



Charmec SF404&504 DA(V)



Normet reserves the right to change
this specification without further notice

Pictures may include options and additional equipment.

INTRODUCTION

Charmec SF 404&504 DA(V) has a compact and short knuckle boom construction enabling small turning radius and agile machine able to access less than 4-meter tunnel envelope.



SF 404 basket boom has one telescopic section and SF 504 two sections having more face coverage. Basket boom tram support is utilized to reduce strains and stresses on basket boom and increase machine productivity.

SF 404&504 -series Charmecs are excellent for development charging in narrow mine orebodies having also capability to move production charging when development work is done.

Large variety of process-based options and accessories will increase productivity.

POWER TRAIN

S-series units have powerful 4-cylinder liquid cooled turbo-charged engines, which power range is between 90–96 kW, depending of the selected engine model. Available emission standards are Tier 3 / Stage IIIA that provide clean and efficient operation.

Machine is equipped with Dana hydrodynamic transmission and planetary type axles which have hydraulically powered dual-circuit oil immersed multidisc service brakes. Moreover, axles have spring applied hydraulically released fail-safe -type parking/safety brake.

SAFETY AND USABILITY

Vehicle has an optional front axle suspension system, which improve safety, driving comfort and increases component lifetime.

Normet's FOPS and ROPS approved safety cabin provides superior visibility and comfortable compartment for the driver and the passenger. Cabin controls are easy and ergonomic to use, and the multifunctional display (MID) provides driving information (speed, RPM, temperatures, safety warnings & alarms etc.), which can be recorded for further analysis. Enclosed cabin provides low noise level ensuring safe and comfortable driving.





PRODUCTIVITY

The amount of air is one key factor to deliver high and uniform ANFO flow to large diameter vertical production charging boreholes. New feature, center mounted large capacity 6 m³/min onboard compressor, will secure maximum ANFO flow and minimize the rebound from upholes.

ANFO moistening system will further increase in hole density and explosive's velocity of detonation as well reduce rebound and waste explosive.

Performance-based accessories like dual layer ANFO charging hose will enable extra meters in uphole charging further increasing productivity.



Anfo charging system is designed to be safest possible having given extra care to electric current groundings, fire safety and safety when working in vicinity of face wall. All Normet ANFO charging hoses has antistatic construction.

Two handheld fire extinguishers are standard and fire suppression system for diesel engine is automatic or manual having actuating points in all operating places.

Person lifting basket has latest safety features like design according to prevailing standards and safety roofs tested through FOPS level II criteria.

Electric system is designed for harsh underground environment. System consists of self-extinguishing wire harnesses with tinned wires, watertight conduits and all exposed components are minimum IP65 protection class. In addition, vehicle layout allows easy access to all service points, all daily checks can be done from the ground level.

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TECHNICAL SPECIFICATION

CHARGING SYSTEM

Pressure max. 7 bar

Extra air for charging

Control in basket to switch between vessels

Storage boxes for primers and detonators

Detonator box lining:

- Antistatic rubber lining
- IME SLP 22 lining

Number of operators:

- 1 charging operator
- 2 charging operators (n/a with one ANFO vessel systems)

ANFO module:

- 2 ANFO vessels and work stand
- 2 ANFO vessels, 4 m³/min front mounted onboard compressor and work stand
- 1 ANFO vessels, load room for bulk ANFO and work stand
- 1 ANFO vessels, ANFO filling system, load room for bulk ANFO and work stand
- 1 ANFO vessels, 4 m³/min center mounted onboard compressor and work stand
- 1 ANFO vessels, 4 m³/min center mounted onboard compressor, ANFO filling system and work stand

ANFO vessel size:

- Without vessels
- 360 l
- 500 l
- 720 l (increased machine height ? mm)

Charging control type:

- Pneumatic hand and foot control for charging and blowing
- Radio controlled charging and air blowing in basket

ANFO hose diameter for manual face charging, 30 m hose:

- 19 x 25 mm
- 22 x 28 mm

ANFO hose diameter for mechanical production charging:

- 30 x 38 mm
- 34 x 44 mm

ANFO hose length for production charging:

- 30 m
- 60 m

NBB BASKET BOOM

Boom:

- NBB435 basket boom (404)
- NBB455 basket boom (504)

Lifting capacity (without optional equipment) 400 kg

Max. lifting height and wall coverage specified in dimensional drawing

Automatic levelling of basket

Start/stop from basket

Battery operated emergency lowering system

Regular basket installation

Basket:

- Short 2-operator square tube basket
- Short 2-operator open profile basket
- One-operator basket

Person lifter safety system:

- Dangerous movement preventing system (mandatory in NAP, NAS, CE area)
- Dangerous movement warning system with overload monitoring
- Dangerous movement warning system without overload monitoring

ENGINE AND TRANSMISSION

- **Deutz TCD 2012 L4, 96 kW/2300 rpm, Tier 3 / Stage IIIA approved**

Catalytic exhaust gas purifier and muffler

Fuel tank capacity 110 l

Dana 20000 series powershift transmission

3 speeds forward and reverse

4-wheel drive

Manual gear selector

- **Mercedes-Benz OM 904 LA, 90 kW/2200 rpm, Tier 3 / Stage IIIA approved**

Catalytic exhaust gas purifier and muffler

Fuel tank capacity 110 l

Dana 20000 series powershift transmission

3 speeds forward and reverse

4-wheel drive

Manual gear selector

PERFORMANCE

Tramming speed (horizontal):

Deutz 27 km/h

Mercedes-Benz 27 km/h

Lateral gradient for tramming (continuous) 4°

Longitudinal gradient for tramming (continuous) 9°

Lateral gradient for operation 3°

AXLES AND BRAKES

Load end axle:
Dana 112 series fixed

Engine end axle:
Dana 112 series

- +/- 8° Oscillation
- Hydro-pneumatic suspension and +/- 8° oscillation

Service brake: hydraulically powered dual-circuit oil immersed multidisc brakes in both axles

Safety/Parking brake: spring applied hydraulically released fail-safe-type brake

TYRES AND RIMS

Tyres:

Nokian Tyres 10.00–20"

Rims:

- Standard rims
- NDT inspected rims

STEERING

Orbitrol type hydraulic frame steering

Frame articulation +/- 40°

HYDRAULIC SYSTEM

Variable displacement pump system:
190 bar, 95 l/min at 2200 rpm

Hydraulic oil tank capacity 115 l

24 VDC ELECTRICAL SYSTEM

Mechanical main switch in battery box

LED driving and indicator lights

LED work lights on cabin

LED work lights in basket

LED side lights (left/right):

- White / White
- Green / Red
- Red / Green

Warning LED light:

Color

- Amber
- Blue
- Red
- Green (n/a with rotating light pattern)
- White (n/a with rotating light pattern)

Light pattern

- Strobe
- Rotating

DRIVER'S COMPARTMENT

Cabin type:

- Open cabin FOPS/ROPS approved
- Enclosed cabin FOPS/ROPS approved with sliding rear window

Driver's seat and seat belt:

- Air suspended T-back seat with 3-point seat belt
- Air suspended heavy duty seat with 3-point seat belt

Seat belt safety interlock for driver:

- Warning indicator in display
- Safety brake application

Cabin door interlock switches with safety brake application

Passenger's seat:

- T-back seat with 3-point seat belt
- Heavy duty seat with 3-point seat belt
- 2 person seat with fixed lap seat belts

Throttle and brake pedal layout:

- Front and side facing pedals with seat swivel
- Front facing pedals

Gear lever side:

- On right side of the steering wheel
- On left side of the steering wheel

MACHINE CONNECTIVITY

- Machine connectivity hardware (WLAN/3G/4G/LTE)
- Data lifetime license (Include connectivity hardware)
- Analytics lifetime license (Include connectivity hardware and data lifetime license)

TECHNICAL DOCUMENTATION

Standard documents:

Instruction manuals, hard copy 2 pcs:

- English
- Russian
- One of destination EU languages

Spare parts manuals, hard copy 2 pcs:

- English
- Russian

PDF manuals on USB-stick 2 pcs, includes instruction and spare parts manuals

Additional documentation:

- Extra hard copies of manuals
- Extra PDF manuals
- LinkOne WebView electronic manuals
- Other than standard language manuals

OTHER

Powder extinguisher:

- 12 kg
- Ansul Sentry

Number of extinguishers:

- 2
- 3

Painting and taping:

- Standard painting and taping
- Painting and taping according to customer specifications

Standard support legs at the load end

Front and rear grounding straps:

- Flat cable
- Chain

Text labels in:

- En/Ru/One of destination EU-languages
- Other language

Measurements:

- Noise
- Vibration
- Emissions

ACCESSORIES

PROCESS PRODUCTIVITY

- Engine end support legs (mandatory if NBB455 basket boom or front mounted onboard compressor is selected)
- Additional pneumatic charging controls (only with pneumatic controlled charging, not available 2-2 charging system)
- Mechanical ANFO hose feeding for production charging up to 25 m (hose reel n/a with electrical system)
 - Electrically controlled hose pusher (requires electric charging controls)
 - Direct hydraulic controlled hose pusher
- Hose guide for upward production charging
- Diverting pulley for downward production charging
- Performance parts for uphole production charging:
 - High capacity 6 m³/min onboard compressor (n/a with electrical system)
 - 34 x 44 mm dual layer ANFO charging hose and friction groove pulleys
 - Power hose feeder with gears, low friction upward hose guide (available with electrically controlled hose pusher)
- Charging hose reel material
 - Steel
 - Stainless steel
- Water for ANFO system: 35 l container
- Detonator's wire roll
- Pressurized air after-cooler for very high humidity (n/a with electrical system)
- 208 l water tank above the cabin (increased machine height 200 mm)
- Hydraulically driven pressure washer with hose reel:

Water pressure, max.	180 bar
Water flow, max.	30 l/min
Hose length	20 m

 - Standard pressure washer
 - Stainless steel reel and rod

- Electrical system:

Main supply voltage

Power supply for the electrical functions

- 50 Hz
 - 380 V (IEC)
 - 400 V (IEC)
 - 415 V (IEC)
 - 525 V (IEC)
 - 690 V (IEC)
 - 1000 V (IEC)
 - 1000 V (AS/NZS)
- 60 Hz
 - 440 V (UL/CSA)
 - 440 V (IEC)
 - 480 V, (460 V) (UL/CSA)
 - 600 V, (575 V) (UL/CSA)
 - 1000 V (UL/CSA)

Robust and abrasion-resistant mains voltage supply cable with PUR outer sheath:

Hydraulically driven reel

Cable in / out reeling function from the cabin and near the reel

- With supply cable (excluding plug)
- Without supply cable (must be sourced and installed locally)

Pilot circuit

- No
- Yes

Hydraulic power pack size 37 kW

110 V, 230 V outlet socket

- No sockets
- High Voltage box, cabin
- High Voltage box, cabin, basket
- Socket supply voltage
 - 220/230/240 V
 - 110/120 V

CARRIER PRODUCTIVITY

- Accessories for open cabin:
 - Protective grids
 - Windshield with wipers
- Accessories for enclosed cabin:
 - Audio system
 - Air conditioning with heating
 - Heated mirrors
- 12 V, 18 A power supply in cabin with socket and connector
- Deutch connector for 24 V, 10 A for external power supply
- Auto engine shutdown during idling
- Engine shutdown delay
- Inlet plug for jump start

- Block heater with interior heater and battery charger 230 V (Interior heater available with enclosed cabin)
- Block heater with interior heater, battery charger, hydraulic oil and filter heaters 400 V (Interior heater available with enclosed cabin)
- Fuel operated pre-heater
- Fast fuel filling system
- Hand pump for filling of hydraulic tank
- Fluid evacuation panel with sampling points
- Automatic lubrication system
- Reversing camera:
 - 1 camera, 1 display
 - 3 cameras, 2 displays
 - 4 cameras, 3 displays.
 OACR/VCR system with recording device with 72 hour memory
- Spare rim and tyre
- Toolbox and maintenance tools
- Stainless steel box for equipments (n/a with electrical system)
- Interior cooling fan
- Wax tape for electric connectors

SAFETY

- Cabin door puddle lights
- Extra warning LED light (From the options below it is possible to choose 1-2 combinations)
 - Color
 - Amber
 - Blue
 - Red
 - Green (n/a with rotating light pattern)
 - White (n/a with rotating light pattern)
 - Light pattern
 - Strobe
 - Rotating
- Fire extinguisher system, 3 point activation (basket, cabin, rear frame)
 - Dry chemical
 - Ansul A-101
 - Manual
 - Automatic, Checkfire 110
 - Liquid agent
 - Fogmaker (Automatic)
- Gear lockout for third gear
- Pump for brake release
 - Electric pump
 - Hand pump
- Redundant brake monitoring system
- Hydraulic pressure monitoring kit
- Methane monitoring system
- Protection guards for tunnel curtains
- Tyre pressure indicators
- Additional wide angle mirrors (n/a with heated mirrors)
- Warning triangles
- Flashlight with charger
- Hearing protectors
- Wheel chocks with brackets

SAFETY BASKET BOOM

- Safety roof or bar on basket
 - Safety bar
 - Safety bar with hydraulic lift
 - Reduces lifting capacity 60 kg
 - Safety roof with hydraulic lift
 - Reduces lifting capacity 100 kg
 - Safety roof with hydraulic lift and slide
 - Reduces lifting capacity 200 kg

NOTE: safety roofs and bar for the basket boom affect to the lifting capacity.

Accessories for basket boom:

- LED working lights on safety roof/bar
- Operator present: Foot pedal switch on basket
- Operator present: Spring loaded valve levers
- 24 V fan in the basket

SERVICES

NORMET SERVICES

Our services cover the whole life cycle of your equipment. They include start-up and commissioning, genuine spare parts, upgrades & modifications, and remanufacturing, as well as rental and leasing offerings, and field services. We also offer improvement services such as operator training and process audits.

SPARE PARTS

Genuine parts from Normet Services ensure that you always have the highest quality parts available to keep your equipment up and running. Depending on your needs, we can offer everything from individual parts to complete parts contracts, and our professionals around the world have the experience to ensure that you have the parts you need when you need them.

Initial spare parts package:

Available for 1000h of use*. Includes periodical service, most common wearing parts and most critical safety parts.

Spare parts packages made for customer needs:

Available based on hours of use*. Includes periodical service, most common wearing parts and most critical safety parts.

* Recommendations are based on average hours – can vary a lot depending on work site conditions.

UPGRADES AND MODIFICATIONS

Our Upgrades and Modifications services are designed to ensure the economical, efficient and purposeful performance of your equipment over its entire life cycle. A service provided by a reliable OEM like Normet ensures the safety and performance of your equipment. Normet Upgrades and Modifications save you both time and money, while delivering the high quality you expect from us.

SERVICE CONTRACTS



With a service agreement, Normet manages your fleet with guaranteed availability and agreed costs, giving you transparency for your life cycle costs, annual operational budget and fleet uptime. This lets you focus on your core operations. Each service agreement is built and customized to meet the individual customer's needs from our portfolio of services. Depending on the level of service agreement you need, you can choose anything from basic technical support for an individual machine all the way up to services for your entire fleet, as well as process performance. The service levels we offer are:

- Parts Availability
- Fleet Support
- Fleet Availability
- Process Performance

The content of a service level can be tailored to meet your particular requirements.

TRAINING SERVICE

Our Training Services are available for you and your operators throughout the equipment lifecycle and they include:

				
	Operation & Maintenance	Spraying	Charging	Scaling
ADVANCED	Advanced fault diagnostics & troubleshooting	Concrete chemicals, testing and preparing for EFNARC-certificate test		
INTERMEDIATE	Troubleshooting training Foundations of electrics, hydraulics and mechanics NorSmart	Advanced training in concrete spraying Economics of concrete spraying	Advanced training in explosives Economics of charging	Advanced training in scaling Economics of scaling
BASIC	Operation and Maintenance Training Basic Product Training	Basic understanding of concrete spraying	Basic understanding of charging	Basic understanding of scaling
LEVEL	SERVICE	PROCESS KNOWLEDGE		

START-UP AND COMMISSIONING

1. OPERATOR TRAINING

	Start-up training	Commissioning
1.1 Classroom training		
General introduction and operation of machine	Basic	No classroom training included in commissioning
Safety instructions	Basic	
Use of manuals	Basic	
Technical introduction of equipment	Basic	
Hands-on service and pre-operation checks	Basic	
Controls and driving (starting, driving, stopping, parking)	Basic	
1.2 Practical training		
Pre-operation checks	Basic	Introduction
Driving, starting, stopping, parking	Basic	Introduction
Preparing the machine for specific operation conditions	Basic	Not covered
Operation	Basic	Introduction
Washing the machine	Basic	Introduction
Troubleshooting	Basic	Basic

2. MAINTENANCE AND REPAIR TRAINING

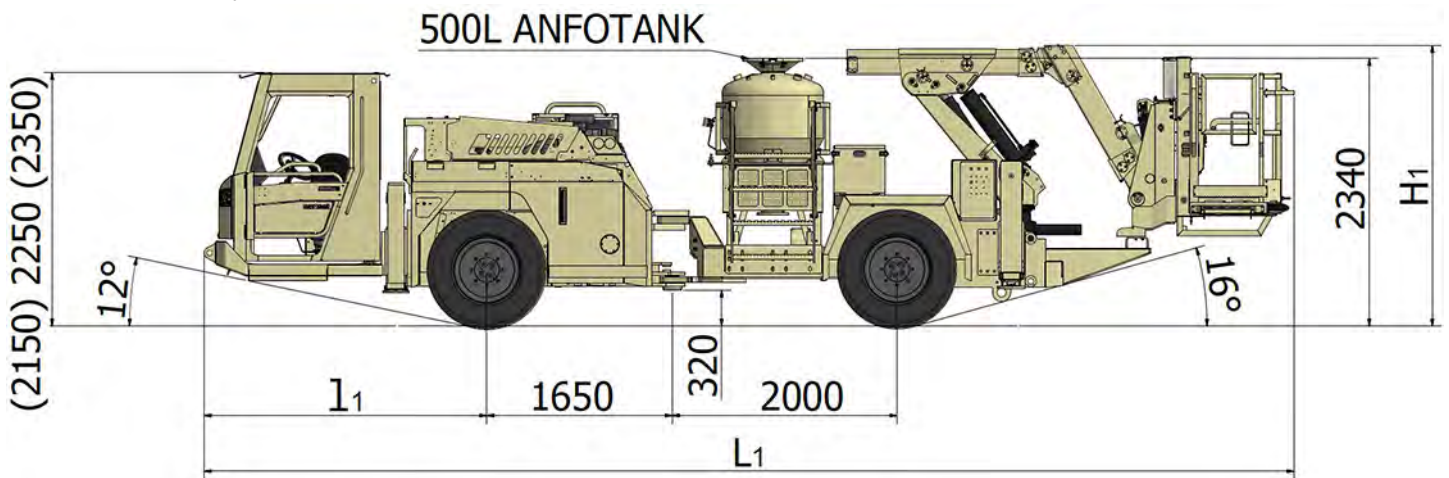
General operation of machines	Basic	Introduction
Symbols of drawings and codes	Basic	Not covered
Understanding hydraulic and electric schematics	Basic	Introduction
Control systems	Basic	Introduction
Function of main components (depending on equipment)	Basic	Introduction
Locations of components in the machine	Basic	Not covered
Periodical maintenance	Basic	Introduction
Troubleshooting	Basic	Not covered
Use of manuals	Basic	Introduction
Connection of hydraulic and electrical equipment	Basic	Not covered

DIMENSIONS

	SF404 DA	SF504 DA	h4		6200 mm	7500 mm
L1	9100 mm	9700 mm	R1		6620 mm	6830 mm
L2	10 080 mm	10 500 mm	R2		6370 mm	6460 mm
I1	2370 mm	2520 mm	C1		3620 mm	3830 mm
H1	2370 mm	2500 mm	C2		3950 mm	4160 mm
h1	950 mm	1030 mm	C3		3370 mm	3460 mm
h2	2630 mm	2690 mm	C4		3700 mm	3790 mm
h3	3920 mm	5250 mm				

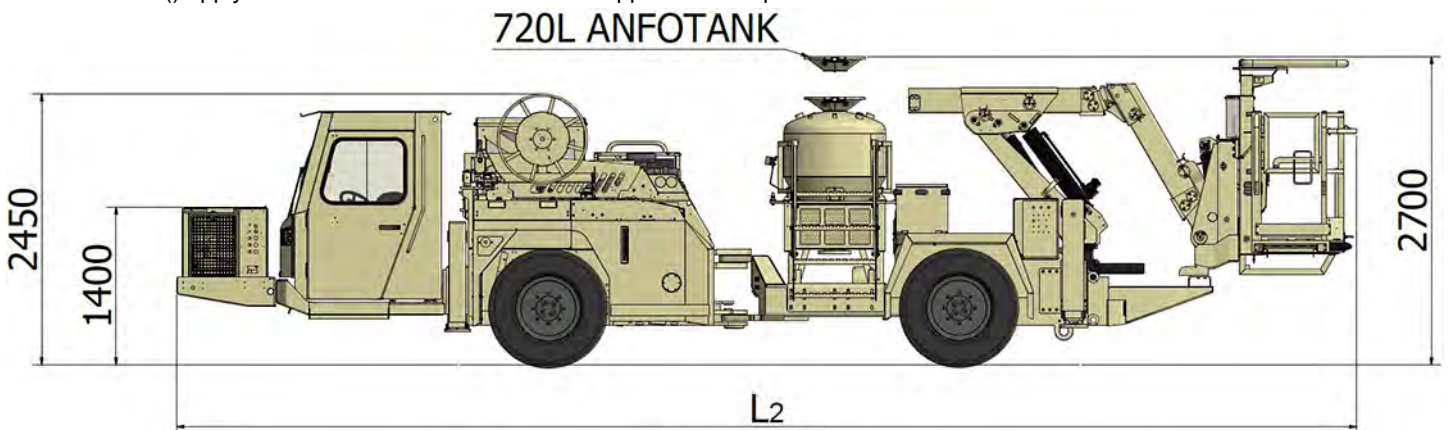
SIDE VIEW – BASIC MACHINE

Dimensions in () apply when the cabin is installed in the upper or lower position.

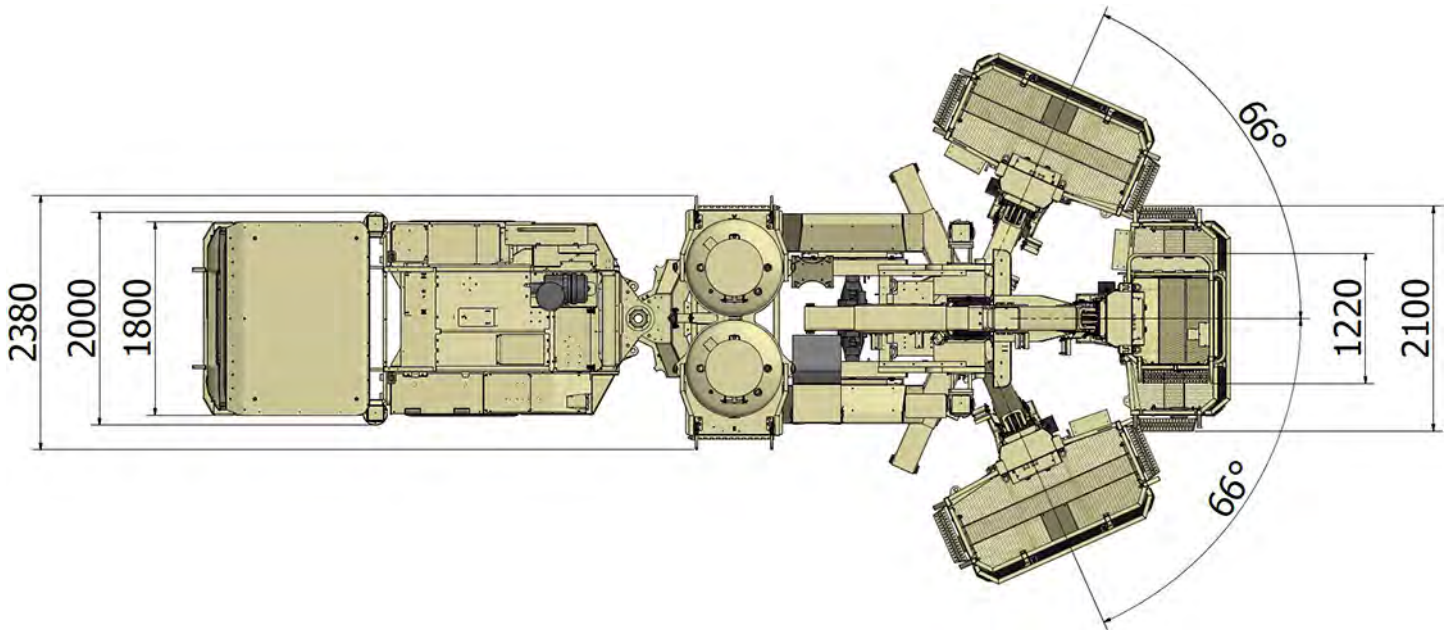


SIDE VIEW – MACHINE WITH OPTIONS

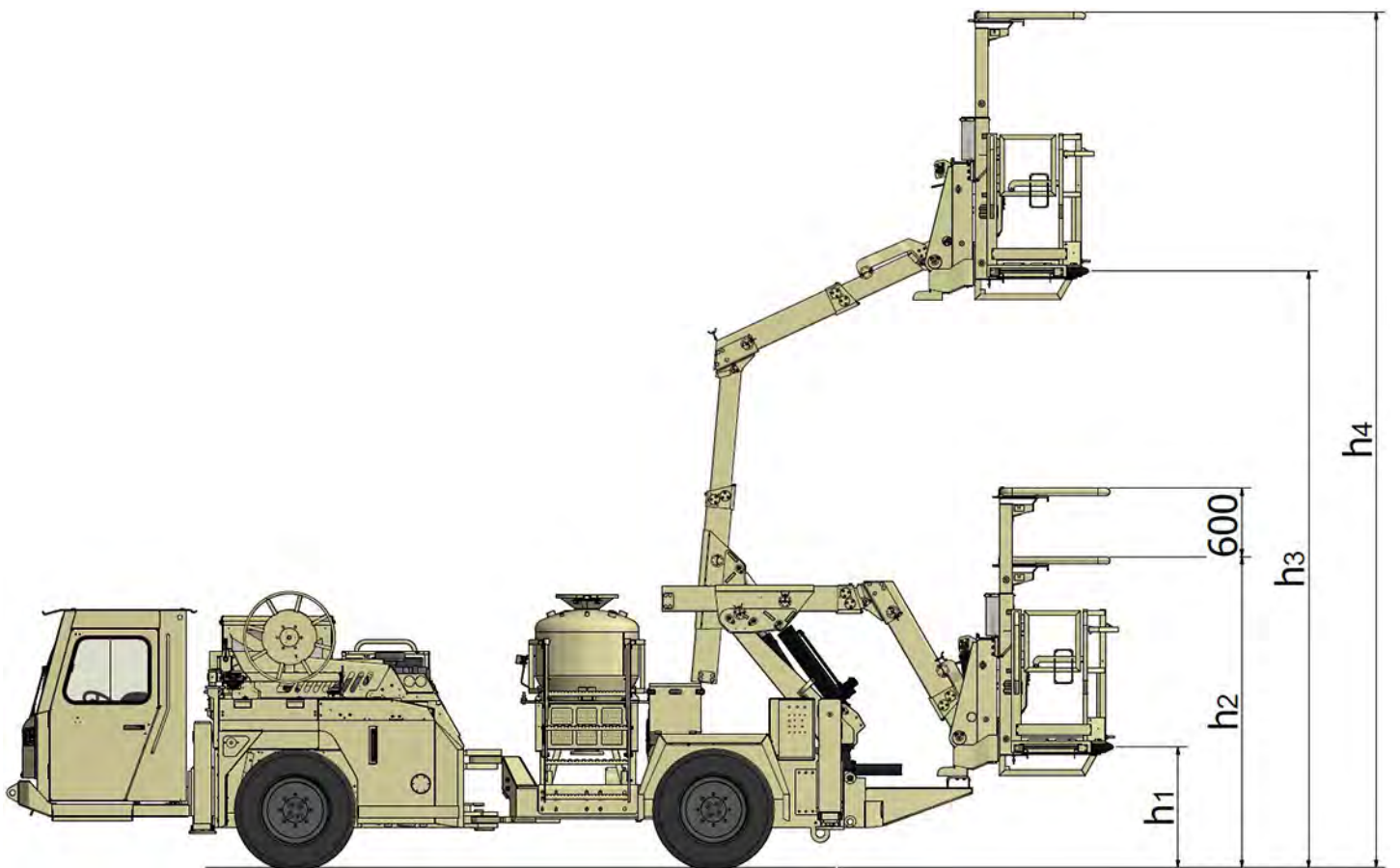
Dimensions in () apply when the cabin is installed in the upper or lower position.



TOP VIEW



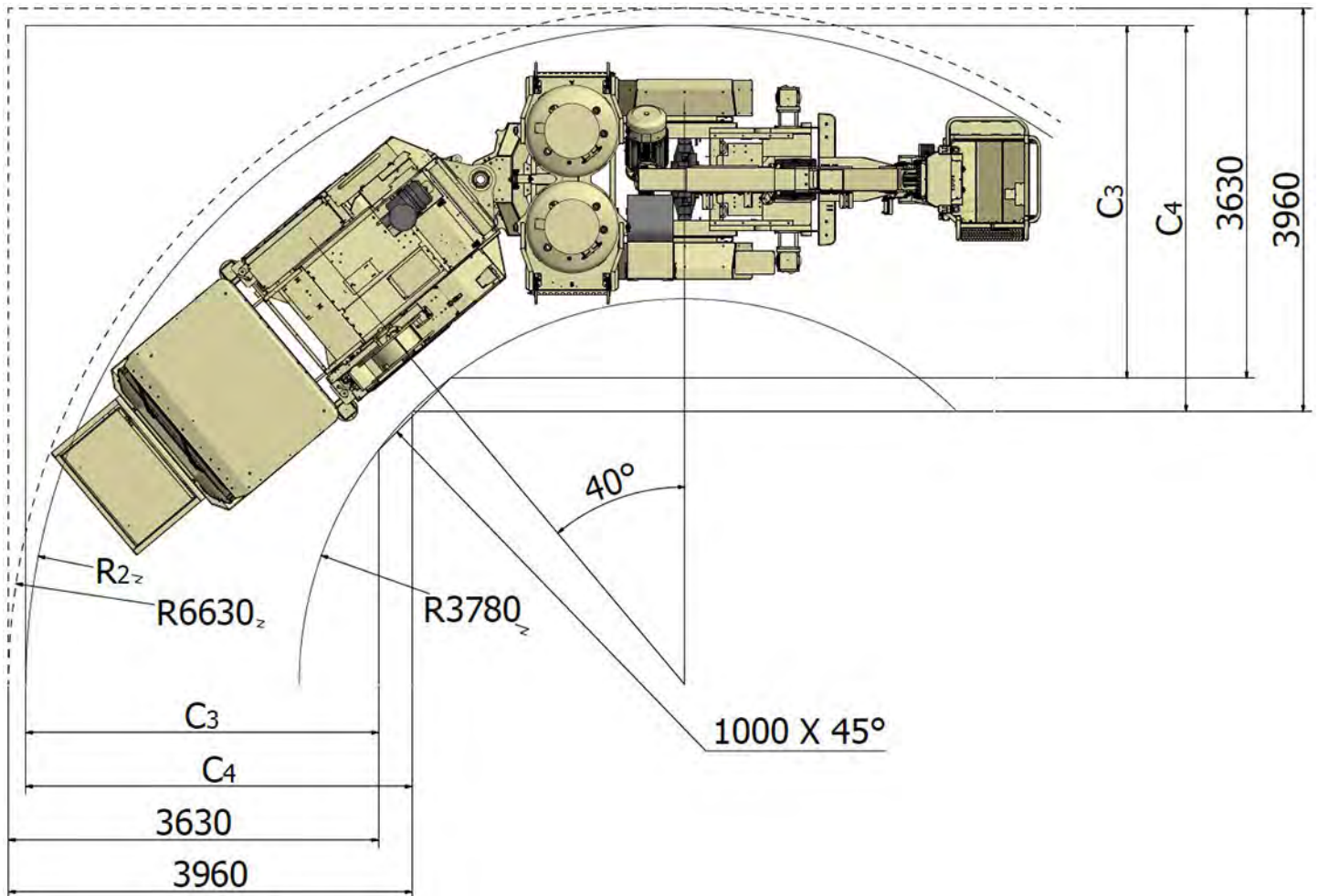
BOOM REACH



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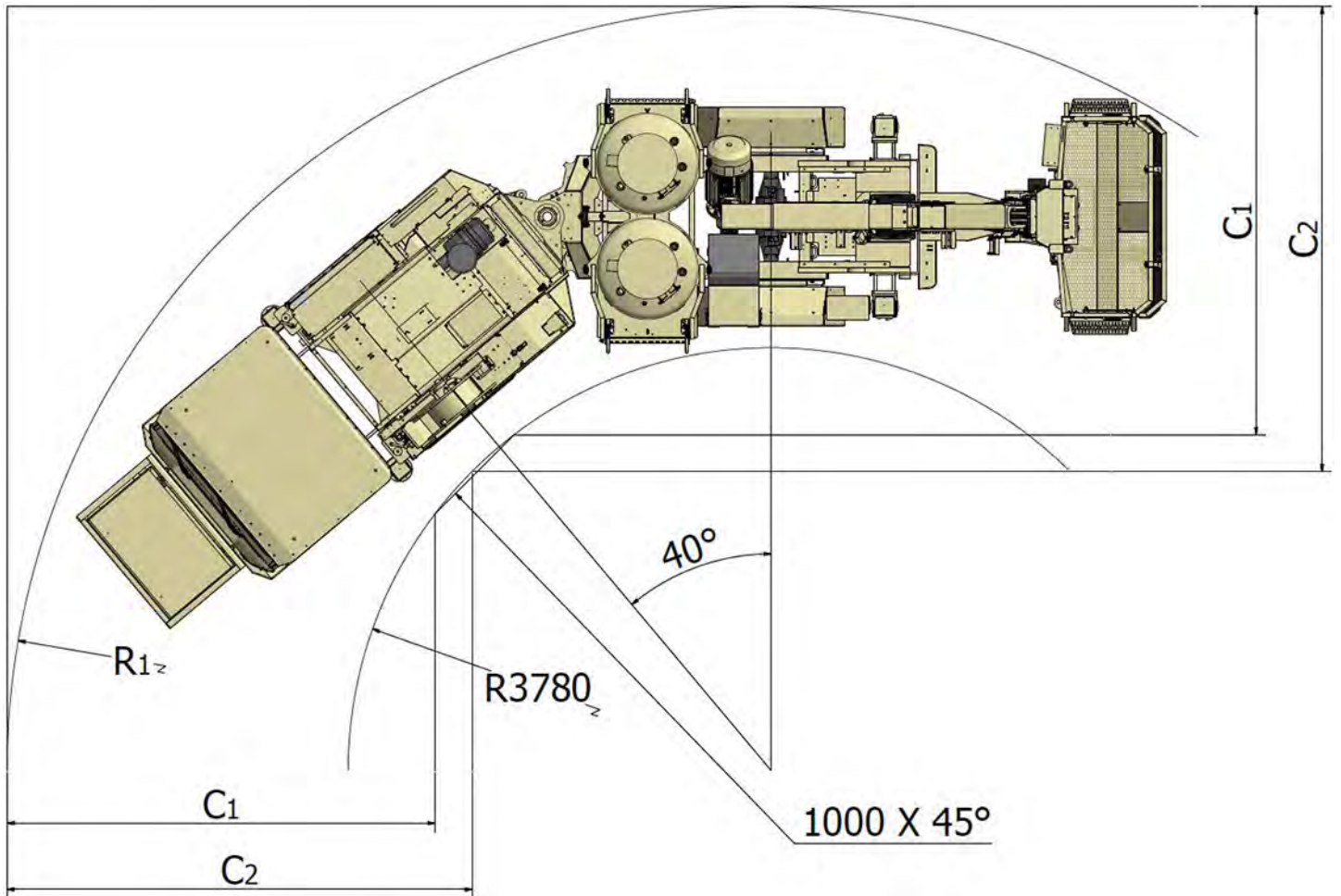
Pictures may include options and additional equipment.

TURNING RADIUS



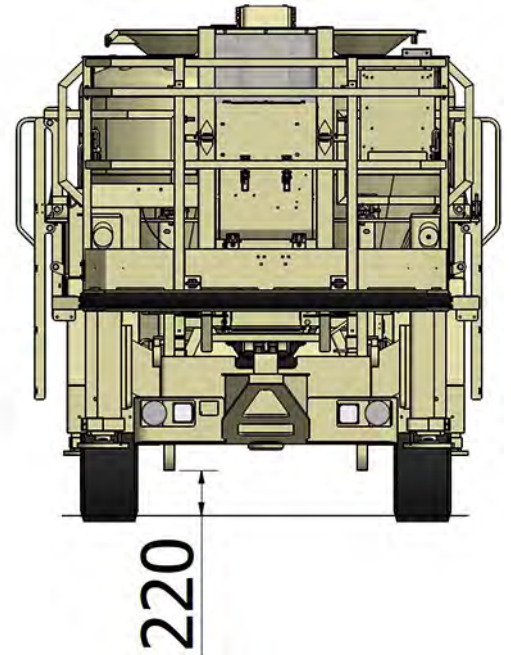
Machine equipped with one man basket

TURNING RADIUS



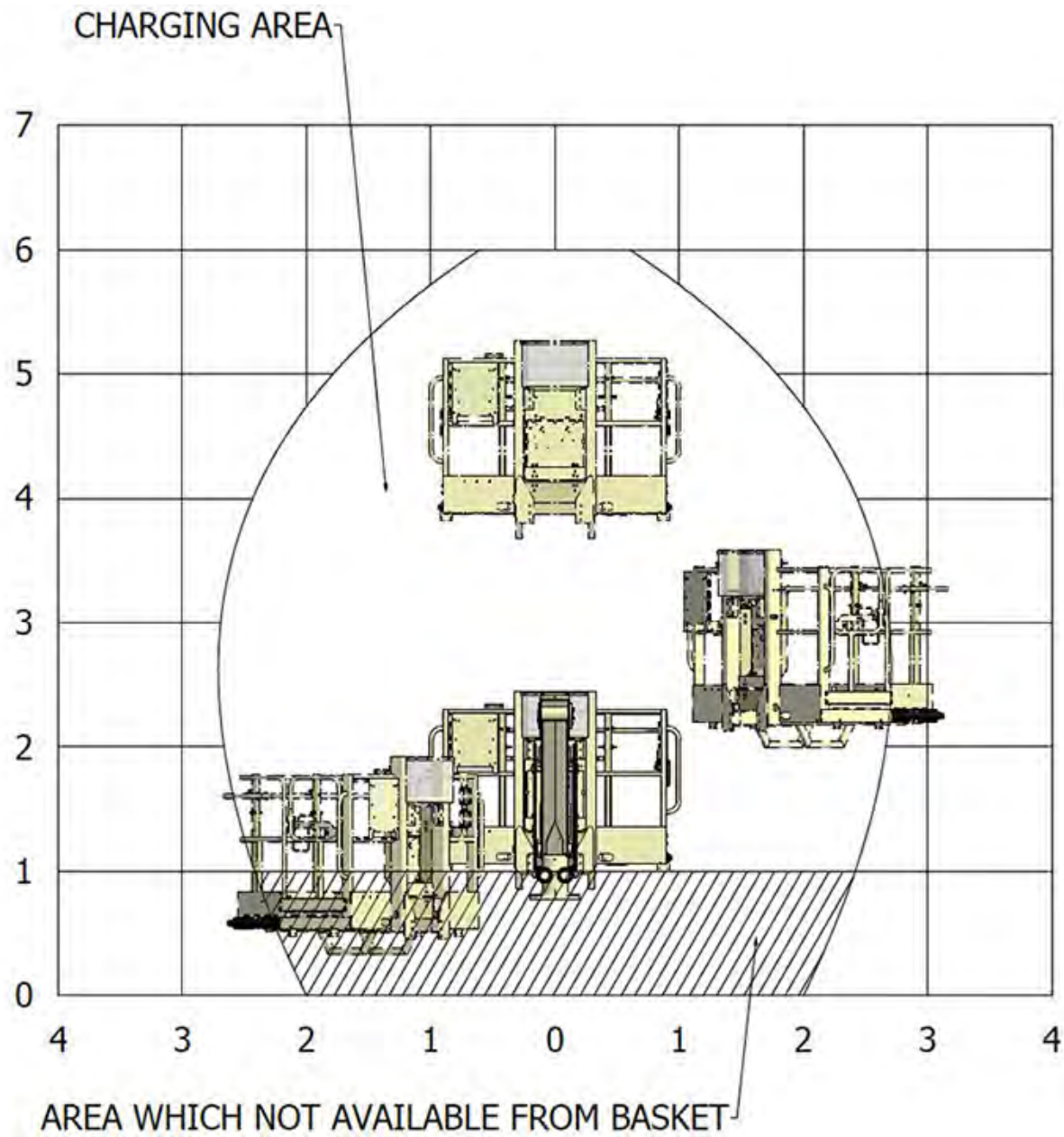
Machine equipped with standard 2-men basket

TURNING RADIUS

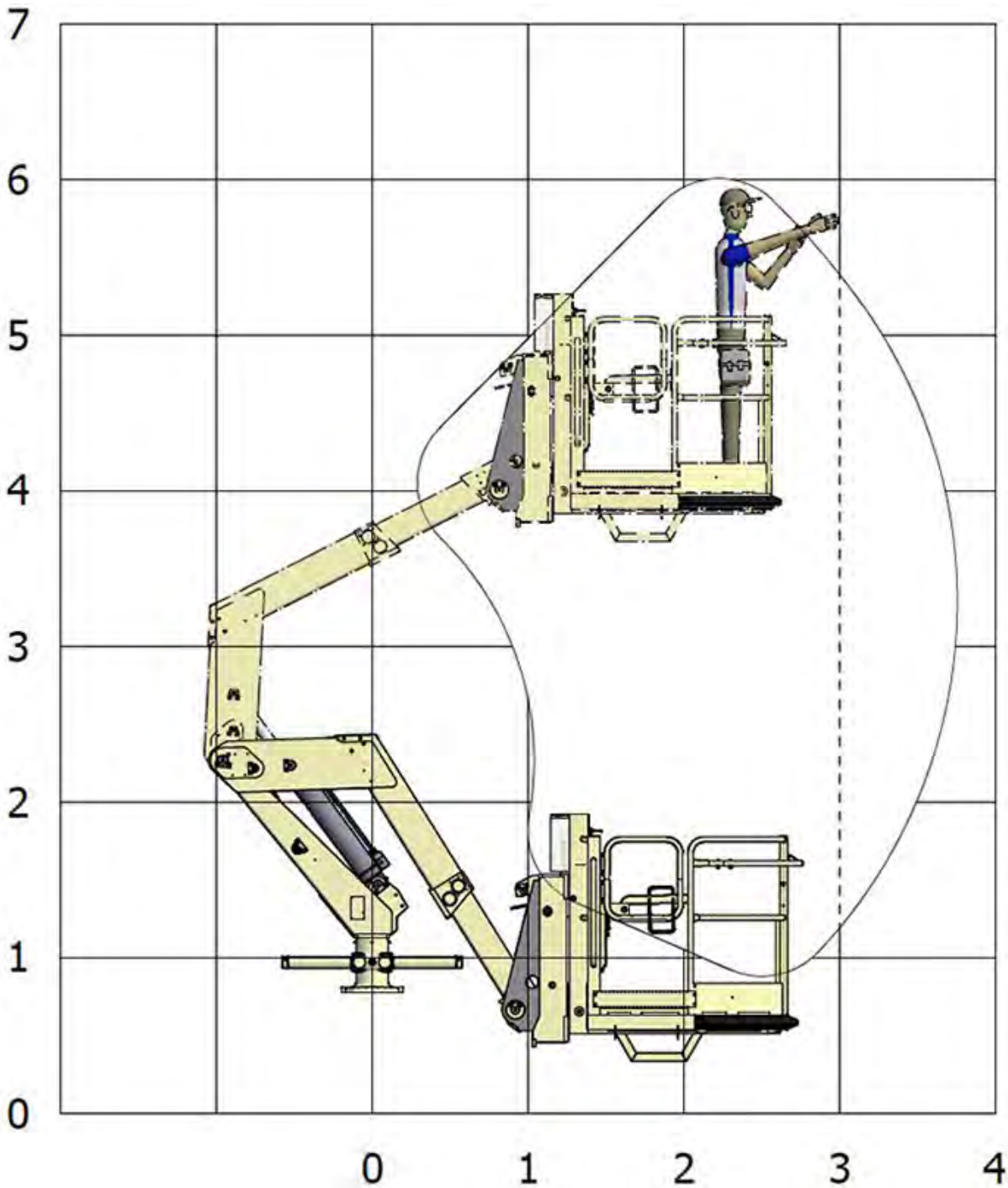


BOOM REACH - NBB435 WITH 66° TURN

Maximized face coverage with single position of machine



BOOM REACH - NBB435 WITH 66° TURN

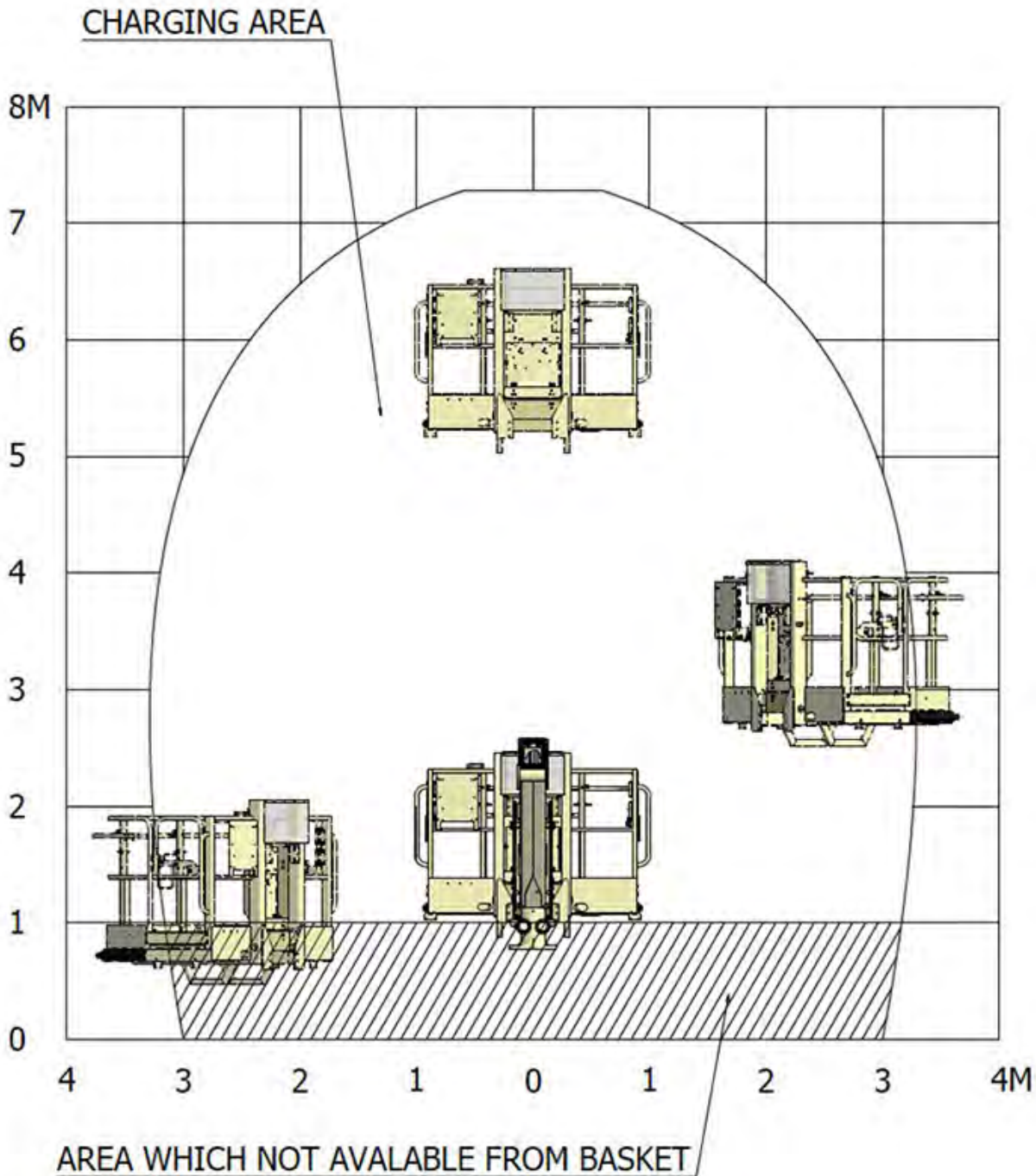


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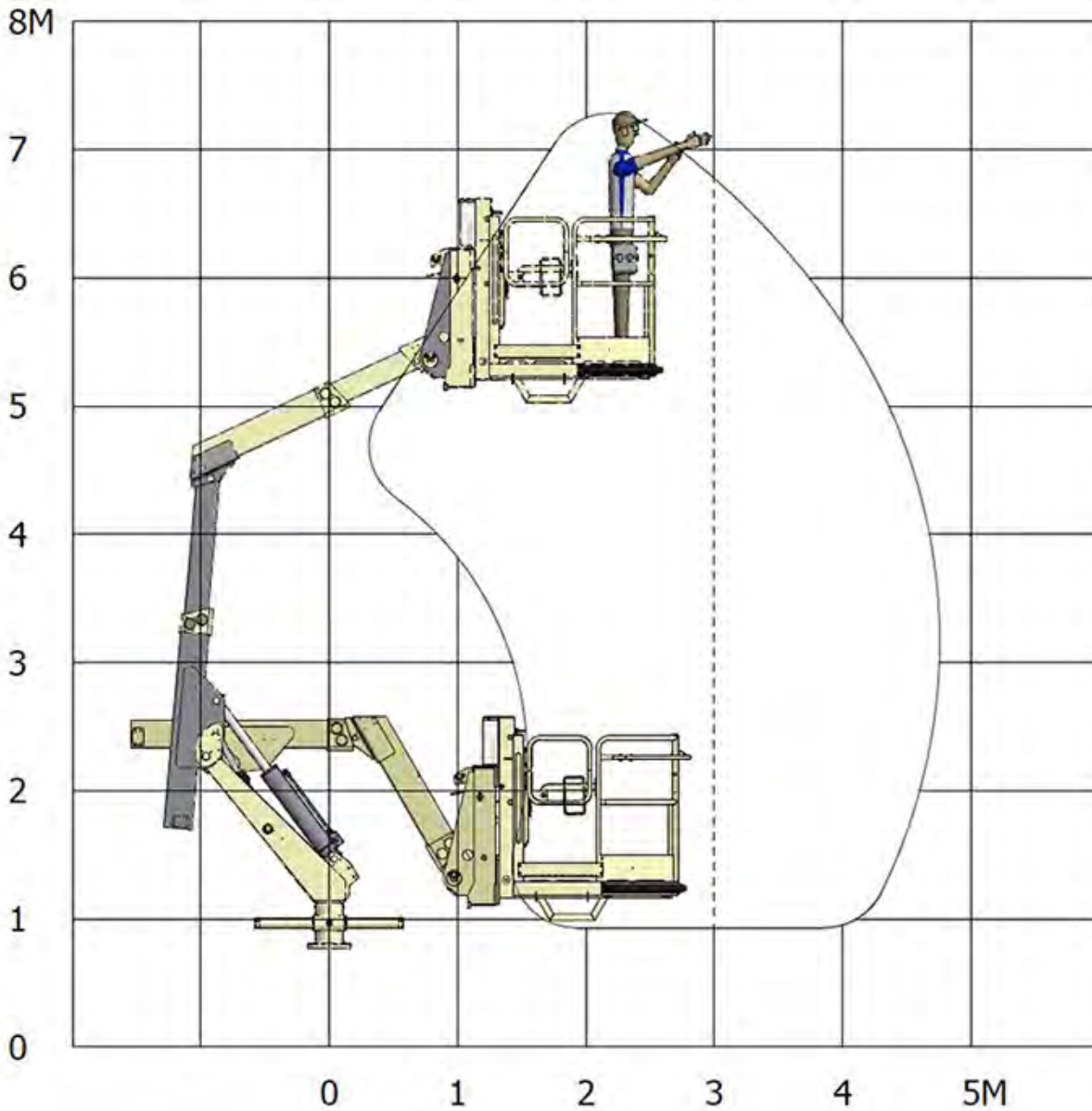
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BOOM REACH - NBB455 WITH 66° TURN

Maximized face coverage with single position of machine



BOOM REACH NBB455 WITH 66° TURN



TRACTIVE EFFORTS

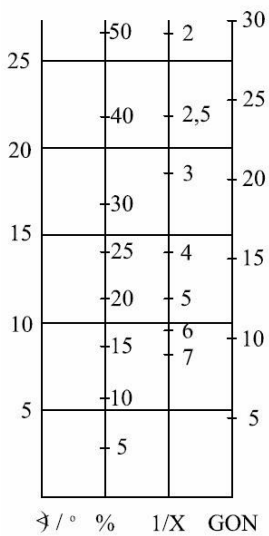
OPERATING WEIGHT

Empty (SF 404)	12 500 kg
Fully loaded (SF 404)	16 000 kg
Empty (SF 504)	13 000 kg
Fully loaded (SF 504)	16 500 kg

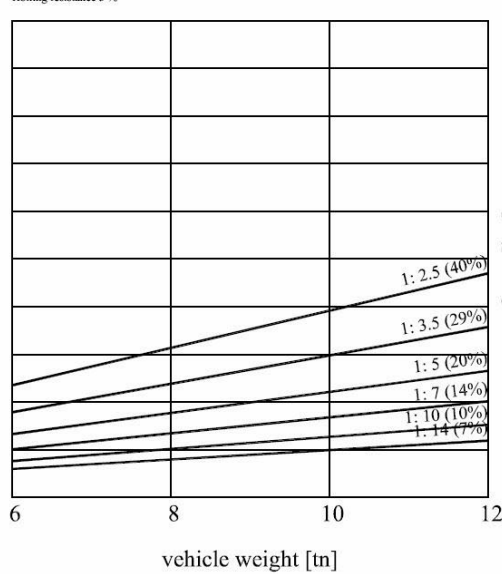
DEUTZ TCD 2012 L4, 96 KW

Performance curve DOC005295

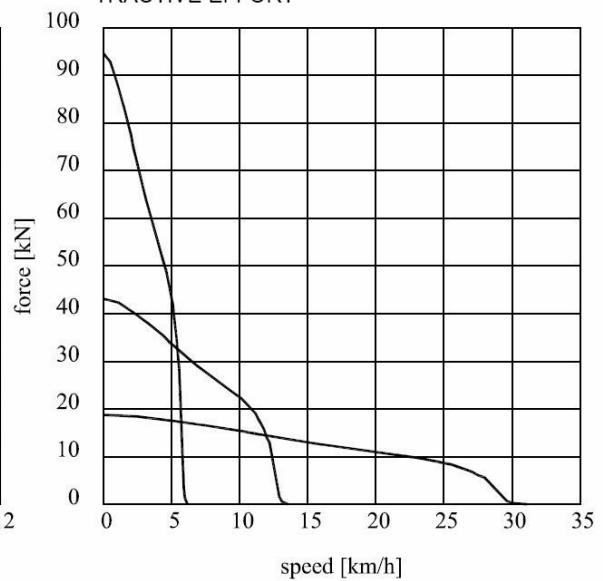
CONVERSION CHART



GRADIENT



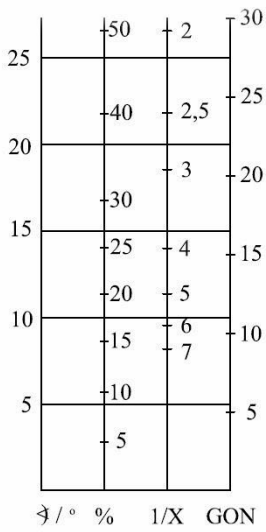
TRACTIVE EFFORT



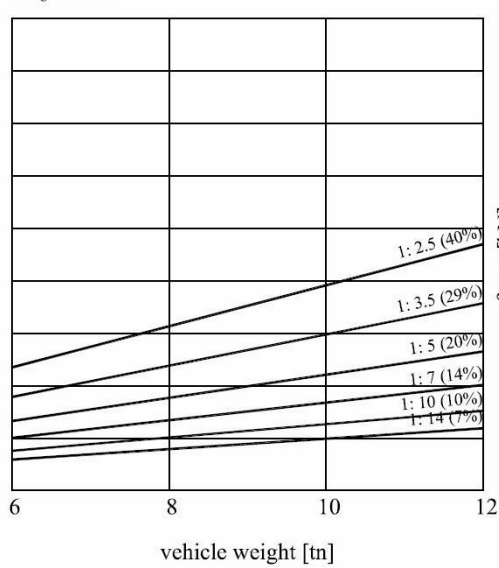
MERCEDES-BENZ OM 904 LA, 90 KW

Performance curve DOC005296

CONVERSION CHART



GRADIENT



TRACTIVE EFFORT

