



# Variomec XS 035 Crew SD



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Pictures may include options and additional equipment.

# INTRODUCTION



The battery-electric **Variomec XS 035 Crew SD** is a purpose-built and agile vehicle for material and people transportation in 3.5 m x 3.5 m or larger tunnels. The vehicle has a 3-ton material carrying capacity and a personnel compartment for 3 passengers. The Variomec XS offers a roomy platform and can be equipped with several different optional equipment to increase machine versatility.

The XS-series SmartDrive is designed to operate in small-sized tunnels with a larger load capacity compared to current light vehicles commonly used in underground mines. The XS-series offers a totally new level of safety, ergonomics, and total cost of ownership while retaining good performance, payload capacity, and mobility of the existing fleet. The vehicle has a full chassis suspension system that improves driving safety and comfort and reduces fatigue. The vehicle layout is optimized for easy access to all service points, allowing all daily checks to be performed from ground level.

The SmartDrive battery-electric vehicle architecture features advanced Li-ion battery technology, fast charging capability, and high-speed electric motor with reduction gear box, delivering instant torque and efficient, emission-free operation. The fast-charging interface adheres to the industry-standard CCS, and the vehicle can be recharged from mine electric grid by using the on-board charger. Energy recuperation technology comes as a standard feature. The batteries are charged during downhill driving and deceleration, which further increases the total efficiency of the operation.

The maximum speed is 30 km/h. The fully reversible 4WD with high traction capability and instant torque ensures safe and reliable movement in difficult ground conditions. The majority of the braking is done via an electric motor recuperating energy, but the vehicle also includes efficient hydraulic dual-circuit oil-immersed multi-disc brakes to provide additional braking power when needed.

Normet's FOPS and ROPS approved safety cabin provides superior visibility and a comfortable compartment for the driver and the passenger. The cabin controls are designed for ease of use and ergonomic efficiency. The multifunctional display (MID) delivers comprehensive driving information, including speed, temperatures, safety warnings, and alarms. Additionally, this data can be monitored remotely through Normet connectivity services.

The NorSmart 3 electric system is designed for harsh underground environments. The system consists of self-extinguishing wire harnesses with tinned wires, watertight conduits, and all exposed components are of a minimum IP65 protection class.

# TECHNICAL SPECIFICATION

## MATERIAL PLATFORM

Carrying capacity	3000 kg
Platform inner dimensions	2180 mm x 1670 mm
Loading height	1160 mm
Openable and removable edges	
Height	390 mm

## PERSONNEL COMPARTMENT

Enclosed personnel compartment FOPS/ROPS approved

- Fresh air blower
- Heating
- Air conditioning

Seats

- Suspended seats with 3 point seat belts for 3 persons
- Bench with retractable lap seat belts for 3 persons

## ELECTRIC DRIVETRAIN

Single permanent magnet electric motor with reduction gear

4-wheel drive

Motor power rating standard range	70 kW
Motor power rating long range	112 kW

## PERFORMANCE

Max. tractive effort	44 kN
Tramming speed (horizontal)	30 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.

## BATTERY

Li-ion battery technology

Energy content

- Standard range 66,5 kWh
- Long range 133 kWh

Liquid cooled

Fast charging capability

## BATTERY CHARGING

22 kW, 230/400V on-board 1/3-phase on-board charger.

Charging time in up to 266 minutes (long range) / 133 minutes (standard range) 0-80%

Suitable for charging the machine from electric vehicle supply equipment (EVSE) utilizing type 2 connector cable or directly from suitable 1/3-phase sockets utilizing type 2 adapter cable

CCS type 2 fast-charging socket

to charge batteries from 0-80% in up to 43 min depending on charger

**NOTE:** compatible CCS charging station required with type 2 plug

## AXLES AND BRAKES

Dana 212 Planetary type axles

Hydraulically powered dual-circuit oil immersed multidisc service brakes in both axles

Spring applied hydraulically released fail-safe -type parking/safety brakes in both axles

Leaf spring suspended chassis

Brake resistor

Electronic braking: energy recuperation via electric motor braking

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

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

Brake testing possible from cabin

## TYRES AND RIMS

BKT 9.00-20" with NDT inspected rims

## STEERING

4-wheel steering with three steering modes

Front axle steering, concentric 4 WS and crab walk

Orbitrol type

## HYDRAULIC SYSTEM

Variable displacement pump system for carrier:  
175 bar, 20 l/min

Hydraulic oil tank capacity 40 l

## 24 VDC ELECTRICAL SYSTEM

2 x 12 V deep cycle batteries

24 V battery charger (DC/DC converter)

LED driving and indicator lights

LED work lights

LED side lights

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

Enclosed cabin, FOPS/ROPS approved

- Fresh air blower
- Air conditioning
- Heated cabin

Driver's seat and seat belt:

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

Cabin door interlock switches with safety brake application

Passenger's seat:

- Mechanically suspended T-back seat with 3-point seat belt
- 2 seats with 3-point seat belts

## 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

Dry chemical fire extinguisher system

Ansul A-101 with Checkfire 210 automatic detection

Powder extinguisher:

- 6 kg
- Ansul Sentry

Painting and taping:

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

Reversing camera:

- 3 cameras, 3 displays
- 3 cameras, 3 displays and reversing radar
- 6 cameras, 3 displays with recording support

Electric pump for brake release

Text labels in:

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

Measurements:

- Noise
- Vibration

## ACCESSORIES

### PROCESS PRODUCTIVITY

- Communication system between cabin and personnel compartment
- Guard grills for personnel compartment windows
- Door interlock switches for personnel compartment
  - Warning signal for driver
  - Safety brake application
- HEPA filter for personnel compartment
- Battery powered outlet 400/230V, 16 A, 50 Hz
- Crane 9 kNm
- Portable welding machine 300 A  
 Dual voltage 230/480V  
 Stick/TIG
- Electric driven air compressor 200 l/min at 6 bar  
 30 L pressure vessel  
 max pressure 8 bar
- Hydraulic driven pressure washer
  - Water tank 100 l

### CARRIER PRODUCTIVITY

- Two-piece windscreen
- Audio system
- Heated mirrors
- HEPA filter for driver's compartment
- 12 V 20 A power supply in cabin with socket and connector
- Drive battery coolant heater with interior heater and 24 VDC battery charger (230 V)
- Fluid evacuation panel with sampling points
- Automatic lubrication system
- Spare rim and tyre
- Toolbox and maintenance tools
- Interior cooling fan
- Wax tape for electric connectors
- 24 VDC pump for hydraulic tank filling

### SAFETY

- Extra 6 kg hand held fire extinguisher
- 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
- Direction lights (Green/Red)
  - Both lights always on
  - Lights follows driving direction
- Extra warning LED light with battery backup
  - Color
    - Amber
    - Blue
    - Red
    - Green (n/a with rotating light pattern)
    - White (n/a with rotating light pattern)
  - Light pattern
    - Strobe
    - Rotating
- Seat belt interlock switch applies safety brake
- Grounding chain
- Redundant brake monitoring system
- Methane monitoring system
- Protection guards for tunnel curtains
- Tyre pressure indicators
- Warning triangles
- Flashlight with charger
- Hearing protectors
- Wheel chocks with brackets
- External water hose connection for battery fire extinguishing

### BEV SAFETY FEATURES

- Battery safe box (for transportation and storage)



# 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 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.

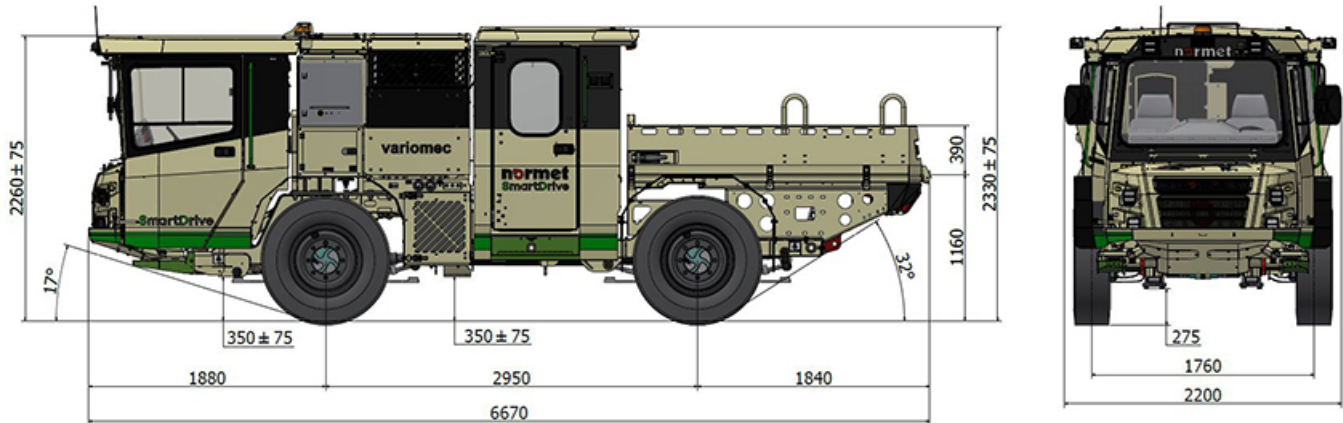
Contact your local Normet office for Upgrade offering to your fleet.

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

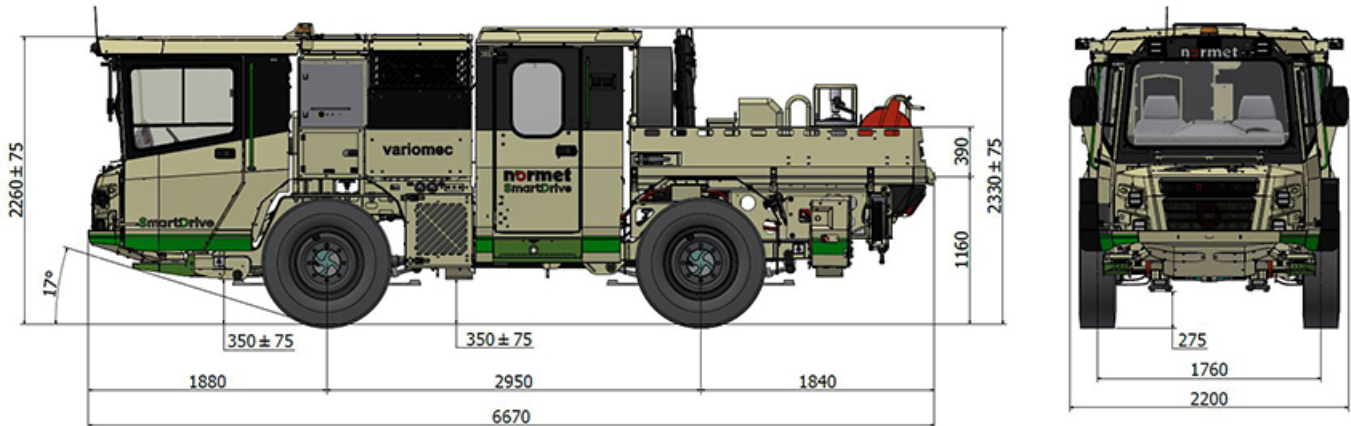
## DIMENSIONS

Length	6670 mm	Track	1760 mm
Width	2200 mm	Ground clearance as shown	275 mm
Height	2330 mm	Turning radius outer	5360 mm
Wheel base	2950 mm	Turning radius inner	2330 mm

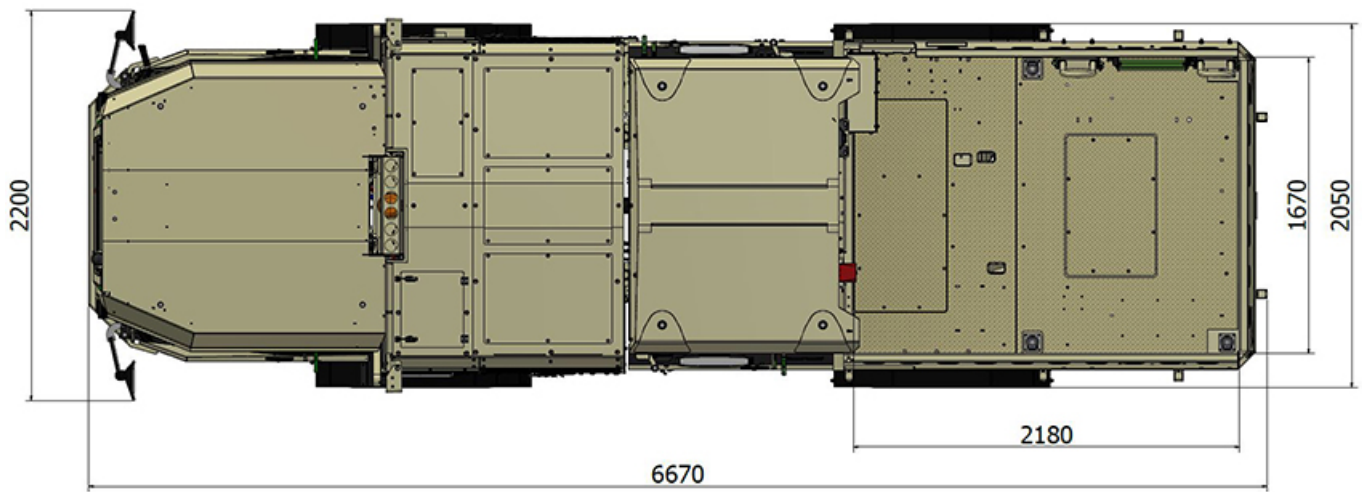
### SIDE AND FRONT VIEW - BASIC MACHINE



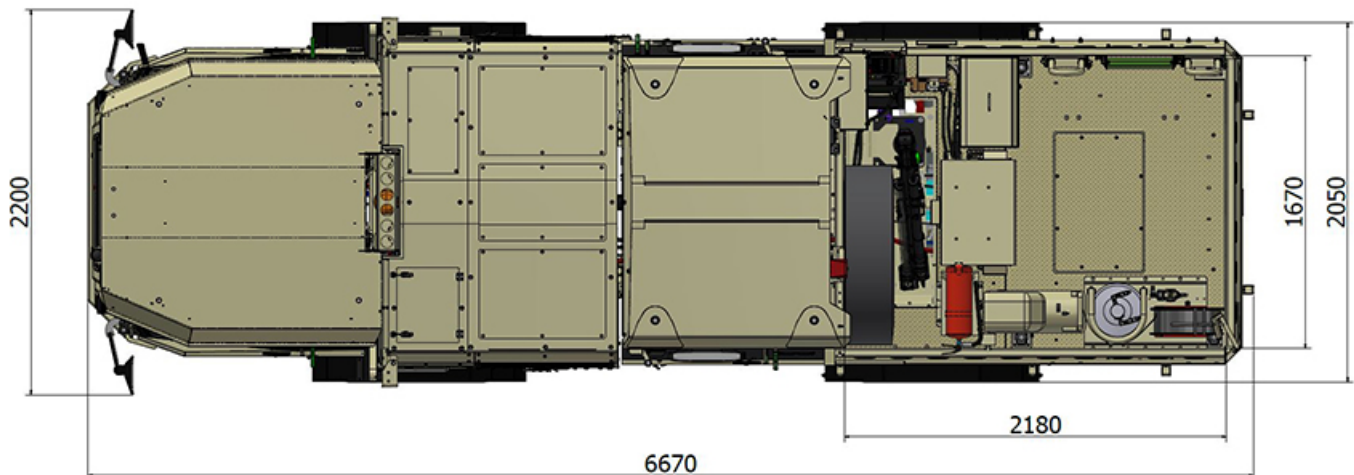
### SIDE AND FRONT VIEW - MACHINE WITH OPTIONS



## TOP VIEW - BASIC MACHINE



## TOP VIEW - MACHINE WITH OPTIONS

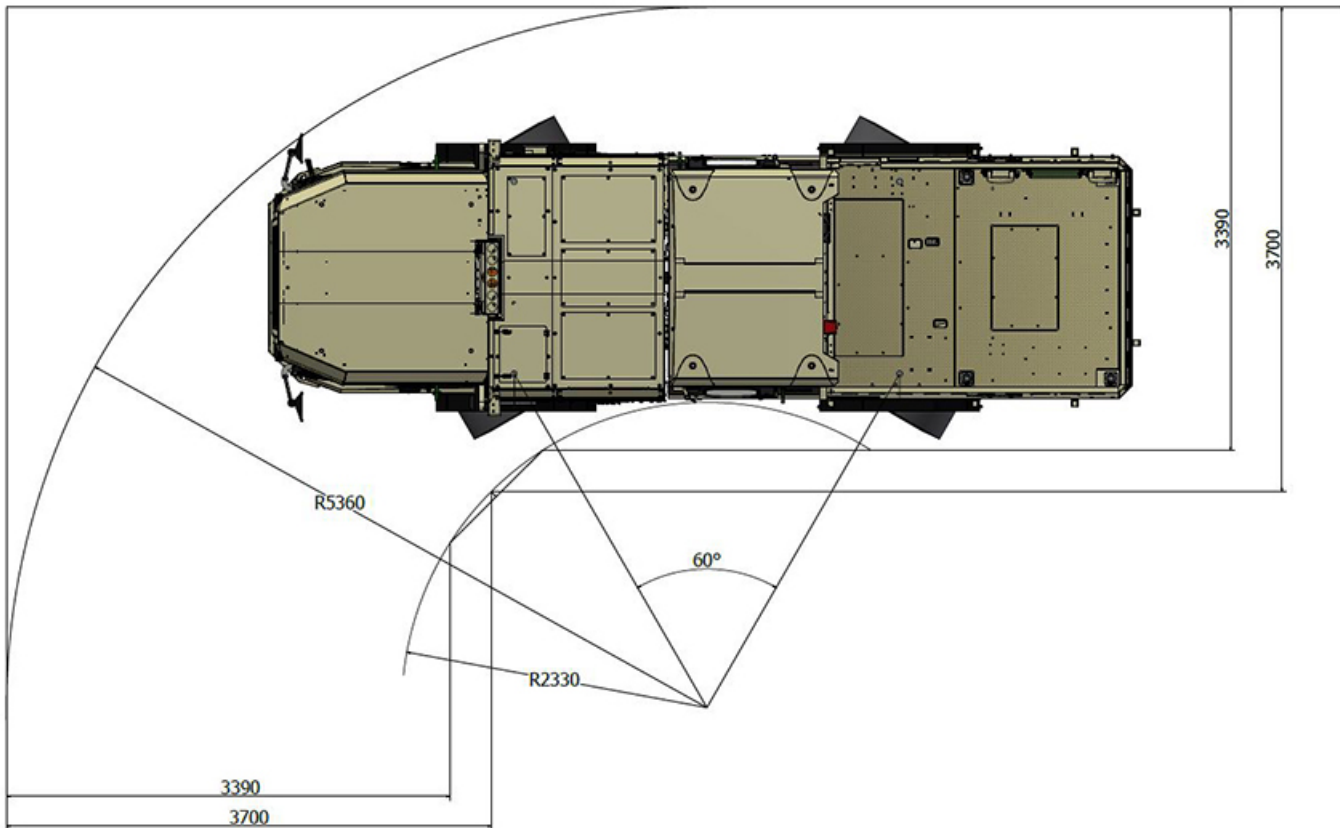


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## TURNING RADIUS



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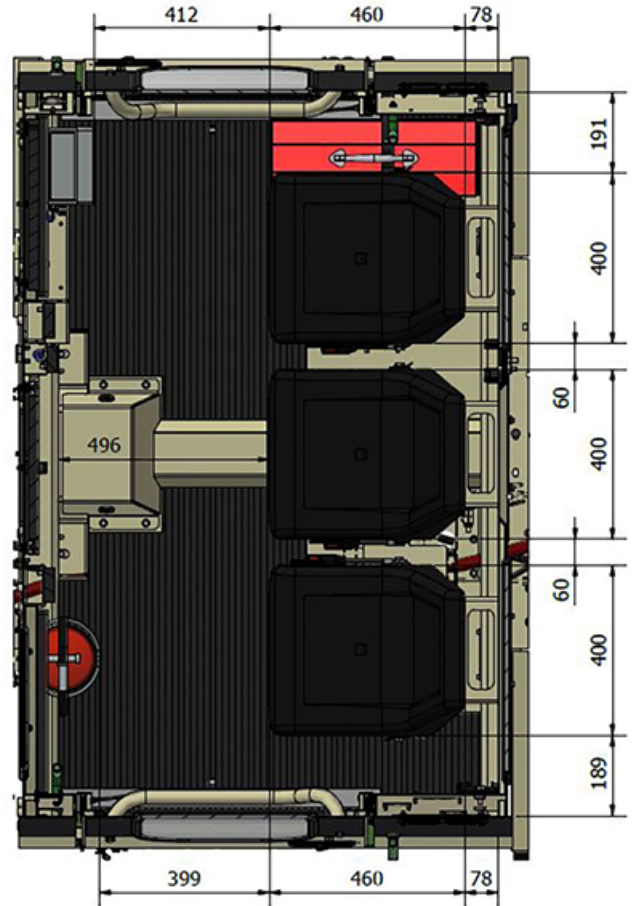
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## TOP VIEW CREW COMPARTMENT

Bench with retractable lap seat belts for 3 persons



Suspended seats with 3 point seat belts for 3 persons



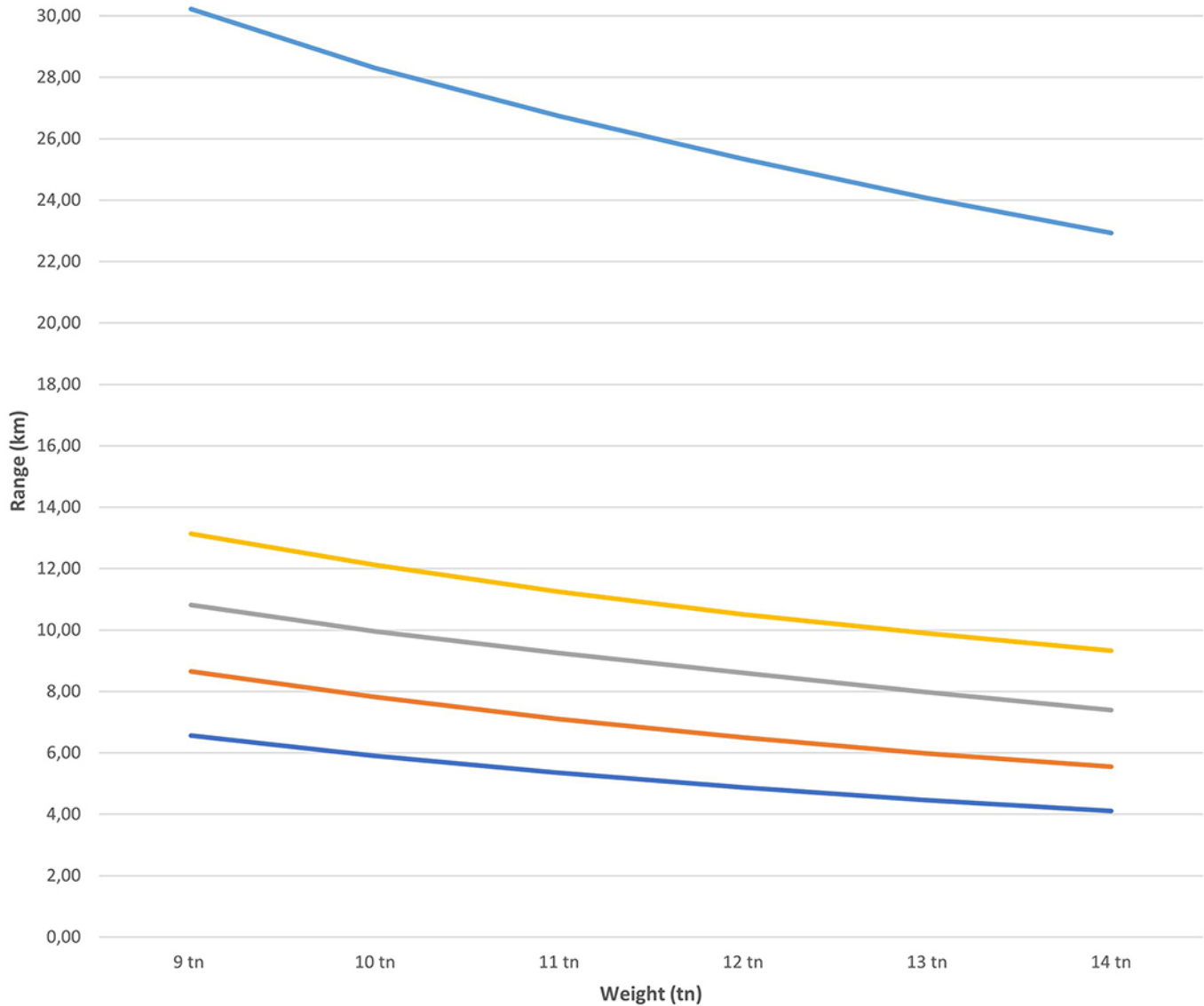
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# DRIVING RANGE AND TRACTIVE EFFORT

## DRIVING RANGE

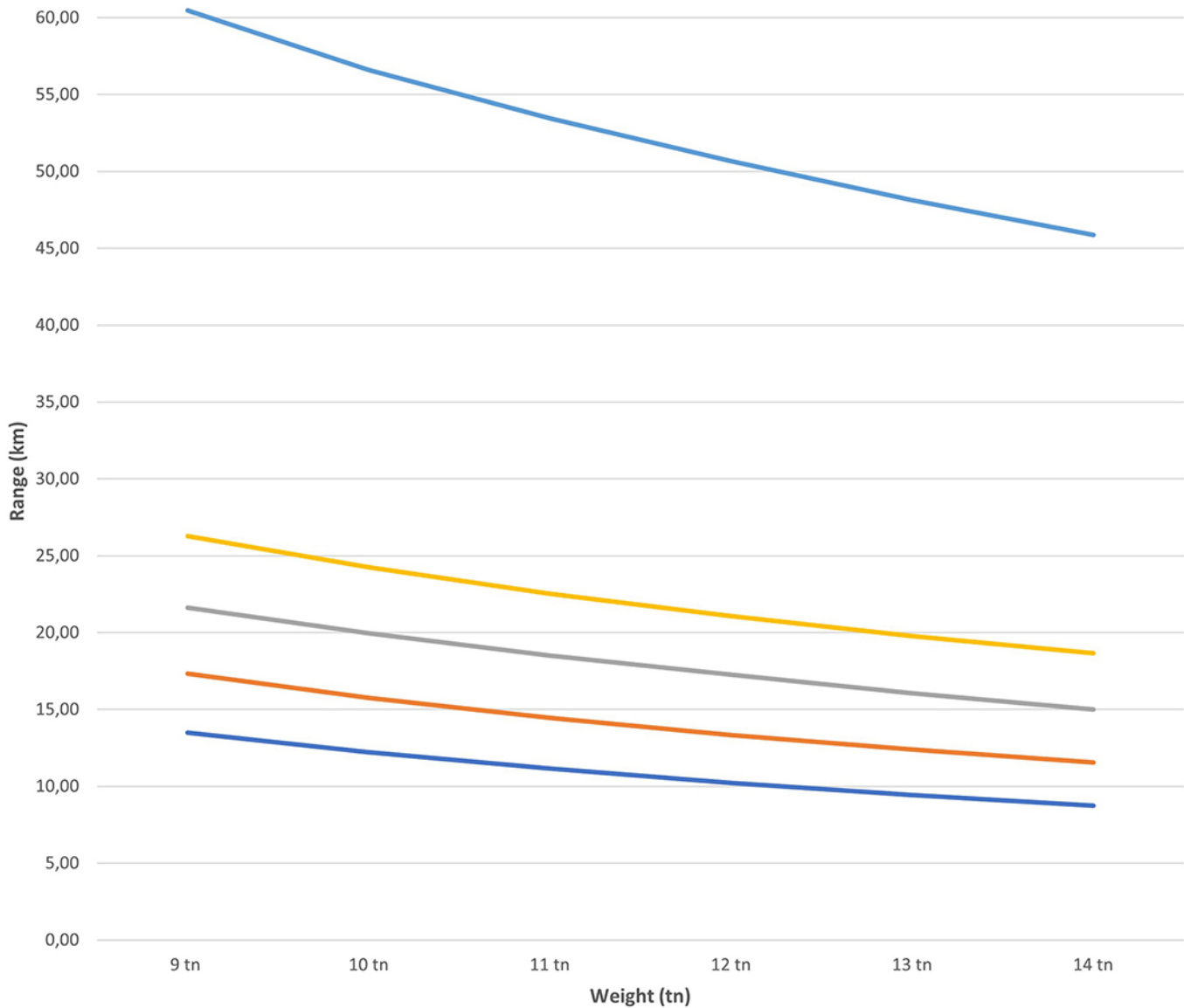
Driving range curve: DOC085386 (Standard range)



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Driving range curve: DOC085383 (Long range)



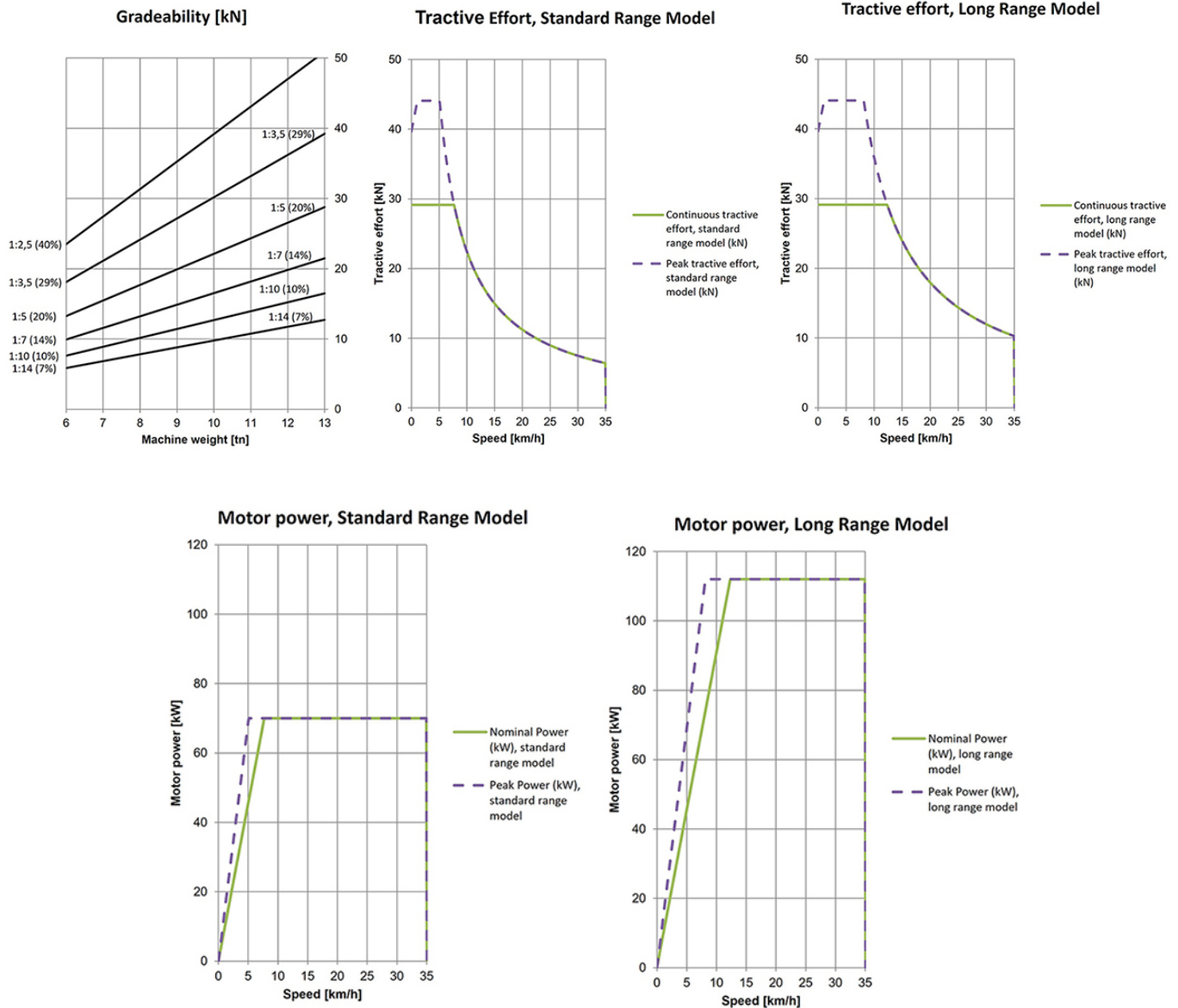
## OPERATING WEIGHT

Empty (Long range)	9700 kg
Fully loaded (Long range)	13 600 kg
Empty (Standard range)	8900 kg
Fully loaded (Standard range)	12 800 kg

final machine weight variate in agree with selected options

## TRACTION EFFORT

Performance curve: DOC083686



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