



Spraymec NorRunner 160 DVC

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Pictures may include options and additional equipment.

INTRODUCTION

ROBUST AND HIGHLY MOBILE CONCRETE SPRAYING MACHINE FOR MEDIUM TO LARGE-SIZED TUNNEL PROFILES

The Spraymec NorRunner is a road-approved, self-propelled, mobile concrete sprayer for tunneling projects with medium to large tunnel profiles.

The robust truck carrier in 8x4/4 configuration enables easy transport on public roads as well as moving the machine on the worksite.

DUAL DRIVE SYSTEM FOR FULL INDEPENDENCE

The spraying operation is possible either from the diesel engine of the truck as well as from the electro-hydraulic power pack.

The reliable and efficient power take-off allows continuous operation with maximum power. The compressor, concrete pump, spray boom and auxiliaries are hydraulically driven.

If a mains supply is available, the entire machine can also be operated electro-hydraulically, thus achieving emission-free and economical operation.

UNMATCHED DOSING SYSTEM AND CONCRETE SPRAYING PUMP TECHNOLOGY

The integrated closed-loop control system continuously monitors and adjusts the dosage of the liquid set accelerator and the concrete pump output.

A unique hydraulic system that independently controls the conveying cylinders reduces further the pulsation in the concrete delivery to an absolute minimum.



SPRAYING BOOM

The simple kinematics of the spray manipulator combined with computer assistance makes it extremely easy to operate and provides one of the largest working ranges in shotcrete processing.

Good protection against rebound and clever routing of the concrete delivery hoses along the manipulator result in a highly effective concrete sprayer.

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HIGH VOLUME COMPRESSOR AND CONCRETE DELIVERY SYSTEM

A reliable and high-volume onboard compressor delivers the air volumes required for a high-quality sprayed concrete application.

The conveying and nozzle system with big diameter steel pipes and hoses minimizes the risk of blockages. Automatic washing system for the nozzle and conveying line reduces personnel to clean the machine.



RELIABLE CONTROL SYSTEM AND ELECTRICS

The spray manipulator is controlled by cable or radio remote control.

All exposed control components are IP65 rated, and the industrial-grade CAN bus system allows effortless troubleshooting.

The well-dimensioned lights on the carrier vehicle and the spray boom provide a good view both while driving and during the spraying operation.

FOCUS ON EASY MAINTENANCE

Easy access to maintenance elements and the central location of lubrication points for the carrier vehicle reduces daily maintenance work. This ensures that no lubrication point is overlooked, thus avoiding costly repairs.

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TECHNICAL SPECIFICATION

SPRAY BOOM

- **SPRAY BOOM SB 516**

Coordinated boom joint control to simplify spraying operation with the possibility of direct control in manual mode.

Nozzle rotation for better distribution of the spray material and surface quality

Durable rebound protection for the boom with hydraulic retractor.

The maximum speed of the boom movements can be adjusted via the display in the user interface (display).

All hydraulic movements are proportionally controlled and pressure compensated.

Boom working range:

Lateral	23 m
Vertical max.	16.5 m
Nozzle rotation	420°
Nozzle tilting	105°

- **SMARTSPRAY SYSTEM**

Advanced machine control for automation of spraying application with additional remote control.

Automatic movement of the spraying head between two previously marked points to keep the distance to the spraying area constant with ease.

Realignment of the nozzles travel axis to facilitate the operation if the machine is not positioned parallel to the spraying area.

Fully automatic spray application of an area previously marked by the corners of rectangles while maintaining the spray distance and perpendicularity to the spray area.

The traveling speed of the nozzle (sum of all joints), traveling path or segment can be adjusted while spraying from the remote control.

The working range of the boom is identical to the standard spray boom and all standard remote controls are supported.

CONCRETE PUMP AND DOSING SYSTEM

CONCRETE PUMP NSP 30

Low-wear and low-maintenance double piston pump specially designed for low-pulsation concrete pumping.

Reversing function for concrete pressure relief in case of over-pressure and automatic switching off of the nozzle air supply.

Pump capacity 3 - 30 m³/h

Pumping cylinder diameter and stroke 200/600 mm

Pumping pressure, max. 51 bar

Feeding hopper 300 l at height (in spraying position) 1440 mm

The high pumping pressure enables the conveying of stiff concrete.

The pump is capable of conveying concrete with an aggregate size of up to 16 mm (including crushed material) and all types of structural fibres up to a length of 60 mm.

The pump unit is hydraulically adjustable in height and can be easily separated from the carrier vehicle.

The controls for adjusting the height of the pump unit are located in the operator's cab and on the front of the machine.

Specially designed hopper with foldable cover with splash protection and for transport. Hydraulically driven agitator in hopper.

Advanced control system (hydraulic and electrical) Nordoser XIM ensures low-pulsation concrete delivery combined with positive cavity (screw) dosing pump

Vibrator with electric drive on hopper grill 24 VDC

The performance of the pump, including the maximum pumping capacity, are based on a theoretical filling rate of 100%.

DOSING SYSTEM FOR ACCELERATOR NORDOSER

Hydraulically driven dosing pump with electric control

Max. pumping pressure 12 bar

Dosing rate 0.6...16 l/min
(36 - 960 l/h)

Accelerator dosing is fully synchronized with concrete delivery. The concrete delivery line and the dosing rate are adjustable from the remote control.

In addition to the standard 1000 l container for liquid set accelerators (IBC), a second container with the same volume can be installed.

CONCRETE DELIVERY SYSTEM

Concrete line diameter 76 mm (3")

Storage place for concrete pipes and hoses for transportation

COMPRESSOR

Hydraulically driven rotary vane compressor	
Free Air Delivery	13.8 m ³ /min
Rated operating pressure	7 bar
Electro-hydraulic power pack in mains operation	110 kW
Air flow to nozzle adjustable in three steps (8 m ³ , 10 m ³ and max.flow)	

ELECTRICAL SYSTEM

Mains supply voltage	1000 V/50 Hz
Robust and abrasion-resistant mains voltage supply cable with PUR outer sheath, 3x 35 mm ² + 3x 6 mm ² , 150 m	
Hydraulically driven cable reel with slip ring	
In and out reel function for mains cable from the cabin, next to the cable reel and concrete pump	
Hydraulic power pack	75 kW
Generator with hydraulic drive	10 kVA
Sockets	7x 230 V, 1x 400 V/50 Hz

CARRIER

Mercedes-Benz Arocs 4158 K 8X4/4 BG16	
Engine OM 473, 425 kW, 2800 Nm at 1100 rpm, Euro VI	
Gearbox Mercedes PowerShift 3	
Engine PTO with flange and flexible clutch	
Drum brakes on front and rear, parking brakes axles 1,3,4	
Spring suspension front and rear	
Driver cabin M-cab (mid long, +250 mm)	
LED driving and indicator lights	
LED warning lights on cabin, rotating, amber, 2 pcs	
Wheel chocks with brackets	
Rear bumper, hydraulically extendable	
Fuel tank capacity	290 l
AdBlue tank capacity	25 l
Battery	2x 220 Ah
Alternator	80 A
Lateral/longitudinal gradient for tramming	4/9°
Lateral/longitudinal gradient for operation	3/9°

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

Spare wheel complete (rim and tire) with bracket mounted on rear cover/below spray boom

Remote Driving System (ReCoDrive) to move the machine from the remote control with Diesel engine

CONTROL SYSTEM

NorSmart control and diagnostic system for:

- Spray boom
- Concrete pump
- Accelerator dosing system
- Safety elements of the spraying system
- Fault diagnostics
- Data logging

HYDRAULIC SYSTEM

Diesel powered hydraulic pumps

PTO with attached hydraulic pumps for spray boom, concrete pump, S-tube, dosing system, and compressor

Auxiliary hydraulic pump to move the boom and support legs when the PTO is not active (driving mode)

Switch in the cabin to activate the generator for accelerator heating during driving

Electro-hydraulic power pack, 75 kW

Hydraulic pumps for spray boom, concrete pump, S-tube, and dosing system

Oil tank capacity, stainless steel 300 l

Return oil filtration 10 µm

Oil level and return filter contamination indicator

Oil cooler for concrete and spray boom circuit

Hydraulic oil type for process:

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

Oil level and return filter contamination indication

REMOTE CONTROL SYSTEM

Wireless remote control

Radio remote control 434 MHz with 4 joysticks including additional cable for bridging the radio link and power supply

The following machine components can be controlled by radio remote control:

- Accelerator dosing rate
- Accelerator pump ON/OFF
- Concrete pump output
- Concrete pump ON/OFF/REVERSE
- Compressed air supply to spray nozzle ON/OFF
- Nozzle quick wash ON/OFF
- Wall washing ON/OFF
- Horizontal tracking of the upper boom telescope ON/OFF
- Automatic second telescope IN/OUT and ON/OFF
- Nozzle nutation ON/OFF

MACHINE WASHING AND SURFACE PREPARATION

High-pressure water system for machine cleaning and pre-wetting of the spray area installed on the spray head. Hydraulic motor drive for water pump (Speck) and nozzle holder with 3 nozzles:

Water pressure, max.	180 bar
Water flow, max.	90 l/min
Hose length in front and rear of machine	13/20 m
Water tank, stainless steel	750 l

WATER HOSE REEL

Water hose reel with hydraulic drive installed on concrete pump

Water hose ID 1", hose length on reel/usable	60/55 m
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24 VDC ELECTRICAL SYSTEM

LED working lights 24 VDC installed on boom (6 pcs.)

LED working lights 230 VAC above the machine for general illumination (3 pcs.)

LED reversing lights 24 VDC behind the cabin on top and underneath (4 pcs.), and on rear bumper (2 pcs.)

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:

- EN
 - One of destination EU languages

Spare parts manuals, hard copy 2 pcs:

- EN

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

Hot climate kit for compressor (extra water/oil-heat exchanger for internal oil system, required for ambient temperatures above 30 °C)

Extra water/oil-heat exchanger hydraulic circuits

Automatic lubrication system for concrete pump and spray boom (excluding nozzle head)

Centralized manual lubrication for carrier

Automatic concrete line washing system including protective cover on hopper

Plug with air and water connection for flushing/cleaning of the 125 mm (5") concrete line

Container for liquid accelerator (IBC) 1000 l, 2 pcs.

Accelerator filling point for two container

Form oil system 24 VDC, with hose reels:

Tank capacity	30 l
Hose length in front and rear of machine	13/20 m
Working pressure	10 bar

Hand-held fire extinguisher, 12 kg, 1 pcs.

Hydraulic stabilizer at the rear end

Storage box for tools and spare parts including tool set:

- Cleaning plug
- Washing ball
- Hitting tool for nozzle
- Claw coupling
- Hose clamp
- Rubber hose 3/4", 4 m
- Carabiner
- Wrench for spraying nozzles
- Hammer 800 g
- Nozzle tip d45 mm plastic
- Cone and special bolt for concrete piston assembly

Fire extinguisher system, Fogmaker, liquid agent, automatic release

Electric pump 24 VDC for emergency use to activate support legs and boom

Anti-freeze tank behind driver's cab 300 l

Water manifold with connection to anti-freeze tank

Water booster pump, 230 VAC, for pressurizing the water system when not connected to the water supply system

Hydraulic oil filling pump, 24 VDC

OTHER

Painting and taping:

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

Text labels in:

- NO or SE
- NO/SE combined
- EN/one of destination EU languages
- Other language

Measurements:

- Noise
- Vibration
- Emissions

ACCESSORIES

PROCESS PRODUCTIVITY

- Concrete thickness measurement system
 - Normet SmartScan
 - Normet SmartScan Align for georeferenced profile data
- Spraying condition monitoring system (ambient, concrete, accelerator temperature and air pressure)
- Heating element kit for accelerator container (IBC): Easily exchangeable jacket-type heating element, 2 circuits each 1000 W, -5°C to 40°C capillary thermostat per circuit Includes separate insulator cover part for container (hole for the filling gap and mixer)
 - For one container
 - For two containers
- Electrically operated mixer for accelerator container (IBC), 0.37 kW, 230 VAC:
 - For one container
 - For two containers
- Bypass filter kit for oil circuit
 - Without motor pump
 - With motor pump
- Hydraulic oil diagnostic sensor
- Wireless remote control 434 MHz with 4 joysticks including additional cable for bridging the radio link and power supply (select the amount of remote controls)

Number of wireless remote controls:
 - 1
 - 2

CARRIER PRODUCTIVITY

- Reversing camera (1 camera, 1 display)

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

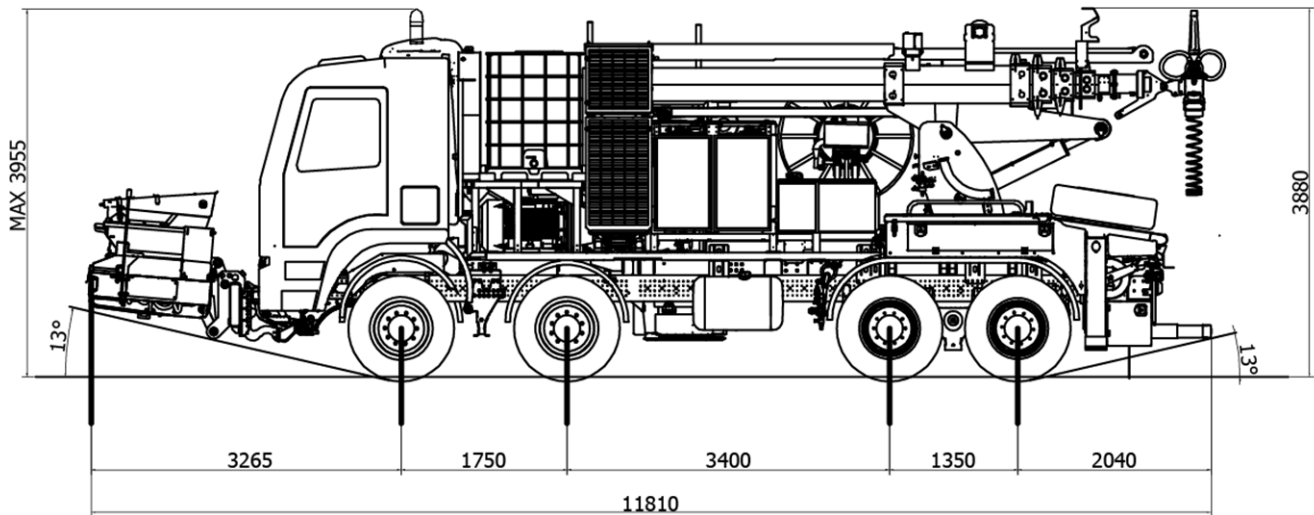
2. MAINTENANCE AND REPAIR TRAINING

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

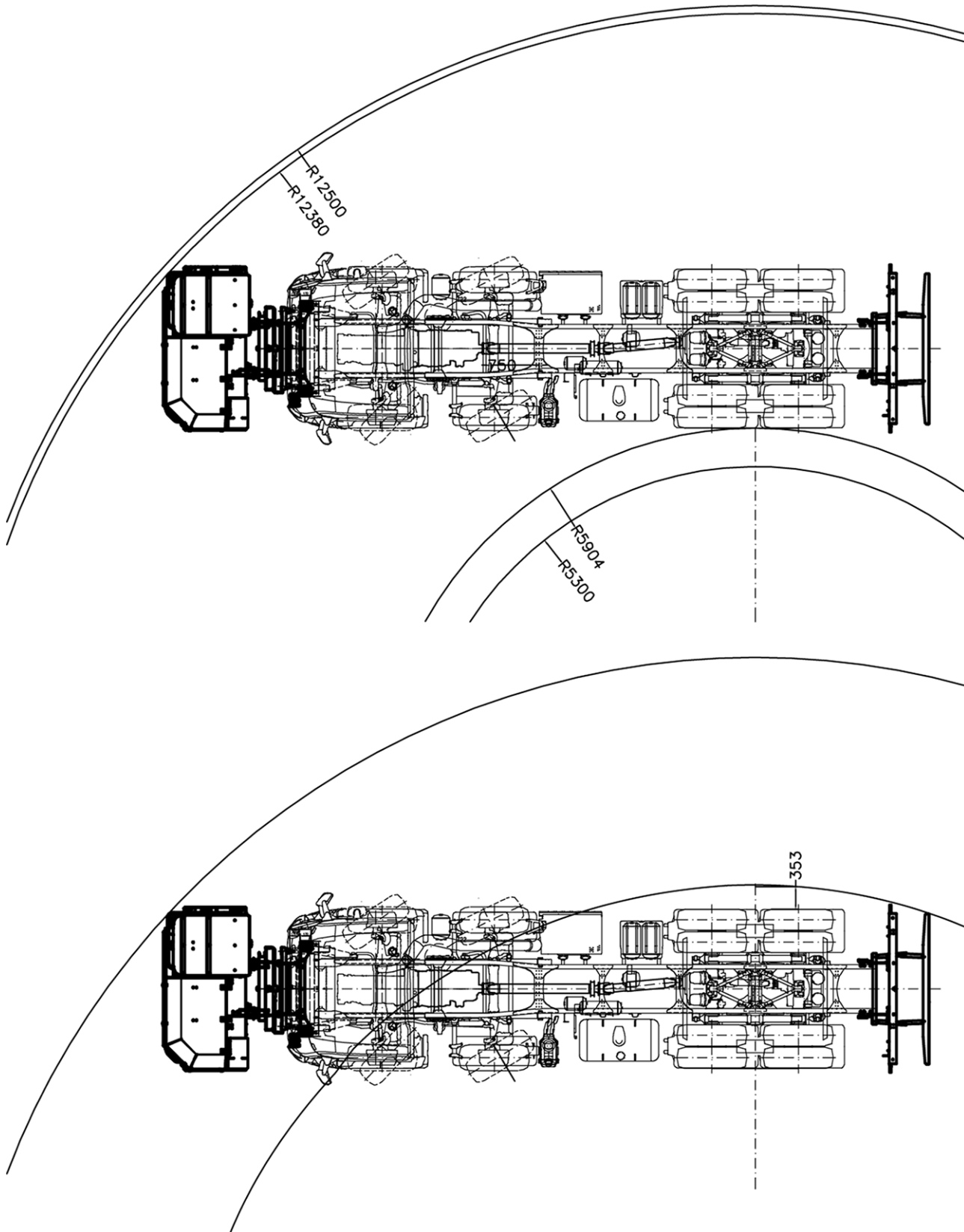
Length	11810 mm	Wheel base	5150 mm
Width	2550 mm	Ground clearance under/between axles	250/300 mm
Height	3880 mm	Operating weight (basic machine)	32000 kg

SIDE VIEW BASIC MACHINE



Transportation and driving dimensions

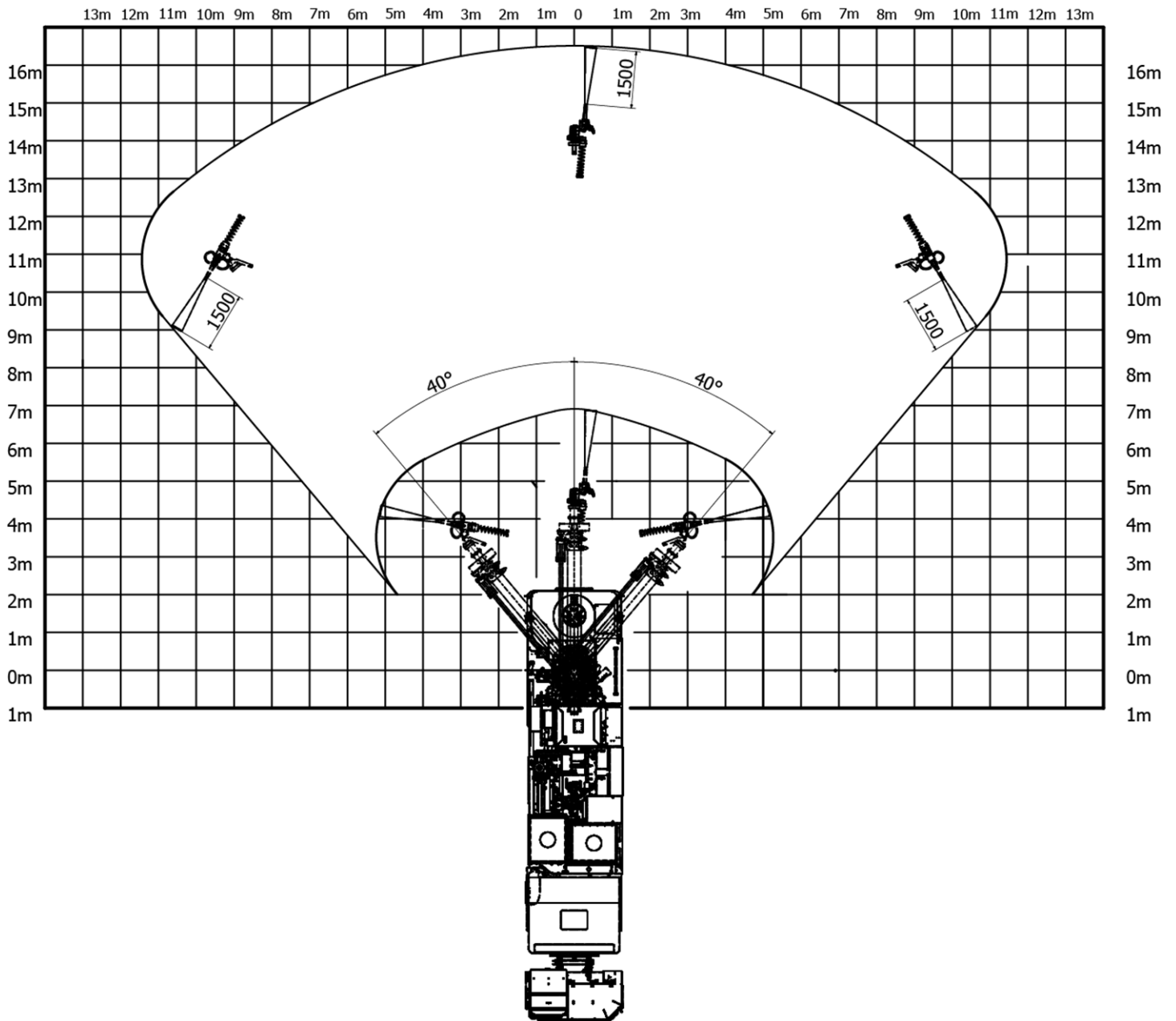
TURNING RADIUS



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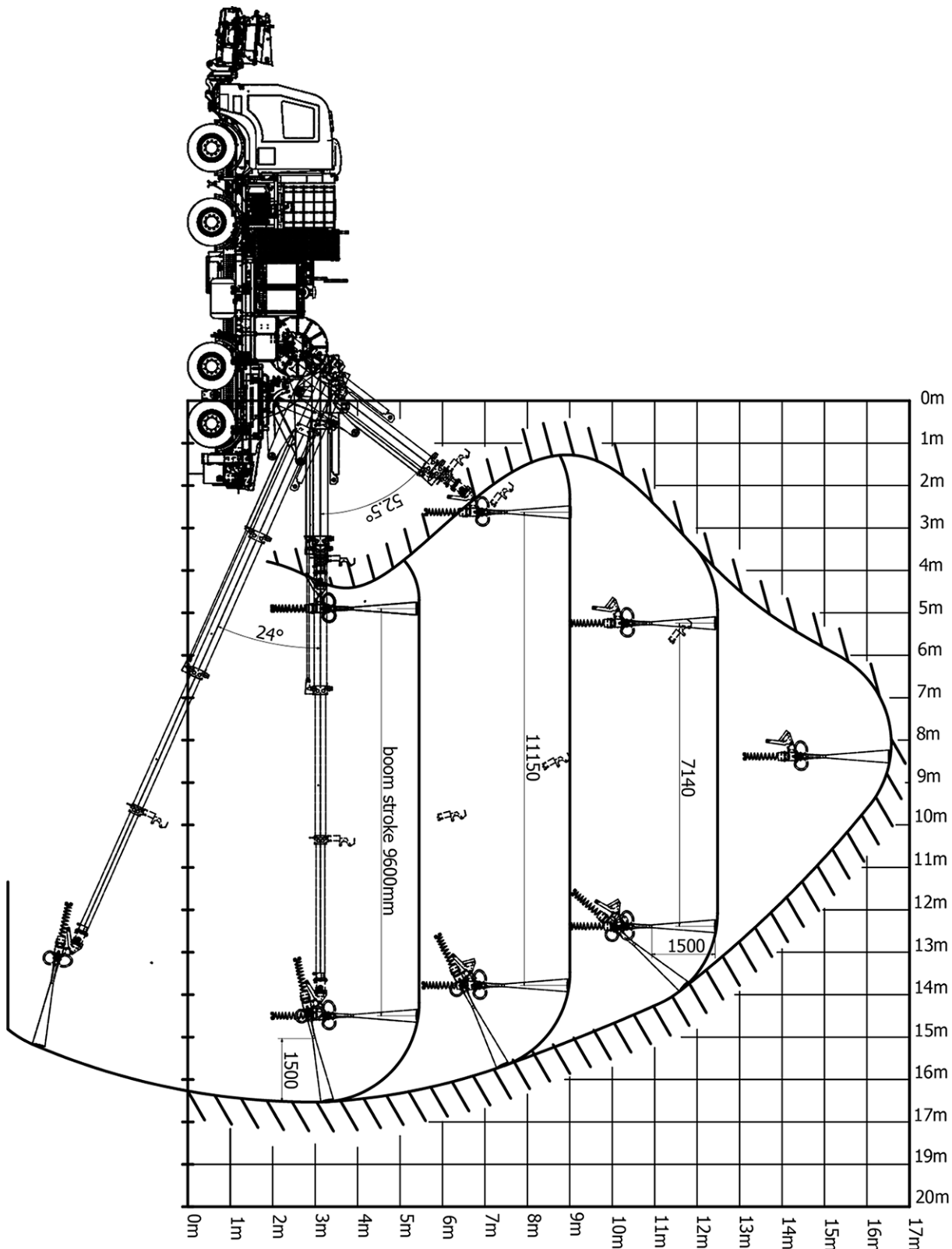
COVERAGE AREA OF SB516 BOOM



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