

CM Presentation CME, Dec 2005

Eickhoff CM 2H



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Eickhoff CM 2H



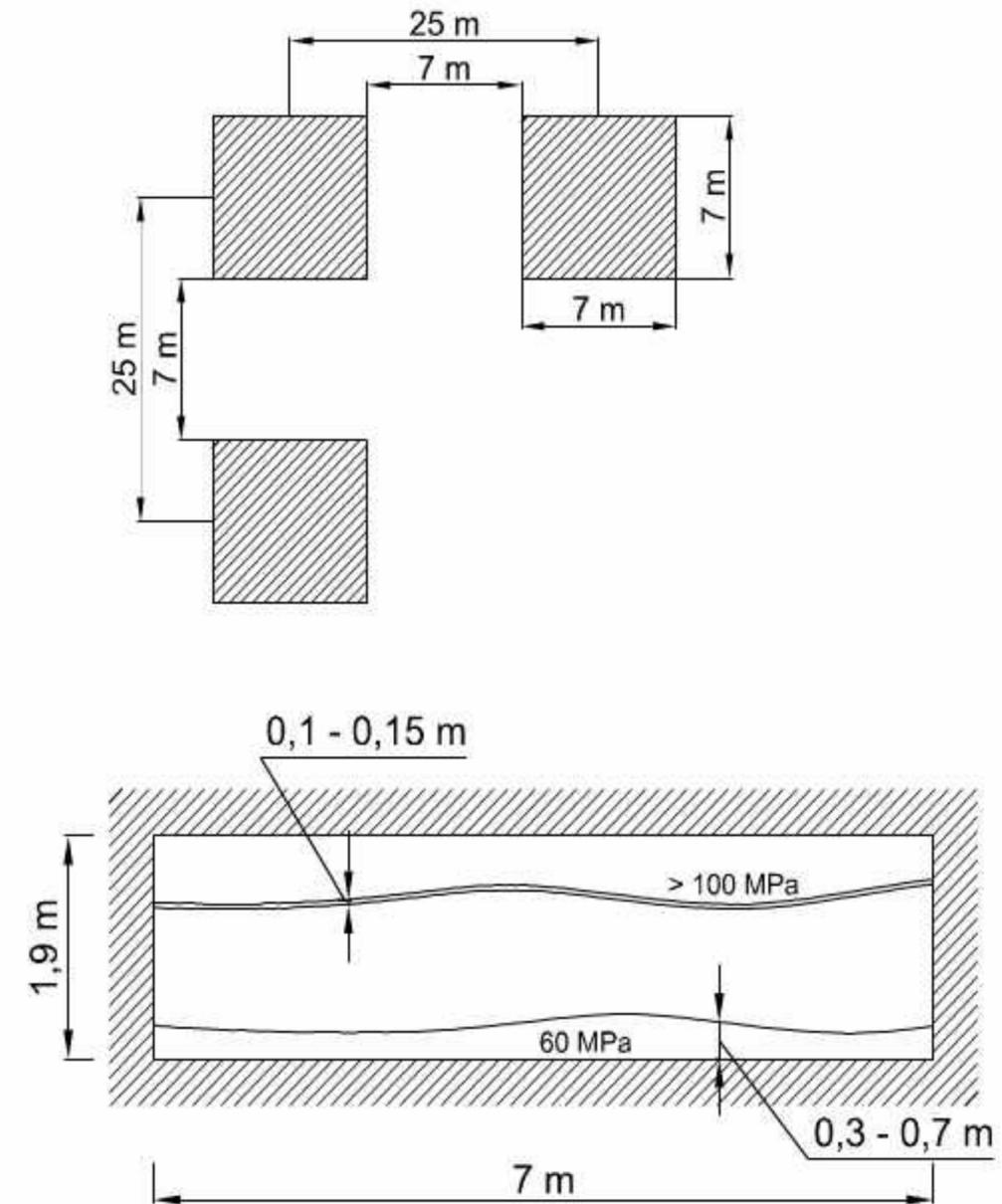
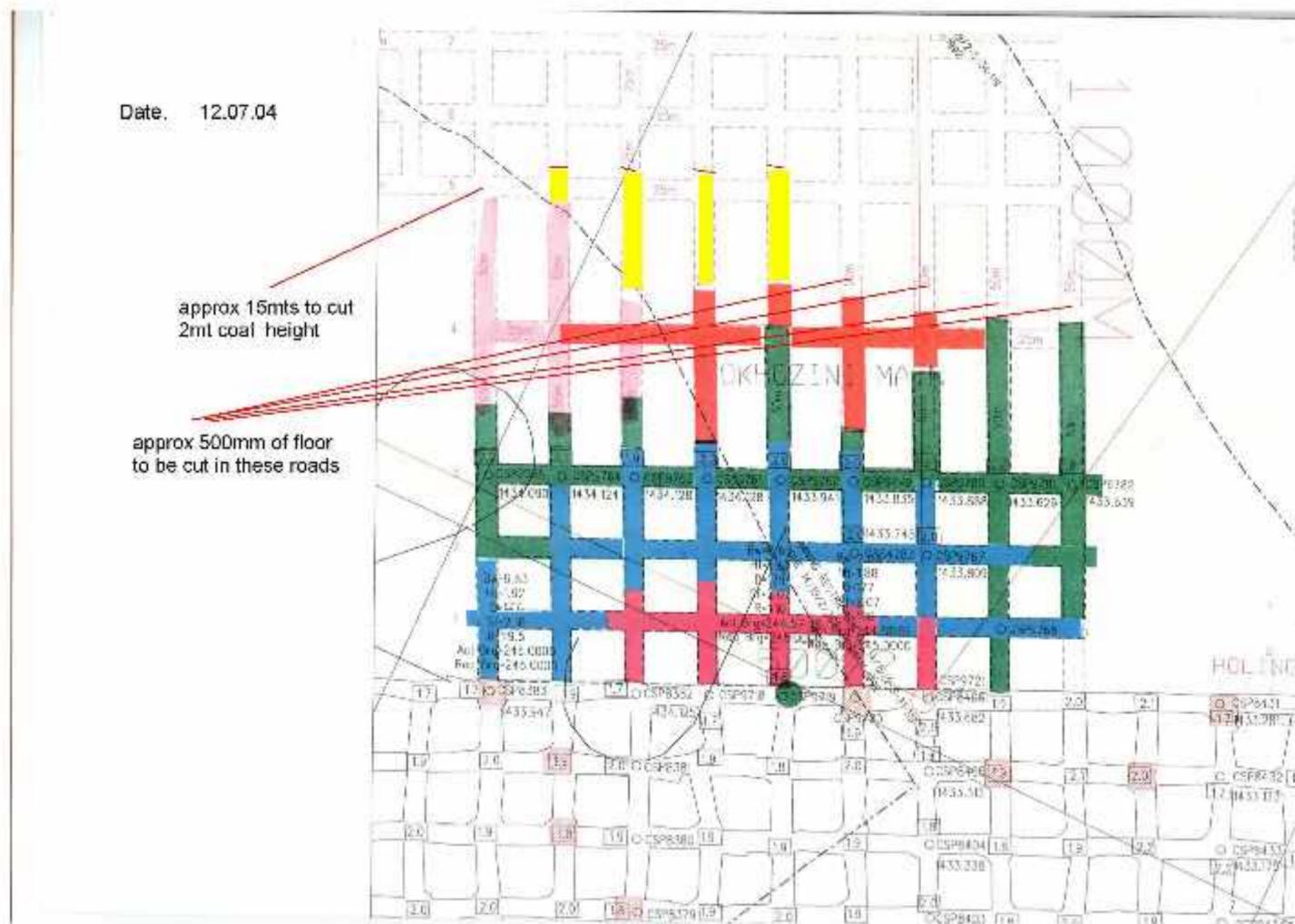
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Eickhoff CM 2H at New Denmark Colliery, Okhozini shaft

- Start underground 24.3.2004
- FULCO-production-system, 14. June 2004
- 1. Inspection at ESA, December 2004
- Resume production, 2. January 2005

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Eickhoff CM 2H at New Denmark Colliery, Okhozini shaft conditions



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Eickhoff VGR II at New Denmark Colliery

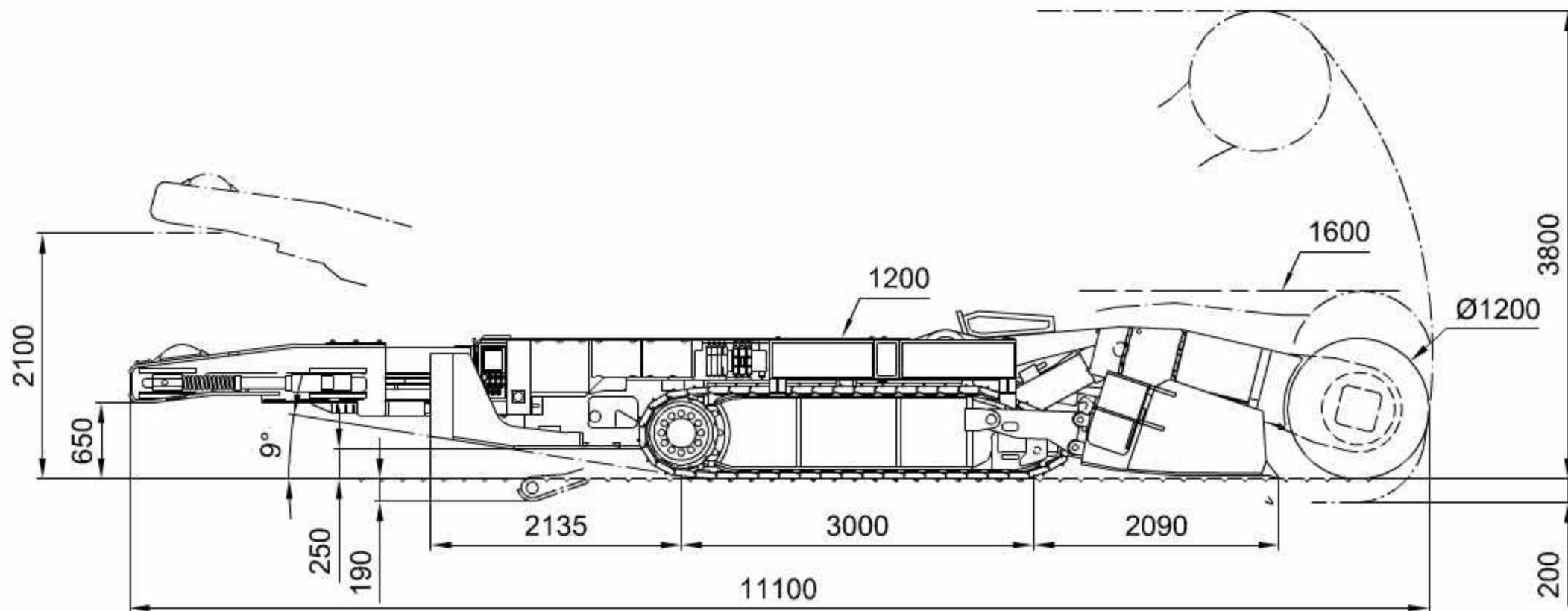
Feedback and experiences

Operational

- operating figures:
 - sump rate: 29 mm/s
 - shear rate: 110 mm/s
 - production rate: 13 t/min
 - tons per hour: 297 t/h
- very stable during cutting
- best 10h shift advance: 70 m (Okhozini shaft record 18.09.2004)

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Eickhoff CM 2, 3.8m cutting height



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Eickhoff CM 2, 3.8m cutting height

Weight	65 t
Ground Pressure	200 kPa
Tram Speed	20 m/min
Track Chain Width	510 mm
Chassis Width	3050 mm
Chassis Height	1200 mm
Cutting Width	3650 mm
Drum Diameter	1200 mm
Cutter Speed	42 rpm
Bit Tip Speed	2,6 m/s
CLA Speed	53 rpm
Supply voltage	1000 V

Motors:

Hydraulic Tram Version:

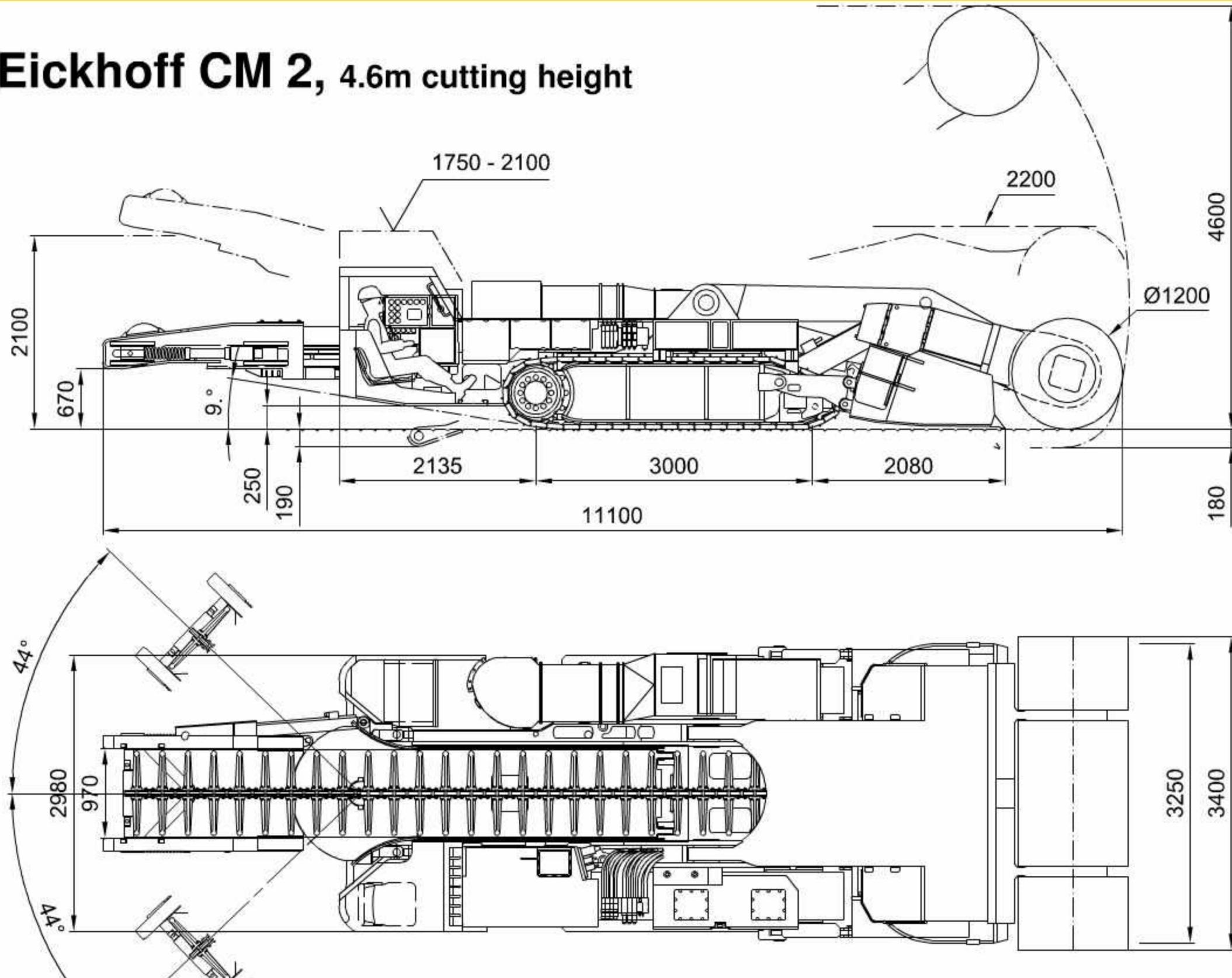
Cutting	2 x 180 kW
Gathering	2 x 45 kW
Traction	---
Pump	1 x 125 kW
Total	<hr/> 575 kW

Electric Tram Version:

Cutting	2 x 180 kW
Gathering	2 x 45 kW
Traction	2 x 42 kW
Pump	1 x 63 kW
Total	<hr/> 597 kW

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Eickhoff CM 2, 4.6m cutting height



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Eickhoff CM 2, 4.6m cutting height

Weight	68 t
Ground Pressure	210 kPa
Tram Speed	20 m/min
Track Chain Width	510 mm
Chassis Width	3050 mm
Chassis Height	1750 mm
Cutting Width	3400 mm
Drum Diameter	1200 mm
Cutter Speed	42 rpm
Bit Tip Speed	2,6 m/s
CLA Speed	53 rpm
Supply voltage	1000 V

Motors:

Hydraulic Tram Version:

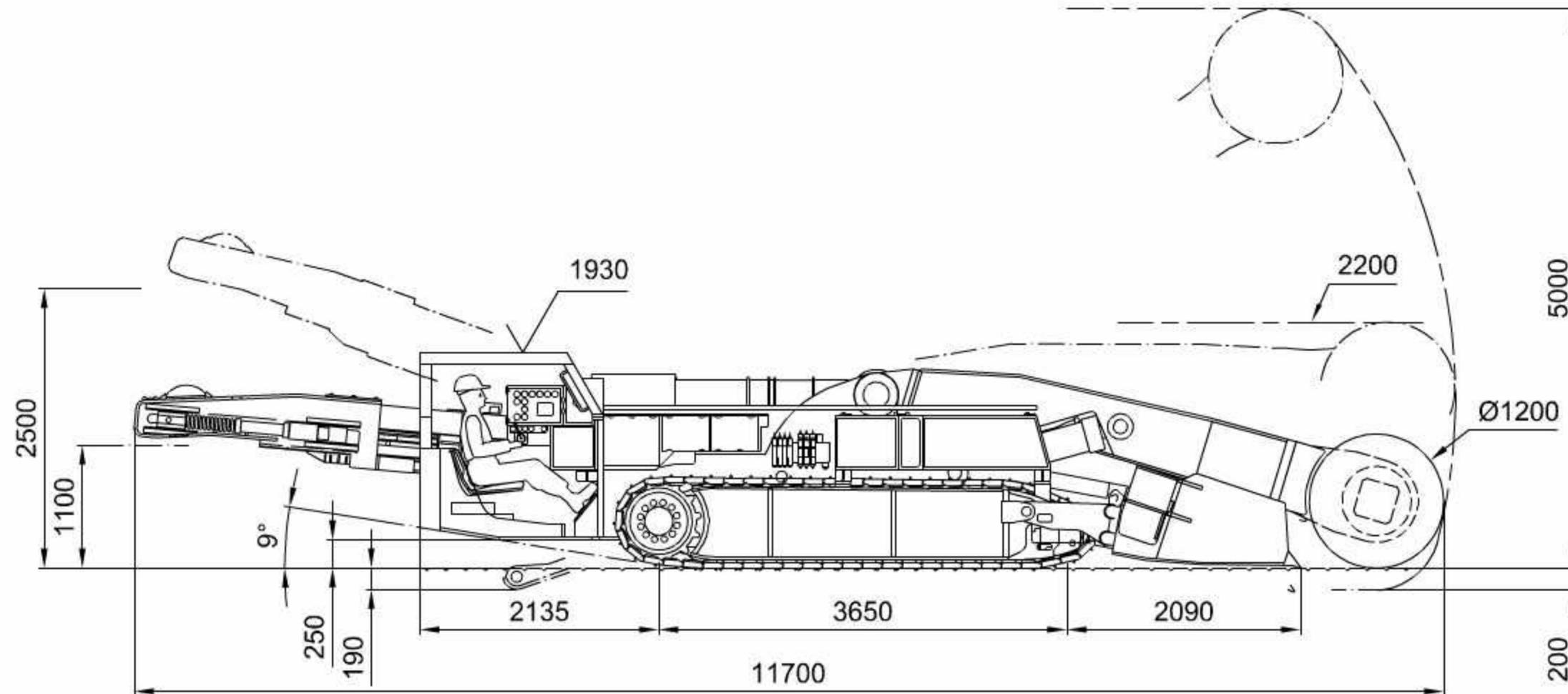
Cutting	2 x 180 kW
Gathering	2 x 45 kW
Traction	---
Pump	1 x 125 kW
Dust Scrubber	1 x 37 kW
Total	<hr/> 612 kW

Electric Tram Version:

Cutting	2 x 180 kW
Gathering	2 x 45 kW
Traction	2 x 42 kW
Pump	1 x 63 kW
Dust Scrubber	1 x 37 kW
Total	<hr/> 634 kW

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Eickhoff CM 3, 5m cutting height



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Eickhoff CM 3, 5m cutting height

Weight	85 t
Ground Pressure	220 kPa
Tram Speed	15 m/min
Track Chain Width	560 mm
Chassis Width	3050 mm
Chassis Height	1750 mm
Cutting Width	3400 mm
Drum Diameter	1200 mm
Cutter Speed	42 rpm
Bit Tip Speed	2,6 m/s
CLA Speed	53 rpm
Supply voltage	1000 V

Motors:

Hydraulic Tram Version:

Cutting	2 x 180 kW
Gathering	2 x 45 kW
Traction	---
Pump	1 x 132 kW
Dust Scrubber	1 x 37 kW
Total	<hr/> 619 kW

Electric Tram Version:

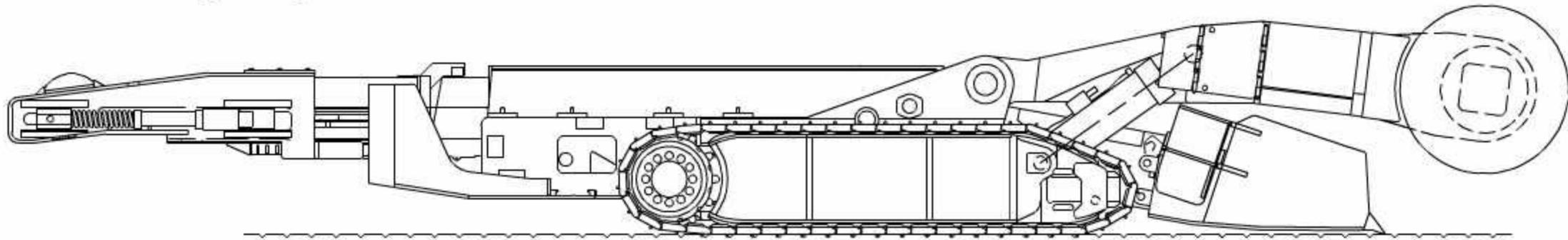
Cutting	2 x 180 kW
Gathering	2 x 45 kW
Traction	2 x 55 kW
Pump	1 x 125 kW
Dust Scrubber	1 x 37 kW
Total	<hr/> 722 kW

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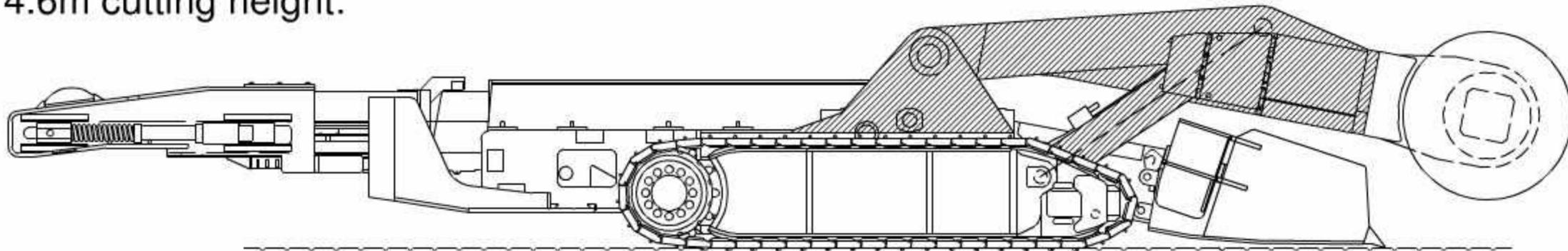
Eickhoff CM 2

Differences

3.8m cutting height:



4.6m cutting height:

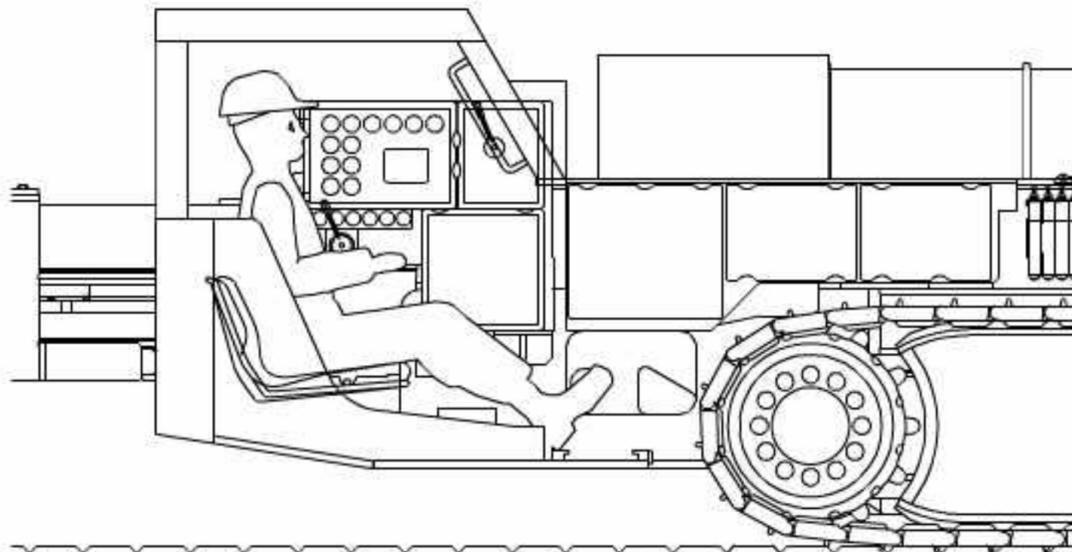


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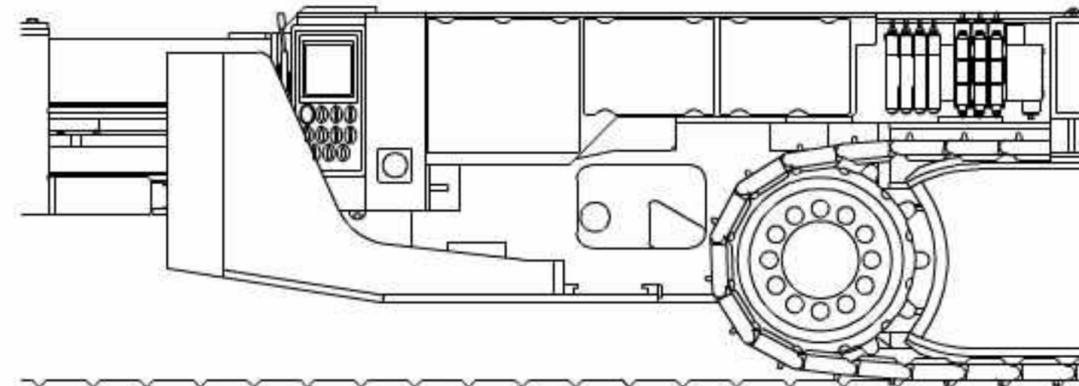
Eickhoff CM 2

Differences

Version with operator seat



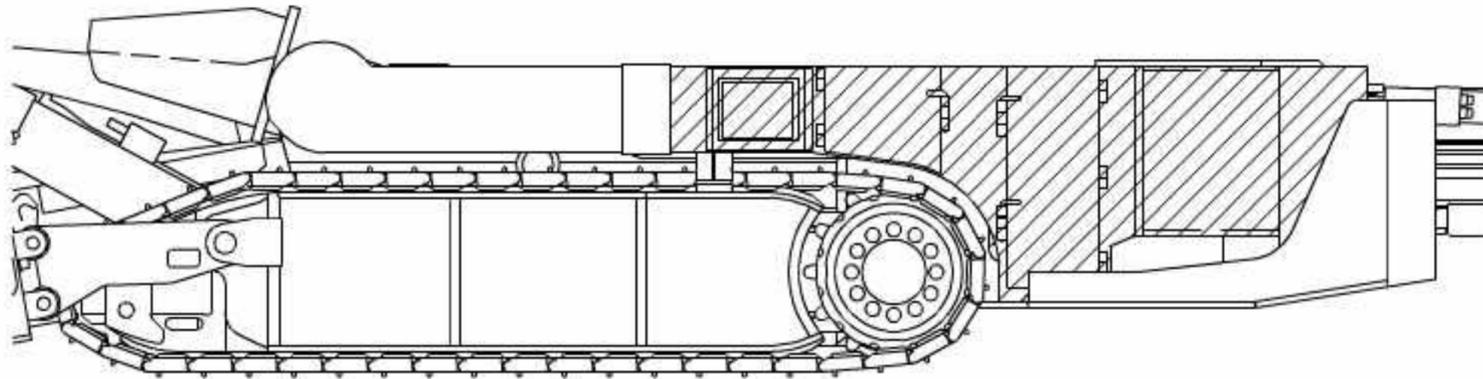
Version with radio control



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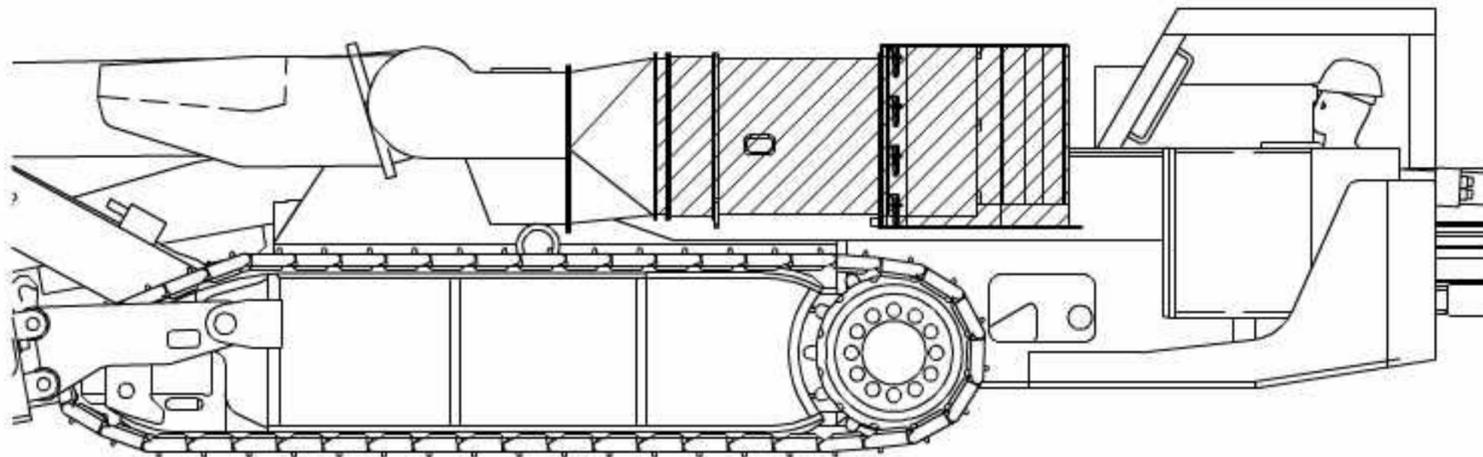
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Differences



CFT wet dust scrubber:

capacity	m ³ /s	3,0
power	kW	17, (hydraulic)

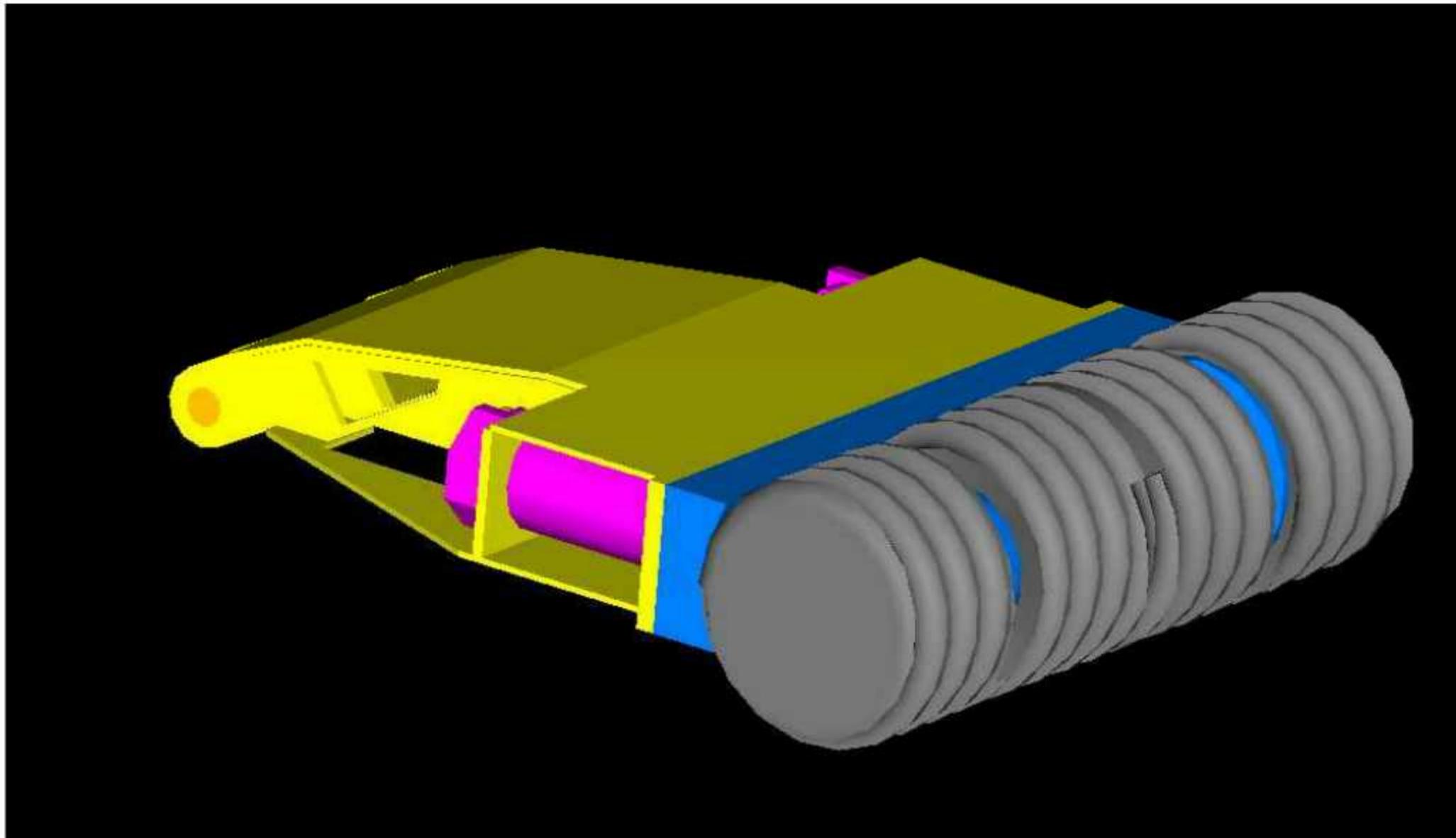


Engart wet dust scrubber:

capacity	m ³ /s	7,5
power	kW	37, (electric)

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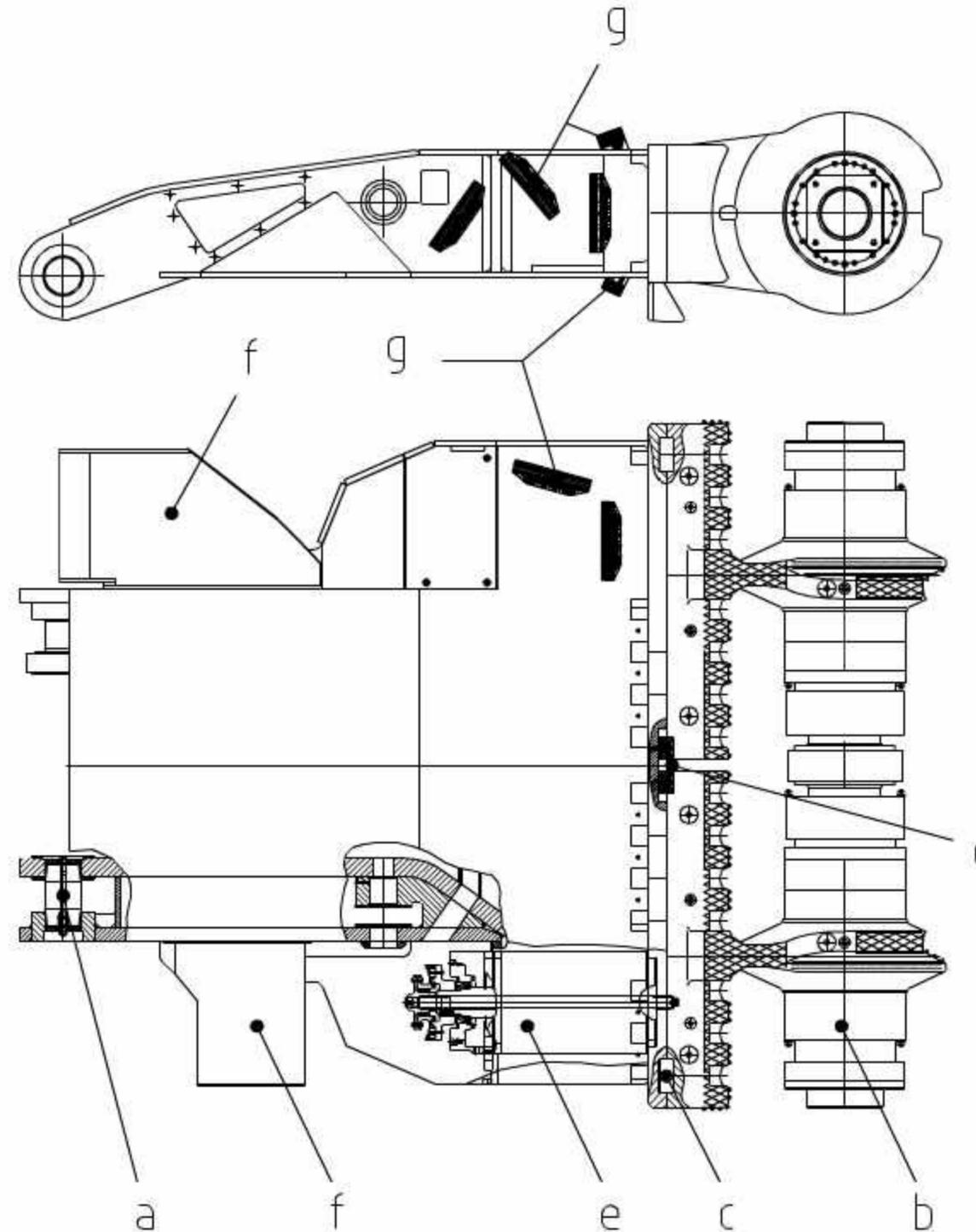


- Cutter boom

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Cutter boom

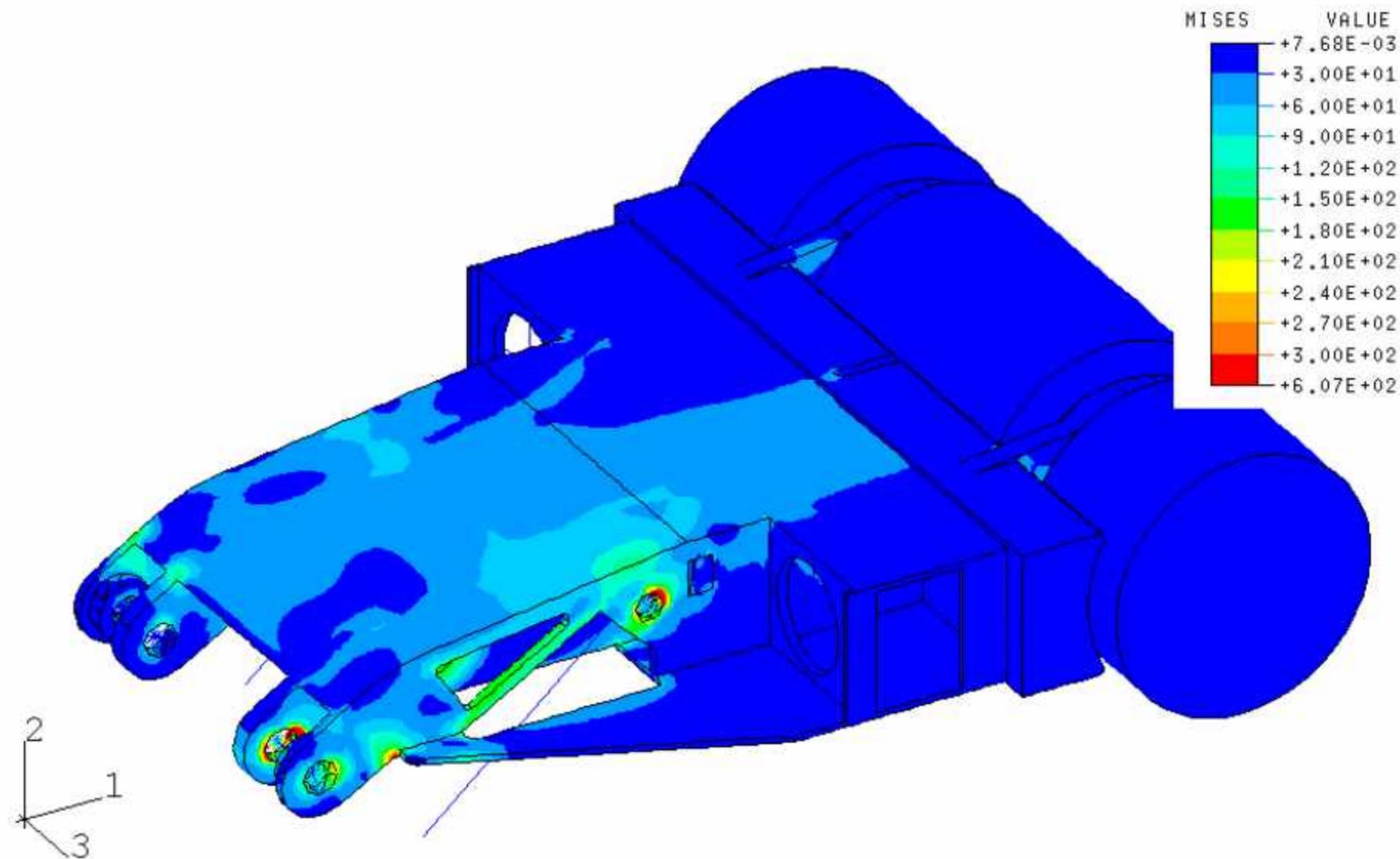


- a) pivot point
- b) cutter gear
- c) bolt
- d) key
- e) cutter motor
- f) duct work
- g) sprays

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FEA cutter boom



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Eickhoff CM 2

Cutter gear case with cutter head



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Eickhoff CM 2

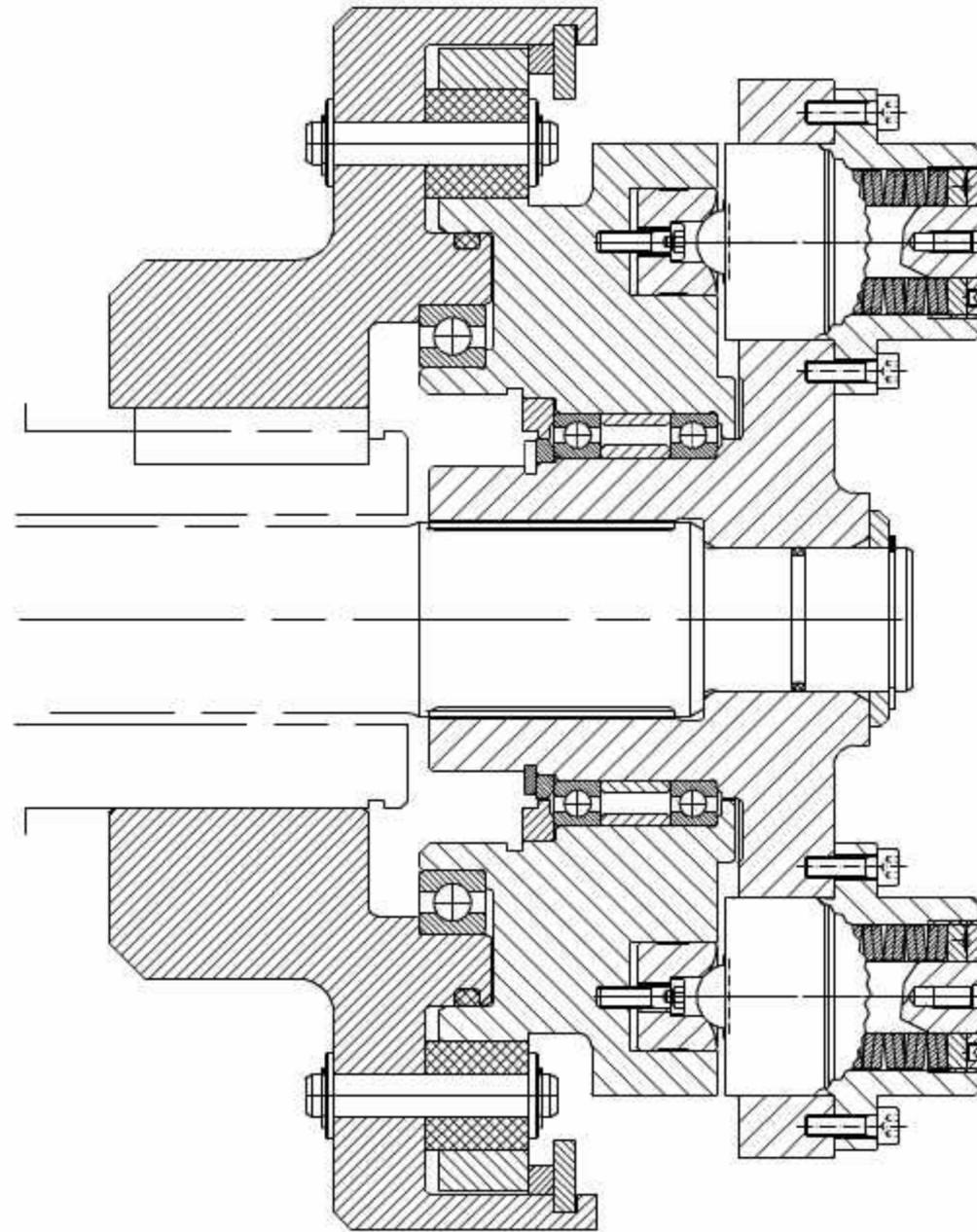
Cutter gear case with cutter head



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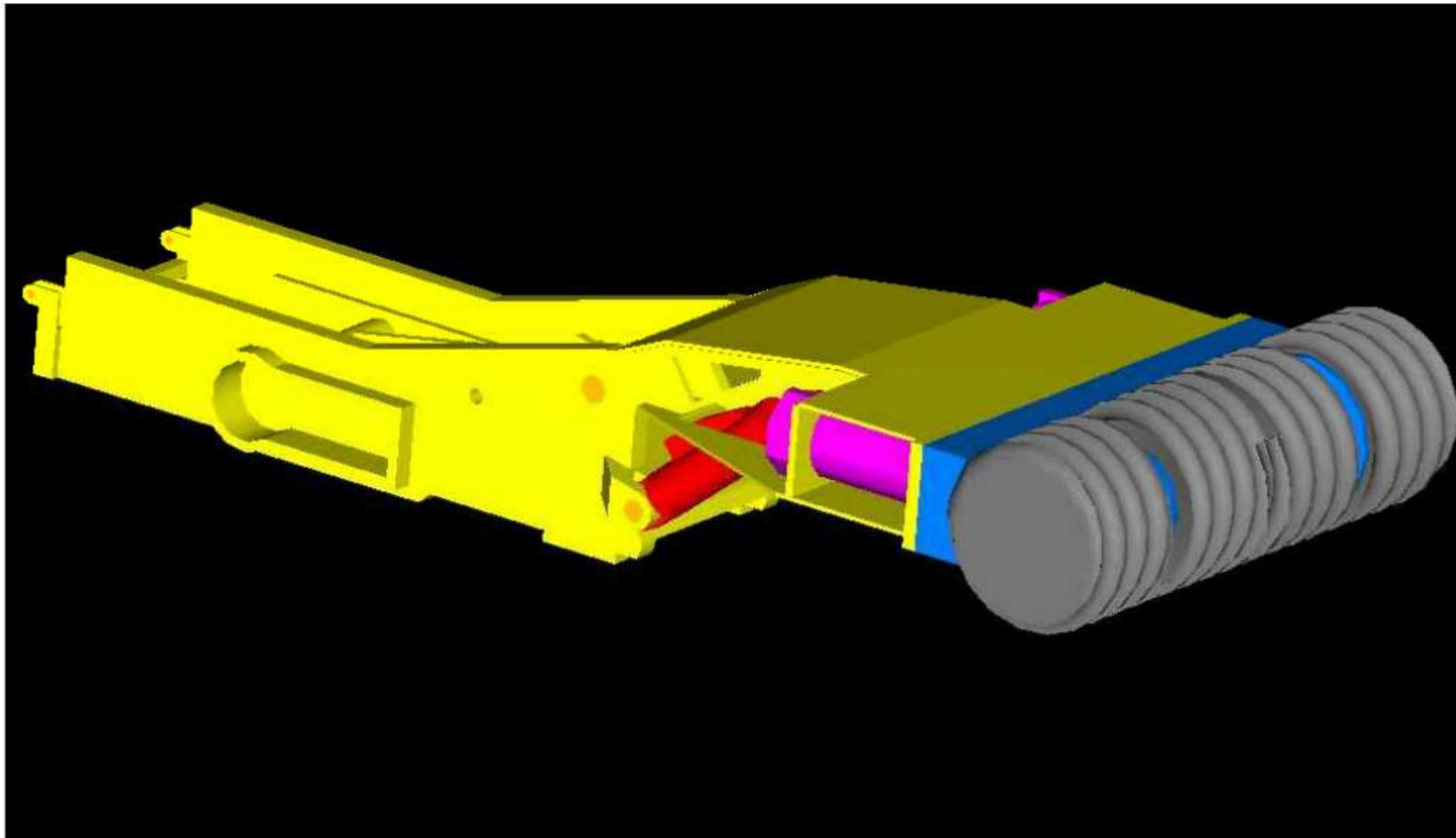
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Cutter switch element coupling



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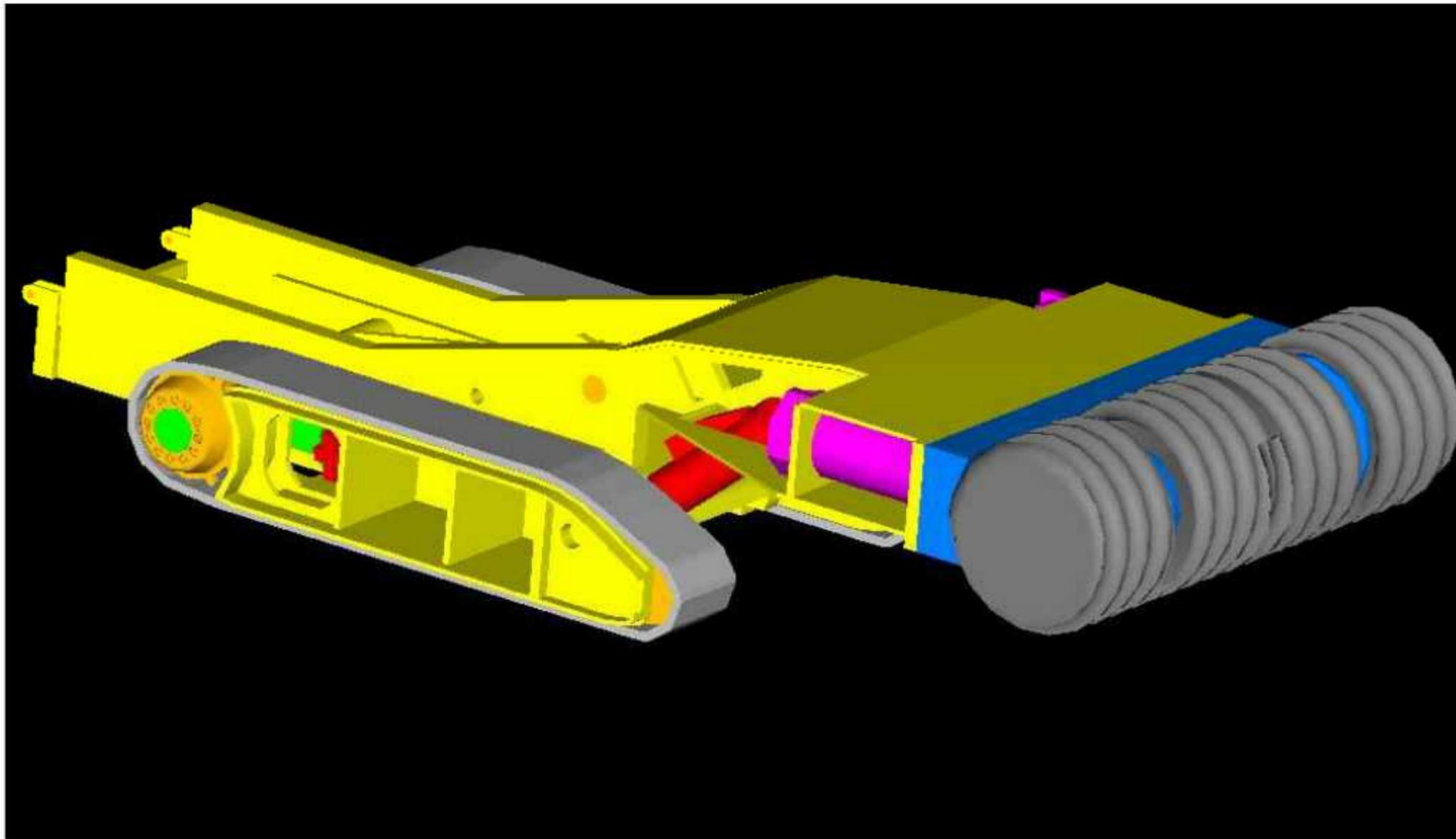
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- Cutter boom
- Main frame

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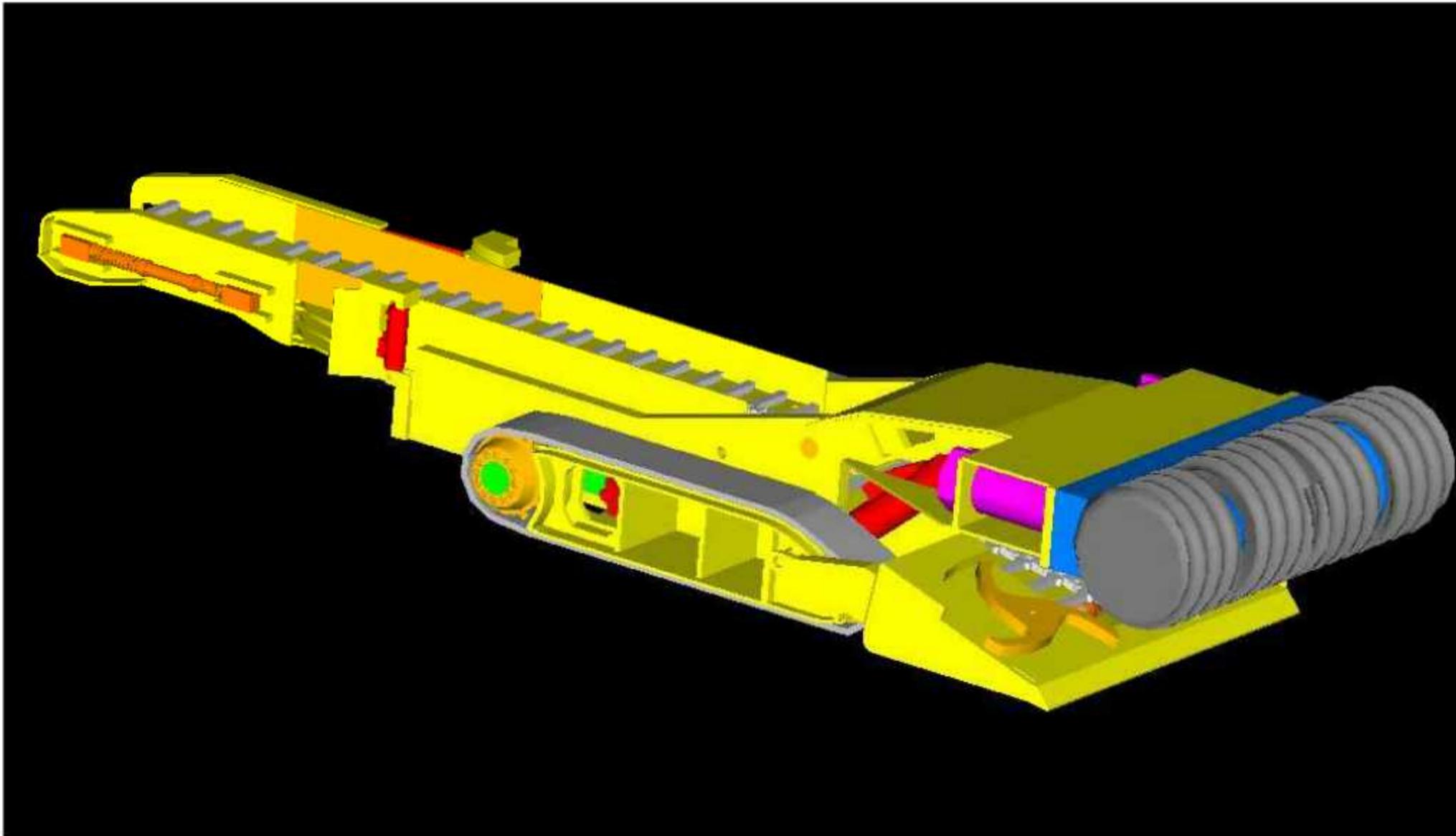
Eickhoff CM 2



- Cutter boom
- Main frame
- Tramming system

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Eickhoff CM 2

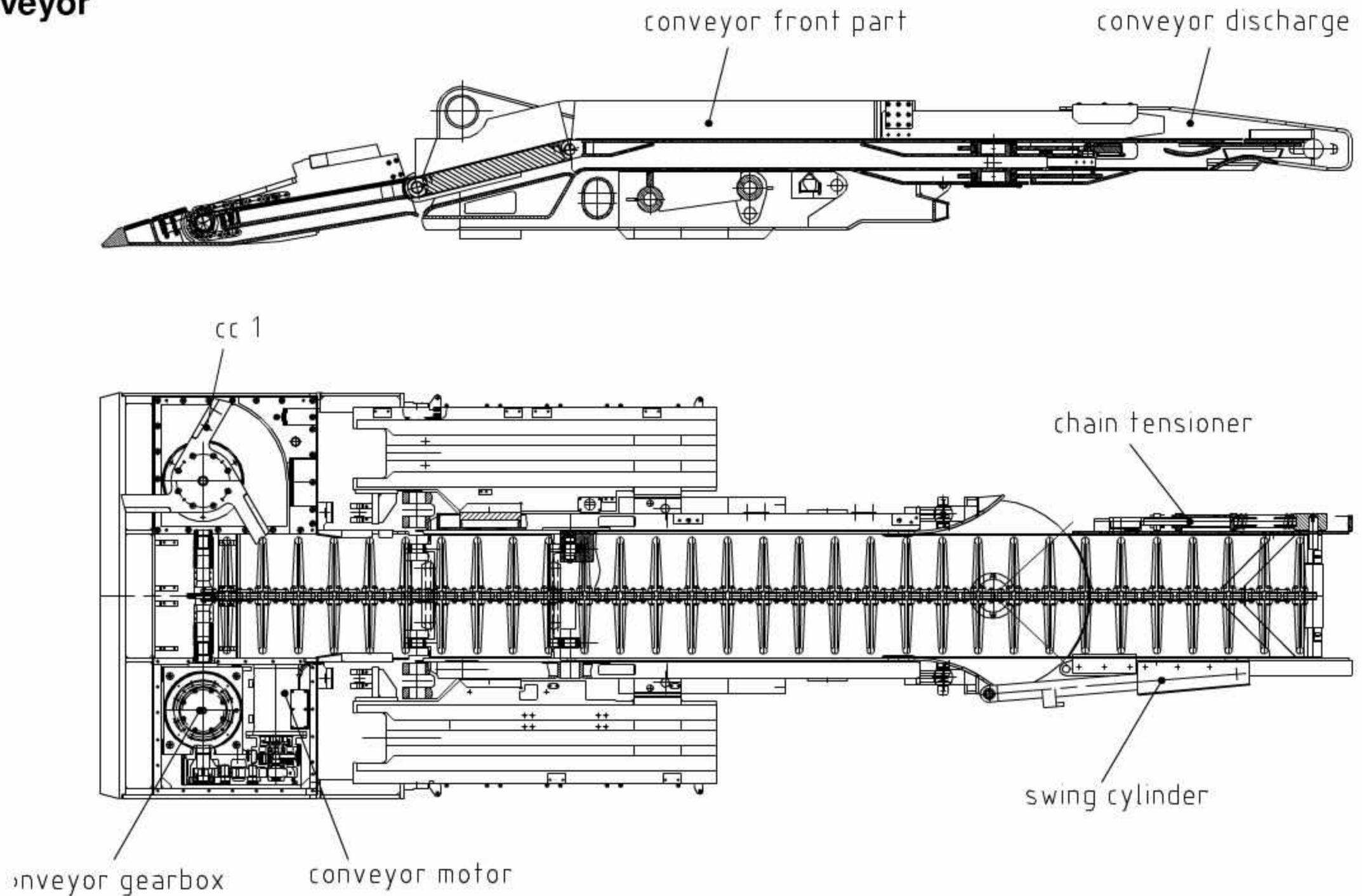


- Cutter boom
- Main frame
- Tramming system
- Conveyor
- Gathering head

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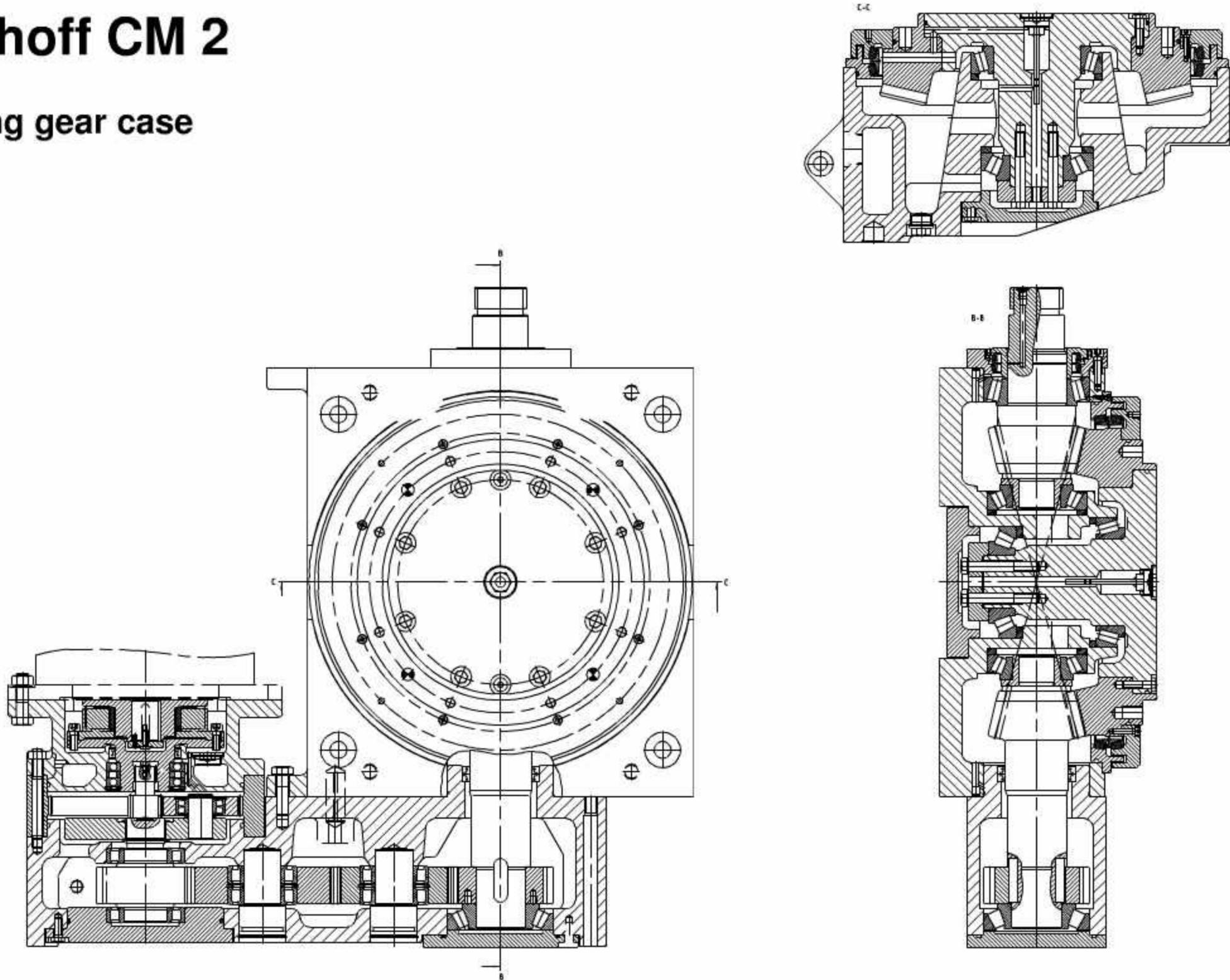
Conveyor



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Loading gear case



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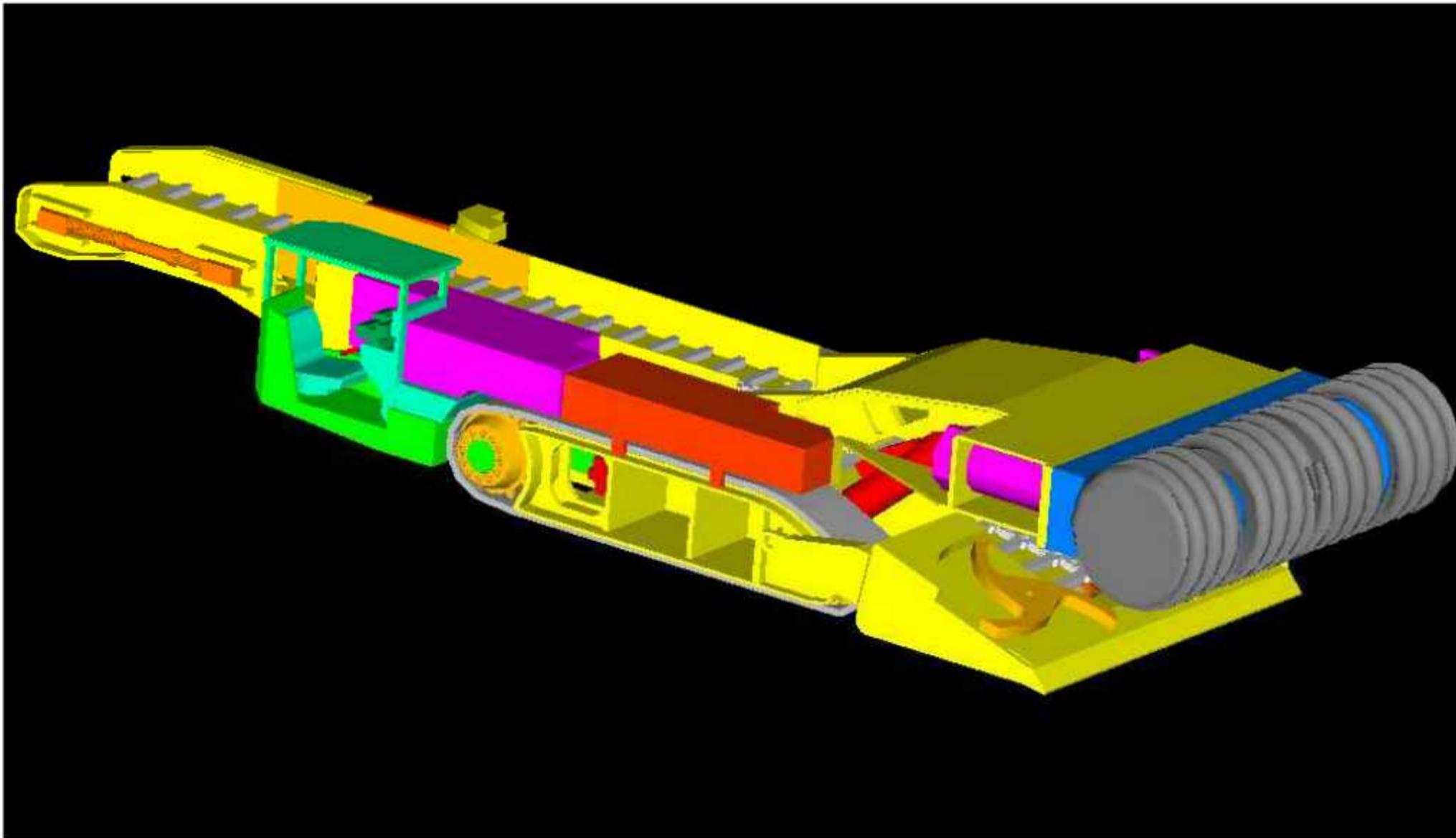
Eickhoff CM 2

Pinless piston rod



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Eickhoff CM 2



- Cutter boom
- Main frame
- Tramming system

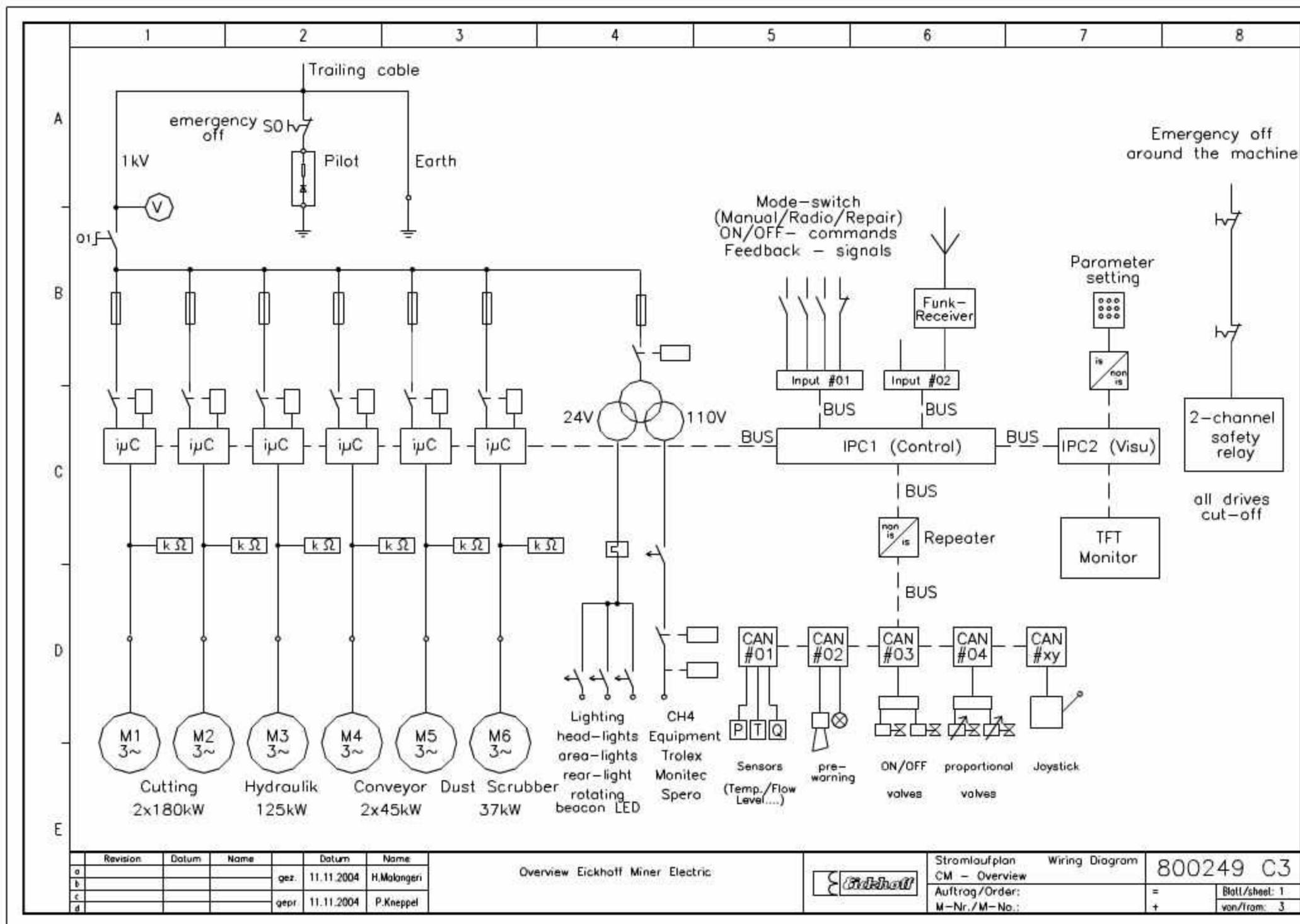
- Conveyor
- Gathering head
- Electric-Box

- Hydraulic tank
- Operator seat

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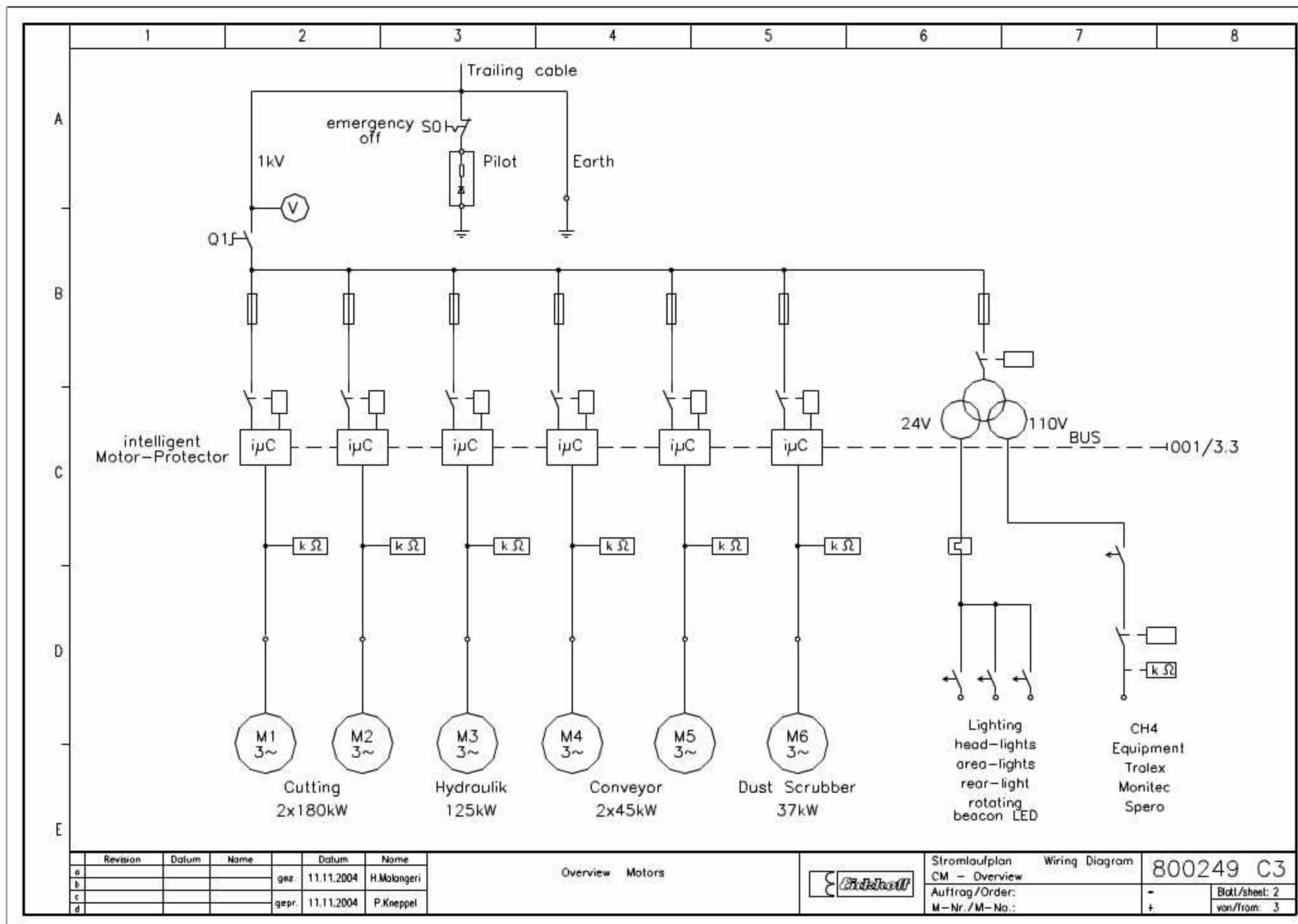
Wiring plan



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Eickhoff CM 2

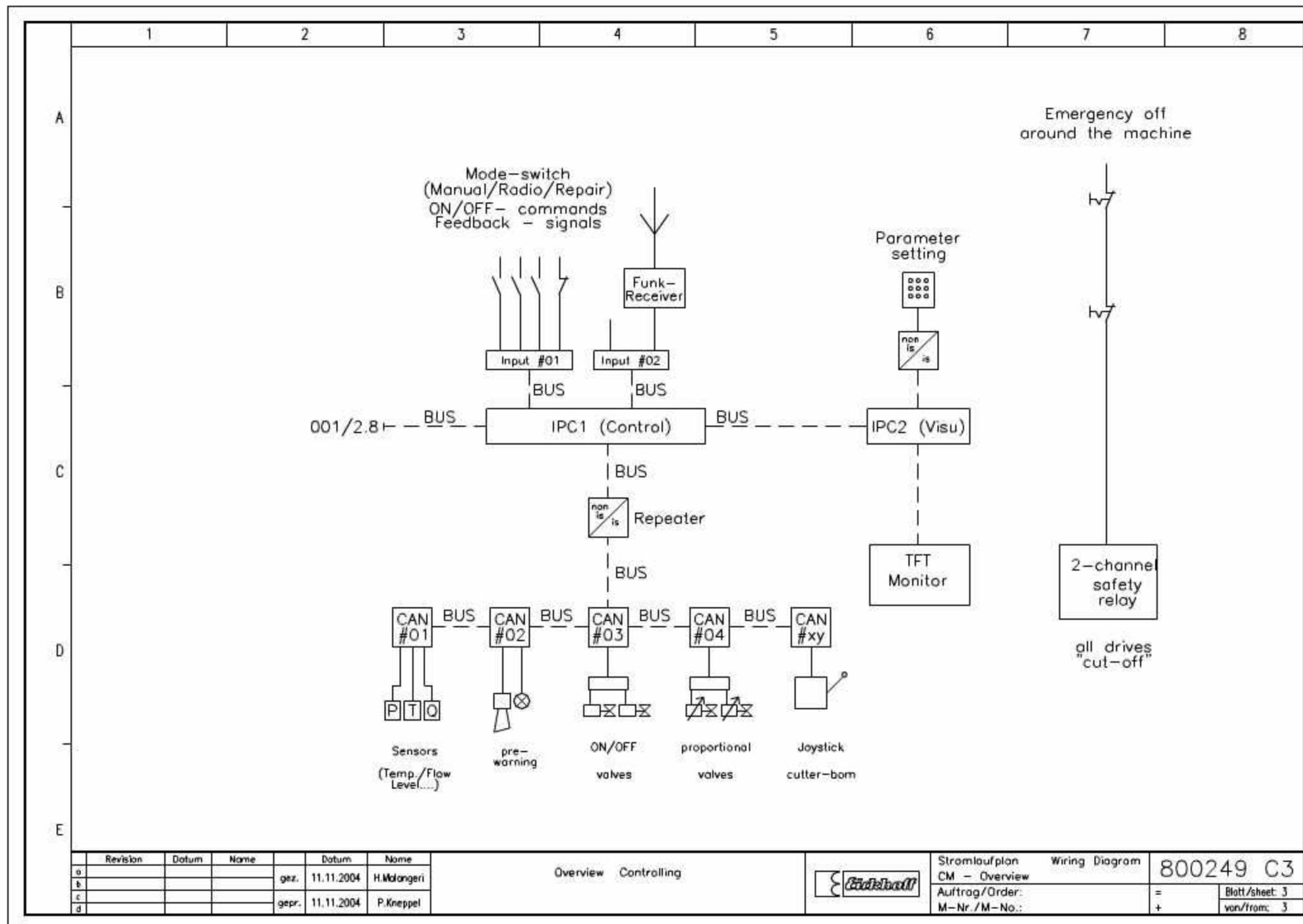
Wiring plan



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Eickhoff CM 2

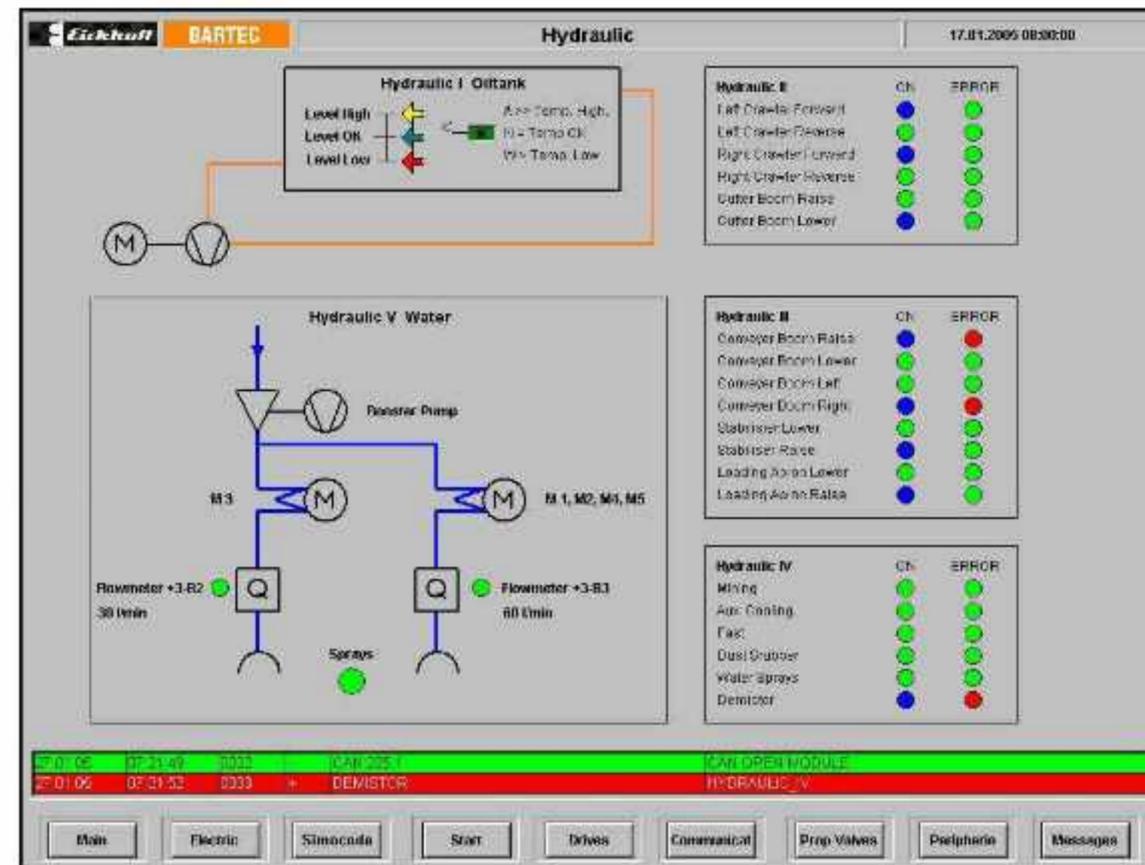
Wiring plan



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Visualization:



10" Display

Operating system:

Siemens WinCC,
MS-Windows

Diagnosis:

Yes

Performance monitoring:

Yes

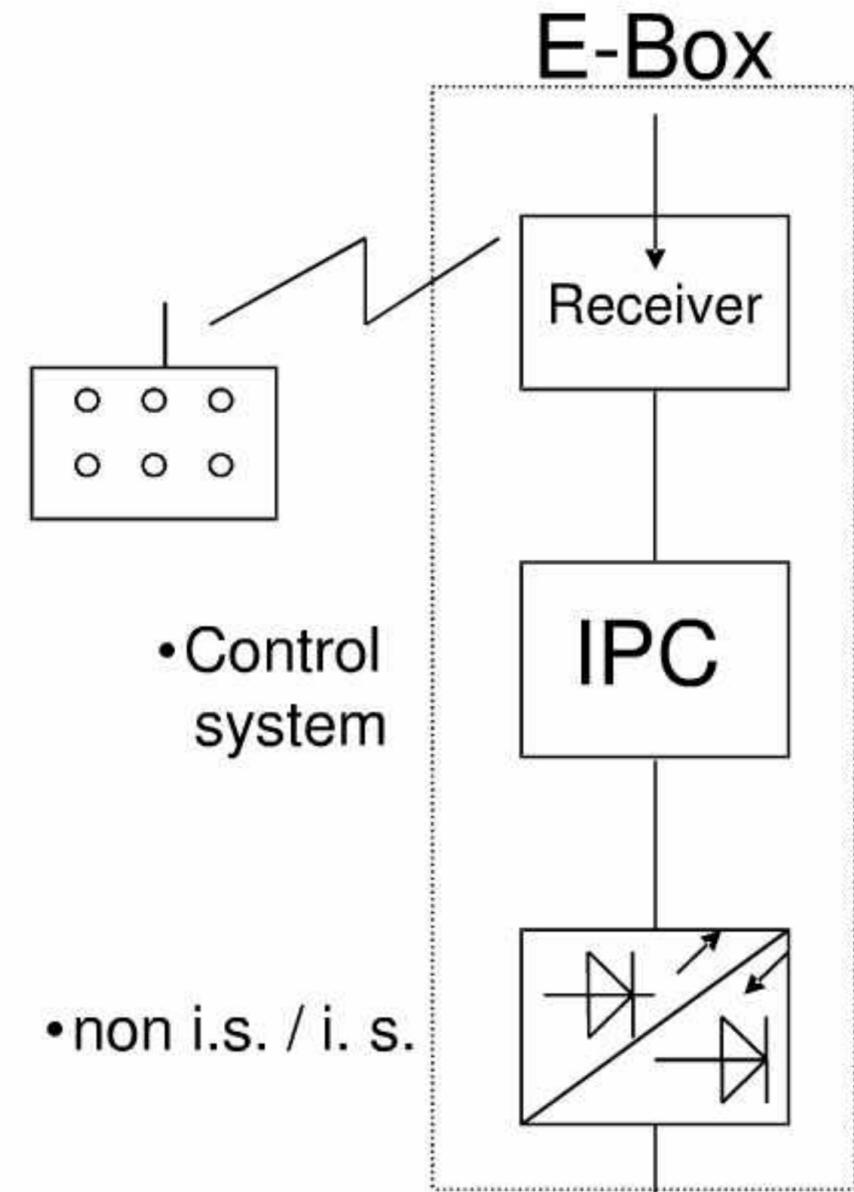
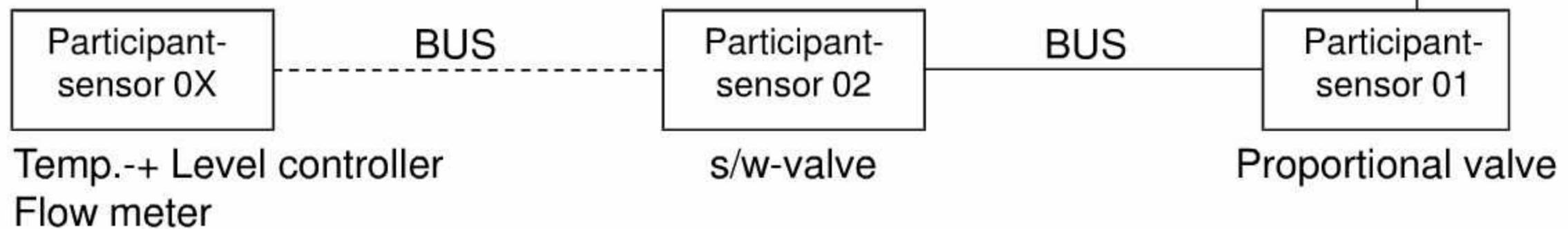
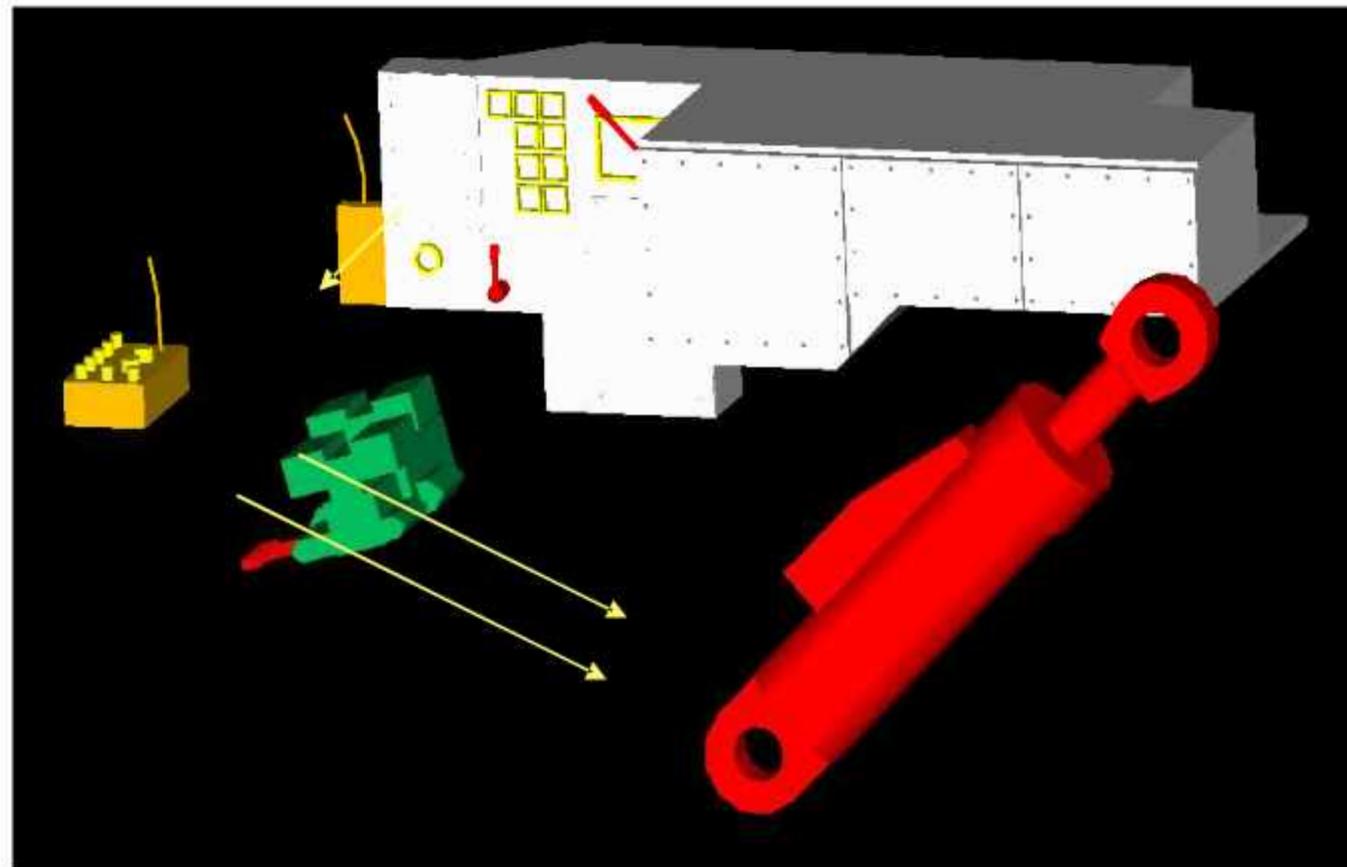
Data transfer:

Compact flash card / online

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CAN-Bus



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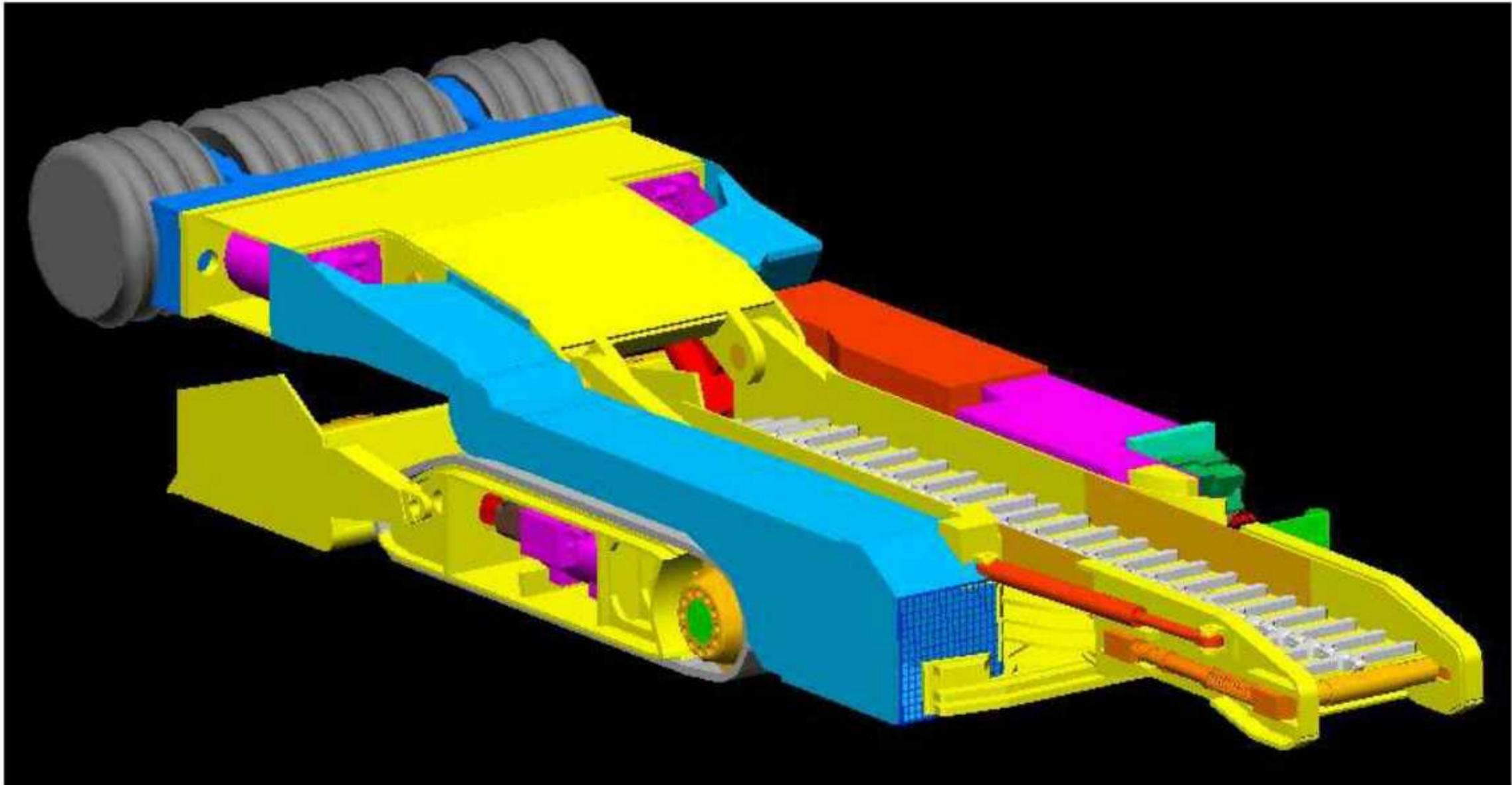
Eickhoff CM 2

Radio Transmitter



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Eickhoff CM 2



- Cutter boom
- Main frame
- Tramming system

- Conveyor
- Gathering head
- Electric-Box

- Hydraulic tank
- Operator seat
- Dust scrubber

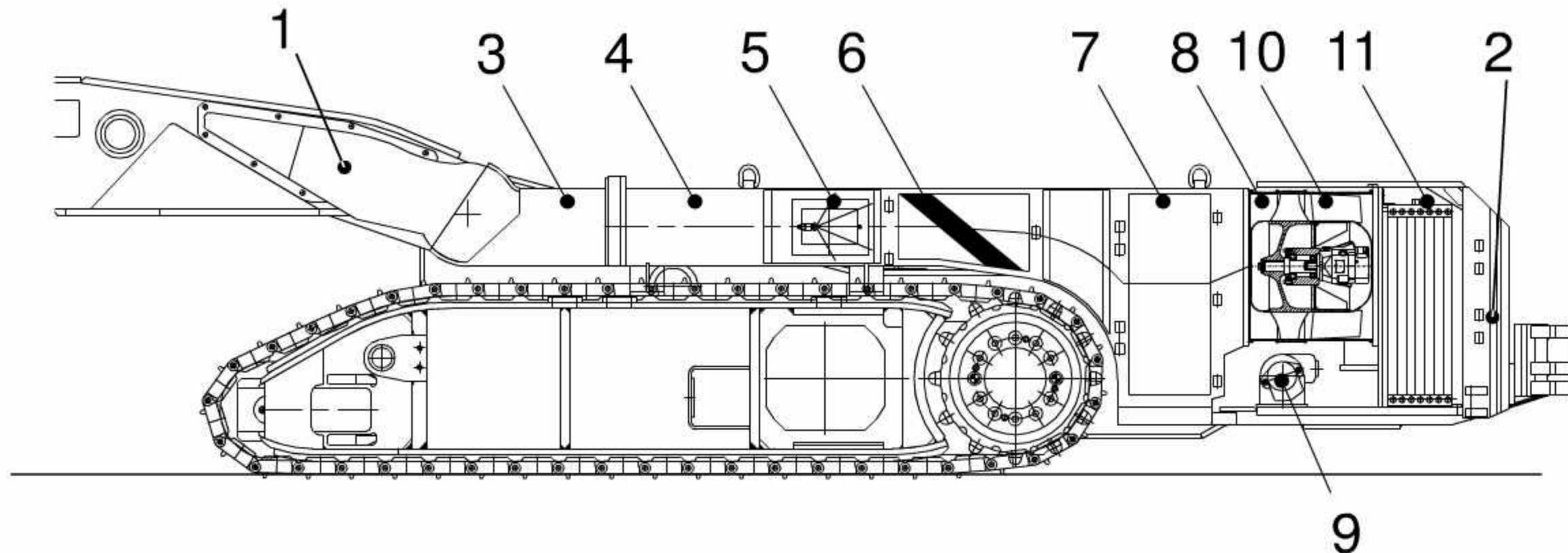
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Eickhoff CM 2

Dust scrubber, Version 1,

Power: approx. 20kW hydraulic driven

Volume: approx. 3 m³/s



1) duct

4) duct

7) demister

10) fan exhaust

2) outlet

5) sprays

8) fan

11) oil-air-cooler

3) hinge

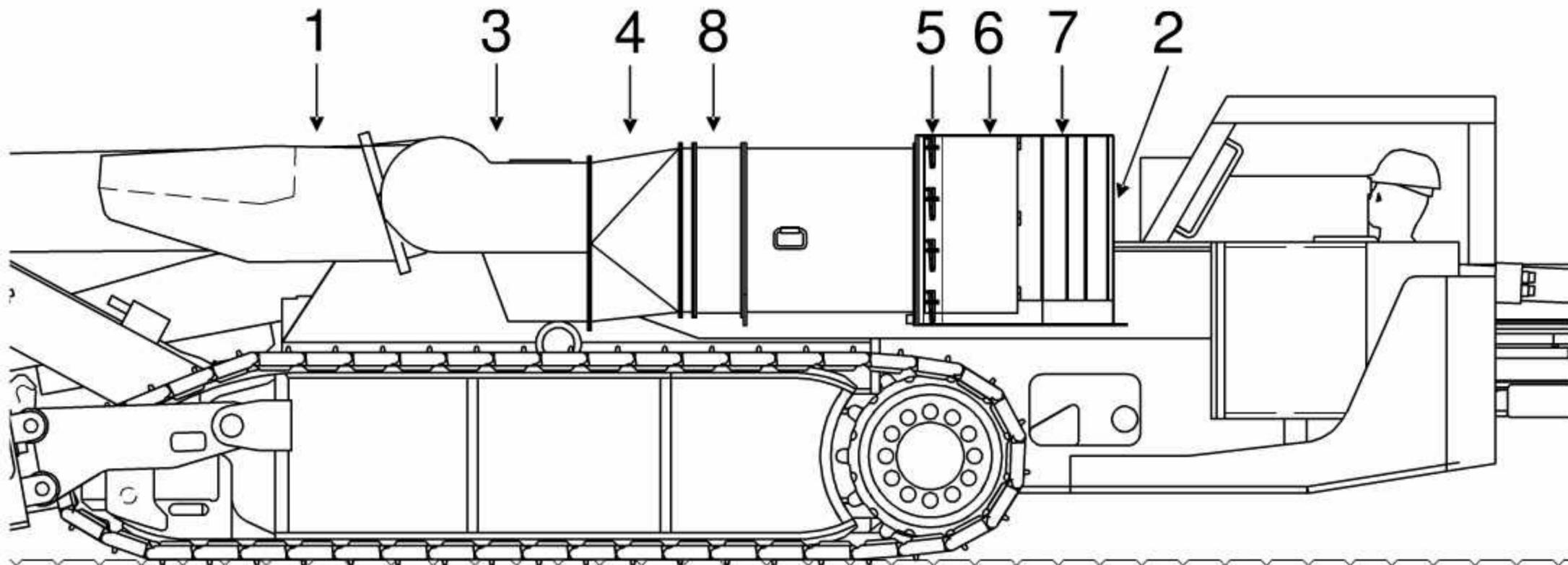
6) scrubber mesh

9) mud pump

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Eickhoff CM 2

Dust scrubber, Version 2,
Power: 37kW (Electric driven)
Volume: approx. 7,5 m³/s



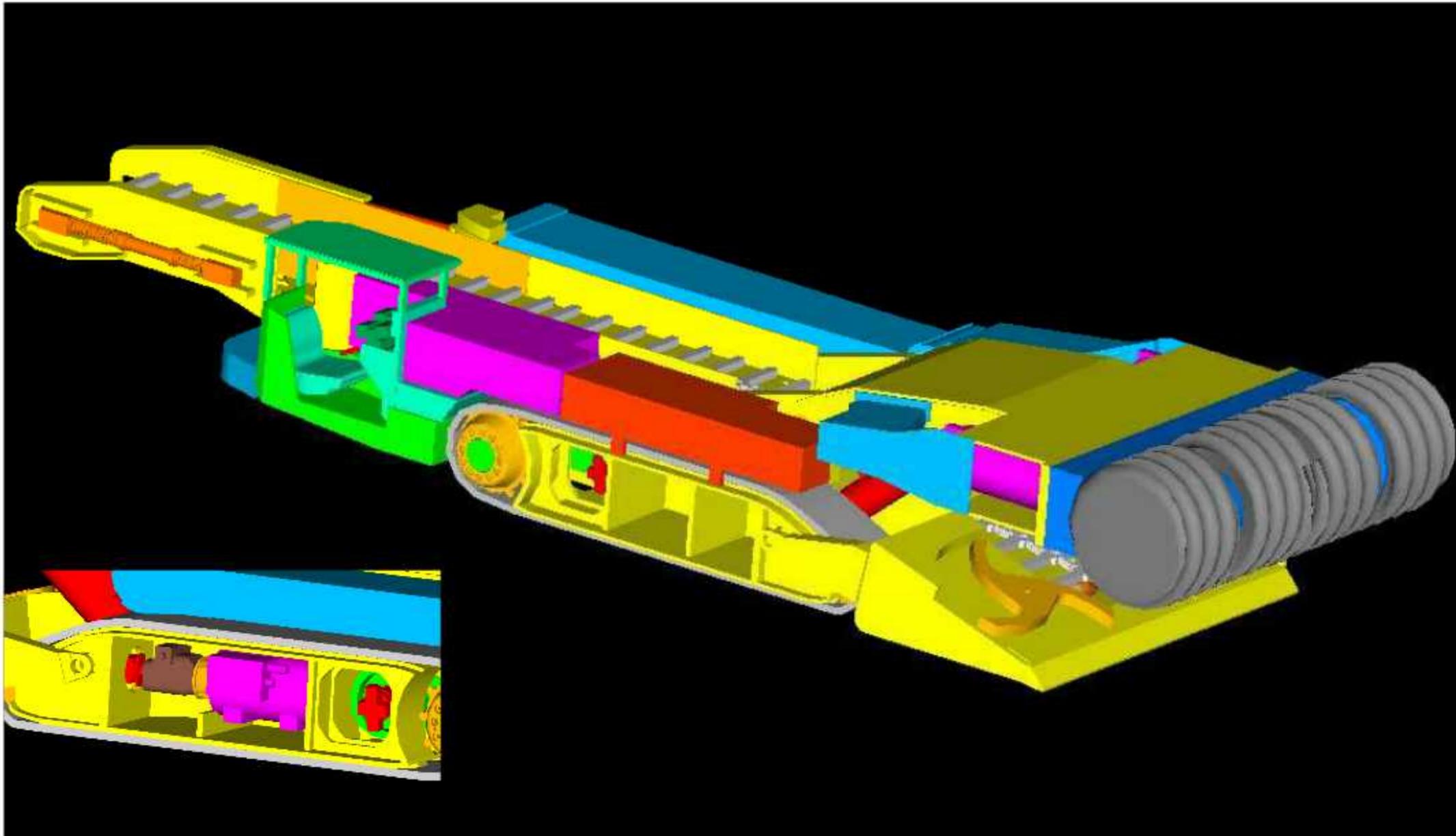
1) duct
4) duct
7) demister

2) outlet
5) sprays
8) fan

3) hinge
6) scrubber mesh

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Eickhoff CM 2H

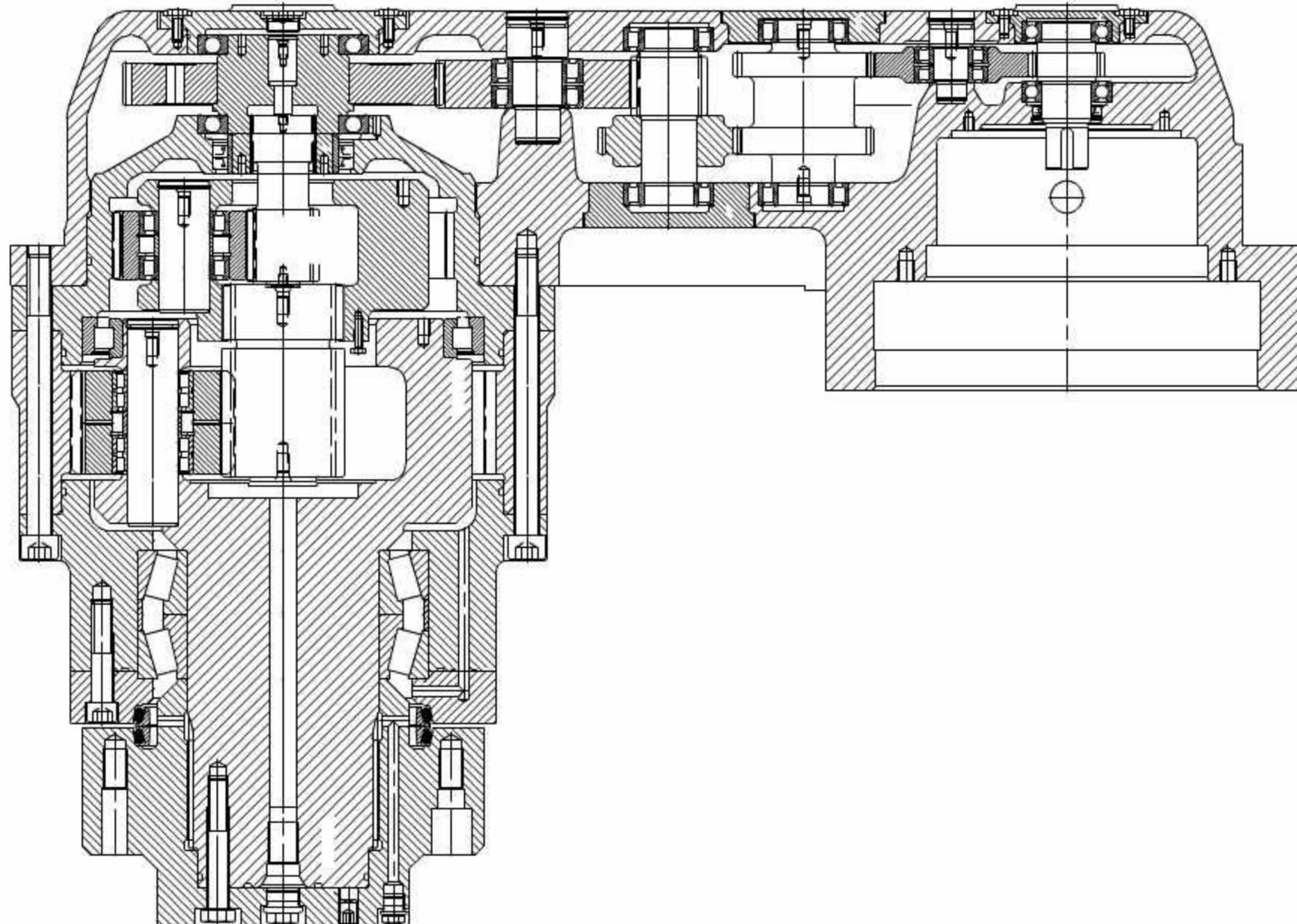


- Hydraulic tramming system

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Eickhoff CM 2

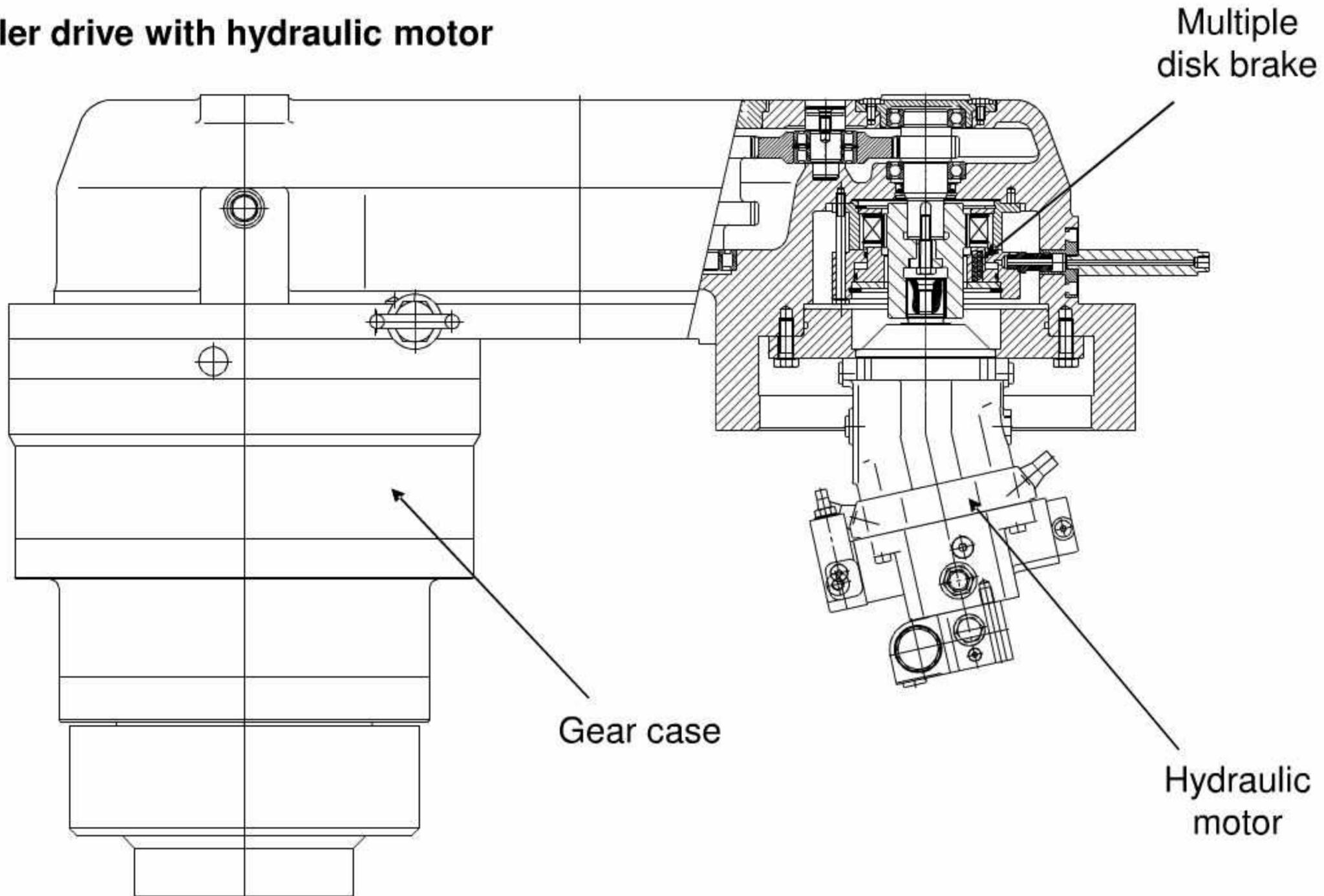
Crawler gear case



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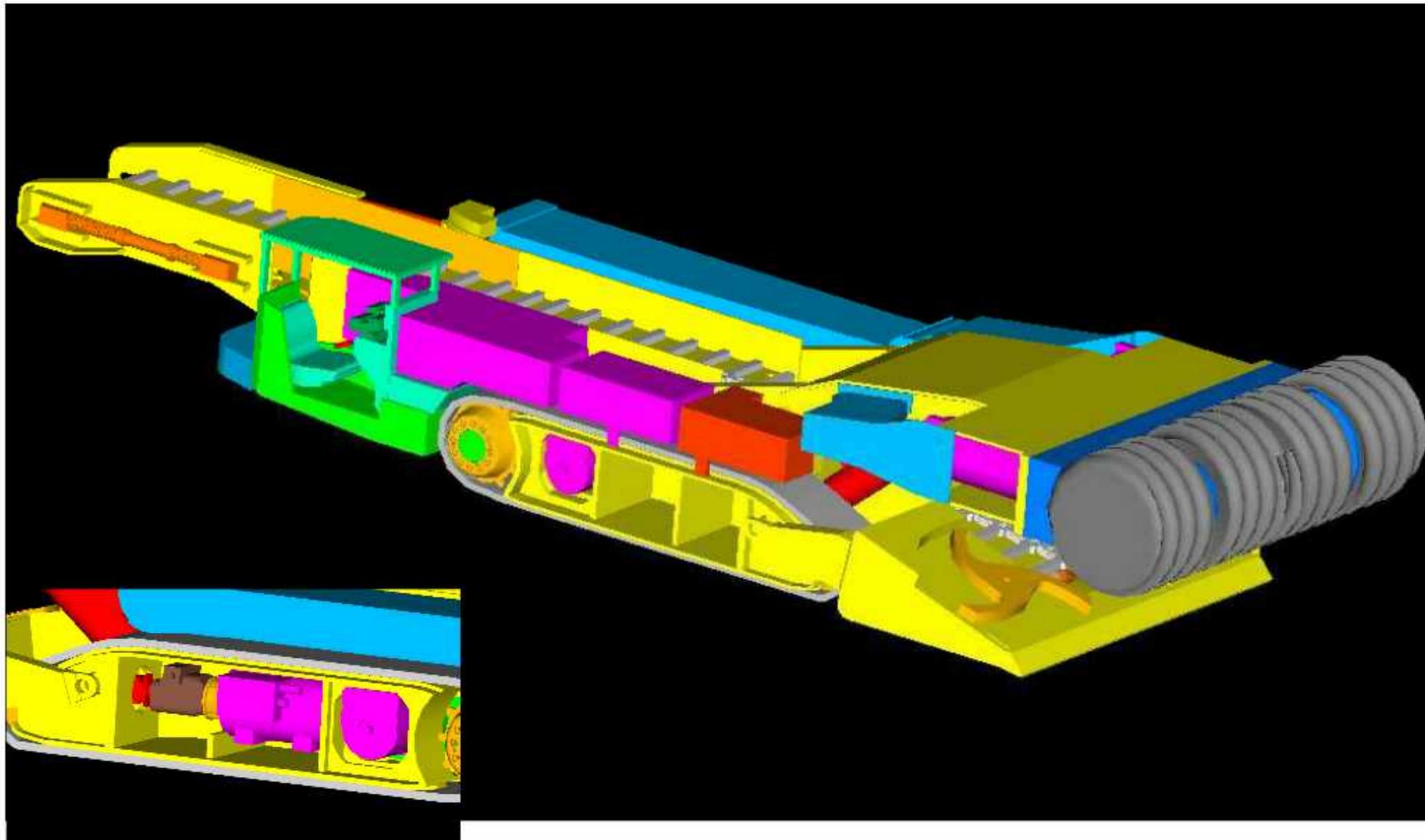
Eickhoff CM 2H

Crawler drive with hydraulic motor



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Eickhoff CM 2E



- Electric tramming system

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Eickhoff CM 2

Features	Customer Benefits
<ul style="list-style-type: none">• Electrical	
<ul style="list-style-type: none">- Only one electric-box, in safe position on the machine	<ul style="list-style-type: none">- Reduced cables and plugs; best protection against moisture; ease for access for maintenance
<ul style="list-style-type: none">- No transformer	<ul style="list-style-type: none">- Lower costs, less space required
<ul style="list-style-type: none">- Separate computers for control and monitoring	<ul style="list-style-type: none">- Higher availability, easier trouble shooting
<ul style="list-style-type: none">- BUS-technology	<ul style="list-style-type: none">- Less contacts and wiring
<ul style="list-style-type: none">- Remote Control	<ul style="list-style-type: none">- Deeper entry into unsupported roof
<ul style="list-style-type: none">- AC-motors with inverters for traction drive (optional)	<ul style="list-style-type: none">- Smaller and more robust then DC-motors, longer lifetime

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Eickhoff CM 2

Features	Customer Benefits
<ul style="list-style-type: none">• Mechanical	
<ul style="list-style-type: none">- High performance gear boxes built to Eickhoff-quality standards	<ul style="list-style-type: none">- Longer lifetime, especially in harder materials
<ul style="list-style-type: none">- Increased machine mass compared to machine height	<ul style="list-style-type: none">- Higher stability
<ul style="list-style-type: none">- Integrated dust scrubber	<ul style="list-style-type: none">- Effective dust collection at dust generation source; supports mine ventilation; protected against damage; reduced noise level
<ul style="list-style-type: none">- Onboard booster pump	<ul style="list-style-type: none">- Optimized stable spray pressure, independent from water supply pressure; low maintenance and low running costs
<ul style="list-style-type: none">- Trammig brake (optional)	<ul style="list-style-type: none">- Higher safety, fail safe

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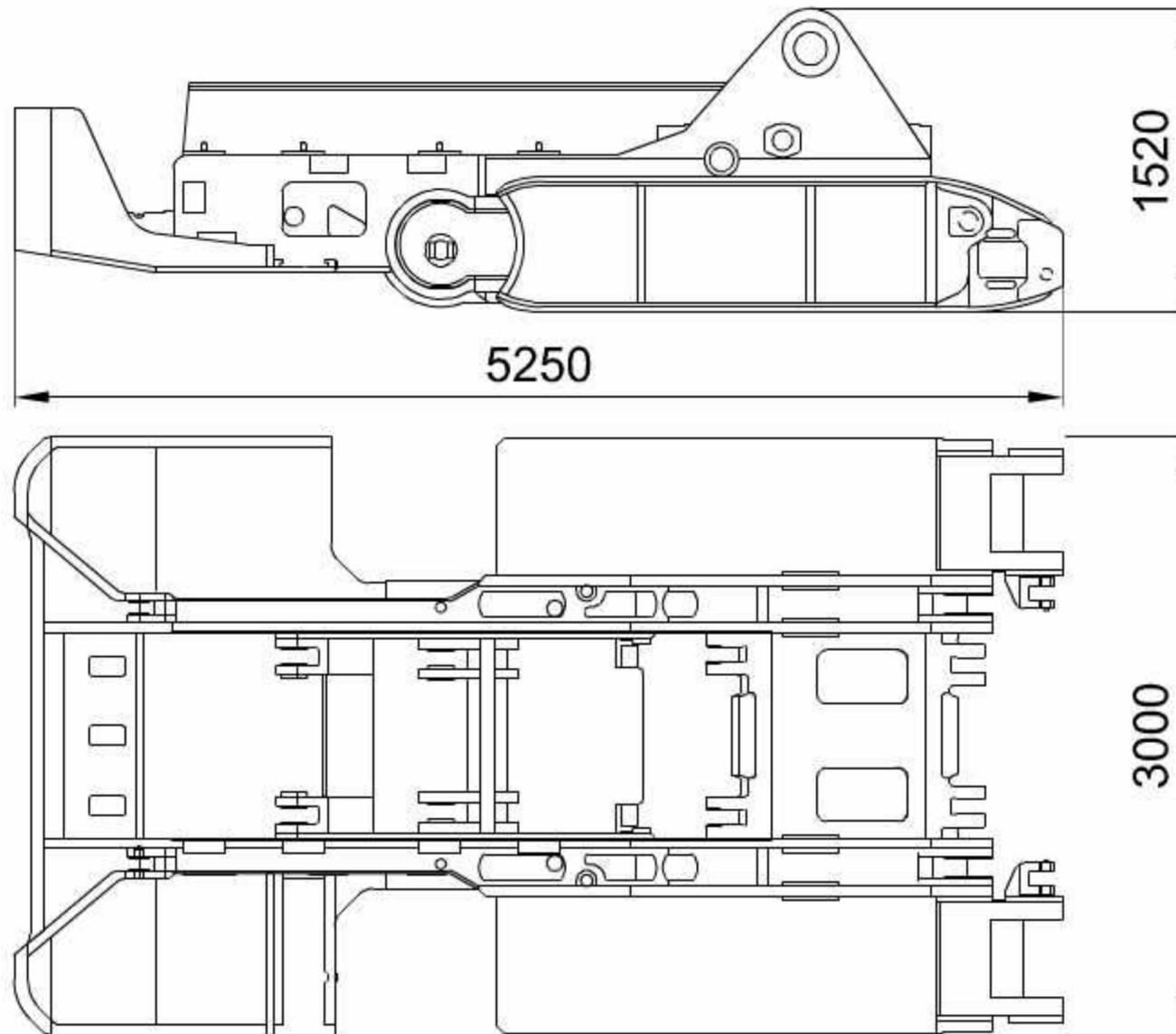
Eickhoff CM 2

Features	Customer Benefits
<ul style="list-style-type: none">• Hydraulic	
<ul style="list-style-type: none">- Proportional sump and shear down	<ul style="list-style-type: none">- Optimum utilization of installed power; avoidance of inadmissible overloads; reduced operator errors; reduction in fines
<ul style="list-style-type: none">- Optimised cooling system for hydraulic and inverter (optional)	<ul style="list-style-type: none">- Lower oil temperature; longer travelling distances up to 1200 m can be covered without additional external cooling; 50% reduced oil capacity
<ul style="list-style-type: none">- Hydraulic tramming	<ul style="list-style-type: none">- Less susceptible to wet conditions; lower cost per tonne traction system
<ul style="list-style-type: none">- Adjustable fan motor	<ul style="list-style-type: none">- Optimised fan speed and higher flexibility; noise reduction

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Eickhoff CM 2

Main components



Main frame:

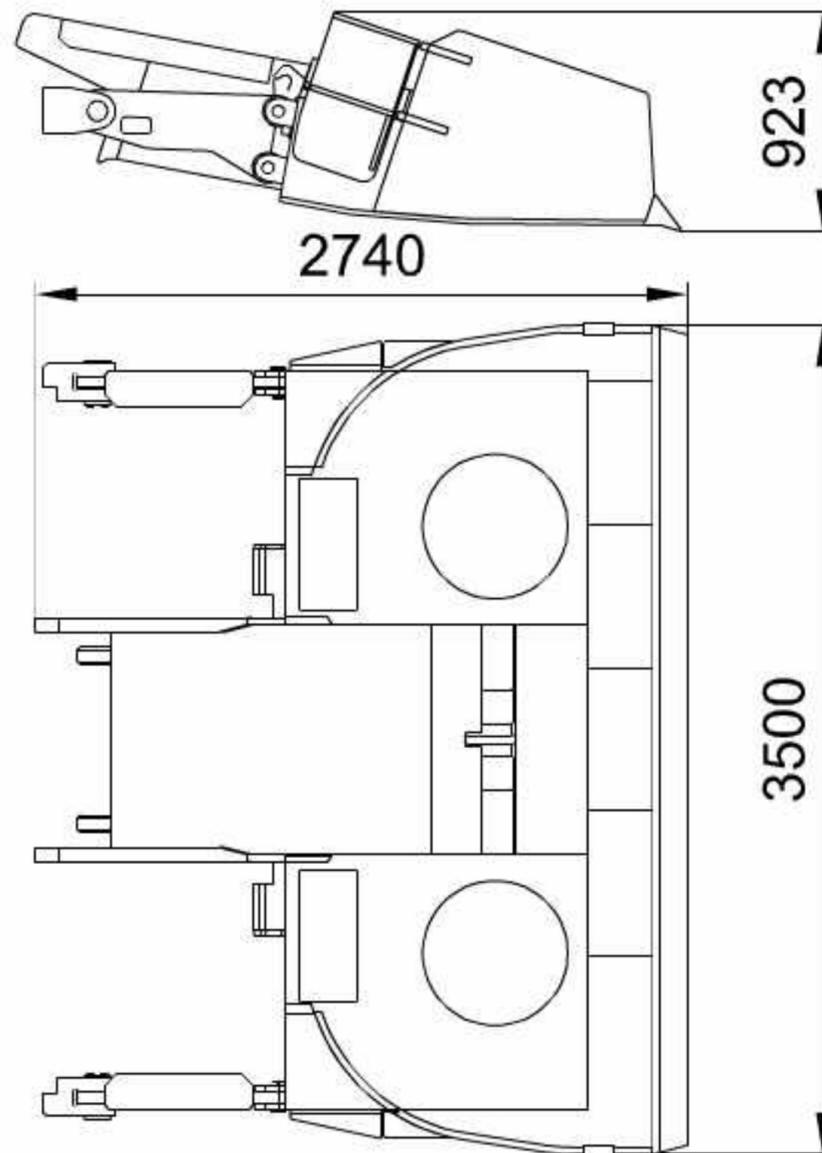
Weight: approx. 13500 kg

Material: Steel,
S355J2G3,
Hardox 400,
GS18NiMoCr36

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Eickhoff CM 2

Main components



Gathering head:

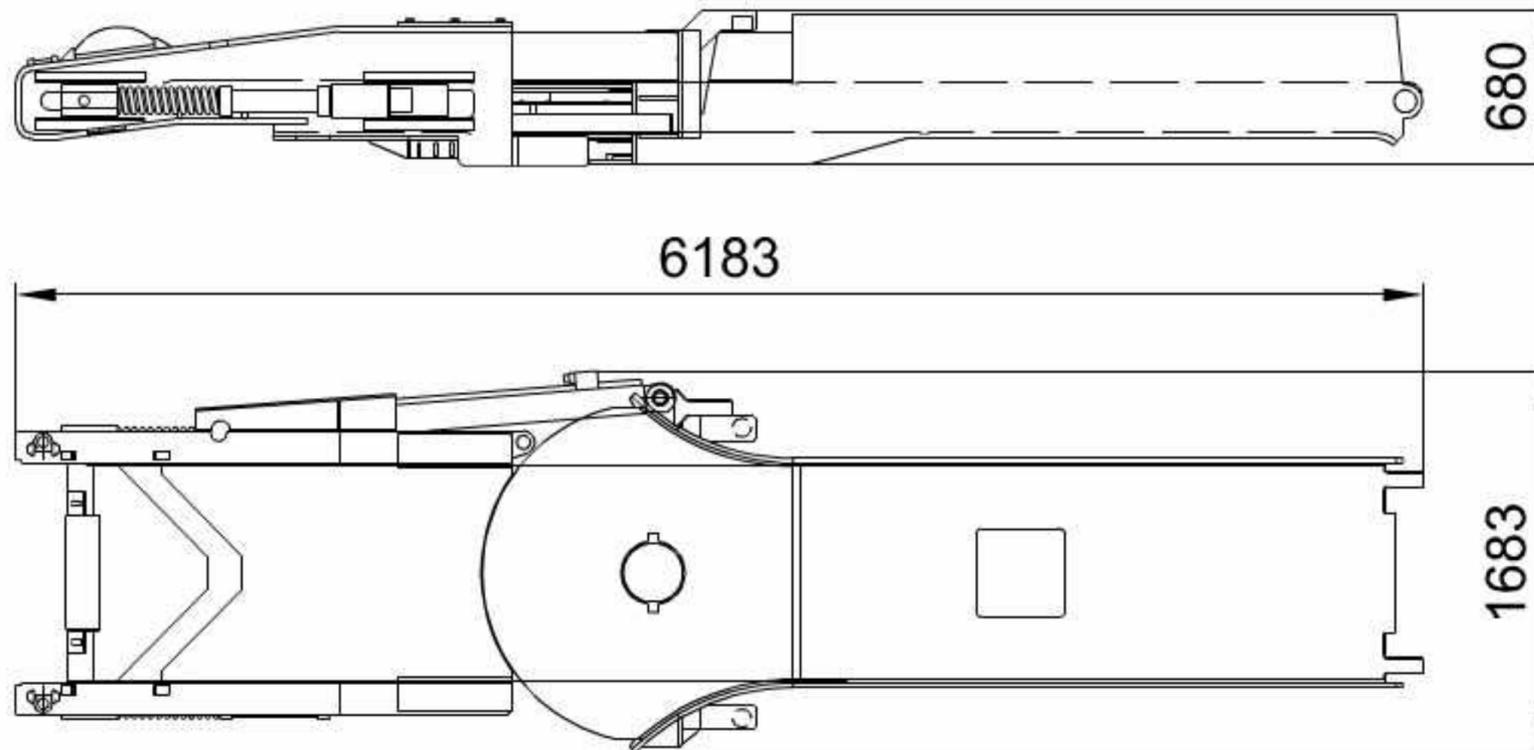
Weight: approx.. 4100 kg

Material: Steel,
S355J2G3,
Hardox 400

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Eickhoff CM 2

Main components



Conveyor:

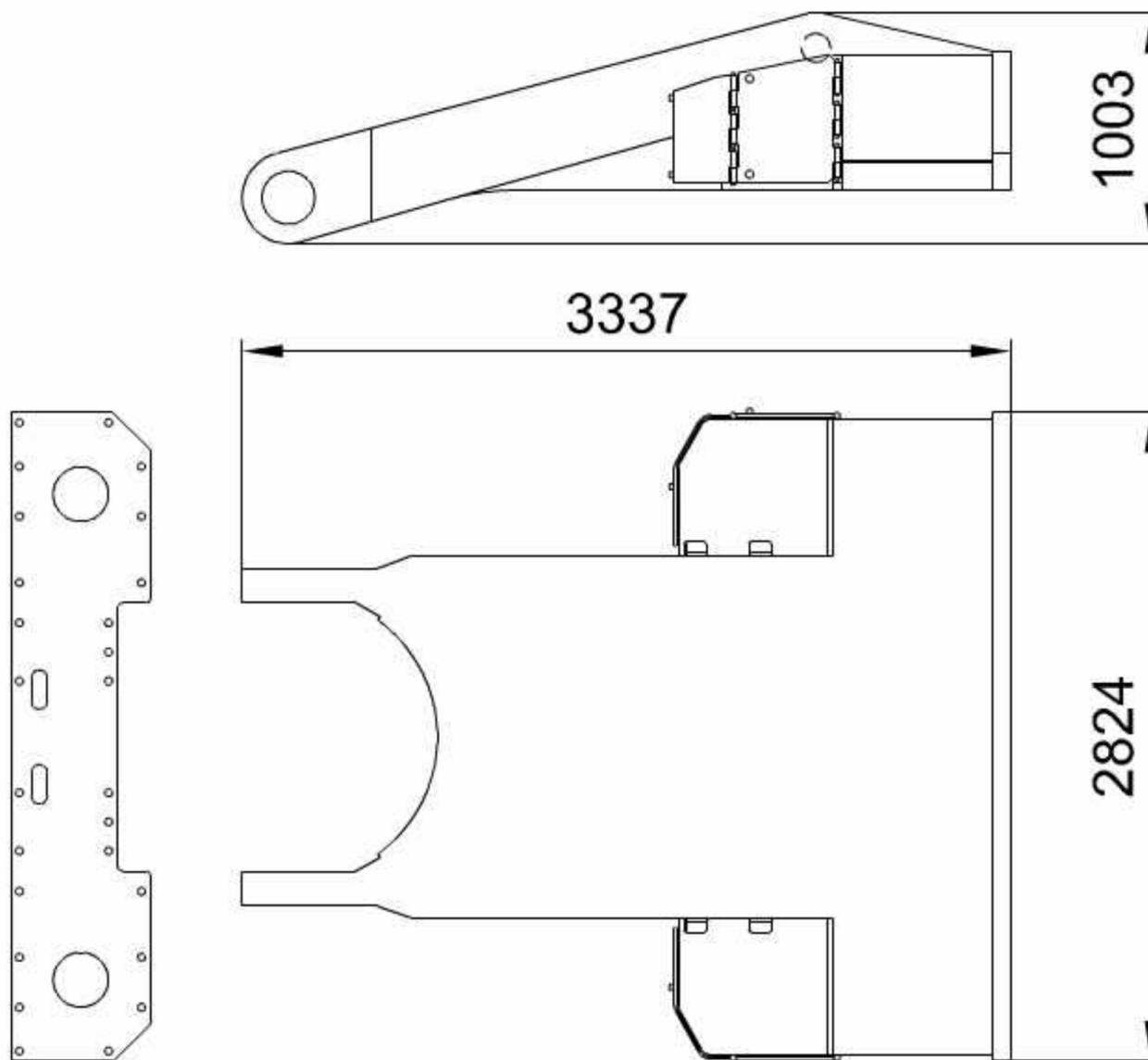
Weight: approx. 5800 kg

material: Steel,
S355J2G3,
Hardox 400,
Spring steel

CM representation CME ec 2

Eickhoff CM 2

Main components



Boom :

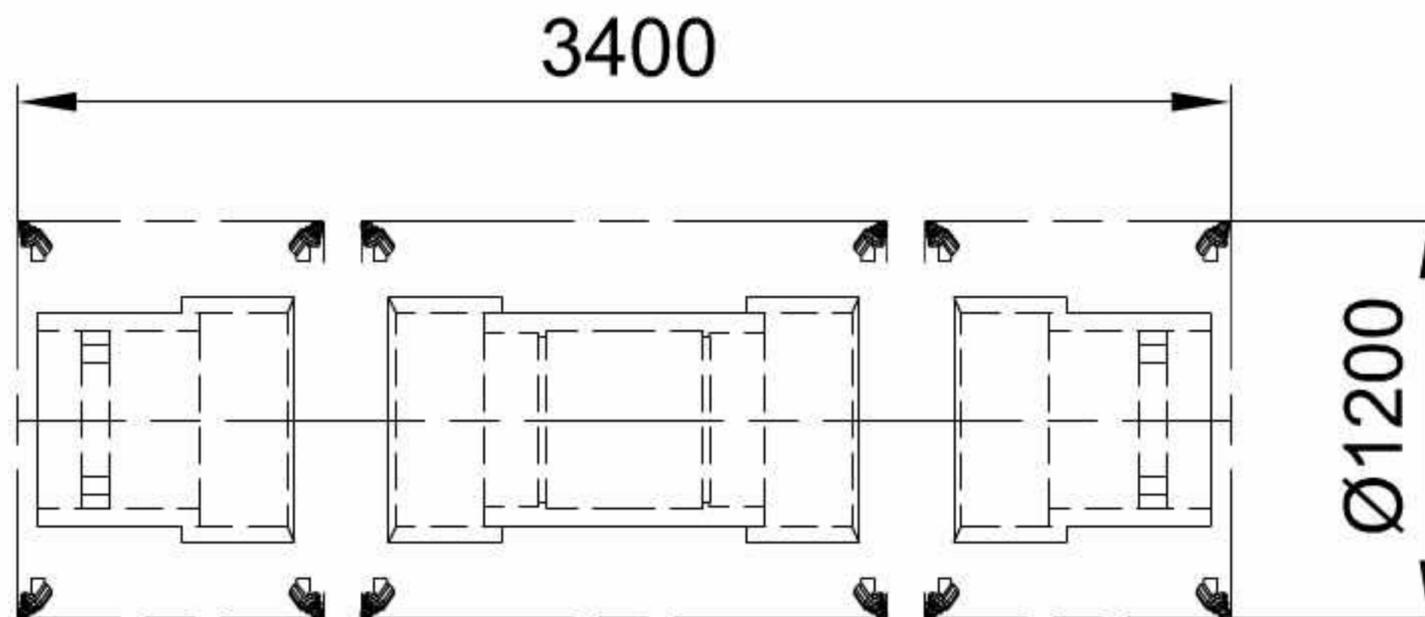
Weight: approx. 5100 kg

Material: Steel,
S355J2G3

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Eickhoff CM 2

Main components



Cutter drums:

Weight: approx. 6000 kg

Material: Steel

Toolbox

Amount: 60 Pieces

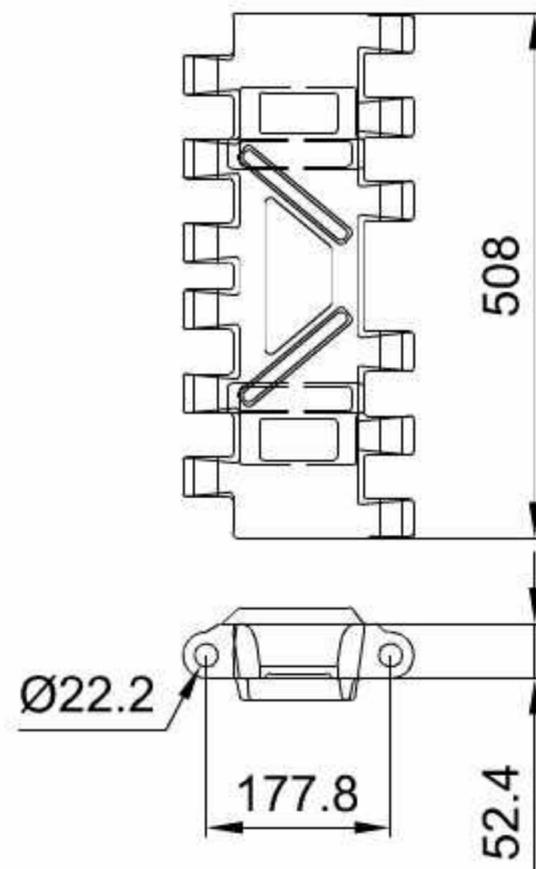
Type: Kennametal KB 175

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Eickhoff CM 2

Main components

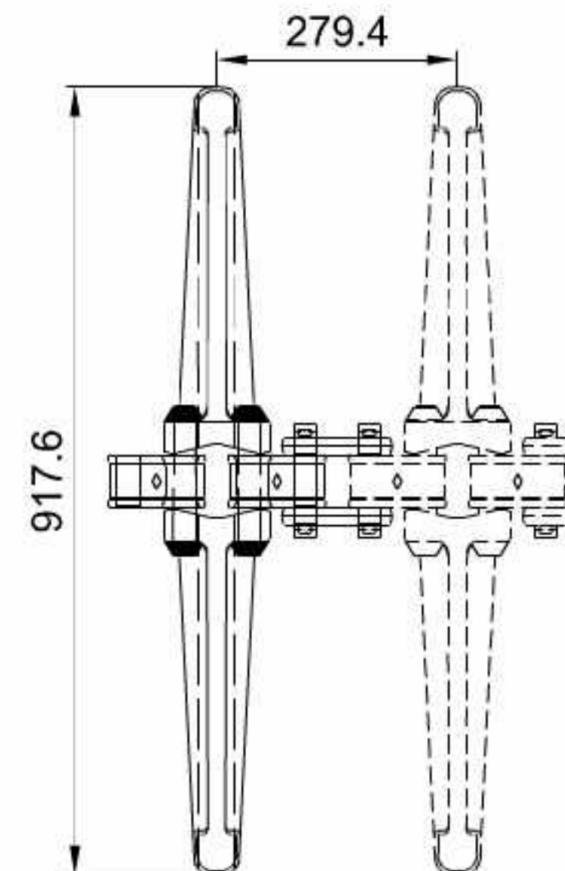
Crawler chain:



Weight: [kg] 31,5

Material: forged

Conveyor chain:



Weight: [kg] 22,-

Material: forged

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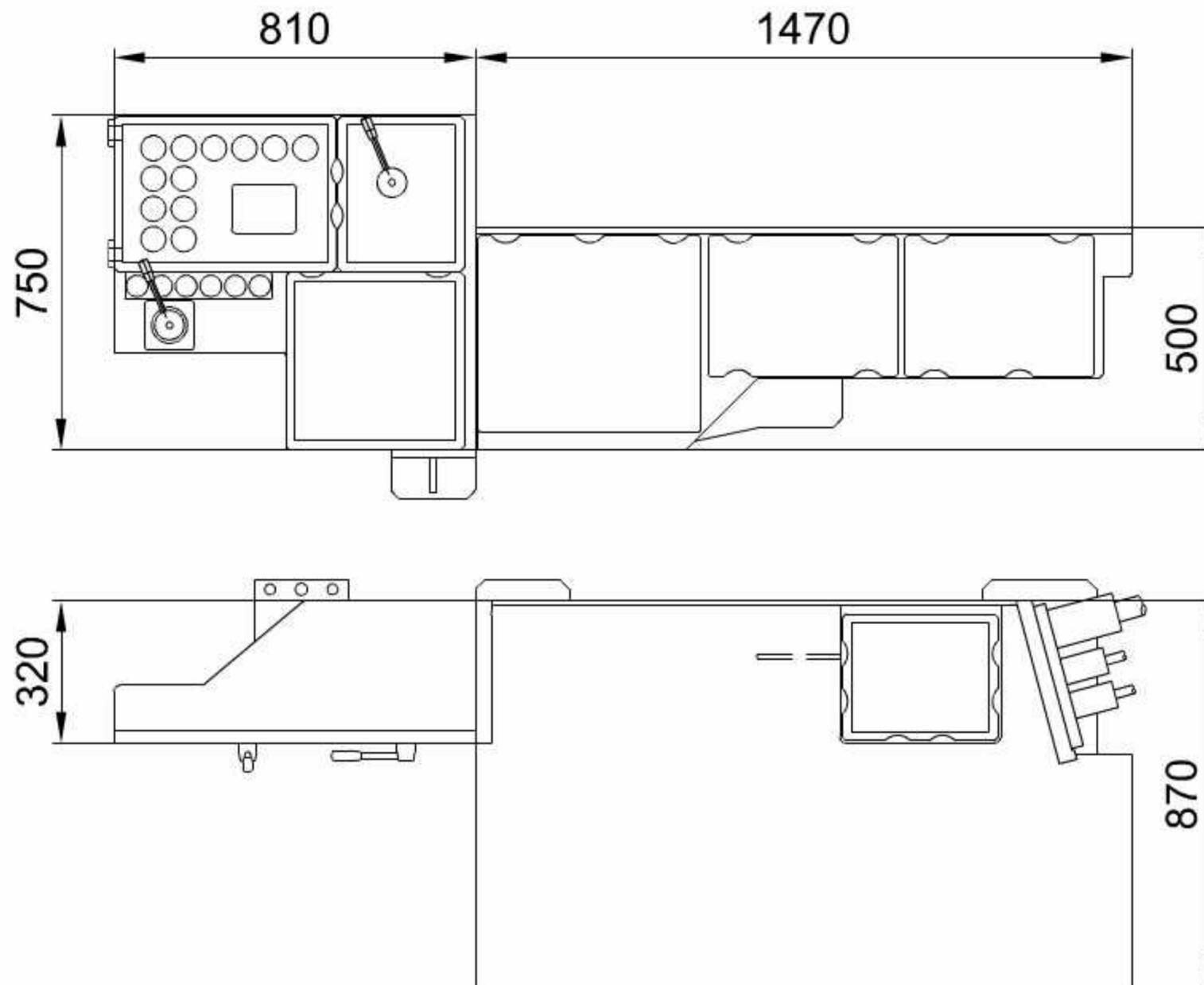
Eickhoff CM 2

Main components

Energy distribution:

Weight: approx. 1100 kg

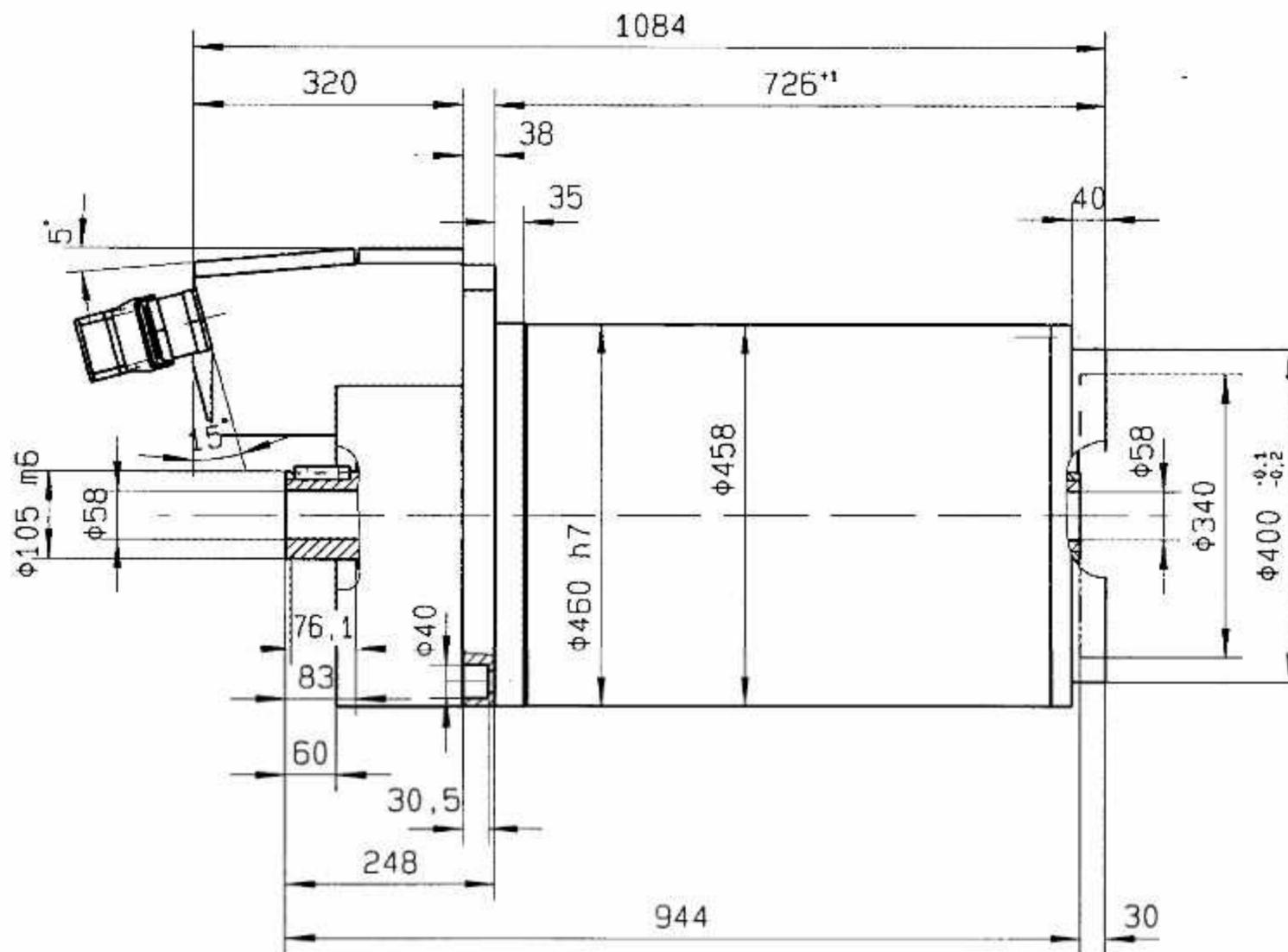
Voltage: 1000 V



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Eickhoff CM 2

Main components



Electric motor

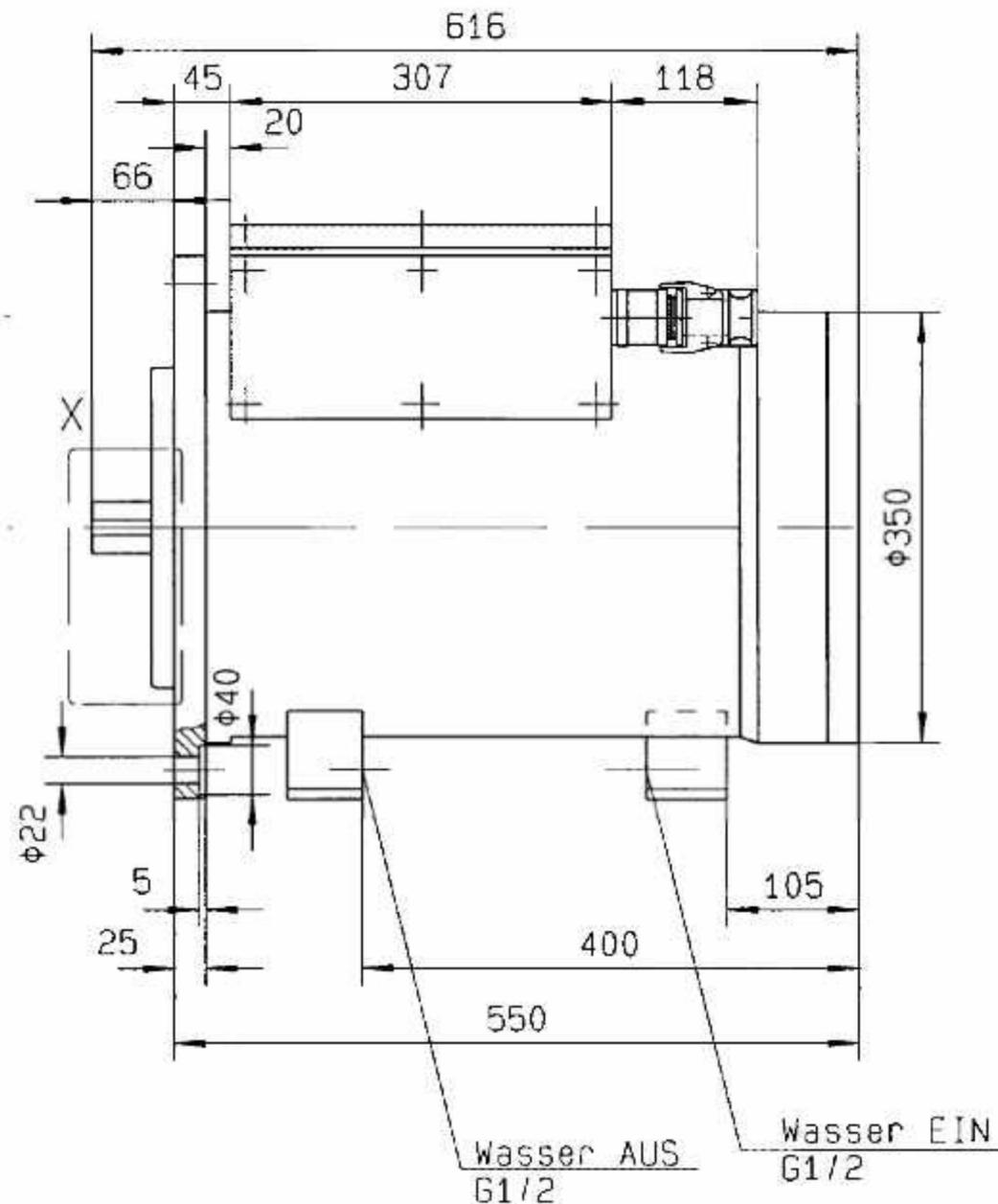
Cutter drive:

Weight:	[kg]	950
Power:	[kW]	180
Voltage:	[V]	1000
Speed:	[Rpm]	1480

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Eickhoff CM 2

Main components



Electric motor

Loading and conveyor drive:

Weight:	[kg]	320
Power:	[kW]	45
Voltage:	[V]	1000
Speed:	[Rpm]	1465

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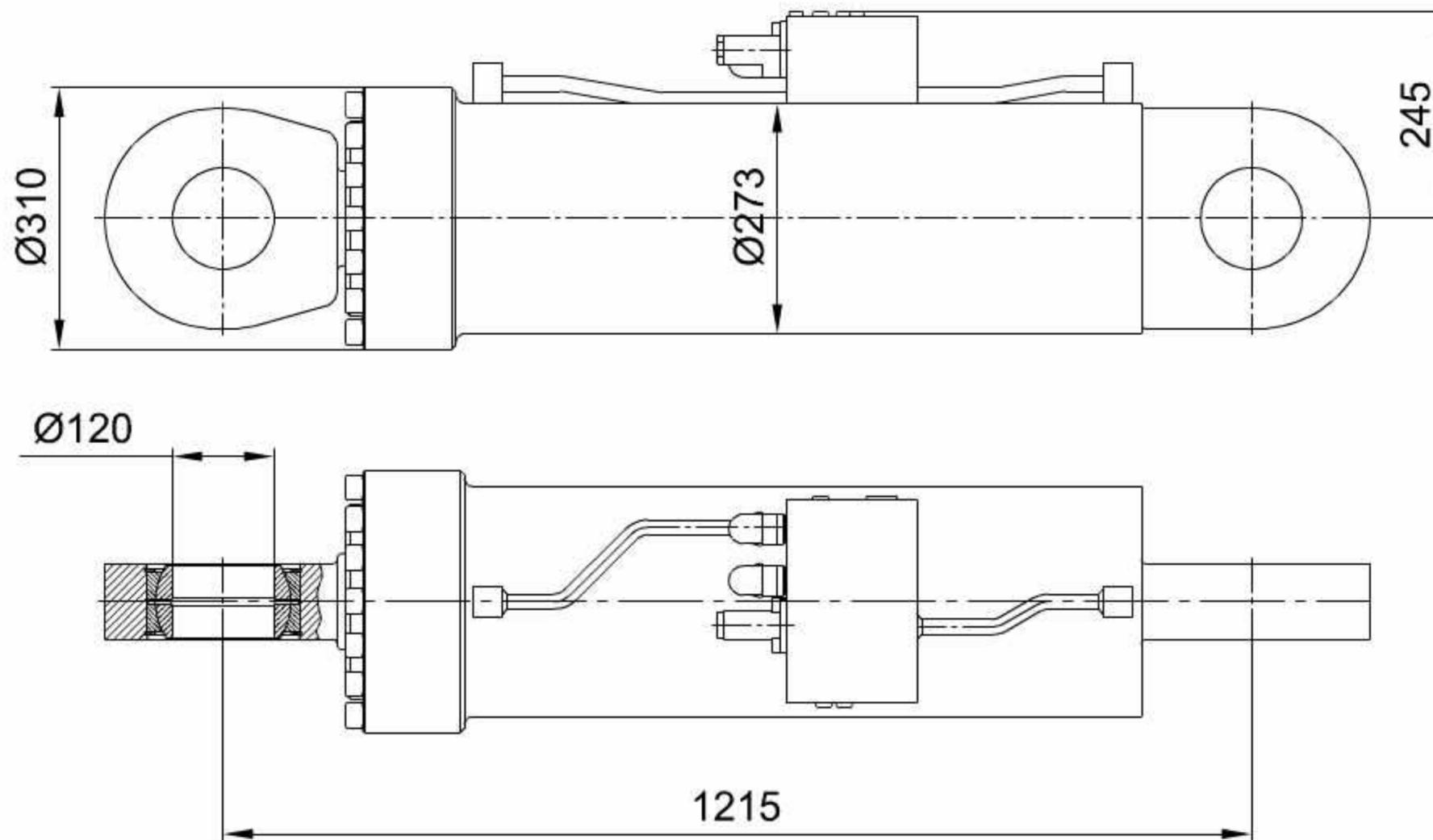
Eickhoff CM 2

Main components

Hydraulic cylinder

Cutter boom raise (3,8m):

Piston diameter:	220 mm
Piston rod diameter:	115 mm
Stroke:	535 mm
Test pressure:	375 bar



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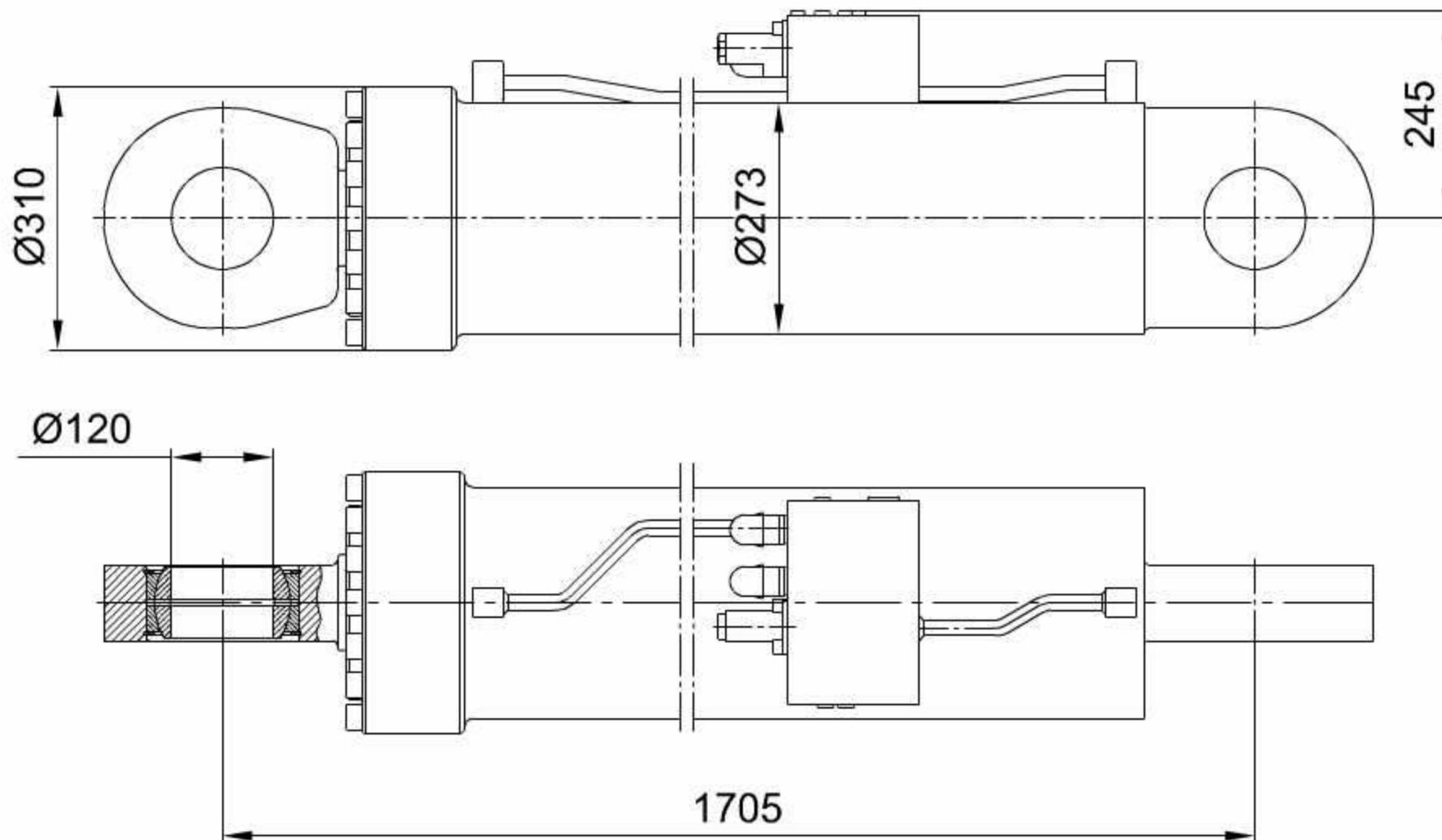
Eickhoff CM 2

Main components

Hydraulic cylinder

Cutter boom raise (4,6m):

Piston diameter:	220 mm
Piston rod diameter:	115 mm
Stroke:	1025 mm
Test pressure:	375 bar



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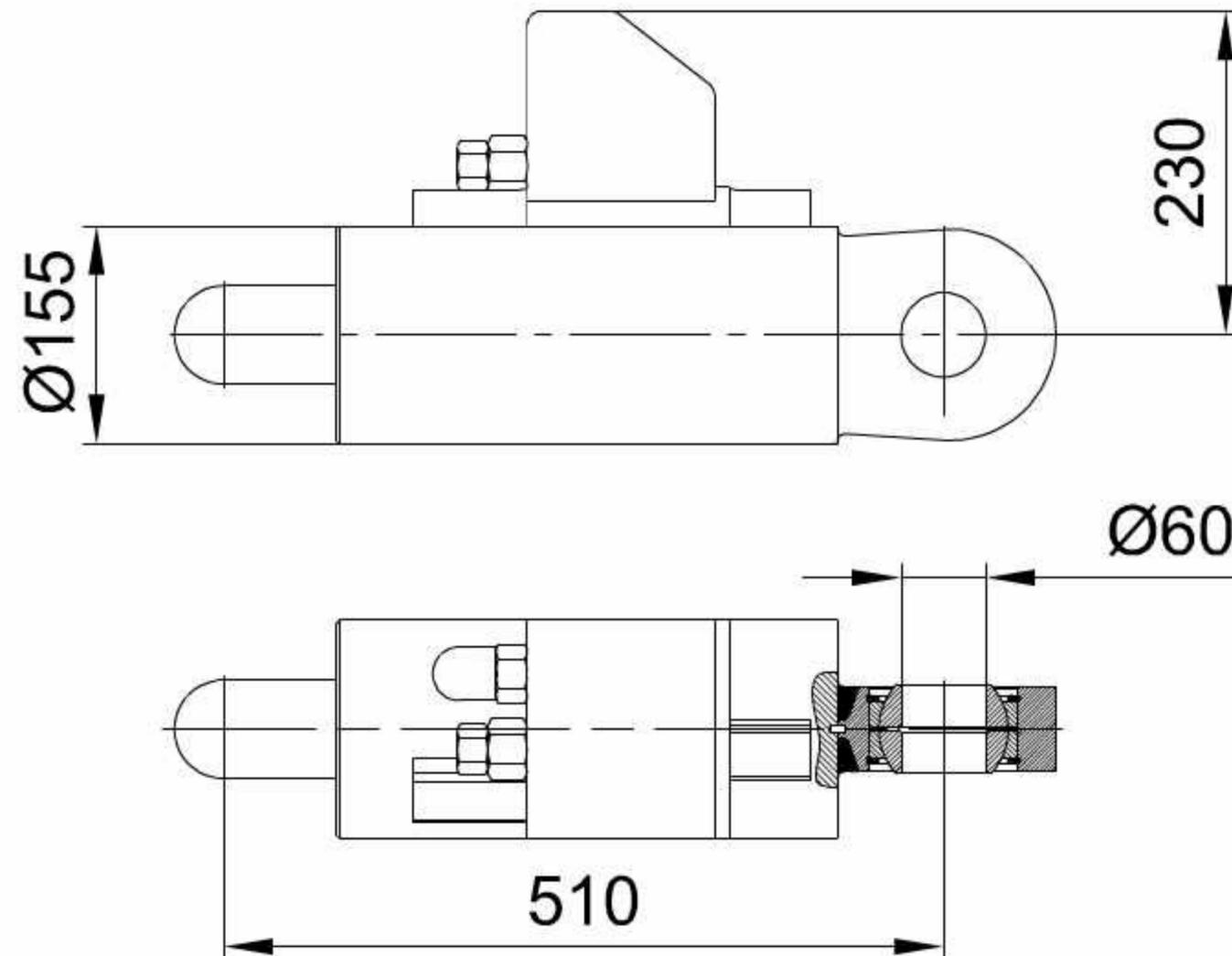
Eickhoff CM 2

Main components

Hydraulic cylinder

Gathering head raise:

Piston diameter:	125 mm
Piston rod diameter:	70 mm
Stroke:	120 mm
Test pressure:	350 bar



CM Presentation CME, Dec 2005

Eickhoff CM 2

Main components

Hydraulic cylinder

Conveyor raise:

Piston diameter:

Piston rod diameter:

Stroke:

Test pressure:

Step1

Step 2

Step 3

120 mm

90 mm

60 mm

110 mm

80 mm

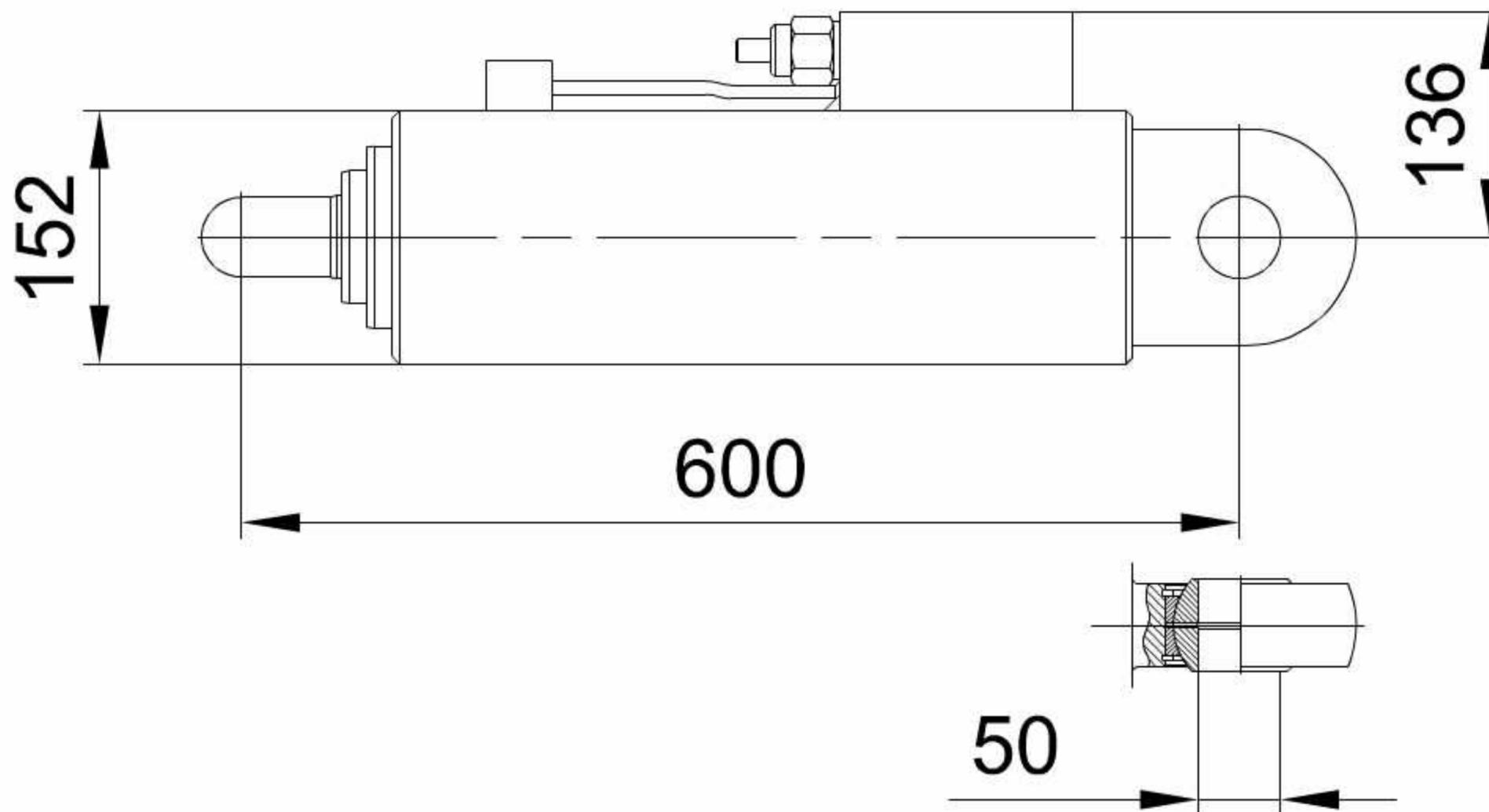
50 mm

245 mm

250 mm

260 mm

300 bar



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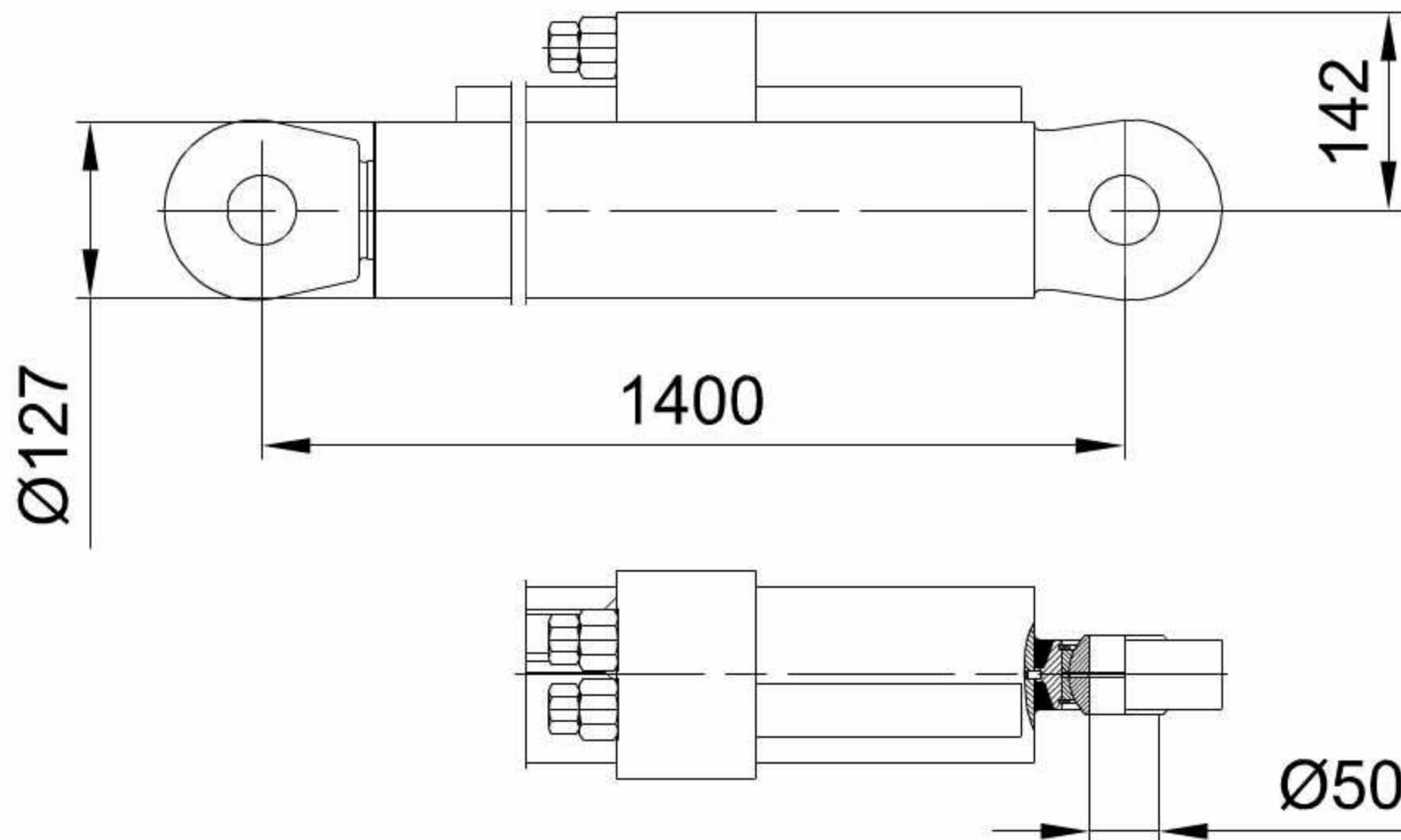
Eickhoff CM 2

Main components

Hydraulic cylinder

Conveyor swivel:

Piston diameter:	100 mm
Piston rod diameter:	70 mm
Stroke:	1050 mm
Test pressure:	350 bar



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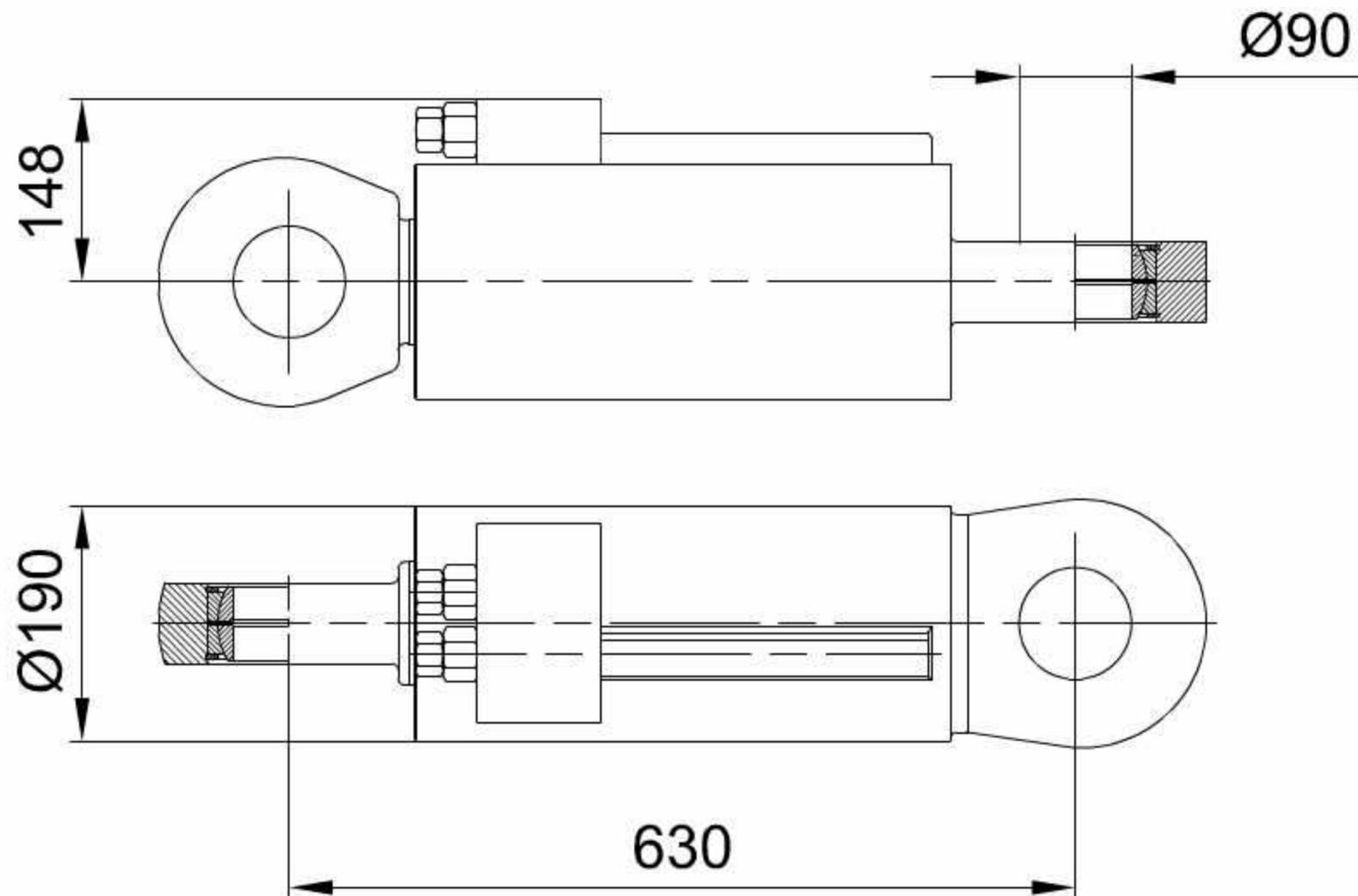
Eickhoff CM 2

Main components

Hydraulic cylinder

Rear support:

Piston diameter:	160 mm
Piston rod diameter:	100 mm
Stroke:	180 mm
Test pressure:	350 bar

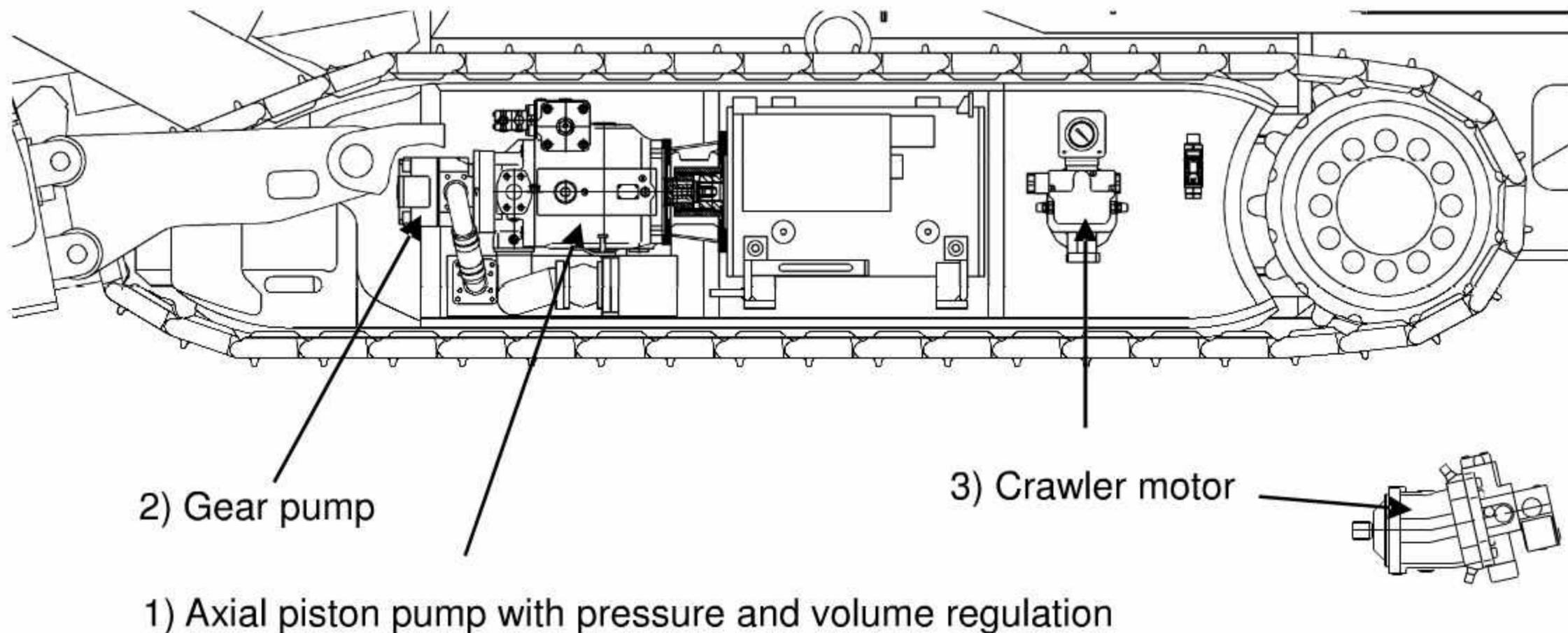


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Eickhoff CM 2

Main components

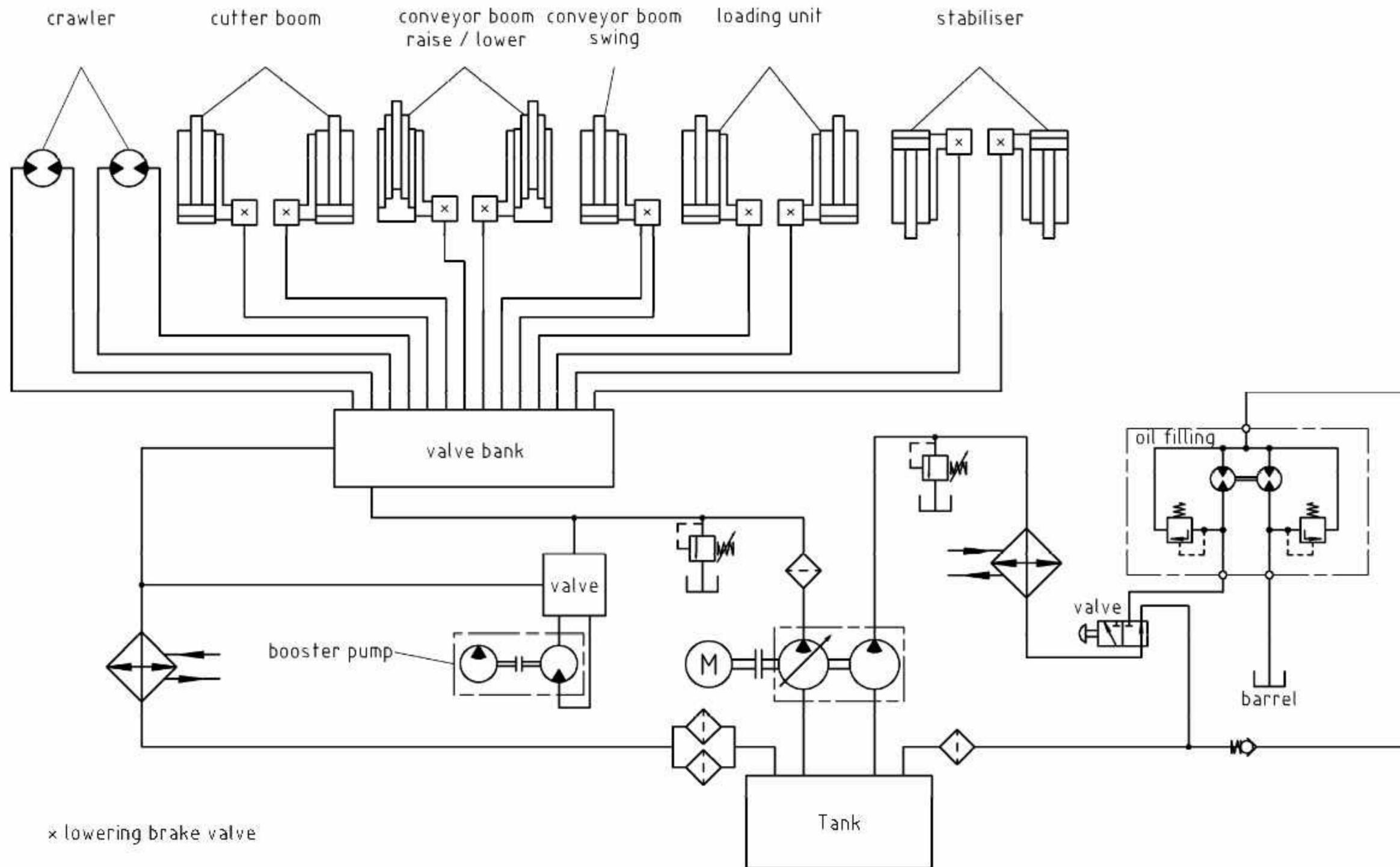
<u>Hydraulic pumps and motors:</u>	1)	2)	3)
volume: (nominal)	200 cm ³ (250 cm ³)	50 cm ³	107 cm ³ (140 cm ³)



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Eickhoff CM 2

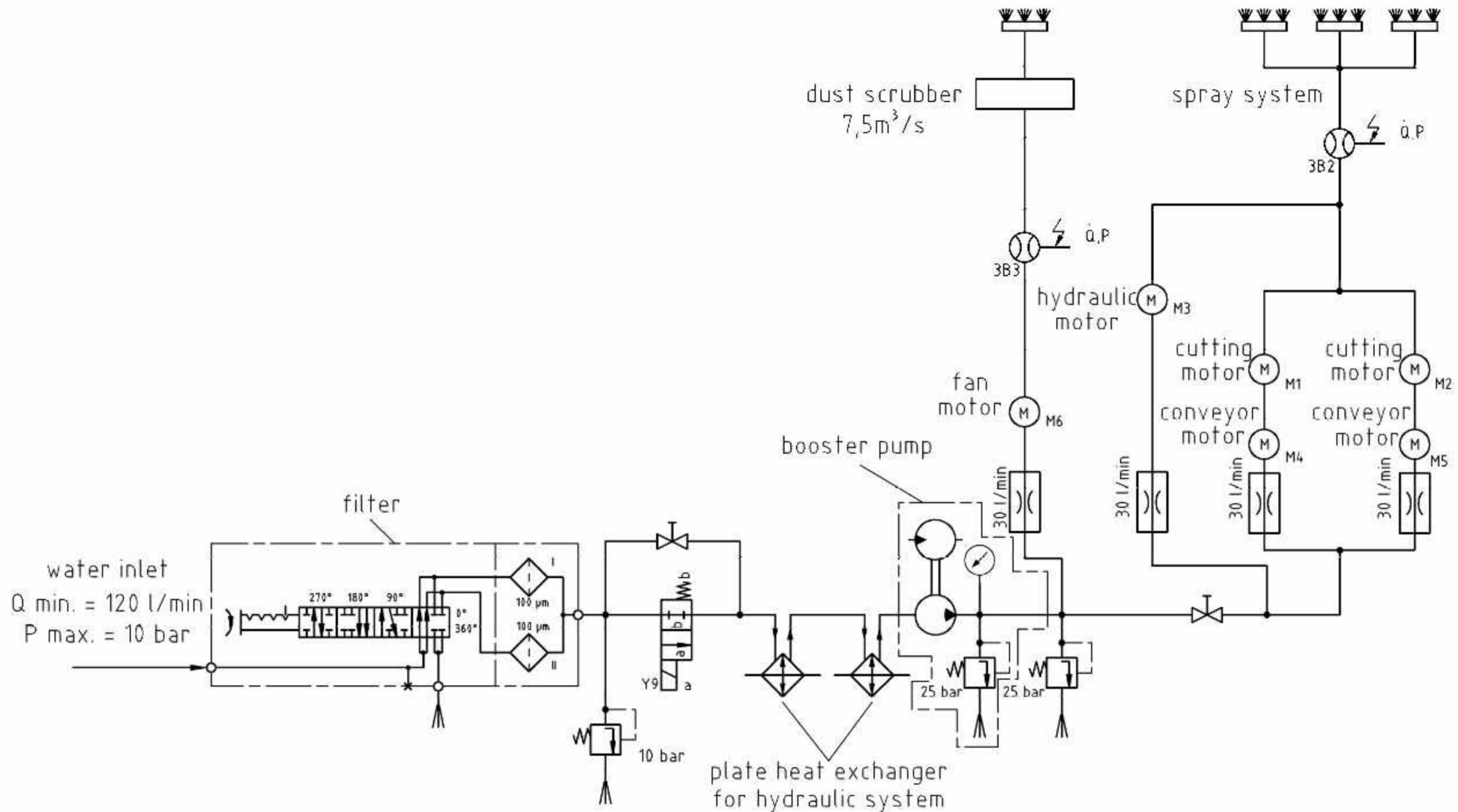
Hydraulic plan



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Eickhoff CM 2

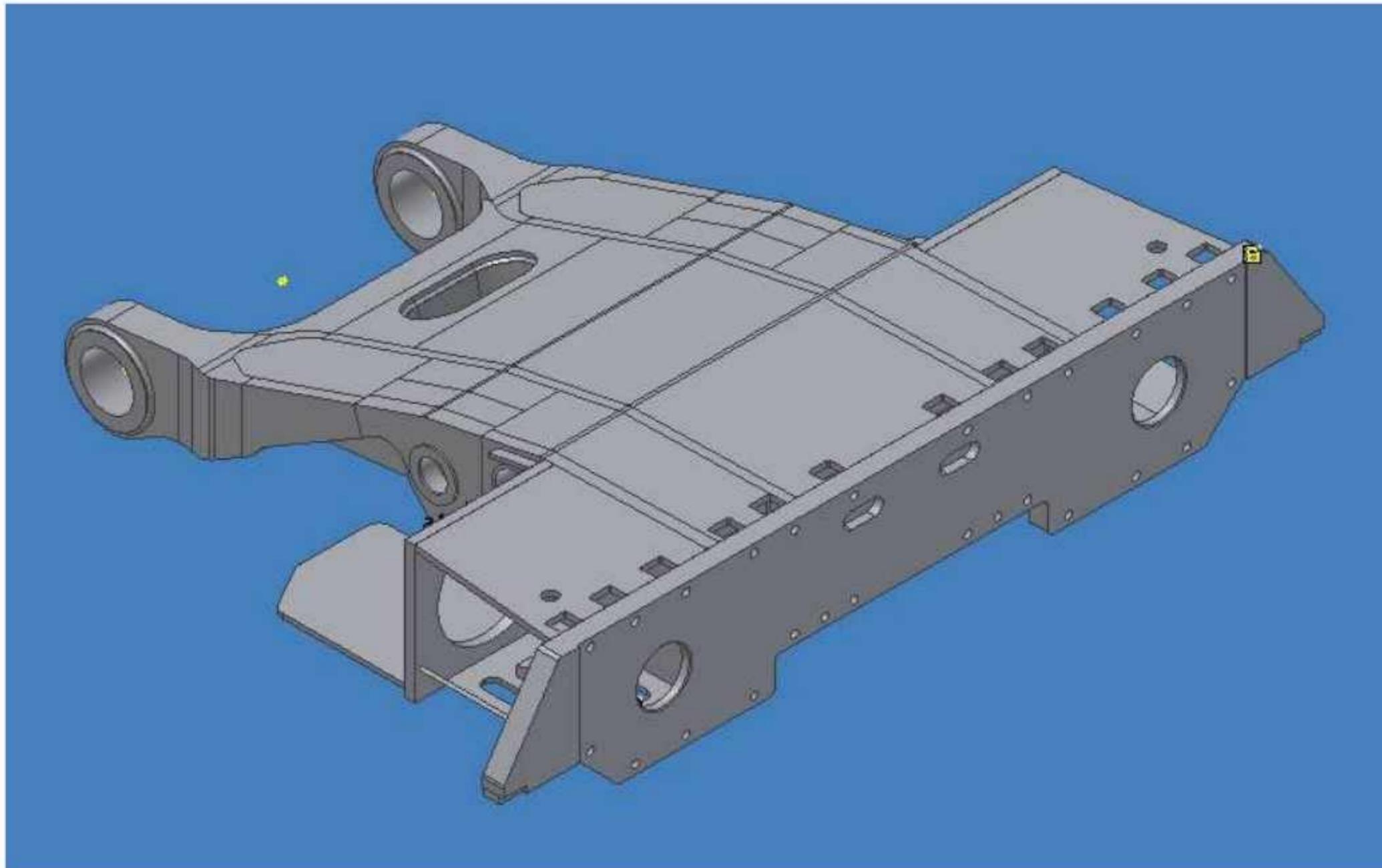
Water distribution



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Eickhoff CM 2

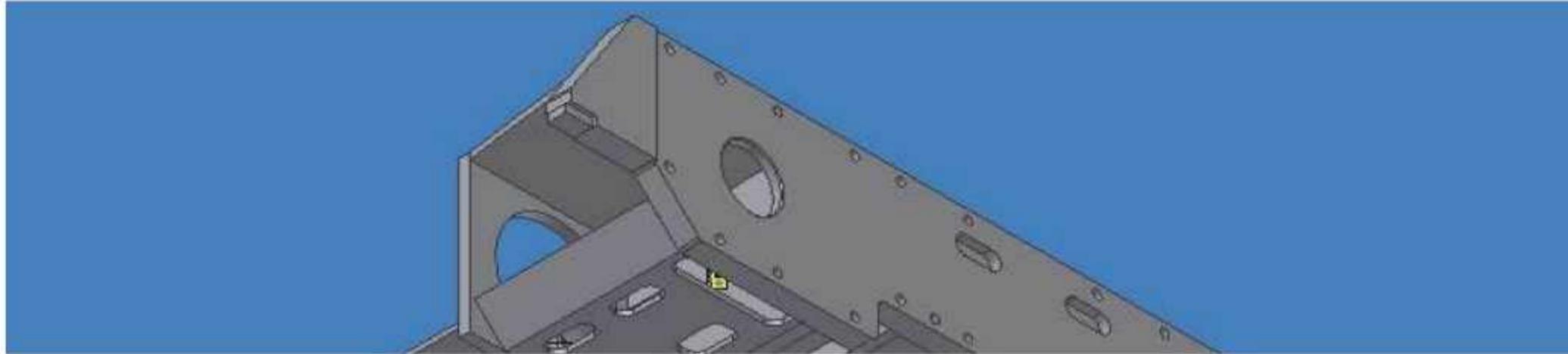
Boom



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Eickhoff CM 2

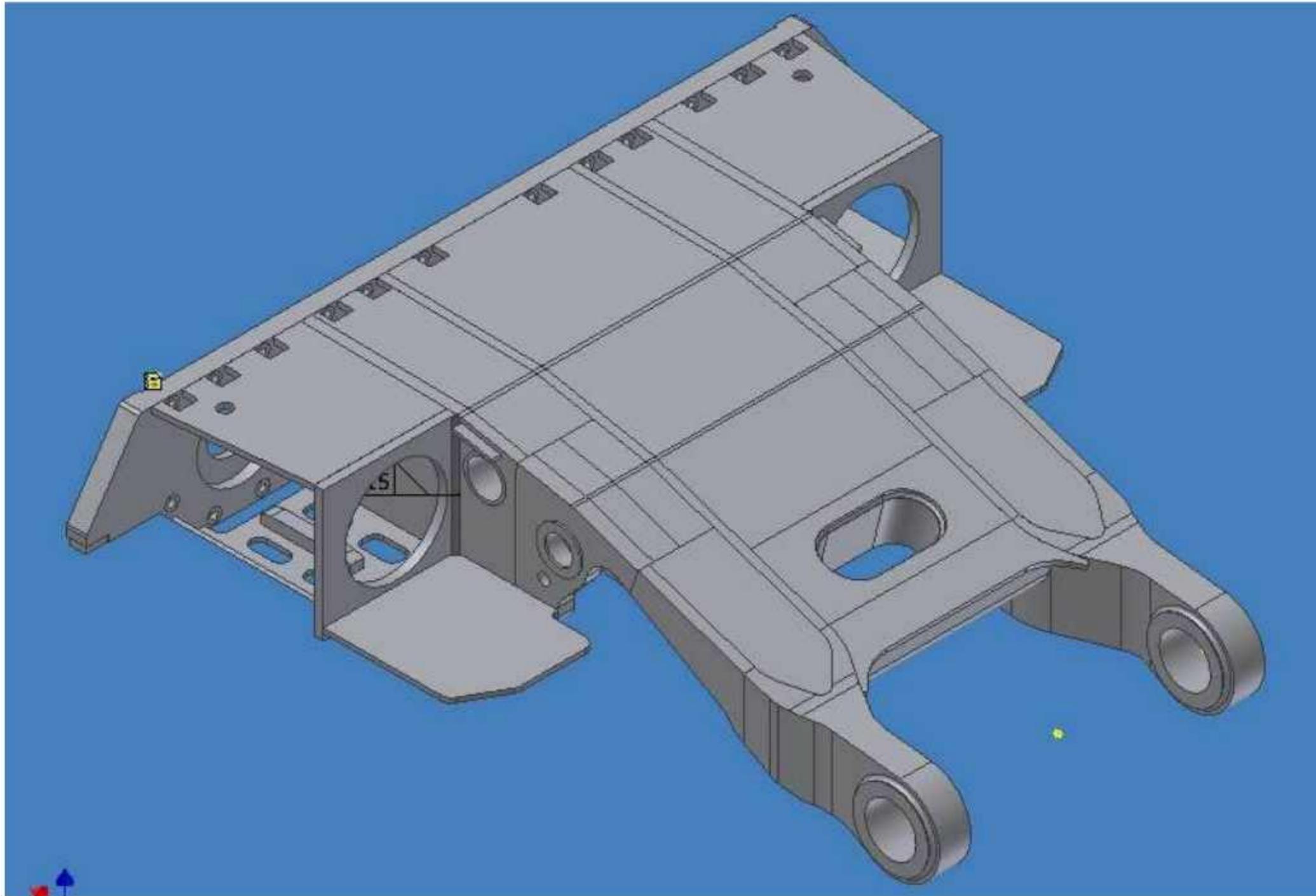
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Eickhoff CM 2

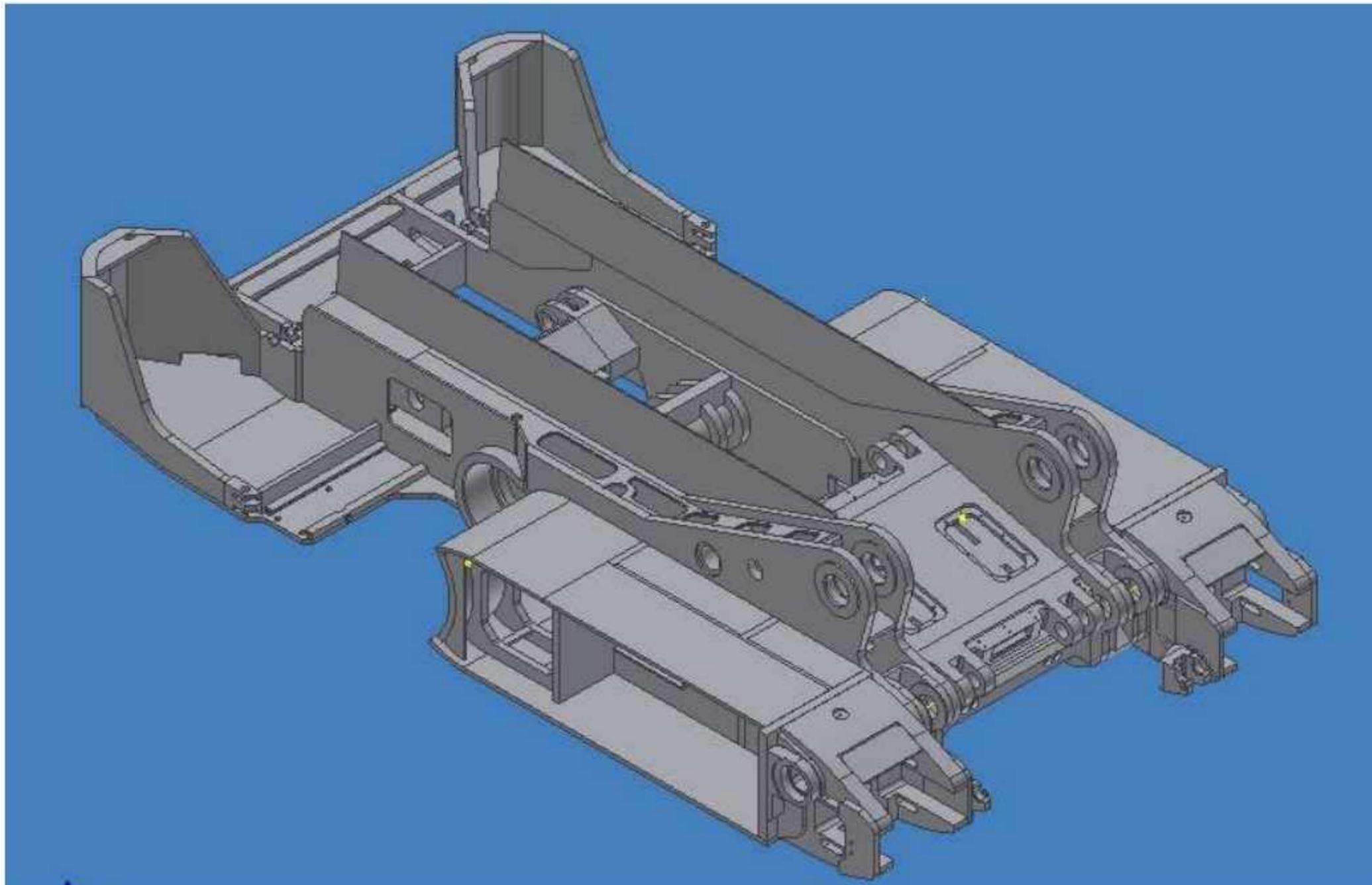
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Eickhoff CM 2

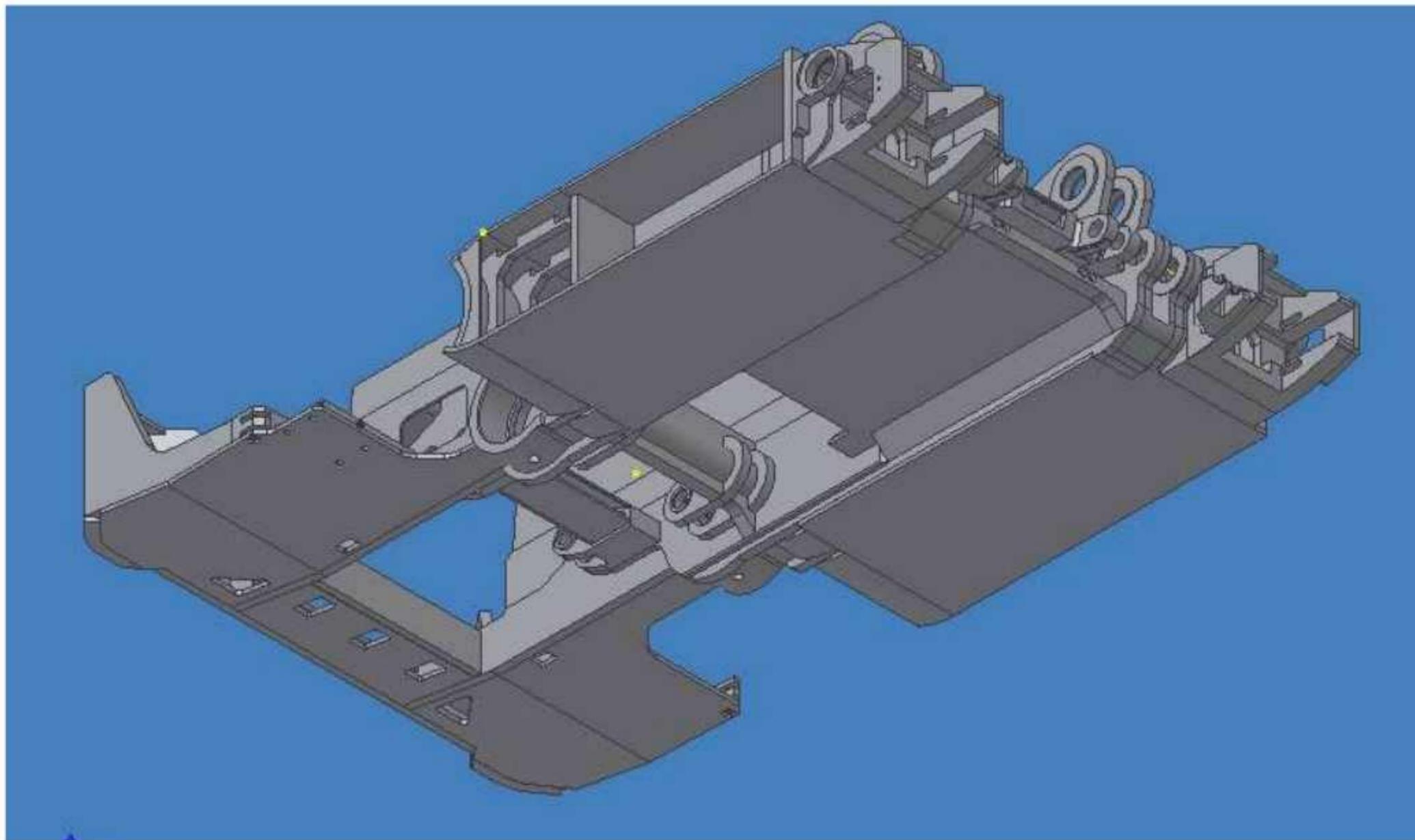
Main frame



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Eickhoff CM 2

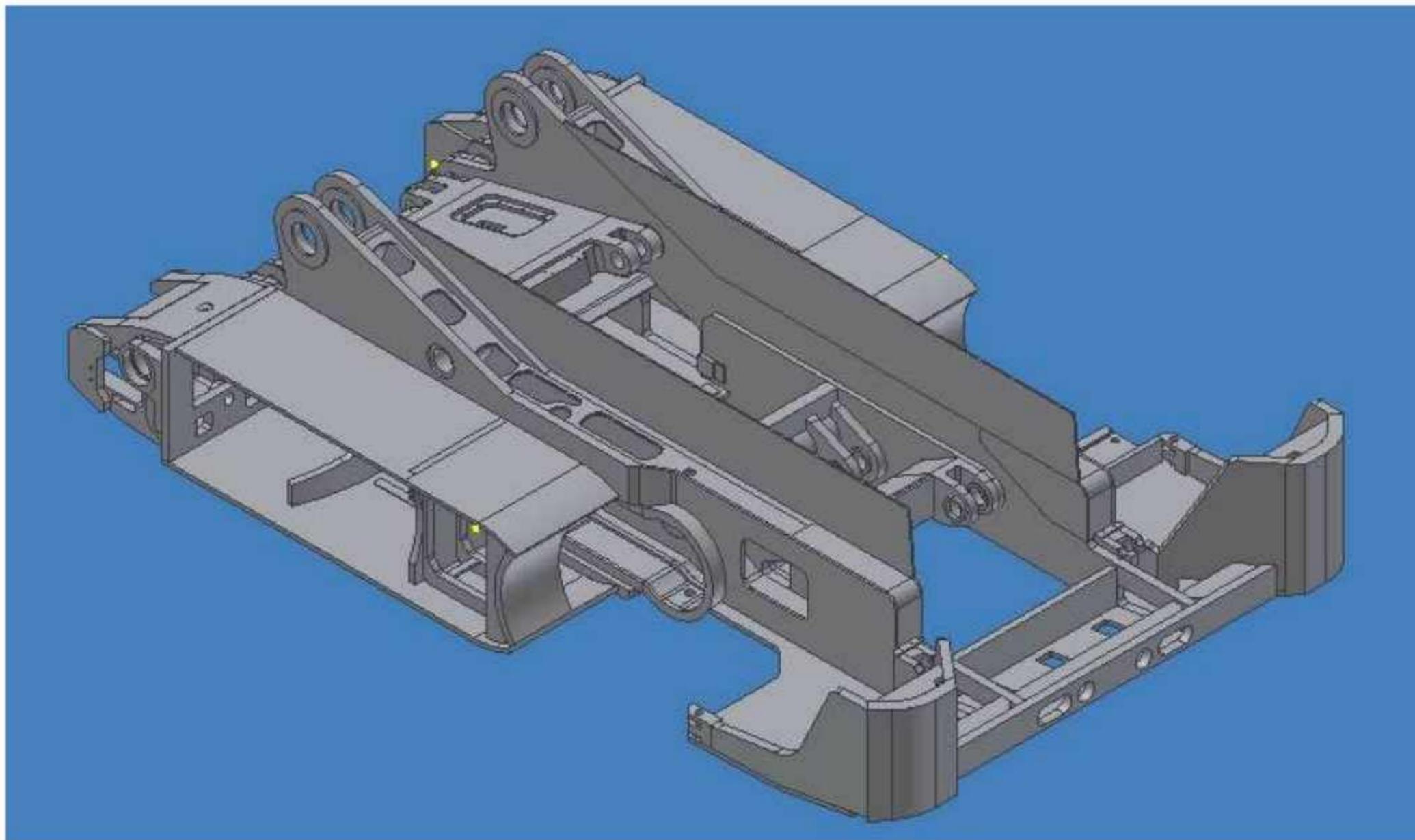
Main frame



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Eickhoff CM 2

Main frame



CM Presentation CME, Dec 2005

Eickhoff CM 2

Main components

component	production	component	production
Cutter gear case	EB	Hydraulic cylinders	
Loading gear case	EB	Hydraulic pumps	
Crawler gear case	EB	Hydraulic motors	
Main frame		Valves	
Gathering head		Control desk	
Cutter boom		Hydraulic tank	
Conveyor		Hydraulic hoses	
Crawler chain		Cooling system	
Conveyor chain		Energy distribution box	
Cutter drums		Electric motors	
Dust scrubber		Control and connection parts	