# Charmec
# MF 605 D(V) SE&LE

Normet reserves the right to change
this specification without further notice

Pictures may include options and additional equipment.

**Normet Oy**
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# INTRODUCTION

**Charmec MF 605 D(V) SE&LE** are sister models having both 6-tons payload for center mounted underground bulk emulsion kits.

Short End version is agile and can perform well both in development and production charging.

Long End version has more room to utilize maximum payload which means up to 4-tons of bulk emulsion brought to site at once.

This considerably reduces the need for driving back and forth to explosives warehouse, which increases the process efficiency whilst keeping machine fit as constant driving is experienced to be the main reason for charging equipment break downs. Less driving, higher productivity, and less machine breakdowns like basket boom wall contacts.

Capable mine proof NBB3S-series basket boom has reach and coverage from 4x4 m to 8x8 m tunnel envelope covering bulk of development tunnel needs in mining.

## POWER TRAIN

M-series units have powerful 4-cylinder liquid cooled turbocharged engines, which power range are between 110 kW to 120 kW. Available emission standards are Tier 3 / Stage IIIA and Stage V that provides 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.

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. 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.

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# TECHNICAL SPECIFICATION

## CHARGING SYSTEM

Process platform on middle of unit

Max. load 6000 kg

Center of gravity shown in the dimensional picture

Process platform size:
- Short end, 800 x 2000 mm
- Long end, 1600 x 2000 mm

Detonator box lining:
- Antistatic rubber lining
- IME SLP 22 lining

Compressed air inlets with water separator on carrier and outlet with lubrication unit in basket

Water inlet with filter and pressure regulator on carrier

## NBB3S BASKET BOOM

Aerial work platform

2-operator basket

Lifting capacity (without optional equipment) 500 kg

Max. lifting height and wall coverage specified in dimensional drawing

Automatic levelling of basket

Start/stop from basket

Battery operated emergency lowering system

Person lifter safety system:
- Dangerous movement preventing system
- Dangerous movement warning system with overload monitoring
- Dangerous movement warning system without overload monitoring

## ENGINE AND TRANSMISSION

- **Deutz TCD 2013 L4, 120 kW/2300 rpm, Tier 3 / Stage IIIA approved**

  Exhaust system for Deutz engine:
  - Catalytic exhaust gas purifier and muffler
  - Diesel particulate filter (DPF)

  Fuel tank capacity 110 l

  **Dana 24000 series powershift transmission**
  3 speeds forward and reverse
  4-wheel drive
  Manual gear selector

- **Cummins QSB4.5, 110 kW/2300 rpm with exhaust brake, Tier 3 / Stage IIIA approved**

  Exhaust system for Cummins engine:
  - Catalytic exhaust gas purifier and muffler
  - Diesel particulate filter (DPF)

  Fuel tank capacity 110 l

  **Dana 24000 series powershift transmission with lock-up**
  3 speeds forward and reverse
  4-wheel drive

  Gear selector:
  - Manual
  - Automatic

- **Cummins B4.5, 120 kW/2500 rpm with exhaust brake, Stage V approved**

  Requires diesel exhaust fluid (DEF) and Ultra-low sulphur diesel (ULSD)

  Diesel particulate filter (DPF)

  Selective catalytic reduction (SCR)

  DEF tank capacity: 19 l

  Fuel tank capacity: 105 l

  **Dana 24000 series powershift transmission with lock-up**
  3 speeds forward and reverse
  4-wheel drive

  Gear selector:
  - Manual
  - Automatic

## PERFORMANCE

Tramming speed (horizontal):

| | |
|---|---|
| Deutz | 26 km/h |
| Cummins | 26 km/h |
| Lateral gradient for tramming (continuous) | 4º |
| Longitudinal gradient for tramming (continuous) | 9º |
| Lateral gradient for operation | 3° |

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## AXLES AND BRAKES

Load end axle:
Dana 123 series fixed

Engine end axle:
Dana 123 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 12.00–20” 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 | 110 l |

## 24 VDC ELECTRICAL SYSTEM

Main switch:
- Mechanical switch in battery box
  - Electric switch with control in cabin and service switch in battery box
  - Electric switch with control in cabin, start isolator and service 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

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## MACHINE CONNECTIVITY

Machine connectivity hardware (WLAN/3G/4G/LTE)

Connectivity services:
- Analytics license for three years
  (includes access to analytics portal)
- Remote monitoring for one year

## TECHNICAL DOCUMENTATION

Standard documents:

Instruction manuals, hard copy 2 pcs:
- English
- One of destination EU languages

Spare parts manuals, hard copy 2 pcs:

English

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:
- 2 x 12 kg
- 2 x Ansul Sentry

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

Extendable support legs at the load end

Grounding straps:
- Flat cable
- Chain

Text labels in:
- En/One of destination EU languages
- Other language

Measurements:
- Noise
- Vibration
- Emissions

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# ACCESSORIES

## PROCESS PRODUCTIVITY AND SAFETY

- Basic upfit for external emulsion charging system
  18 x 1,5 mm$^2$ 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
- Engine end support legs
- Production charging*
  Direct hydraulic controlled hose pusher
  (includes 4 pcs of groove pulleys)

  Charging hose outer diameter
  - 32 mm
  - 40 mm

  - Without hose
  - 50 m charging hose

  - Additional groove pulleys 4 pcs

  Hose guides
  - Hose guide for upward production charging
  - Diverting pulley for downward production charging

  Stainless steel production charging reel

  Production charging reel coupling size
  - 1 1/4” rotary coupling and tube
  - 1” rotary coupling and tube

- Onboard compressor
  - 2.5 m$^3$/min
  - 0.45 m$^3$/min
- Hydraulically driven pressure washer with hose reel:

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

  Stainless steel reel and rod
- Extra oil cooler
- 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
- Boom suspension
- 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
- 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 (cULus)
    - 440 V (IEC)
    - 480 V, (460 V) (cULus)
    - 600 V, (575 V) (cULus)
    - 1000 V (cULus no sertified)

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

  Hydraulically driven reel with spooling device

  Cable in / out reeling function from
  the cabin and near the reel
  - With supply cable 100 m
    (excluding plug)
  - Without supply cable
    (must be sourced and installed locally)

  Pilot circuit
  - No
  - Yes

  Hydraulic power pack 22 kW:
  Single pump for carrier and process 90 l/min at 1500 rpm

*Reduces lifting capacity of boom

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## CARRIER PRODUCTIVITY

- Protective grids for open cabin
- Accessories for enclosed cabin:
  - Audio system
  - Air conditioning with heating
  - Cabin pressurization and air filtration system (ISO 23875-compliant)
  - Heated mirrors
- 12 V, 18 A power supply in cabin with socket and connector
- 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)
- Fast fuel filling system
- 24 VDC operated 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, 1 displays with recording support
- Spare rim and tyre
- Toolbox and maintenance tools
- Interior cooling fan
- Wax tape for electric connectors

## 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, Ansul A-101 dry chemical
  - Manual activation
  - Automatic detection, Checkfire 110
- Gear lockout for third gear
- Engine end safety rails and ladder (n/a with electrical system)
- Emergency pump for brake release and steering
- Redundant brake monitoring system
- Hydraulic pressure monitoring kit
- Protection guards for tunnel curtains
- Tyre pressure indicators
- Additional wide angle mirrors (n/a with heated mirrors)
- Warning triangles
- Flashlight with charger
- Wheel chocks with brackets

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# 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/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.

## 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.

## 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 breaker boom systems. 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.

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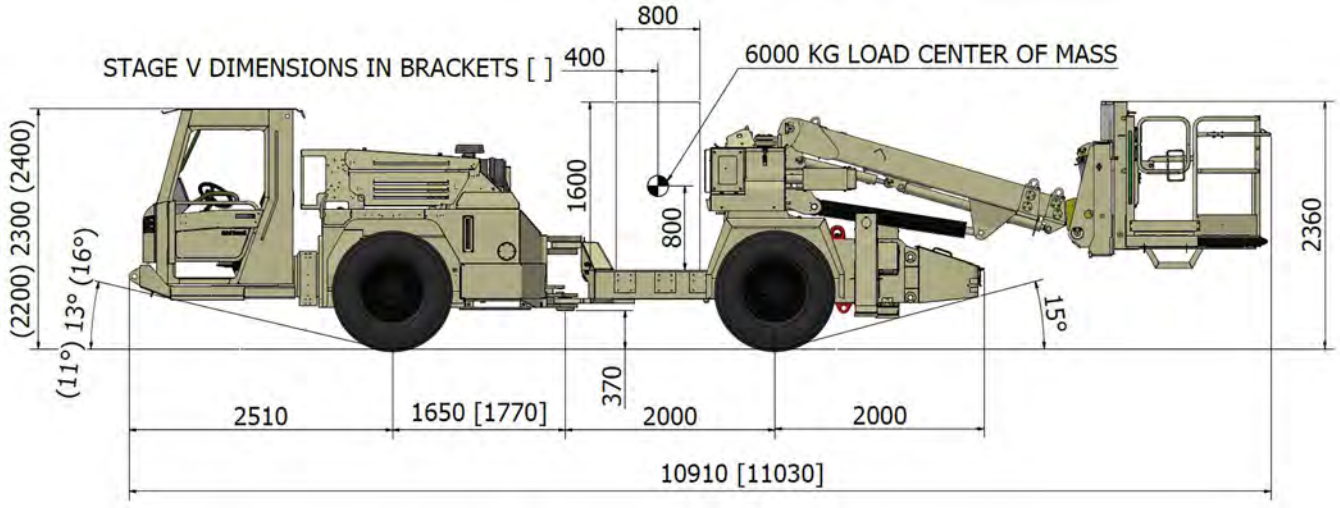
# DIMENSIONS

| | SE | LE |
|---|---|---|
| **Length** | 10 910 mm | 11 710 mm |
| **Width** | 2000 mm | 2000 mm |
| **Height** | 2360 mm | 2360 mm |
| **Wheel base** | 3650 mm | 4450 mm |
| **Track** | 1670 mm | 1670 mm |

| | SE | LE |
|---|---|---|
| **Ground clearance as shown** | 370 mm | 370 mm |
| **Turning radius outer** | 7820 mm | 8750 mm |
| **Turning radius (with boom turned 10°)** | 7200 mm | 8080 mm |
| **Turning radius inner** | 4480 mm | 5610 mm |

## SIDE VIEW – BASIC MACHINE

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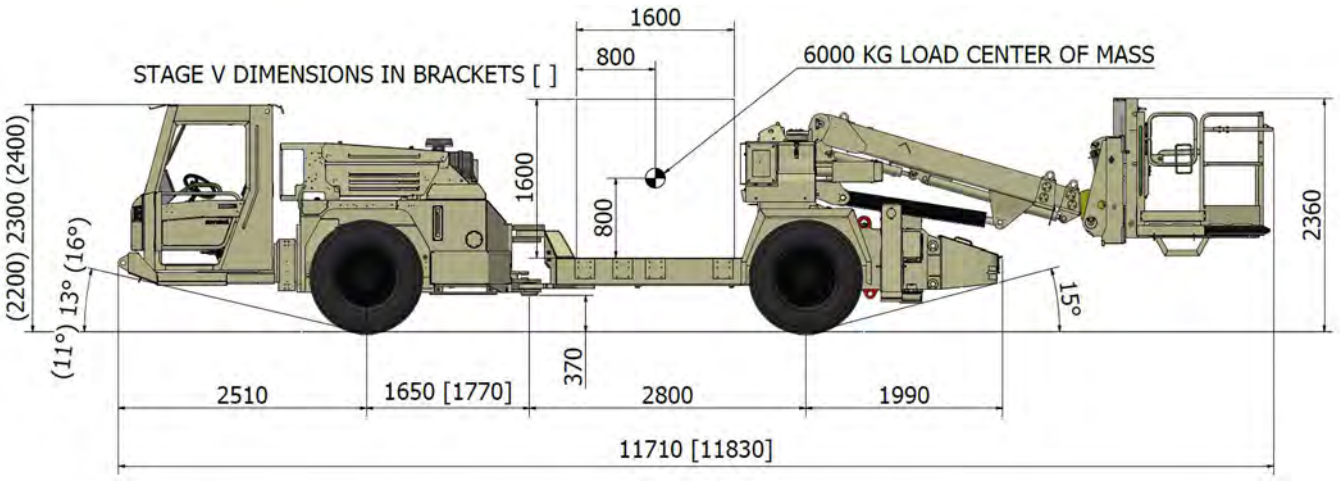
## SIDE VIEW – BASIC MACHINE

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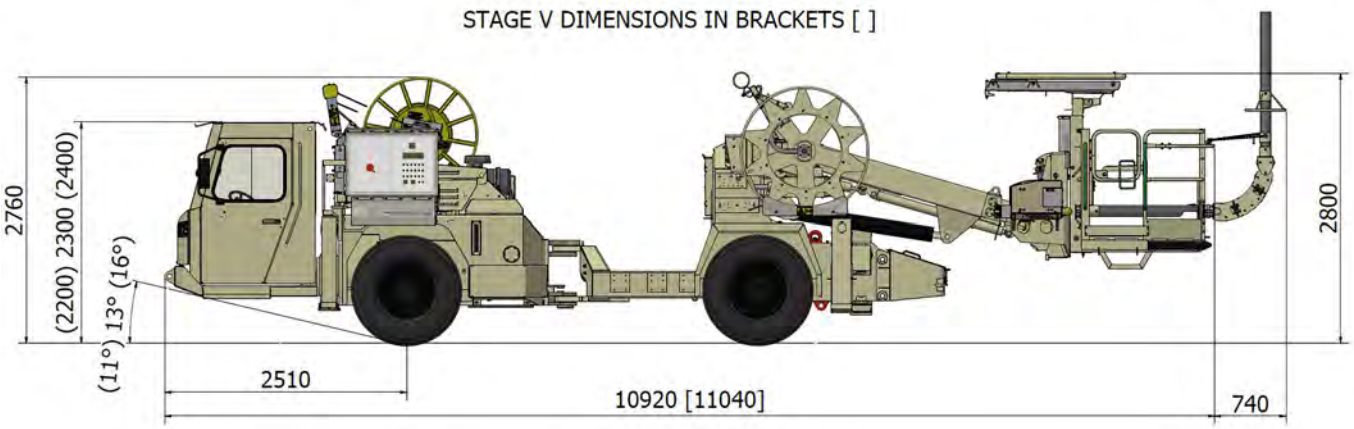
## SIDE VIEW – MACHINE WITH OPTIONS

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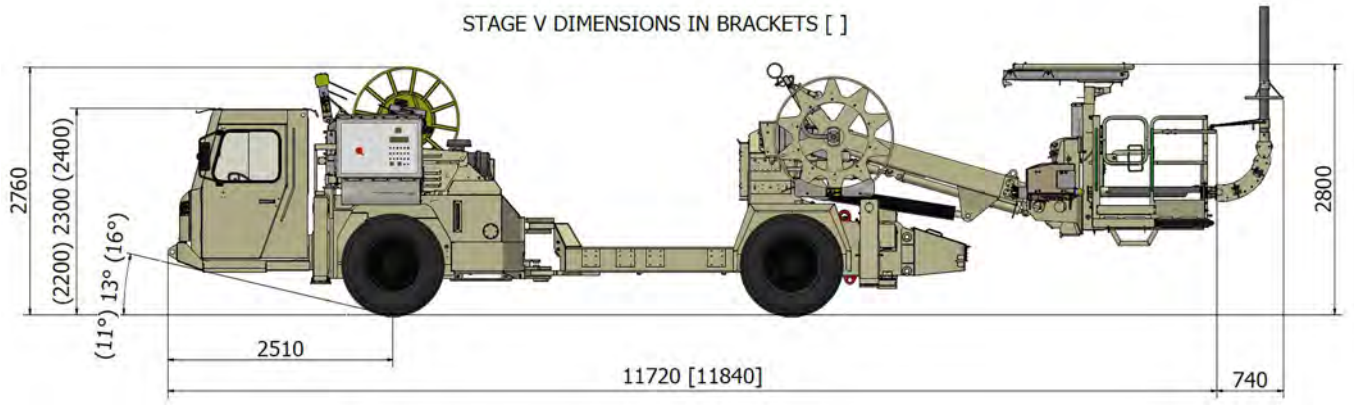


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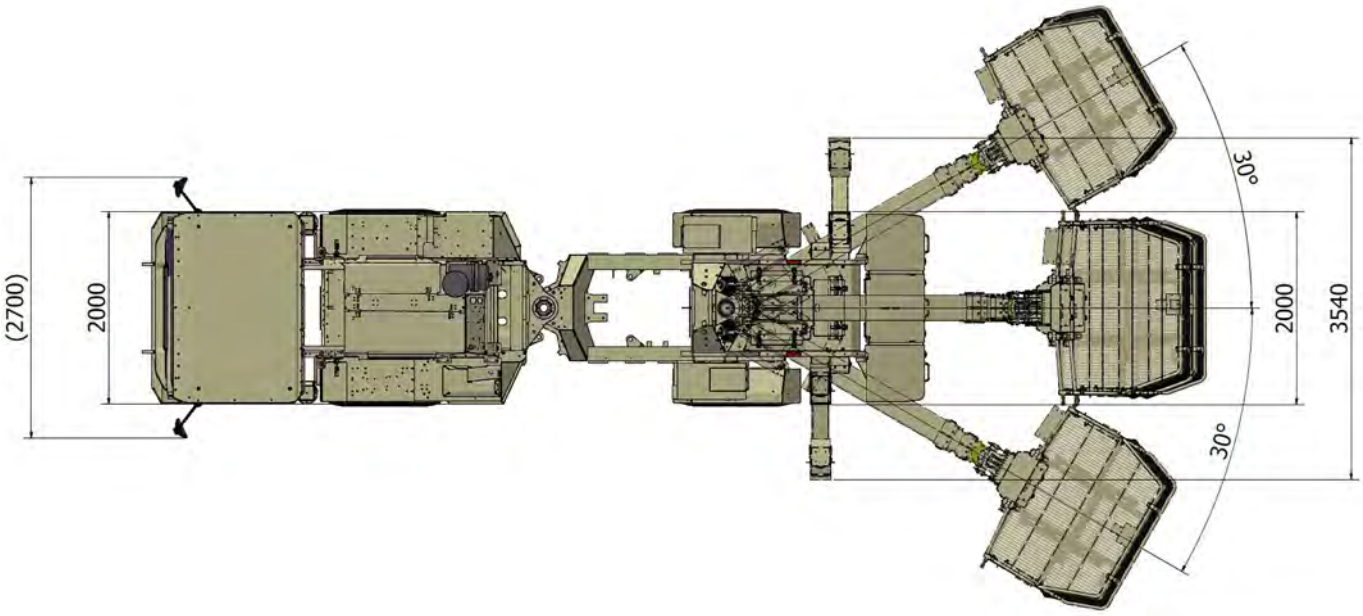
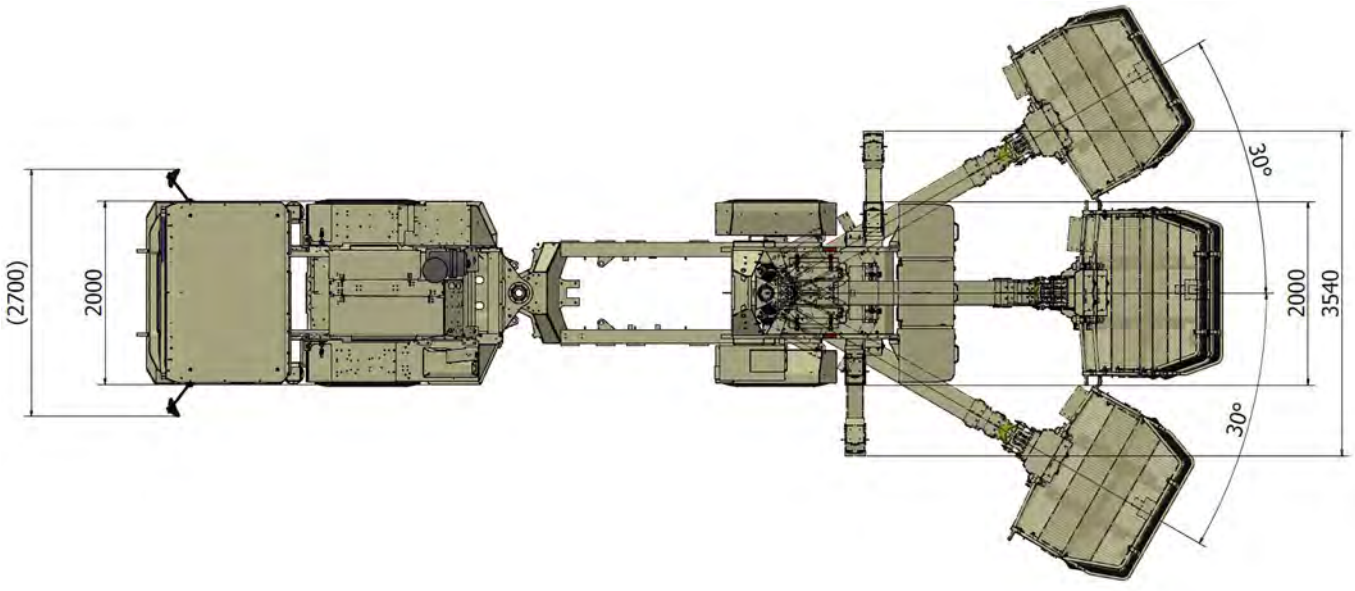
## TOP VIEW




Charmec MF 605 SE

## TOP VIEW

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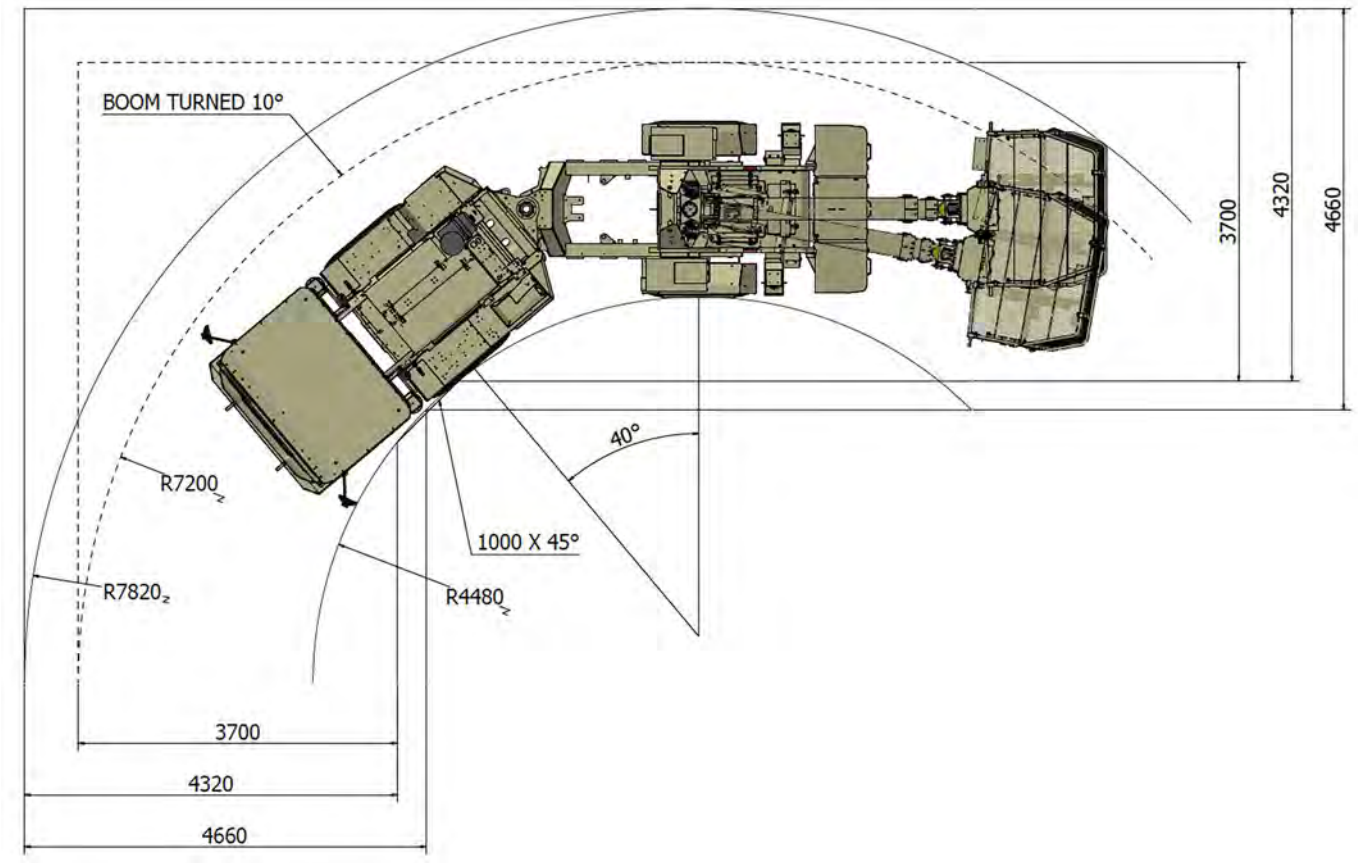


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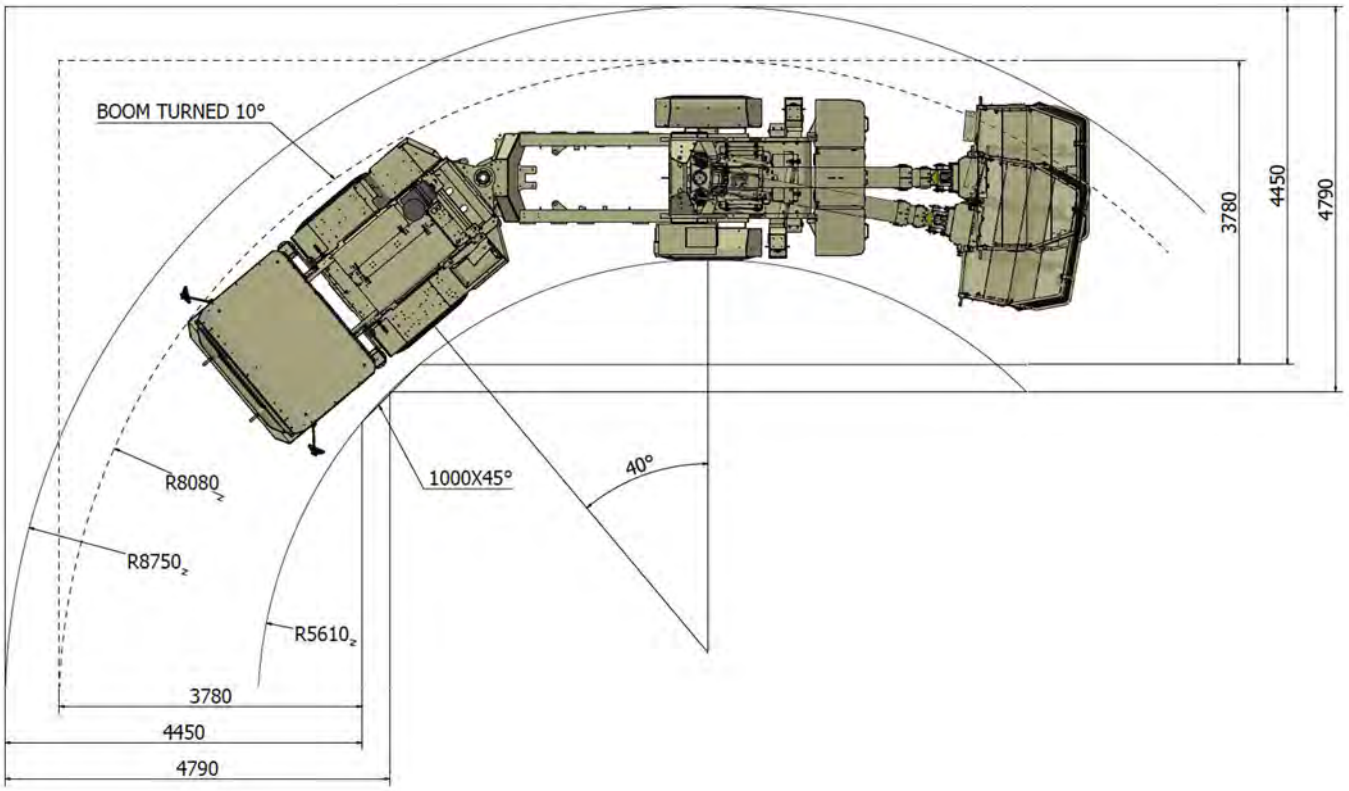


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## FRONT VIEW

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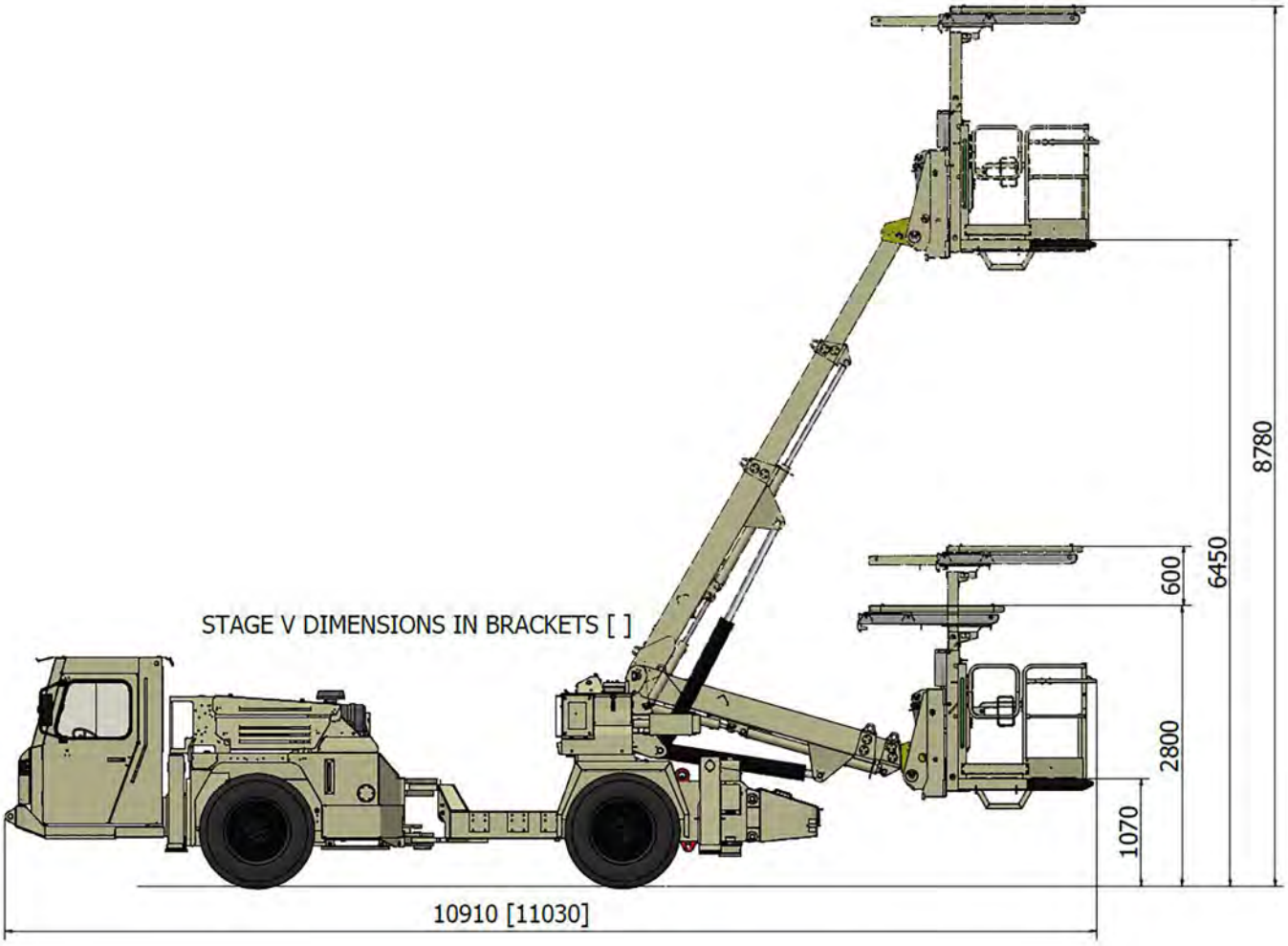
## BOOM REACH

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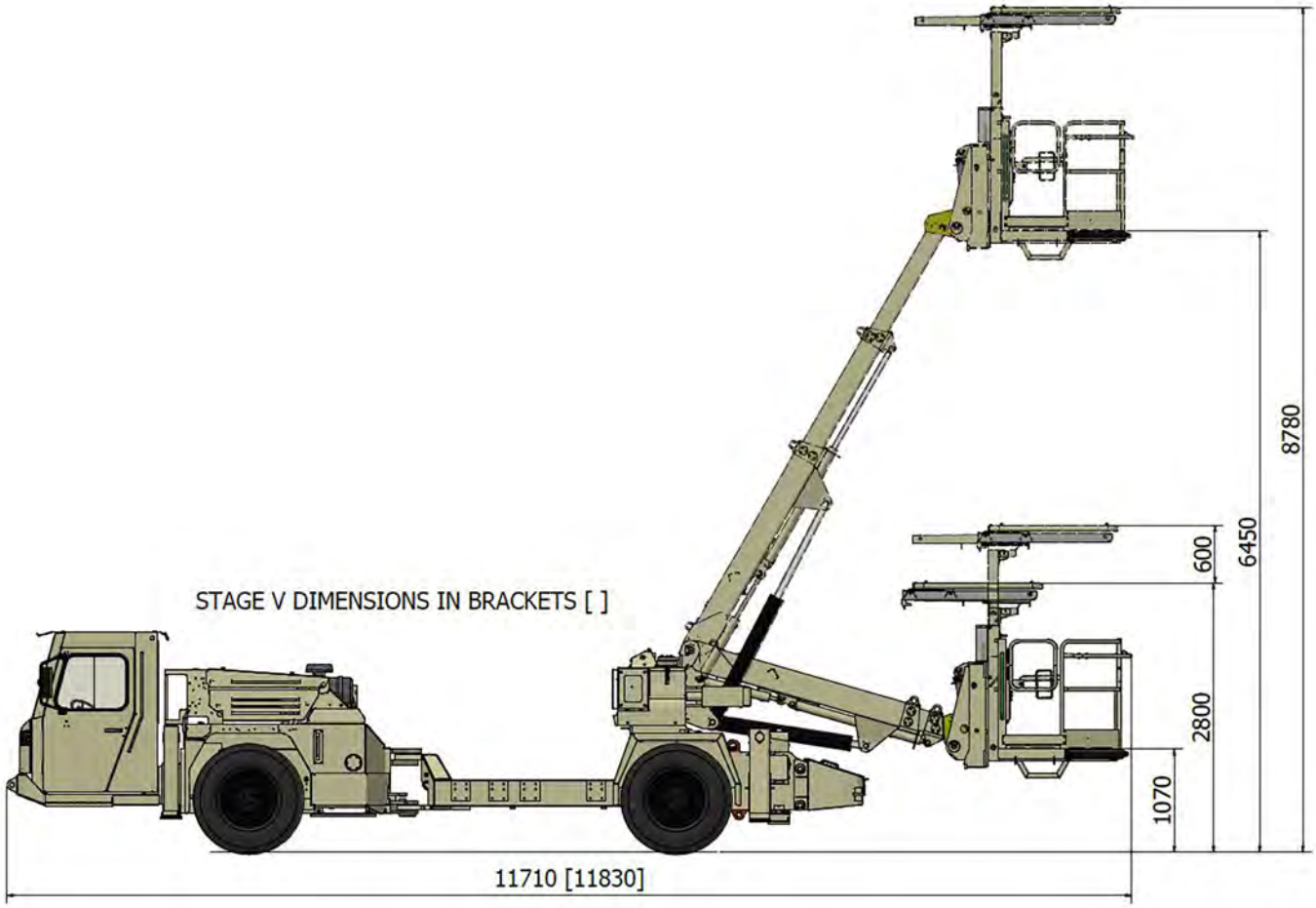


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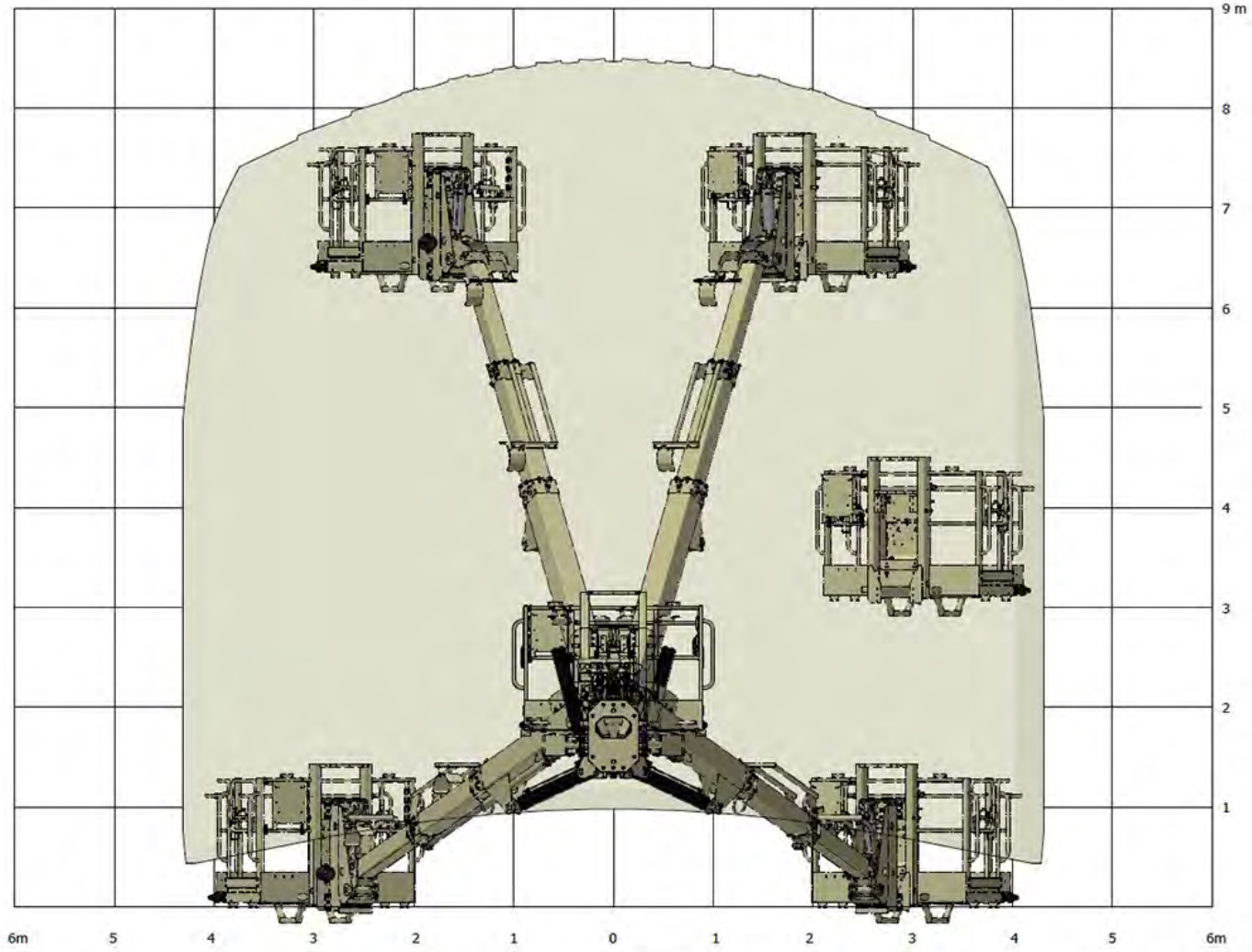
## BOOM REACH - NBB3S WITH 30° TURN

Maximized face coverage with single position of machine

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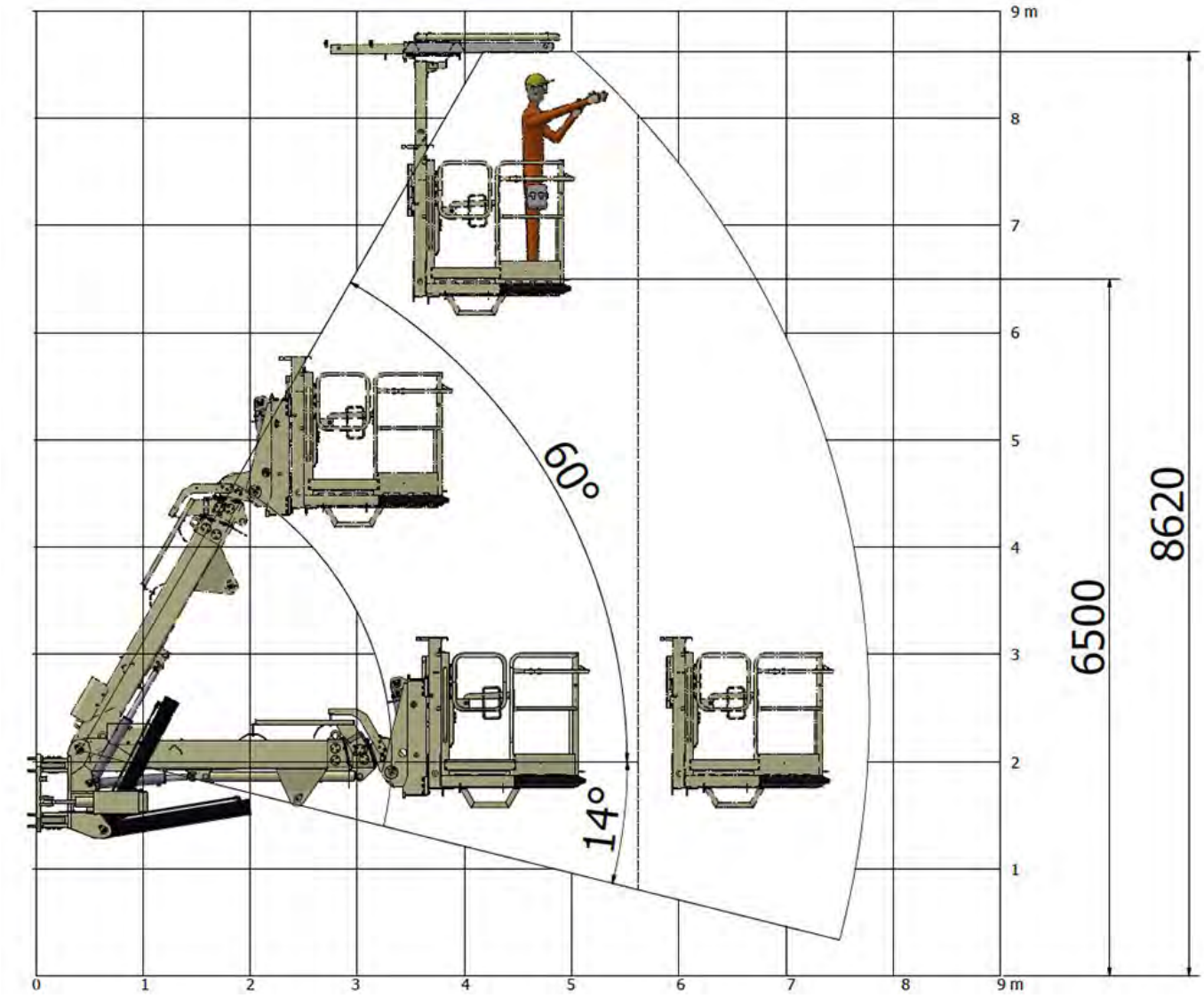


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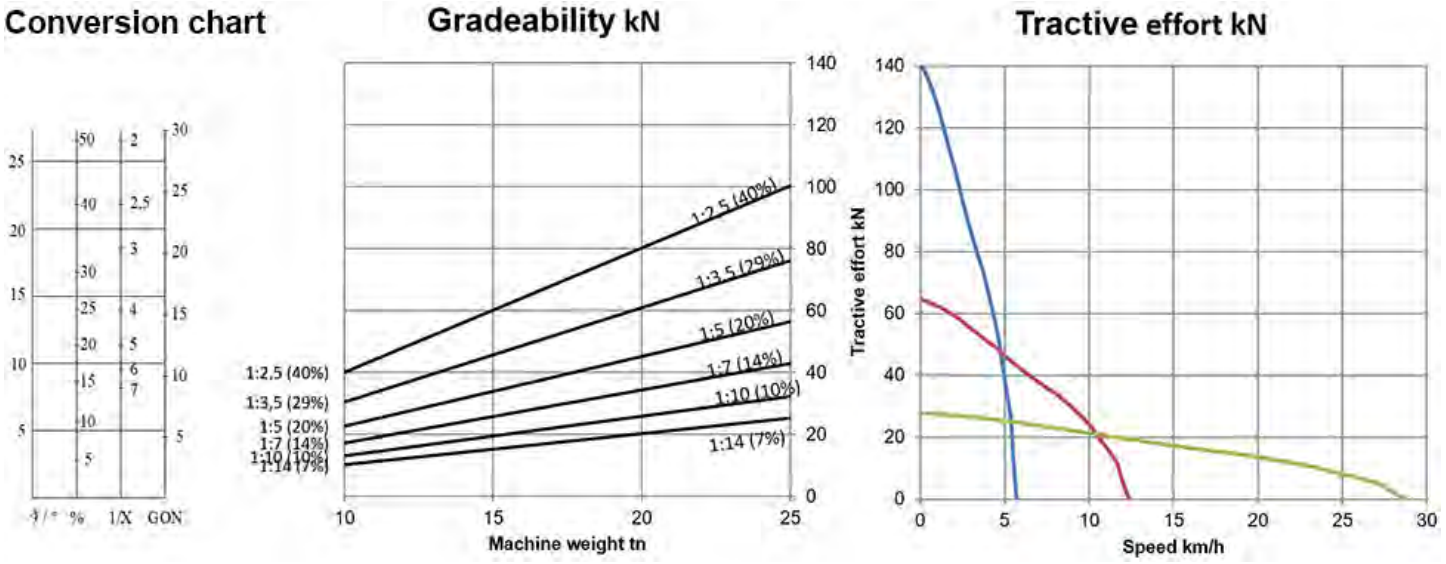
# TRACTIVE EFFORTS

## OPERATING WEIGHT

| | |
|---|---|
| Empty | 15 000 kg |
| Fully loaded | 22 000 kg |
| | final machine weight variate in agree with selected options |

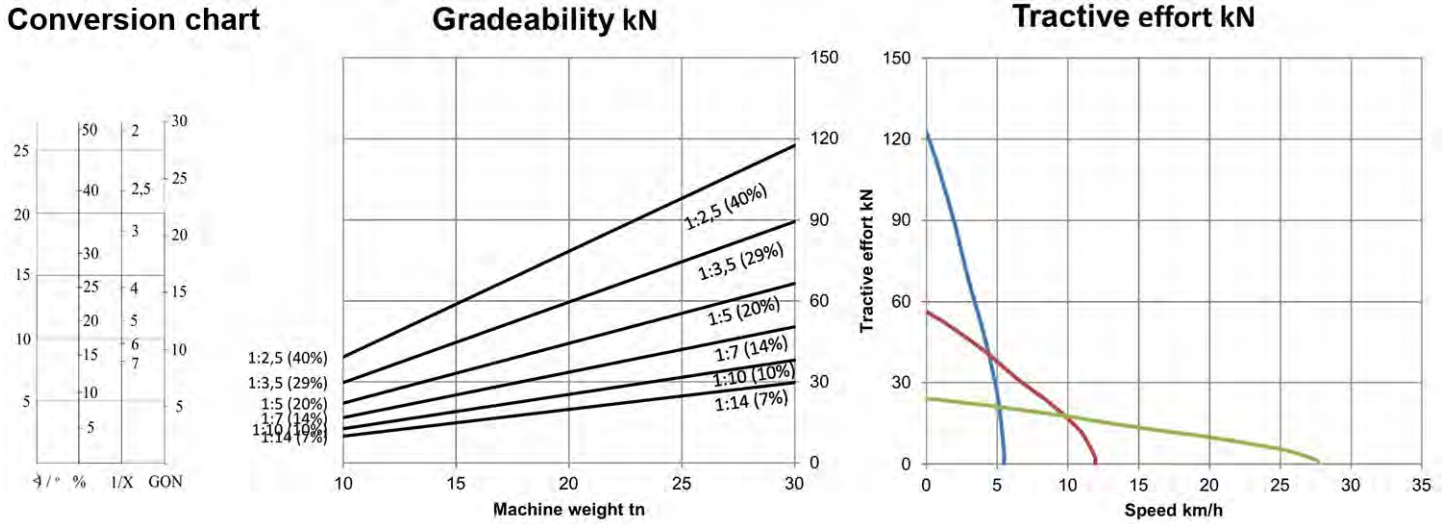
## DEUTZ TCD 2013 L4, 120 KW WITH 12.00-20" TIRES

Performance curve DOC060005




## CUMMINS QSB 4.5 110 KW 12.00-20" TIRES

Performance curve with lock-up DOC088121

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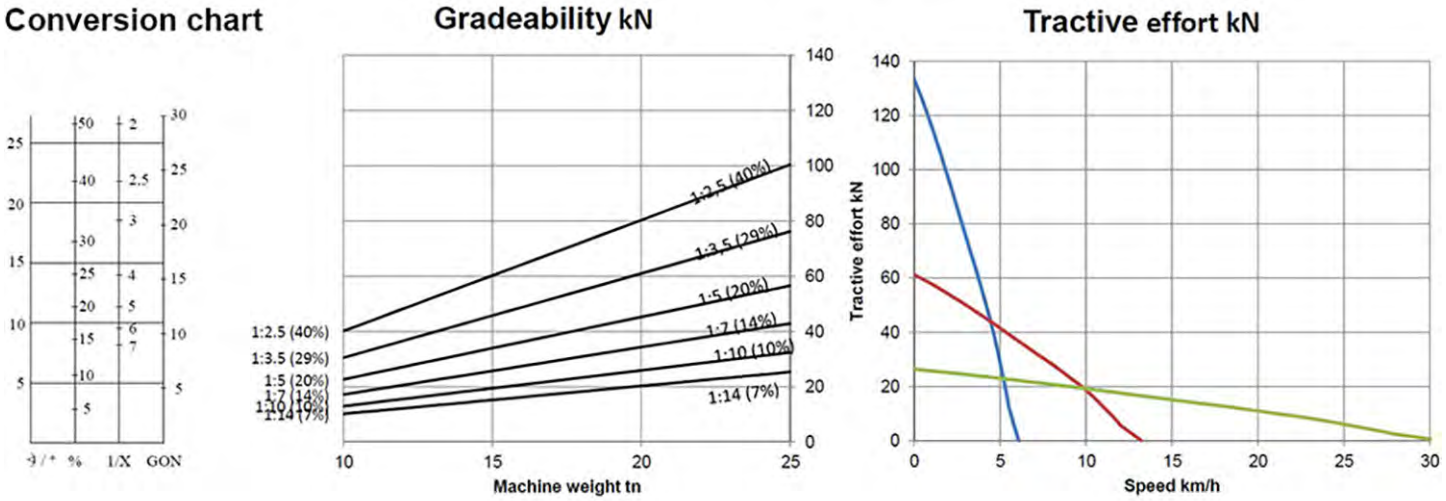
## CUMMINS B 4.5 120 KW 12.00-20" TIRES

Performance curve with lock-up DOC028557




Normet reserves the right to change
this specification without further notice

Pictures may include options and additional equipment.



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