



Charmec RM905 TA(C)

INTRODUCTION

Charmec RM905 TA(C) is bulk ANFO charging machine for underground excavation and tunnelling. Twin boom configuration enables independent charging work for both baskets shortening charging cycle time and at same time providing large face reach and coverage.



Normet basket booms are specially engineered for underground work having strong and robust structure withstanding corrosive underground environment and aggressive explosives chemicals.

POWER TRAIN

M-series units have powerful 4-cylinder liquid cooled turbo-charged engines, which power range is between 110-121 kW, depending of the selected engine model. Available emission standards are Tier 3 / Stage IIIA and Stage V that provide clean and efficient operation.

Machine is equipped with Hydrostatic 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

Normet's FOPS and ROPS approved safe and spacious cabin provides superior visibility and comfortable compartment for the driver. 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. Optional enclosed cabin provides low noise level ensuring safe and comfortable driving.



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.

PRODUCTIVITY

The amount of air is one key factor to deliver high and uniform ANFO flow into boreholes.

Large capacity 6 m³/min onboard compressor will secure maximum ANFO flow and ANFO moistening system will further increase in hole density and explosive's velocity of detonation as well reduce dust creation.

Performance-based accessories like ANFO tank filling system and pressure air after cooler further enhances the productivity.

TECHNICAL SPECIFICATION

CHARGING SYSTEM

Pressure max. 7 bar

Extra air for charging

2 charging operators

ANFO module:

- 2 ANFO vessels, work stand and load room for bulk ANFO
- 2 ANFO vessels, 6 m³/min onboard compressor and work stand
- 2 ANFO vessels, ANFO filling system and load room for bulk ANFO
- 2 ANFO vessels, 6 m³/min onboard compressor and ANFO filling system

NOTE: Only electric operated 4 m³/min compressor available with high voltage electrical system.

ANFO vessel size:

- Without vessels
- 360 l
- 500 l
- 720 l

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

NBB BASKET BOOM

2 x NBB3 basket boom

Lifting capacity (without optional equipment) 500 kg

Standard 2-operator basket

Max. lifting height and wall coverage specified in dimensional drawing

Automatic levelling of basket

Start/stop from basket

Battery operated emergency lowering system

Basket installation position:

- Regular
- Hanging (reduce max. lifting height 500 mm)

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

Normet reserves the right to change this specification without further notice

ENGINE AND TRANSMISSION

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

Catalytic exhaust gas purifier and muffler

Fuel tank capacity: 140 l

Hydrostatic 4-wheel transmission

- **Cummins B4.5, 121 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: 140 l

Hydrostatic 4-wheel transmission

PERFORMANCE

Tramming speed (horizontal): 25 km/h

Lateral gradient for tramming (continuous) 4°

Longitudinal gradient for tramming (continuous) 9°

Lateral gradient for operation 3°

AXLES AND BRAKES

Planetary type axles:

Front: Dana 213

Rear: Dana 223

Fixed axle at the front of the carrier

Oscillating axle +/-8° at the rear end of the carrier

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 12.00–20"
- Bridgestone 12.00–20"

Rims:

- Standard rims
- NDT inspected rims

Pictures may include options and additional equipment.

STEERING

Two- and four-wheel steering and crabwalk.
Steering wheel and orbital type power steering control unit.

HYDRAULIC SYSTEM

Variable displacement pump system:
190 bar, 135 l/min at 2200 rpm

Oil tank capacity, stainless steel 130 l

Return oil filtration 10 µm

Oil level and return filter contamination indicator

Carrier hydraulic system (hydrostatic):

Pump 115 cm³

Motor 160 cm³

Oil tank capacity, stainless steel 110 l

Return oil filtration 10 µm

Oil level and return filter contamination indicator

Hydraulic oil type for process and carrier (hydrostatic drive system):

- Mineral hydraulic oil
- Biodegradable hydraulic oil (ISO 15'380/HEES)

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

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 air conditioning and heating

*ROPS not available with 125 T

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

Seat belt safety interlock for driver:

- Warning indicator in display
- Safety brake application

Cabin door interlock switch with safety brake application

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

2 pairs of support legs; extendable legs at the load end and standard at the engine 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

- ANFO tank vibrator (only with radio controlled charging)
- Water for ANFO system: 70 l container
- Detonator's wire roll
- Pressurized air after-cooler for very high humidity
- Extra oil cooler (available without compressor)
- 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 with spooling device

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 30 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

- 400 V 16 A outlet socket for accessories like submersible pump
- 3 x 100 W LED working lights on cabin roof (no UL or AS/NZS approval)

CARRIER PRODUCTIVITY

- Audio system for enclosed cabin
- 12 V, 18 A power supply in cabin with socket and connector
- 24 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)
- Fuel operated pre-heater
- Fast fuel filling system
- Hand pump for filling of hydraulic tank
- Fluid evacuation panel with sampling points
- Automatic lubrication system for carrier and lifting boom(s)
- Reversing camera:
 - 2 camera, 2 displays
 - 4 cameras, 3 displays
- Spare rim and tyre
- Toolbox and maintenance tools
- Stainless steel box for equipments
- 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:

- 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

SAFETY

- 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)
- Higher speed range disabling (standard in 125 T)
- Electric pump for brake release
- Tyre pressure indicators
- Warning triangles
- Flashlight with charger
- Hearing protectors
- Wheel chocks with brackets

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

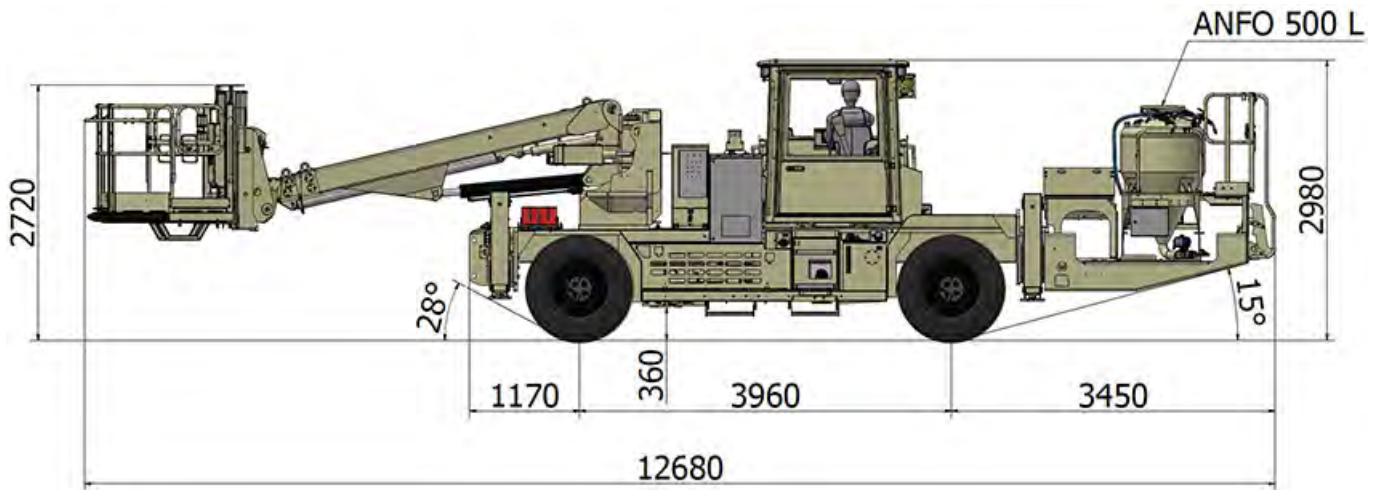
2. MAINTENANCE AND REPAIR TRAINING

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

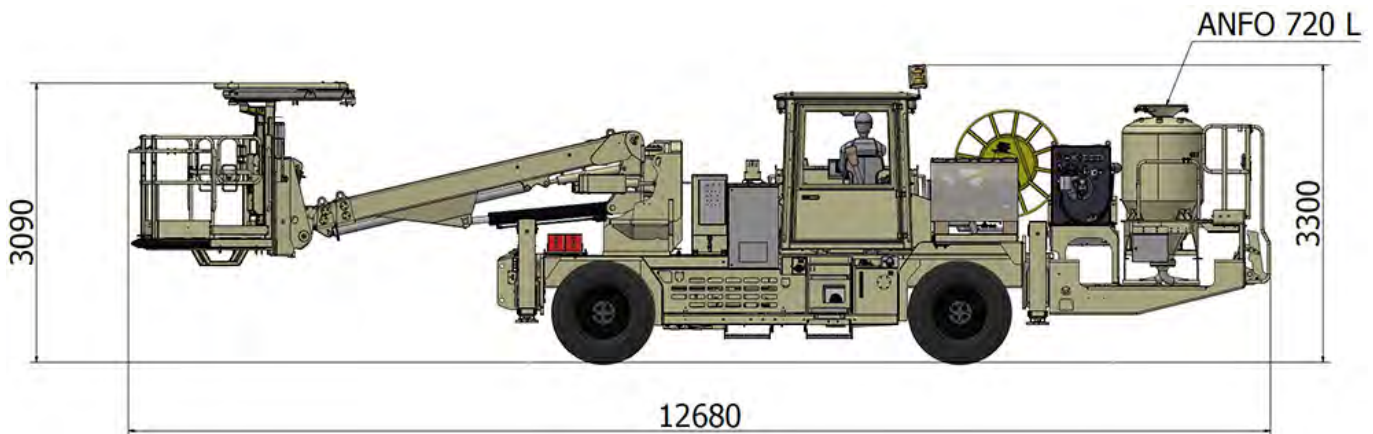
DIMENSIONS

Length	12 680 mm	Track	1930 mm
Width	2400 mm	Ground clearance as shown	360 mm
Height	2980 mm	Turning radius outer	9620 mm
Wheel base	3960 mm	Turning radius inner	4010 mm

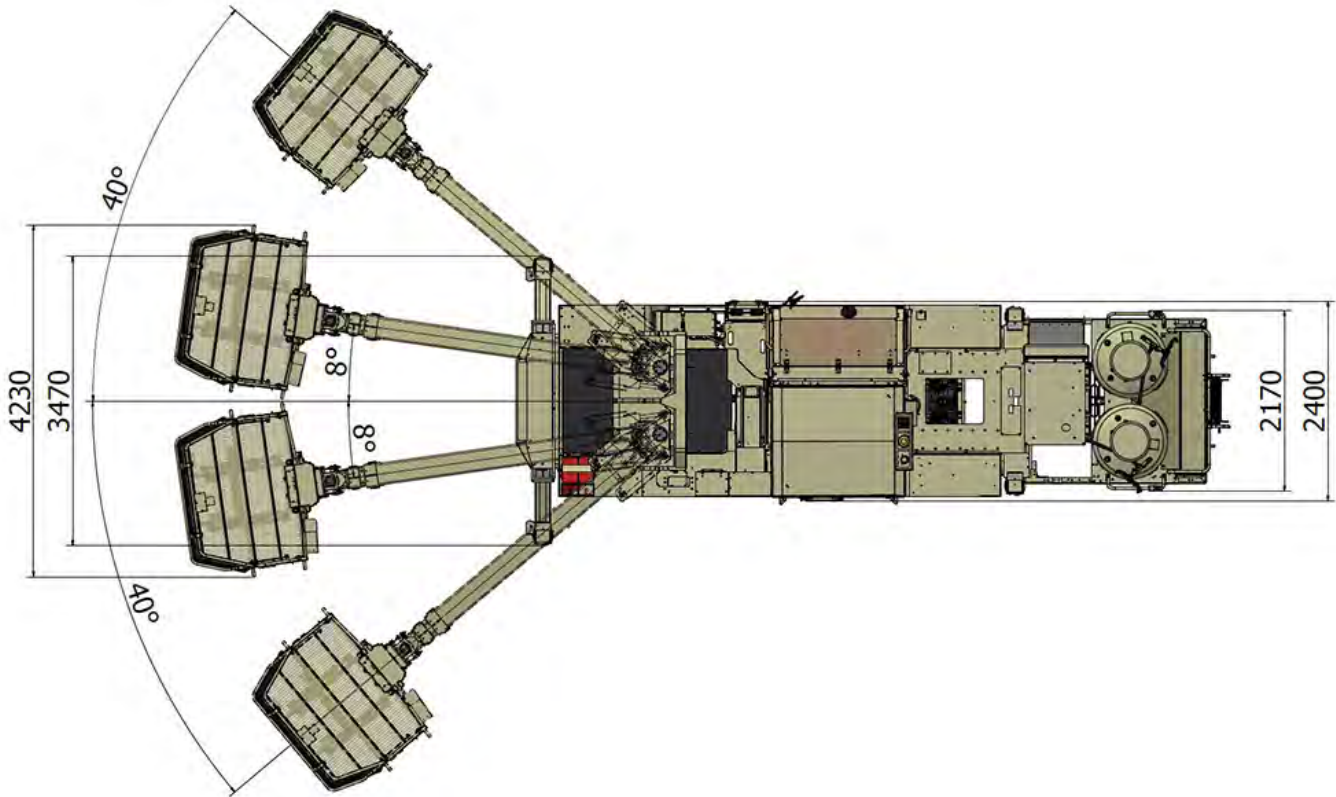
SIDE VIEW – BASIC MACHINE



SIDE VIEW – MACHINE WITH OPTIONS



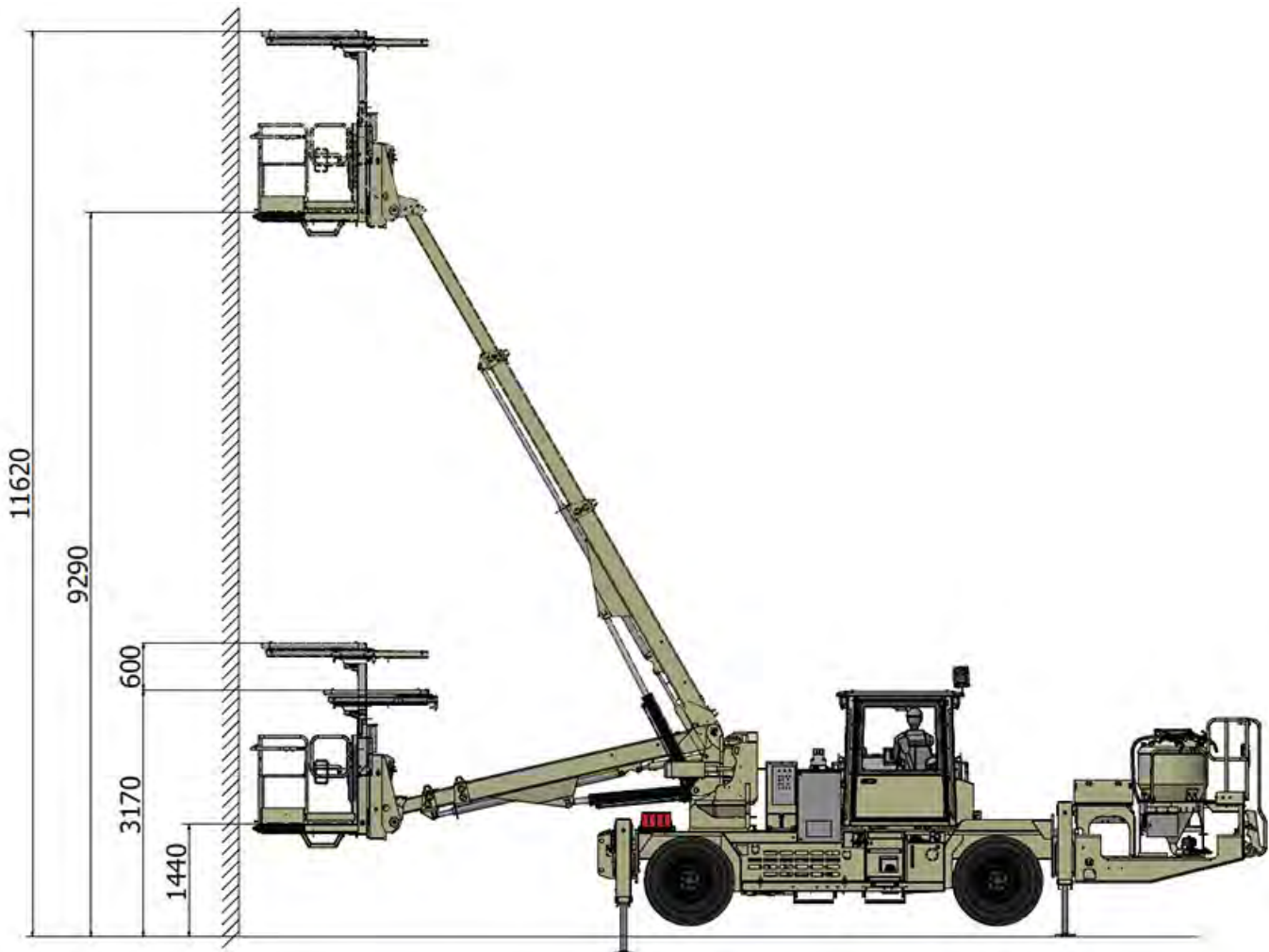
TOP VIEW



Normet reserves the right to change this specification without further notice

Pictures may include options and additional equipment.

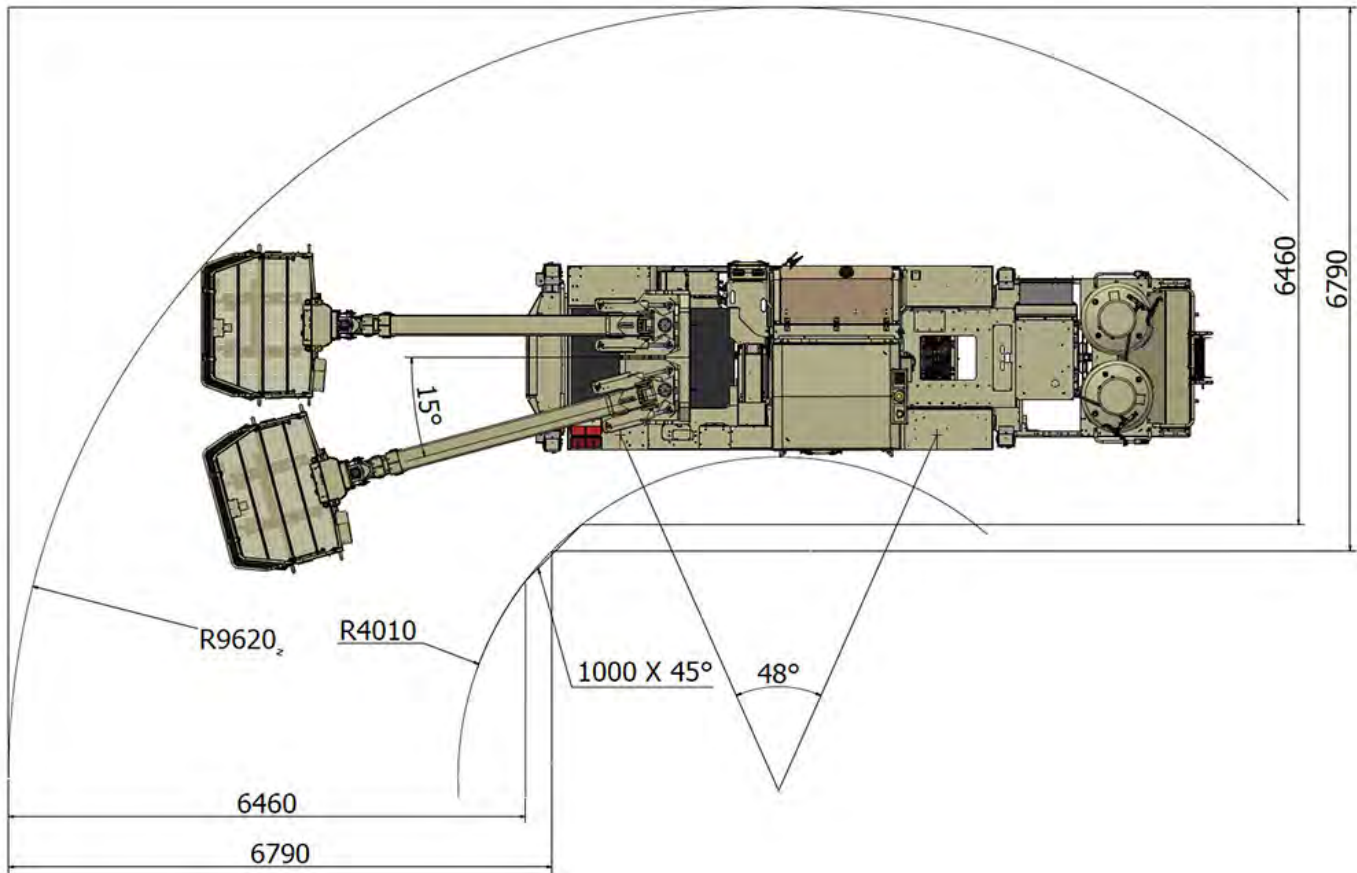
BOOM REACH



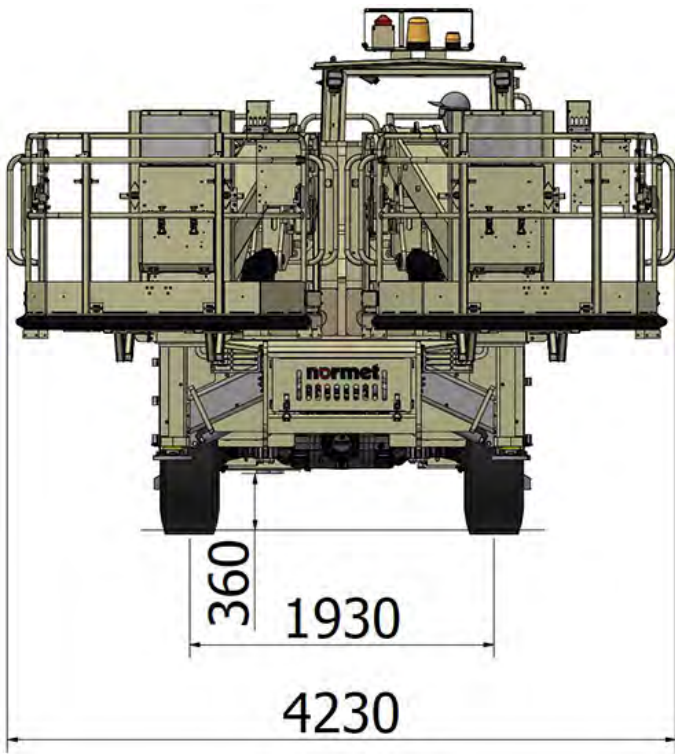
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TURNING RADIUS



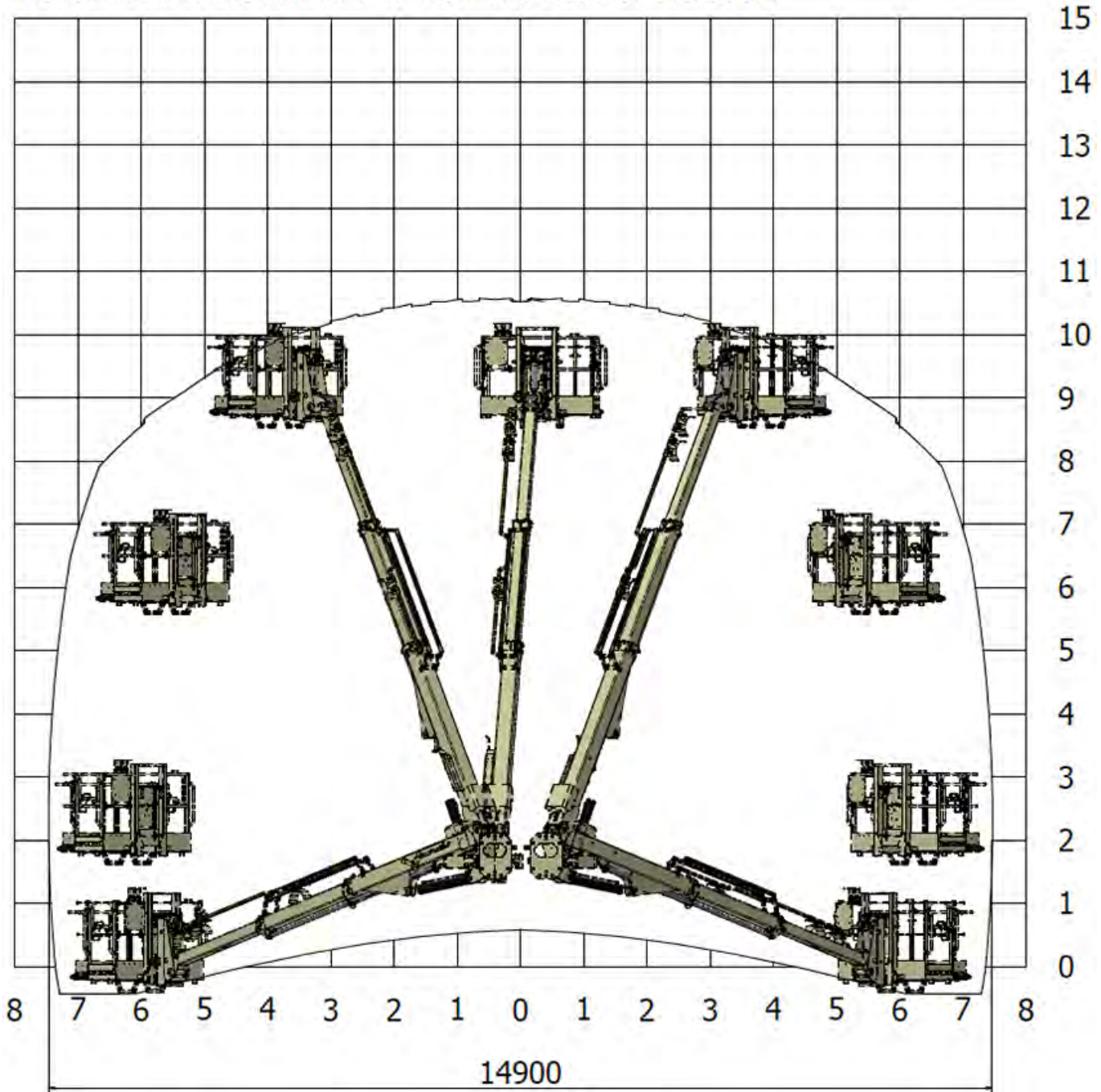
FRONT VIEW



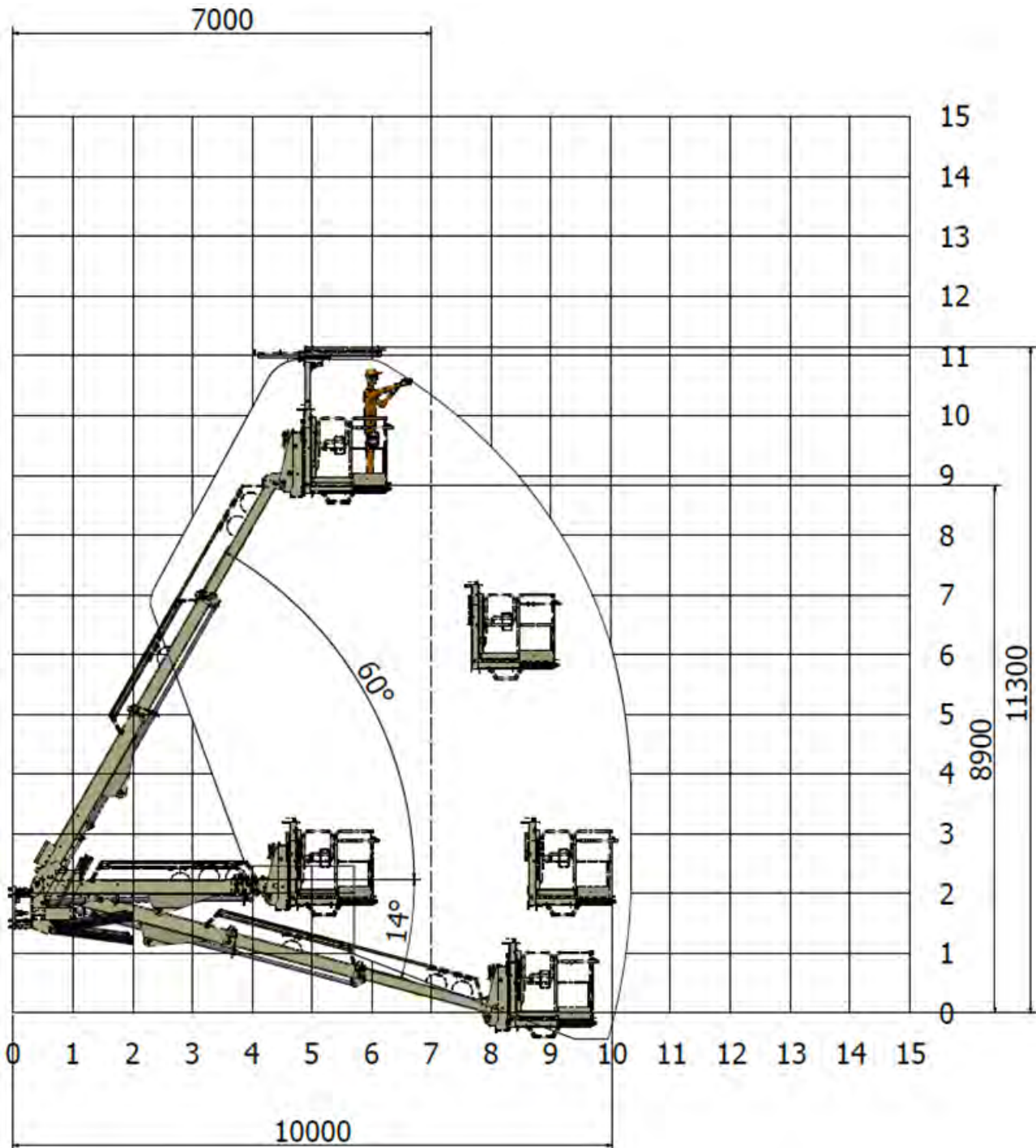
Machine equipped with twin boom

BOOM REACH – NBB 3 TWIN BOOM WITH 40° TURN

Reach area in the tunnel 7 m from the base of the boom



BOOM REACH – NBB 3 TWIN BOOM WITH 40° TURN



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TRACTIVE EFFORTS

OPERATING WEIGHT

Empty	21 000 kg
Fully loaded	24 000 kg

CUMMINS QSB4.5 110 KW

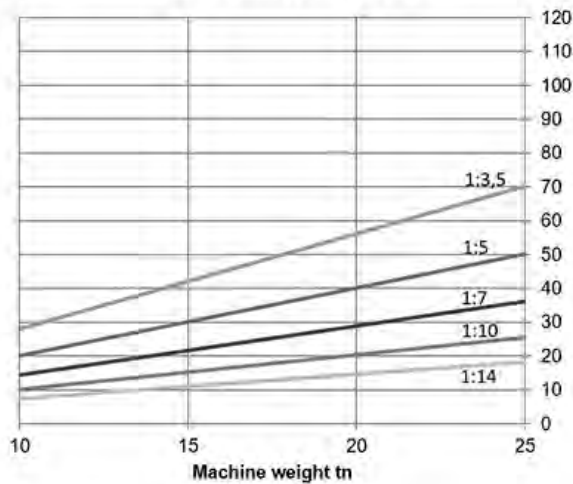
Performance curve DOC033669

Conversion chart

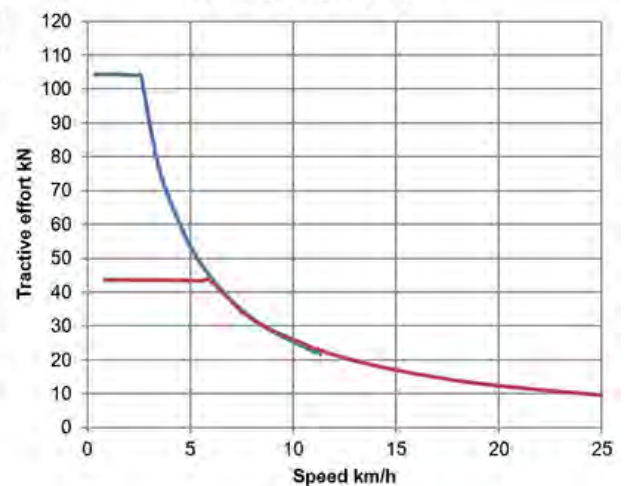
50	2	30
40	2,5	25
30	3	20
25	4	15
20	5	10
15	6	5
10	7	
5		

1/X GON

Gradeability kN



Tractive effort kN



CUMMINS B4.5 121 KW

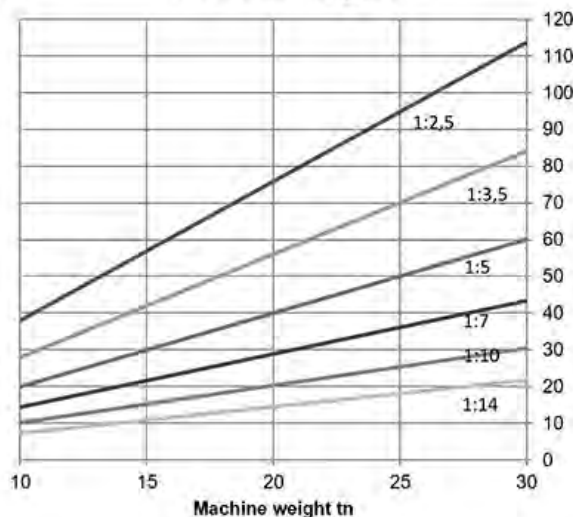
Performance curve DOC059936

Conversion chart

50	2	30
40	2,5	25
30	3	20
25	4	15
20	5	10
15	6	5
10	7	
5		

1/X GON

Gradeability kN



Tractive effort kN

