Beam Runway Rubber Removal Machine

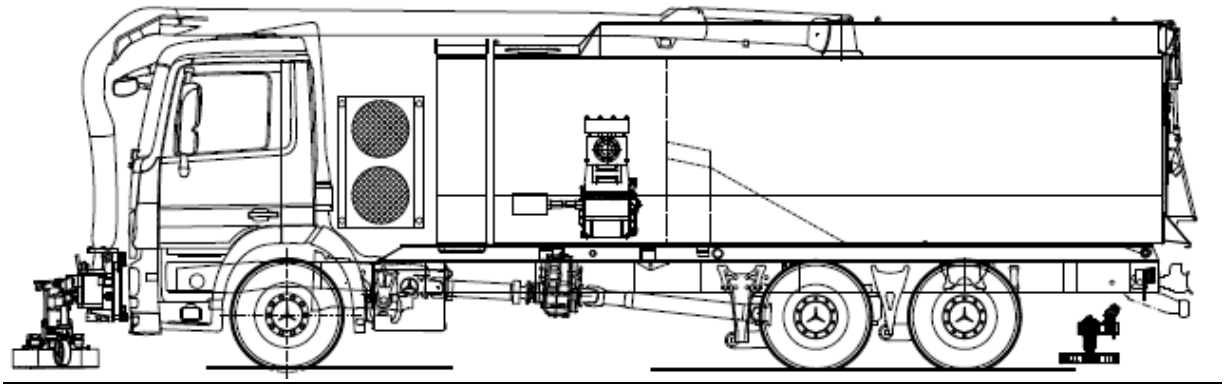
Summary

Runway rubber removal:

- Using ultra high pressure water (2500 bar)
- Cleans a path up to 1500 mm wide
- Fast rate of removal – 1500m^2/hour
- In cab CAN microprocessor control system
- Full hydrostatic drive giving infinite and easy control of speed
- One man operation
- Restores runway friction characteristics

Painted line removal:

- Using ultra high pressure water (2500 bar)
- 300 mm stripe removed at one go
- Fast rate of removal
- In cab CAN microprocessor control system
- Full hydrostatic drive giving infinite and easy control of speed
- One man operation



Beam machines are constructed in our purpose built factory in Denmark, from a 'menu' of different hopper sizes and materials with power packs and water systems to suit an individual customer's requirements.

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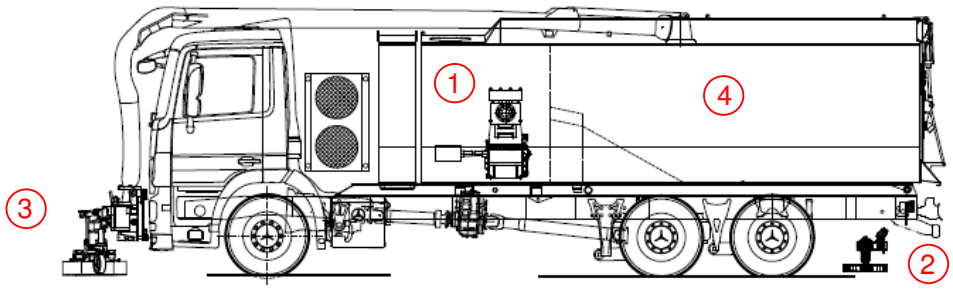
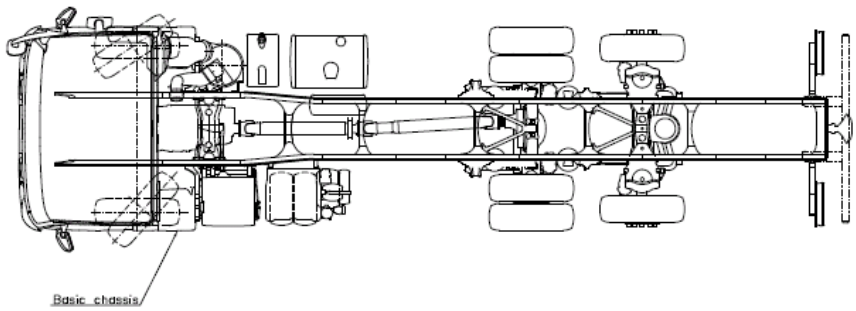
General Outline

The UHP machine is a truck mounted surface cleaning system equipped with an ultra high pressure water pump, rotating spray heads and a vacuum recovery tank that can be mounted onto any suitable 6x2 chassis – in this case a Mercedes Actros 2554 6x2 with a 395KW engine. All functions are controlled from the cabin via a computerised CAN system and all power is taken from the chassis engine via an Omsi hydrostatic gearbox and a chassis engine PTO.

A Hammelmann HDP174 UHP pump is mounted in a protected cowling integrated within the hopper (1). The pump is powered directly by a chassis engine PTO. It is mounted onto the chassis rails using steel bolts and rubber mounts and can be adjusted and controlled to deliver high pressure water at up to 36 litres per minute and 2500 bar. For runway rubber removal, water is pumped to a spray system located behind the rear axle of the chassis (2). The spray system covers a width of 1500mm with 3 x 500mm rotating spray heads. The spray heads are fixed whilst in work mode avoiding the complication and reliability issues associated with 'typewriter type mechanisms). For painted line removal, water is pumped to a different spray head mounted on the front of the chassis (3). This system can remove lines of 300mm width. Each spray head (front and rear) rotates at high speed and has a precise jet pattern that removes rubber or paint whilst leaving the ground surface unscathed. The distance of the spray heads from the ground can be adjusted to vary the pressure of water impacting the surface. The spray heads are enclosed in ground hugging hoods which incorporate vacuum nozzles. As the jets remove rubber or painted lines, the debris is vacuumed simultaneously into the waste hopper (4). In transit mode, the spray heads front and rear are lifted clear of the surface.





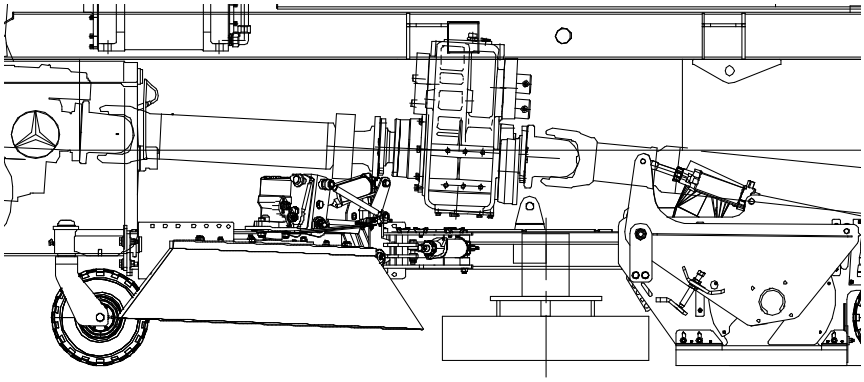
The hopper and water tanks are constructed from 304 stainless steel. This gives corrosion protection and efficient waste discharge. The capacity of the waste hopper is 6200 litres and it houses integrated water tanks with a capacity of 5050 litres. The hopper which is mounted onto the chassis, is tipped to discharge waste through a rear door by means of a hydraulic cylinder attached to the hopper subframe. A filter within the hopper separates dirty water from the debris.

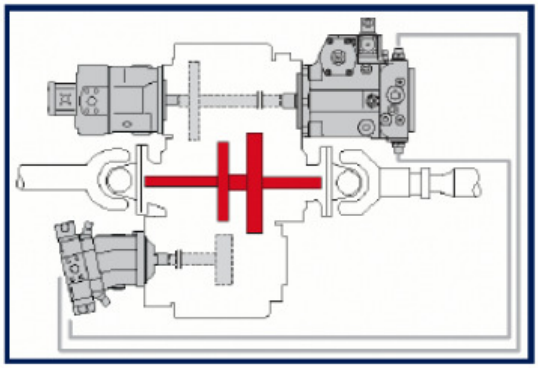
The in cab touch screen control panel enables monitoring of key functions and parameters – speed, fuel, oil pressure, engine tacho, working water pressure, water tank level, pump pressure etc.

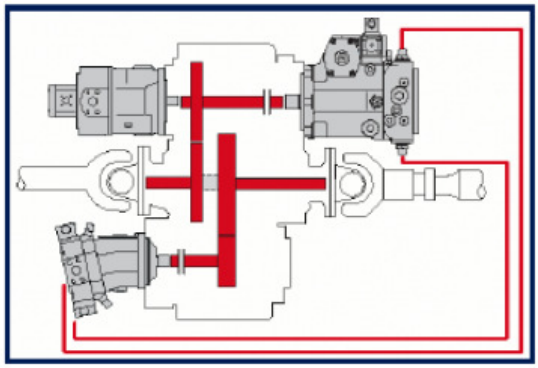
Hydrostatic drive

The fan impeller, the rotor system and the truck itself in cleaning mode are driven from the chassis engine via an Omsi HT 600 / 3000 gearbox with maximum output power of 200 kW.

The gearbox is mounted on the chassis between the front and rear axles and below the chassis rails. It is connected directly to the chassis drive shaft. The gearbox can be operated in two modes. In transit mode where normal truck speeds can be attained, the gearbox acts as a direct mechanical link between the prop shaft running from the truck gearbox and the second prop shaft running to the rear axles - a 'straight through' drive. In hydrostatic mode, the direct drive to the rear axles is disengaged. The gearbox then drives a hydraulic pump to power the rear wheels. In hydrostatic mode, this gives infinite control of speed from zero up to the maximum of 12km/h. In hydrostatic mode, the gearbox also runs the fan impeller via a hydraulic piston pump.







Torque – mechanical transmission	3000 daNm
Range of drive ratios	1 /1 – 1,7
Maximum output power	200 kW
Centre distance – main drive / output	432 mm
Maximum truck speed	90 km/h

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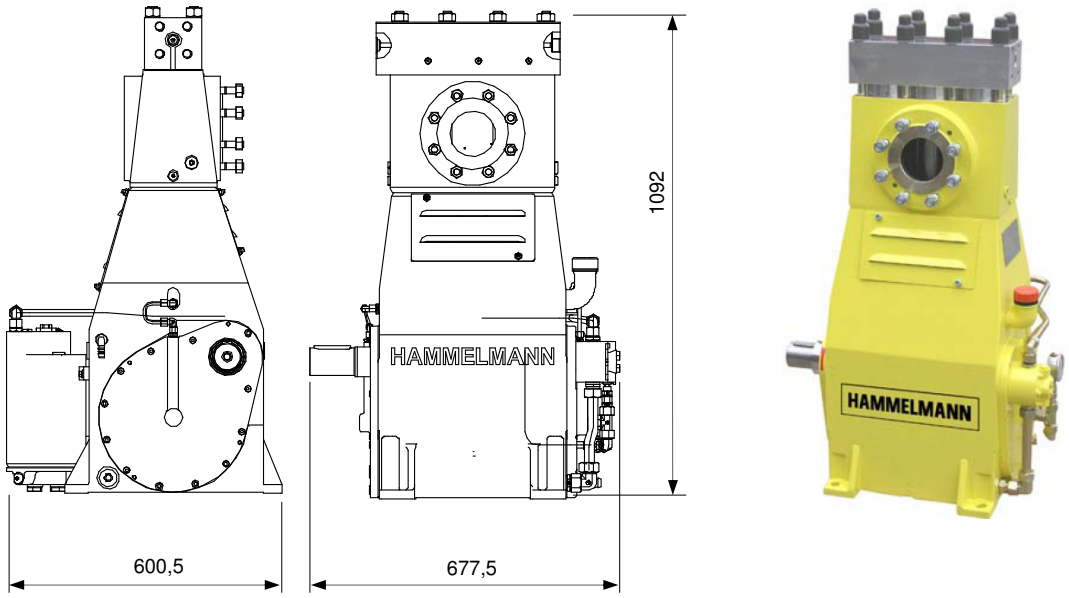
Hammelmann Water Pump

2500 Bar UHP Pump

The Hammelmann ultra high pressure pump (HDP174) is built to operate continuously at 2500 bar and 2150 rpm. The pump has a stainless steel stress free pump head and a hydrodynamic sealing system with tungsten carbide pistons. This pump is used for rubber removal and paint demarking.



A priming pump is used to ensure a strong feed of water to the UHP pump. Water is filtered through 2 inline filters of 10 and 1 microns respectively. The high pressure system is equipped with a safety valve. A safety cut out ensures the pump is shut down if inlet pressure falls below 2 bar.

The CAN system allows for preset safety features which ensure that the pump shuts down in the event of a failure that might cause damage to the runway surface or the machine itself. For example, if the chassis speed falls below a set minimum, the pump will shut down. Also, if there is low water level, low engine oil pressure or high engine oil temperature or if there is a failure in the hydraulic system, rotor system or water systems the pump will also automatically shut down.

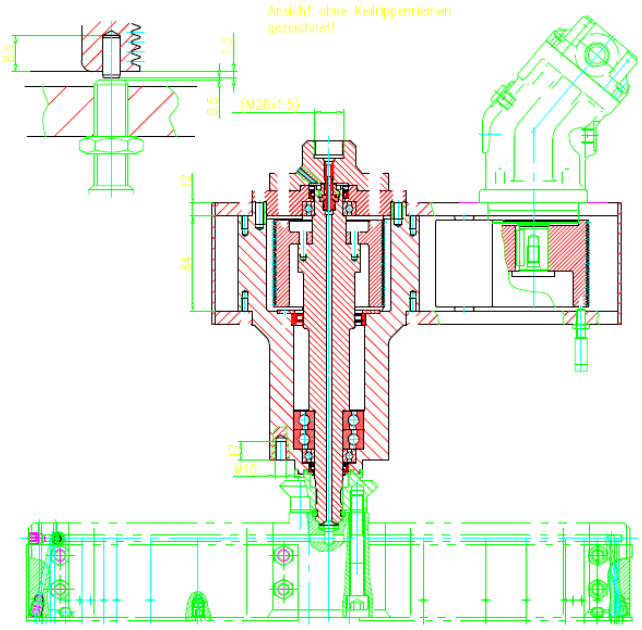
Hammelmann is perhaps the best known manufacturer of ultra high pressure pumps in the world. It has over 50 years of experience in producing pumps and spray systems. Its name is synonymous with innovation, quality and reliability. It has service centres worldwide including Thailand. It is for these reasons that Beam chooses to work with Hammelmann on all UHP machines.

Jetting Systems / Spray Heads

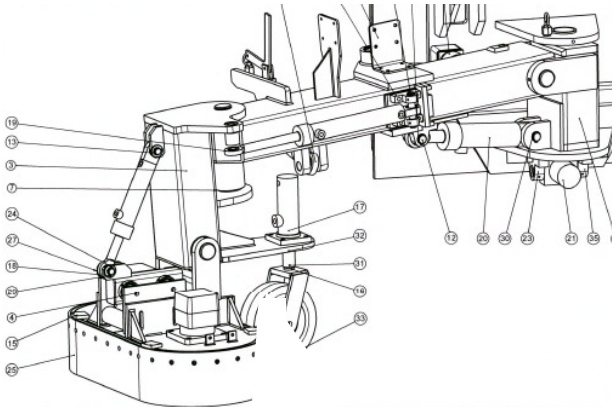
UHP 2500 Bar Jetting System

The UHP jetting heads have a unique nozzle pattern that has been developed specifically for rubber and painted line removal. It ensures optimal removal rates without damage to the runway surface. The components are produced by Hammelmann. The rear mounted rubber removal system contains 3 heads, each with a diameter of 500mm. The front mounted paint removal system has 1 head with a 300mm diameter.

All spray heads are mounted in vacuum hoods supported on robust caster wheels. The height of the heads is adjustable to allow the correct setting for different cleaning conditions. The heads are pneumatic lifted and lowered. A camera is located at the rear to enable the driver to monitor the rear mounted equipment.



Cross section of spray head



Front mounted spray head

Technical Data

Feature	Data
General	
Length	9000 mm
Width	2500 mm
Weight - Tare (standard machine)	15000 kg
Speeds	
Transiting speed	Up to 90 km/h
Sweeping	Up to 12 km/h
Rubber removal rates	up to 1500 m^2/h
Hopper	
Waste hopper capacity:	6200 litres
Water tank capacity:	5050 litres
Suction fan impeller	
Fan impeller speed:	3800 rpm
Fan impeller air flow:	600 m^3/min
Vacuum:	1800 mm water column
Chassis	
Mercedes Actros 2554	4 stroke water cooled 6 cyl diesel
Engine power	395KW
Axles	3 Axle – with 1 drive axle
Steering	Mechanical with power assist
Breaking system	Pneumatic with spring safety system
Emissions standard	Euro 3
Comfort	Adjustable seats, air con, cabin lights, designed for ease of access and maintenance. Rear view mirrors
Fuel tank capacity	600 litres to give over 8 hours use
Hand of drive	Left
Towing	Front and rear tow hooks
Spare wheel	One included, together with hydraulic jack and tools and tire inflation hose with air pressure guage
Electrical System	
Voltage	24v
Alternator	100A
Battery output	165 Ah
Battery charger	Outsource 230VAC
Lighting	Rotating beacons front and rear, vehicle lights, signal lights, and working lights
Low pressure water system for wash down	60 l/min @ 6 bar
Miscellaneous	
Warranty	12 months from commissioning
Technical documentation – operation and maintenance	3 sets

Please refer to the tender compliance statement for further details

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