



# Utimec MF 328 PER

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Pictures may include options and additional equipment.

## INTRODUCTION

**MF 328 PER** with 32+2 persons transport capacity is designed for people transportation in underground mines and tunnels. Utimec personnel carriers includes several safety features as standard and optional full chassis suspension offers outstanding ergonomics for passengers.



### POWER TRAIN

M-series units have powerful 4-cylinder liquid cooled turbo-charged engines, which power range is 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.

Electric system is designed for harsh underground environment. System consists of self-extinguishing wire harnesses with tinned wires, water tight 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.

## TECHNICAL SPECIFICATION

### PERSONNEL COMPARTMENT

- Open compartment for 32 persons
- Enclosed compartment for 32 persons
  - Heating
  - Air conditioning

Individual suspended seats with 3-point seat belts

### 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 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) 4°

Longitudinal gradient for tramming (continuous) 9°

Depending of machine configuration, lateral and longitudinal tramming gradient can temporarily be higher.

### AXLES AND BRAKES

Dana 123-series planetary type axles

- +/- 8° oscillation engine end axle, fixed load end axle
- Full hydro-pneumatic suspension in both axles (Suspension increases machine height by 50 mm)

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 standard rims
- Nokian Tyres 12.00-20" with NDT inspected rims
- Bridgestone 12.00-20" with NDT inspected rims

### STEERING

Orbitrol type hydraulic frame steering

Frame articulation +/- 40°

### HYDRAULIC SYSTEM

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

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

### 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)

### 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
- 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:

- 6 kg
- 12 kg
- Ansul Sentry

#### Number of extinguishers:

- 1
- 2

### Painting and taping:

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

### Text labels in:

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

### Measurements:

- Noise
- Vibration
- Emissions

## ACCESSORIES

### PROCESS PRODUCTIVITY

- Personnel compartment door safety interlock switches
  - Warning signal
  - Safety brake application
- Communication system between cabin and personnel compartment
- Front support legs
- Pressure washer with 230 l tank on cabin roof (increases cabin height by 250 mm)

### 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
- 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
  - 1 camera, 1 display and reversing radar
  - 4 cameras, 1 display 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
  - Dry chemical  
Ansul A-101
    - Manual
    - Automatic, Checkfire 110
  - Liquid agent  
Fogmaker (Automatic)
- Gear lockout:
  - Forward:
    - Highest gear locked out
    - 2 highest gears locked out
  - Reverse:
    - Highest gear locked out
    - 2 highest gears locked out
- Engine end safety rails and ladder
- Front and rear grounding straps
  - Flat cable
  - Chain
- 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.

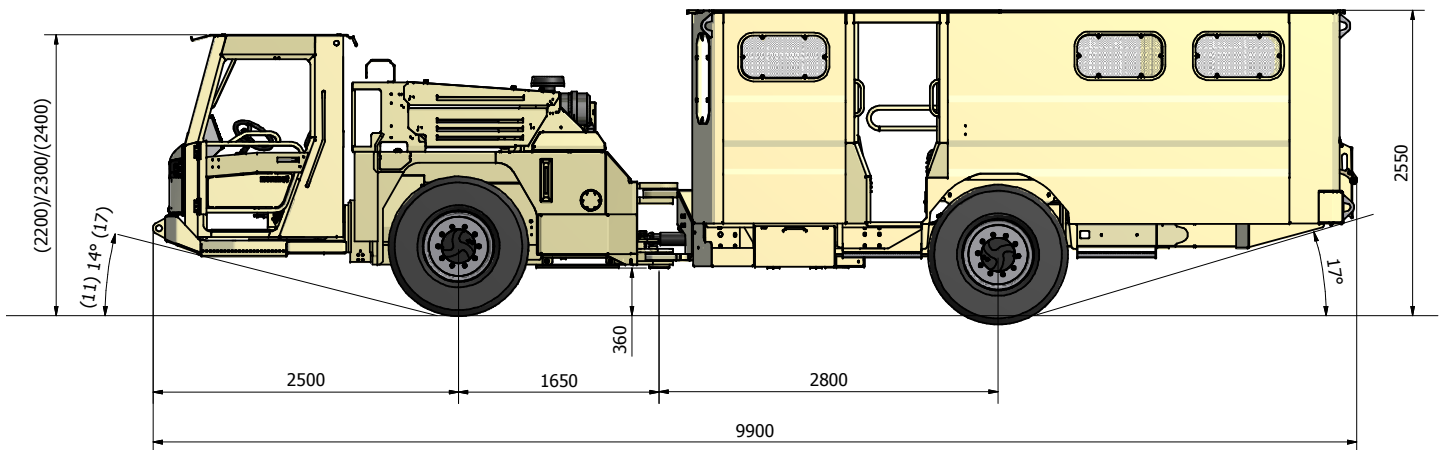
More information check [normet.com](https://www.normet.com).

## DIMENSIONS

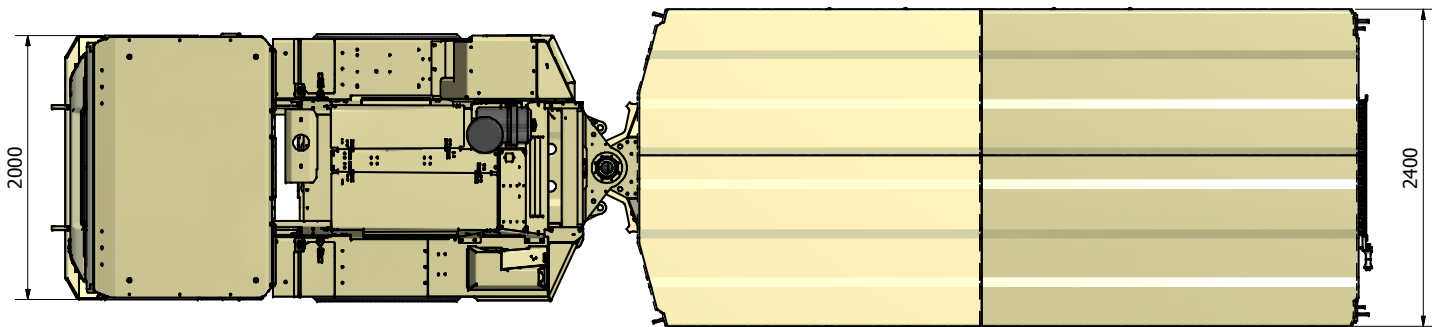
Length	9900 mm	Track	1670 mm
Width	2400 mm	Ground clearance as shown	360 mm
Height	2550 mm	Turning radius outer	7700 mm
Height of cabin	2300 mm	Turning radius inner	4650 mm
Wheel base	4450 mm		

### SIDE VIEW – BASIC MACHINE

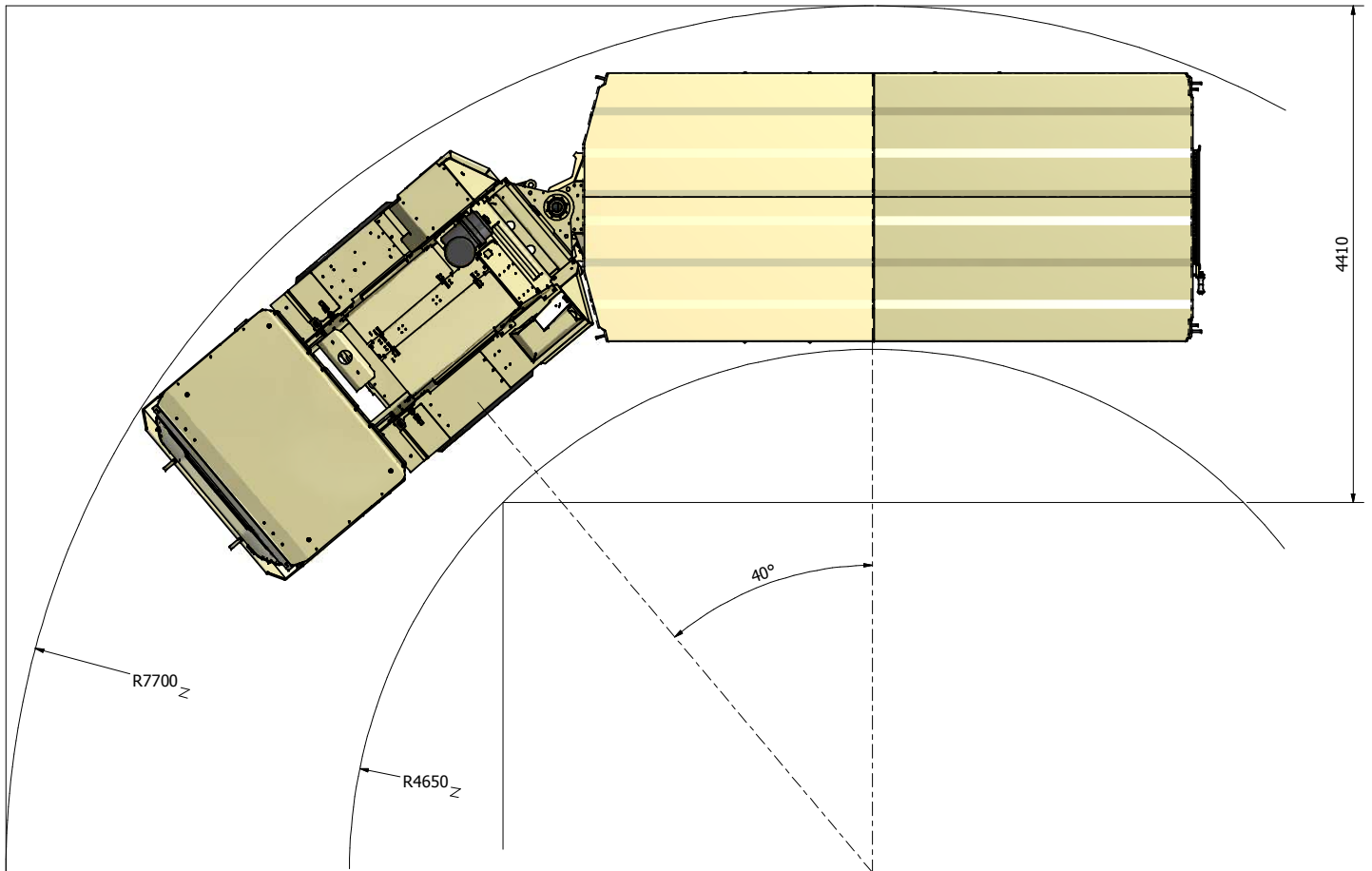
Dimensions in ( ) apply when the cabin is installed in the upper or lower position.



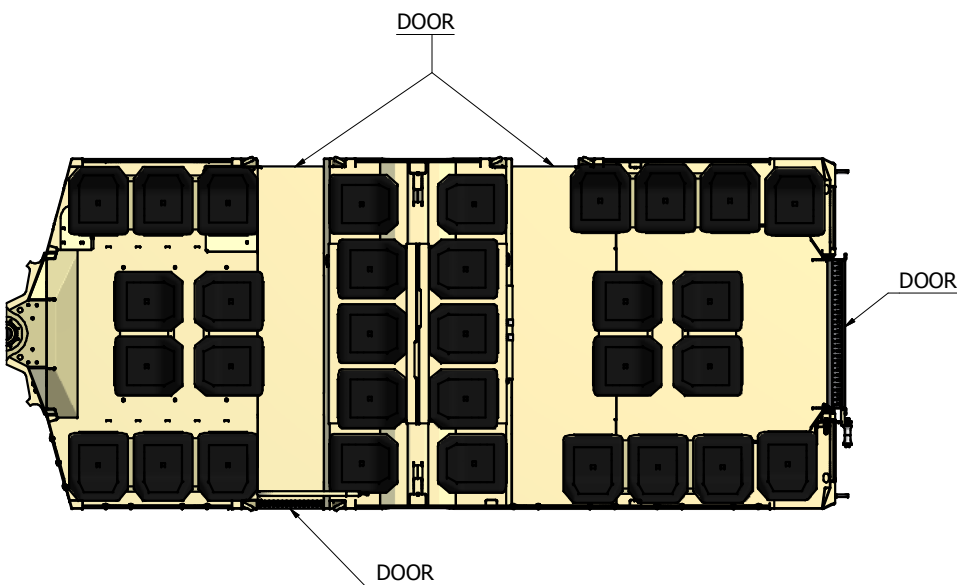
### TOP VIEW



## TURNING RADIUS



## SEAT LAYOUT



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## TRACTIVE EFFORTS

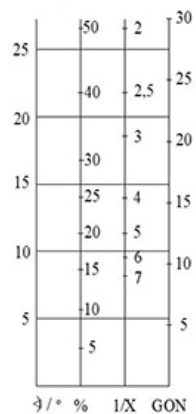
### OPERATING WEIGHT

Empty 13 000 kg  
 Fully loaded 17 500 kg  
 final machine weight variate in agree with selected options

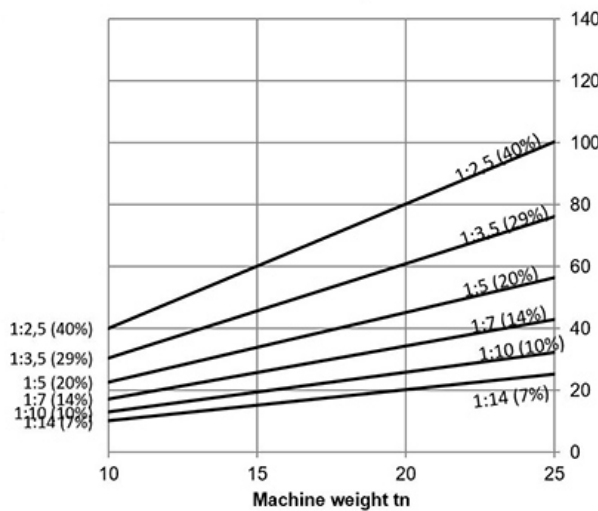
### DEUTZ TCD 2013 L4, 120 KW

Performance curve DOC060005

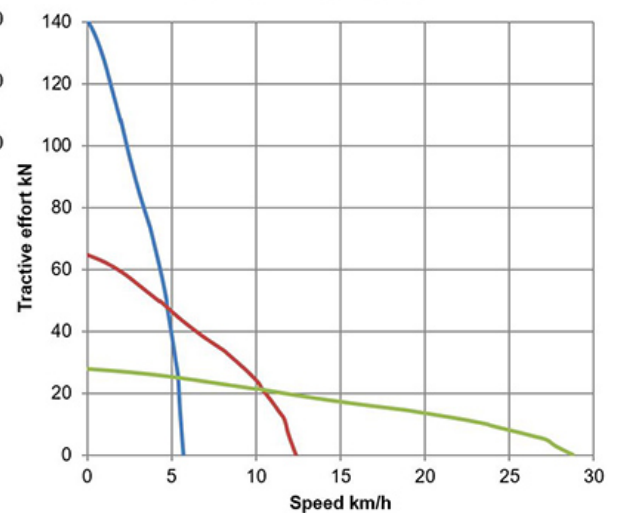
#### Conversion chart



#### Gradeability kN



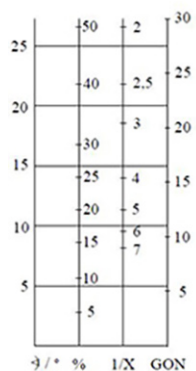
#### Tractive effort kN



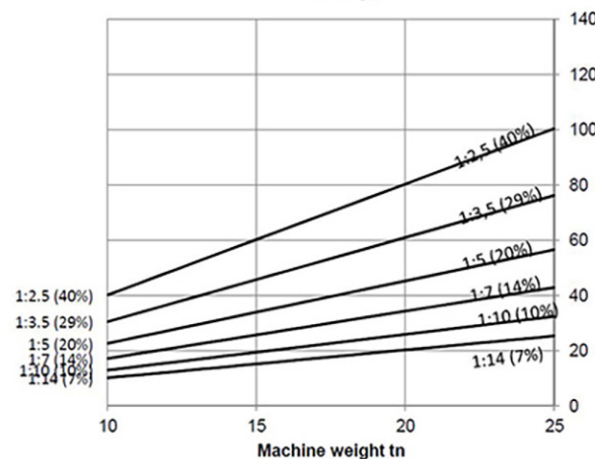
### CUMMINS B 4.5 120 KW

Performance curve with lock-up DOC028557

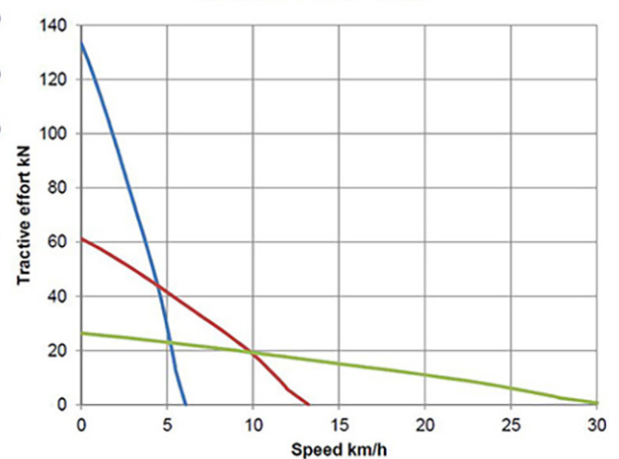
#### Conversion chart



#### Gradeability kN



#### Tractive effort kN



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