crane

Potain

Manitowoc
Crane Care

2.2

Handling substances which are harmful to the environment

Which substances are harmful to the environment?

When you carry out maintenance work on the truck crane you will occasionally work with consumables which are classified as harmful to the environment by current national and regional regulations.

These include oil, fuel, grease, used oil and fuel filters, as well as rags which have come into contact with these environmentally harmful substances.

- When handling these substances observe the current national and regional regulations as well as the instructions in this chapter.

Use suitable equipment

Substances harmful to the environment can be corrosive. When doing maintenance work involving these consumables (engine and hydraulic oils, coolant, fuel) always use containers, hoses, pumps, funnels etc. which are large enough and which are resistant to the consumables.

For oil sampling, always use containers that can be closed and have sufficient capacity and resistance to the consumables.

The approximate amount of consumable to be expected is specified in the maintenance plans.

Filling and draining

- When filling and draining, make absolutely sure that no substances harmful to the environment seep into the earth, escape into the sewage system or pollute natural waters.
- Collect consumables (e.g. oils, fuels, coolant) in a suitable container when draining.
- Always use a drain hose when draining, and a funnel or a pump with hose suitable for the respective substance when filling.

Sample table to determine the remaining theoretical service life on winch no. 1 (main hoisting winch)

Crane model:

GMK 3045

Work number:

3045 42 06

Commissioned on:

June 10 1990

Serial number of the winch in accordance with the model plate: 13 301

.....

Last general overhaul performed on:

Winch design data (see operating manual):

M 3

Power unit group:

Q 1 (L1)

Load spectrum:

Km = 0.125

Factor of the load spectrum:

D = 3 200 hrs

Inspection interval no. (max. 1 year)	Date of commissioning/date of inspection	Operating conditions since the last inspection	Factor of the load spectrum	Operating hours of the entire crane	Operating hours of the superstructure	Operating hours of the superstructure since the last inspection	Operating hours of the winch	Operating hours of the winch since the last inspection	Used proportion S_i of theoretical service life D_i	Remaining theoretical service life $D_i - S_i$	Name of competent person	Signature	Note	Name of the approved inspector	Signature
"i"			Km _i	[hrs.]	[hrs.]	[hrs.]	[hrs.]	[hrs.]	[hrs.]	[hrs.]					
0(*)	10. 6. 90	–	–	–	–	–			0	3200					
1	5. 6. 91	L 1	0,125	–	–	–	160	160	160	3040	Müller				
2	20. 5. 92	L 3	0,5	–	–	–	640	480	1920	1120	Huber				
3	18. 5. 93	L 2	0,25	–	–	–	940	300	600	520	Schmitz				

IMPORTANT:

A general overhaul is to be performed every 10 years.

For alternative provision, refer to Section 5.4.2, p. 5 - 25.

Last general overhaul performed on

S_i = Used proportion of theoretical service life since the last inspection

D_i = Remaining theoretical service life

D_{i-1} = Remaining theoretical service life after the previous inspection

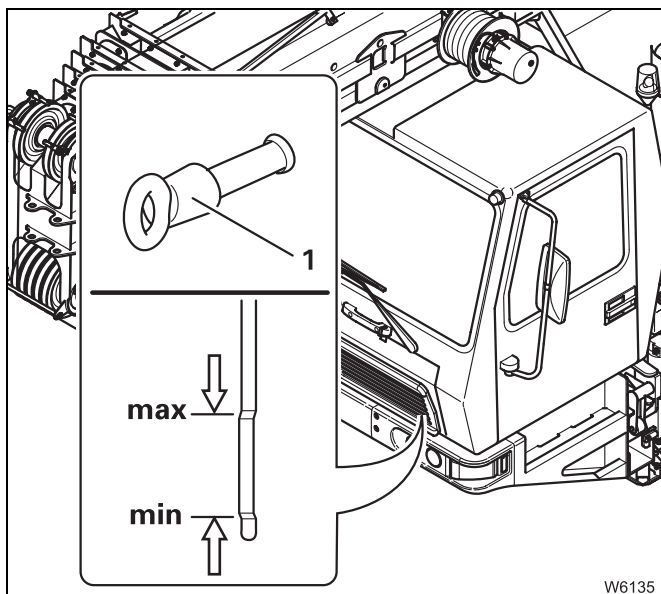
K_m = Factor of the load spectrum used to calculate the winch.

This factor is given in the operating manual.

Km_i = Load spectrum factor in inspection interval "i" according to Section 2.1

T_i = Effective operating hours in inspection interval "i" according to Section 2.2

(*) Copy last line of the previous page to the following page.



- Open the front flap; p. 7 - 1.
- On the dipstick (1), check whether the oil level is between the **min.** and the **max.** marks (arrows).
- Put the oil dipstick into the dipstick tube after the check and close the front flap.

If the oil level is too low:

- Top up the oil, p. 7 - 14.

7.3.2

Topping up the oil

Data on the prescribed oil specification; *Engine manufacturer's documentation.*

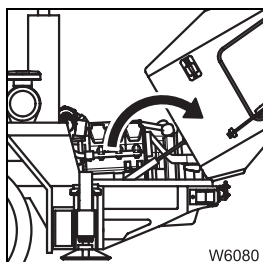
Oil

Engine oil in litres	Designation according to DIN 51502	Specification classification	GROVE part no.
34	HD – CD	MIL-L 2104 C DB 228.5	First fill oil: SAE 5 W-30 03329588

Prerequisites

- The truck crane is horizontal.
- The engine is not running and is secured against unauthorised use;
 p. 2 - 3.

Topping up oil



- Tilt the driver's cab forwards; *Tilting*, p. 7 - 2.

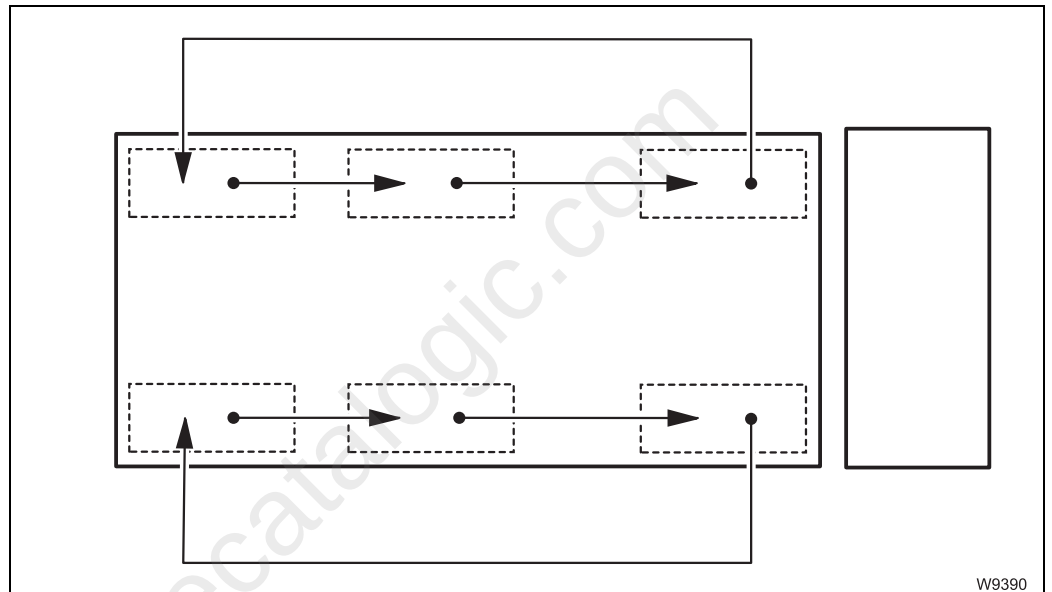
Changing the tyres



Risk of accidents if procedure is incorrect

This section only shows the sequence to be followed when changing tyres. When removing/installing the wheels, observe all the safety instructions and the procedure stated in the operating manual.

- Remove the wheels from the axles.
- Mount the wheels on another axle, as shown in the diagram. Replace any damaged parts. Tighten the wheel nuts; p. 7 - 43.



7.17

Towbar coupling

Depending on the scope of equipment of your truck crane, it may have towbar couplings (additional equipment) from various manufacturers. Their wear values may vary from those specified;  *Separate operating manual*.

7.17.1

Lubricating the towbar coupling

M 1

This maintenance work is not required if the towbar coupling is connected to the central lubrication system.

Grease, spare parts, tools

Lubricating grease	Designation according to DIN 51502	Specification classification	GROVE part no.
Grease	KP – L2K	DIN 51825	00554201

– Grease gun from the tool set.

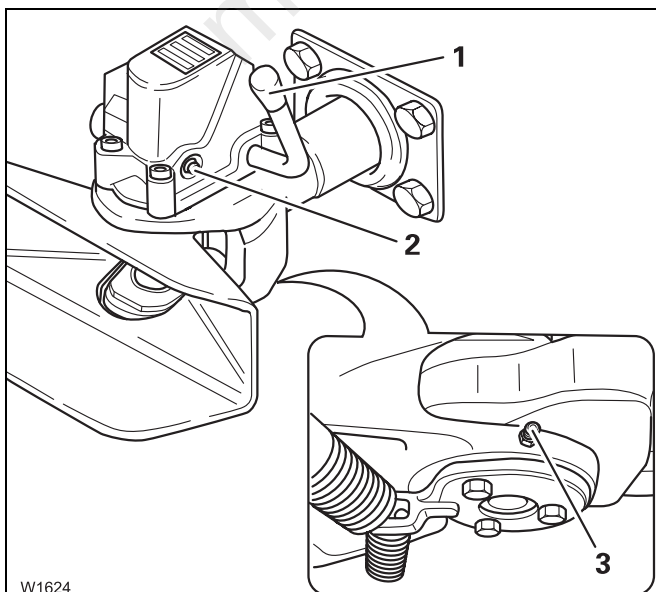


Risk of injury when the automatic closing device is triggered

Do not put your hand into the coupling jaw when the towbar coupling is open. This may trigger the automatic closing device, make the cotter pin move down and seriously injure your hand.



To avoid over-lubrication, the towbar coupling should be lubricated only when open.



- Clean the lubricating nipples (2) and (3).
- Open the towbar coupling. To do this, move the lever (1) up.
- Press grease into the lubricating nipples (2) and (3).
- Close the towbar coupling.



Having the tilting play measured

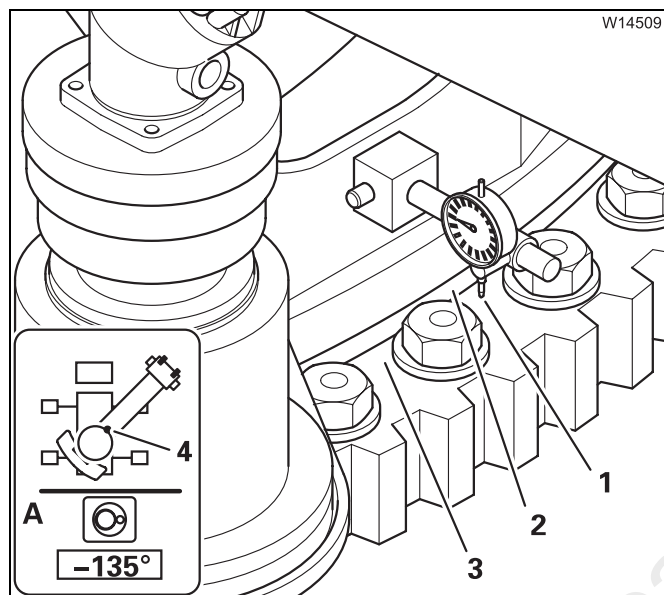
The base value of the tilting play is determined and documented by **Manitowoc Crane Care** or an authorised GROVE dealer when the ball slewing bearing is put into operation or replaced.

The maximum permissible wear is 2.6 mm.

This results in the maximum permissible tilting play.

Base value + max. permissible wear = max. permissible tilting play

Example: 0.33 mm + 2.6 mm 2.93 mm



Current tilting play

- Have the current tilting play measured by **Manitowoc Crane Care** only or by an authorised GROVE dealer.

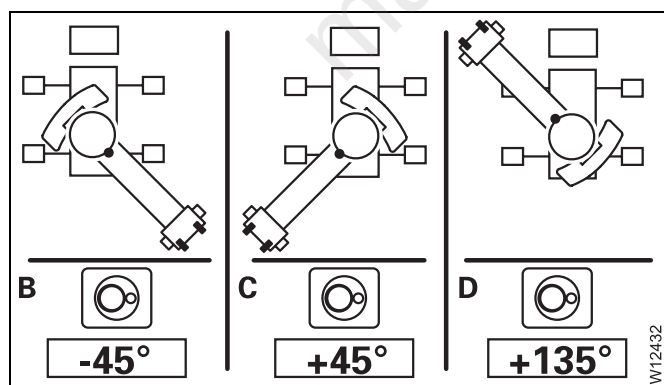
The first measurement is performed at a slewing angle of -135° – display (A).

To do so, the dial gauge is fastened on the front of the turntable (4) and the switch (1) placed onto the lower ring (3) as close as possible to the gasket (2).

After inclination of the turntable due to the tilting movement:

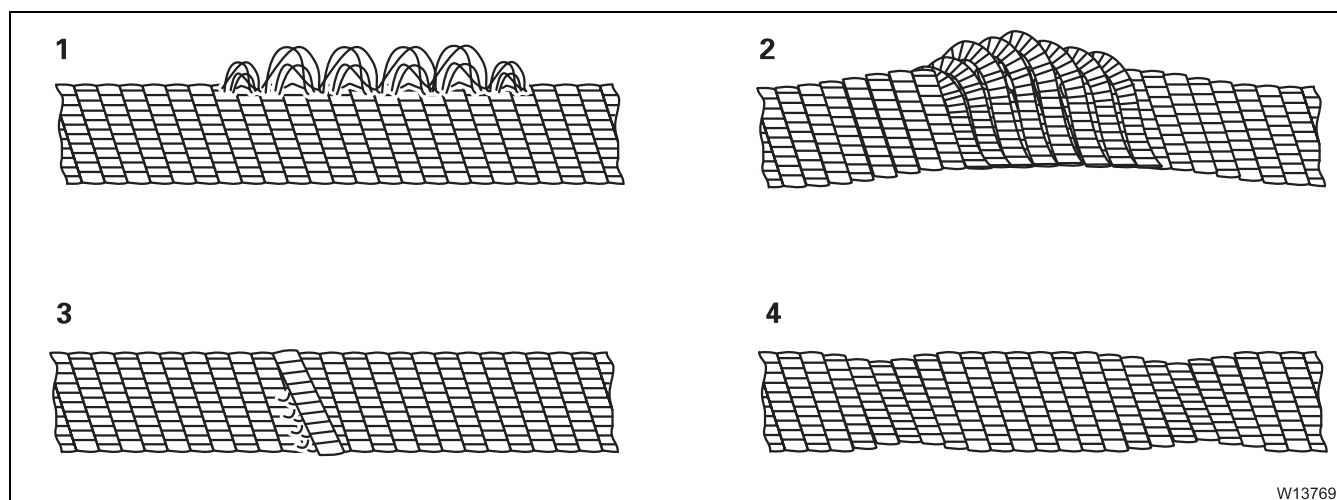
- Have the current tilting play documented;
Appendix – Tilting play measurement report.

If the **current tilting play** is greater than the **max. permissible tilting play**, you must have the ball slewing bearing replaced by **Manitowoc Crane Care** or an authorised GROVE dealer.



- Have the measurement repeated at the slewing angles

- B** -45°
- C** $+45^\circ$
- D** $+135^\circ$



W13769

Damage	Description	Cause	Replacement
Loop formation (1)	Outer layer wires in the form of hair pins are protruding from the rope away from the sheave.	General wear due to ageing of the rope or subsequent damage resulting from damage to the rope.	Immediately replace rope if the rope structure has been substantially altered by the loop formations.
Loosening of wires or strands (2)	Outer wires or strands have become loose. Only the inner strands continue to bear the load.	Corrosion or abrasion.	Replace the rope immediately .
		Other causes.	The number of broken wires determines when the rope must be replaced.
Knot formation (3)	Repeatedly occurring knot-like thickening of rope; the insert protrudes frequently. Strands bear on each other at thin points; increased frequency of wire breaks.	General wear due to ageing of the rope or subsequent damage resulting from damage to the rope.	Determine number of wire breaks; replace rope immediately if serious knot formation occurs.
Constriction (4)	Diameter reduction over short sections.	General wear caused by aging of the rope.	Replace rope immediately if serious constriction is detected.

Table to determine the remaining theoretical service life on winch no.

Crane type:
 Work no.:
 First put into operation on:
 Winch serial number as shown on model plate:
 Last general overhaul performed on:
 Winch design data (see operating manual):
 Engine group:
 Load spectrum:
 Factor of the load spectrum:
 Theoretical service life:

Inspection interval no. (max. 1 year)	Date of commissioning/ date of inspection	Operating conditions since the last inspection	Factor of the load spectrum Km_i	Operating hours of the entire crane	Operating hours of the superstructure	Operating hours of the superstructure since the last inspection	Operating hours of the winch	Operating hours of the winch since the last inspection	Used proportion of theoretical service life D_i : $S_i = \frac{Km_i}{Km} \times T_i$ [hrs.]	Remaining theoretical service life $D_i = D_{i-1} - S_i$ [hrs.]	Name of competent person	Signature	Note	Name of the approved inspector	Signature
"1"															
(*)															

IMPORTANT:

A general overhaul is to be performed every 10 years.
 For alternative provision, refer to Section 5.4.2, p. 5 - 25.

Last general overhaul performed on

- S_i = Used proportion of theoretical service life since the last inspection
- D_i = Remaining theoretical service life
- D_{i-1} = Remaining theoretical service life after the previous inspection
- Km = Factor of the load spectrum used to calculate the winch.
This factor is given in the operating manual.
- Km_i = Load spectrum factor in inspection interval "i" according to Section 2.1
- T_i = Effective operating hours in inspection interval "i" according to Section 2.2
- (*) Copy last line of the previous page to the following page.

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