

# LUKAS

*Passion makes the difference!*

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**Rerailing  
equipment**



# ***LUKAS Rerailing System – the light alloy compact system for all rail vehicles***

LUKAS Rerailing Equipment was originally developed in close cooperation with the Deutsche Bundesbahn (the German Federal Railways, now called Deutsche Bahn AG) and underwent further development with significant enhancements during over 40 years of inter-company cooperation with renowned railway companies. LUKAS Rerailing Systems are used to rerail all models of derailed rail vehicles safely, reliably and with millimetre precision.

The newly developed double-acting DUO Traversing System allows vehicles to be moved in both directions from the control desk without ancillary equipment.

In addition to classic rerailing, the equipment of the LUKAS Rerailing System can also be used to upright overturned vehicles or to pull apart wedged-together vehicles.

The particular advantage that gives mobility to the LUKAS system lies in the low weight of its individual components in addition to fast readiness for use.

LUKAS rerailing equipments are constantly modernised to match all vehicle models. The variety of the components allows equipment to be configured optimally to match all vehicle types.

Original LUKAS Rescue Tools are available to rescue casualties after an accident.

## **Technical advantages at a glance**

- Fast working speed due to hydraulic jack extension and retraction
- Lifting and lowering with millimetre precision due to advanced valve technology
- Automatic safety quick stop prevents loads dropping suddenly
- Can be used very fast due to the low component weight
- Fast and secure component connection due to non-interchangeable couplings
- Operation from a safe distance

- Reliable function even in extreme temperatures
- Jack protection provided by integral automatically triggering overload valves
- Jack stability provided by base plates (accessory)
- Optimised jack installation/extension heights

## **Method of operation**

LUKAS Rerailing Systems operate hydraulically. Even heaviest rail vehicles can be lifted and traversed with the hydraulic jacks. A motor pump generates the required oil pressure, and high precision valves control the extension and retraction movements of the hydraulic jacks.

## **The basic components of a rerailing system are therefore:**

- Motor pump to generate pressure
- Control desk as a control console for the jacks
- Telescopic jack for lifting
- Long lifting jack and accessories for uprighting overturned rail vehicles
- DUO traversing unit
- Connection hoses
- Mechanical accessories such as a rerailing bridge, roller carriage and distance bars



## Functions of LUKAS Rerailing Systems at a glance

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# Two-speed power packs



## Motor Pumps Series 6

The motor pumps generate the hydraulic pressure for all equipment in the LUKAS Rerailing System. Pumps are available powered by gasoline, electricity or diesel. They are low-weight due to their compact construction.

High-pressure hoses with quick-release couplings make the connection to the control desk.

Type	GC-6	PC-6	DC-6/5KW
Oil output rate, 20 MPa/50 MPa		6 / 2.6 l/min	
Usable oil quantity		40 l	
Motor	4-stroke petrol	220 V / 400 V – 50 Hz	Diesel
Motor output	3.5 kW	2.2 kW	5 kW
Dimensions L x W x H, approx.	560 x 540 x 665 mm	560 x 540 x 695 mm	550 x 480 x 750 mm
Weight without oil	55 kg	61 kg	81 kg

## ZPH 3/8 Hand Pump

Reliable and robust two-stage hand pump that is used as a reserve pump for emergencies or in areas faced by explosion hazards. LUKAS telescopic jacks can be extended quickly with this hand pump.



ZPH 3/8-1D for one double-acting jack  
 ZPH 3/8-2D for two double-acting jacks

	Oil output rate 18 MPa (180 bar)	Oil output rate 50 MPa (500 bar)	Weight	L x W x H
1D	10.8 cm <sup>3</sup>	4.2 cm <sup>3</sup>	18.2 kg	890 x 230 x 182 mm
2D	10.8 cm <sup>3</sup>	4.2 cm <sup>3</sup>	21 kg	936 x 230 x 182 mm

Recommended oil – LUKAS Hydraulic Oil compliant with DIN 51524, Part 1

# Control System



CT7-6/3DV Control Desk



CT7-6/4DV Control Desk

## The control desk is the core of the rerailing system

All lifting, lowering, traversing and positioning operations are controlled with the control valves.

The valves incorporate a dead-man's safety system (automatic spring reset), are clearly arranged and allow all rerailing operations to be precision-controlled from a safe distance.

## There are two control desk models

- A) 3 valves to lift and to lower the load  
1 valve to traverse the load  
Model CT7-6/3DV

- B) 4 valves to lift and to lower the load  
2 valves to traverse the load  
Model CT7-6/4DV

Dimensions L x W x H	805 x 700 x 1100 mm
Weight	36.5 kg

Dimensions L x W x H	1025 x 700 x 1070 mm
Weight	60 kg



# Compact power packs for light rail vehicles



PC6-2DV



PC6-4DV

## Motor Pumps Series 6

We recommend the compact power packs for lifting jacks up to model HP 25 T 450 R. They can be supplied with gasoline or 230V / 50 Hz electric motors.

The oil tank can be filled to a maximum of 24 l depending on the oil capacity of the hydraulic jacks used. The maximum usable oil quantity in this case is then 20 l.

The valve components for lifting and traversing can be individually combined. The hydraulic pump and the control valves are combined into a compact unit, which has a small space requirement and great mobility.

Power packs with gasoline engine	GC6-2DV	GC6-4DV
Lifting with	2 jacks	4 jacks
Traversing with	1 DUO Traversing Unit	1 DUO Traversing Unit
Oil output rate 160/500 bar	4.7 / 1.45 l/min	4.7 / 1.45 l/min
Dimensions L x W x H	560 x 470 x 990 mm	560 x 565 x 990 mm
Weight (without oil)	52,5 kg	58,5 kg

Power packs with electric motor	PC6-2DV	PC6-4DV
Lifting with	2 jacks	4 jacks
Traversing with	1 DUO Traversing Unit	1 DUO Traversing Unit
Oil output rate 160/500 bar	4.4 / 1.4 l/min	4.4 / 1.4 l/min
Dimensions L x W x H	560 x 470 x 990 mm	560 x 565 x 990 mm
Weight	55.5 kg	61.5 kg

# Telescopic jacks



	HP 10/T 280 R	HP 25/T 185 R	HP 25/T 450 R	HP 50/T 185 R	HP 50/T400 R	HP 65/T 500 R	HP 130/115 R
Lifting force 1/2/3 kN*	650/301/104	650/301	650/266	1066/504	1066/504	1665/703	1348
Stroke 1/2/3 mm	90/94/94	95/89	223/227	89/96	195/204	250/251	115
Total stroke mm	278	184	450	185	399	501	115
Height (retracted) mm	215	215	380	234	400	452	272
Oil capacity l	1.4	1.3	2.8	2	4.3	8.8	2.9
Weight kg	14.4	14	24	24	41	69	53

\*at 53 MP

## Lifting jacks

LUKAS telescopic jacks are manufactured out of high-strength light alloy metal and are therefore lightweight, corrosion resistant and easy to maintain. Due to their telescopic construction they combine long piston strokes with a small retracted height.

The piston surfaces are hard-anodised to protect against damage. The piston guard plates are corrugated and made out of high-strength steel.

All lifting jacks are fitted with hose-break safety valve that prevents the load from lowering in case of a sudden pressure drop or hose break.

The jack stroke heights and forces are matched to one another. All lifting jacks are delivered with piston guard plates.

A connection hose pair for each jack is needed to connect the jack to the control desk. The jack connection couplers are coloured (red/blue).



# Lifting of rail vehicles

## Stacking sets

If there is only space for the use of low telescope jacks under a rail vehicle stacking sets can be used to increase the attainable lifting height at a maximum of 490 mm. The increase in lifting height is obtained from

the number and height of piston plates and stacking rings. Extension is performed in stages.

Stacking set for	HP 10/T, HP 25/T	HP 50/T 185 R	HP 50/T 400 R	HP 65/T	HP 130/1155 R
Stacking ring, quantity / height mm	4/65	4/65	2/150	3/133.4	1/110 + 4/95
Piston plate, quantity / height mm	3/65 + 1/45	3/65 + 1/45	1/20 + 1/123 + 1/150	1/20 + 2/135 + 1/100	5/95
Fork lever, quantity	1	1	1	1	1
Stroke extension up to mm	240	240	293	390	465
Total weight kg	14.5	21	22.2	42	47



## Base plates for telescopic jacks

Base plates increase the jack platform and increase jack stability. Base plates should be used for all lifting operations.

Base plate for	HP 10 / T.. HP 25 / T..	HP 50 / T..	HP 65 / T..
Weight kg	7.2	9	24.5

# Traversing and rerailing

## Rerailing bridges

After the rail vehicle has been lifted, it is laterally moved by one or two roller carriages and the DUO Traversing Unit.

When it has reached the correct position the vehicle will be lowered onto the rails. Rerailing bridges provide the safe base for all rerailing operations.



### Height 140 mm

Length m	1.1	2.2	3.3	4.4
Width mm	350	350	350	350
Weight kg	40	81,5	120,5	163

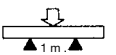
### Height 184 mm

Length m	1.1	2.2	3.3
Width mm	300	300	300
Weight kg	64	128	192

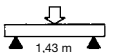
### Capacity of rerailing bridges height 140 mm



700 kN fully supported



500 kN with 1 m distance between supports



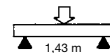
400 kN with 1.43 m distance between supports



1200 kN fully supported



900 kN with 1 m distance between supports



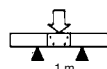
650 kN with 1.43 m distance between supports

## Connection of rerailing bridges

Bridges can be extended. Two rerailing bridges are connected to one another by connection elements. The connection points must be supported.

### Connection elements for bridges

Height mm	140	184
Weight kg	18	21
Maximum bridge capacity kN with 1 m distance between supports	200	300



# The new LUKAS DUO Traversing System

## Roller carriage, DUO Traversing Unit, distance bars

One roller carriage (central lifting at one point) or two roller carriages (lifting at two points) are needed depending on the design of the rail vehicle. The integral roller-carriage sliding plates safely compensate the slight arc movement caused by the vehicle during movement. Slide skids are also fitted to the roller carriages. Distance bars adjustable to any required length are used in pairs to connect the roller carriages rigidly for safe movement on the bridge.

The DUO Traversing Unit is used to shift in both directions over the whole bridge length. Traversing is controlled from a safe distance and only from the control desk.



DUO Traversing Unit	140 mm	184 mm
Push/pull force, kN	176/84	176/84
Stroke, mm	320	320
Dimensions, mm *	668 x 360 x 174	668 x 310 x 174
Weight, kg	23	23

DUO Traversing Unit for heavy load	184 mm
Push/pull force, kN	337/207
Stroke, mm	320
Dimensions, mm *	653 x 320 x 186
Weight, kg	42

\* with guide plates

Roller carriage for bridges	140 mm	184 mm
Permissible load, kN	750	750
Height, mm	129	109
Weight, kg	42	43

Heavy load roller carriage for bridges	184 mm
Permissible load, kN	1000
Height, mm	140
Weight, kg	63

Adjustable distance bars (set)	
Short Length max/min mm	1830/1030
Weight, kg	40
Long Length max/min mm	2800/1500
Weight kg	65



LUKAS DUO Traversing System for rail vehicles with one jacking point

LUKAS DUO Traversing System for rail vehicles with two jacking points

# Axle pusher and tilting jack

## Axle pusher

The axle pusher is used to push rail vehicles onto the track that were shouldered with the wheel flange on the rails during rerailing. The LZM 10/160 jack operates the axle pusher hydraulically.

Please order the jack and piston guard plates separately.

	LZM 10/160	Axle pusher
Stroke	160 mm	–
Weight	3,8 kg	11 kg



## Rerailing with the tilting jack

Depending on their design, few types of vehicles can be rerailed easily with a HP 25 / K 400R jack, a radius plate and the wheel stop. The rail vehicle moves horizontally and vertically at the same time due to the inclined piston stroke movement. The wheel stop stops the traversing movement as soon as the wheels are situated over the rails.

Additionally the tilting jack is used for uprighting rail vehicles with the lifting belt. For further information please refer to the following page.



## Necessary accessories:

Tilting jack HP 25 / K 400R ①

Radius Plate ②

Wheel stop ③

Weight 18,6 kg



# Uprighting of Rolling stock

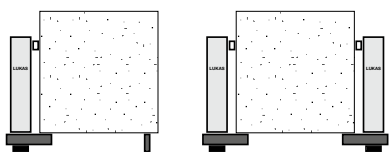
The LUKAS uprighting system is used to upright all overturned rail vehicles easily so that they can be re-ailed later if required.

The lifting belt ④ is laid around the rail vehicle and fixed to the frame with the holding rope ⑤ and shackle ⑥. For the first lifting operation is a HP 25 / K 400R and a radius plate required.

The vehicle is lifted up onto the slings of the lifting belt with the tilting set and then with the claw jack. When the piston is fully extended a second claw jack is placed in position and is used to continue the uprighting operation.



## Lifting with the claw jack



The claw jack ① is delivered with a base plate, which allows the jack to lift loads such as iron slab trucks.

The radius plate ③ is required as support for the claw jack and tilting jack when rail vehicles are lifted or uprighted with the lifting belt.



	Claw jack ① HP 50 / P 850R	Tilting jack ② HP 25 / K 400R	Radius plate ③	Lifting belt ④	Holding rope ⑤	Shackle ⑥
Weight, kg	52	22	7.5	51	15	12.8
Permissible load, kN	--	--	--	400	500	250
Lifting force, kN	520	266	--	--	--	--
Stroke, mm	850	400	--	--	--	--
Height (retracted), mm	1150	599	--	--	--	--
Oil capacity, l	8	1.55	--	--	--	--

# Pulling device • Accessories

## Pulling device

The LUKAS pulling device is used to pull apart wedged-together vehicles or to release vehicles jammed against tunnel or bridge walls. Obstacles can be removed from the tracks. The pulling device can be fastened to the rails or ground anchors regardless of the rail gauge.

The pulling device consists of: 9.5 m pulling rope, pulling jack with holding ropes and rail attachments. The rail profile must be given when the order is placed.



### Pulling device

Pulling force 220 kN

Oil capacity 1 l

Weight 190 kg

Please state the rail profile when making enquiries!



## Hydraulic hoses for the LUKAS rerailing system

	Motor pump Series 6	Compact power packs Series 6
Connection:	2x hose 10 m black	--
Control desk – motor pump	Weight 4.4 kg	--
Connection:	Hose pair 10 m red/red	Hose pair 10 m red/red
Control desk – lifting jack	Weight 7 kg	Weight 7 kg
Connection:	Hose pair 10 m red/red	Hose pair 10 m yellow/yellow
Control desk – DUO traversing jack	Weight 7 kg	Weight 7 kg
Anchor jack	Hose 10 m black	Hose 10 m black
	Weight 4.4 kg	Weight 2.75 kg



# Rescue tools



LUKAS Rescue Tools provide effective assistance for rail accidents. They are used to hull out access openings in the outer walls of rail vehicles as well as opening or removing jammed doors.

LUKAS Rescue Tools combine low weight with a very high force and working speed. The tools can be operated easily and safely in all working positions.

LUKAS Rescue Tools have proved their efficiency in many rail accidents where people are injured and trapped, and they are standard equipment for many railway companies throughout the world.

Spreader	SP 310	SP 510
Spreading force up to	256 kN	230 kN
Spreading distance	720 mm	800 mm
Squeezing force up to	122 kN	70.4 kN
Pulling distance up to	622 mm	665 mm
Pulling force up to	51 kN	58 kN
Oil requirement	243 cm <sup>3</sup>	425 cm <sup>3</sup>
Dimensions: LxWxH	790 x 330 x 180 mm	900 x 344 x 215 mm
Weight	19.6 kg	24.9 kg



Cutter	S 330	S 530
Cutting force up to	510 kN	740 kN
Round bar steel up to dia.	33 mm	40 mm
Blade opening	225 mm	283 mm
Oil requirement	98 cm <sup>3</sup>	150 cm <sup>3</sup>
Dimensions: LxWxH	726 x 225 x 163 mm	775 x 235 x 165 mm
Weight	14.6 kg	17.9 kg

# Rescue tools



Telescopic rams	R 420	R 424
Total stroke	575 mm	875 mm
Stroke/lifting force, piston 1	295 mm/267 kN	445 mm/267 kN
Stroke/lifting force, piston 2	280 mm/133 kN	430 mm/133 kN
Extended length	1055 mm	1505 mm
Oil requirement	1410 cm <sup>3</sup>	2139 cm <sup>3</sup>
Dimensions LxWxH	480 x 112 x 211	630 x 112 x 211 mm
Weight	16.7 kg	20.9 kg



R 420

R 424

## Technical data of the power packs:

Motor:	4-stroke gasoline engine or 230 V/50 Hz electric motor	
Oil output rate:	gasoline engine: 3 x 2.35 l/min/3 x 0.75 l/min ND-HD electric motor: 3 x 2.2 l/min/3 x 0.7 l/min	
Capacity of oil reservoir	5 l – 7.5 l	
Usable oil quantity	3.8 – 6.3 l	
Dimensions		
LxWxH	P640 TG-HR	842 x 710 x 495 mm
	P640 TE-HR	772 x 605 x 485 mm
Weight, approx.	100 kg	



Trimo power packs for simultaneous operation of three rescue tools

Mobility with compact power packs



## P 620 OG

Gasoline engine	1.1 kW
Oil output rate low pressure	2 l/min
Oil output rate high pressure	0.78 l/min
Capacity of oil reservoir	2 l
Usable oil quantity	1.6 l
Dimensions LxWxH	340 x 275 x 395 mm
Weight	12.9 kg

# High-pressure lifting bags 8 bar

The high-pressure lifting bags are ideal for the first lifting of derailed rail vehicles with a low ground clearance. The insertion height is only 25 mm. The lifting forces range from 24 – 68 t per bag. The bags are strengthened with aramid, which is what makes them low-weight and ideal for extreme loads.



Mini lifting bags		V31	V40	V54	V68
Max. lifting force	kg	31 400	39 600	54 400	67 700
Max. lifting height	cm	37.0	40.2	47.8	52.0
Dimensions	cm	65 x 69	78 x 69	86 x 86	95 x 95
Insertion height	cm	2.5	2.5	2.5	2.5
Nominal content	l	57.5	75.0	124.2	161.9
Air requirement at 8 bar l		517.5	675.0	1117.8	1457.1
Max. working pressure	bar	8	8	8	8
Test pressure	bar	12	12	12	12
Burst pressure	bar	38.0	38.0	36.0	32.5
Weight	kg	9.5	11.8	17.2	21.9



High-pressure compressors can be delivered with gasoline or electric motors.

## Double controller 8 bar

Plastic housing, dead-man's safety system

Inflation hose 5 m, yellow

Inflation hose 10 m, red

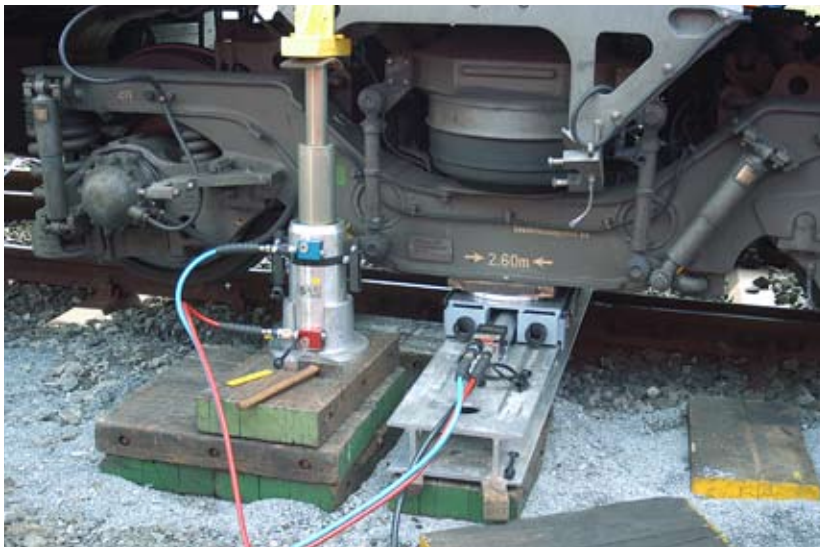
Inflation hose 10 m, yellow

Pressure reducer 200/300 bar with manual connection

# Examples of operation



Lifting the vehicles



Positioning of the traversing unit



Traversing the middle bogie

# Examples of operation



Uprighting start phase



Uprighting end phase



Rerailling

# ***Rerailing systems – equipment for rail-road vehicles***



LUKAS vario set, the power supply and control unit for mounting on the vehicle's front auxiliary shaft.



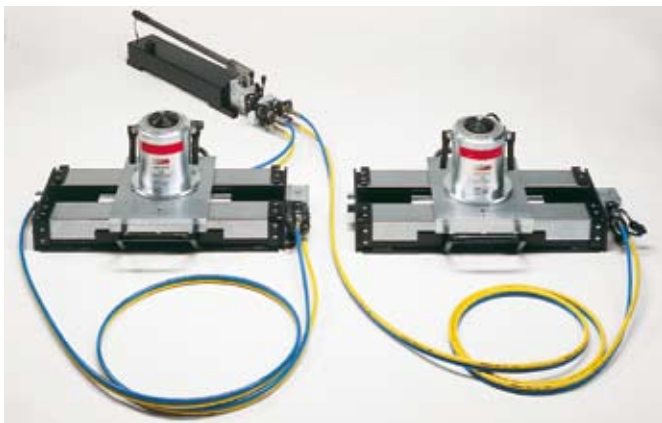
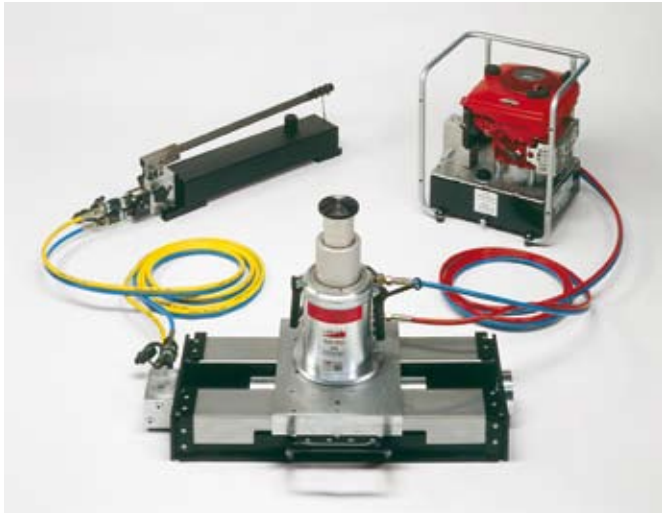
Emergency vehicle – LUKAS rerailing system operated by motor pump and control desk.



The LUKAS rerailing system can easily be stowed inside vehicles. Its low weight is a special LUKAS advantage.

# LUKAS compact rerailing systems

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## LUKAS compact rerailing systems

The mobile version for lifting and rerailing light rail vehicles.

Internal jacks customized to vehicles

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All information has been carefully checked. However, we cannot assume liability for any errors or omissions.

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