



Charmec SF 404&504 D(V)



Normet reserves the right to change
this specification without further notice

Pictures may include options and additional equipment.

INTRODUCTION

Charmec SF404&504 D(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 engine, which power range is 96 kW. 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.

Emulsion 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.

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.

PRODUCTIVITY

Power hose pusher with Normet emulsion charging hoses provides excellent reach to vertical production charging holes.

Direct hydraulic operated hose handling system is simple and reliable and in case exact hose retraction speed is required electrically controlled system can be provided.

Development charging can be mechanized by using face charging hose reel which will extract and retract charging hose mechanically with extreme speed accuracy.

Installation of external emulsion unit can be provided as a service which makes possible customer to receive unit ready to work.

TECHNICAL SPECIFICATION

CHARGING SYSTEM

Process platform on middle of unit

Max. load 4000 kg

Center of gravity shown in the dimensional picture

Process platform size 1060 x 2000 mm

- Readiness for external emulsion unit:
 - Basic upfit for external emulsion charging system
18 x 1,5 mm² cable between charging system and basket
 - Hydraulic hoses for charging system:
pressure 3/4", tank 1", leak 1/4", LS 1/4"
 - 24 VDC supply for charging system
- Readiness according customer specification

Detonator box lining:

- Antistatic rubber lining
- IME SLP 22 lining

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

PERFORMANCE

Tramming speed (horizontal): 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

- Nokian Tyres 10.00-20" with standard rims
- Nokian Tyres 10.00-20" with NDT inspected rims

STEERING

Orbitrol type hydraulic frame steering

Frame articulation +/- 40°

HYDRAULIC SYSTEM

Variable displacement pump system 190 bar at 2200 rpm:

- Single pump for carrier and process 135 l/min
- Separated pumps for carrier 95 l/min and for process 135 l/min

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)
- Analytics license (includes connectivity hardware)

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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

Pictures may include options and additional equipment.

ACCESSORIES

PROCESS PRODUCTIVITY

- Engine end support legs (mandatory if NBB455 basket boom is selected or charging system empty weight less than 900 kg or front mounted compressor selected)
- Installation service for external emulsion charging system
 - CE-marking for installation of external emulsion charging system
- Compressed air inlets with water separator on carrier
- Compressed air outlet and oil lubrication unit in basket
- Water inlet with filter and pressure regulator
- Electrically controlled face charging reel and valve with face charging hose 25 x 20 mm, 15 m (n/a with production charging)
- Production charging (n/a with face charging reel, hose reel n/a with electrical system)
 - Direct hydraulic controlled hose pusher
 - Electrically controlled hose pusher and valve

Hose diameter and length (includes 4 pcs of groove pulleys)

- Without hose
 - 32 x 23 mm, 50 m
 - 40 x 31 mm, 50 m

Additional groove pulleys, 4 pcs

- 28 mm
- 32 mm
- 40 mm

Hose guides

- Hose guide for upward production charging
- Extension for hose upward hose pusher
- Diverting pulley for downward production charging

Charging hose reel material

- Steel
- Stainless steel

Production charging reel coupling size

- 1 ½" rotary coupling and tube
 - 1" rotary coupling and tube
- 4 m³/min front mounted onboard compressor
 - Electrically driven
 - Hydraulically driven
- 230 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 with diesel driven compressor. Separate pumps for compressor and process 65 l/min at 1500 rpm

Hydraulic power pack size 22 kW with electrically driven compressor. Single pump for carrier and process 90 l/min at 1500 rpm

Socket supply voltage

- No sockets
 - 220/230/240 V (no UL/CSA or AS/NZS approval)
 - 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 with recording support
- 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 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

SAFETY

- Cabin door puddle lights
- Extra 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
- 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

SERVICES

NORMET SERVICES

Normet is committed to servicing its customers all over the world. We provide service from a single machine to an entire fleet. The Normet service offering consists of many different products from delivery of parts and training to fleet performance agreements.

More information check [normet.com](https://www.normet.com):

<https://www.normet.com/en/products-and-services>

For any questions about Normet Services contact local Normet.

<https://www.normet.com/en/contact/>

SPARE PARTS

As a leading global Original Equipment Manufacturer, we are committed to providing a complete solution to your spare parts needs. All of Normet's spare parts are manufactured to the highest possible standards to help maintain the safety and profitability of your projects. Our spare parts improve efficiency and total cost of ownership throughout your operations.

Start a carefree journey with Normet equipment by having the right selection of parts available from the beginning.

Spare part recommendation / Start-up Spare Part package:

Available for the first 2000h*: includes periodical service parts, most common wearing parts and other recommended parts. (*Recommendations are based on average hours that can vary depending on worksite conditions.)

Underground, every part is critical!

More information check <https://www.normet.com>

SERVICE AGREEMENTS

Service agreements are always customized to meet our customer needs, consisting of various Normet service products. The service solution is created together with the customer and the level of an agreement can vary with different support agreements (including e.g. parts, periodical maintenance, on-call services, and audits) up to guaranteed fleet availability or process performance (including e.g. parts, all maintenance activities, operator trainings and process audits).

Note that we can provide Digital solutions with connected equipment.

More information check [normet.com](https://www.normet.com).

TRAININGS

Training services can be tailored to your individual needs and range from equipment service training to process application training.

We offer a sustainable training path from the beginning of your operation to the execution stage of your project.

More information check [normet.com](https://www.normet.com).

COMMISSIONING

Equipment commissioning concerns **equipment familiarization**. This is included as part of Normet vehicle delivery. Safety introduction and operating basics for Normet Equipment. Review of Normet user and spare parts manuals. Hands-on equipment safety device operational training. Ensure product quality and customer satisfaction during handover.

Commissioning includes machinery handover to customers and safety operating principles without technical insights or process application training.

EXTENDED COMMISSIONING

We offer an extended training package on top of standard commissioning. Normet provides extended commissioning services that offer basic insights into maintenance manuals, periodical and daily maintenance, as well as modern operating perspectives to maximize handling efficiency. Safety-oriented training ensures reliable operations for Battery Electric Vehicles and Diesel-Driven based on your vehicle fleet. This cost-effective solution covers the essential aspects of equipment operation, safety, and maintenance schedules.

To ensure continuous and maximized safe operations with your new equipment and to expand your knowledge scale of operations, this option is the most suitable and recommended option for extending your new equipment training. This cost-effective solution covers the essential aspects of equipment operation, safety, and maintenance schedules.

UPGRADES AND MODIFICATIONS

We build our machines to last. We also understand that your needs on the ground can change - and reacting to that change makes a big difference in your productivity. Normet Upgrades & Modifications provide you with access to product improvements that meet your evolving requirements and let you stay one step ahead of the curve.

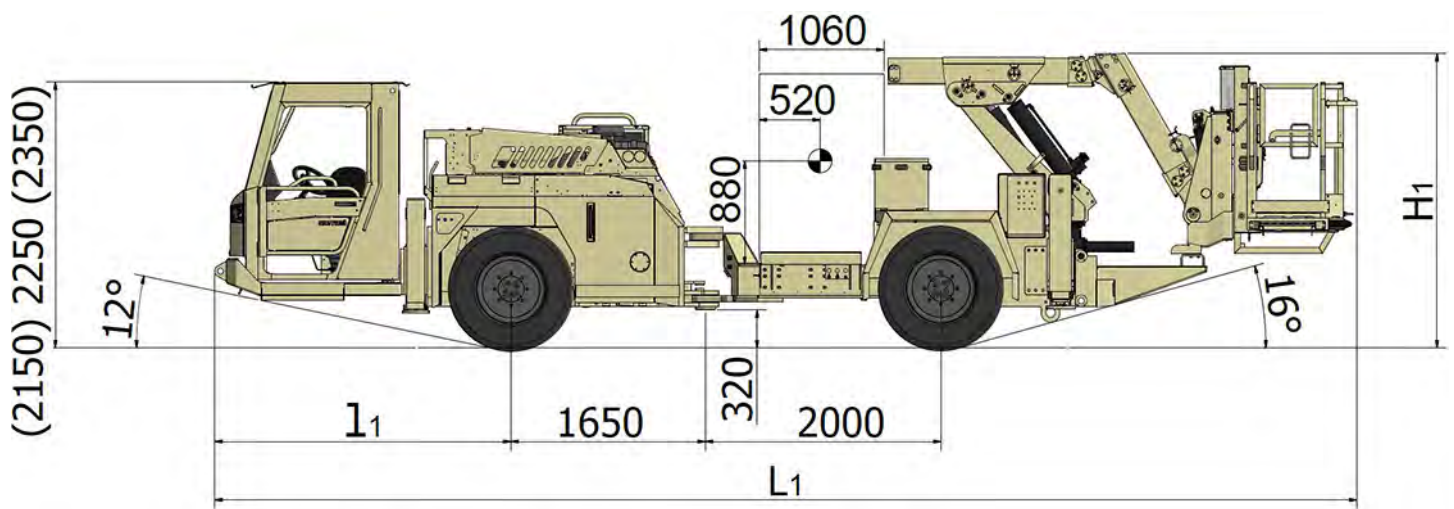
Contact your local Normet office for Upgrade offering to your fleet.

More information check [normet.com](https://www.normet.com).

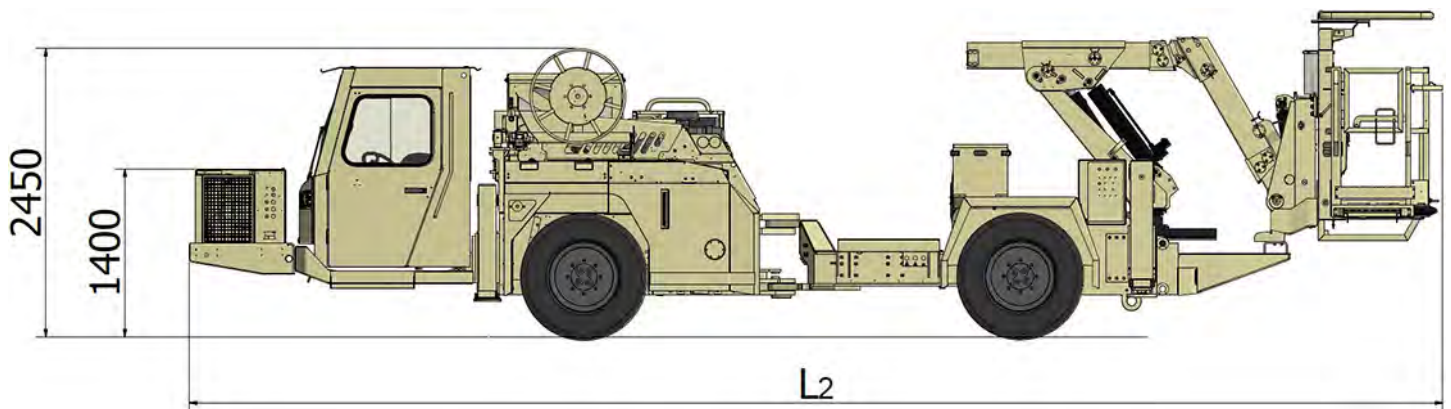
DIMENSIONS

	SF404 D	SF504 D		SF404 D	SF504 D
L1	9100 mm	9700 mm	h4	6200 mm	7500 mm
L2	10 080 mm	10 500 mm	R1	6620 mm	6830 mm
l1	2370 mm	2520 mm	R2	6370 mm	6460 mm
H1	2370 mm	2500 mm	C1	3490 mm	3700 mm
h1	950 mm	1030 mm	C2	3820 mm	4030 mm
h2	2630 mm	2690 mm	C3	3240 mm	3330 mm
h3	3920 mm	5250 mm	C4	3570 mm	3660 mm

SIDE VIEW – BASIC MACHINE



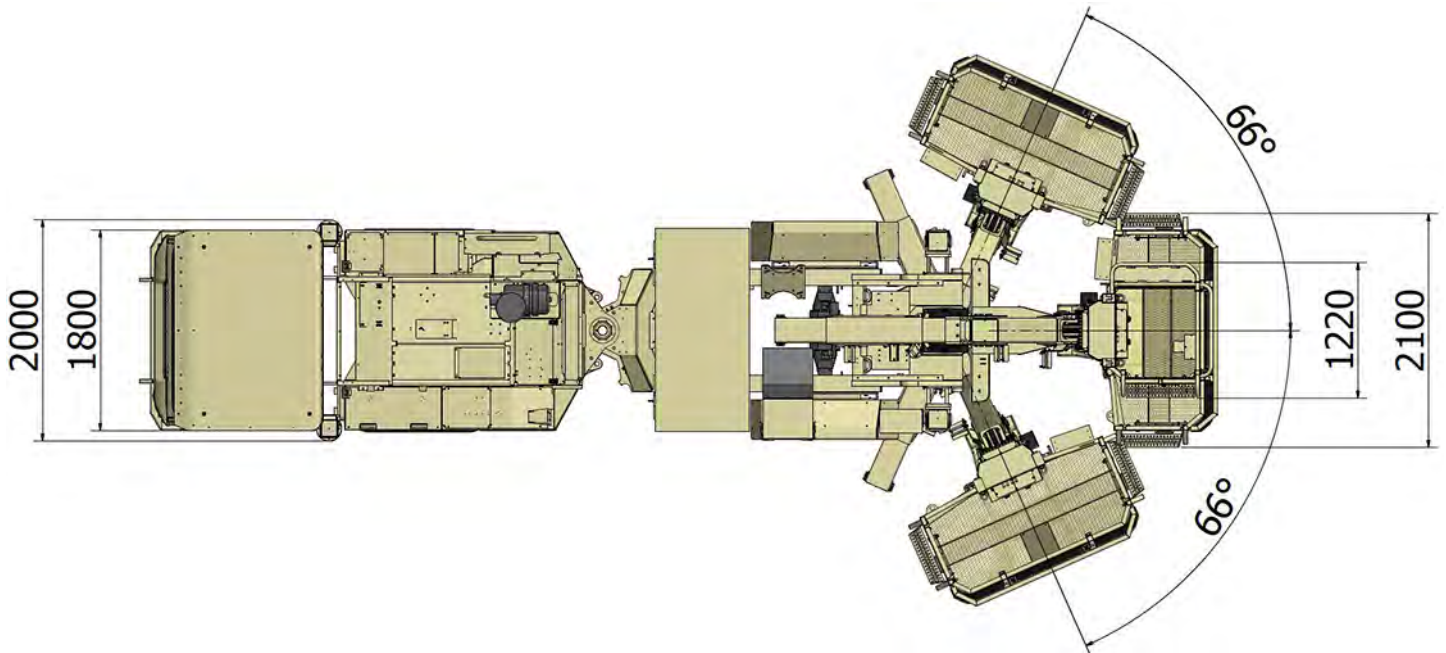
SIDE VIEW – MACHINE WITH OPTIONS



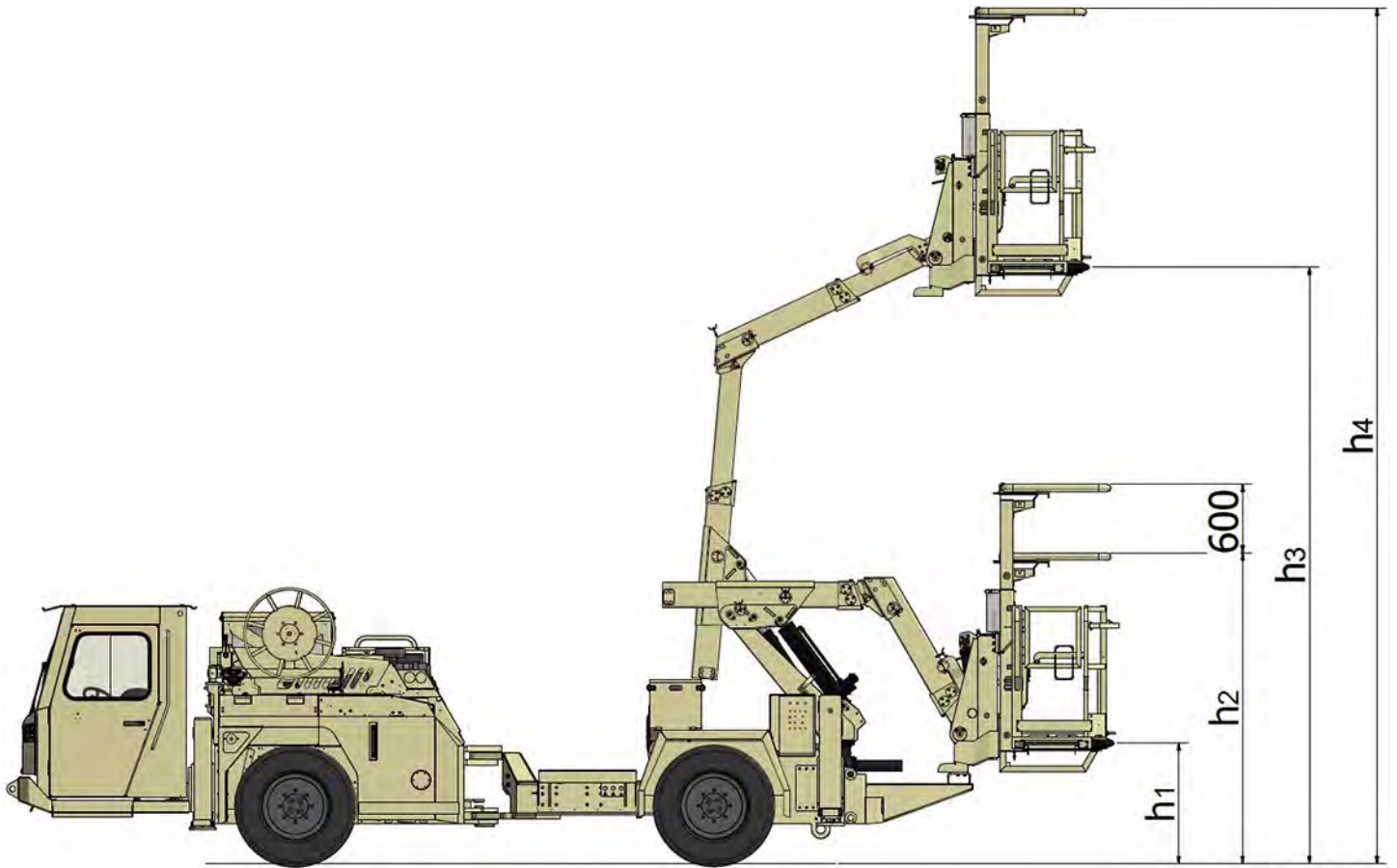
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TOP VIEW



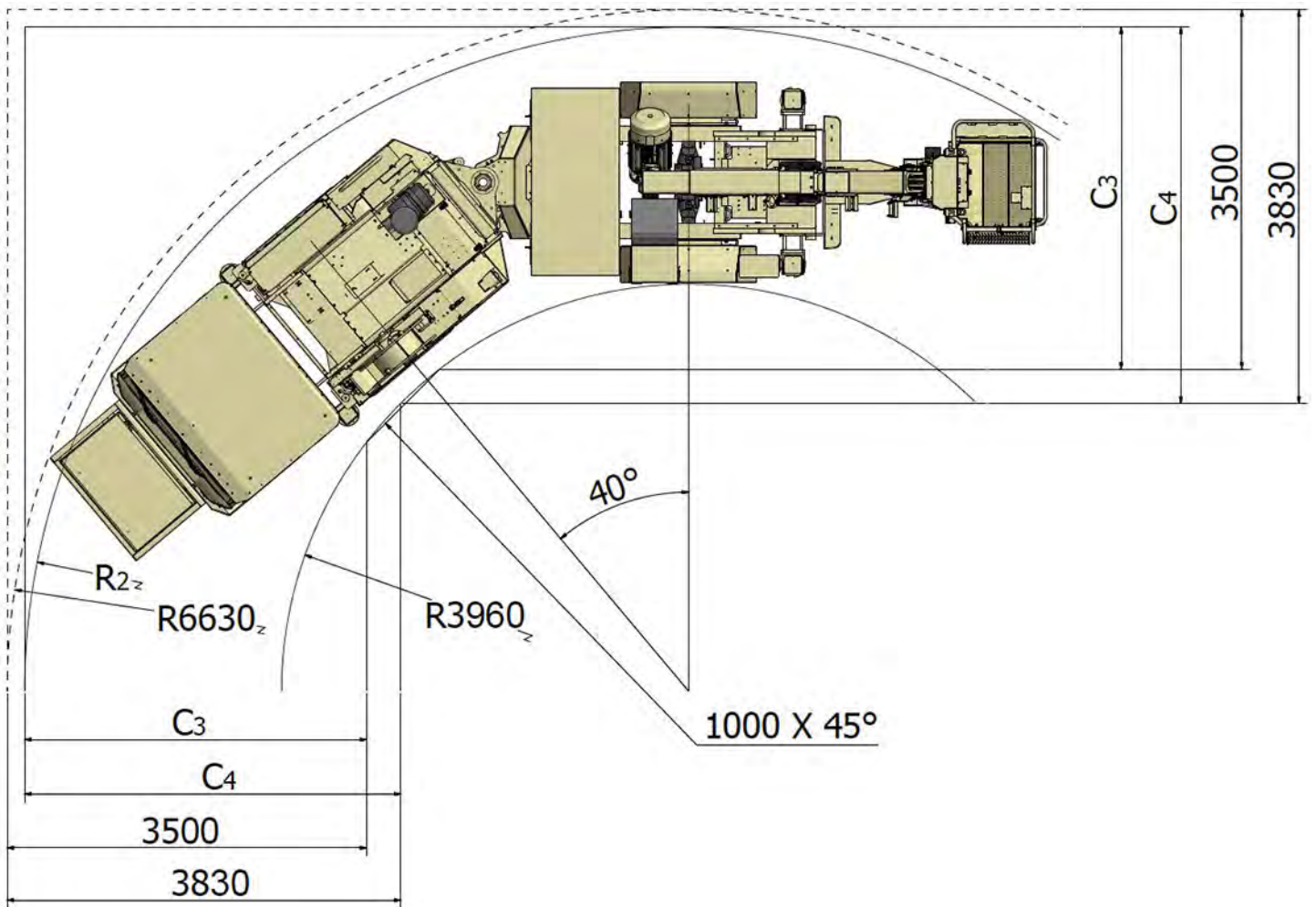
BOOM REACH



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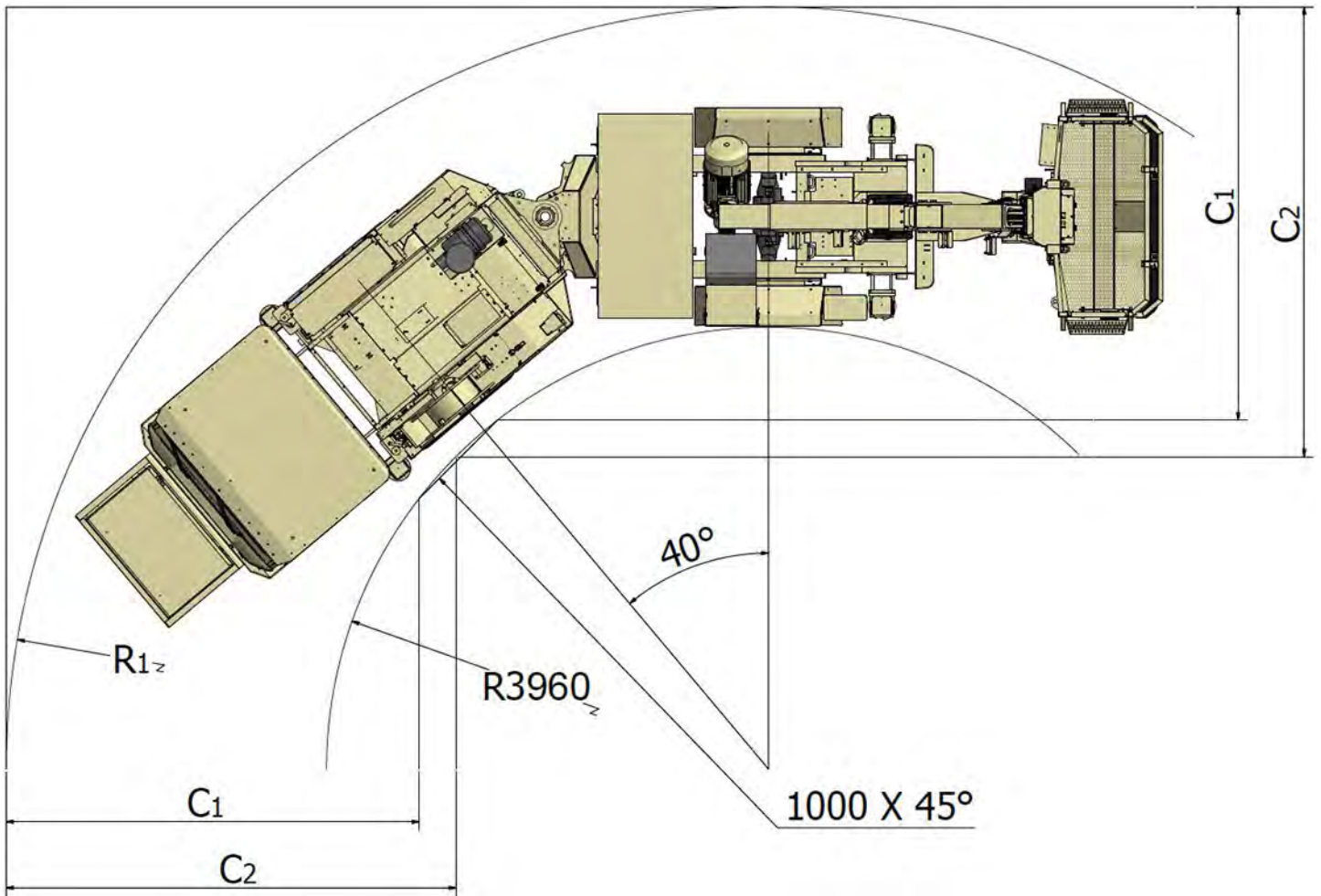
Pictures may include options and additional equipment.

TURNING RADIUS



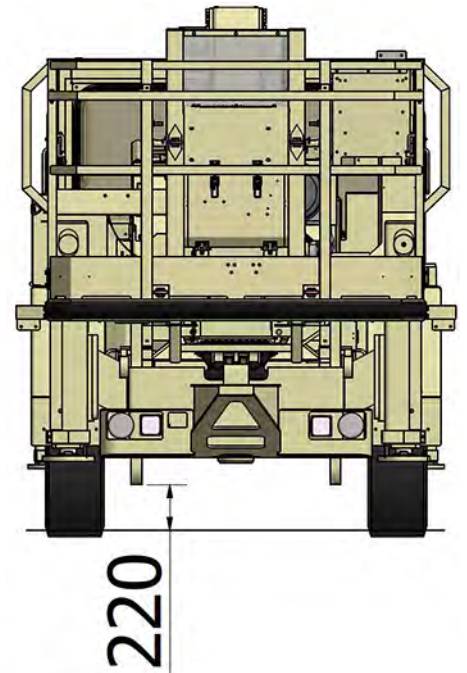
Machine equipped with one man basket

TURNING RADIUS



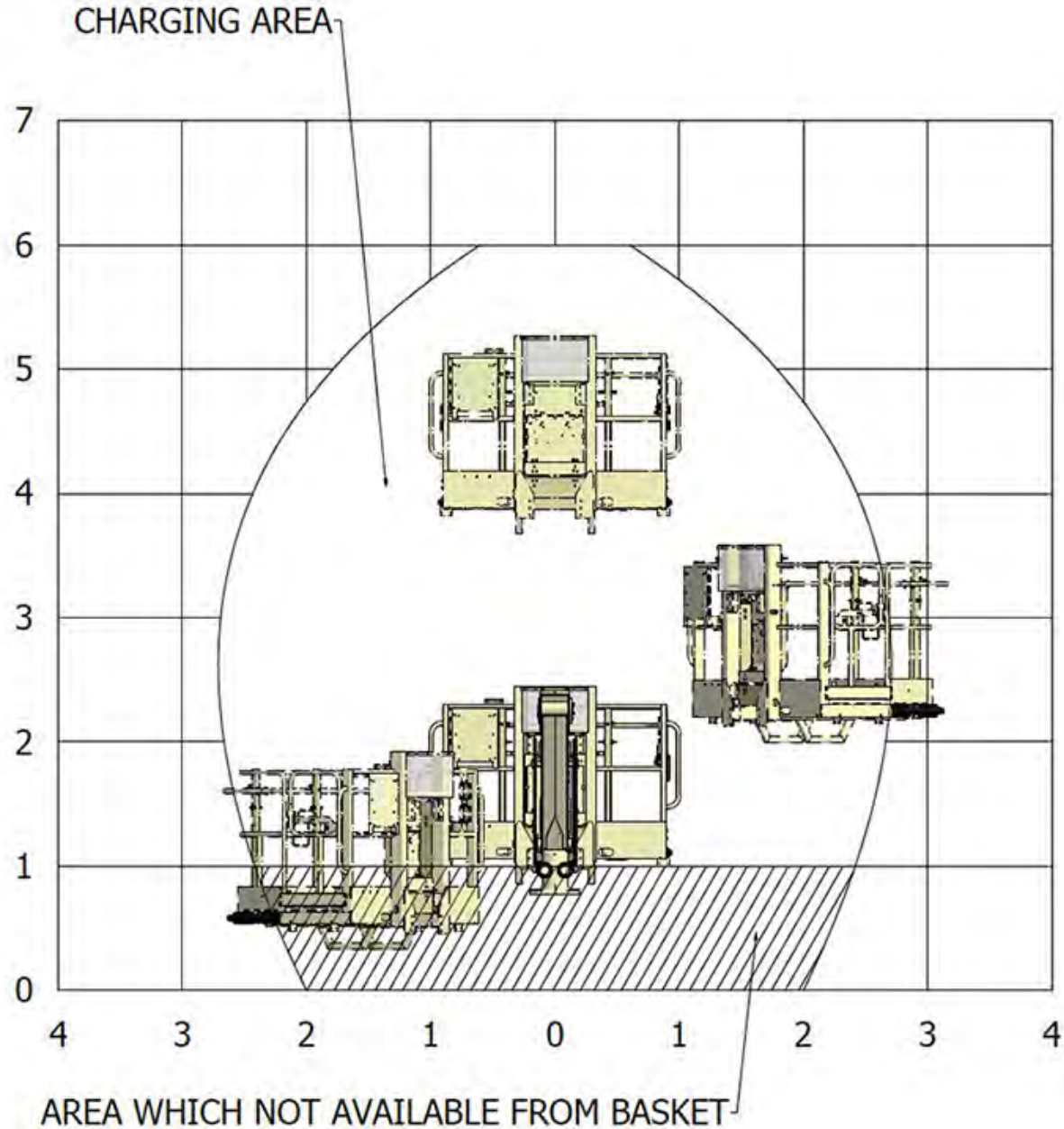
Machine equipped with standard 2-men basket

FRONT AND BACK VIEWS

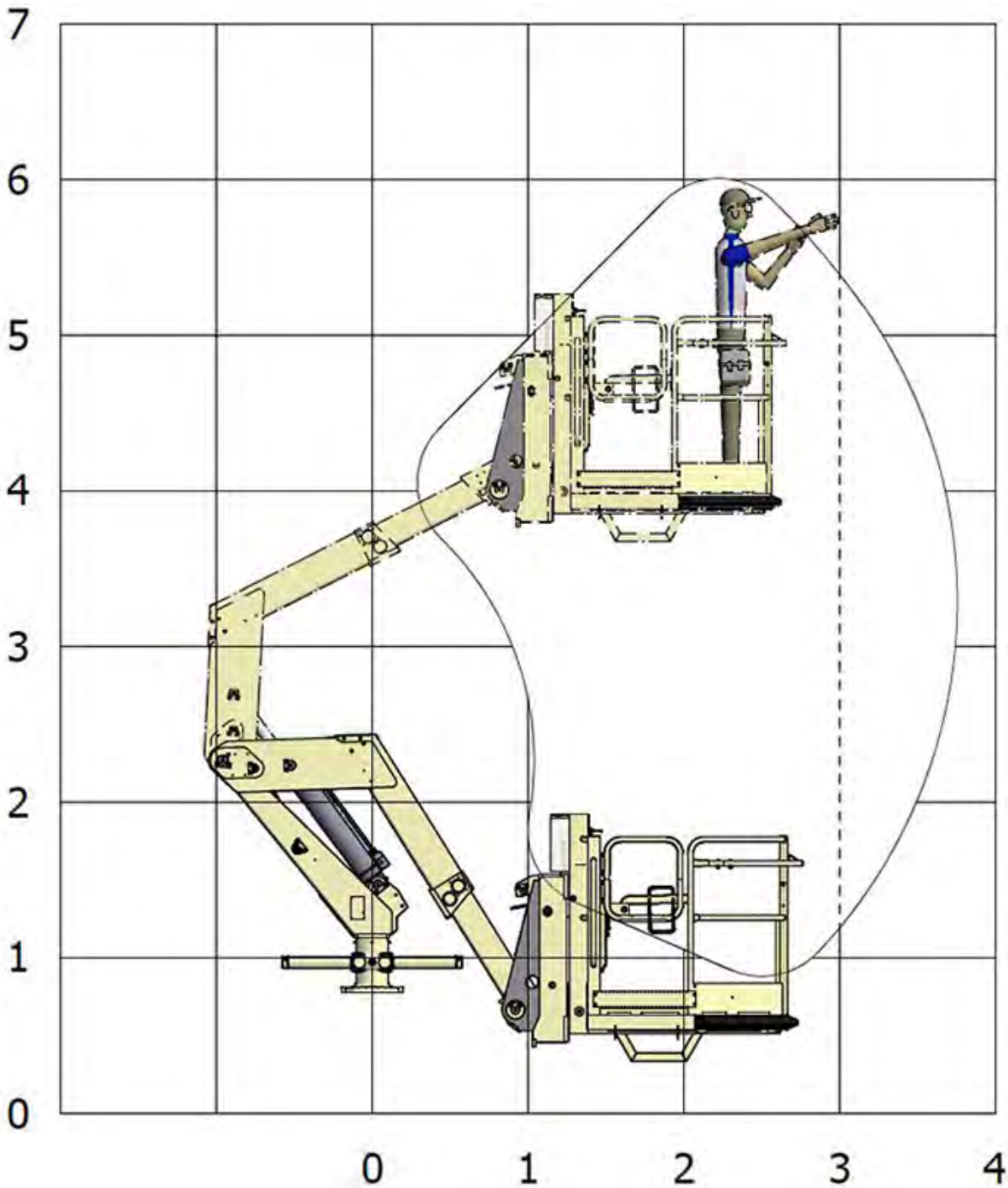


BOOM REACH - NBB435 WITH 66° TURN

Maximized face coverage with single position of machine

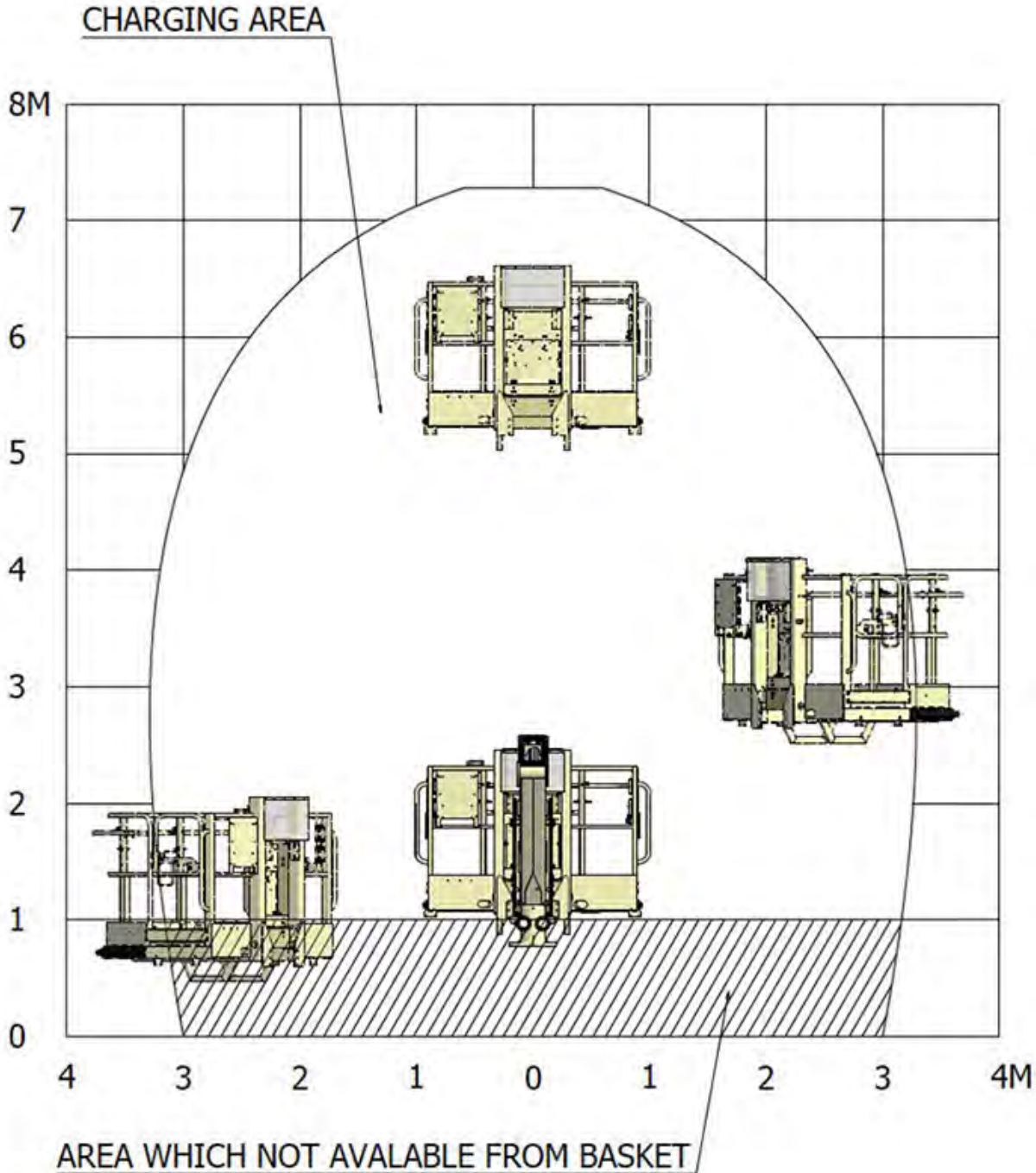


BOOM REACH - NBB435 WITH 66° TURN

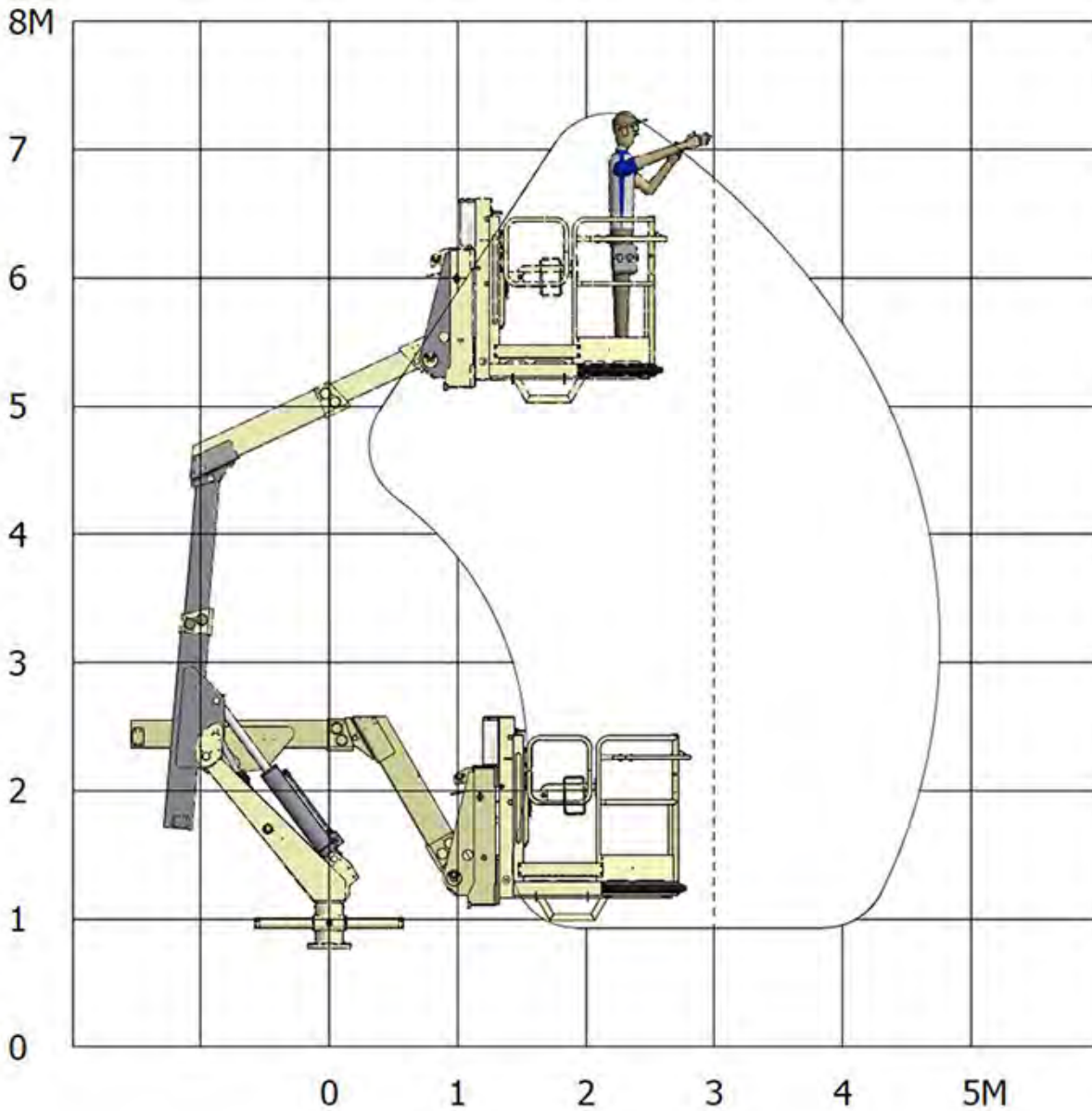


BOOM REACH - NBB455 WITH 66° TURN

Maximized face coverage with single position of machine



BOOM REACH NBB455 WITH 66° TURN



TRACTIVE EFFORTS

OPERATING WEIGHT

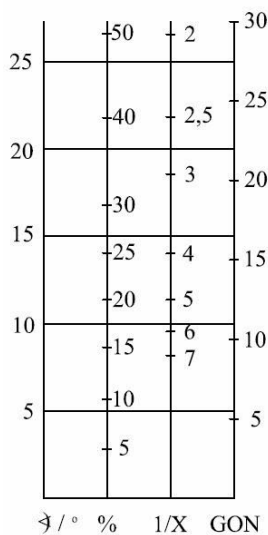
Empty (SF 404)	11 700 kg
Fully loaded (SF 404)	17 000 kg
Empty (SF 504)	12 200 kg
Fully loaded (SF 504)	17 500 kg

final machine weight variate in agree with selected options

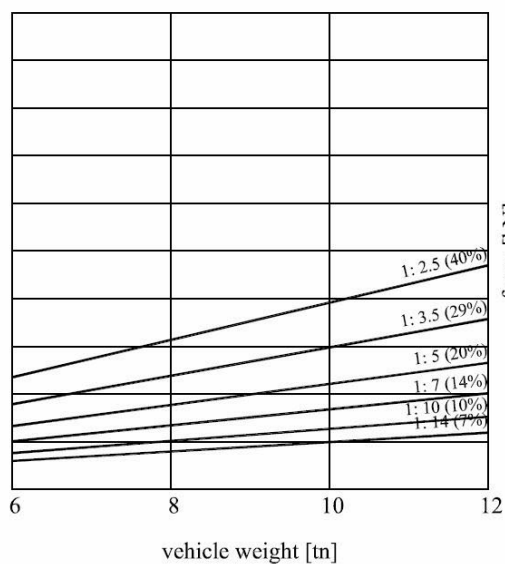
DEUTZ TCD 2012 L4, 96 KW

Performance curve DOC005295

CONVERSION CHART



GRADIENT
Rolling resistance 3 %



TRACTIVE EFFORT

