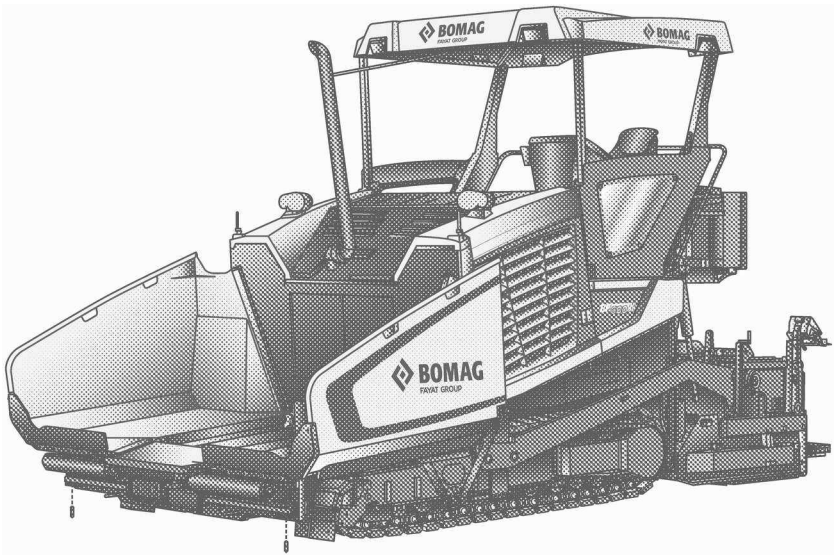
BOMAG
FAYAT GROUP

Service Manual

BF 700 C S600



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1 General

1.1 Introduction Service Manual

General

This manual:

- addresses the BOMAG Customer Service and professionally trained personnel.
- provides support for repair work or maintenance procedures on the machine.

This manual described the deinstallation, dismantling , assembly, installation as well as the repair of components and assembly groups as far as this makes sense with respect to tools and spare parts supply.

Documentation

For the BOMAG machines described in this manual the following documentation is additionally available:

- Operating and maintenance instructions
- Spare parts catalogue
- Service information (if necessary)

Genuine BOMAG spare parts

Use only genuine BOMAG spare parts.

Spare parts needed for repairs can be taken from the spare parts catalogue for the machine.

Updating service

This manual is not subject of an updating service. For this reason we would like to draw your attention to the additionally published service informations.

In case of a new release all necessary changes will be included.

In the course of technical development we reserve the right for technical modifications without prior notification.

Copyright

DANGER!

Danger to life when disregarding the safety regulations!

– Strictly follow the safety regulations in this instruction manual.

1.2 Concerning your safety

1.2.1 Handling fuels and lubricants

1.2.1.1 Preliminary remarks

The operating company must ensure that all professional users have read and follow the corresponding safety data sheets for the individual fuels and lubricants.

Safety data sheets provide valuable information about the following characteristics:

- name of substance
- possible dangers
- composition / information on constituents
- first-aid measures
- fire fighting measures
- measures in case of accidental release
- handling and storage
- limitation and monitoring of exposure / personal protective equipment
- physical and chemical properties
- stability and reactivity
- toxicological data
- environmental data
- notes on waste disposal
- information on transport
- legislation
- other data

1.2.1.2 Safety regulations and environmental protection regulations for handling diesel fuel

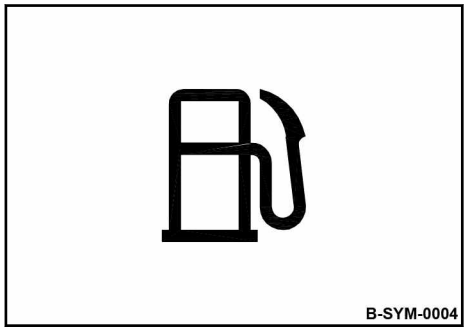

Fig. 1

WARNING!

Danger of burning by ignited diesel fuel!

– Do not allow diesel fuel to come into contact with hot components.
– Smoking and open fire is prohibited!
– Wear your personal protective equipment (protective gloves, protective clothing).

CAUTION!

Health hazard caused by contact with diesel fuel!

– Wear your personal protective equipment (protective gloves, protective clothing).
– Do not inhale any fuel fumes.
– Avoid contact.

CAUTION!

Danger of slipping on spilled diesel fuel!

– Immediately bind spilled diesel fuel with an oil-binding agent.

ENVIRONMENT!

Diesel fuel is an environmentally hazardous substance!

– Always keep diesel fuel in proper containers.
– Immediately bind spilled diesel fuel with an oil-binding agent and dispose of properly.
– Dispose of diesel fuel and fuel filters according to regulations.

1.2.1.3 Safety regulations and environmental protection regulations for handling AdBlue®/DEF

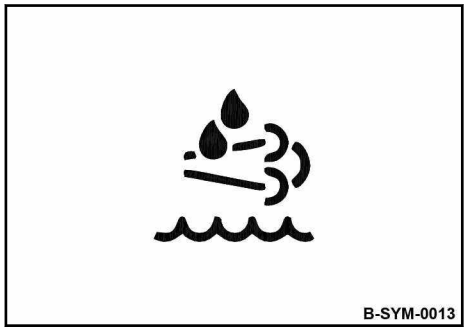

Fig. 2

CAUTION!

Health hazard caused by ammonia vapours!

– Wear your personal protective equipment (protective gloves, protective clothing).
– Do not inhale ammonia vapours.
– Avoid contact and consumption.

AdBlue®/DEF has not been classified as environmentally harmful.

1.2.1.4 Safety regulations and environmental protection regulations for handling oil

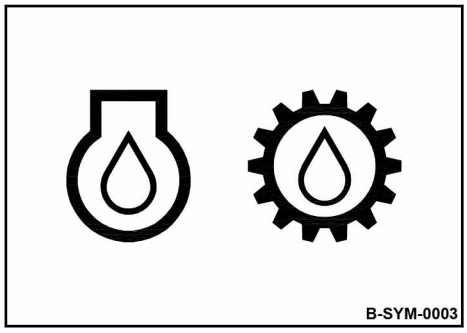

Fig. 3

WARNING!

Danger of burning by ignited oil!

– Do not allow oil to come into contact with hot components.
– Smoking and open fire is prohibited!
– Wear your personal protective equipment (protective gloves, protective clothing).

CAUTION!

Health hazard caused by contact with oil!

– Wear your personal protective equipment (protective gloves, protective clothing).
– Do not inhale any oil vapours.
– Avoid contact.

CAUTION!

Danger of slipping on spilled oil!

– Immediately bind spilled oil with an oil-binding agent.

ENVIRONMENT!

Oil is an environmentally hazardous substance!

– Always keep oil in proper containers.
– Immediately bind spilled oil with an oil-binding agent.
– Dispose of oil and oil filter according to regulations.

1.2.1.5 Safety regulations and environmental protection regulations for handling hydraulic oil

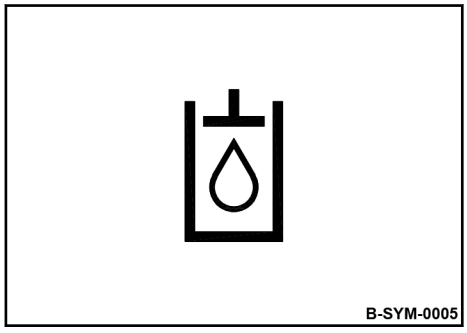

Fig. 4

WARNING!

Danger of injury caused by escaping pressure fluid!

– Always depressurize the hydraulic system before starting work in the hydraulic system.
– Wear your personal protective equipment (protective gloves, protective clothing, goggles).

Should pressure fluid penetrate the skin, immediate medical help is required.

WARNING!

Danger of burning by ignited hydraulic oil!

– Do not allow hydraulic oil to come into contact with hot components.
– Smoking and open fire is prohibited!
– Wear your personal protective equipment (protective gloves, protective clothing).

CAUTION!

Health hazard caused by contact with hydraulic oil!

– Wear your personal protective equipment (protective gloves, protective clothing).
– Do not inhale any oil vapours.
– Avoid contact.

CAUTION!

Danger of slipping on spilled oil!

– Immediately bind spilled oil with an oil-binding agent.

ENVIRONMENT!

Oil is an environmentally hazardous substance!

– Always keep oil in proper containers.
– Immediately bind spilled oil with an oil-binding agent.
– Dispose of oil and oil filter according to regulations.

1.2.1.6 Safety regulations and environmental protection regulations for handling coolants

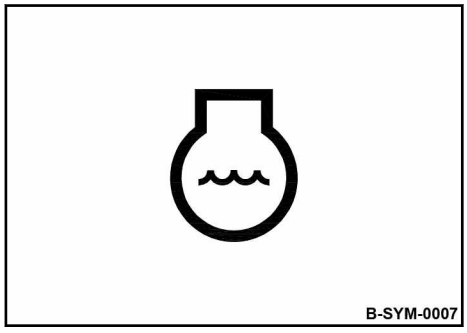

Fig. 5

WARNING!

Danger of scalding by hot fluid!

– Open the compensation tank only when the engine is cold.
– Wear your personal protective equipment (protective gloves, protective clothing, goggles).

CAUTION!

Health hazard caused by contact with coolant and coolant additives!

– Wear your personal protective equipment (protective gloves, protective clothing).
– Do not inhale any fumes.
– Avoid contact.

CAUTION!

Danger of slipping on spilled coolant!

– Immediately bind spilled coolant with an oil-binding agent.

ENVIRONMENT!

Coolant is an environmentally hazardous substance!

– Always keep coolant and coolant additives in proper containers.
– Immediately bind spilled coolant with an oil-binding agent and dispose of it according to regulations.
– Dispose of coolant according to regulations.

1.2.1.7 Safety regulations and environmental protection regulations for handling battery acid

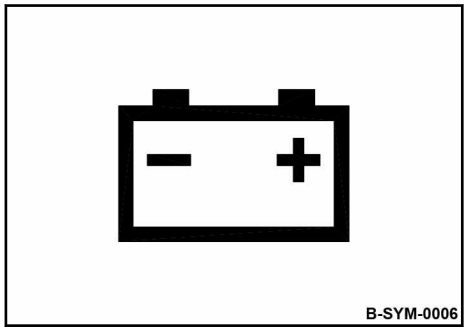

Fig. 6:

WARNING!

Danger of cauterization with acid!

- Wear your personal protective equipment (protective gloves, protective clothing, goggles).
- Do not allow clothes, skin or eyes to come into contact with acid.
- Rinse off spilled battery acid immediately with lots of water.

Rinse acid off clothes, skin or eyes immediately with lots of clean water.

Immediately call for medical advice in case of cauterization.

WARNING!

Danger of injury caused by exploding gas mixture!

- Remove the plugs before starting to recharge the battery.
- Ensure adequate ventilation.
- Smoking and open fire is prohibited!
- Do not lay any tools or other metal objects on the battery.
- Do not wear jewellery (watch, bracelets, etc.) when working on the battery.
- Wear your personal protective equipment (protective gloves, protective clothing, goggles).

ENVIRONMENT!

Battery acid is an environmentally hazardous substance!

- Dispose of battery and battery acid according to regulations.

1.2.2 Parking the machine in secured condition

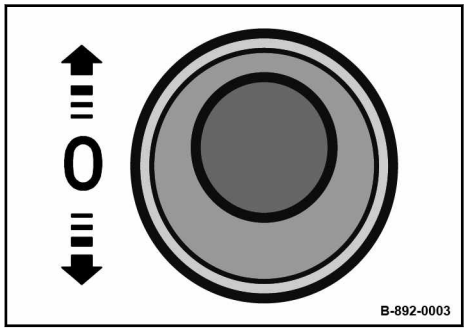

Fig. 7

1. Drive the machine onto level and firm ground.
2. Shift the travel lever to “Middle” position.

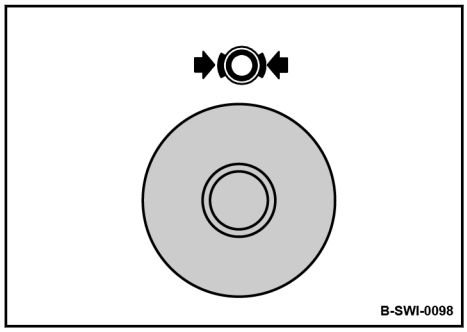

Fig. 8

3. Press the parking brake switch.
4. Completely lower the screed with the toggle switch/button for lifting/lowering the screed (b).

NOTICE!

Danger of engine damage!

– Do not shut down the engine all of a sudden from full load speed, but let it idle for about two minutes.

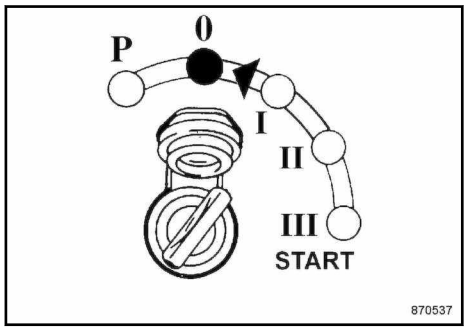

Fig. 9

5. Turn the ignition key to position “0” and pull it out.

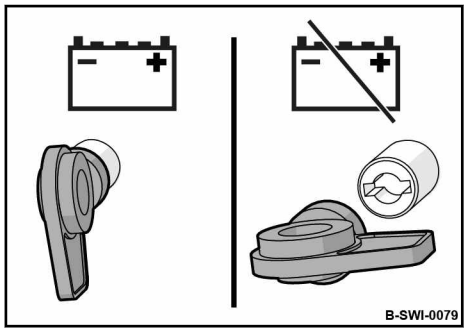

Fig. 10

6. Turn the main battery switch counter-clockwise and pull it out.

1.3 Fuels and lubricants

1.3.1 Engine oil

1.3.1.1 Oil quality

The following engine oil specifications are permitted:

- Engine oils acc. to Mercedes-Benz operating instructions sheet no. 228.5 or 228.51

The list of approved engine oils is also available on the Internet under the following address:

http://bevo.mercedes-benz.com/

Avoid mixing engine oils.

1.3.1.2 Oil viscosity

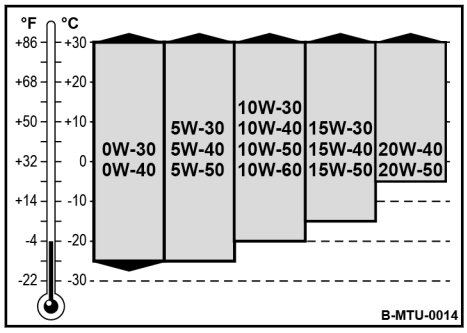

Fig. 11: Oil viscosity diagram

Since engine oil changes its viscosity with the temperature, the ambient temperature at the operating location of the engine is of utmost importance when choosing the viscosity class (SAE-class).

Only use multi-purpose oils.

The temperature data of the SAE-class always refer to fresh oils. The engine oil ages during travel operation because of soot and fuel residues. This adversely affects the properties of the engine oil, especially at low ambient temperatures.

Optimal operating conditions can be achieved by using the oil viscosity chart as reference.

1.3.1.3 Oil change intervals

If the oil change intervals are not reached over a period of 2 years, the oil change should be performed at least every 2 years, irrespective of the operating hours reached.

1.3.2 Fuel

1.3.2.1 Fuel quality

In order to fulfil the regulations of the exhaust gas legislation, diesel engines equipped with an exhaust gas aftertreatment system, must only be operated with sulphur-free diesel fuel.

The following fuel specifications are permitted:

- EN 590
- ASTM D975 Grade-No. 1-D S15 and 2-D S15

1.3.2.2 Winter fuel

For winter operation use only winter diesel fuel, to avoid clogging because of paraffin separation.

At very low temperatures disturbing paraffin separation can also be expected when using winter diesel fuel.

Diesel fuels suitable for temperatures down to -44 °C (-47 °F) are available for Arctic climates.

NOTICE!

Danger of engine damage!

– The admixture of petroleum and the addition of “flow enhancing additives” (fuel additives) is not permitted.

1.3.2.3 Storage

Even traces of zinc, lead and copper can cause deposits in the injection nozzles, especially in modern Common-Rail injection systems.

Zinc and lead coatings in refuelling systems and fuel lines are not permitted.

Copper containing materials (copper lines, brass items) should be avoided, because they can cause catalytic reactions in the fuel with subsequent depositing in the injection system.

1.3.3 AdBlue®/DEF

1.3.3.1 AdBlue®/DEF quality

AdBlue® is a non-inflammable, non-toxic, colour and odourless as well as water soluble fluid.

AdBlue® is alternatively also called “Urea” or “DEF” (Diesel Exhaust Fluid).

NOTICE!

Damage to the exhaust gas aftertreatment system!

Filling the AdBlue®/DEF tank with cleaning agent or other operating media or fuels, mixing in additives or diluting AdBlue®/DEF will damage the exhaust gas aftertreatment system.

Use only AdBlue®/DEF as per DIN 70070/ISO 22241.

In case of incorrect filling you should contact a qualified expert workshop.

If AdBlue®/DEF comes into contact with spray painted or aluminium surfaces, you should rinse off the affected areas immediately with lots of water.

1.3.3.2 Low outside temperatures

AdBlue®/DEF freezes at a temperature of approx. -11 °C (12 °F). Winter operation is also guaranteed at temperatures below -11 °C (12 °F).

At low temperatures crystals may form on the wound hose between engine and exhaust silencer. Such crystallization does not impair the function of the exhaust gas aftertreatment. If necessary just remove the crystals with clear water.

1.3.3.3 Storage

Use only tanks made of the following material to store AdBlue®/DEF:

- Cr-Ni steels acc. to DIN EN 10 088-1/2/3
- Mo-Cr-Ni steels acc. to DIN EN 10 088-1/2/3
- Polypropylene
- Polyethylene

NOTICE!

Damage to the exhaust gas aftertreatment system!

Containers made of the following materials are not suitable for storing AdBlue®/DEF, because components of these materials may dissolve and thus damage the exhaust gas aftertreatment system:

- aluminium
- copper
- copper containing alloys
- non-alloyed steel
- galvanized steel

The service life of AdBlue®/DEF without any loss of quality is influenced by the storage conditions.

Exposure of stored containers to direct insolation and UV-radiation must be strictly avoided.

constant storage temperature	Minimum shelf life (months)
< 10 °C (50 °F)	36
< 25 °C (77 °F)	18
< 30 °C (86 °F)	12
< 35 °C (95 °F)	6
> 35 °C (95 °F)	Check the product before use

AdBlue®/DEF should remain in the tank for max. four months.

1.3.3.4 Cleanliness

NOTICE!

Damage to the exhaust gas aftertreatment system!

Contaminated AdBlue®/DEF, e.g. caused by other operating fluids, cleaning agents or dust leads to:

- increased emission values
- damage to catalytic converters
- engine damage
- malfunction of the exhaust gas aftertreatment system.

Always ensure strict cleanliness of the AdBlue®/DEF in order to avoid malfunction of the exhaust gas aftertreatment system.

If you pump AdBlue®/DEF out of the tank, e.g. in case of a repair, do not fill it back into the tank. Otherwise the cleanliness of the fluid can no longer be guaranteed.

1.3.4 Coolant

1.3.4.1 General

The coolant is a mixture of water and anti-corrosion/anti-freeze agent.

The anti-corrosion/anti-freeze agent in the coolant has the following properties:

- Heat transfer
- Corrosion protection
- Cavitation protection
- Frost protection
- Increase of boiling temperature

Leave the coolant in the system all year around. This applies also for countries with high ambient temperatures.

Check the anti-corrosion/anti-freeze concentration in the coolant every six months.

Use only approved anti-corrosion/anti-freeze agents.

1.3.4.2 Topping up coolant

NOTICE!

Danger of engine damage!

Use only prepared coolant with 50 % by volume anti-corrosion/anti-freeze as per sheet 325.5 or 326.5 to replenish the system.

Information on operating fluids tested by Mercedes-Benz and approved for your engine can be found on the internet under:

http://bevo.mercedes-benz.com/

Only fill in anti-corrosion/anti-freeze agent of the same quality range.

In case of coolant loss, do not fill only with water, but add also the appropriate proportion of approved anti-corrosion/anti-freeze agent.

1.3.4.3 Replacing coolant

- every 3 years

When renewing the coolant you must make sure that the coolant contains 50 Vol.-% by weight of anti-corrosion/anti-freeze agent. This corresponds with a frost protection down to -37 °C (-35 °F).

Do not exceed a proportion of 55 Vol.-% (frost protection down to approx. -45 °C (-49 °F)). Otherwise heat discharge and anti-freeze properties will be adversely affected.

The water in the coolant must meet certain requirements, which are most frequently met by drinking water. If the water quality is not sufficient, you should have water specially prepared. Follow the operating fluids instructions according to sheet 310.1 issued by Mercedes-Benz.

1.3.5 Hydraulic oil

1.3.5.1 Mineral oil based hydraulic oil

The hydraulic system is operated with hydraulic oil HV 32 (ISO) with a kinematic viscosity of 32 mm^2/s at 40 °C (104 °F) and 7 mm^2/s at 100 °C (212 °F).

When refilling or changing oil, use only hydraulic oil type HVLP according to DIN 51524, part 3, or hydraulic oil type HV according to ISO 6743/4.

The viscosity index must be at least 180 (observe information of manufacturer).

1.3.5.2 Bio-degradable hydraulic oil

The hydraulic system can also be operated with a synthetic ester based biodegradable hydraulic oil.

The biologically quickly degradable hydraulic oil Panolin HLP Synth.46 meets all demands of a mineral oil based hydraulic oil according to DIN 51524.

In hydraulic systems filled with Panolin HLP Synth.46 always use the same oil to top up.

When changing from mineral oil based hydraulic oil to an ester based biologically degradable hydraulic oil, you should consult the lubrication oil service of the oil manufacturer, or our customer service for details.

NOTICE!

Danger of damage to the hydraulic system!

- After the changeover check the hydraulic oil filters increasingly for contamination.
- Have regular oil analyses performed regarding the water content and mineral oil.
- Replace the hydraulic oil filter at the latest after 500 operating hours.

1.3.6 Gear oil SAE 75W-90

Use a fully synthetic gear oil in accordance with SAE 75W-90, API GL5 with a kinematic viscosity of at least 16 mm^2/s at 100 °C (212 °F).

1.3.7 Lubrication grease

For lubrication purposes use an EP-high pressure grease, lithium saponified (penetration 2), acc. to DIN 51502 KP 2G.

1.3.8 High-temperature lubrication grease

For lubrication purposes use an EP-high pressure grease, lithium saponified (penetration 3), for raised bearing temperatures acc. to DIN 51502 KP 3 P-20.

NLGI-classification 3 acc. to DIN 51818.

1.4 List of fuels and lubricants

Assembly group	Fuel or lubricant		Spare parts number	Filling quantity
	Summer	Winter		Observe the level mark!
Engine oil	SAE 5W-30 Specification: *Chapter 1.3.1 „Engine oil“ on page 16*		009 920 13 20 l	17.5 l (4.6 gal us)
	SAE 5W-30			
	SAE 15W-40			
	SAE 5W-40			
Fuel	Diesel	Winter diesel fuel		285 l (75 gal us)
	Specification: *Chapter 1.3.2 „Fuel“ on page 16*			
AdBlue®/DEF	Specification: *Chapter 1.3.3 „AdBlue®/ DEF“ on page 17*			40 l (10.6 gal us)
Coolant	Mixture of water and anti-freeze agent Specification: *Chapter 1.3.4 „Coolant“ on page 20*		009 940 03 20 l	36 l (9.5 gal us)
Hydraulic system	Hydraulic oil (ISO), HV32 Specification: *Chapter 1.3.5.1 „Mineral oil based hydraulic oil“ on page 21*		009 920 14 20 l	160 l (42 gal us)
	or ester based biodegradable hydraulic oil Specification: *Chapter 1.3.5.2 „Bio-degradable hydraulic oil“ on page 21*			
Transfer case	Gear oil SAE 75W-90 Specification: *Chapter 1.3.6 „Gear oil SAE 75W-90“ on page 22*		009 925 05 20 l	7 l (1.8 gal us)
Travel gear	Gear oil SAE 75W-90 Specification: *Chapter 1.3.6 „Gear oil SAE 75W-90“ on page 22*		009 925 05 20 l	5 l each (1.3 gal us)
Lubrication points	High pressure grease (lithium saponified) Specification: *Chapter 1.3.7 „Lubrication grease“ on page 22*			as required
Auger drive chain box	High temperature - high pressure grease (lithium saponified) Specification: *Chapter 1.3.8 „High-temperature lubrication grease“ on page 22*		009 960 09 400 g	as required
Emulsion	Bitumen separating agent		009 741 03 20 l	30 l (8 gal us)

1.5 Repair notes for hydraulics

Please note

Cleanliness is of utmost importance. Dirt and other contaminations must strictly be kept out of the system.

- Connections and screw fittings, filler neck covers and their immediate surrounding areas must be cleaned before removal.
- Before loosening hoses, pipe lines etc. relieve all pressure from the system.
- During repair work keep all openings closed with clean plastic plugs and caps.
- Never run pumps, motors and engine without oil or hydraulic oil.
- When cleaning hydraulic components take care not to damage any fine machined surfaces.
- Chemical and rubber dissolving cleansing agents may only be used to clean metal parts. Do not let such substances come in contact with rubber parts.
- Rinse of cleaned parts thoroughly, dry them with compressed air and apply anti-corrosion oil immediately. Do not install parts that show traces of corrosion.
- Avoid the formation of rust on fine machined parts caused by hand sweat.
- Use new O-rings or seal rings for reassembly.
- Use only hydraulic oil as sliding agent when reassembling. Do not use any grease!
- Use only the specified pressure gauges. Risk of damaging the pressure gauges under too high pressure.
- Check the hydraulic oil level before and after the work.
- Use only clean hydraulic oil in strict compliance with the specification in the operating and maintenance instructions to fill the hydraulic system.
- Check the hydraulic system for leaks, if necessary find and rectify the cause.
- Before taking new hydraulic components into operation fill these with hydraulic oil as specified in the operating and maintenance instructions.
- After changing a hydraulic component thoroughly flush, refill and bleed the complete hydraulic system.
- Perform pressure tests at operating temperature of the hydraulic oil (approx. 40 °C).
- After the completion of all tests perform a test run and then check all connections and fittings for leaks with the engine still stopped and the hydraulic system depressurized.

Before commissioning

- Fill the housings of hydraulic pumps and motors with hydraulic oil. Use only hydraulic oils according to the specification in the maintenance instructions.
- After changing a component flush the hydraulic system as described in the flushing instructions.

Taking into operation

- Bleed the hydraulic circuits.
- Start up the hydraulic system without load.
- Check the hydraulic oil level in the tank, if necessary top up with hydraulic oil as specified in the operating and maintenance instructions or drain oil off into a suitable container.

After taking into operation

- Check fittings and flanges for leaks.
- After each repair check all adjustment data, system pressures, rotational speeds and nominal values in the hydraulic system, adjust if necessary.
- Do not adjust pressure relief valves and control valves to values above their specified values.

2 Technical data

Technical data

Dimensions

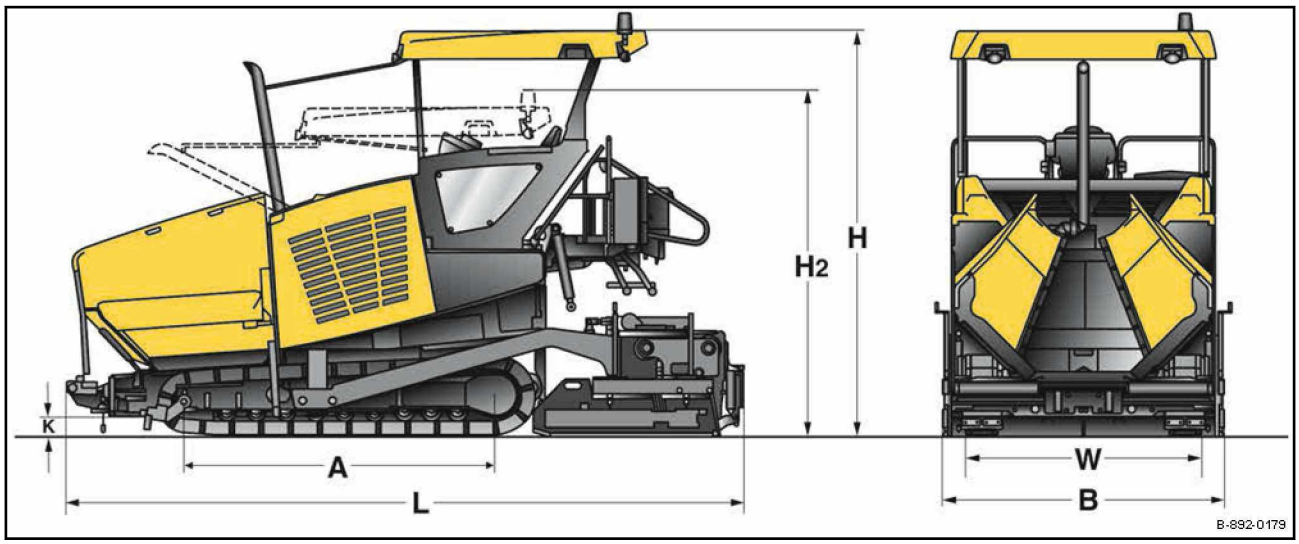

Fig. 12

A	B	H	H_2	L	W
2975 (117)	3000 (118)	3910 (154)	3061 (121)	6460 (254)	2255 (89)
Dimensions in millimetres (Dimensions in inch)					

Weights		
Operating weight (CECE) with screed	20200 (44533)	kg (lbs)

Travel characteristics		
Working speed	0 – 25 (0 – 66)	m/min (ft/min)
Travel speed	0 – 4 (0 – 2.5)	km/h (mph)
Max. permissible ascent	15	°

Drive		
Engine manufacturer	MTU	
Type	4R 1000	

Drive		
Cooling	Fluid	
Number of cylinders	4	
Rated power ISO 3046	116/158	kW/hp
Rated speed	2000	min^{-1}
Fuel	Diesel	

Crawler track		
Ground contact area (length x width)	2975 x 300	mm
	(117.1 x 11.8)	(in)

Hopper		
Capacity	7	m^3
	(247)	(ft^3)
Width (wings open)	3330	mm
	(131)	(in)
Width (wings closed)	2270	mm
	(89)	(in)
Length	1800	mm
	(71)	(in)
Filling height (middle)	590	mm
	(23.2)	(in)

Scraper belt / auger		
Quantity	2	
Rated speed	64	min^{-1}
Individual control	Standard	
Reversing operation	Standard	

Conveyor auger		
Quantity	2	
Width	400	mm
	(15.7)	(in)

Technical data

Conveyor auger		
Rated speed	117	min^{-1}
Reversing operation	Standard	

Screed		
Basic width retracted	3000 (118)	mm (in)
Basic width extended	6000 (236)	mm (in)
Max. working width	7500 (295)	mm (in)
Min. paving width with reducing skids	2300 (91)	mm (in)
Mat height	300 (11.8)	mm (in)
Screed plate depth	400 (15.7)	mm (in)
Screed plate thickness	15 (0.6)	mm (in)
Heating	electric	
Crown profile	-2.5 to +4.5	%
Tamper frequency	0 to 30	Hz
Vibration frequency	0 to 60	Hz

Filling capacities		
Fuel (diesel)	285 (75)	l (gal us)

Additional engine data		
Manufacturer		MTU
Combustion principle		4-stroke diesel
Low idle speed	590	min^{-1}
High idle speed	600	min^{-1}
Specific fuel consumption	205	g/kWh