

SUPER 316 G

with cabin

Operator manual

1. GENERAL INFORMATION

1.1. APPLICATION OF RIG

The Super 316 G rigs are designed for tunnelling, preparatory work, and mining.

1.2. RECOMMENDED OPERATING CONDITIONS

- Underground mines
- Ambient temperatures $\pm 0^{\circ} \dots + 40^{\circ}\text{C}$
- On special applications, consult Tamrock's engineering department.

1.3. MANNERS AND CONDITIONS IN WHICH THE RIG SHOULD NOT BE USED

- Insufficiently scaled drilling site.
- Inadequate training of operator.
- Inadequate lighting.
- Unauthorized persons in working area.
- Inadequate ventilation.
- Low/high supply voltage. (The operating voltage of the rig must not vary more than $\pm 10\%$ of the rated voltage in any operating situation.)
- Explosion gases in drift.
- Inadequate earthing.
- Defective safety systems.

1.4. GENERAL SAFETY INSTRUCTIONS



Do not operate the rig unless you have been properly trained. Read the operating instructions before using the rig.



Observe caution, and make sure that the rotation of the bolting unit will not cause personal or material damage.



Do not go under the booms unnecessarily.



The operator must acquaint himself with the instruction manuals provided by the manufacturer, and follow the instructions therein. Plan your work in advance with the prevention of accidents, damage, and injuries in mind. The operator must know the performance characteristics of the rig.

- Always use the safety equipment required for the work.
- The operator must be acquainted with the operating, service, and safety instructions for the rig.
- The operator must be acquainted with the safety regulations for the rig and the mine.
- No unauthorized persons should be allowed within the danger zone.
- The rig should be kept clean of oil and dirt.
- Any faults or defects must be reported at once to the person in charge.

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1.5. TECHNICAL DATA

1.5.1. CARRIER:

Type TC 400

ENGINE:

Type Deutz F6L 413 FRW
 Structure 4-stroke, swirl-chamber diesel
 Cylinders 6
 Piston displacements 3768 cm³
 Output 102 kW/2300RPM (138 hp)
 Cooling system air cooling
 Oil sump capacity 12 l
 Oil type API-Class CC/SE or CC/SF
 Fuel consumption 28l/h
 Weight 790 kg

TRANSMISSION

Clark Powershift Three speeds forward and reverse.
 type 12.6 MHR 24341
 Axles:
 front: SISU BTI
 rear: SISU CEA (i=22.4)

OSCILLATION

Engine end axle oscillation ± 7°

BRAKES

Service brake Compressed air brake systems
 with drum brakes in all wheels.
 Two separate circuits.
 Safety/parking brake Drum brakes actuated by spring,
 released by compressed air.

HYDRAULICS

Hydraulic pump 22/11cm³ / r 230 bar

STEERING AND CONTROL

Steering valve Orbitrol OSPB - 315

ELECTRIC SYSTEM

Voltage 24 V
 Battery 2 x 12V
 Starter motor 4.8 kW 24 V
 Alternator Valeo 45A
 Fuses:
 main fuses 25A ja 50A
 circuit breaker

1.5.2. BOOM:**Measures and technical data:****ZRU 1000E middle boom****Weights:**

- boom and hoses 2300 kg
- boom, HL550Super, THF 500
and hoses 3050 kg

Other specifications:

- Boom head rotation 360°
- Boom lift
- up 60°
- down 30°
- Boom swing (symmetric) ± 45°
- Boom extension 2000 mm
- Feed swing (symmetric) ± 45°
- Feed tilt
- up 30°
- down 60°
- Feed extra tilt 90°

ZRU 1400E side booms**Weights:**

- boom and hoses 2850 kg
- boom, HL550Super, THF 500
and hoses 3600 kg

Other specifications:

- Boom head rotation 360°
- Boom lift
- up 60°
- down 30°
- Boom swing (symmetric) ± 45°
- Boom extension 3200 mm (1800+1400)
- Feed swing (symmetric) ± 45°
- Feed tilt
- up 30°
- down 60°
- Feed extra tilt 90°

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1.5.3. FEED:

Type	TF 500-18
Weight	490 kg
Total length	7100 mm
Feed advance	5270 mm
Feed force	25 kN
Drifter rod	18'

1.5.4. HYDRAULIC ROCK DRILL:

Type	HL550 Super
Weight	130 kg
Length	1000 mm
Profile height	76 mm
Percussion mechanism:	
Flow	115 l / min / 230 bar
Operating pressure	120 - 250 bar
Percussion rate	68 Hz
Impact energy	325 Nm
Accumulator pressure:	
– high pressure (HP)	80 bar
– low pressure (LP)	4 bar
Accumulator gas	Type N ₂
Filling valve	Vg 8 DIN 7756
Rotation mechanism:	
Motor type	OMSU 80
– flow	46 l / min / 250 rpm
– pressure	max. 175 bar
Torque	400 Nm / 175 bar
rotation speed	0 - 250 rpm
Flushing:	
– water flow	40 l / min
– pressure	10...20 bar
Working temperature of standard system:	
ambient temperature with	
water flushing	0...+ 40 °C
Oil operating temperature	+ 40...+ 60 °C
Hose fittings:	
Percussion:	
pressure and return sides	JIC 1 1/16" - 12
Rotation	JIC 3/4" - 16
Flushing	JIC 3/4" - 16

1.5.5. HYDRAULIC:**Powerpack HPP 555:**

Length/width	450/605 mm
Height	1335 mm
Weight	420 kg
Electric power	55 kW
Rotation speed	3000 r/min (50 Hz)
Capacity of the pumps:	
– Percussion, feed and boom movements	130 l/min / 230 bar
Rotation	52 l/min / 210 bar

1.5.6. PNEUMATIC:

Compressor	Tamrock CD3000 D
Motor	18,5 kW
Capacity	1,7 m ³ / min
Maximum pressure	8 bar
Safety valve opening pressure .	bar
Compressor oil filling capacity .	6 l
Oil recommended	see separate oil recommendation

1.5.7. WATER CIRCUIT:

Water pump :	WBP3 HP
Motor	11 kW
Pressure	7 – 25 bar
High pressure water pump: ...	
Pressure	
Water hose reel	AL 189

1.5.8. ELECTRIC SYSTEM:

Voltage	380V/ 50 Hz
Input power	200 Kw
Electric motor	Strömberg (HPP 555)
Cable reel	AK 189
VYK	

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1.5.9. OTHER TECHNICAL SPECIFICATIONS:

Tyres	12.00 x 20 PR 18
Pressure	8 bar
Total weight	34420 Kg

Level ground, booms in transport position, and rock drills in rear position:

Front axle weight	25760 Kg
Rear axle weight	8640 Kg
Width	2,5 m
Length	15.7 m
Transportation high	3.2 m
Turning radius (inside/outside)	3.7 / 9.0 m
Tramming speed horizontal	max. 14 km/h
Tramming speed 14%=1:7=8°	4 km/h
Ground clearance	320 mm
Gradeability	15°

Traction force:

I – gear	200 kN
II – gear	111 kN
III – gear	48 kN

Lightning:

driving light	6X24V 70w
working light	4X220V / 500w

Tank capacity

Fuel	160 l
Hydraulic oil	270 l
Water tank	160 l
Engine	19 l
Transmission	30 l

Axles oil capacity:

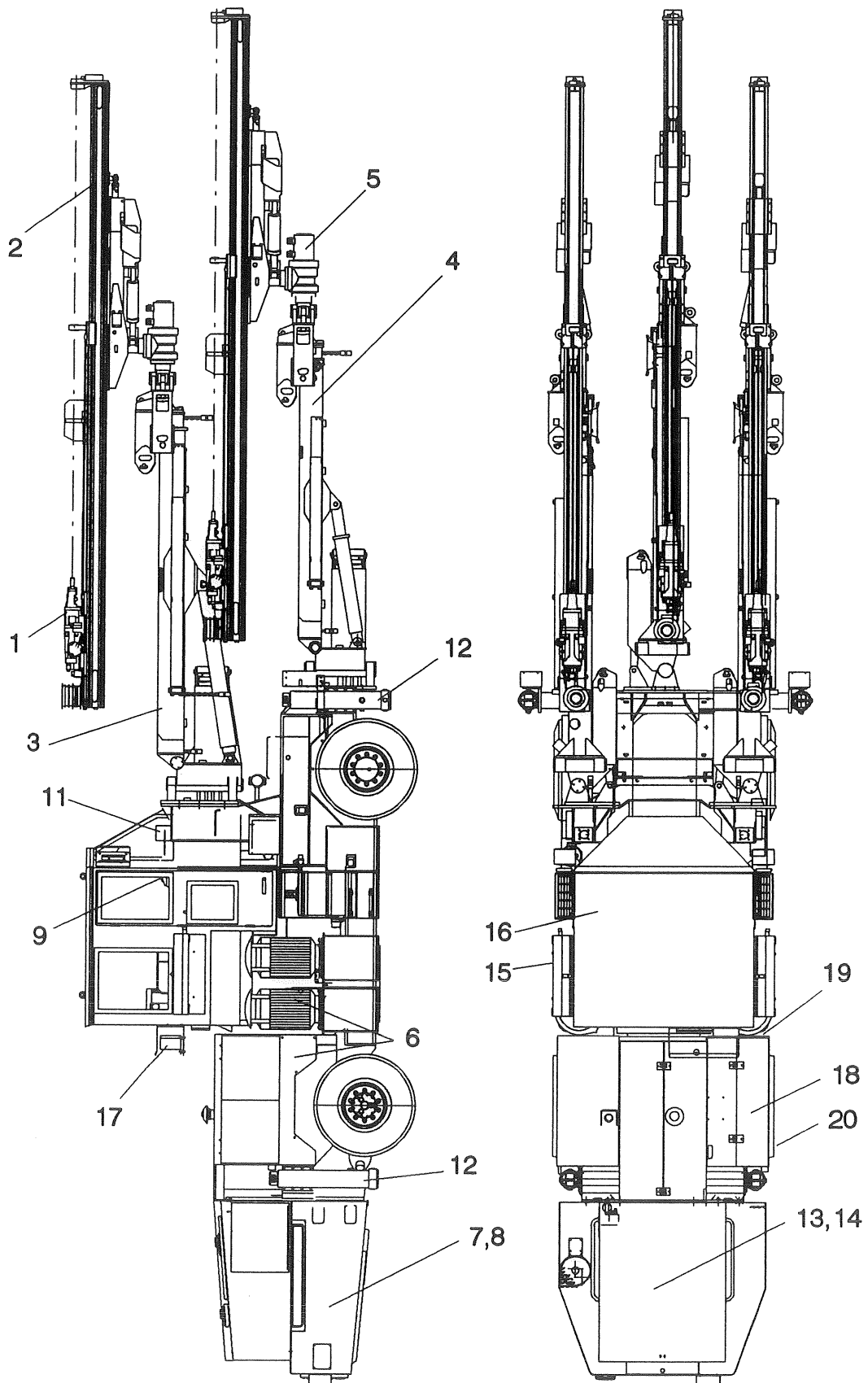
front	17 l
rear	6 l

Planetary reduction:

front	1.8 l
rear	1.0 l

NOISE LEVEL AND NOISE EMISSION

Noise level at the operator's position .	80 dB (A)
Noise emission	105 dB (A)



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1.6. MAIN COMPONENTS

1 Hydraulic rock drill	3 X HL 550 SUPER
2 Feeder	3 X THF 500 – 18
3 Boom	2 X ZRU 1400E
4 Boom	ZRU 1000E
5 Rotation mechanism	3 X Eckart
6 Hydraulic powerpack	3 X HPP 555
7 Water hose reel	AL 189
8 Cable reel	AK 189
9 Control panel	3 x TPC 530
10 Carrier	TC 400
11 TMS data displaying unit	TMS DDSS
12 Hydraulic jacks	HS
13 Compressor	C 2000 DTR
14 Water booster pump	WBP3
15 Return filters	
16 Cabin	
17 Cooling system	
18 Electric switchgear	MSE
19 Carrier main switch	
20 Main switch	

2. IDENTIFICATION

2.1. TYPE PLATES

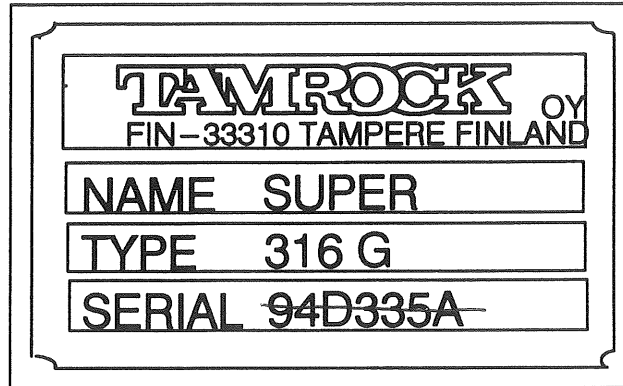


Fig. 1. Rig's type plate

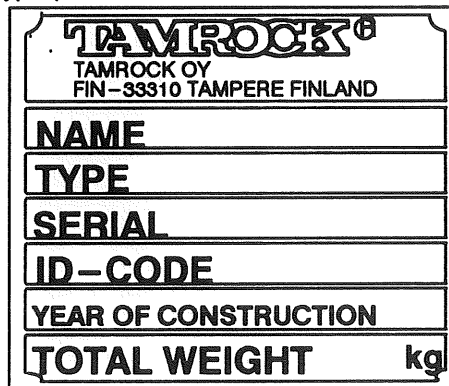
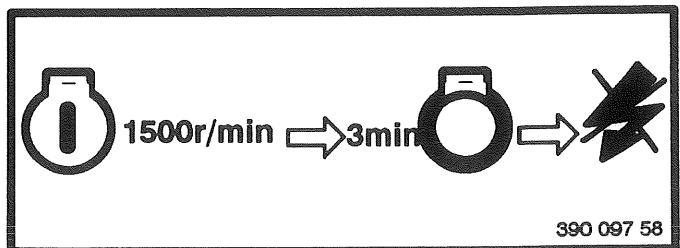
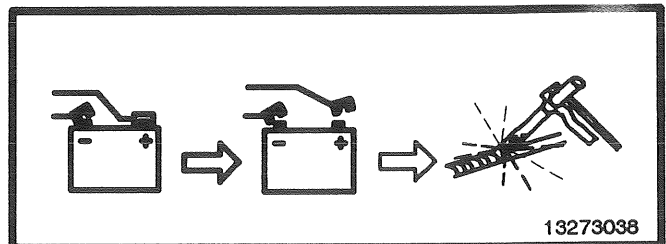


Fig. 2. Component type plate

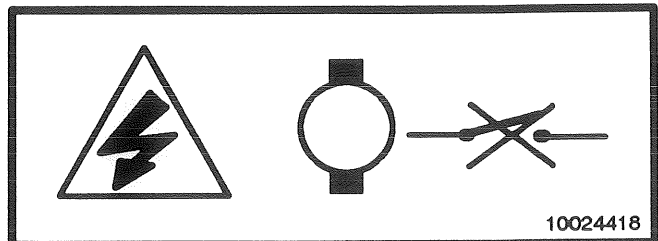
1. To allow for thermal equalization, let the engine run at 1500 rpm for 3 minutes before stopping it.



2. Disconnect the battery terminals before welding on the rig.



3. The main switch does not make the cable reel slip rings dead.

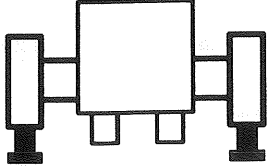


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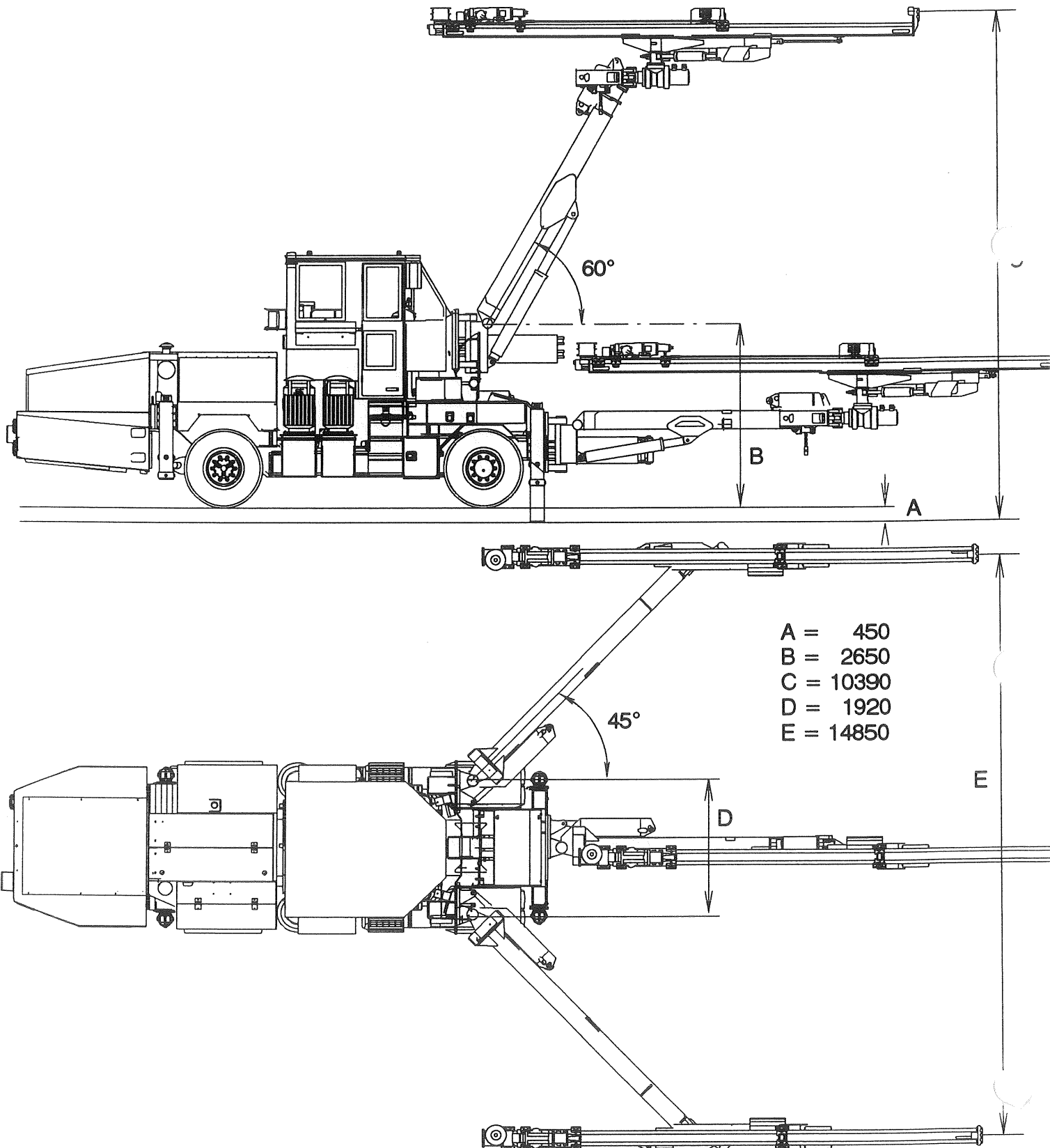
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2.2. WARNING SIGNS

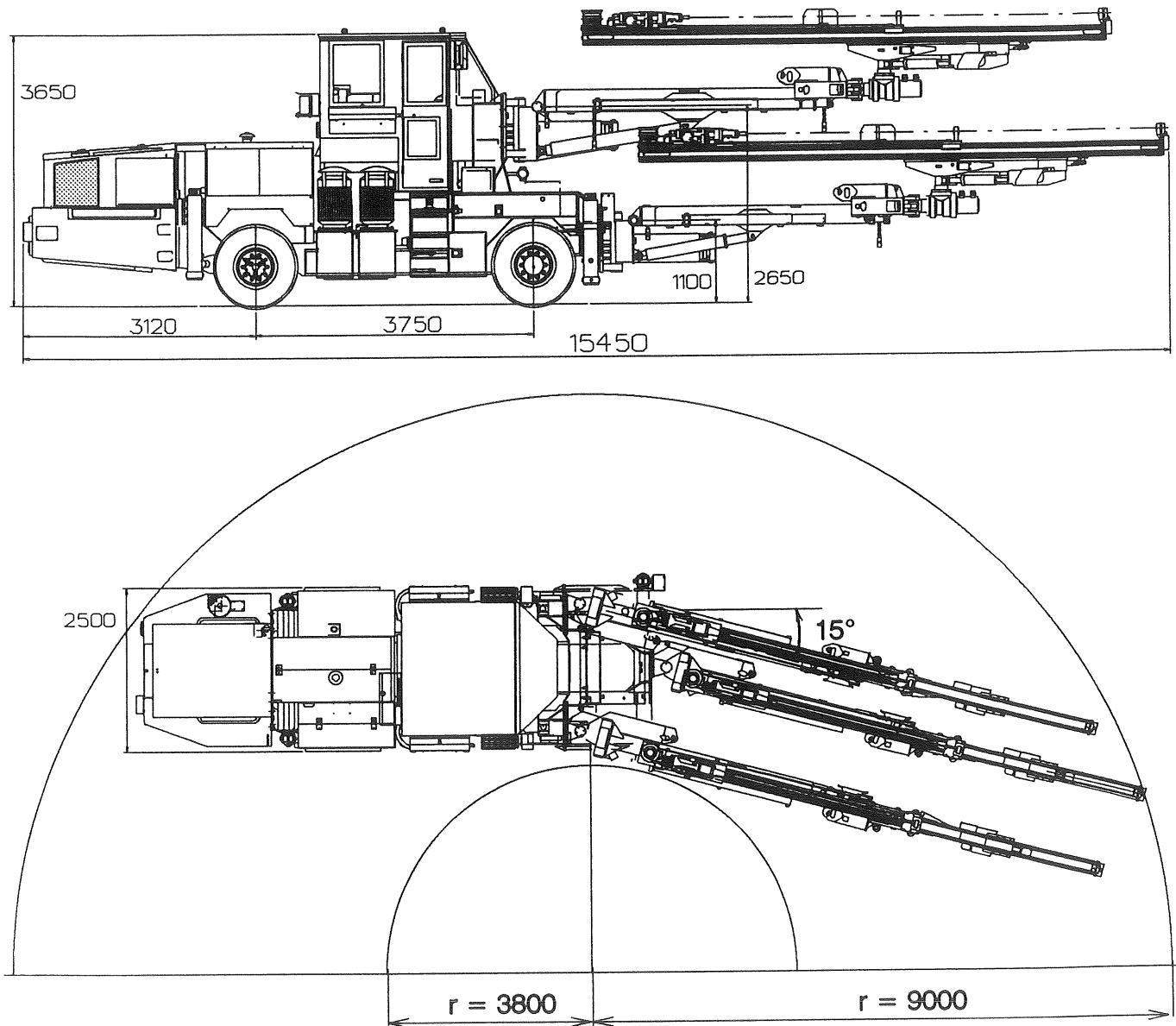
A DANGER  Hazardous voltage. Can cause severe injury or death. Disconnect main supply cable before servicing. ID = 207 269 48	A DANGER  Hazardous voltage. Can cause severe injury or death. Turn power off before servicing. ID = 207 279 58	! WARNING  Hazardous boom motion. Can cause bodily injury. Secure boom before servicing hydraulic system. ID = 207 339 48	! WARNING  High pressure hydraulic oil injection hazard. Can cause bodily injury. Unpressurise hydraulic system before removing plugs or fittings. ID = 207 349 58
! WARNING  High pressure air injection hazard. Can cause severe injury. Relieve pressure before removing filler plug or fittings. ID = 207 309 18	! WARNING  Hazardous moving and rotating parts. Can cause severe injury. Do not enter working range with machine in operation. ID = 207 329 38	! WARNING  Slipping hazard. Can cause bodily injury. Be careful when climbing onto and from machine. ID = 207 359 68	! WARNING  Tipping hazard. Can cause severe injury or death. Extend hydraulic jacks fully before operation. ID = 207 259 38
! WARNING  Tipping hazard. Can cause severe injury or death. Drive with booms and charging basket extensions fully retracted. Do not swing booms more than allowed. ID = 207 289 68	! WARNING  Roll over hazard. Can cause severe injury or death. Keep booms in driving position when tramming. Do not exceed allowed maximum gradient angles. ID = 207 369 78	SAFETY INSTRUCTIONS - Before operating read instruction manual carefully. - Pay special attention to info carrying this symbol . - Use only genuine spare parts. ID = 207 379 88	SAFETY INSTRUCTIONS - Disengage drive before starting engine. - Do not operate with doors open and unlatched. - Stop engine when servicing, adjusting and refueling. - Do not leave running when unattended. ID = 207 389 98

2.3. MAXIMUM DRILLING ANGLES AND OTHER DIMENSIONS



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2.4. TRANSPORT MEASUREMENT AND TURNING RADIUS



The maximum amount of boom swing is 15° degrees from the centre line when the rig is not on the jacks.

2.5. MAXIMUM INCLINATION ANGLES DURING DRIVING



Do not exceed the maximum angles.

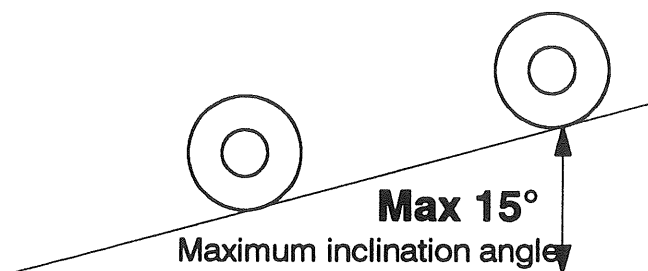
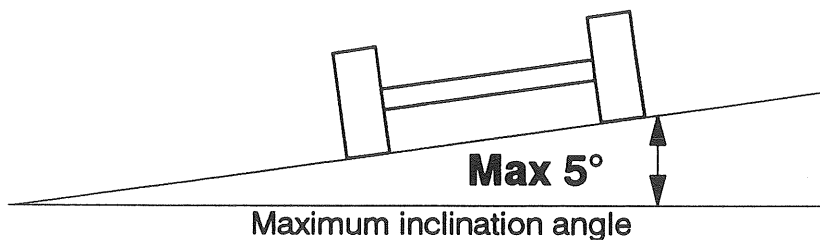


Fig. 3. Inclination angles



The rig must not be driven or left parked in an over 15° slope.



The rig may be towed in steeper slopes, but you have to make sure that the towing vehicle has sufficient traction power. Cf. towing instructions.