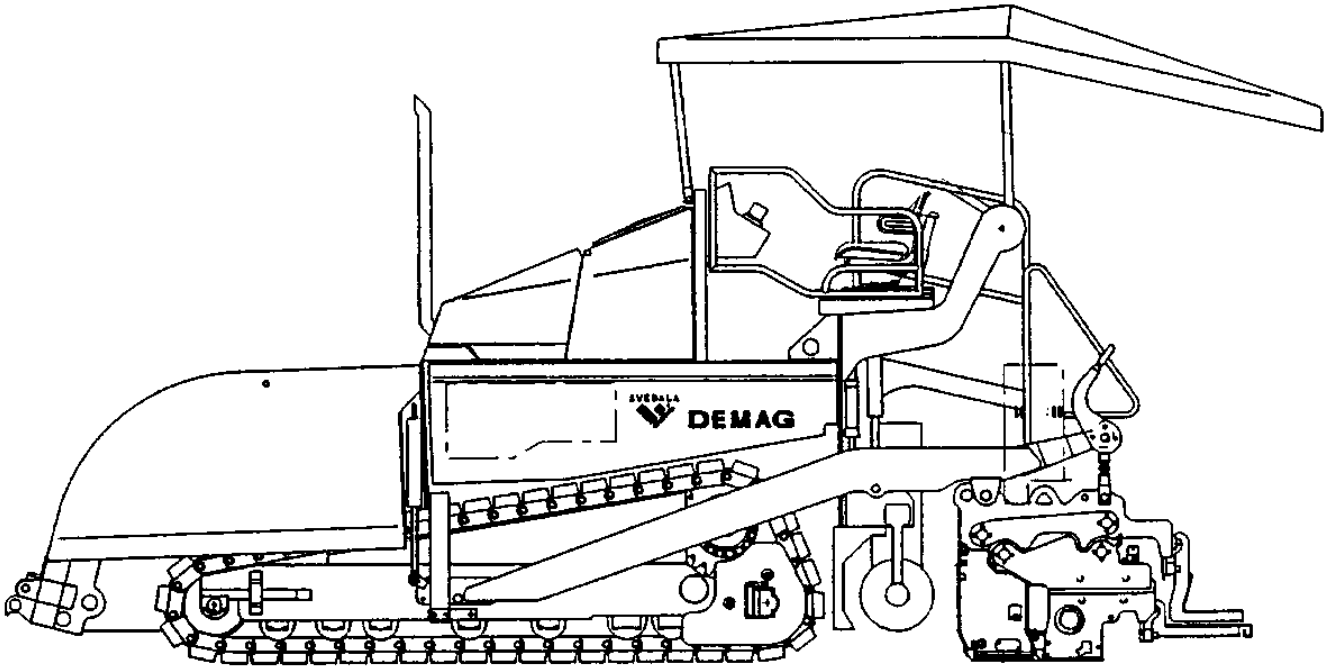
SVEDALA DEMAG



Road Finisher

DF 115 C
DF 135 C

Operating instructions

GB

02-01.03

900 98 06 40

Foreword

For safe operation of the machine, a specific knowledge is necessary, which is provided in these operating instructions. The information is provided in a concise, clear form. The chapters are arranged according to letters. Each chapter begins with page 1. The page identification consists of the chapter letter and page number.
Example: Page B 2 is the second page in Chapter B.

In these operating instructions, various options are also documented. During operation and maintenance, it must be ensured that the description applicable to the available option is used.

Safety information and important explanations are identified by the following pictograms:

Precedes safety information to be observed to prevent danger to persons.

Precedes information to be observed to prevent material damage.

Precedes information and explanations.

- ● Identifies standard equipment.

- ○ Identifies additional equipment.

The manufacturer reserves the right in the interest of further technical advances, to make changes maintaining the essential features of the described machine type, without simultaneous amendment of these operating instructions.

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A Use for the intended purpose

☞ The ”Guide to the intended and proper use of road finishers” is included in the scope of supply of this machine. It is an integral part of these operating instructions and must be observed in any event. National requirements apply without restriction.

The road construction machine described in these operating instructions is a road finisher that is suitable for laying material, rolled or lean-mixes concrete, track ballast and uncombined mineral compounds for paving surfaces.
The finisher must be used, operated and maintained according to the information in these operating instructions. Use for any other than the intended purpose is improper and can cause injury to persons and cause damage to the road finisher or property.

Use for any other than the above described purpose is not for the intended purpose and is expressly forbidden! For operation on slopes or for use for special purposes in particular (landfill construction, dam construction) the manufacturer must be consulted in any event.

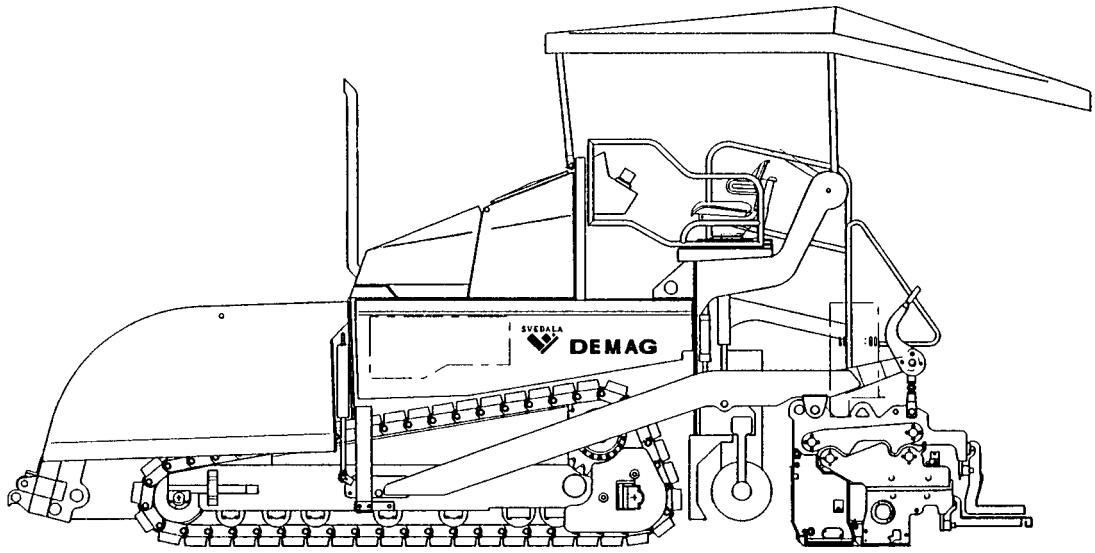
Obligations of the operator: Operator in the sense of these operating instructions is any natural or judicial person who uses the road finisher himself or on whose behalf the machine is used. In exceptional cases (e.g. leasing, hire), the operator is the person who is responsible for fulfilling the aforementioned obligations in accordance with the contractual agreements concluded between the owner and the user of the road finisher.
The operator must ensure that the road finisher is used only for the intended purpose and dangers to the life and health of the user or third parties of any kind are avoided. In addition. the accident prevention regulations, other safety rules as well as the operating, maintenance and repair instructions must be observed. The operator must ensure that all users have read and understood these operating instructions.

Mounting accessories: The road finisher can only be operated with the laying screeds approved by the manufacturer. Additional equipment that affects or supplements the functions of the road finisher may only be mounted or installed with the prior written permission of the manufacturer. The permission of the local authorities may be required in some cases.
The permission of the manufacturer is still required despite permission being given by the authorities.

B Vehicle description

1 Description of application

The SVEDALA DEMAG road finisher is equipped with a crawler for laying bituminous material, rolled or lean-mixes concrete, track ballast and uncombined mineral compounds for paving surfaces.



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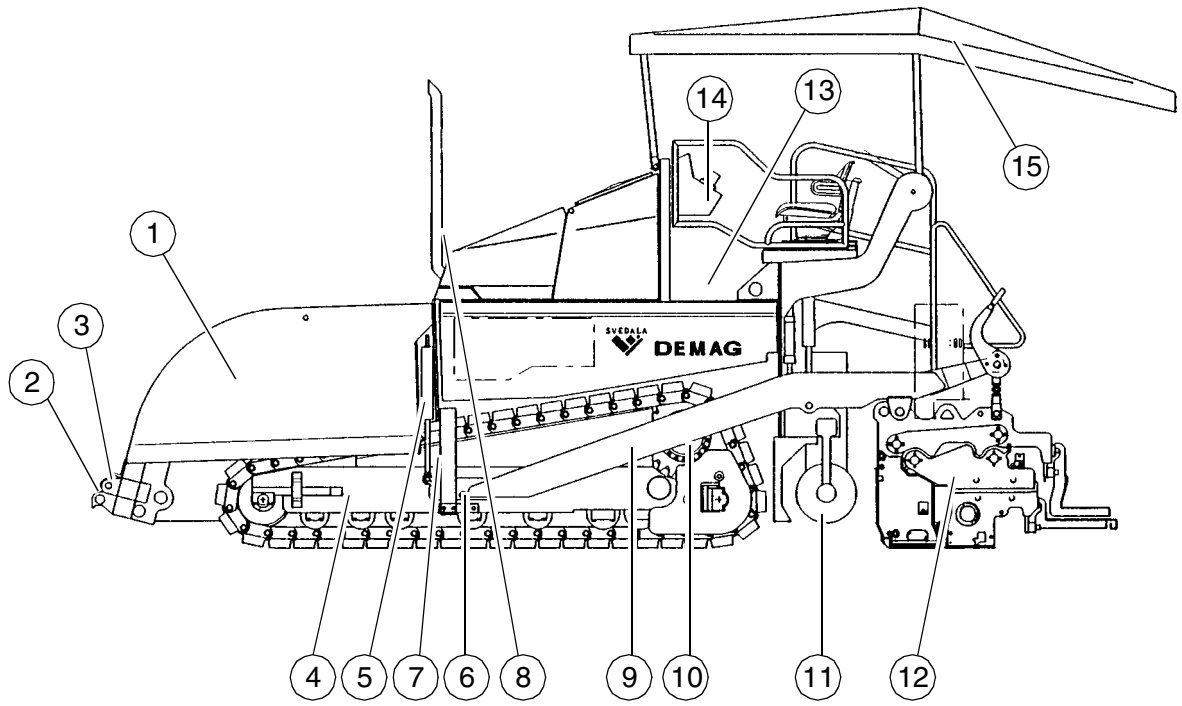

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Item		Designation
1	●	Hopper (trough)
2	●	Push rollers for truck docking
3	●	Pipe for visual gauge (direction indicator) and trailing ski mount
4	●	Crawler
5	●	Levelling cylinder for laying thickness
6	●	Traction roller
7	●	Levelling arm draw bar
8	●	Laying thickness indicator
9	●	Levelling arm
10	●	Track drive
11	●	Spreader
12	●	Screed
13	●	Operator’s stand
14	●	Operation panel (laterally movable)
15	○	Weather protecting sunroof

● = Standard equipment	○ = Additional equipment

2.1 Vehicle

Design

The road finisher has a frame in a steel welded construction on which the individual assemblies are mounted.

The track groups (4) level out surface unevenness and ensure high laying accuracy due to the suspension of the screed (12). With the infinitely variable speed hydrostatic drive (10), the speed of the road finisher can be adapted to suit the respective working conditions.

Operation of the road finisher is greatly facilitated by the automatic material feed system (1), separate final drives (10) and clearly arranged control elements (15).

Additional equipment

- Individual hopper control
- Electric refuelling pump
- Hydraulic spreader height adjustment
- Weather protection shed/weather protecting sunroof
- Screed enlargement
- Screed vibration system
- Generator
- Special paint finish
- Automatic levelling system and accessories
- Other accessories such as edge compactor floodlight, level, trailing shoe, rock deflector

Available as special accessories (optional):

- Automatic levelling system/cross fall control
- Additional cut off shoe
- Larger operation widths
- Automatic central lubrication system for finisher and/or screed
- Weather protecting sunroof (16)
- Further equipment and upgrade options available on request.

Engine: The road finisher is driven by a water-cooled, six-cylinder Deutz diesel engine. For further information, refer to the engine manual.

Track group: The two track groups are independently driven. They operate directly without drive chains requiring care and maintenance.
The tension of the track groups can be adjusted via grease tensioners.

Hydraulics: The diesel engine drives the hydraulic pumps for all main drives of the finisher via the flange-mounted distribution gear and its secondary drives.

Final drive: The infinitely variable speed final drive pumps are connected to the final drive motors via appropriate high-pressure hydraulic hoses. These oil motors drive track groups via planetary gears that are arranged directly in the drive sprockets of the tracks.

Steering/Operator's stand: The independent, hydrostatic final drives enable turning on the spot.
The electronic synchro control ensures exact straight running and can be adjusted from the operation panel.
By means of a lock, which can be reached from above, the movable operation panel can be secured on the right or left side of the finisher.

Push roller crosshead: The push rollers for the material trucks are attached to a crosshead, which is pivoted in the centre.
By means of the crosshead, the varying distances to the rear wheels of the material trucks can be adjusted. The finisher is pushed less off course laying on bends is facilitated.

Hopper (trough): The trough inlet is provided with a flight bar conveyor system for discharge and further transport to the distribution spreader.
The capacity is about 13,0 t.
For improved discharge and uniform material feed, each of the side covers of the trough can be folded hydraulically (optional).

Material feed: The road finisher has two independently driven flight bar conveyors, which transport the material from the trough to the distribution spreaders.
The flow capacity and speed during the laying operation is regulated fully automatically via level scanning.

Distribution spreaders: Driving and actuation of the distribution spreaders take place independent of the flight bar conveyors. The left and right spreader half can be operated separately. The drive is fully hydraulic.
An inward or outward conveying direction can be selected as required. This ensures a sufficient supply of material when large amounts of material are required on one side. The spreader speed is continuously controlled by the material flow via ultrasonic sensors.

Screed lift and enlargement: By means of the spreader lift and enlargement, optimal adaptation to diverse laying thicknesses and widths is ensured.

During adjustment with ratchets, the height is adjusted with turnbuckle spindles at the guide supports in the back panel.
In a further version with hydraulic cylinders (optional), the height can be adjusted from the operation panel.
For adjustment to various operating widths, spreader segments in various fixed lengths can be mounted and removed.

Levelling system/cross fall control: With the cross fall control (optional), the traction angle either on the left or right can be controlled with a defined difference with respect to the opposite side.

The cross fall inclination always operates in combination with the screed lift on the respectively opposite side.

By means of the levelling arm traction angle (traction roller) lift, the laying thickness of the material or skimming level of the screed can be controlled.
Actuation takes place on both sides electro-hydraulically and can take place either manually via a toggle switch or automatically via an electronic grade transmitter.

Screed hoist: The screed hoist serves for lifting the screed for transport purposes. Hoisting takes place on both sides electro-hydraulically via the hydraulic cylinders at the levelling arms and activated via toggle switches on the operation panel.

Automatic screed stopping system and screed load/release equipment: With the automatic screed stopping system, any produced screed stopping marks can be avoided. When the finisher is stopped (truck change), the control valves switched to float position are closed and blocked to prevent the screed sagging while stopping.

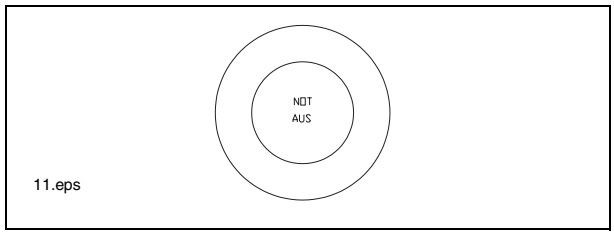
By activating the screed release equipment, the track group is subjected to higher load in order to improve traction.
By activating the screed load equipment, better compaction can be achieved for various laying operations.

3 Safety devices

Safe working is only possible with perfectly functioning control and safety devices as well as properly fitted protective devices.

☞ The functions of the devices must be tested at regular intervals (see Chapter D, Section 2.1).

3.1 Emergency button

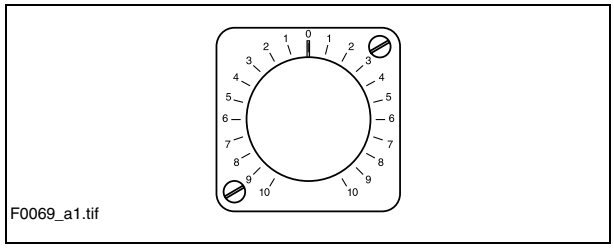


- on operation panel
- on both remotes (optional)

⚠ When the emergency button is pressed, motor, drives and steering are deactivated (any necessary countermeasures such as manoeuvring, screed lifting and similar) are no longer possible! Risk of accident!

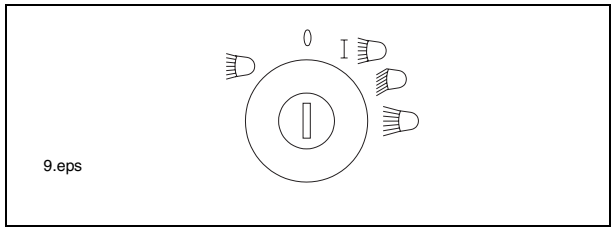
3.2 Steering

The finisher is steered with the steering potentiometer.



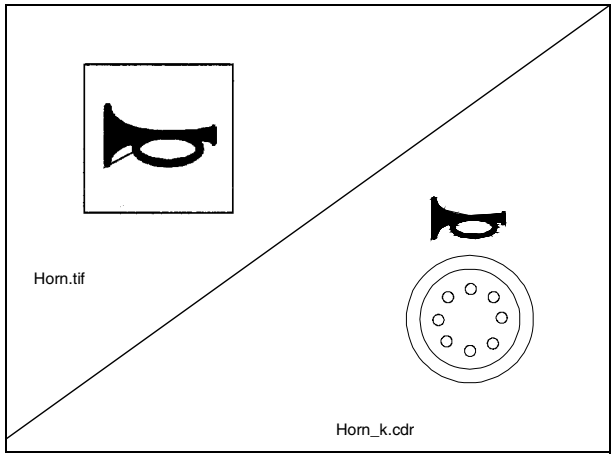
3.3 Ignition lock/lighting equipment

The lighting can be switched on and off by turning the ignition lock in the appropriate direction.



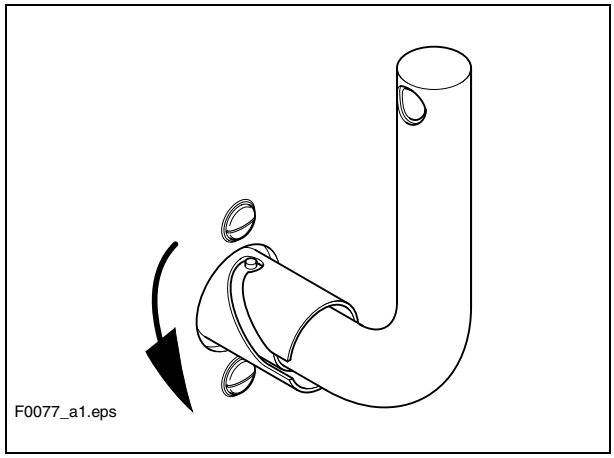
3.4 Horn

- on operation panel
- on both remotes

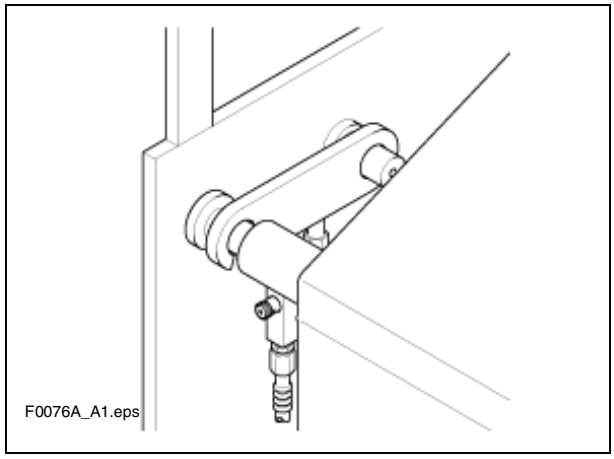


3.5 Power switch

The power switch is located on the right-hand side of the paver finisher between the central panel and hopper.

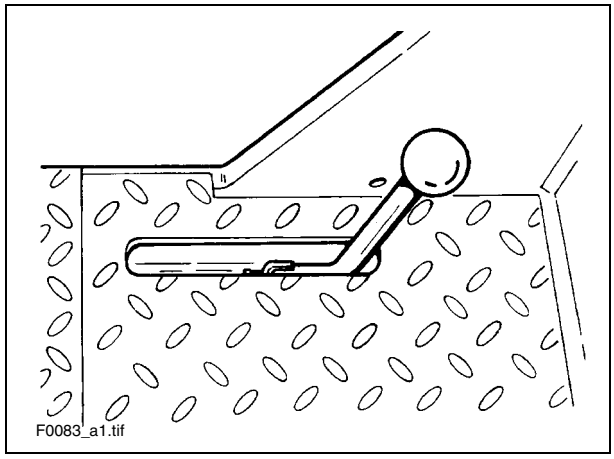


3.6 Trough safety lock

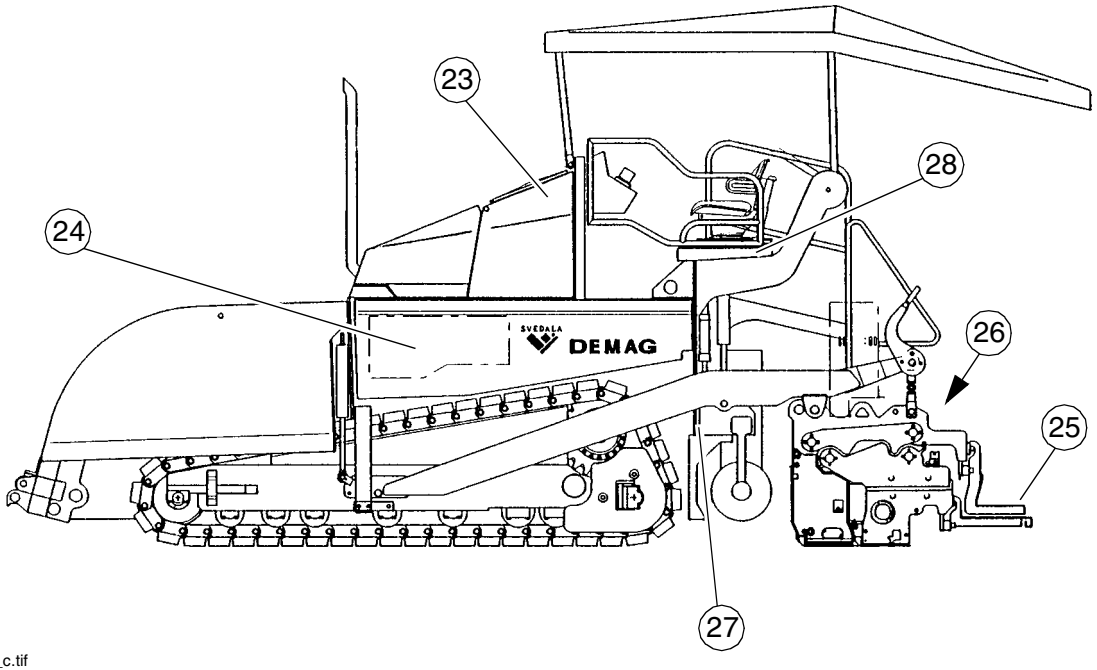


3.7 Screed safety lock

The screed safety locks are provided on both sides on the operation panel behind the seats.



3.8 Other safety devices



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Item	Designation
23	Engine covers
24	Side flaps
25	Catwalks
26	Screed covers
27	Material duct
28	Screed hazard lights

Other equipment:

- Wedges
- Warning triangle
- First-aid box

4 Technical data standard type

4.1 Performance data

Screed used	Basic width (without cut off shoe)	Minimum operating width (with cut off shoe)	Infinitely hydr. adjustable up to	Maximum operating width (with extension sections)	
EB 50	2,5	2.0	5,0	8,0	m
EB 75	3,0	2,5	6,0	9,0	m
Transport speed				0 - 5	km/h
Operating speed				0 - 23	m/min
Laying thickness				300	mm
Max. Particle size				40	mm
Theoretical laydown rate (DF115C)				600	t/h
Theoretical laydown rate (DF135C)				750	t/h

4.2 Final drive/track group

Drive	Hydrostatic drive, infinitely variable speed
Track group	Two individually driven crawlers with rubber pad track groups
Turning radius	Turning on the spot
Speed	see above

4.3 Engine

DF 115 C

Make/Type	Deutz BF6M 2012
Design	6-cylinder diesel engine (water-cooled)
Power	118 KW/160 BHP (at 2100 1/min)
Fuel tank capacity	(see Chapter F)

DF 135 C

Make/Type	Deutz BF6M 2012
Design	6-cylinder diesel engine (water-cooled)
Power COM II	131 KW/178 BHP (at 2100 1/min)
Power COM II (2006)	129 KW/175 BHP (at 2100 1/min)

4.4 Hydraulic system

Pressure generation	Hydraulic pumps via distribution gear (directly flanged on to engine)
Pressure distribution	Hydraulic circuits for: -Final drive -Material feed and distribution - Tamper/vibration (optional) - Cylinder actuating elements for trough, levelling, screed lift, screed extend/retract, Spreader lift (optional) - Downstream compressor (optional)
Hydraulic oil tank capacity	(see Chapter F)

4.5 Hopper (trough)

Capacity	ca. 6 m³ = about 13 t
Minimum inlet height, centre	480 mm
Minimum inlet height, external	600 mm

4.6 Weights (all values in t)

Finisher without screed	about 14,0 t
- Finisher with screed EB 50 (incl. side plates	about 17,6 t
- With extension sections for max. Operating width - additional max.	
- With filled trough additional max.	

☞ For weights of the respective screeds and screed sections, see operating instructions for screeds.

4.7 Material feed

Flight bar conveyor	For left and right operation
- Drive	Hydrostatic, infinitely variable speed
- Flow control	Fully automatic via adjustable switching points

4.8 Material distribution

Distribution spreader	For left and right operation Hydrostatic central drive, infinitely variable speed
- Drive	Independent of flight bar conveyor spreader halves switchable for operation in opposite directions
- Flow control	Fully automatic via adjustable switching points
- Spreader lift	- mechanical via chain - mechanical - hydraulic (optional)
- Spreader enlargement	With extension sections (see spreader mounting diagram)

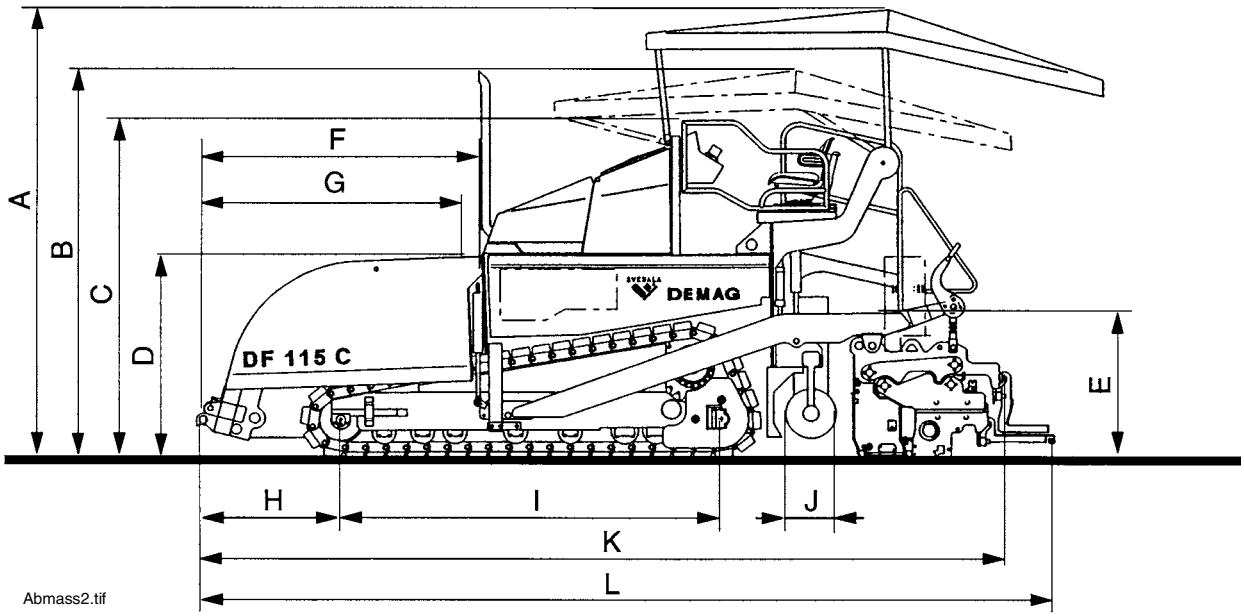
4.9 Screed lift

Special functions	When stationary: - Screed stop - Screed stop with preloading max. pressure 50 bar) When laying: - Screed load - Screed release - (max. pressure 50 bar)
- Levelling system	Mechanical grade transmitter Optional systems with and without cross fall control

4.10 Electrical equipment

Power supply	24 V
- Batteries	2 x 12 V, 88 Ah
- Fuses	see Chapter F, Section 5

4.11 Dimensions (all dimensions in mm)



	Designation	ca.
A	Overall height with roof	3460
B	Transport height with roof folded down	3000
C	Min. transport height without roof and tail pipe	2610
D	Trough height (trough fully closed)	1600
E	Operation panel height	1600
F	Hopper length	2100
G	Dumping	1950
H	Distance push roller <-> front bearing	1010
I	Distance front <-> rear track group	2920
J	Spreader diameter	380
K	Length without screed catwalk with screed EB 50	6100
L	Max. length with screed EB 50	6400

☞ Technical data of screed, see screed operating instructions.

5 EN standards

5.1 Continuous sound pressure level

⚠ The use of hearing protection is prescribed for this finisher. The sound emission value can vary significantly due to the various laying materials and exceed 85 dB(A). Damage to hearing can be caused if the machine is used without hearing protection.
The sound emission values of the finisher were measured according to the draft standard ENV 500-6 of March 1997 and ISO 4872 under free field conditions.

DF115C: Sound pressure level in operator's cab (head height): L_{AF} =82,9 dB(A)
DF135C: Sound pressure level in operator's cab (head height): L_{AF} =82,2 dB(A)

DF115C: Sound capacity level: L_{WA} =106,2 dB(A)
DF135C: Sound capacity level: L_{WA} =106,6 dB(A)

Sound pressure level at the machine

Measuring point	2	4	6	8	10	12
Sound pressure level L_{AFeq} (dB(A)) DF115C	74,0	75,2	70,6	73,3	72,8	71,7
Sound pressure level L_{AFeq} (dB(A)) DF135C	72,7	75,7	73,6	73,1	73,3	71,5

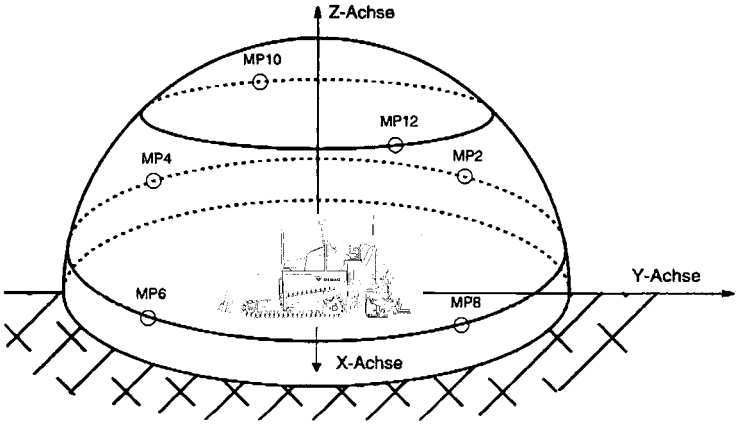
5.2 Operating conditions during measurements

The diesel engine operated at maximum speed. Flight bar conveyors, spreaders, tampers and vibration arrangement operated at minimum of 50% of their maximum speed.

5.3 Measuring point arrangement

Semi-spherical measuring surface with a radius of 16 m. The machine was located in the centre. The measuring points had the following coordinates:

	Measuring point 2, 4, 6, 8			**Measuring point 10, 12**		
Coordinates	X	Y	Z	X	Y	Z
	±11,2	±11,2	1,5	- 4,32 +4,32	+10,4 -10,4	11,36 11,36



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5.4 Whole body vibrations

In normal use, the weighted effective acceleration values in the operator's cab of a_w = 0,5 m/s² according to the draft standard prEN 1032-1995 are not exceeded.

5.5 Hand-arm vibrations

n normal use, the weighted effective acceleration values in the operator's cab of a_{hw} = 2,5 m/s² according to the draft standard prEN 1033-1995 are not exceeded.

5.6 Electromagnetic compatibility (EMC)

In normal use, the weighted effective acceleration values in the operator's cab of a_{hw} = 2,5 m/s² according to the draft standard prEN 1033-1995 are not exceeded.

- Emitted interference according to DIN EN 50081-1/03.93:
  < 40 dB µV/m for frequencies from 30 MHz-230 MHz at a measuring distance of 3 m
  < 47 dB µV/m for frequencies from 20 MHz - 1 GHz at a measuring distance of 3 m

- Immunity to electrostatic discharge (ESD) according to
  DIN EN 61000-4-2/03.96:
  ± 4 KV contact and ± 8-KV air discharges had no identifiable effect on the finisher. The changes according to assessment criteria "A" were observed, i.e. The finisher continued to operate properly during the test.

☞ Changes to electrical or electronic components and their arrangement may only take place with the prior written permission of the manufacturer.

6 Identification points for signs

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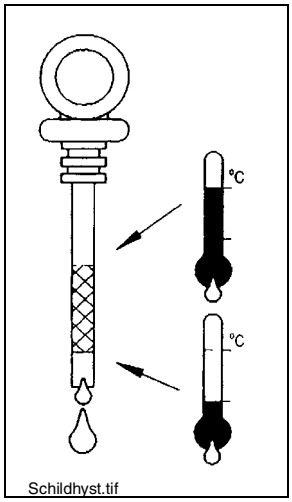

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Safety information on gas system

1. Fix the gas cylinders in the holders provided and secure to prevent them falling and twisting.
2. Do not extract gas without using hose protection and gas regulator.
3. Gas cylinders, valves and fittings must be inspected for leaks every two years by an **expert**.
4. Leaks must be reported immediately to the **supervisor**. For locating leaks, suitable foaming agents must be used.
5. In case of leaks, prior to working breaks, on completion of work, with extinguishing of the burner and in case of fires, the cylinder valves must be closed immediately.
6. To be observed when igniting the burner.
   1. Open cylinder valves and main shut-off valve. Press hose protection for several seconds.
   2. Turn ignition key and switch on power supply with separate switch.
   3. Troubleshooting should be carried out only by the **supervisor**.
      Observe operating instructions.
7. Only use original SVEDALA DEMAG gas hoses with mark of conformity DIN-DVGW 29.02e588

9

FLiquefied petroleum gas system

Year of manufacture:	
Propane	Propane
Inlet pressure	1.5 bar
Connected load per burner	1.5 kg/h

2

DIESEL

3

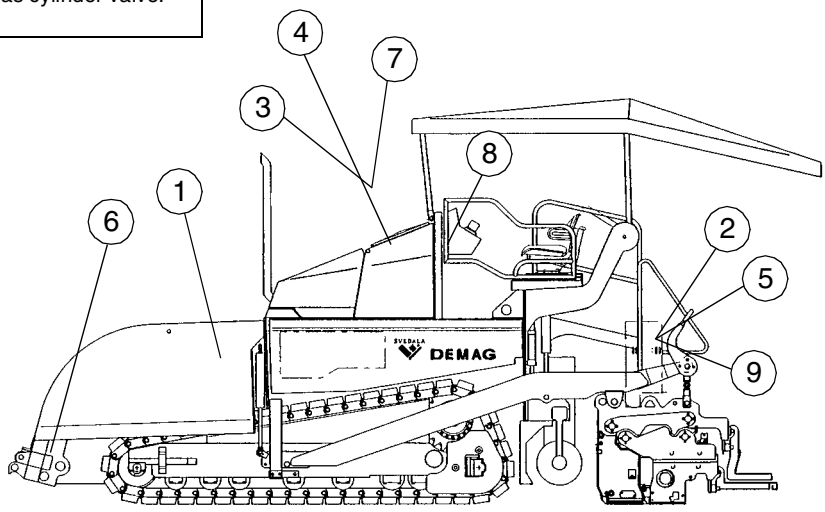
Hydraulic oil
HE 46

4

Immediately close safety valve
- with extinguishing of the burner
- in case of fires

On completion of work, additionally close gas cylinder valve.

5



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Attention: It is forbidden to stand in the operating area of the hopper.

6

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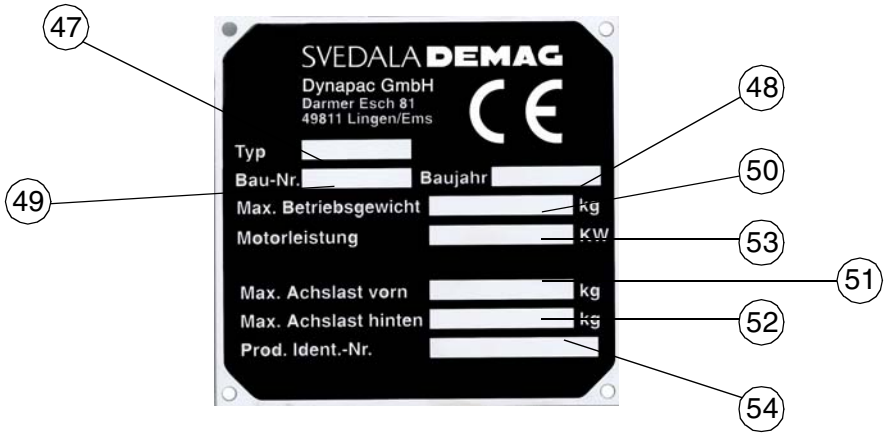
8

Signs must be legible at all times. Damaged or illegible signs must be renewed immediately.

Item	Designation
1	Serial plate
2	Sign “Liquefied petroleum gas system”
3	Sign “Filler neck for diesel fuel”
4	Sign “Filler neck for hydraulic oil”
5	Sign “Close safety valve immediately”
6	Sign “Attention: Standing in the operating area....”
7	Sign “Check hydraulic oil level”
8	Sign “Hearing protection”
9	Sign “Safety information on gas system”

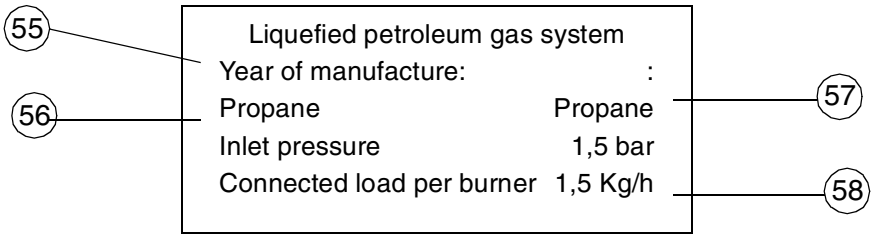
*	Signs under engine hood
**	Signs on both sides of finisher
***	Sign on operation panel

6.1 Serial plate finisher (1)



Item	Designation
47	Finisher type
48	Year of manufacture
49	Serial number of finisher series
50	Maximum permissible operating weight including all extension sections in kg
51	Maximum possible load on front axle in kg
52	Maximum permissible load on rear axle in kg
53	Rated power in kW
54	Product identification number (PIN)

6.2 Serial plate liquefied petroleum gas system (2)



Item	Designation
55	Year of manufacture
56	Type of gas to be used
57	Inlet pressure in bar
58	Average gas consumption of mounted screed in kg/h

C Transportation

1 Safety regulations for transportation

⚠ Accidents can happen when the paver finisher and the screed are not properly prepared for transportation or when transportation is carried out improperly!

Reduce both the paver finisher and the screed to their basic widths. Remove all protruding parts (such as the levelling device, auger limit switches, aprons, etc.). When transporting under a special permit, secure these parts!

Close the hopper lids and engage the hopper transport safeguards. Lift the screed and engage the screed transport safeguards. Convert the protective roof and engage the latch.

Check that the clamping device for the auger frame is fastened and that the telescopic tube cannot slide out.

Pack all parts that are not permanently fixed to the paver finisher and the screed into the appropriate boxes and into the hopper.
Close all coverings and check that they are securely seated.

In Germany, gas bottles must not be transported on the paver finisher or on the screed.
Disconnect the gas bottles from the gas system and protect them with their caps. Use a separate vehicle to transport them.

When loading via ramps, the paver finisher may slip aside, tilt or topple over.
Drive carefully! Keep the danger area free of persons!

Additional stipulations for transportation on public roads:

⚠ In Germany; caterpillar pavers **must not be driven as self-propelling vehicles** on public roads.
Note that in other countries different regulations may apply.

The operator must be in the possession of a valid permit for vehicles of this type.

The operating panel must be moved to the side of the oncoming traffic and secured in this position. The driving lights must be properly adjusted.

Only attachments and accessories may be transported in the hopper, no material or gas bottles!

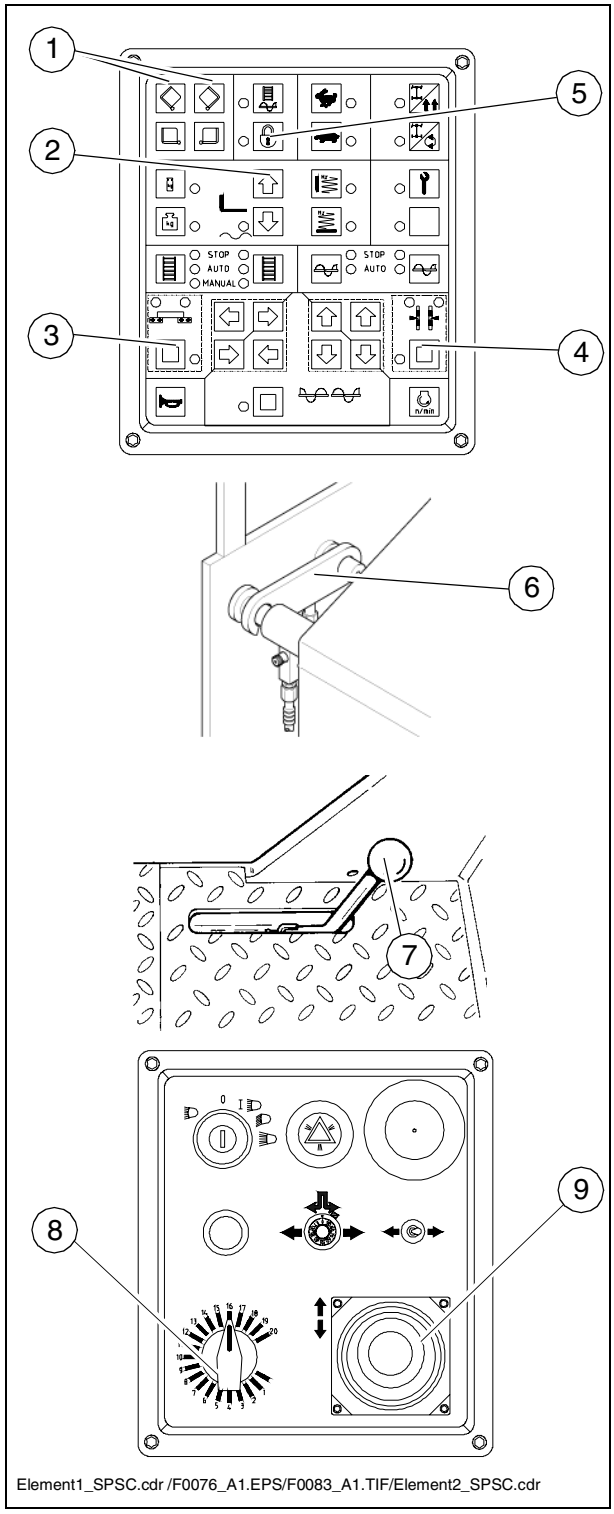
If necessary, the operator must be assisted by a second person when driving on public roads – especially at road crossings and junctions.

2 Transportation on low-bed trailers

⚠ Reduce the paver finisher and the screed to their basic widths; also remove any attached side plates. To prevent damages to the screed, the inclination of the ramp to be used must not exceed 11° (19%).

2.1 Preparations

- Prepare the paver finisher for operation (see chapter D, section 3).
- Use switch (1) to close the hopper lids. Engage both hopper transport safeguards (6).
- Use switch (2) to lift the screed. Retract the screed parts by using switch (3) in connection with the keys in the keyblock left until the screed matches the basic width of the paver finisher. Engage the screed transport safeguard (7).
- Extend the levelling cylinders completely by using key (4) in connection with the keys in the keyblock right.
- Press button (5)
- Set the preselector (8) to „zero“. Set the drive lever (9) to the center position.
- Retract the screed parts until the screed matches the basic width of the paver finisher.
- Remove all protruding or loose parts from the paver finisher and the screed (see also the „operating instructions for the screed“). Store these parts in a safe place.
- When screed is operated with the optional gas heating system:
- Remove the gas bottles for the screed heating system:
  - Close the main shut-off valves and the bottle valves.
  - Unscrew the valves on the bottles and remove the gas bottles from the screed.
  - Transport the gas bottles on a second vehicle; heed all pertaining safety regulations.



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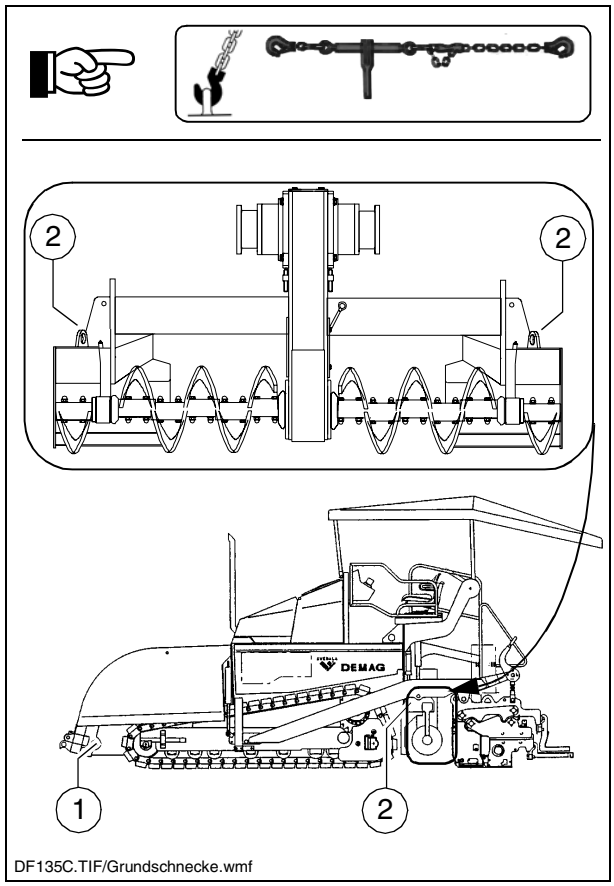
2.2 Driving onto the low-bed trailer

Make sure that there are no persons in the danger area during loading.

- Use the work gear and low engine speeds to drive onto the low-bed trailer.
- Lower the screed onto wooden blocks on the low-bed trailer.
- Switch off the paver finisher.
- Attach and secure the protective hood to protect the operating panel.
- If necessary, swing down the protective roof:
  - Take out the bolts and pull the roof to the rear by gripping it with the bow-type handle. When it is in the lower position, secure it with the bolts.
  - Take the protective roof tarpaulin off when covering longer distances.

- Secure the paver finisher to the low-bed trailer:
  - Use only appropriate, approved attachment devices.
  - Use the four securing points provided (1,2).

- Wait until the exhaust extension tube has cooled down; then remove it and store it.



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2.3 After transportation

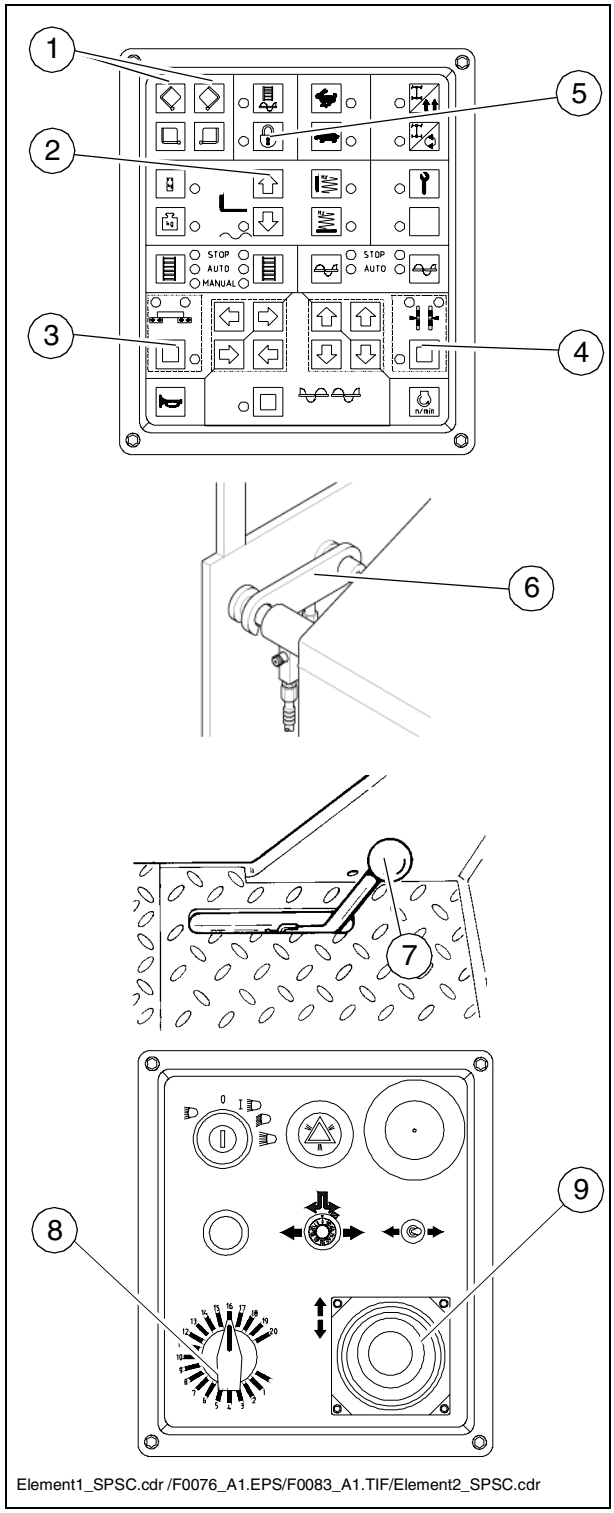
- Remove the attachment devices.
- Swing up the protective roof. Take out the bolts, push the protective roof forward to raise it and insert the bolts to lock it again.
- Mount the protective tarpaulin if it has been removed.
- Lift the screed to the transportation position and lock it.
- Start the engine and drive from the trailer at a low engine/traction speed.
- Park the paver finisher in a secure spot, lower the screed and switch off the engine.
- Remove the key and/or cover the operating panel with the protective hood and secure it.

3 Transportation on public roads

⚠ Reduce the paver finisher and the screed to their basic widths; also remove any attached side plates.

3.1 Preparations

- Prepare the paver finisher for operation (see chapter D, section 3).
- Use switch (1) to close the hopper lids. Engage both hopper transport safeguards (6).
- Use switch (2) to lift the screed. Retract the screed parts by using switch (3) in connection with the keys in the keyblock left until the screed matches the basic width of the paver finisher. Engage the screed transport safeguard (7).
- Extend the levelling cylinders completely by using key (4) in connection with the keys in the keyblock right.
- Press button (5)
- Set the preselector (8) to „zero“. Set the drive lever (9) to the center position.
- Retract the screed parts until the screed matches the basic width of the paver finisher.
- Remove all protruding or loose parts from the paver finisher and the screed (see also the „operating instructions for the screed“). Store these parts in a safe place.
- When screed is operated with the optional gas heating system:
- Remove the gas bottles for the screed heating system:
  - Close the main shut-off valves and the bottle valves.
  - Unscrew the valves on the bottles and remove the gas bottles from the screed.
  - Transport the gas bottles on a second vehicle; heed all pertaining safety regulations.



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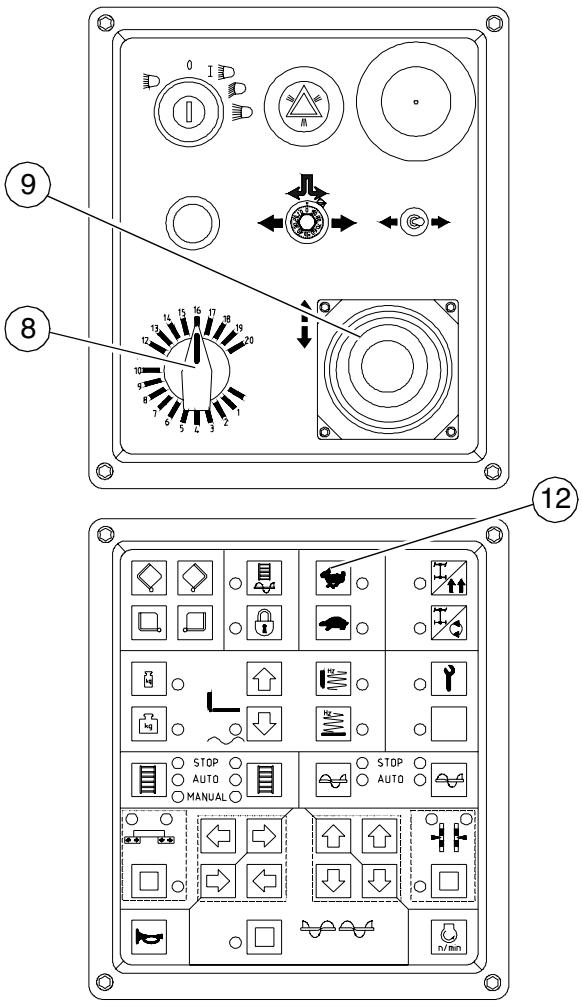
3.2 Driving on public roads

- Set the Fast/Slow switch (12) to “Hare”.
- Turn the preselector (8) to maximum.
- Use the drive lever (9) to regulate the speed.
- Press the emergency stop button when a dangerous situation arises!



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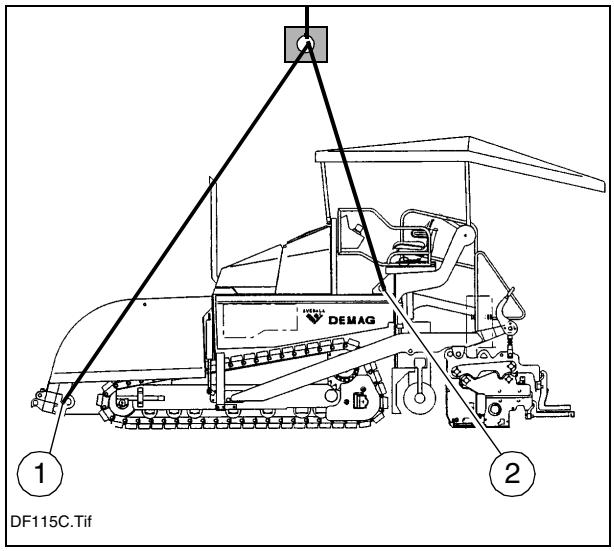
4 Loading by crane

⚠ Use only lifting gear that can bear the load.
(For the weights and dimensions, see chapter B, sections 3)

☞ Four lifting eyes (1,2) are provided for loading the vehicle with a crane.

- Park the paver finisher and render it safe.
- Engage the transport safeguards.
- Remove any attachments and accessories from the paver finisher and the screed until the basic width has been attained.
- Take off all protruding or loose parts and the gas bottles of the screed heating system (see chapter E and D).
- Attach the lifting gear to the four lifting eyes (1,2).



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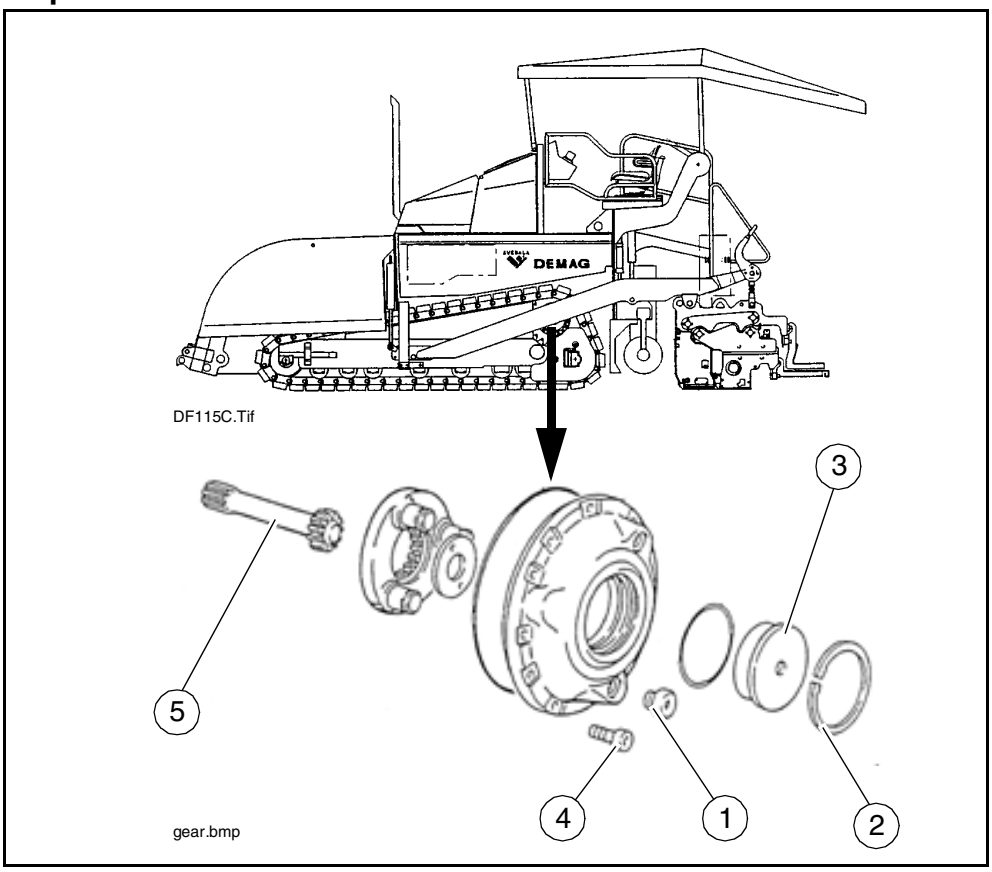
⚠ Make sure that the paver finisher remains in a horizontal position during transport!

Description of disconnect mechanism



The disconnect mechanism allows the machine to be towed. The gear drive and hydraulic motor are disconnected when the mechanism is activated.

⚠ The integral parking brake in the gear drive is non functional when the gear drive is in the disengaged position!

⚠ Ensure that the disconnect mechanism is only operated with the machine at a standstill!

⚠ Observe that dirt or other contaminants do not enter the gear drive.

Disengaging procedure:

- Drain the oil by removing the drain plug (1) in lower position.

☞ Any oil spillage must be collected in suitable containers!

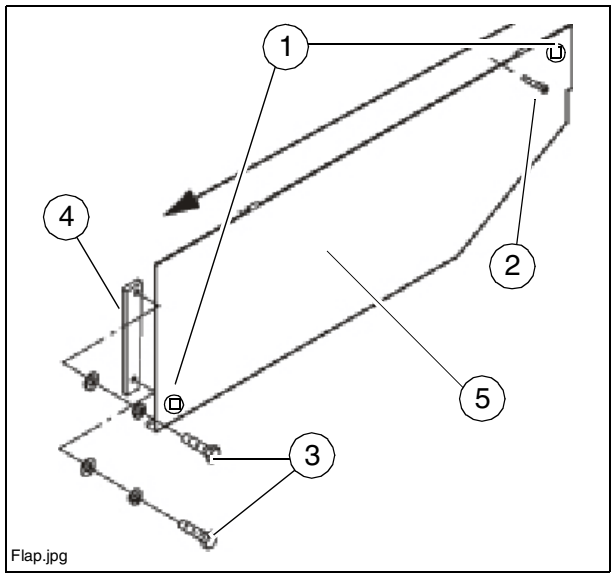
- Remove the snap ring (2)
- Remove the cap (3) by using one screw (4) M8 of the gearbox case cap.
- Remove the pinion gear (5) by using the same screw.
- Reinstall the cap (3) and secure with the snap ring (2)

☞ The engaging procedure ensues in reversed order

6 Removing lateral flaps with screed raised.

Should it be necessary to open the lateral flaps with the screed raised, i.e. when the crossbeams are in front of the lateral flaps, these can be pushed to the side and removed.

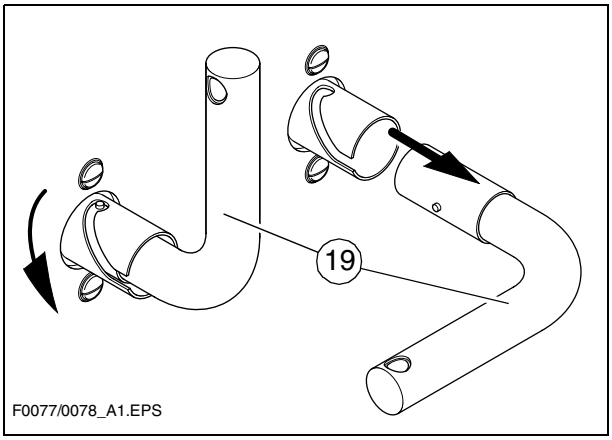
- Open both locks (1).
- Remove locking screw (2).
- Remove two mounting screws (3) and side plate (4),
- Push lateral flap (5) toward removed side plate and remove behind crossbeam.



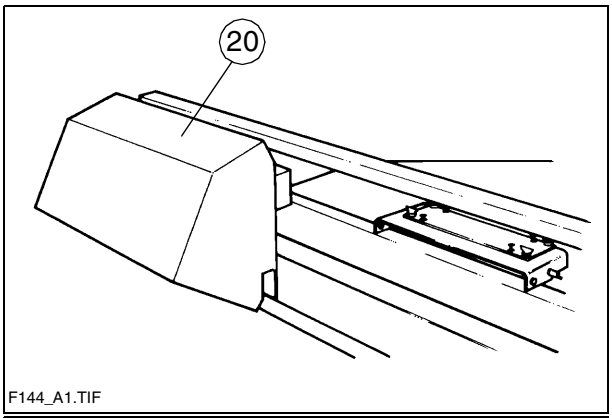
7 Safely parking the vehicle

⚠ When the paver finisher is parked at a location accessible to the public, it must be secured in such a way that unauthorized persons or playing children cannot damage the vehicle.

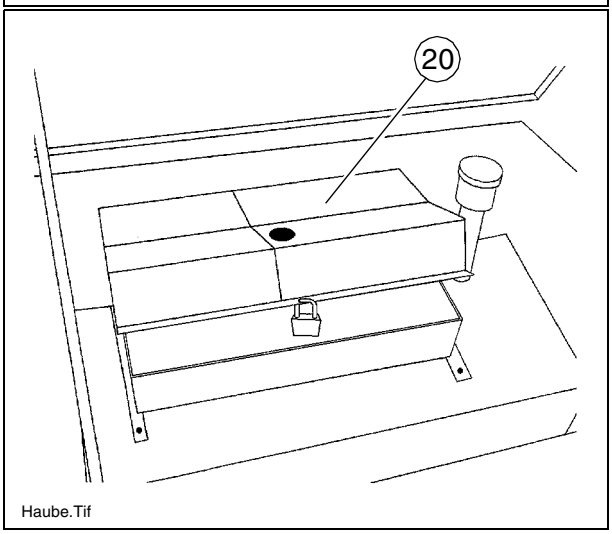
- Pull off the ignition key and the main switch (19) and take it with you – do not hide them somewhere on the machine.



- Protect the operating panel with the dust cover (20) and lock it.
- Store loose parts and accessories in a safe place.



☞ Secure the dust cover (20) during operation with the lock on the terminal box under the maintenance flap on the RH side!



D Operation

1 Safety regulations

Starting the engine, the traction drive, the conveyor, the auger, the screed or the lifting devices can cause injuries or even the death of persons.
Make sure before starting any of these devices that no-one is working at, in or beneath the paver finisher or within its danger area!

- Do not start the engine or do not actuate any controls when this is expressly forbidden! Unless otherwise specified, the controls may only be actuated when the engine is running!

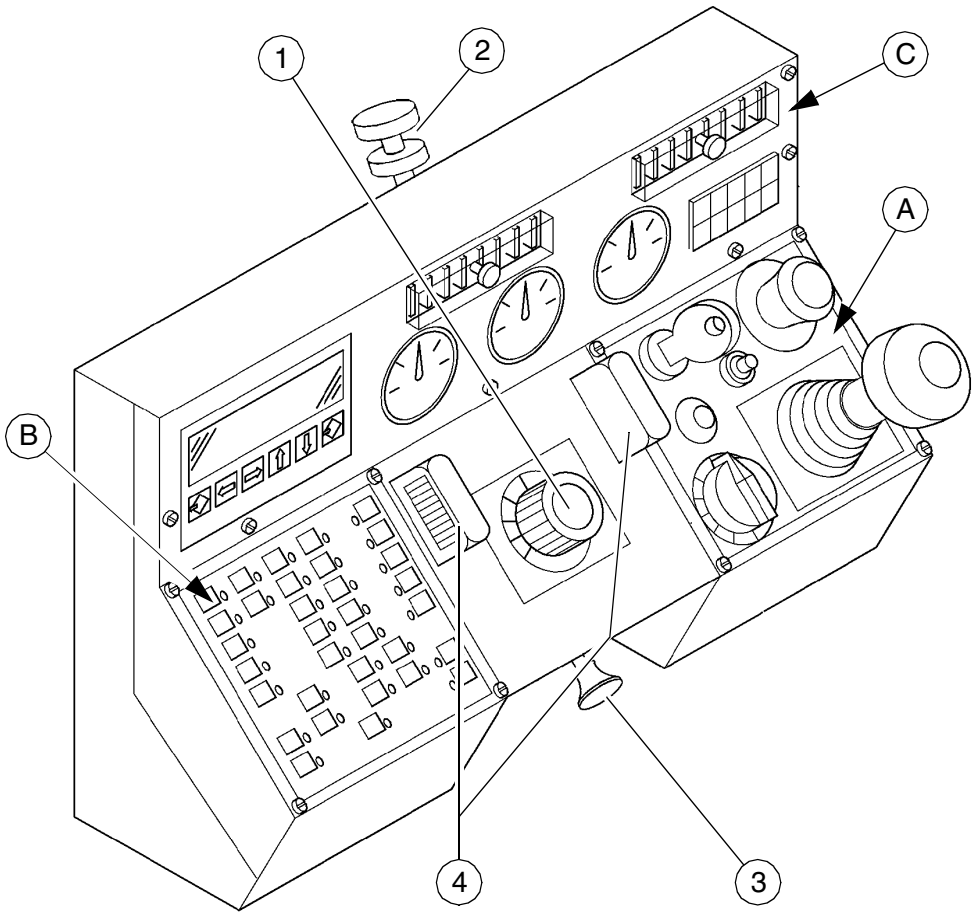
Never crawl into the auger tunnel or step into the hopper or onto the conveyor. Danger to life and limb!

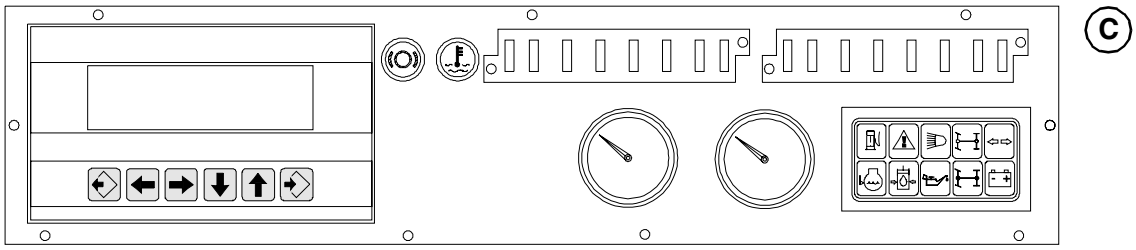
- Always make sure during operation that no-one is endangered by the machine!
- Ensure that all protective covers and hoods are fitted and secured accordingly!
- When damages are detected, eliminate them immediately! Operation must not be continued when the machine is defective!
- Do not let any persons ride on the paver finisher or the screed!
- Remove obstacles from the road and the work area!
- Always try to choose a drivers's position that is opposite to the flowing traffic! Lock the operating panel and the driver's seat.
- Keep a sufficient safety clearance to overhanging objects, other machines and points of danger!
- Be careful when travelling on rough terrain to keep the paver finisher from slipping, tipping or turning over.

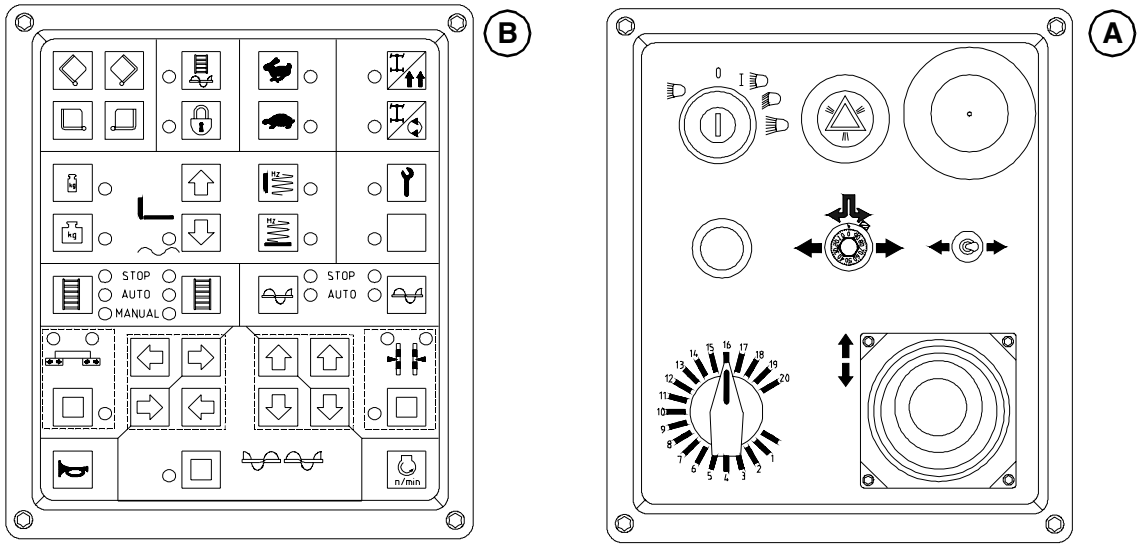
Always be the master over the machine; never try to use it beyond its capacities!

2 Operating elements

2.1 Operating panel







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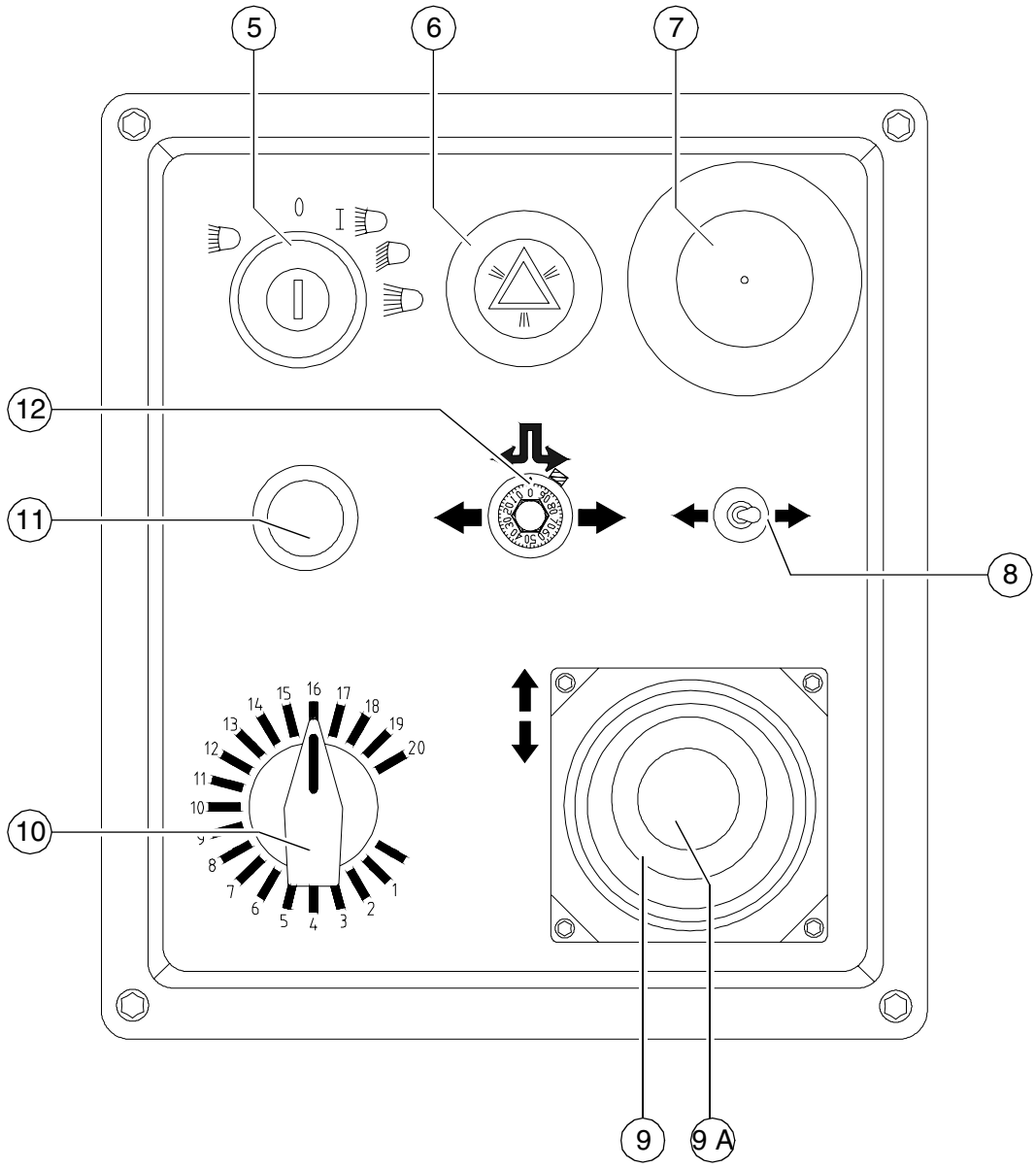
⚠ General notes on the observation of CE regulations

All functions of self-engaging buttons which might provoke a risk during start-up of the diesel engine (conveying function of auger and conveyor) are set to STOP in case of an emergency stop or a control restart. Changes of settings which are performed when the diesel engine is at a standstill („AUTO" or „MANUAL") are reset to „STOP" when the diesel engine is started.
Turning on the spot (button 19) is reset to straight-ahead travel.

Item	Designation	Brief description
1	Steering potentiometer	The steering wheel movement is transferred electrohydraulically. ☞ For precision adjustment, (position „0" = straight ahead) refer to adjustment for straight ahead travel. For turning on the spot, refer to switch (turning on the spot).
2	Retaining bracket for operating panel	For securing the movable operating panel against inadvertent movement at the desired finisher height. - Turn the knurled screw at the desired location into the designated notch and secure with the knurled nut. STOP When not secured, the operating panel can move. Danger of accidents during transportation!
3	Latch for operating panel	In the case of seats which can be swung out beyond the machine contour (option), the operating panel can also be moved beyond the basic width of the paver finisher. Pull out the latch and move the operating panel; let the latch engage again. STOP An unlatched operating panel can slide out of position. Danger of accidents during transportation!
4	Lights	Lights up instrument panel A / B when the parking light is switched on.

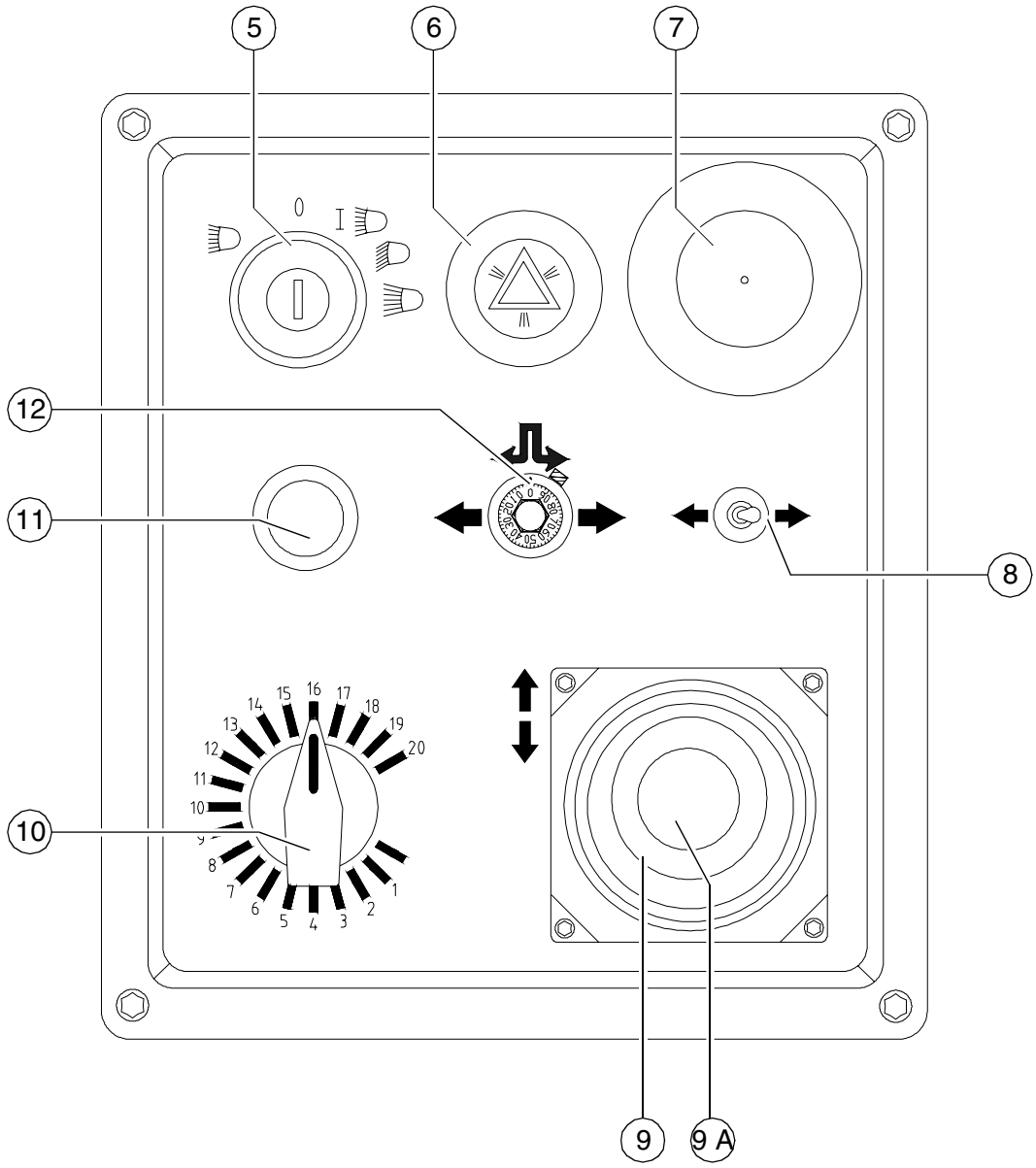
A



Element2_KC.cdr

Item	Designation	Brief description
5	Ignition lock and illumination switch	Key positions: 1 Ignition on 2 Parking/tail lights, fittings lighting, if necessary working lights 3 Headlights (dipped beam lighting) 4 Main beam lighting ☞ Release lock between 2 and 3 by pressing in. Turning key to left = parking light
6	Not used	
7	Emergency stop button	In the case of an emergency (danger to persons, possible collision etc.), press in the button! - Pressing the emergency stop button switches off the engine, the drives and the steering system. Making way, lifting the screed or other actions are then no longer possible! Danger! - The emergency stop button does not shut off the gas heater system. Close the main shut-off valve and the valves on the bottles by hand! - In the case of electrical malfunctions, the engine must be turned off manually at the leverage of the injection pump. To restart the engine, the button must be pulled out again.
8	Not used	

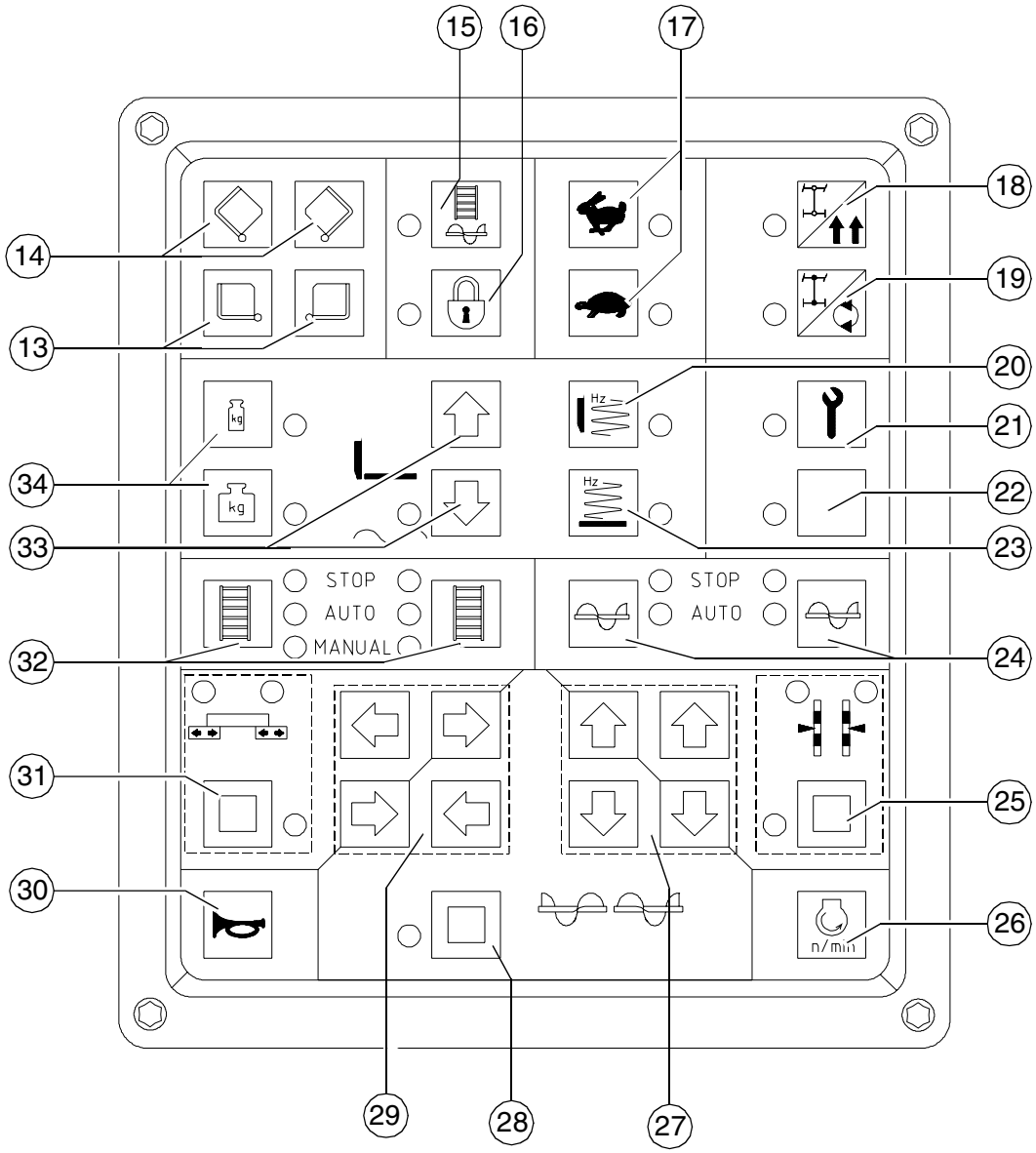
A



Element2_KC.cdr

Item	Designation	Brief description
9	Drive lever (forward - reverse)	For switching on the paver finisher functions and for continuously regulating the traction speed – forward or reverse. Zero position: starting is possible; engine at idling speed; no traction drive Depending on the position of the drive lever, the following functions can be activated: - Position 1: Conveyor and auger on. - Position 2: Screed motion (tamper/vibration) on; traction drive on; increase speed until the stop is reached. Use the preselector to set the maximum speed.
10	Preselector, traction drive	For setting the maximum speed that can be reached when the drive lever is at its stop. ☞ The scale roughly matches the speed in m/min (during paving).
11	Starter	Starting is only possible when the driver lever is in the neutral position. All emergency stop buttons (on the operating panel and the remote controls) must be pulled out.
12	Straight-ahead travel synchronization	Additional function for machines without synchronization or when sensors in the caterpillar drives are defective. Using this potentiometer, both chains can be synchronized for straight-ahead travel while driving: - Set the steering wheel to position „0”; then adjust the potentiometer until the finisher is travelling straight ahead.

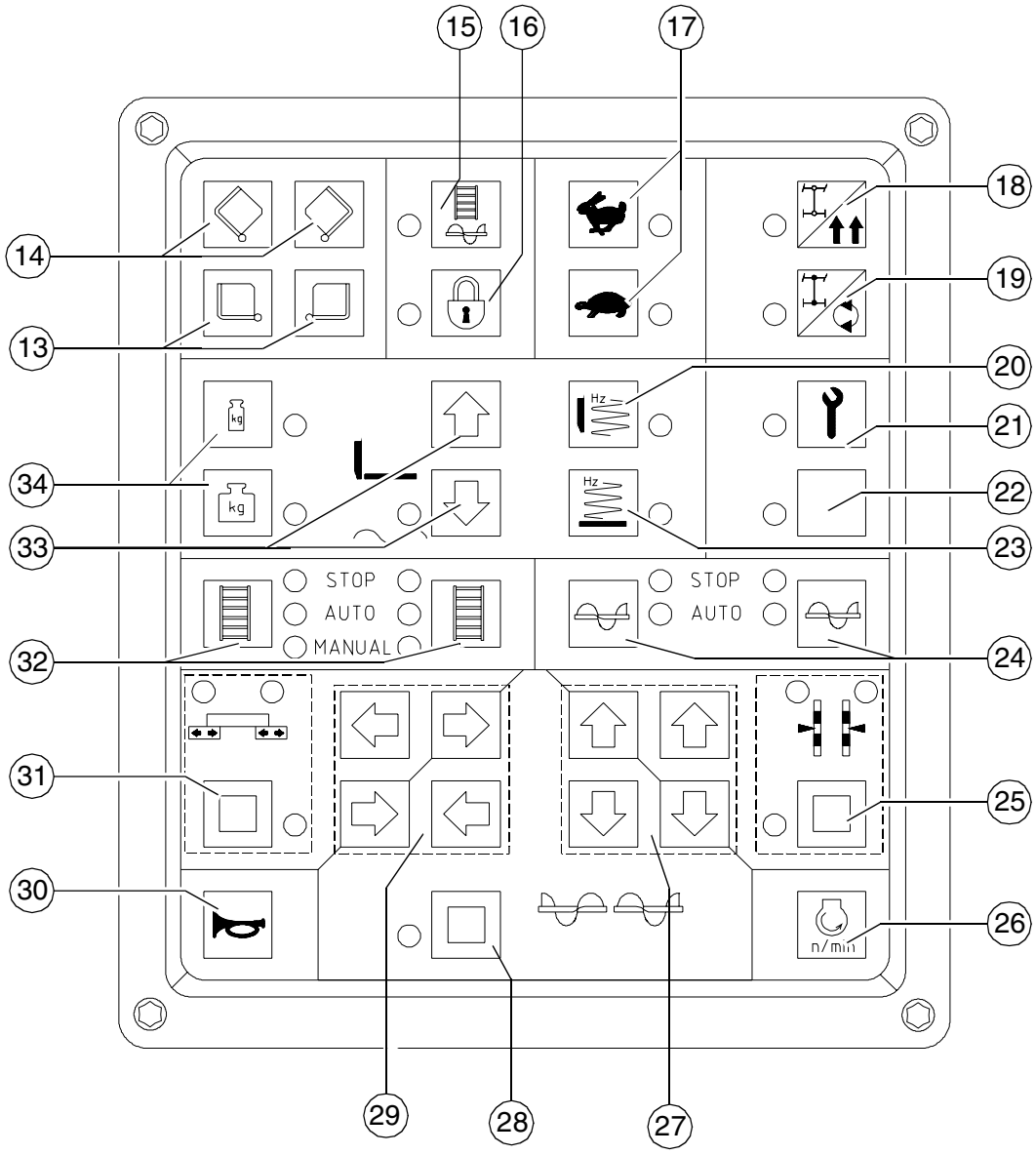
B



Element1_SPSC.cdr

Item	Designation	Brief description
13	Open hopper	Push-button: Left: open left hopper halve Right: open right hopper halve If both hoppers are hydraulically actuated at the same time (1 valve), either the left button or the right button can be used for operation.
14	Close hopper	Push-button: - Left: close left hopper halve - Right: close right hopper halve Separate actuation (○): Is required when paving in spaces where there is only limited space at one side or when obstacles obstruct unloading of the truck.
15	Filling the machine for paving	Self-engaging button with LED indication - Operating requirements: button 16 „OFF” Button 15 is used for the filling function: - The diesel engine speed is increased to the preselected nominal speed and all conveying functions (conveyor and auger) which are set to „Automatic” can be activated. **Switching off:** Press button 15 again or tilt the drive lever to the paving position.
16	Main function switch	Self-engaging button with LED indication Button 16 locks all functions necessary for paving. Although the individual functions are set to „Auto”, they are not activated when the drive lever is moved. The set-up is retained, allowing the machine to be re-positioned and unlocked at the installation site. Paving can be continued by moving the drive lever. ☞ Button 16 is set to „ON” when restarting.

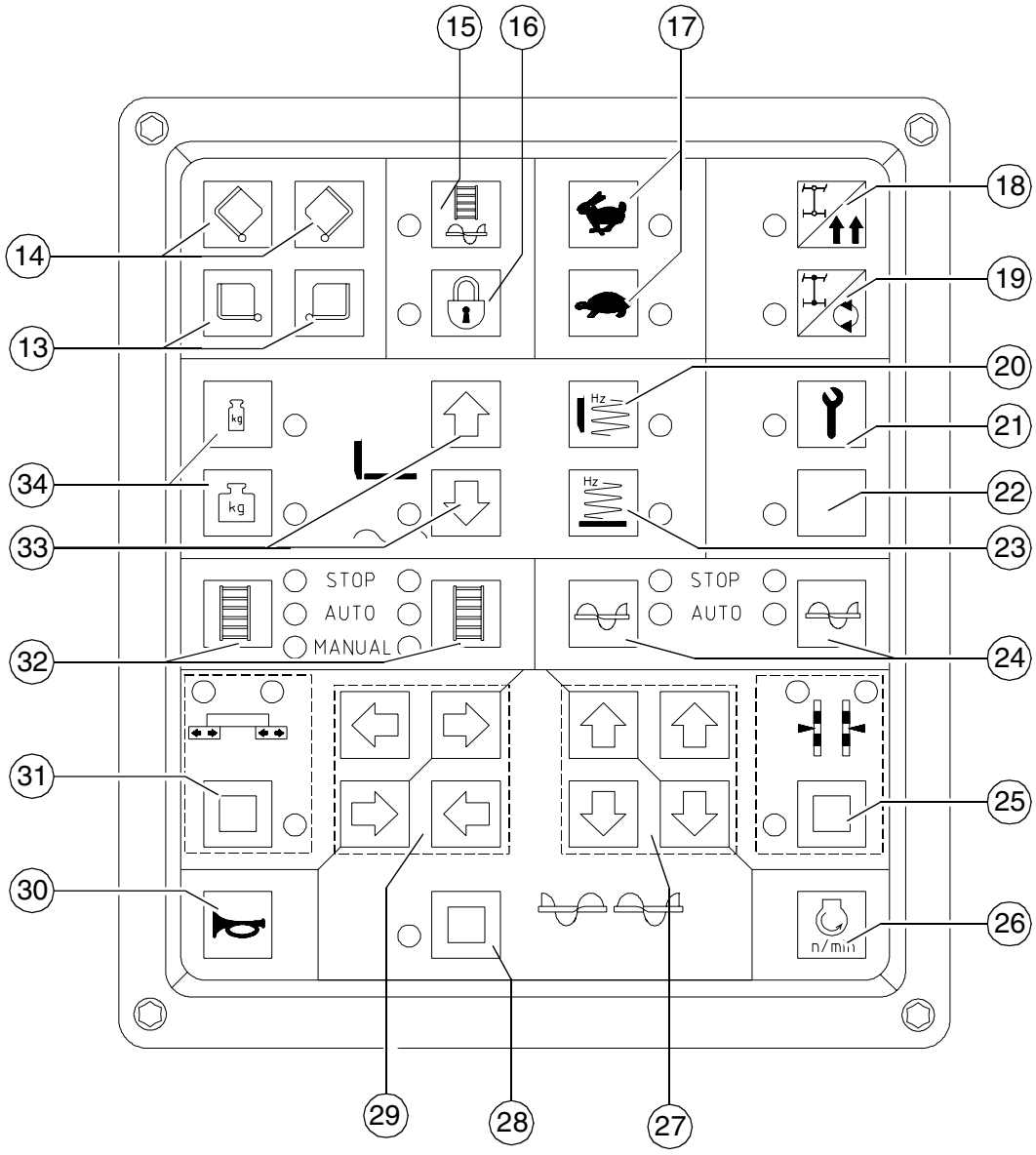
B



Element1_SPSC.cdr

Item	Designation	Brief description
17	Traction drive fast/slow	Self-engaging buttons with LED indication **Hare:** transport speed When button 16 is set to OFF (stands for paving), button 17 has to be set to „tortoise". **Tortoise:** operating speed for paving - Only change the speed when the paver finisher is at a standstill! ☞ When restarting, the buttons are set to working speed (tortoise).
18	Straight-ahead travel	Self-engaging buttons with LED indication ☞ When restarting, the button is set to „Straight-ahead travel". Normal position for straight-ahead travel. ☞ If the button at the bottom has been inadvertently activated (with the steering knob (1) set to straight-ahead travel), the finisher does not move. This is often interpreted as a 'malfunction'. Button 17 is set to „tortoise".
19	Turning on the spot	The finisher turns on the spot (the caterpillar chains run in opposite directions) when the steering knob (1) is set to „10". Steering knob turned to the left = finisher turns to the left Steering knob turned to the right = finisher turns to the right STOP When the finisher turns, persons and objects next to the finisher are in extreme danger. Watch the area where the finisher turns!
20	Tamper (screed-specific)	Self-engaging button with LED indication - Operating requirements: button 16 must be set to „OFF" Switching function ON or OFF. - The function is activated when moving the drive lever. - Set-up operation is actuated in conjunction with button 21.
21	Set-up operation	When the machine is at a standstill, this button is used for the commissioning of all working functions which are only activated when the drive lever (travelling machine) is moving. - Button 21 „ON" Button 16 „OFF" The diesel engine speed is increased to the preselected set value.

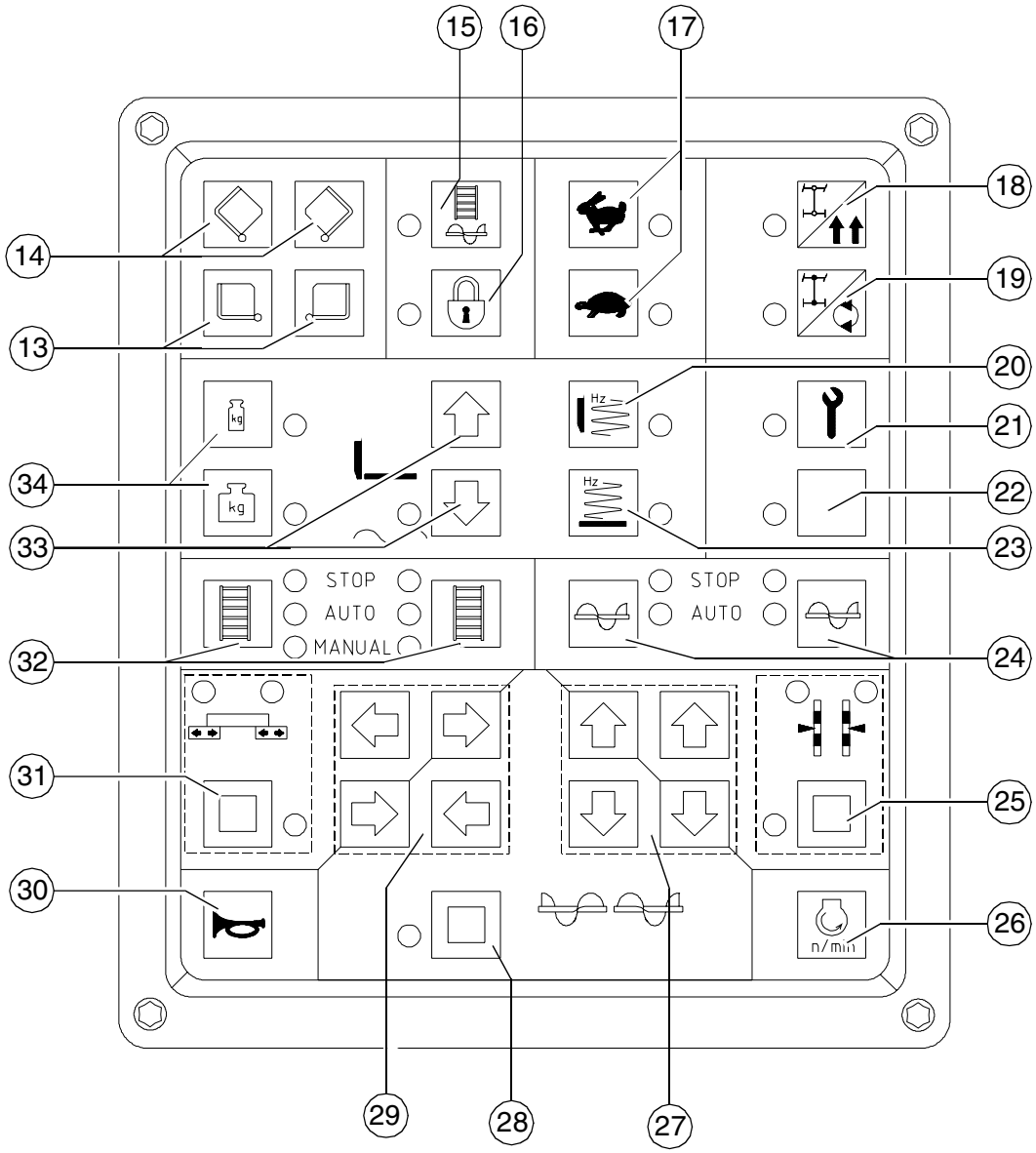
B



Element1_SPSC.cdr

Item	Designation	Brief description
22	Not used	
23	Vibration	Operation and application: see button (20).
24	Auger left/right	Self-engaging buttons with LED indication Toggling between two switching conditions. **Stop:** Operational readiness Auto Reset to STOP in case of an emergency stop or a restart. Button 16 locks the conveying function.
25	Levelling cylinder left/right	Self-engaging button with LED indication For manually actuating the levelling cylinders when automatic levelling is switched off. The switch on the remote control must be set to „manual”. LED „C” (left) and LED „D” (right) indicate the setting. Switched off by pressing the button again or by pressing button 28 or 31. Adjustment of the levelling cylinders occurs by using the appropriate button in the pad (right) for the directions of movement (27).
26	Engine speed adjuster ○	For continuous adjustment of the engine speed (when drive lever (9) is at the stop). Pressing the button opens a menu on the display in which the set value for the diesel engine speed can be viewed or changed. Min. position: idling speed Max. position: rated speed ☞ For paving, select the rated speed; reduce the speed for transportation. ☞ The automatic speed control keeps the set speed constant even under a load.
27	Pad (right) for directions of movement	Used in conjunction with buttons 25, 28 and 31; releases a movement towards the indicated direction.

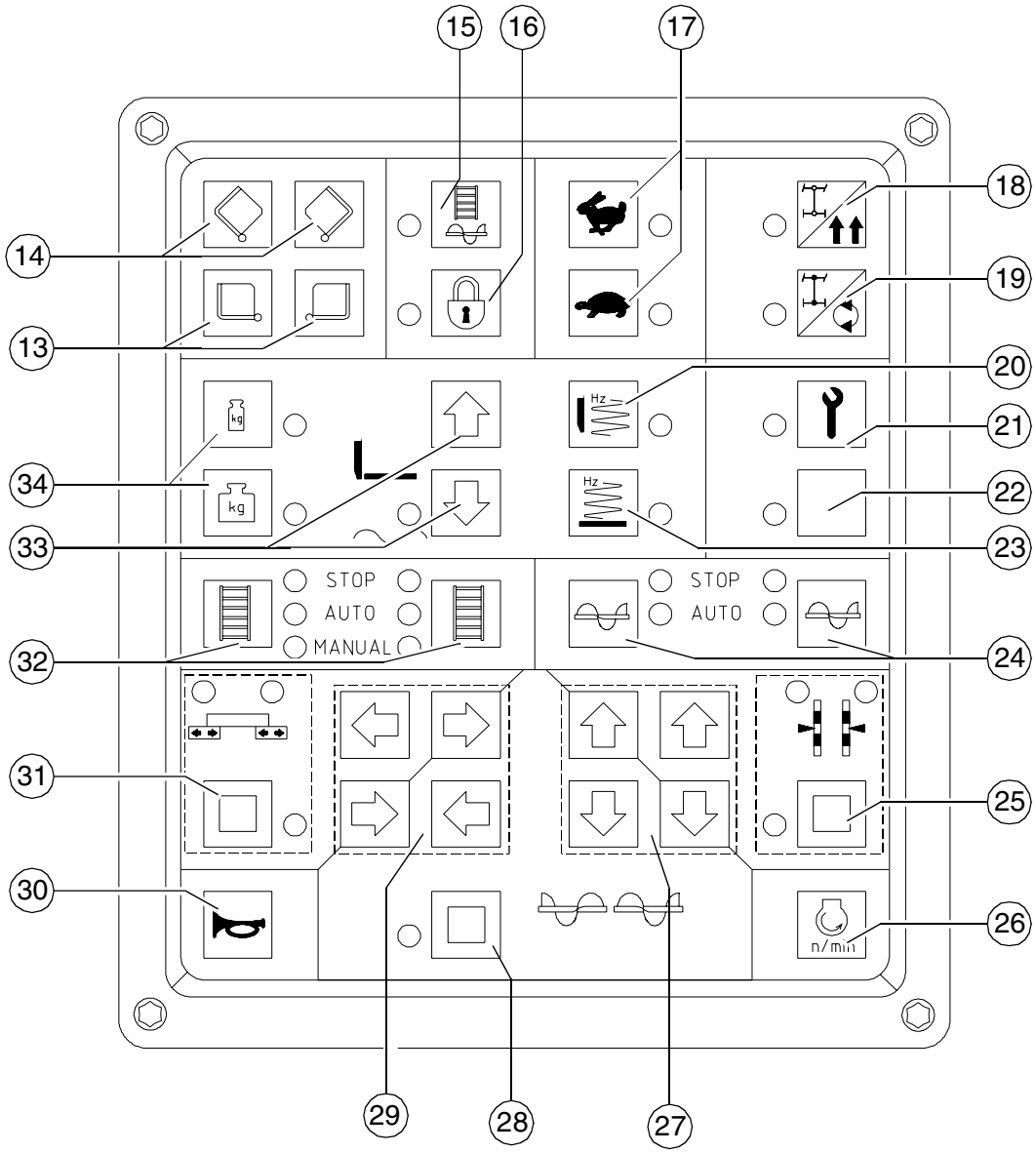
B



Element1_SPSC.cdr

Item	Designation	Brief description
28	„MANUAL” auger operation and lifting/lowering the auger	Self-engaging button with LED indication Switched off by pressing the button again or by pressing button 25 or 31. 1. „MANUAL” auger operation - Requirements: button 24 must be set to „AUTO” - Using the buttons in the pad (left) for the directions of movement (29), the conveying speed of the automatic function can be exceeded with full conveying performance in the direction of the corresponding arrow. 2. Lifting/lowering the auger - Using the buttons in the pad (right) for the directions of movement (27), the auger is lifted or lowered to the direction of the arrow.
29	Pad (left) for the directions of movement	Used in conjunction with buttons 25, 28 and 31; releases a movement to the indicated direction.
30	Horn	Must be activated in the case of emergencies and to indicate that the machine starts to move!
31	Extend/retract screed parts	Self-engaging button with LED indication Switched off by pressing the button again or by pressing button 25 or 28. Using the buttons in the pad for the directions of movement, the screed is moved to the indicated direction of the arrow. LED „A” and LED „B” indicate the vario screeds.
32	Conveyor, left/right	Self-engaging buttons with LED indication To change between the three switching states, press the button again: **STOP**: Operational readiness AUTO MANUAL Reset to STOP in case of an emergency stop or a restart. Button 16 locks the conveying function.

B



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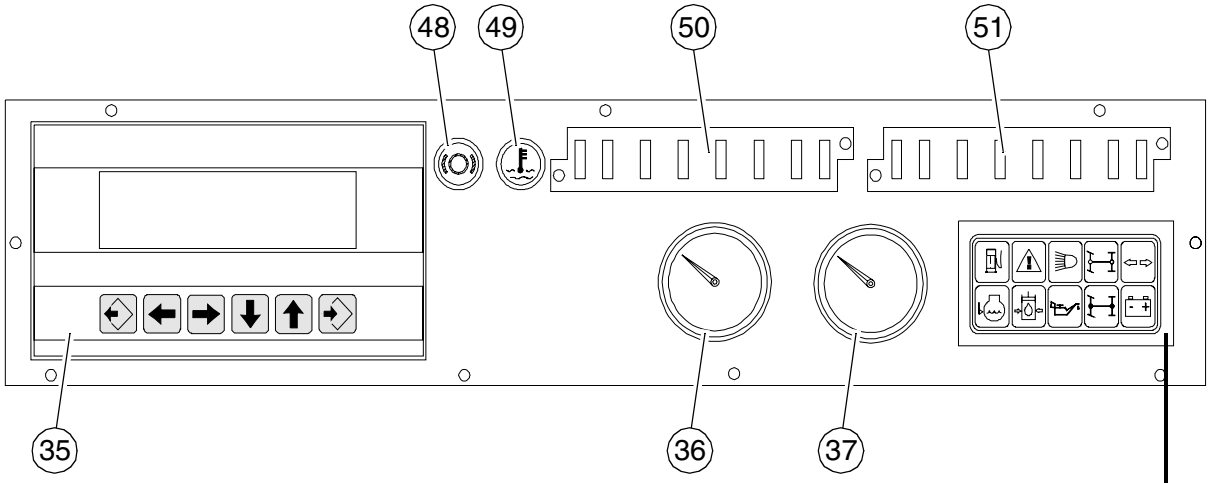
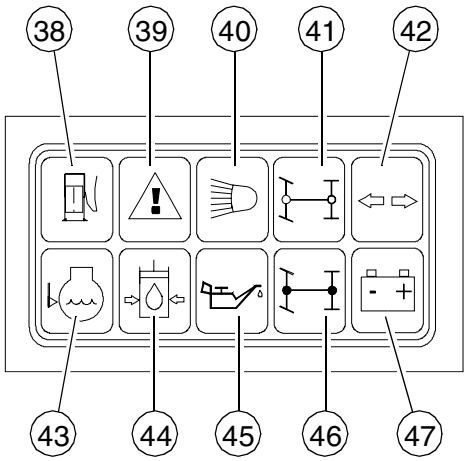
Item	Designation	Brief description
33	Screed position	 Push-button function **Lift screed**  Self-engaging button with LED indication **Lower screed/screed in floating position** Screed floating position: Pressing the button turns the LED ON and prepares the screed for „floating position", which is activated by the actuated drive lever (9). Pressing the button again or pressing the button Lift screed turns the LED off. Lower screed: Keep the button (LED ON) pressed. As long as the button is pressed, the screed is lowered. After releasing the button, the screed is blocked again and the LED indicates OFF. Button 16 is set to the OFF position ⚠ During paving, the screed must always be in the floating position. This also applies to intermediate stops and truck changes when the automatic screed stop is used. ☞ If the floating position is not activated during paving, the horn issues a warning signal.
34	Screed charging/ relieving device	Self-engaging buttons with LED indication Switched off by pressing the button again or by toggling between the two buttons. For charging/relieving the screed to influence traction and the compacting ratio. - To pre-adjust the pressure of the hydraulic oil, set this button and button 21 to „ON".

C

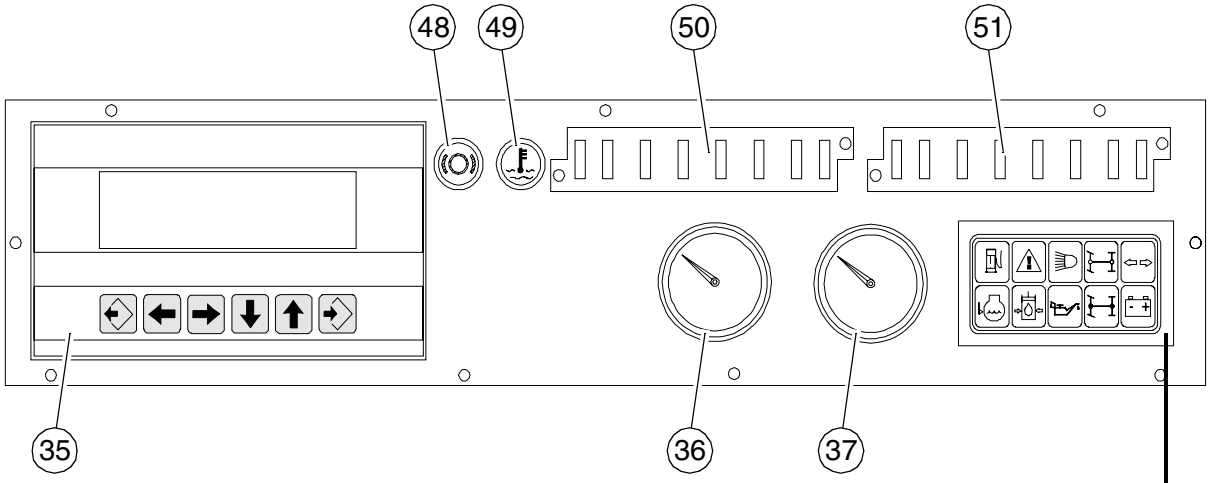


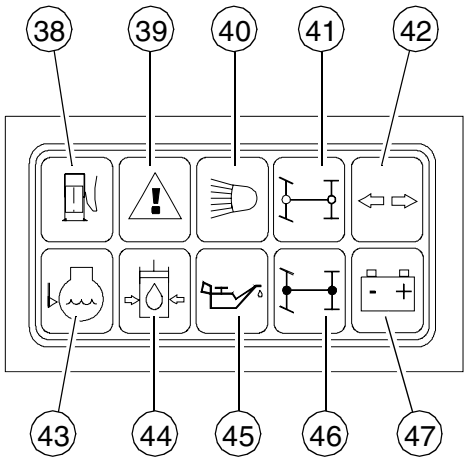


Element3_SPSC.cdr, Kontrollleucht_SPSC.cdr

Item	Designation	Brief description
35	TDM Control, input and display terminal	Display keyboard  Button „Enter” starts the menu operation  Buttons „Left/right”  Buttons „Scroll up/down”  Button „Escape” closes the menu
36	Temperature indicatorforhydraulicoil	Normal display up to 120 °C = 248 °F. ⚠ Stop the paver finisher when higher temperatures are encountered (drive lever (9) to the center position), let the engine cool down while idling. Determine the cause and correct it if necessary.
37	Fuel gauge	Always heed the fuel gauge. ⚠ Do not completely empty the diesel tank! Otherwise, the entire fuel system must be ventilated.

C

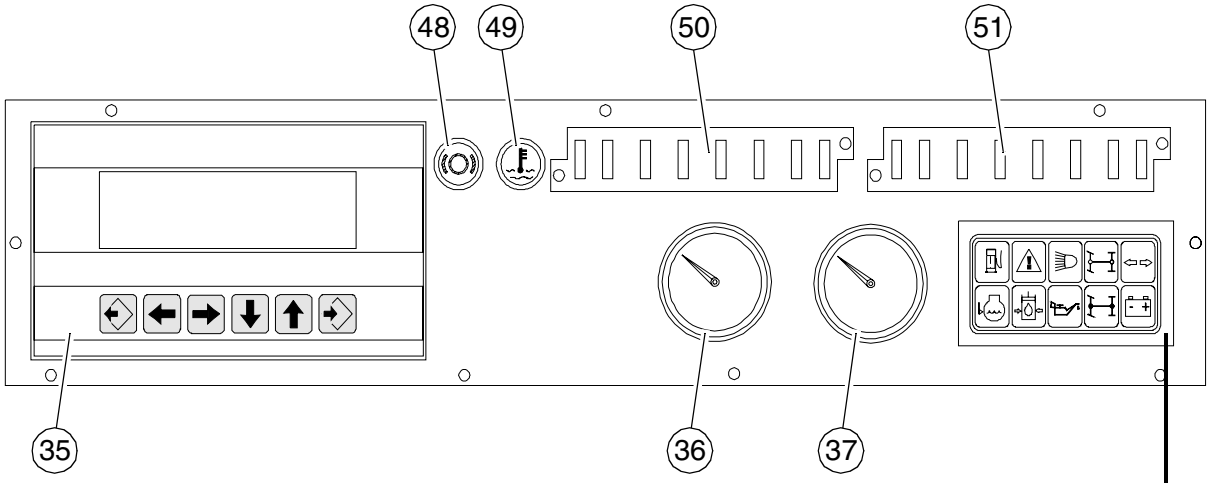


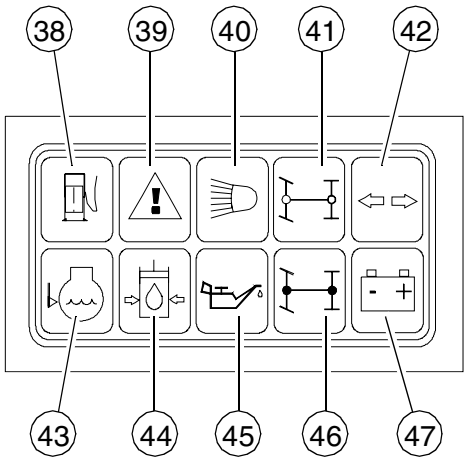


Element3_SPSC.cdr, Kontrollleucht_SPSC.cdr

Item	Designation	Brief description
38	"Water in fuel" warning lamp (red)	Lights up if too high a volume of water has been detected in the fuel system water separator. ⚠ Drain off the separated water immediately as described in the Maintenance Instructions to avoid damaging the engine. ☞ Lights up (test) for a few seconds after ignition is switched on.
39	Error message (yellow)	Indicates that there is an error in the engine. Depending on the severity of the error, the machine may be temporarily operated or the engine may be automatically shut down. To prevent further damage, the error should however be rectified as soon as possible. ☞ Lights up (test) for a few seconds after ignition is switched on. ☞ For error diagnosis, see the section "Engine malfunctions"!
40	High beam indicator (blue)	Lights up when the high beam is switched on (at the ignition key (18)). STOP Avoid blinding the oncoming traffic!
41	Not used	
42	Not used	
43	Coolant check (red)	Lights up if the coolant level is too low. ⚠ If the light does not go out, switch off engine immediately. For other possible errors, see engine's operating instructions.
44	Oil pressure indicator for the hydraulic traction drive (red)	Must go out shortly after the engine has been started. Observe warm running. The hydraulic oil is possibly too cold and stiff. ⚠ Do not switch on the traction drive when the lamp does not go out (see the section „Malfunctions"). ☞ The lamp goes out when the pressure drops below 2.8 bar = 40 psi.
45	Diesel engine oil pressure check (red)	Must go out after starting. ⚠ If the light does not go out, switch off engine immediately. For other possible errors, see engine's operating instructions.
46	Not used	
47	Battery charge indicator (red)	Must go out after starting when the engine revs up. - Switch off the engine.

C

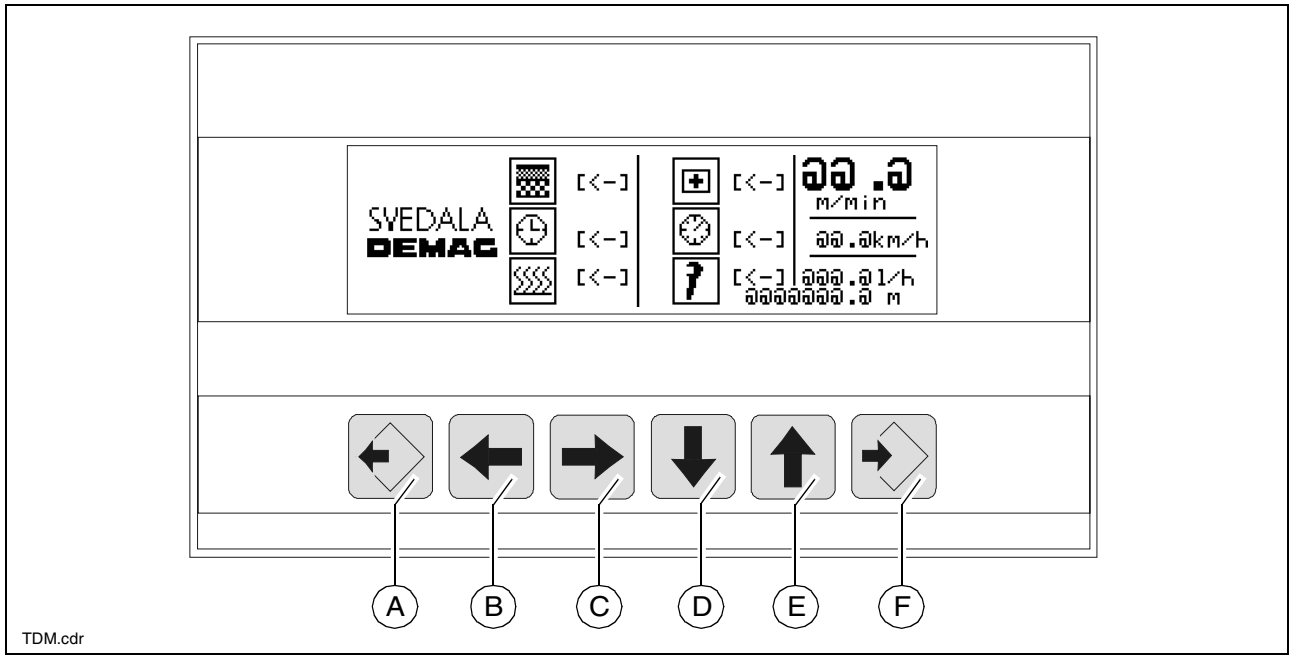




Element3_SPSC.cdr, Kontrollleucht_SPSC.cdr

Item	Designation	Brief description
48	Not assigned	
49	Engine temperature check (red)	Lights up if the engine temperature is too high. ⚠ The engine performance will be throttled down automatically. (still possible to process the paver finisher). Stop paver finisher (drive lever in central position), leave engine to cool at idling speed. Determine cause and if necessary rectify (refer to “Faults“ section). Once cooled down to normal temperature, the engine will fully function again.
50	Fuse box	☞ For assignment of fuse strips, refer to chapter F.
51	Fuse box	☞ For assignment of fuse strips, refer to chapter F.

2.2 Operating the input and display terminal



Display keyboard

(A) Button „Escape“ closes the menu

(B)/(C) Buttons „Left/right“

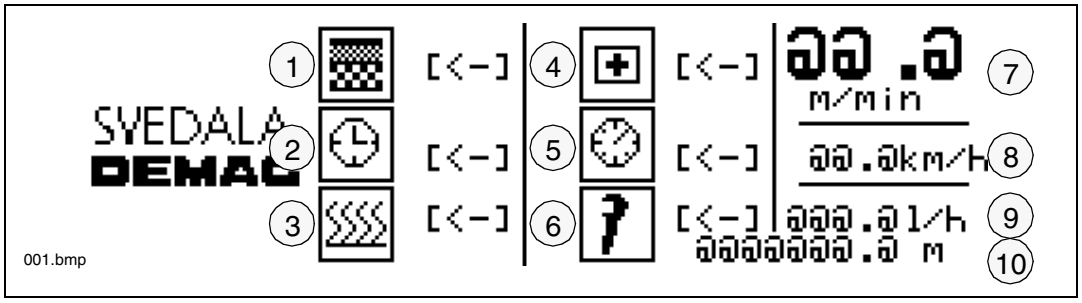
(D)/(F) Buttons „Scroll up/down“

(F) Button „Enter“ starts the menu operation

Working in the menu

Once the ignition has been switched on and after a brief charging process, the main menu appears on the display:

Various actual values are displayed here and operators can select from 6 sub-menus.



- Capacity of flow/paving depth (1)
- Operating hour meter (2)
- Heating control for electrical screed heater (○) (3)
- Emergency function / screed stop and tamper start (4)
- Display showing various actual engine statuses (5)
- Service program for workshop and mechanics (6)

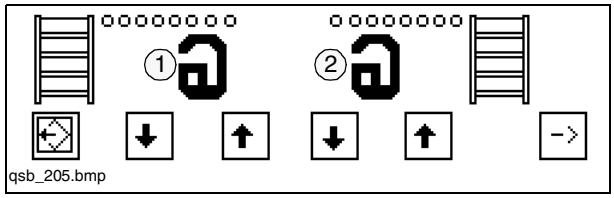
Push button (F) to select one of the subordinates, choose one of the subordinates by pressing push button (D/E) (the arrow becomes black) and enter by pressing push button (F).

The following actual values are shown on the right-hand side of the display.

- Present roadspeed / operating speed in m/min (7)
- Present roadspeed / operating speed in km/h (8)
- Present fuel consumption in l/h. (9)
- Distance covered during defined period of operation (10)

Transport volume/layer thickness (1)

Transport volume of conveyor



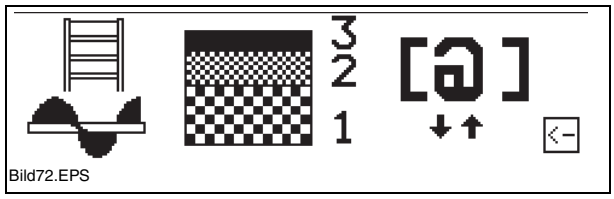
As with the two remote controls, the transport speed of the two conveyors can be set separately.

- Reduce speed of left-hand conveyor - button (B)
- Increase speed of left-hand conveyor - button (C)
- Reduce speed of right-hand conveyor - button (D)
- Increase speed of right-hand conveyor - button (E)

The speed can be set to 8 different stages. The speed stage set for each conveyor is shown in displays (1) and (2).

Press button (F) to jump to the sub-menu for setting the layer thickness. Press button (A) to jump back to the main menu.

Paving depth)



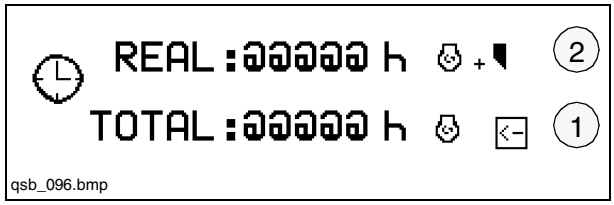
One can choose out of three preselected paving depths.

- Top course (3)
- Intermediate course (2)
- Bottom layer (1)

⚠ Softly tamper start-up when function top course (3) is selected: the tamper frequency will be increased to the preselected value depending on the driving speed.

To select one of these three press push button (F) (figure becomes black and flashes), choose one of the subordinates by working push button (D/E) and confirm by pressing push button (F).

Operating hour meter (2)

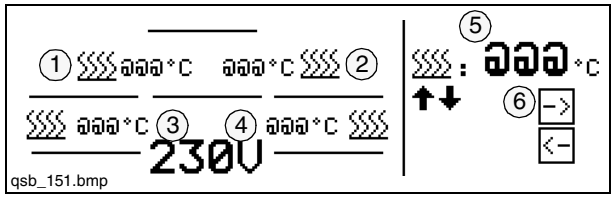


Two different operating hours values are displayed:

- Total operating hours (1) with engine running
- Real operating hours (2) during installation

⚠ In order to observe maintenance intervals (chapter F), call up every day and note the total operating hours!

Heating control for electrical screed heater (3) (○)



In this menu sub-item, the heating temperature for the following screed elements can be read off and can be jointly set for all screed elements:

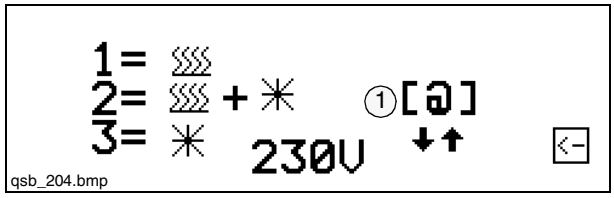
- Actual temperature value, main screed, on left (1)
- Actual temperature value, main screed, on right (2)
- Actual temperature value, extendable part, on left (3)
- Actual temperature value, extendable part, on right (4)
- Nominal temperature value set for all screed elements (5)

☞ The temperature is set in stages of 1°C in a range of between 20° and 180°C

To change the nominal value (5), press button (F) (number is highlighted with black background and flashes).
The nominal value can now be modified using the buttons (D/E).
Confirm the value required by pressing the button (F) (number no longer flashes).
The menu sub-item can be exited by pressing the button (A).

Select the „Sub-menu“ symbol (6) and confirm by pressing button (F) to jump into the sub-menu for selecting the activated consumers:

Selection of activated Electronic elements



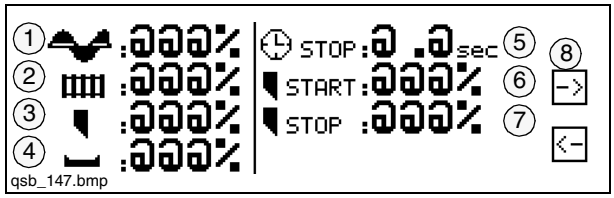
This menu sub-item is used to set which electronic elements on the screed heater (system) switch cabinet can be activated:

- Selection 1: heating only
- Selection 2: heating and lighting
- Section 3: lighting only

To change the present selection (1), press button (F) (number is highlighted with black background and flashes).
To modify the selection, press buttons (D) or (E) until the number required can be seen on the display (1).
Confirm the required selection by pressing the button (F) (number no longer flashes).

The sub-item can be exited by pressing the button (F)

Emergency function / screed stop and tamper start (4)



If a nominal value specification or actual value measurement fails (e.g. sensor defective, remote control failed), the performance of various functions can be set for automatic operations.

- auger (1)
- slat bar conveyor (2)
- tamper (3)
- vibration (4)

The current value can be set to between 0 and 100%.

☞ Settings can only be made to these functions during an instance of failure.

Three further sub-items can be selected as variable functions:

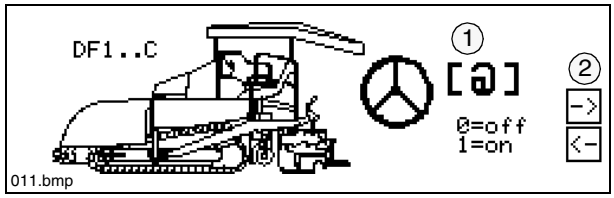
- screed stop (5)
- tamper start (6)
- tamper stop (7)

- When restarting the machine, the screed stop (5) is opened once the input time has expired.
- The nominal value for the tamper start dynamics (6) can be set in the range of between 0 and 100%.
  Nominal specification is 50%. (Delayed tamper start)
- The nominal value for the tamper start dynamics (7) can be set in the range of between 0 and 100%. Nominal specification is 50%. (Delayed tamper stop)

Use the (B/C) or (D/E) buttons to select the function required and use the (F) button to enter the sub-item (number has black background and flashes). Use the (D/E) buttons to change the value and press the (F) button to confirm (number stops flashing). If necessary, use the (B/C) or (D/E) buttons to select the next sub-item or transfer the value modified and exit the menu sub-item by pressing the (F) button twice.

Select the "Sub-menu" symbol (8) and confirm by pressing button (F), to jump to the sub-menu for setting the automatic steering unit:

Automatic steering unit



☞ No functions are saved in the wheeled paver program in this sub-menu item!

In this menu sub-item, the operator can use the selection (1) to set whether the automatic steering unit is to be activated or deactivated:

- Selection 0: automatic steering unit deactivated
- Selection 1: automatic steering unit activated.

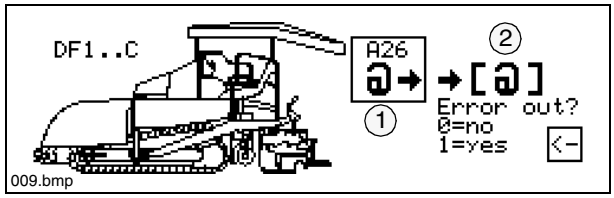
If the appropriate equipment (Sonic-Ski) is fitted, the finisher can independently travel along a reference body (e.g. securing rope) when the automatic steering unit is activated.

☞ If the operator undertakes a steering movement, for reasons associated with safety, this overrides the automatic steering unit.

The menu sub-item can be exited by pressing the button (A).

Select the „Sub-menu“ symbol (2) and confirm by pressing button (F) to jump into the sub-menu for calling up saved error messages:

Error memory



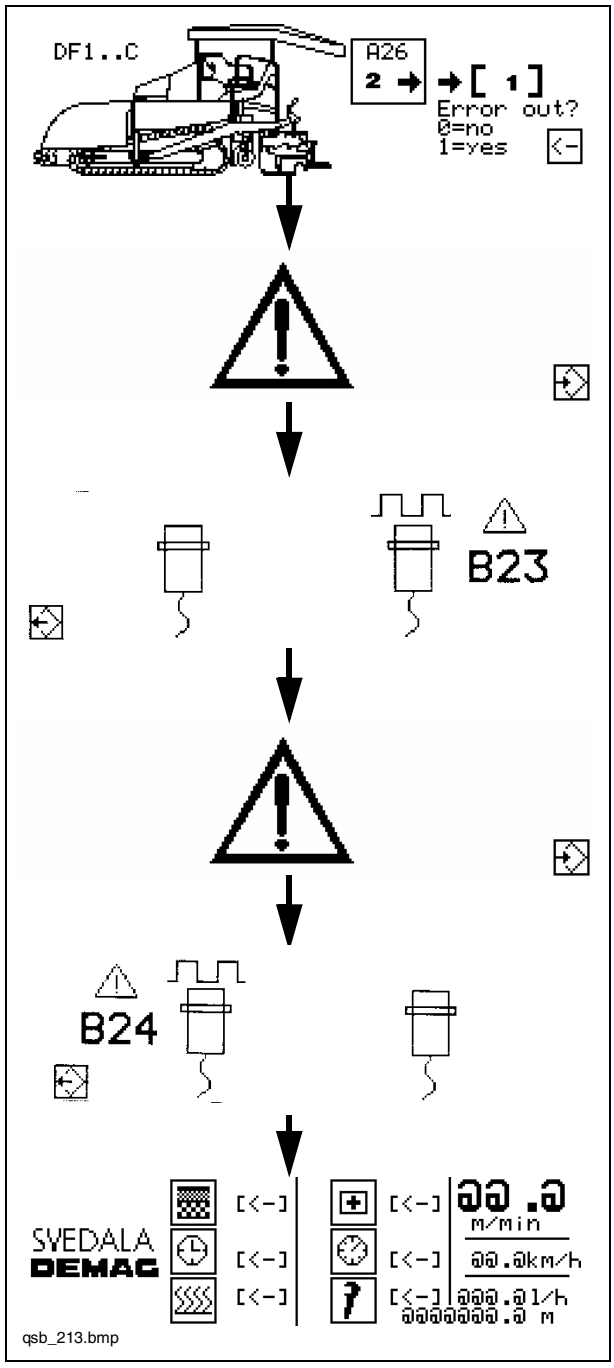
No functions are saved in the wheeled paver program in this menu sub-item!

Errors which have arisen and are saved in the system can be called up in this menu sub-item:

The number of error messages saved is shown in display (1). Selection (2) can be used to set whether the errors are to be shown one another in the display or whether this is initially not to be the case.

- Selection 0: do not display error messages
- Selection 1: display error messages

If error messages are not to be called up, exit the menu item by pressing the button (A).
To call up the messages, use button (C) to call up the selection window (2), make selection with button (F) and press the button (E) to set the value to „1“.
The saved errors are displayed one after another following confirmation by pressing the button (F):



Example:

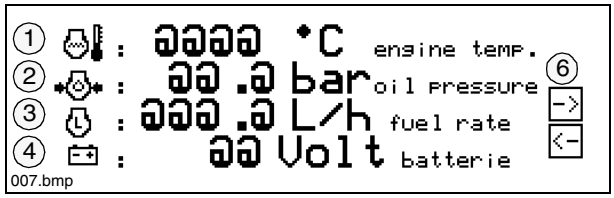
There are two error messages in the memory.

- Selection 1: error display
- Error information
- 1st error: right drive sensor
- Error information
- 2nd error: left drive sensor“

☞ For a more precise error diagnosis, refer to „Error diagnosis and error localisation“ section

☞ The errors saved can be called up again if the ignition is switched off and back on again.

Display showing various actual engine statuses (5)

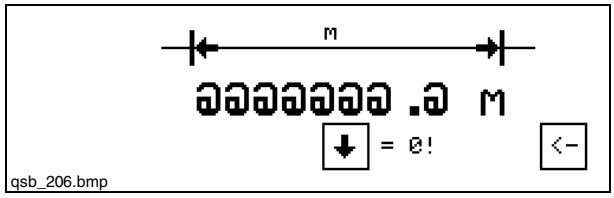


Several actual engine statuses can be monitored in this sub-item:

- Engine temperature (1)
- Oil pressure (2)
- Fuel consumption in L/h (3)
- Battery voltage (4)

Select the „Sub-menu“ symbol (6) and confirm by pressing button (F) to jump into the „Counter showing distance travelled“ sub-menu:

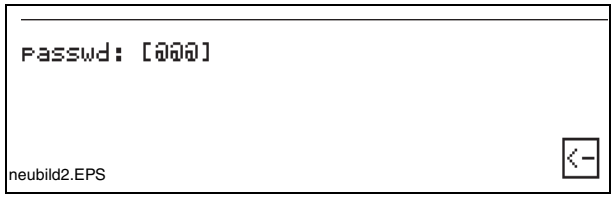
Counter showing distance travelled



The counter showing distance travelled (on the working site in metres) which is fitted in the paver can called up in this display.

The display can be set to „zero“ by pressing the button (D).

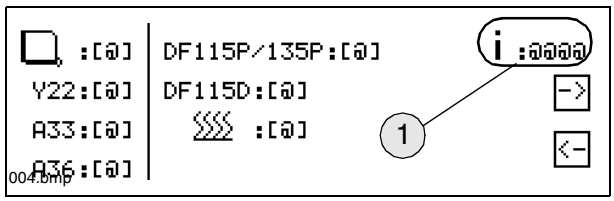
Service program for workshop and mechanics (6)



After choosing this subordinate a request for a password input appears in the display.

⚠ Only instructed personal is authorized for the further proceedings!

- Return to the basic menu by pressing push button (A)



- By pressing the (F) button, the following screed is called up and the programmable controller software version (1) can be queried:
- Return to the basic menu by pressing the (A) button

☞ Settings can only be made in this screen if the correct numerical code has been entered.

Additional information and adjustments / showing up via LC-display

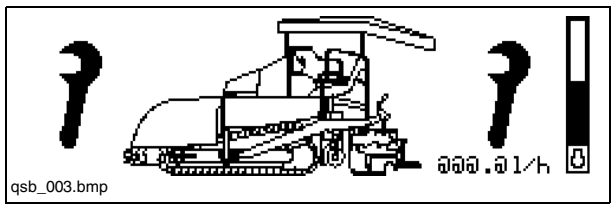
Adjustment of the RPM speed of the engine

Comes up when pressing push button (26) of the operating panel.

- Indicating the scheduled value as well as actual value of the RPM speed.

To adjust the scheduled value, press push button (A) (figure becomes black and flashes), reset the value by working push button (D/E). To undertake the change press push button (F) and confirm by pressing button (A). To leave the level of subordinate press push button (26) again.

Set-up operation

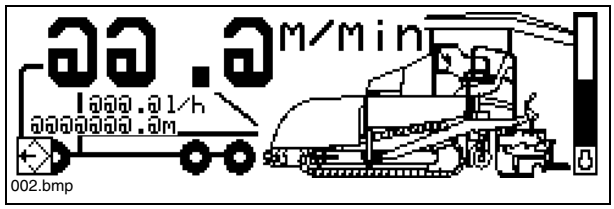


Comes up when pressing push button (21) of the operating panel. RPM speed of the engine is displayed graphically. The present fuel consumption is also displayed in l/h.

Stop

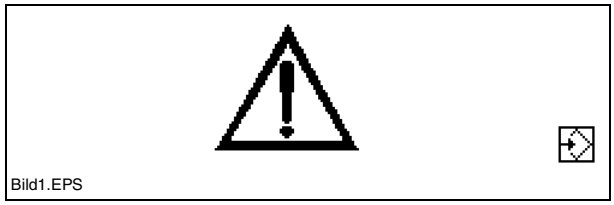
Comes up in the case of emergency button of the operating panel (7) or remote control (54○) is pressed.

Paving information



Comes up during paving and shows the actual speed of paving. RPM speed of the engine is displayed graphically.
The current fuel consumption in l/h and the distance covered during defined period of operation in m are also displayed.

Information of malfunction



Comes up in case of malfunction.

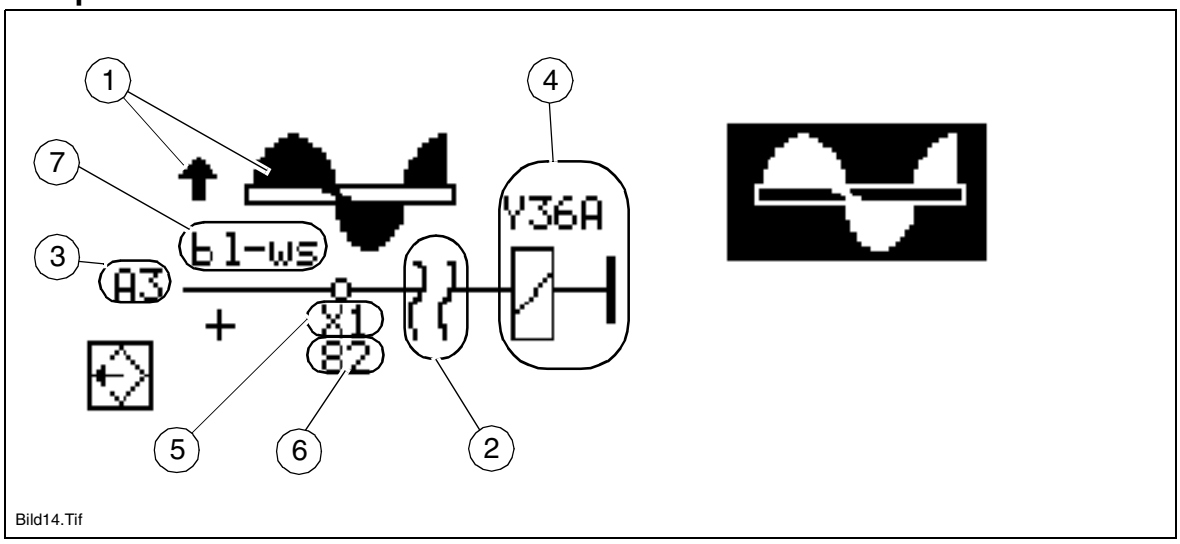
- Diagnosing and detecting of the error by pressing push button (F).
- To leave this menu press push button (A).

2.3 Diagnosing and detecting malfunction

In the case of the display indicating malfunction select this menu by pressing push button (F).

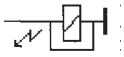
The following information is given.

Example:



Pos.	Description
1	the part affected and its function
2	electrical malfunction
3	matching PLC-module
4	controlled element
5	matching terminal strip
6	matching cable clamp
7	colour of the cable

Variations of malfunction (Pos 2)

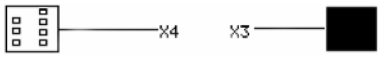
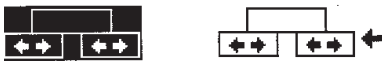
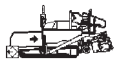
Meaning	Graphic
Parting of cable	
Short circuit	

Variations (Pos. 4)

Meaning	Graphic
Ultrasound sensor/mechanical limit switch	
Potentiometer	
Valve	
Electronics unit for automatic drive	

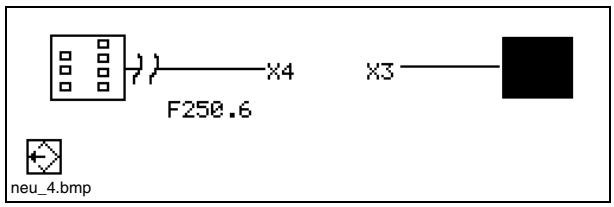
Variations of malfunction (Pos 1)

Meaning	Graphic
Auger L.H. lifting	
Auger L.H. lowering	
Auger R.H. lifting	
Auger R.H. lowering	
Levelling L.H. lifting	
Levelling L.H. lowering	
Levelling R.H. lifting	
Levelling R.H. lowering	
Hopper L.H. open	
Hopper L.H. close	
Hopper R.H. open	
Hopper R.H. close	
Screed charging	
Screed relieving	
Screed charging or relieving	
Screed floating position	

Meaning	Graphic
Screed stop	
Tamper function	
Vibration function	
Left remote control	
Right remote control	
Screed L.H. extend	
Screed L.H. retract	
Screed R.H. extend	
Screed R.H. retract	
Starting	
Horn	
Travel drive pump	

Additional note „fuse“

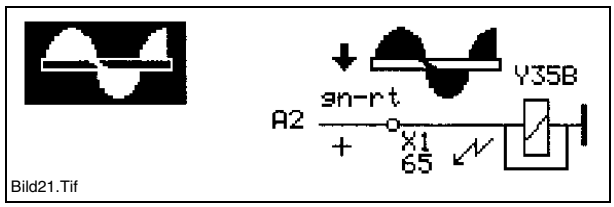
Some error messages also make reference to the relevant fuse (example F250.6).
This should be checked first before initiating any other measures.



Variety of colours (Pos 7)

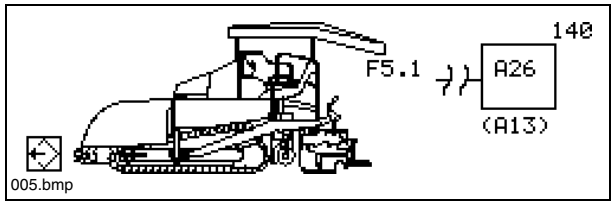
Abbr.	Meaning
bl	blue
br	brown
ge	yellow
gn	green
rs	pink
rt	red
sw	black
vi	lilac
ws	white

Example:



- Malfunction of the auger R.H. lowering.
- Short circuit of the valve Y35B at the PLC-module A2
- Terminal strip X1, cable clamp 65, colour of the cable: green-red

Automatic drive error message

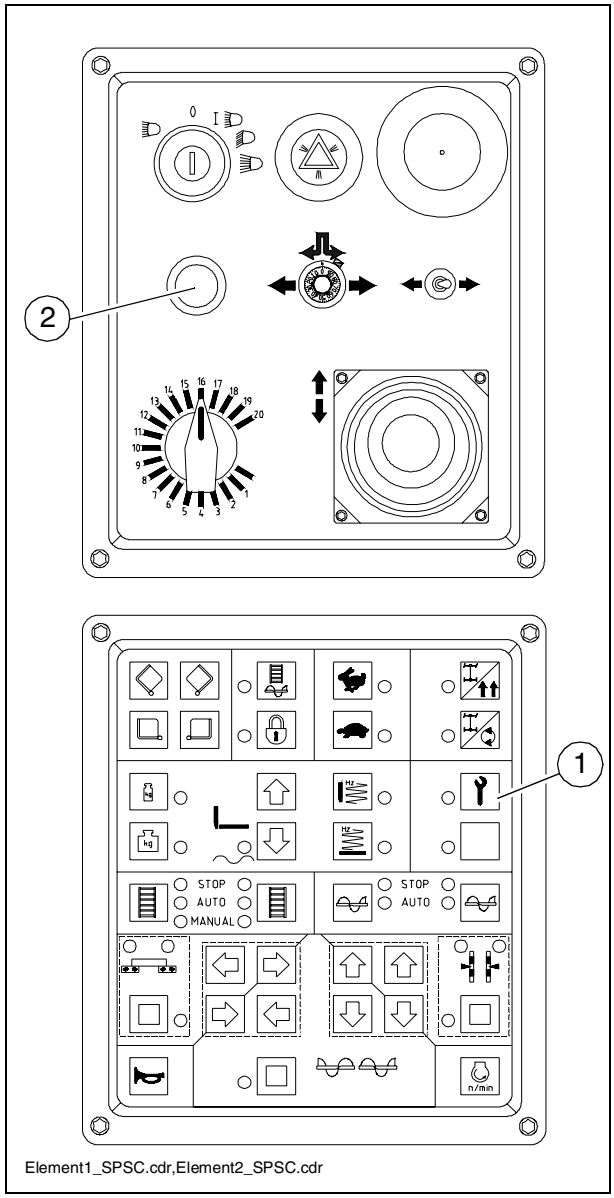


The electronics unit for the automatic drive has failed.
Data connection with the master module is interrupted.

☞ First check whether fuse F5.1 is still intact.

If the fuse has not caused the interrupt to the data connection, the diesel engine can be started (using an emergency start):

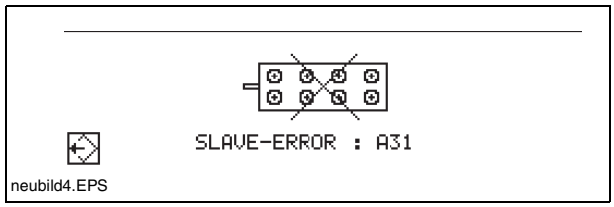
- Engage button (1) (LED on).
- Press start button (2).



Further malfunction:

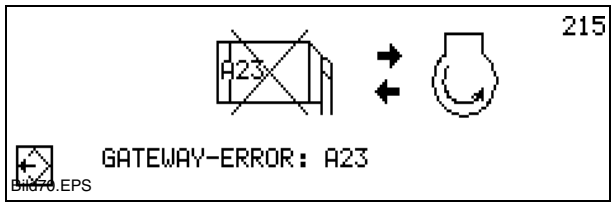
Slave error

- Slave defective (Example Slave A31)



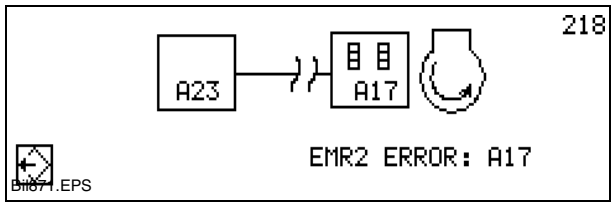
Gateway

- Error in gateway



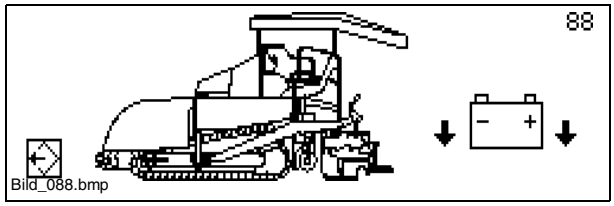
EMR

- Error in engine electronics EMR



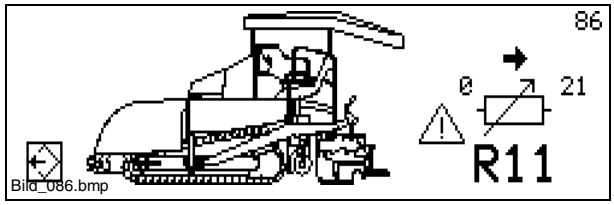
Battery

- Potential to low



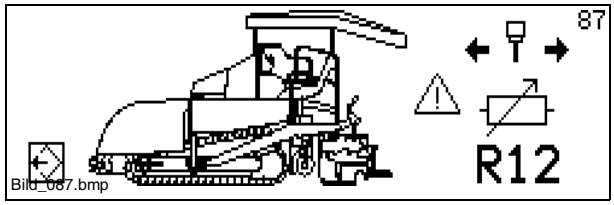
Travelling speed

- Potentiometer defective



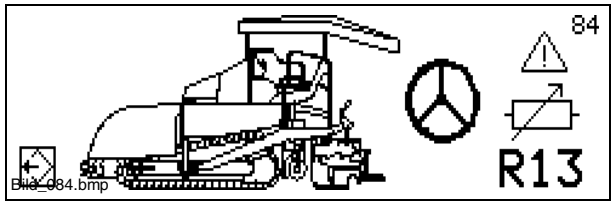
Drive lever

- Potentiometer defective



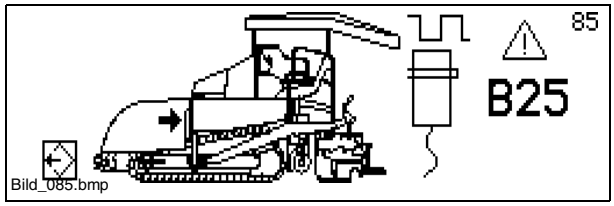
Steering potentiometer

- Potentiometer defective



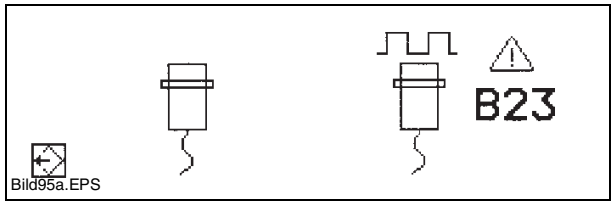
Sensor RPM engine

- Sensor defective



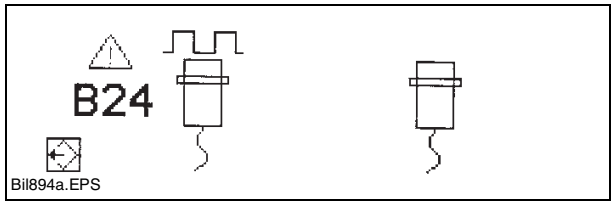
Sensor caterpillar drive right

- Sensor defective



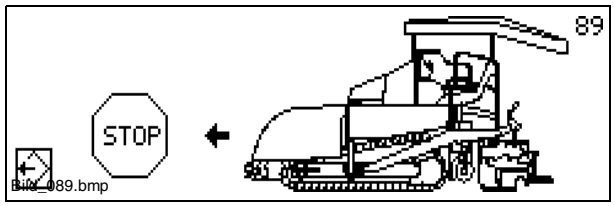
Sensor caterpillar drive left

- Sensor defect



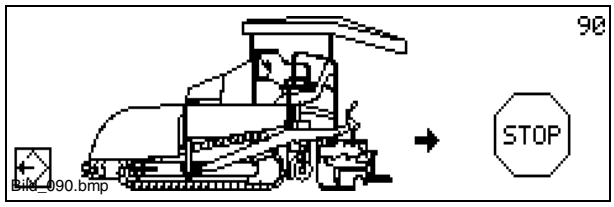
Travelling motion

- Forward blocked



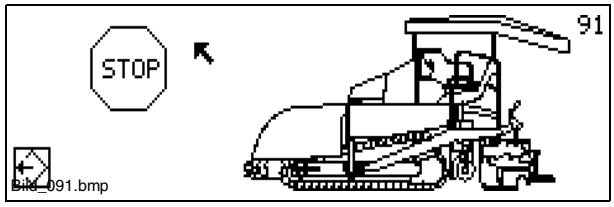
Travelling motion

- Backward blocked



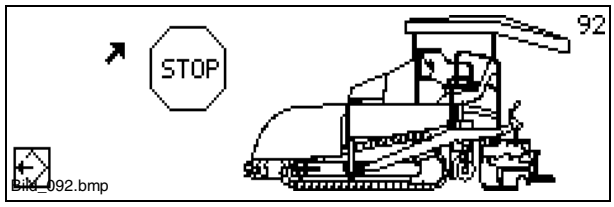
Travelling motion

- Turning left blocked



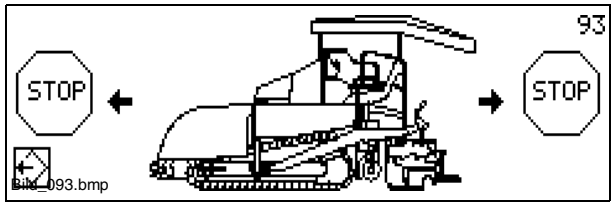
Travelling motion

- Turning right blocked



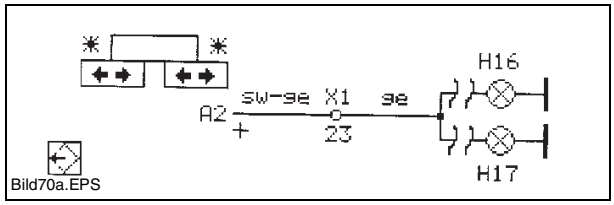
Travelling motion

- Forward+backward blocked



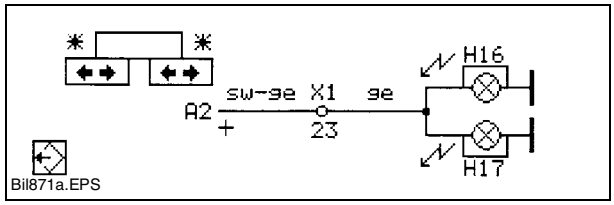
Screed warning light

- Parting of cable or lamp defective



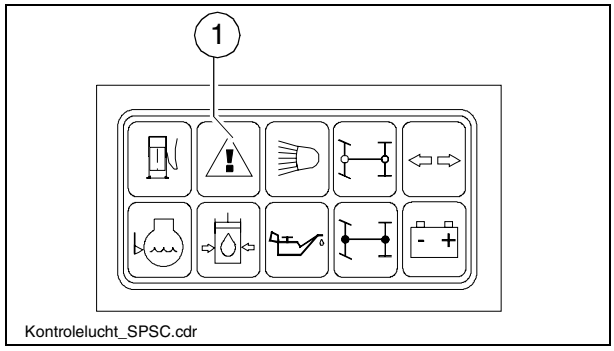
Screed warning light

- Short circuit



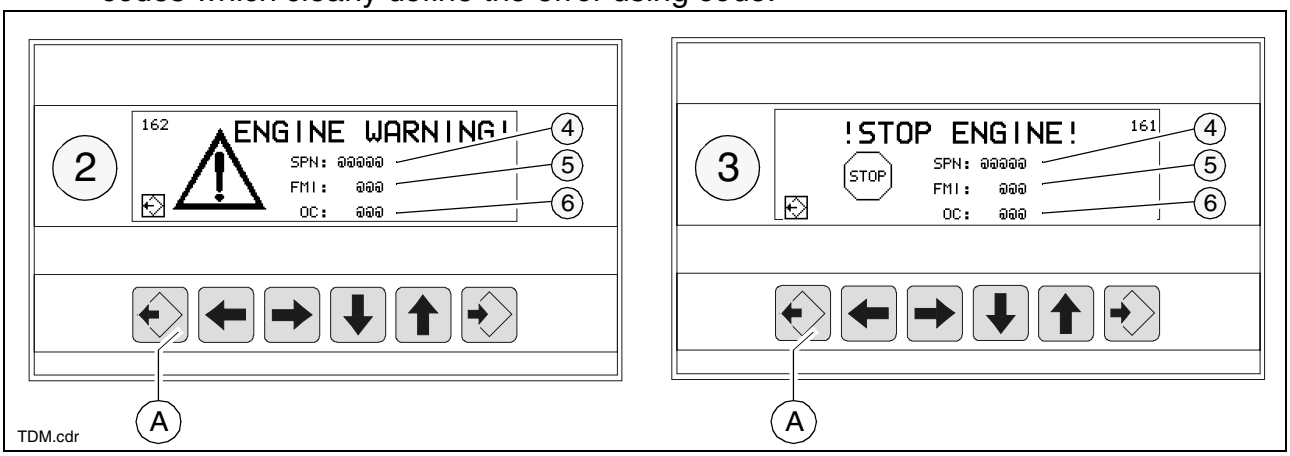
2.4 Engine error messages

If an error is found in the engine, this is signalled by the associated warning light (1) of the electronic engine control system (EMR) and at the same time displayed in code on the display.



- Permanently lit warning light (1) (yellow): there is an error in the engine. The machine can be temporarily operated. To prevent further damage, the error should however be rectified as soon as possible.
- Warning light (1) (yellow) flashes: a serious error has been found in the engine and the engine is stopped automatically and/or has to be stopped to prevent further damage.

The error message shown at the same time on the display contains several numerical codes which clearly define the error using code.



- “ENGINE WARNING!” display (2) is displayed if there is a less serious error and the warning light (1) is permanently lit up.
- ”!STOP ENGINE!” display (3) is displayed if there is a serious error and an engine stop is triggered and the warning light (1) flashes.

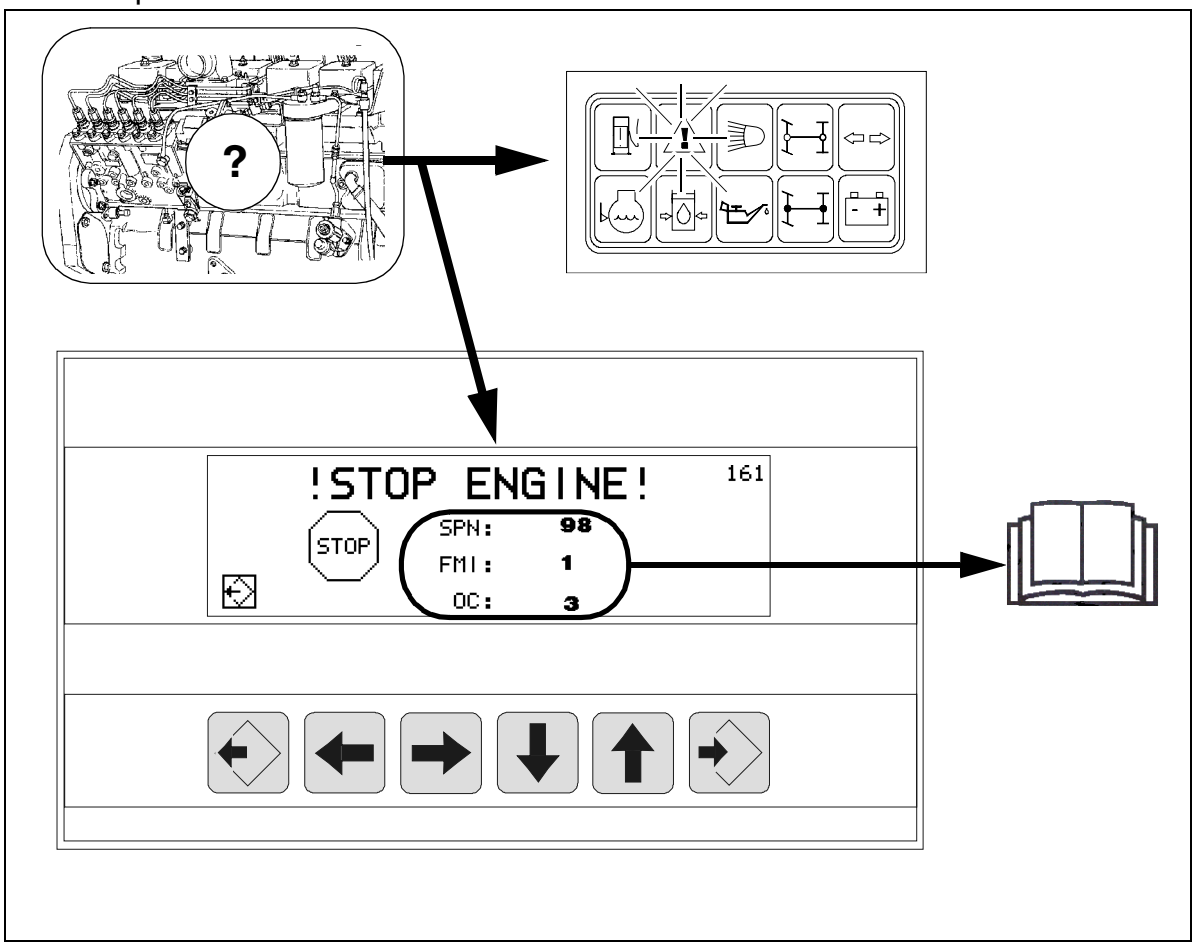
The SPN (4) and FMI (5) displays shown determine the component affected by the error and the type of error occurring. The OC display (6) indicates the frequency with which the error displayed has already occurred.

☞ To determine the error using error code, refer to the „Malfunctions“ section!

A displayed error can be acknowledged and removed from the display by pressing the button (A). If several errors occur at the same time, these are also displayed once the message displayed has been acknowledged using button (A).

☞ The machine ignition has to be switched off and then on again if you want to call up errors which have already been acknowledged.

Example:



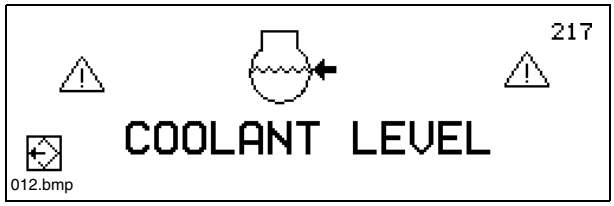
Explanation:
The flashing warning light signals a serious error in the engine with an automatic and/or essential engine stop.
Display indicator:
SPN: 98
FMI: 1
OC: 3

Cause: The sensor signals that the oil level is too low.
Consequence: Speed restriction and possible engine shutdown, if the engine protection shutdown function is activated.
Frequency: This error has now occurred three times.

⚠ Inform the After-Sales Service for your paver finisher of the error numbers displayed and they will discuss the next course of action with you.

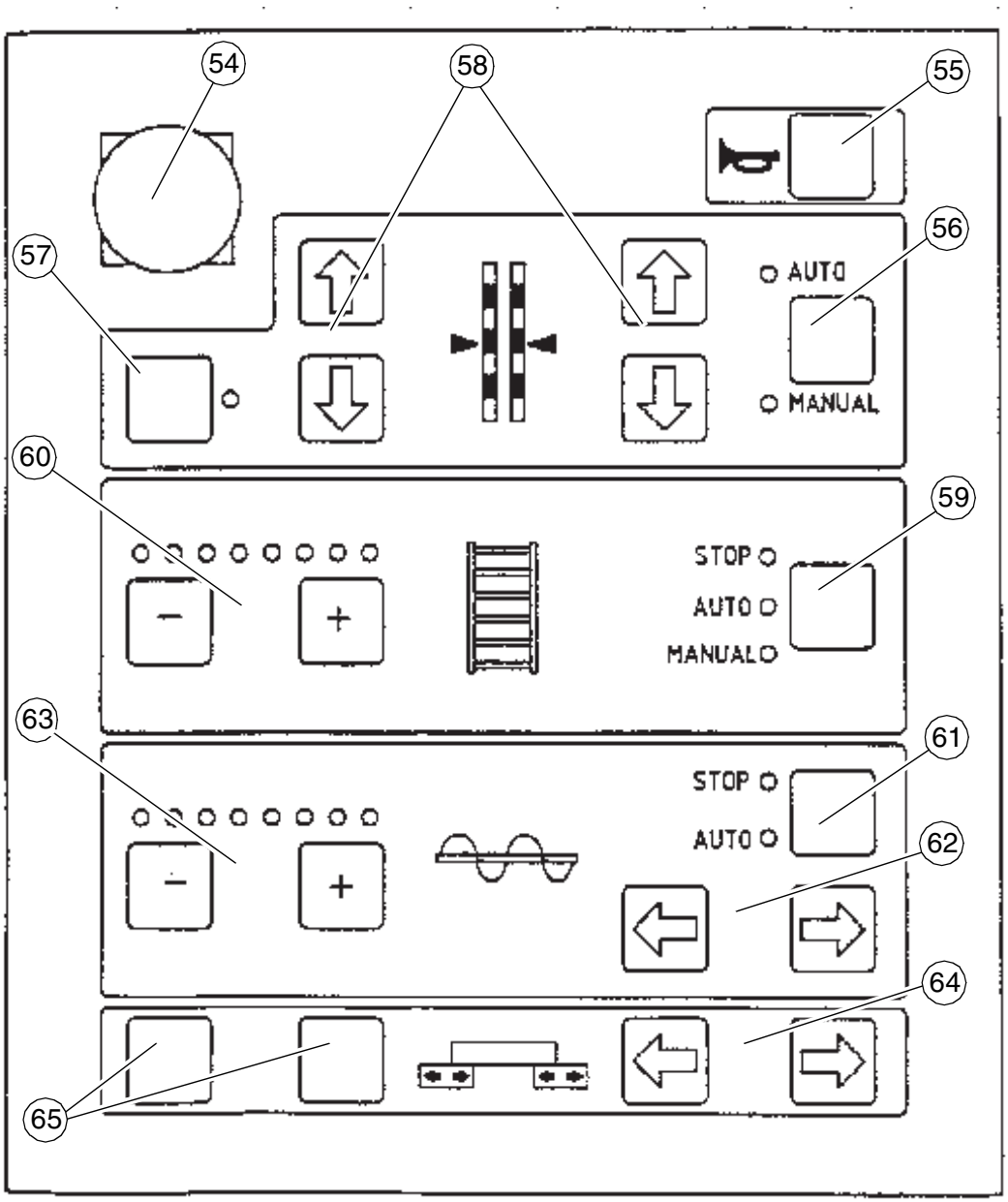
"Coolant level too low" error message

Is displayed if too low a level of coolant has been detected.



⚠ To prevent damage to the engine, switch off engine immediately and top up coolant as defined in maintenance instructions.

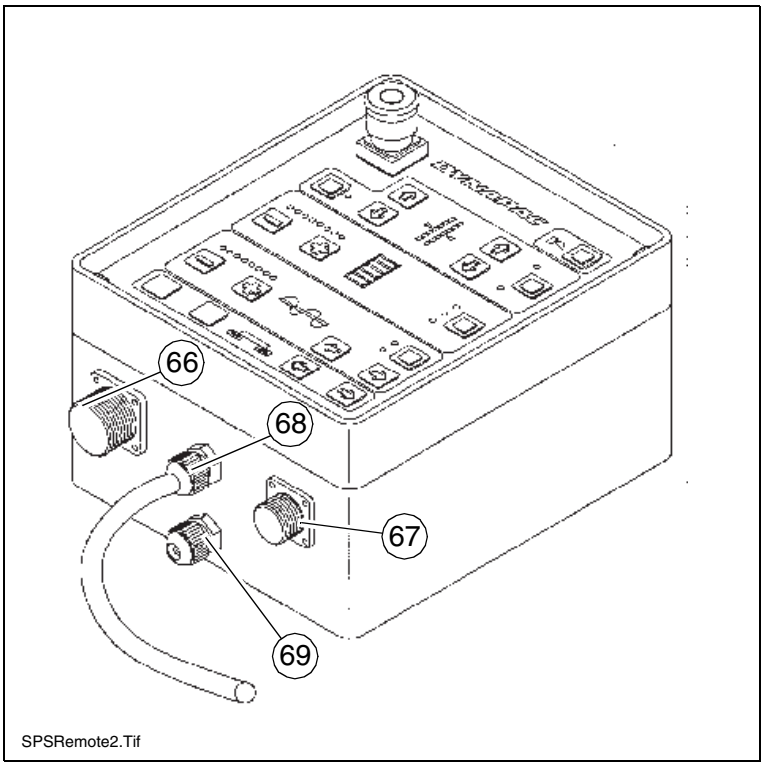
2.5 Remote control



SPSRemote.Tif

Item	Designation	Brief description
54	Emergency stop button (○)	Function and application as with the emergency stop button (7) on the operating panel. Important for dangerous situations when the driver's "sight" is restricted.
55	Horn	Function as for push-button (30) on the operating panel.
56	Levelling cylinder	Levelling cylinder Function and applications as for switch (25) on the operating panel - Switch must be set to "manual".
57	Button to switch on levelling cylinder adjustment on the other side	By using this button, there will be the possibility to adjust the levelling cylinder on the other side. Indication on the other remote control switches automatic into switching state „manual".
58	Buttons for directions of movement	Functions in same way as buttons (27) on operating panel.
59	Conveyor	Functions in same way as button (32) on operating panel.
60	Adjuster for the capacity of flow	To adjust the capacity of flow, use the plus/minus buttons. Indication by LED. - Switch (59) must be set to „auto" to undertake the alternation.
61	Auger	Functions in same way as button (24) on operating panel.
62	Buttons for conveying direction of the auger.	By using this button, there will be the possibility to switch on the conveying function in both directions. - Switch (61) must be set to „auto".
63	Adjuster for the capacity of flow	To adjust the capacity of flow, use the plus/minus buttons. Indication by LED. - Switch (61) must be set to „auto" to undertake the alternation.
64	Extend/retract screed parts	Used to hydraulically extend or retract the extendable parts of the variable screed.
65	not used	

Bottom



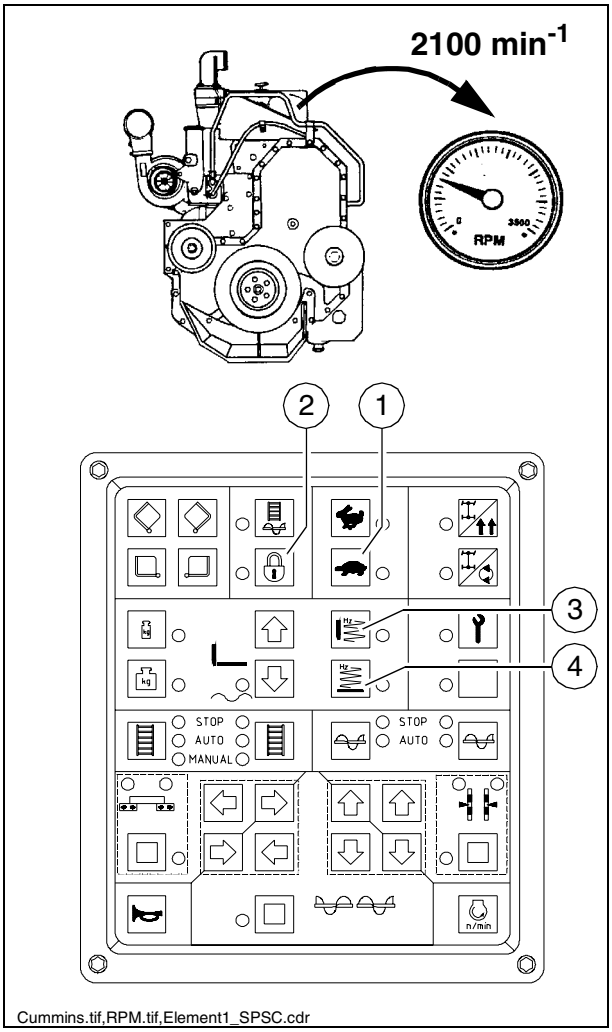
Item	Designation	Brief description
66	Socket for auto-matic levelling unit	Connect the cable for the grade control unit here.
67	Socket for auger limit switch	Connect the cable for the material limit switch here.
68	Cable for the remote control	Connect the plug to the screed (see operating instructions for the screed).
69	Ventilation valve cap	

Emergency program for TDM-failure

To ensure the pavers operating ability during a display failure, an emergency program will be started automatic.

Following setting and functions will be adjusted and switched on:

- Number of revolutions of the Diesel engine: 2100 min^{-1}
- Traction drive (1) slow (Turtle)
- Operating main switch (2) OFF
- Tamper (3) switched on
- Vibration (4) switched on



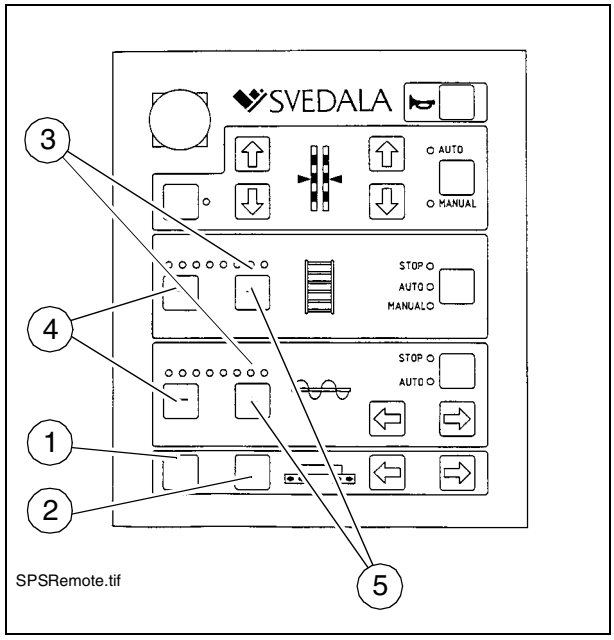
Cummins.tif,RPM.tif,Element1_SPSC.cdr

⚠ Connected functions will not be indicated by LED during a display failure!

☞ Tamper and vibration can be deactivated by the associated rotary potentiometer (set to „zero“).
The frequency of the tamper and vibration can be read off the two associated displays (O).

Accessory the following function can be switched by using the remote controls:

- Press button (1) to close the hopper.
- Press button (2) to open the hopper.
- Lifting the screed:
  - Switch off the LED bar (3) of auger and conveyor completely by using the accompanying Minus-buttons (4).
  - Lift the screed infinitely variable by using the both Minus-buttons(4) simultaneous.



SPSRemote.tif

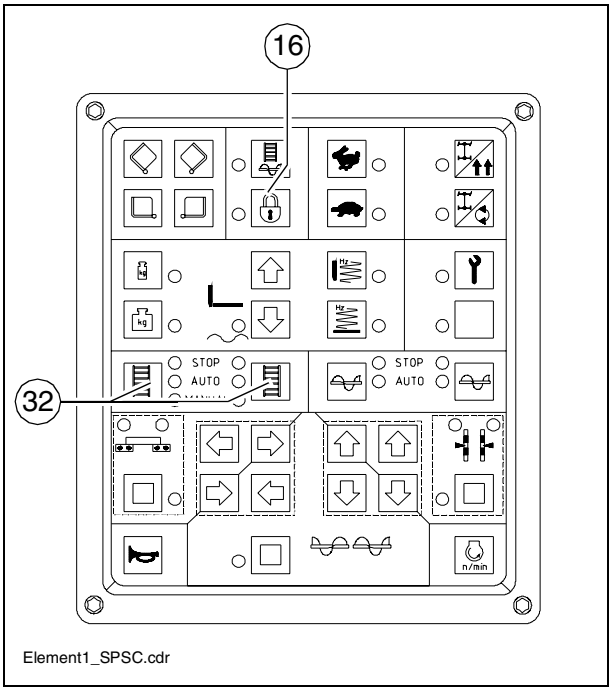
- Switching the screed into readiness (floating position):
  - Switch the LED bar (3) of auger and conveyor completely on by using the accompanying Plus-buttons (5).
  - Switch the screed into floating position by pressing the both Plus-buttons simultaneous.

⚠ The screed will be lowered at first when the drive lever is moved out of the center position!

☞ To lift the screed out of floating position, the LED bar of auger and conveyor must be deleted again.

2.6 Special functions

Reversible conveyor



The direction of transport of the conveyor can be changed over to the opposite direction to move material located just in front of the auger back slightly. Material losses, e.g. during transport operations can therefore be avoided.

- Switch main function switch (16) over to „Off“ switch position (LED off).
- Hold down one or both of the buttons (32) in the „STOP“ switch position for approx. 5 seconds.
  The system jumps into the „Manual“ switch position and the conveyor moves approx. 1 metre towards the hopper. The system then jumps back into the „Stop“ switch position.

If necessary, this process can be repeated as many times as required to allow the conveyor to move further in the opposite direction.

2.7 Operating elements on the paver finisher

Batteries (71)

Located behind the right side cover are the batteries of the 24 V system.

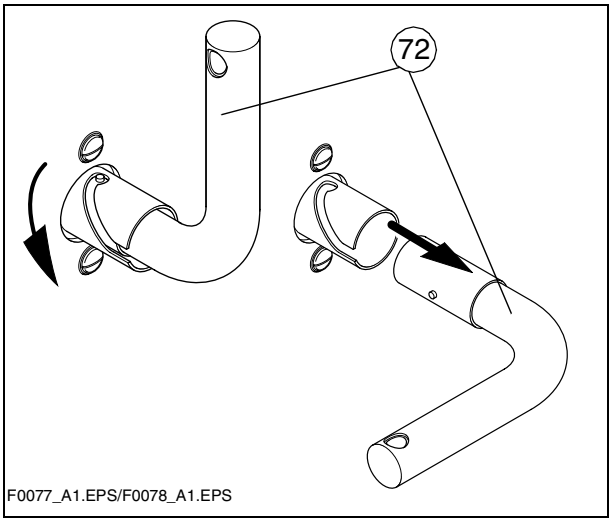
Bat115.jpg

☞ For the specifications, refer to chapter B, ”Technical Data”.
For servicing, see chapter F.

⚠ Heed the instructions when starting the finisher externally. (see section “Starting the paver finisher, External starting (starting aid)“)

Battery main switch (72)

Located on the right side between the front wall and trough is the battery switch, which isolates the battery from the main fuse.



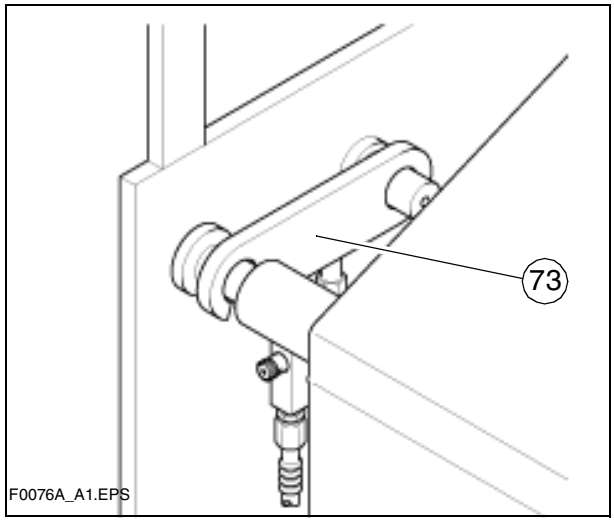
F0077_A1.EPS/F0078_A1.EPS

☞ For the assignment of all fuses, see chapter F, section 5.

- For switching off, turn the key pin (72) to the left and pull it out.

☞ Do not lose the key pin as in this case the paver finisher can no longer be moved!

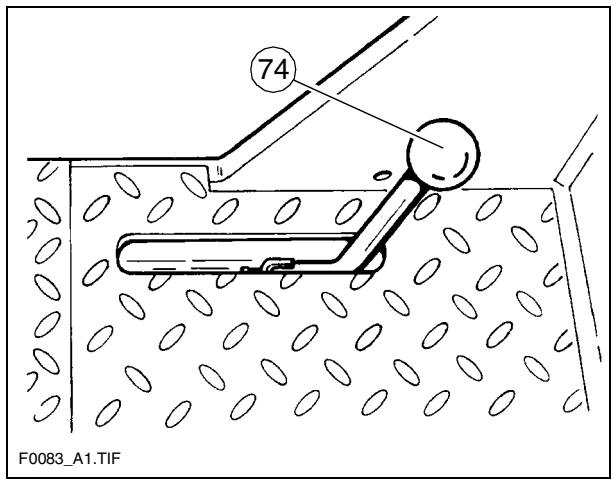
Transport safeguards for the hopper (73)



Before parking or transporting the paver finisher, the hopper halves must be swung upwards and the transport safeguards for the hopper must be inserted.

Do not enter the hopper while the engine is running! Danger of being caught by the conveyor!
Without transport safeguards inserted, the hopper halves will slowly open; danger during transportation!

Mechanical screed transport safeguard (to the left and the right beneath the driver's seat) (74)



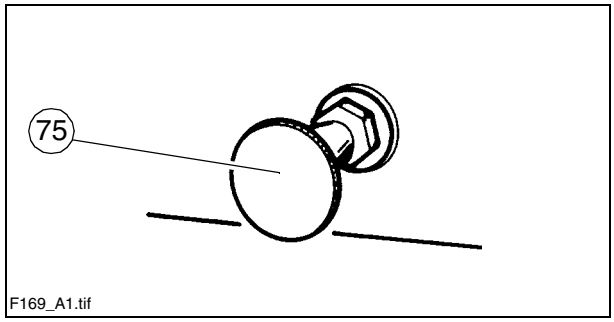
Used to protect the lifted screed from inadvertent lowering. The screed transport safeguard must be inserted before transportation and when work is finished.

Transportation with an unsecured screed bears the danger of accidents!

- Lift the screed.
- Actuate the levers.
- Check that the latches (to the left and to the right) engage in the crossbeams.

ATTENTION!
Insert screed lock only at crown adjustment „zero"! Screed lock only for transportation!
Do not enter or work under screed only secured with screed lock for transportation!
Danger of accident!

Seat lock (behind the driver's seat) (75)



F169_A1.tif

Telescoping seats (○) can be extended beyond the basic width of the paver finisher. They must be locked.

STOP The seats must not protrude from the vehicle during transportation. Push the seats back to the basic width of the paver finisher!

- Pull out the locking button and move the seat; let the locking button engage again.

STOP The driver's seat can move when the locking button is not engaged properly. Danger of accidents during transportation!

Separator fluid spraying system (80) (○)

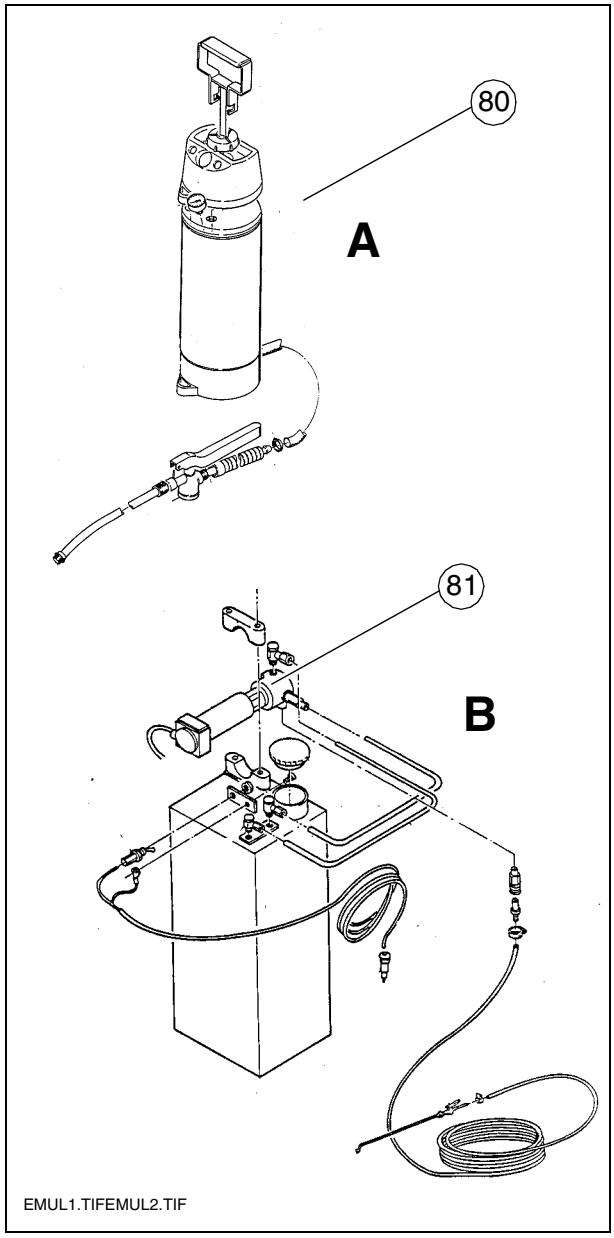
Used to spray the parts coming into contact with asphalt with a separator emulsion.

A Spray bottle with pressure pump

B Sprayer with electric pump (81)

⚠ Only switch on the spraying system when the diesel engine is running; otherwise, the battery will be discharged. Switch off after use.

STOP Don't spray into open flame or on hot surface! Danger of explosion!

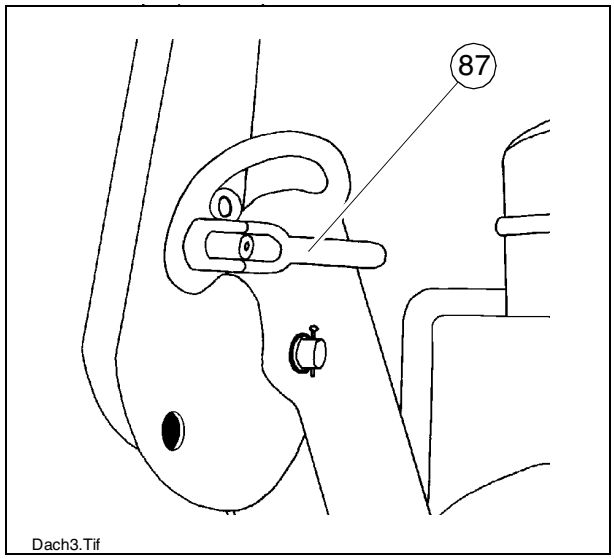


EMUL1.TIFEMUL2.TIF

Locking of the collapsible roof (LH and RH on the roofs console) (87):

To lower the roof (for example during transport on a low bed trailer):

- Loose the twistlock (87)
- Draw the roof frame with the bow-type handle to the front
- Arrest the twistlock in the second locking hole.

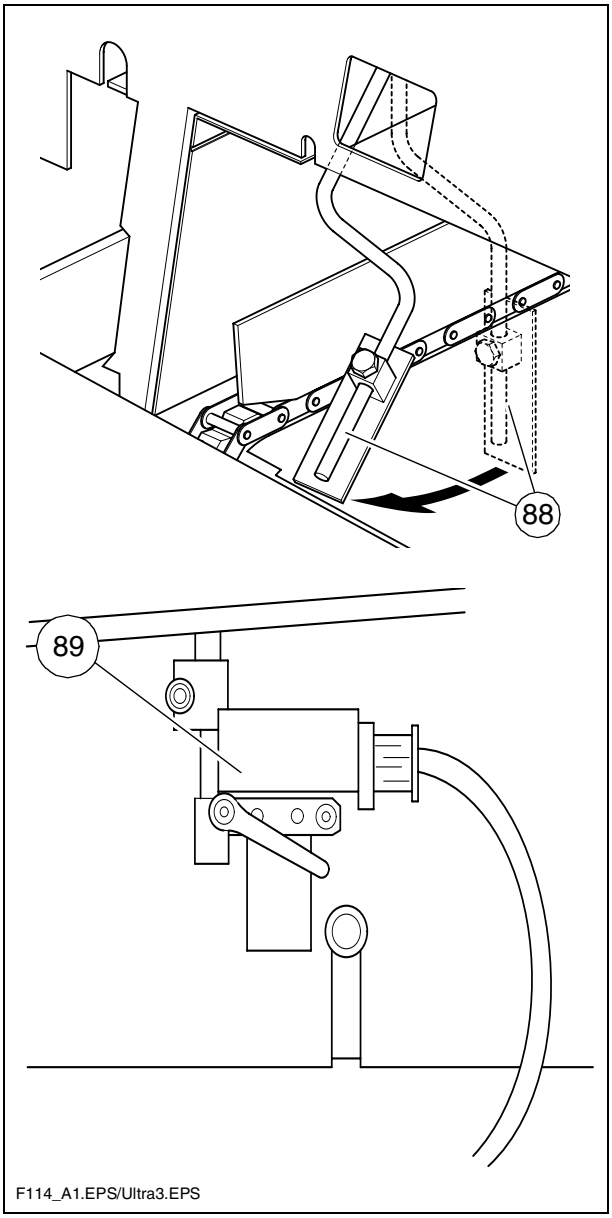


Dach3.Tif

Conveyor limit switches (88) (left and right):

The mechanical conveyor limit switches (88) or the ultrasonic conveyor limit switches (89) control the material flow at the respective conveyor half. The conveyors should stop when the material has roughly reached the area below the auger tube.

☞ This requires that the auger height has been adjusted correctly (see chapter E).



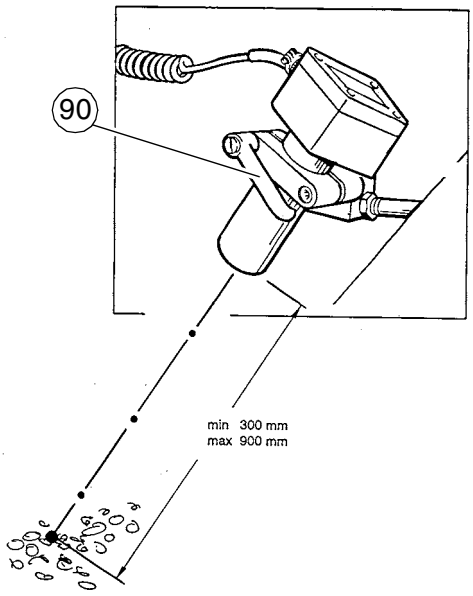
F114_A1.EPS/Ultra3.EPS

Ultrasonic auger limit switches (90) (left and right)

☞ The limit switches control the material flow at the respective auger half.

The ultrasonic sensor is mounted by means of an appropriate leverage to the side plate. Loose clamping lever for adjustment and modify angle / height of the sensor.
The cables must be connected to the remote control units located at the sides of the screed.

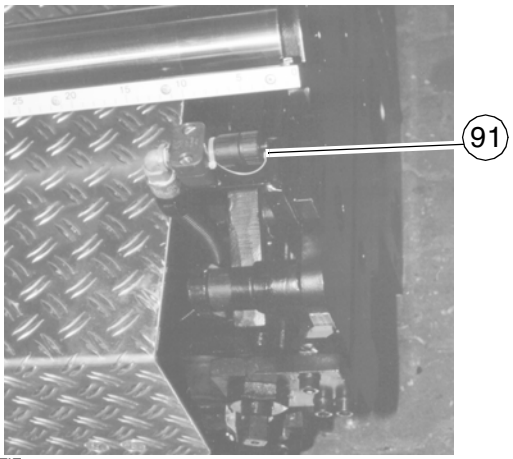
☞ We recommend to adjust the limit switch positions while the material is distributed.



21031.TIF

Sockets for the remote control (left and right) (91)

Connect the cable of each large remote control unit to socket.



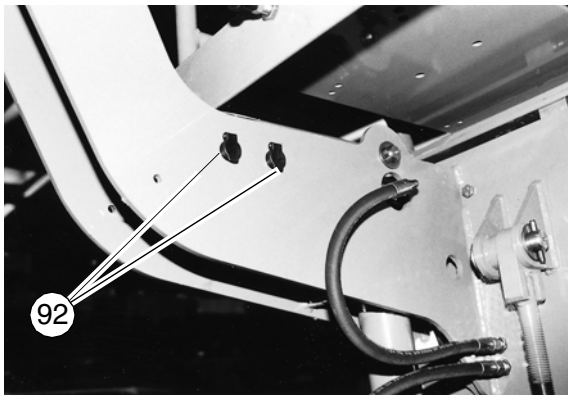
F0171.TIF

Sockets for working lights (left and right) (92)

Connect the working lights (24 V) here.

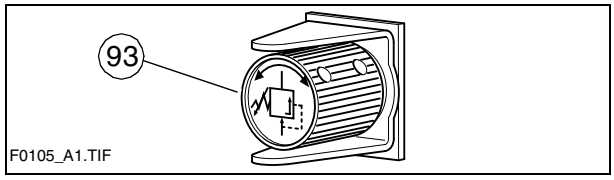
- Power is present when the main switch is switched on.

☞ As an option, one socket can be used to provide power for an electrically heated seat.



SCHEIN.TIF

Pressure control valve for screed charging/relieving (93) (○)



Used to adjust the pressure for additional charging/relieving of the screed.

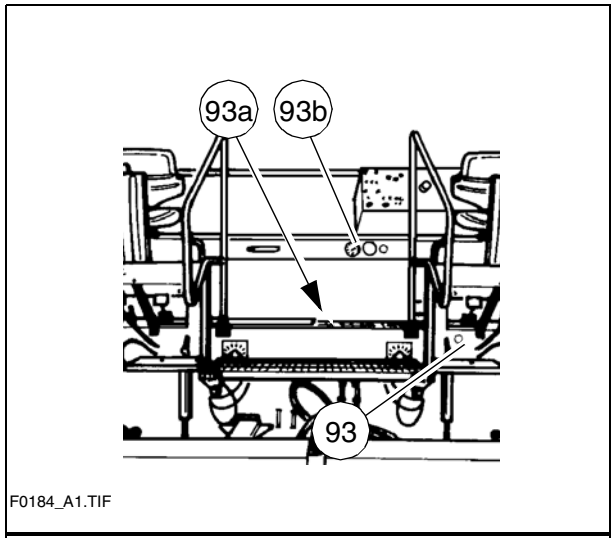
- See ”screed charging/relieving device” (44).
- Pressure display: see manometer (93b).

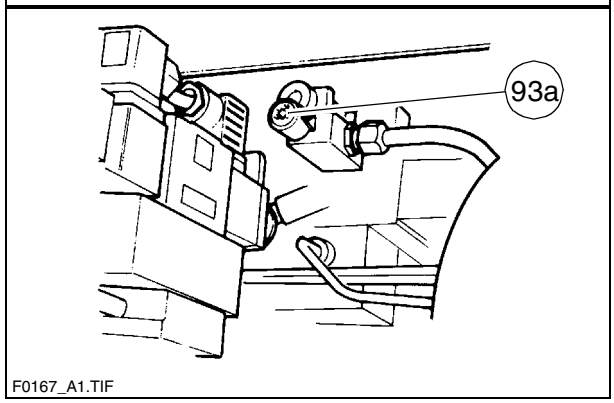
Pressure control valve for screed stop with pretensioning (93a) (○)

Thisvalveislocatedbeneaththeright-hand bottom flap of the operator´s platform.

It is used to adjust the pressure for ”screed stop with pretensioning”.

- Activation: see “screed charging/relieving device” (44).
- Pressure display: see “manometer” (93b).

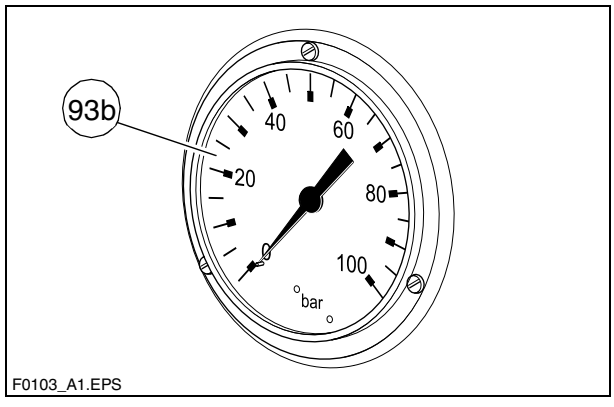




Manometer for screed charging/relieving and screed stop with pretensioning (93b)

Displays the pressure for

- Screed stop with pretensioningscreed stop with pretensioning when the drive lever (22) is set to the neutral position (pressure to be adjusted using valve (93a));



☞ Screed charging/relieving device when the drive lever (22) is in the third position (pressure to be adjusted using valve (93)).

3 Operation

3.1 Preparing for operation

Required devices and aids

To avoid delays on site, check before starting work whether or not the following devices and aids are present:

- Wheel loader for transporting heavy extendable parts
- Diesel fuel
- Engine oil and hydraulic oil, lubricants
- Separating agents (emulsion) and manual injector
- Two filled propane gas bottles
- Shovel and broom
- Scraper (spatula) for cleaning the auger and the hopper infeed area
- Parts that may become necessary for extending the auger
- Parts that may become necessary for extending the screed
- Percentage spirit level and levelling rail, 4 m long
- Levelling wire
- Protective clothing, signal vest, gloves, ear protection

Before starting work
(in the morning or when starting paving)

- Heed the safety instructions.
- Check the personal protective equipment.
- Take an inspection walk around the paver finisher and check for leaks and damages.
- Install parts removed for transportation or for the night.
- Open the bottle valves, the shut-off valves and the main shut-off valve of the gas heater for the screed.
- Perform the check according to the ”Checklist for the machine operator” given below.

Checklist for the machine operator

Check!	How?
Emergency stop button - on the operating panel - on both remote control units ○	Push in the button. The diesel engine and all running drives must stop immediately.
Steering	The paver finisher must immediately follow every steering wheel movement in a precise manner. Check straight running.
Horn - on the operating panel - on both remote control units ○	Briefly press the horn button. The horn must sound.
Lights	Switch on with the ignition key, walk around the paver finisher to check and switch off again.
Hazard warning lights of the screed (with vario screeds)	With the ignition switched on, press the switches for extending/retracting the screed parts. The rear lights must flash.
Gas heater system: - Bottle holders - Bottle valves - Pressure reducer - Hose break safety devices - Shut-off valves - Main shut-off valve - Connections - Indicator lamps of the switch box	Check: - Secure seat - Cleanliness and tightness - Working pressure 1.5 bar - Function - Function - Function - Tightness - All lamps must light up when the system is switched on

Check!	How?
Auger covers	For larger working widths, the walkway plates must be extended and the auger tunnels must be covered.
Screed covers and walkways	For larger working widths, the walkway plates must be extended. Hinged walkway plates must be swung down. Check that the side shields, the side plates and the covers are securely seated.
Screed transport safeguard	When the screed is lifted, it must be possible to push the locking rods sideways into the recesses in the cross-beams using the lever beneath the seat.
Hopper transport safeguard	When the hopper is closed, it must be possible to fold the catches over the lock studs on the two halves of the hopper.
Protective roof	Both locking bolts must be in the provided bore hole.
Miscellaneous: - Engine hood - Lateral flaps	Check that the hoods and flaps are securely seated.
Accessories: - Wedges - Warning triangle (○) - First-aid kit (○)	The accessories must be in the provided holders.

3.2 Starting the paver finisher

Before starting the paver finisher

Before starting the diesel engine and beginning operation, the following steps must be performed:

- Daily maintenance of the paver finisher (see chapter F)

⚠ Check the operating hour counter to determine whether or not additional maintenance work (such as monthly or yearly maintenance) must be performed.

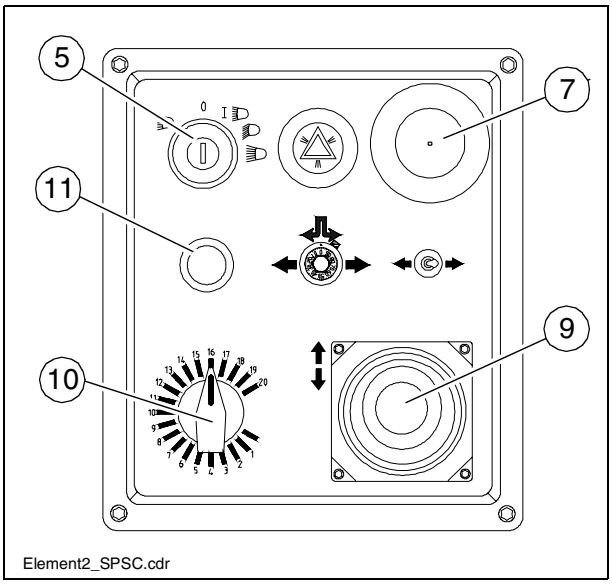
- Check the safety devices and protective devices.

„Normal" starting

Set the drive lever (9) to the center position and the speed adjuster (10) to minimum.

- Insert the ignition key (5) in position „0". The lights should be switched off during starting to reduce the current drain on the battery.

☞ Starting is not possible when the drive lever is not in the center position or when an emergency stop button (7) or (54○) on the remote control unit has been pressed („STOP" in the LC-display).



- Press the starter button (11) to start the engine. Do not let the starter run permanently for more than 20 seconds; allow for a break of 1 minute after every attempt!

External starting (starting aid)

☞ The engine can be started with the help of an external power source if the batteries are empty and the starter no longer turns.

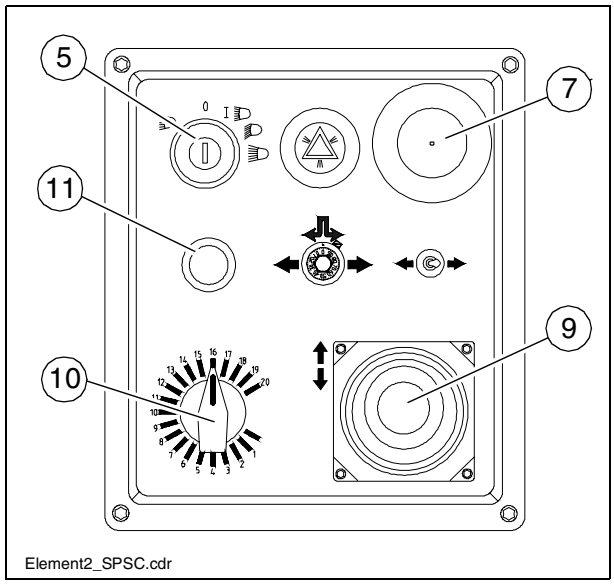
Suitable power sources are:

- Other vehicles with a 24 V system
- Additional 24 V battery
- Start device that is suitable for external starting (24 V/90 A).

⚠ Standard chargers or quick chargers cannot be used for external starting.

To externally start the engine:

- Switch on the ignition, set the drive lever (9) to the center position.
- Use appropriate cables to connect the external power source.



⚠ Observe the polarity! Always connect the negative cable last and disconnect it first!

☞ Starting is not possible when the drive lever is not in the center position or when an emergency stop button (7) or (54○) on the remote control unit has been pressed („STOP“ in the LC-display).

Press the starter button (11) to start the engine. Do not let the starter run permanently for more than 20 seconds; allow for a break of 1 minute after every attempt!

When the engine is running:

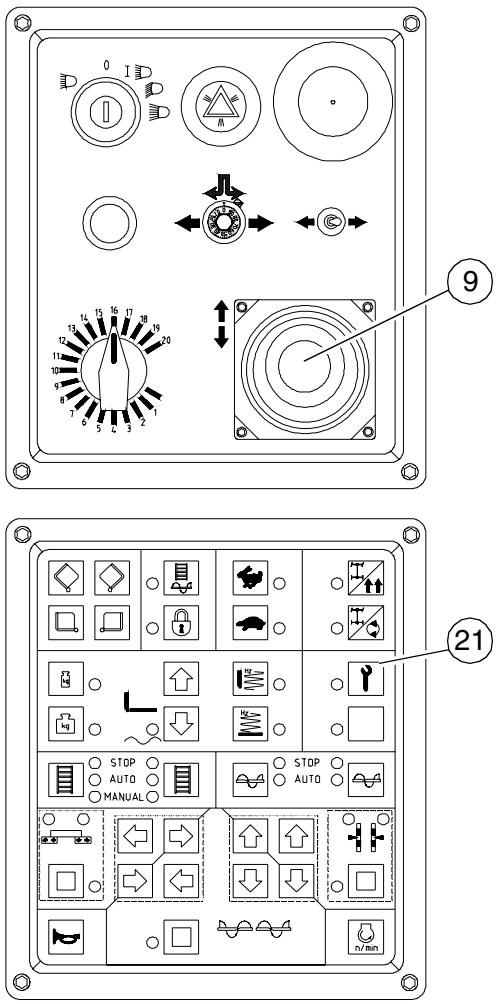
- Disconnect the power source.

After starting

To increase the engine speed:

- Set the drive lever (9) to position 1 (slightly off the center position).
- Increase the engine speed by pressing button (21) on the operating panel. The engine speed will be increased to the preselected value.

⚠ Let the paver finisher warm up for ca. 5 minutes if the engine is cold.



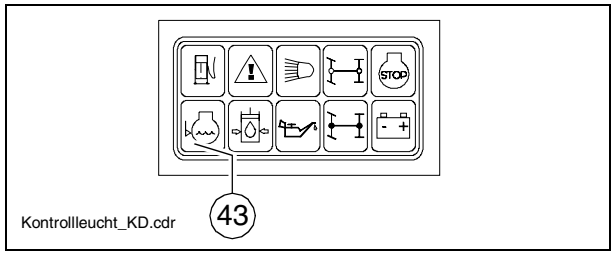
Element1_SPSC.cdr,Element2_SPSC.cdr

Indicator lamps

The following indicator lamps must be observed under all circumstances:

For further possible faults, refer to the operating instructions for the engine.

Coolant check (43)

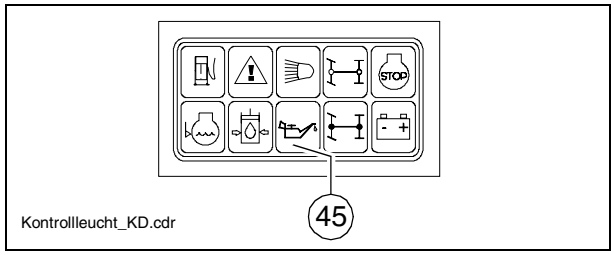


Must go out after starting.

⚠ If the light does not go out or lights up during operation:
switch off engine and check coolant level.

For other possible errors, see engine's operating instructions.

Oil pressure indicator lamp for the diesel engine (45)

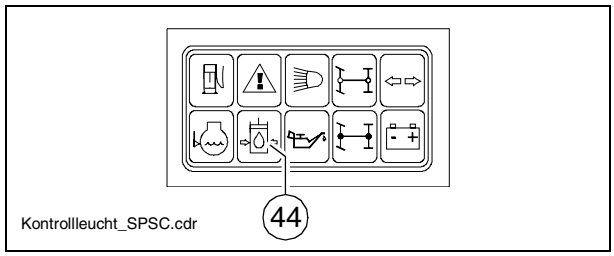


- Must go out right after the engine is started.

⚠ Pull out the ignition key immediately to switch off the engine if the lamp does not go out or lights up during operation. Check the engine oil level.

For further possible faults, refer to the operating instructions for the engine.

Oil pressure indicator lamp for the traction drive (44)



- Must go out after starting.

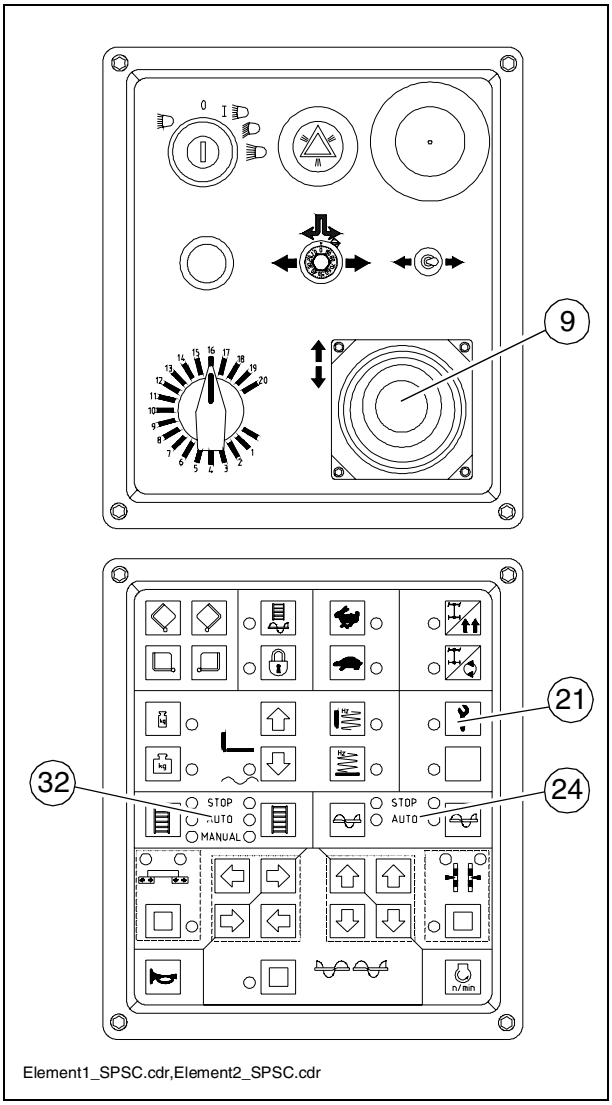
⚠ If the lamp does not go out: Do not switch on the traction drive! Otherwise, the entire hydraulic system could be damaged.

When the hydraulic oil is cold:

- Set the conveyor switch (32) to „manual" and the auger switch (24) to „auto".
- The remote control has to be connected and the same function have to be set to „auto"
- Set the drive lever (9) to position 1
- Press button (21) to increase the engine speed, the conveyor and the auger start operating.
- Let the hydraulics warm up until the indicator lamp goes out.

☞ The lamp goes out when the pressure drops below 2.8 bar = 40 psi.

For further possible malfunctions, refer to section 4.

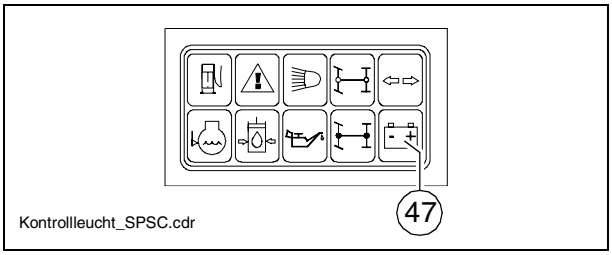


Element1_SPSC.cdr,Element2_SPSC.cdr

Battery charge indicator (47)

Must go out after starting when the engine revs up.

⚠ Briefly rev up the engine when the lamp does not go out or light up during operation. Switch off the engine and determine the cause for the malfunction if the lamp does not go out.



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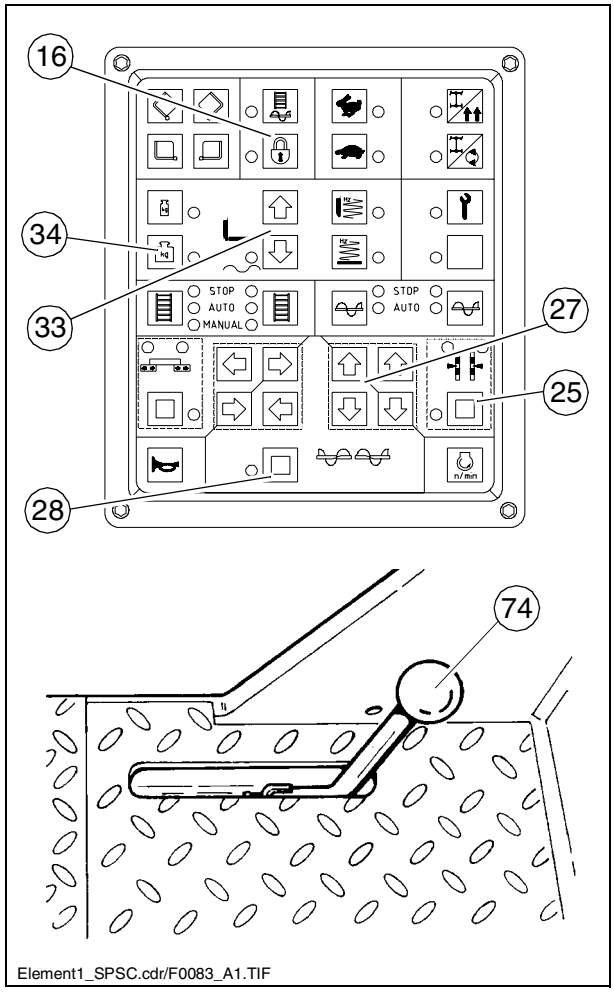
For further possible malfunctions, refer to the section „Malfunctions".

3.3 Operation during transportation

Lifting and securing the screed

- Button (16) has to be switched off
- Switch off the buttons (34) and lift the screed full by using button (33).
- Extend the levelling cylinders full by using the buttons (25) and (27).
  The remote control has to be connected and the same function has to be set to „manual“.
- Lift the auger crossbeam by using the buttons (28) and (27)
- Insert the screed transport safeguards (74)



Driving and stopping the finisher

- Set the Fast/Slow switch (17) to „Hare”.
- Set the preselector traction drive (10) to mark 10
- For driving, carefully tilt the drive lever (22) forward or backward according to the drive direction desired.

In case of an emergency, press the emergency stop button (7)!

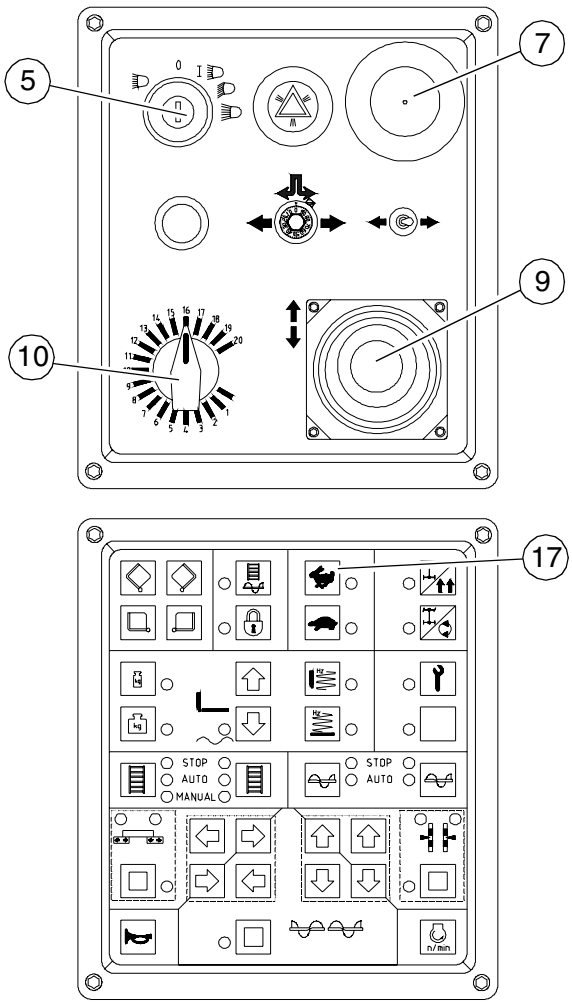
- To stop the finisher, set the drive lever (9) to the center position.

Switching off and securing the finisher

- Turn the ignition key (5) to the „0” position and pull it out to switch off the engine.

The battery can get exhausted if the finisher is standing still for longer periods of time with the ignition switched on.

- Lower the screed.

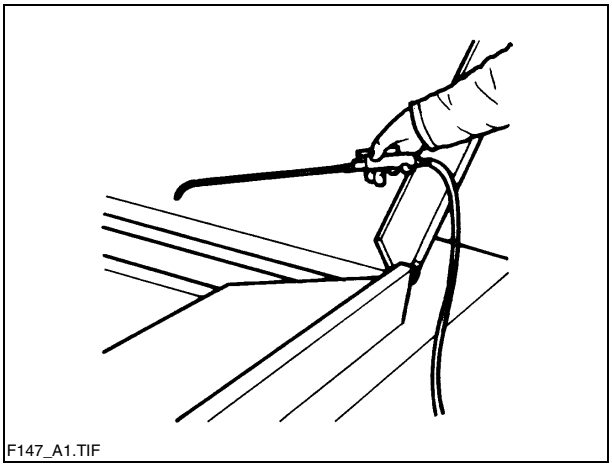


Element1_SPSC.cdr,Element2_SPSC.cdr

3.4 Preparations for paving

Separating agent

Spray the parts coming into contact with asphalt (hopper, screed, auger, push roller) with a separator emulsion.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⚠ Do not use diesel fuel as it dissolves the bitumen (prohibited in Germany!).

Screed heater

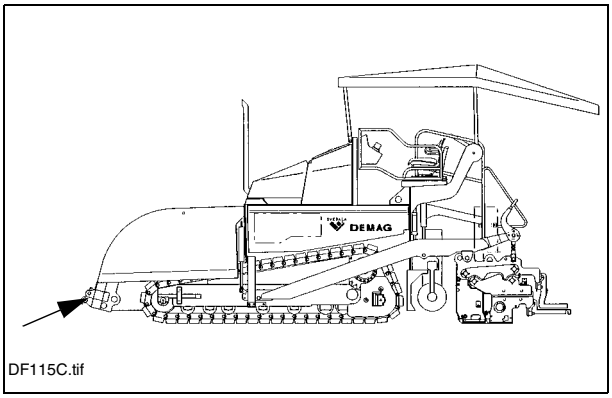
Switch on the screed heater ca. 15–30 minutes (depending on the ambient temperature) before paving begins. Warming up prevents the material from sticking to the screed plates.

☞ See the section 3.3 on how to operate the heater.

Direction marks

To ensure straight paving, a direction mark must be present or established (road edge, chalk lines or similar).

- Slide the operating panel to the desired side and secure it.
- Pull the direction indicator out of the bumper(arrow)andadjustitaccordingly.



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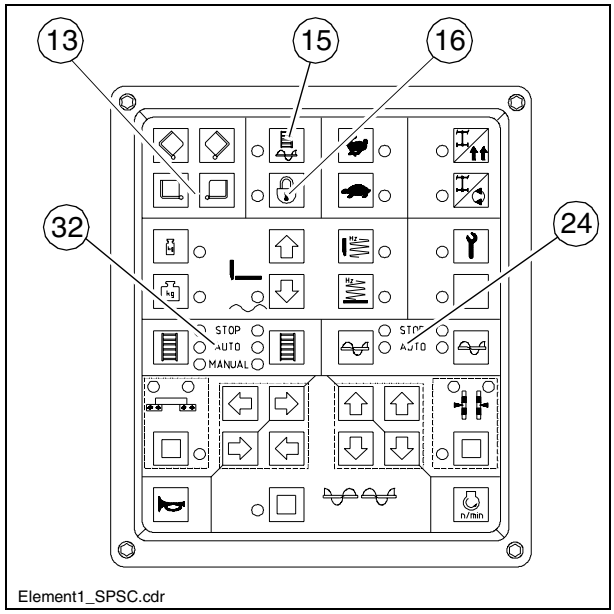
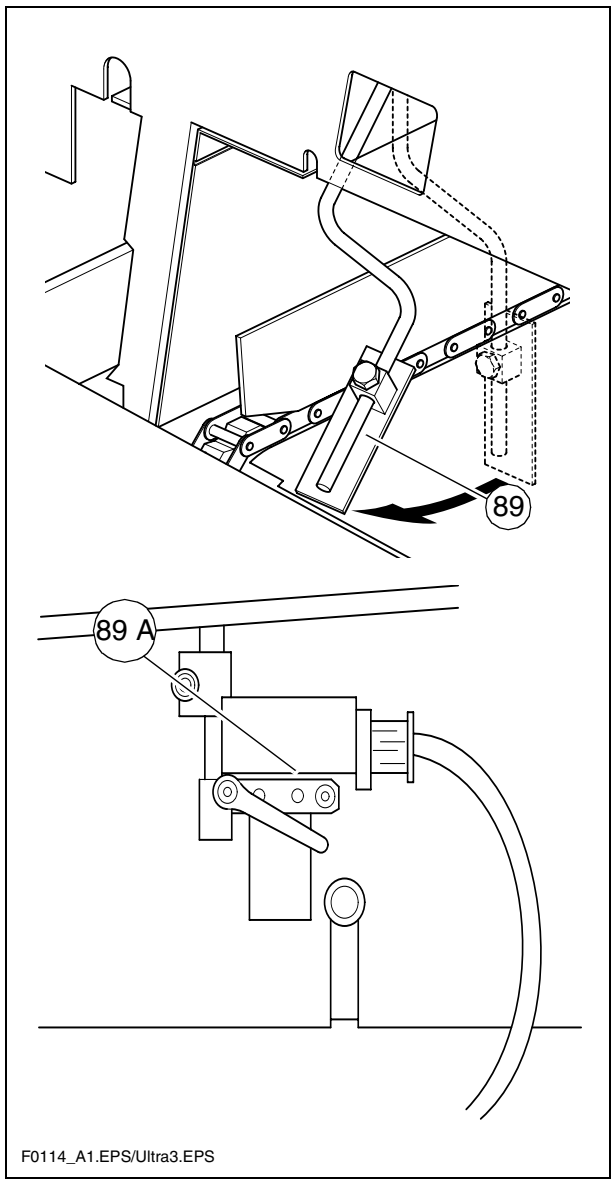
Loading/distributing material

- Button (16) has to be switched off.
- Use switch (13) to open the hopper. Instruct the truck driver to dump the material.
- Set the switches for the auger (24) and the conveyor (32) to „auto”.
- Press button (15) to fill the machine for paving.



Element1_SPSC.cdr

- Switch the conveyors on.
  The limit switches for the conveyors (89) or (89a○) must switch off when the material has reached the area beneath the auger crossbeam.
- Check that the material is conveyed properly.
  Manually switch on or off the conveyor if the material is not conveyed properly until a sufficient amount of material lies in front of the screed.



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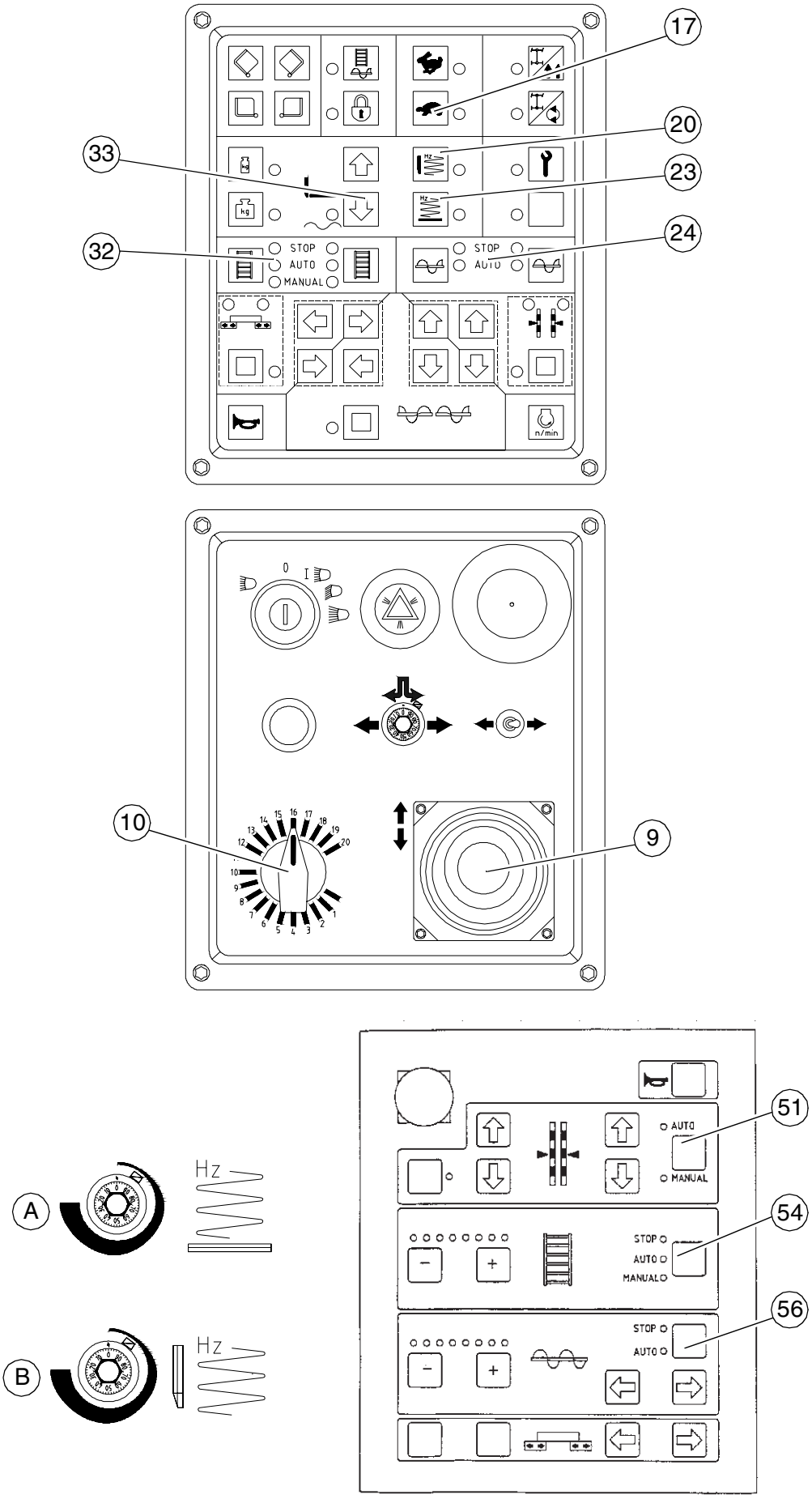
3.5 Starting for paving



Element1_SPSC.cdr/Element2_SPSC.cdr/Tamprev.cdr/Vibrev.cdr/SPSRemote.Tif

Set the switches, levers and controls listed below to the specified positions when the screed has reached its operating temperature and a sufficient amount of material lies in front of the screed:

Item	Switch	Position
17	Traction drive fast/slow	Tortoise-operating speed
10	Preselector traction drive	Mark 6-7
33	Preparation for screed floating position	LED ON
23	Vibration	LED ON
20○	Tamper	LED ON
24/56	Auger left/right	Auto
32/54	Conveyor left/right	Auto
51	Levelling	Auto
A	Speed regulator, vibration	ca. mark 40-60
B	Speed regulator, tamper	ca. mark 40-60

- Push the drive lever (9) all the way to the front and start driving.Screed floating position is activated now.
- Observe the distribution of the material and adjust the limit switches if necessary.
- Set the compacting elements (tamper and/or vibration) according to the required compaction ratio.
- Let the paving master check the layer thickness after 5–6 meters and correct if necessary.

Carry out the check in the area of the drive chains or wheels as the screed tends to level an uneven ground. The reference points for the layer thickness are the drive chains or wheels.

The basic setting of the screed must be corrected when the actual layer thickness deviates significantly from the values indicated by the scales (see the operating instructions for the screed).

☞ The basic setting is for asphalt material.

3.6 Checks during paving

The following points must be constantly observed during paving:

Paver function

- Screed heater
- Tamper and vibration
- Engine oil and hydraulic oil temperature
- The screed parts must be retracted and extended in time when obstacles are in the way
- Uniform material transport and distribution or supply to the screed; may require corrections to settings of the material switches for conveyor and auger.

☞ See the section ”Malfunctions” when paver functions fail.

Quality of the layer

- Layer thickness
- Slope
- Evenness in the driving direction and at right angles to it (check with 4 m levelling rod)
- Surface structure/texture behind the screed.

☞ See section 4 ”Malfunctions, Problems during Paving” if the paving quality is poor.

3.7 Paving with screed stop and screed charging/relieving

General

The screed hydraulics can be influenced in two ways to attain optimum paving results:

- Screed stop with and without pretensioning
  with the paver finisher halted,
- Screed charging or relieving
  with the paver finisher driving.

☞ Relieving reduces the screed weight and increases the traction force.
Charging increases the screed weight, reduces the traction force, but increases the compaction ratio. (To be used with light-weight screeds in exceptional cases.)

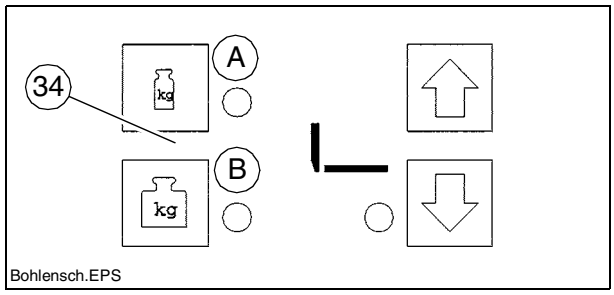
Screed charging/relieving

This function charges or relieves the screed regardless of its own dead weight.

Switch (34) has the following positions:

A: Relieving (screed 'lighter')
B: Charging (screed 'heavier')

Switch positions „Screed charging/relieving" are only effective when the paver finisher moves. When the paver finisher stops, „screed stop" is automatically selected.

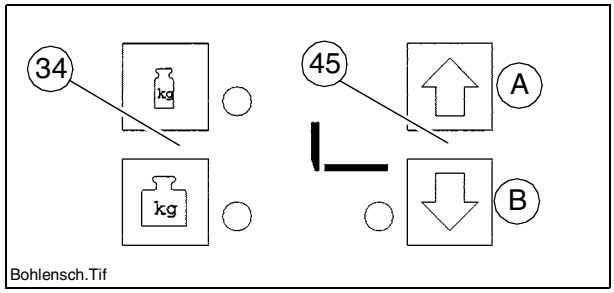


Screed stop

The „screed stop" function is used to block the screed hydraulics to prevent the screed from lowering when the paver finisher stops during paving.

The switches (34) have to be switched off

- Automatic screed stop when the drive lever is in the center position
- To lift the screed press button (45A)
- To lower the screed press 1.5 sec. button (45B)



⚠ The screed block function is not sufficient as a safeguard during transport or maintenance work!
In such a case, the screed transport safeguard must be inserted.

Screed stop with pretensioning

As for charging/relieving, a pressure of 2-50 bar can be individually applied to the screed lifting cylinders. This pressure can neutralize the weight of the screed to prevent the screed from sinking into the freshly laid material, thus supporting the screed stop function, especially in those situation where the screed relieving function is used.

The pressure to be applied depends on the load-bearing capacity of the material. If necessary, the pressure must be readjusted or changed as required during the first stops until the lower edge of the screed no longer leaves any marks when the finisher moves on again.

A pressure greater than 10-15 bar neutralizes the screed weight, thus preventing the screed from sinking into the material.

☞ When combining the "screed stop" and "screed relieving" functions, make sure that the pressure difference between the two functions does not exceed 10-15 bar.

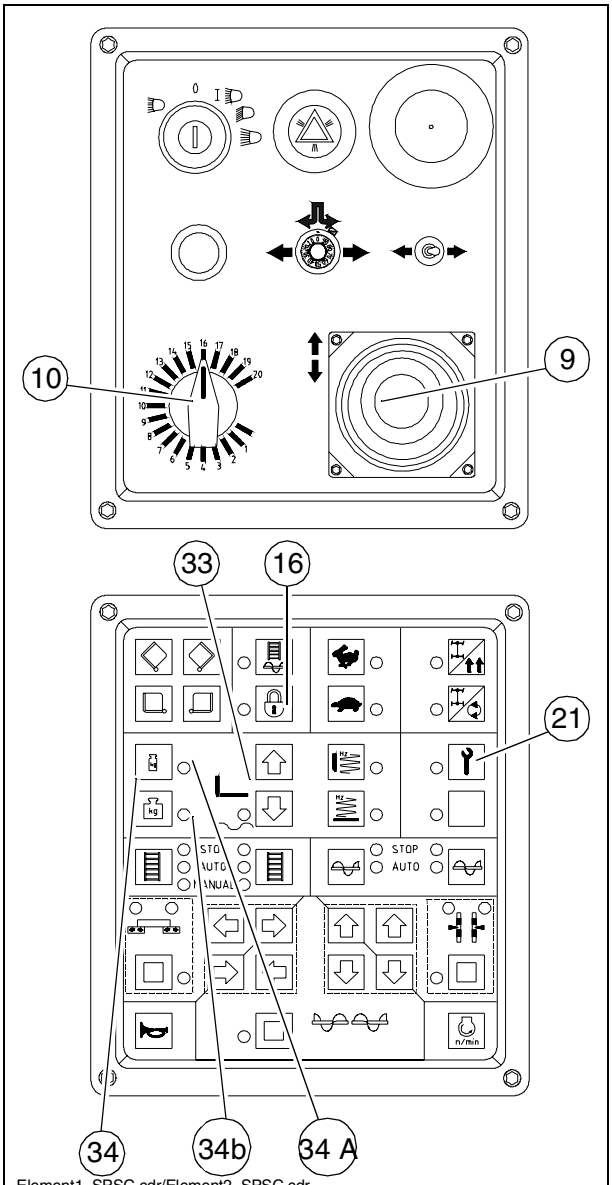
Especially in those cases where the "screed relieving" function is only briefly used as a start-up aid, there is a danger of uncontrolled floating when starting up again.

☞ Do not use the "screed stop with pretensioning" function while paving with the "screed stop" function.

Adjusting the pressure (○)

Pressure adjustments can only be made while the diesel engine is running. Therefore:

- Start the diesel engine and set the traction controller (10) to zero (precaution against inadvertent advancing).
- Set switch (33) to the floating position.



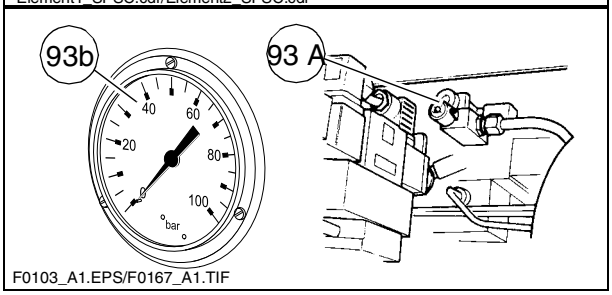
Element1_SPSC.cdr/Element2_SPSC.cdr

For screed stop with pretensioning

- Set the drive lever (9) to the center position.
- Set switch (16) to position (LED OFF) and switch (21) to position (LED OFF).
- Use control valve (93a) (below the bottom plate of the operator´s platform) to adjust the pressure and read it from the manometer (93b).
  (Basic setting: 20 bar)

For screed charging/relieving

- Set the drive lever (9) to the center position.
- Set switch (16) to position (LED OFF) and switch (21) to position (LED ON).
- Set switch (34) to position (LED ON) (relieving 34a) or (charging 34b).
- Use control valve (93) (on the rear panel of the paver finisher) to adjust the pressure and read it from the manometer (93b).



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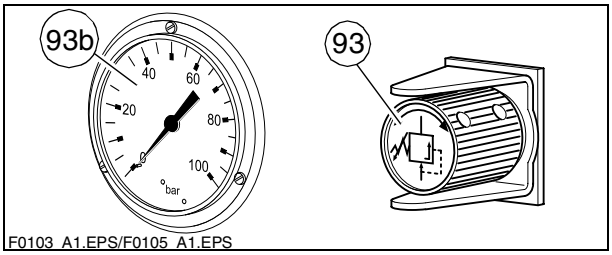
☞ When screed charging/relieving is necessary and automatic levelling is used (grade control and/or slope control), the compacting performance changes (layer thickness).



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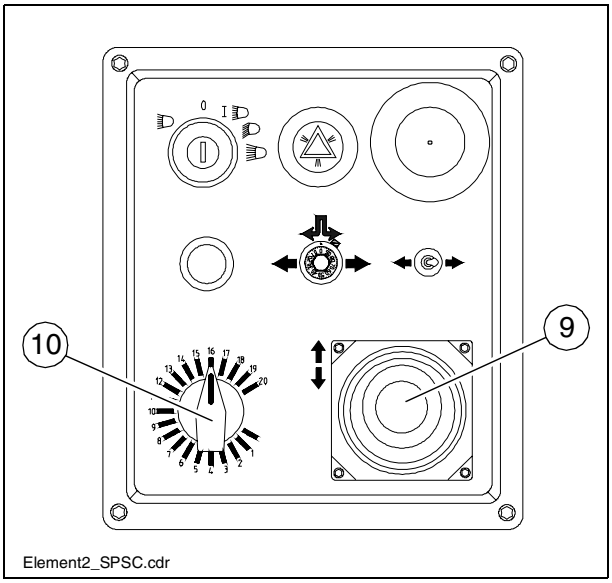
☞ The pressure can also be set or corrected during paving.
(Max. 50 bar)

3.8 Interrupting/terminating operation

During breaks

- Determine the approximate duration.
- When cooling down of the material below the minimum paving temperature must be expected, run the paver finisher empty and create an edge like the end of a layer.
- Set the drive lever (9) to the center position.



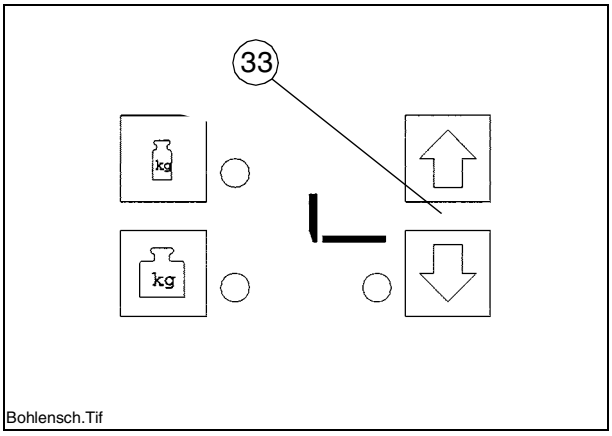
During extended interruptions

- Drive lever (9) into centre position, RPM speed adjustment (10) to minimum position.
- Switch off ignition.
- Switch off screed heater (system).
- When screed is operated with the optional gas heating system, close the valves of the bottles.

☞ The screed must be heated up to the correct paving temperature before paving may be restarted.

When work is finished

- Run the paver finisher empty and stop it.
- Lift the screed by using button (33).
- Retract the screed parts to the basic screed width and lift the auger. Where applicable, completely extend the levelling cylinders.



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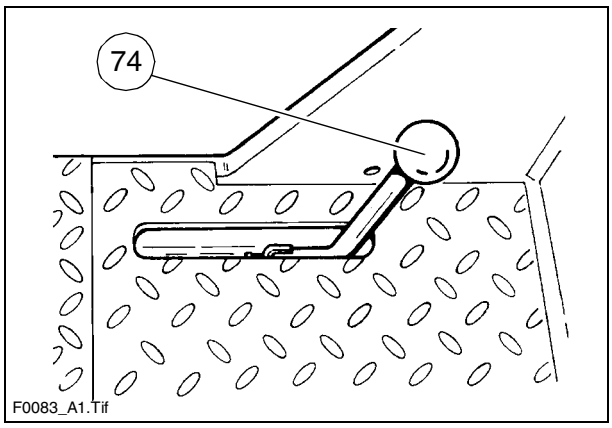
- Insert the mechanic screed transport safeguard (74) on both screed lifting cylinders.
- While operating the tampers at a low speed, let any material residues drop out.



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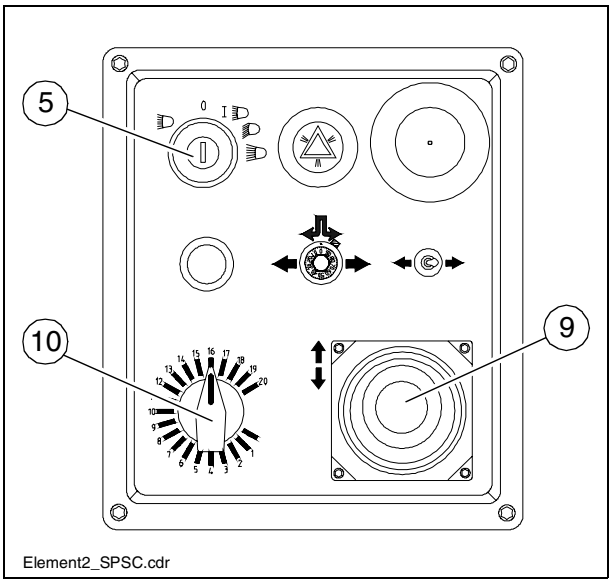
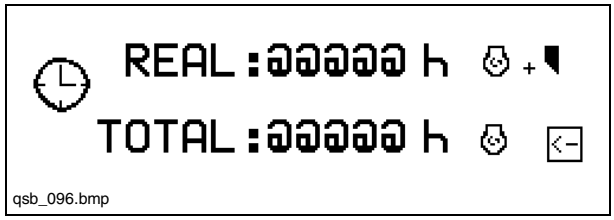
- Set the drive lever (9) to the center position and the speed adjuster (10) to minimum
- Switch off the ignition (5).
- Switch off screed heater (system).
- When screed is operated with the optional gas heating system, close the main shut-off valves and the valves of the bottles.
- Remove the levelling units and stow them away in the boxes, close all flaps
- Remove all parts that extend beyond the paver finisher contour or secure them if the paver finisher is to be transported over public roads on a low-bed trailer.



Element2_SPSC.cdr

- Read and check the operating hour meter to determine whether maintenance work must be performed (see chapter F).
- Cover and lock the operating panel.
- Remove material residues from the screed and the paver finisher and spray all parts with separator fluid.



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4 Malfunctions

4.1 Error codes for engine

Explanation:
FMI: Failure Mode Identifier
SPN: Suspect Parameter number

Error group	Error no. (in SERDIA)	Error location / description of error	Flash code short 0.4 s	Flash code long 0.8 s	Flash code short 0.4 s	FMI	SPN	Cause	Comments	Remedial action
Zero defects display	-	No errors	**2**	-	-	31	524287	No **active** errors present		
Recording of engine speed / roadspeed	01	Speed sensor 1	**2**	**1**	**1**	8	190	Sensor failed. Distance to gear too great. Additional error impulse. Cable connection interrupted.	Controller in emergency mode (if sensor 2 is available). Emergency shutdown (if sensor 2 is not available or has failed).	Check distance. Check cable connection. Check sensor and replace if necessary.
	02	Speed sensor 2	**2**	**1**	**2**	8	190		Controller in emergency mode (with sensor 1). Emergency shutdown (if sensor 1 is not available or has failed).	
Sensors	06	Nominal value sensor 2 (manual throttle)	**2**	**2**	**2**	2	201	Error on corresponding sensor input (e.g. short circuit or cable break).	Refer to Section 4.15 Influence of error response. If sensor fails, the associated monitoring function is deactivated.	Check sensor cable. Check sensor and replace if necessary. Check error limits for sensor.
	07	Charged air pressure	**2**	**2**	**3**	2	102			
	08	Oil pressure	**2**	**2**	**4**	2	100			
	09	Coolant temperature	**2**	**2**	**5**	2	110			
	10	Charged air temperature	**2**	**2**	**6**	2	105			

Error group	Error no. (in SERDIA)	Error location / description of error	Flash code short 0.4 s	Flash code long 0.8 s	Flash code short 0.4 s	FMI	SPN	Cause	Comments	Remedial action
Actuator	50	Feedback	2	5	1	12	SID 24	Actuator not connected. Error in actuator feedback.	Emergency shutdown. Controller cannot be operated.	Check actuator and replace if necessary. Check cable. Check error limits for "feedback".
	52	Reference feedback				13	SID 24			Check actuator; if necessary: replace. Check cable. Check error limits for "reference feedback".
	53	Control stroke variance				7	SID 23	Fuel injection pump / actuator jams or is not connected. Variance between nominal/actual control stroke > 10% of total control stroke.	Error message (disappears once variance is < 10%).	Check actuator / actuator linkage / fuel injection pump, replace if necessary. Check actuator cable.
Hardware inputs/outputs	67	Error Hand Setp1	2	6	2	11	91			
	68	Error CAN Setp1				2	898			
Communication	70	CAN bus controller	2	7	1	12	SID 231	CAN controller for CAN bus issues error messages. Error cannot be permanently rectified despite re-initialisation.	Application-dependent	Check CAN connection, output resistance (refer to section 12.4), check control unit.
	71	CAN interface SAE J 1939				9	SID 231	Overflow in reception buffer or a message cannot be sent by (data) bus.		
	74	Cable break, short circuit or serious bus error				14	SD 231			Check CAN connection, cable connection. Check sensor and replace if necessary.

Error group	Error no. (in SERDIA)	Error location / description of error	Flash code			FMI	SPN	Cause	Comments	Remedial action
			short 0.4 s	**long** 0.8 s	**short** 0.4 s					
Memory	76	Parameter programming (write EEPROM)	**2**	**8**	**1**	12	SID 253	Error during parameter programming in controller's hard disk.	Emergency shutdown. Engine cannot be started.	Switch ignition off and back on again. Check again. If error occurs, inform DEUTZ service department.
	77	Cyclic program test				12	SID 240	Ongoing monitoring of program memory issues error messages (commonly referred to as "Flash test").		
	78	Cyclic RAM test				2	SID 254	Ongoing monitoring of RAM (volatile memory) issues error messages.		Note down values of parameters (3895 and 3896). Switch ignition off and back on again. Check again. If error occurs, inform DEUTZ service department.
Control unit hardware	80	Power supply (actuator)	**2**	**9**	**1**	2	SID 254	Power supply for controller not within permissible range.	Error message (disappears once power returns to normal range).	Switch ignition off and back on again. Check again. If error occurs, inform DEUTZ service department.
	83	Reference voltage 1	**2**	**8**	**2**	2	SID 254	Reference voltage for controller not within permissible range.	Error message (disappears once voltage returns to normal range). Backup value 5 V.	Check voltage supply. Switch ignition off and back on again. Check again. If error occurs, inform DEUTZ service department.
	84	Reference voltage 2				2	SID 254			
	85	Reference voltage 4				2	SID 254			
	86	Internal temperature	**2**	**9**	**2**	12	171	Internal temperature for control unit not in permissible range.	Error message (disappears once temperature returns to normal range).	Switch ignition off and back on again. Check again. If error occurs, inform DEUTZ service department.

Error group	Error no. (in SERDIA)	Error location / description of error	Flash code			FMI	SPN	Cause	Comments	Remedial action
			short 0.4 s	**long** 0.8 s	**short** 0.4 s					
Program logic	90	Parameter error (interrogate EEPROM and/ orcheck total incorrect).	**2**	**10**	**1**	2	SID 253	No data found or check total for data incorrect. (Note: error only occurs during parameter setting / saving and/or reset).	Engine cannot be started.	Check data for correct setting. Save parameters. Switch ignition off and back on again. Check again. If error occurs, inform DEUTZ service department.
	93	Stack overflow				2	SID 240	Internal computing error (commonly referred to as "Stack overflow" error).	Emergency shutdown. Engine cannot be started.	Note down values of parameters (3897 and 3898). Switch ignition off and back on again. Check again. If error occurs, inform DEUTZ service department.
	94	Internal error				2	SID 254			

Error group	Error no. (in SERDIA)	Error location / description of error	Flash code			FMI	SPN	Cause	Comments	Remedial action
			short 0.4 s	**long** 0.8 s	**short** 0.4 s					
Functional error, warning	30	Oil pressure warning	**2**	**3**	**1**	1	100	Oil pressure below speed-dependent warning characteristics curve.	Error message (disappears once oil pressure returns to above the recovery limit). After a delay period has passed - filling limit.	Check engine (oil level, oil pump). Check oil pressure sensor and cable. Check oil pressure warning characteristics curve.
	31	Coolant temperature warning	**2**	**3**	**2**	0	110	Coolant temperature has exceeded warning threshold.	Error message (disappears once coolant temperature has again fallen below recovery threshold). After a delay period has passed - filling limit.	Check coolant. Check coolant temperature sensor and cable.
	32	Charged air temperature warning	**2**	**3**	**3**	0	105	Charged air temperature has exceeded warning threshold.	Error message (disappears once charged air temperature has again fallen below recovery threshold). After a delay period has passed - filling limit.	Check charged air. Check charged air temperature sensor and cable.
	34	Coolant level warning	**2**	**3**	**5**	1	111	"Coolant level too low" shift input is active.	Error message.	Check coolant level. Check coolant level sensor and cable.
	35	Speed warning (in coasting mode)	**2**	**3**	**6**	14	SID 190	Speed was/is above (overspeed) speed limit. "Coasting mode" function is active.	Refer to section 4.3.3 Overspeed protection.	Check parameter (21). Check speed setting.
								Check PID setting. Check linkage. Check actuator, replace if necessary. Check cable to actuator. Check speed sensor (impulse for incorrect speed). Check number of teeth. Check vehicles for possible coasting mode.		
								Fuel temperature has exceeded warning threshold.	Error message (disappears once fuel temperature has again fallen to below recovery threshold).	Check fuel. Check fuel sensor and cable.

4.2 Problems during paving

Problem	Cause
Wavy surface ("short waves")	- change in the material temperature, admixing - wrong material composition - incorrect operation of the roller - incorrectly prepared foundation - long standstill times between loads - grade control reference line is not suitable - grade control jumps to the reference line - grade control toggles between up and down (inertia setting is too high) - bottom plates of the screed are loose - bottomplatesofthescreedarewarpedornotuniformlyworn - screed does not work in the floating position - too much play in the mechanical screed link/suspension - finisher speed is too high - augers are overloaded - changing material pressure against the screed
Wavy surface ("long waves")	- change in the material temperature - admixing - roller has stopped on the hot material - roller has turned or roller speed has been changed too fast - incorrect operation of the roller - incorrectly prepared foundation - truck brake is applied too tight - long standstill times between loads - grade control reference line is not suitable - incorrect installation of the grade control - limit switch is not correctly set - screed is empty - screed has not been switched to the floating position - too much play in the mechanical screed link - auger is set too deep - auger is overloaded - changing material pressure against the screed
Cracks in the layer (over the entire width)	- material temperature is too low - change in the material temperature - moisture on the foundation - admixing - wrong material composition - wrong layer height for the maximum grain size - cold screed - bottom plates of the screed are worn or warped - finisher speed is too high
Cracks in the layer (center strip)	- temperature of the material - cold screed - bottom plates are worn or warped - wrong crowning

Problem	Cause
Cracks in the layer (outer strip)	- temperature of the material - screed extendable parts are incorrectly installed - limit switch is not correctly set - cold screed - bottom plates are worn or warped - finisher speed is too high
Layer composition is not uniform	- temperature of the material - change in the material temperature - moisture on the foundation - admixing - wrong material composition - incorrectly prepared foundation - wrong layer height for the maximum grain size - long standstill times between loads - vibration is too slow - screed extendable parts are incorrectly installed - cold screed - bottom plates are worn or warped - screed does not work in the floating position - finisher speed is too high - auger is overloaded - changing material pressure against the screed
Marks in the surface	- truck hits too much against the finisher while aligning to the finisher - too much play in the mechanical screed link/suspension - truck brake is applied - vibration is too high while standing on a spot
Screed does not react to corrective measures as expected	- temperature of the material - change in the material temperature - wrong layer height for maximum grain size - incorrect installation of the grade control - vibration is too slow - screed does not work in the floating position - too much play in the mechanical screed link - finisher speed is too high

4.3 Malfunctions on the paver finisher or screed

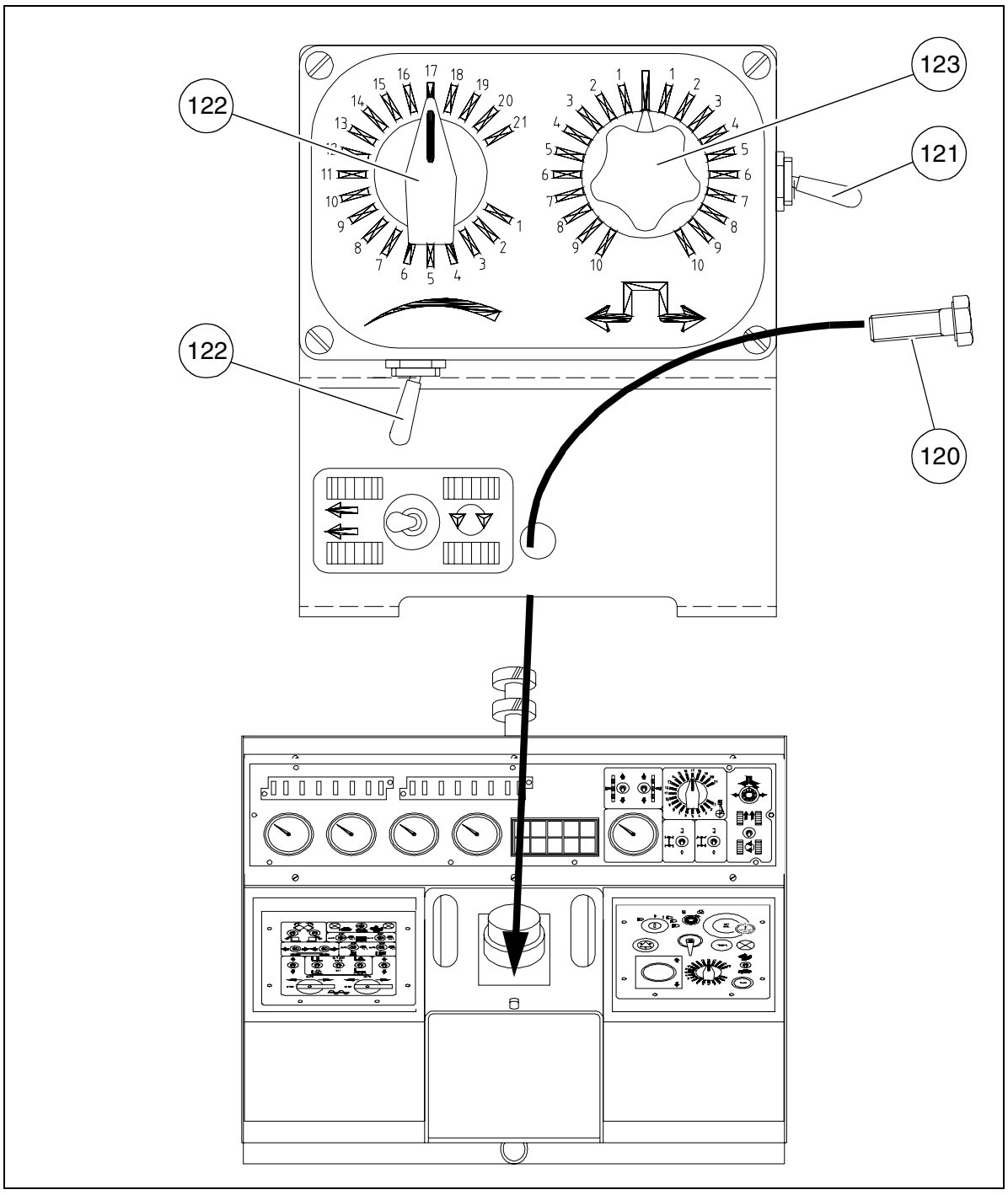
Malfunction	Cause	Remedy
At the diesel engine	Diverse	See operating instructions for the engine
Diesel engine does not start	Batteries empty	See ”External starting” (start assistance)
	Diverse	see ”Towing”
Tamper or vibration does not operate	Tamper is obstructed by cold bitumen	Properly heat the screed
	Hydraulic oil level in the tank is too low	Top up the oil
	Pressure limiting valve is defective	Replace the valve; if necessary, repair and adjust the valve
	Leak in the suction line of the pump	Seal or replace the connections
		Tighten or replace the hose clamps
	Oil filter is soiled	Clean the filter; if necessary, replace the filter
Conveyor or augers run too slowly	Hydraulic oil level in the tank is too low.	Top up the oil
	Power supply is interrupted	Check fuses and cables; replace if necessary
	Switch is defective	Replace the switch
	One of the pressure limiting valves is defective	Repair or exchange the valves
	Pump shaft broken	Replace the pump
	Limit switch does not switch or regulate correctly	Check the switch; replace and adjust the switch if necessary
	Pump is defective	Check the high pressure filter for dirt particles; replace if necessary
	Oil filter is soiled	Replace the filter
Hopper cannot be swung open	Engine speed is too low	Increase the speed
	Hydraulic oil level is too low	Top up the oil
	Leak in the suction line	Tighten the connections
	Flow rate regulator defective	Replace
	Leaking seals of the hydraulic cylinder	Replace
	Control valve is defective	Replace
	Power supply interrupted	Check fuse and cables; replace if necessary

Malfunction	Cause	Remedy
Hoppers lowers inadvertently	Control valve is defective	Replace
	Leaking seals of the hydraulic cylinder	Replace
Screed cannot be lifted	Oil pressure too low	Increase the oil pressure
	Leaking seal	Replace
	Screed relieving or charging is switched on	Switch must be in the center position
	Power supply is interrupted	Check fuse and cables; replace if necessary
Crossbeams cannot be lifted or lowered	Switch on the remote control is set to ”auto”	Set the switch to ”manual”
	Power supply is interrupted	Check fuse and cables; replace if necessary
	Switch on the operating panel defective	Replace
	Excess pressure valve defective	Replace
	Flow rate regulator defective	Replace
	Seals defective	Replace
Crossbeams lower inadvertently	Control valves defective	Replace
	Pilot-controlled non-return valves defective	Replace
	Seals defective	Replace

Malfunction	Cause	Remedy
Tractiondoesnotwork	Traction drive fuse defective	Replace (Fuse holder on the operating panel)
	Power supply is interrupted	Check potentiometer, cables, connectors; replace if necessary
	Traction drive monitoring (type-specific) defective	Replace
	Electro-hydraulic servo unit of the pump defective	Replace the servo unit
	Insufficient supply pressure	Check and adjust if necessary
		Check the suction filter; replace the supply pump and the filter if necessary
	Drive shaft of hydraulic pumps or engines broken	Replace pump or engine
Irregular engine speed, engine stop function does not work	Fuel level too low	Check the fuel level; refill fuel if necessary
	Fuse ”engine speed control” defective	Replace (fuse strip on the operating panel)
	Defective power supply cables (cables broken or short-circuited)	Check potentiometer, cables, connectors; replace if necessary

4.4 Emergency device/steering, drive system

In case of a male function in the electronic drive system it is possible to override the system by an emergency device. This emergency device is included in the tool set of every crawler machine.
To install the emergency device all plugs of the drive pump servo valves have to be replaced by the plugs of the emergency device. (short screw driver is necessary.)
The cable shoe is connected to power supply of 24 Volts and the cable eye is connected to ground.
The plug of the hydraulic brake valve is replaced by the corresponding plug of the emergency device.
The current power supply is connected as above.
The steering unit has to be mounted onto the operator desk.
To connect the plugs follow to the wiring diagram on page 70.



Following functions are located in the steering unit:

Pos.	Designation
121	Switch for preselection of the zero position and forward reverse movement
122	Adjustment knob for speed control (Replace speed preselector 23)
123	Steering knob (Replace steering 6)
124	Switch to turn the paver on the spot (Replace switch 30)

Function

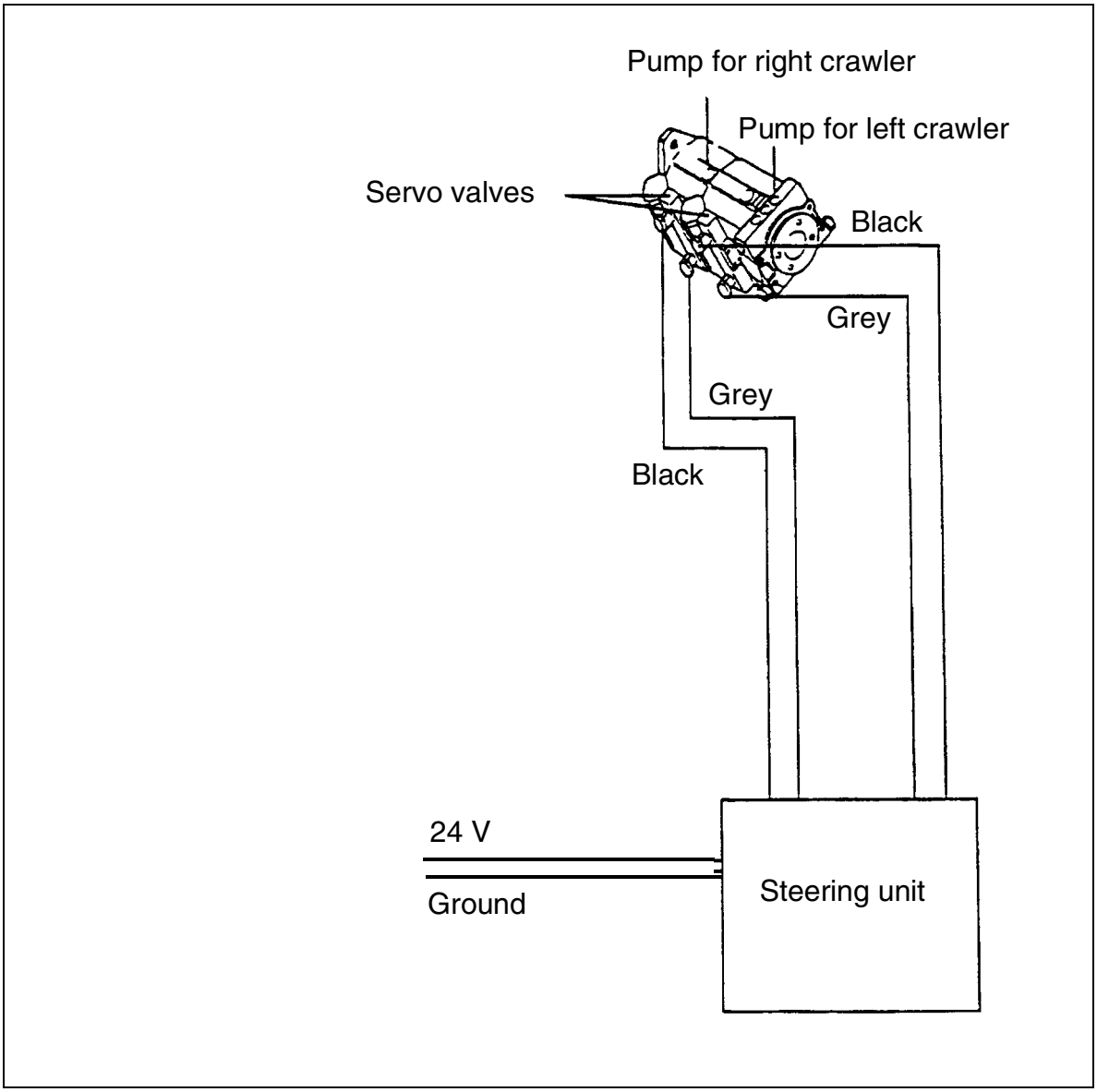
If the emergency device is connected all functions like engine speed, conveyor, auger, tamper and vibration have to be controlled by the forward reverse lever (22).

Starting up for laying

- Preselect the speed with turning knob (122)
- Push switch (121) in forward direction
- Engage forward reverse lever (22) like under normal conditions
- All other functions (123, 124) have to be in the position described in the instruction manual (Operation)

Transport

- Adjust turning knob (122) to a low speed
- Push switch (121) to the recommended direction and engage the forward reverse lever to forward direction.
- If the recommended direction is reverse push switch (22) in reverse, but still the forward reverse lever should be moved to forward direction
- Adjust the driving speed with turning knob (122)
- All other functions have to be in the position described in the instruction manual (Operation)
- The function for switch (124) (30) is as described in the instruction manual


Pump for right crawler
Pump for left crawler
Servo valves
Black
Grey
Grey
Black
24 V
Ground
Steering unit

E Setting-up and field replacement

1 Special safety information

Persons can be injured if the engine, final drive, flight bar conveyor, spreader, screed or lifting devices are started unintentionally.
Unless otherwise described, work must be carried out only with the engine stopped!

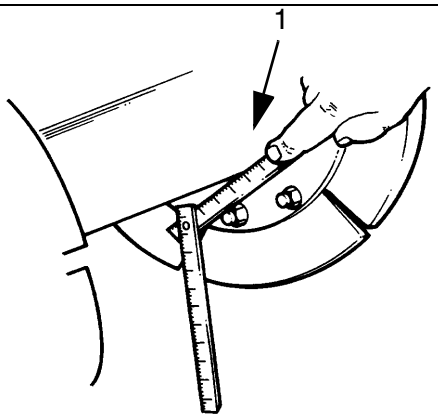
- Securing the finisher to prevent unintentional starting:
  Move the driving lever into the centre position and turn the preselector control to zero; if necessary, remove final drive lock in the operation panel; remove ignition key and battery switch.
- Mechanically secure raised machine components (e.g. screed or trough) against lowering.
- Change spare parts properly or have them changed.

When connecting or disconnecting the hydraulic hoses and working on the hydraulic system, hot hydraulic fluid can spray out under high pressure.
Switch off the engine and render the hydraulic system pressureless! Protect the eyes!

- Before re commissioning, refit all protective devices properly.
- When carrying out all work, the catwalk must extend over the entire screed width. The hinged catwalk (optional for Vario screeds) must only be raised under the following conditions:
- When laying in the vicinity of a wall or similar obstacle.
- For transport on a trailer.

2 Distribution spreader

2.1 Height adjustment



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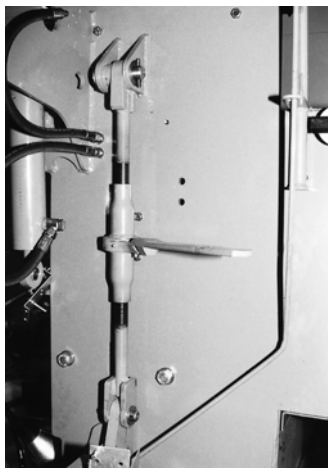
The height of the distribution spreader (1) – measured from its bottom edge – should be minimum 50 mm (2 inches) above the material laying height, depending on the material mix.

Example: Laying thickness 10 cm
Adjustment 15 cm from the ground

In the event of incorrect height adjustment, the following problems can occur when laying:

- Spreader too high:
  Unnecessary amount of material in front of the screed; material overflow. In the case of large operating widths, tendency towards separation and traction problems.
- Spreader too low:
  Insufficient amount of material compacted by the spreader. Resulting unevenness cannot be completely levelled (wavy).
- Increased wear on the screed segments.

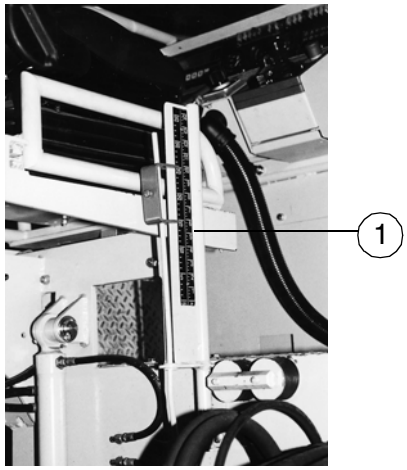
2.2 For mechanical adjustment with ratchet


Ratsche.TIF

- Adjust the ratchet driving pin counter clockwise or clockwise rotating. Driving to the left lowers the spreader, driving to the right lifts the spreader.

- Adjust the required height by alternate operation of the left and right side.

- The current height can be read off on the scale (1) in cm or inches (left column inches, right column cm).



Schnskal.TIF

2.3 For hydraulic adjustment (Optional)

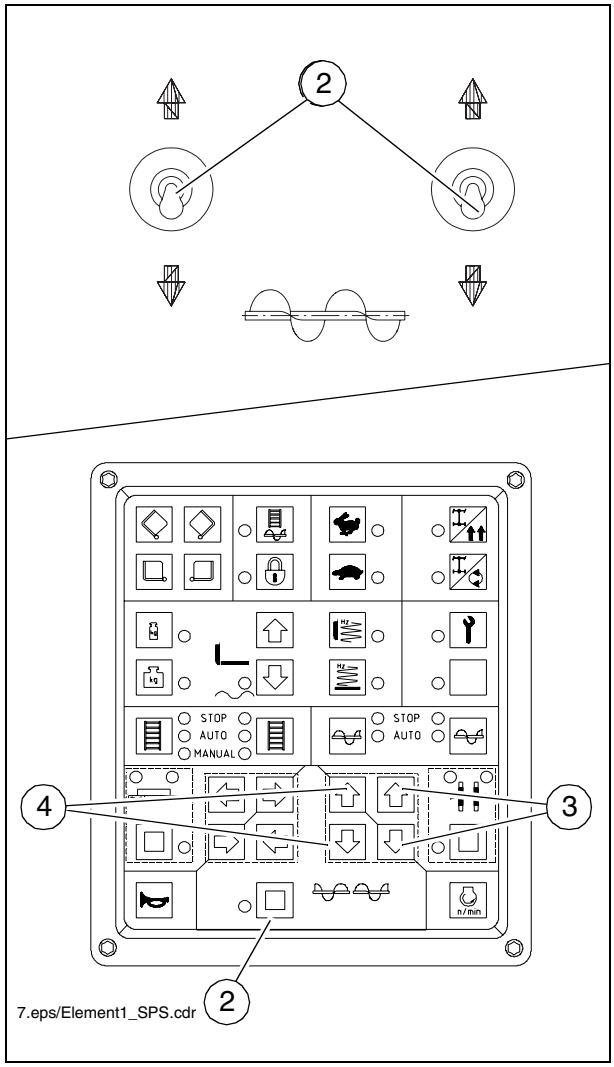
- Note the currently adjusted height of the screed beam - left and right - on the scale.
- Push or pull the switches (2) on the operating panel to retract or extend the hydraulic cylinders.

(Pavers eguiped with PLC system o)

- Activate the spreader adjustment with the push button (2).
- With the push buttons (3) and (4), retract or extend the right and left hydraulic cylinders.

⚠ Actuate the push buttons simultaneously, so that the spreader beam does not tilt.

- Check that the height on the left right corresponds.



2.4 Spreader enlargement

Depending on the particular type of screed, diverse operating widths can be achieved.

☞ The spreader and screed enlargement must correspond.
See also the chapter ”Setting-up and field replacement” in the screed operating instructions:

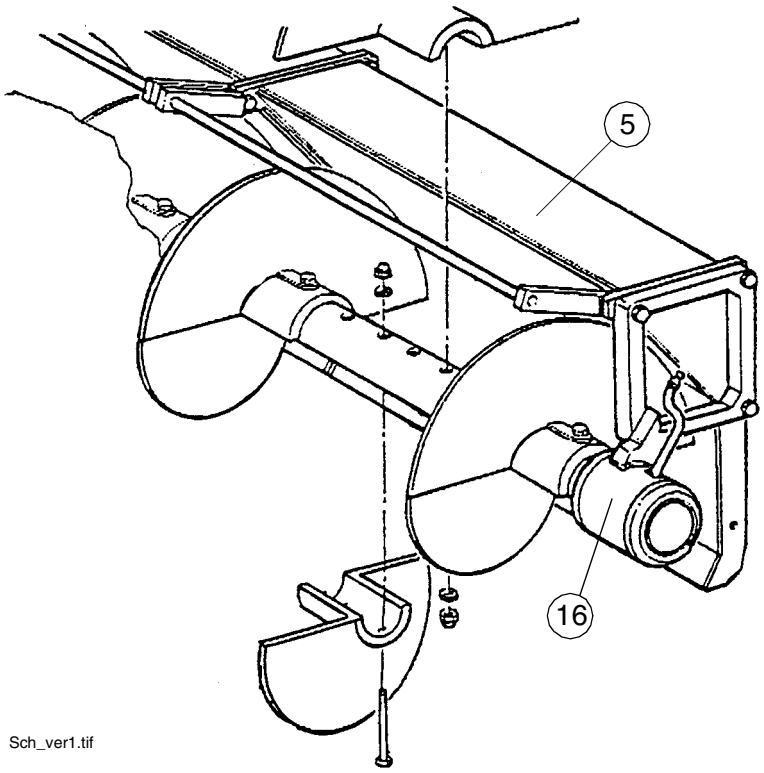
- Screed mounting plan
- Spreader mounting plan

In order to achieve the required operating width, the respective screed extensions, side plates, spreaders, tunnel plates or cut off shoes must be mounted.

For operating widths above 3.00 m, the distribution spreader should be provided with an extension on each side to improve material distribution and reduce wear.

STOP When carrying out all work on the spreader, the diesel engine must be switched off. Risk of injury!

2.5 Mounting extensions



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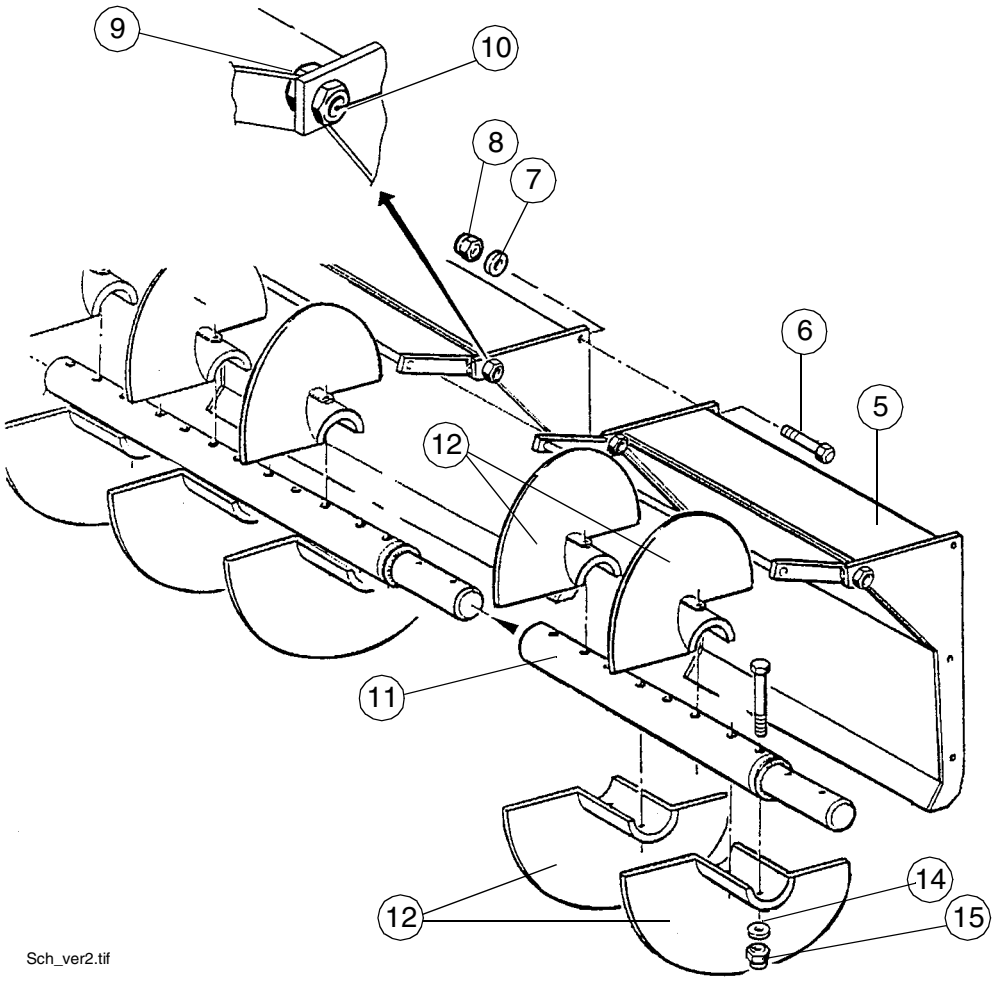


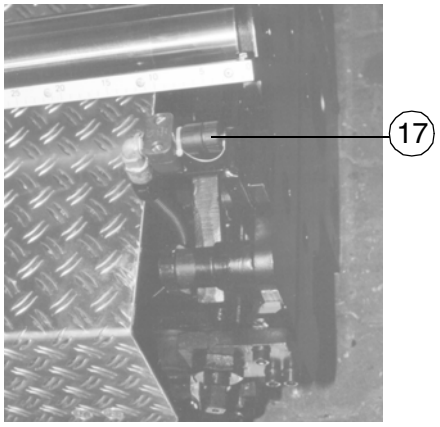
Sch_ver2.tif

- Fix material duct (5) with screws (6), washers (7) and nut (8) to the basic equipment.
- The material duct is adjustable to enable adaptation to the existing duct.
  For this purpose, loosen nuts (9) and turn the fairlead (10) for the screw (6).
- Mount spreader shaft extension (11) on the spreader shaft of the basic equipment.
- Fix spreader wing (12) with screw (13), washer (14) and nut (15) to the spreader extension and simultaneously tightly screw the spreader shafts together.

☞ If the operating conditions on the construction site permit spreader extension or make it necessary, the worm bearing (16) must also be fitted, once the spreader extension exceeds 600 mm.
For spreader enlargements with worm bearing at the basic equipment, the shortened spreader wing must be mounted on the bearing. Otherwise the spreader wing and bearing can be damaged when laying 30 grain.

3 Screed

All work for mounting, setting-up and screed enlargement is described in the screed operating instructions.



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4 Electrical connections

After mounting and adjustment of the mechanical assemblies, the following connections must be established:

4.1 Connect remotes

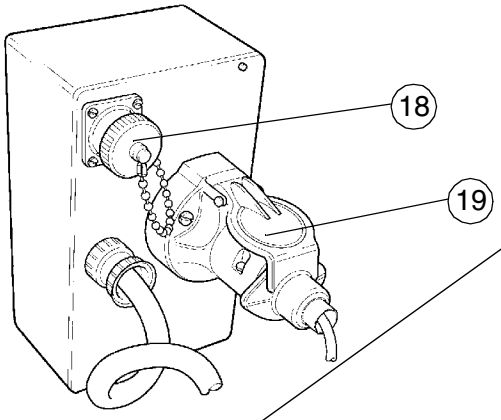
to socket (17) (at the screed).

4.2 Connect grade transmitter

to socket (18) (at remote).

4.3 Connect spreader limit switch

to socket (19) (at remote).



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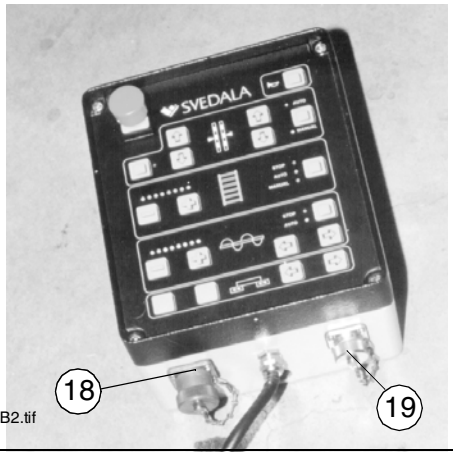

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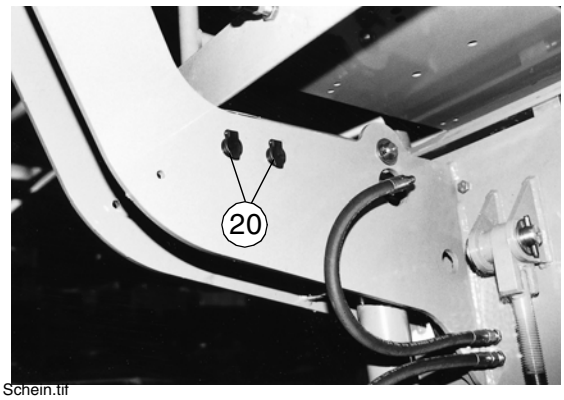
4.4 Connect floodlight

to sockets (20) (at finisher).



Schein.tif

F Maintenance

1 Safety information on maintenance

Before starting maintenance, secure the finisher and mounting components against unauthorized restarting:

- Move the driving lever into the centre position and turn the preselector control to zero.
- Remove final drive lock in the operation panel.
- Remove ignition key and battery switch.

Lifting and jacking: Mechanically secure raised machine components (e.g. screed or trough) against lowering.

Spare parts: Only use original parts and change them properly! When in doubt, consult the manufacturer!

Re commissioning: Before re commissioning, mount all protective devices properly.

Cleaning: Never carry out cleaning with the engine running.
Do not use flammable substances (petroleum of similar).
When using a steam jet cleaner, cover electrical parts and insulating material for protection.

Working in closed rooms: Exhaust fumes must be routed to the outside. Propane gas cylinders must not be stored in closed rooms.

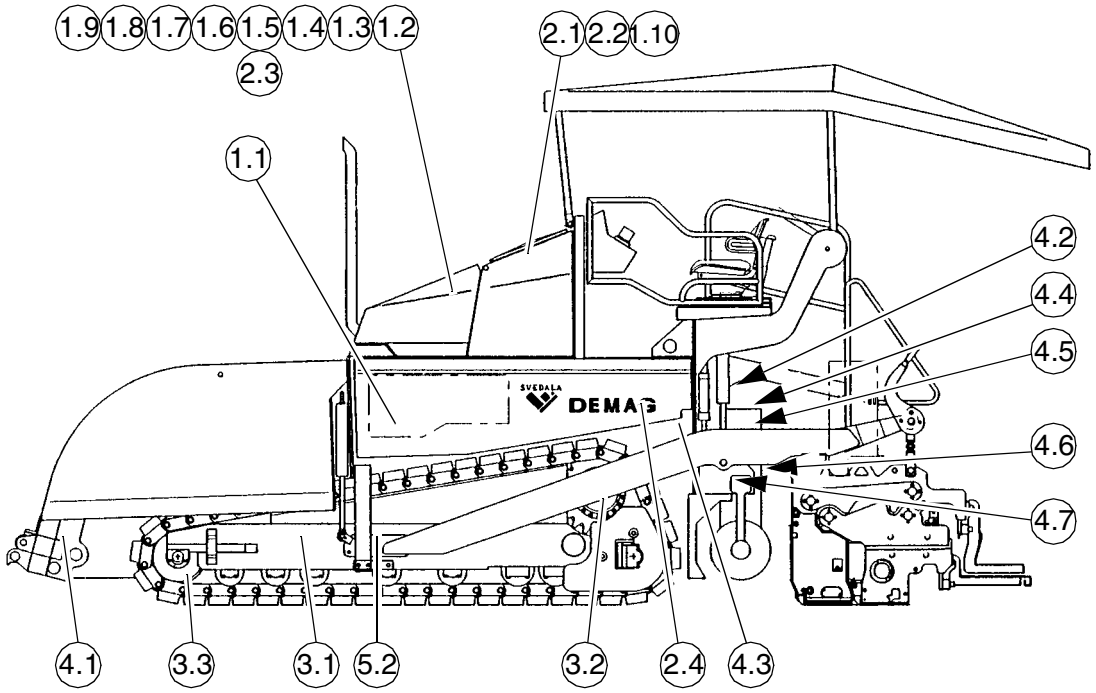
In addition to these Maintenance Instructions, the Maintenance Instructions of the engine manufacturer must always also be observed. All other maintenance work and intervals noted in these instructions are also binding.

2 Maintenance intervals

2.1 Overview of assembliesn

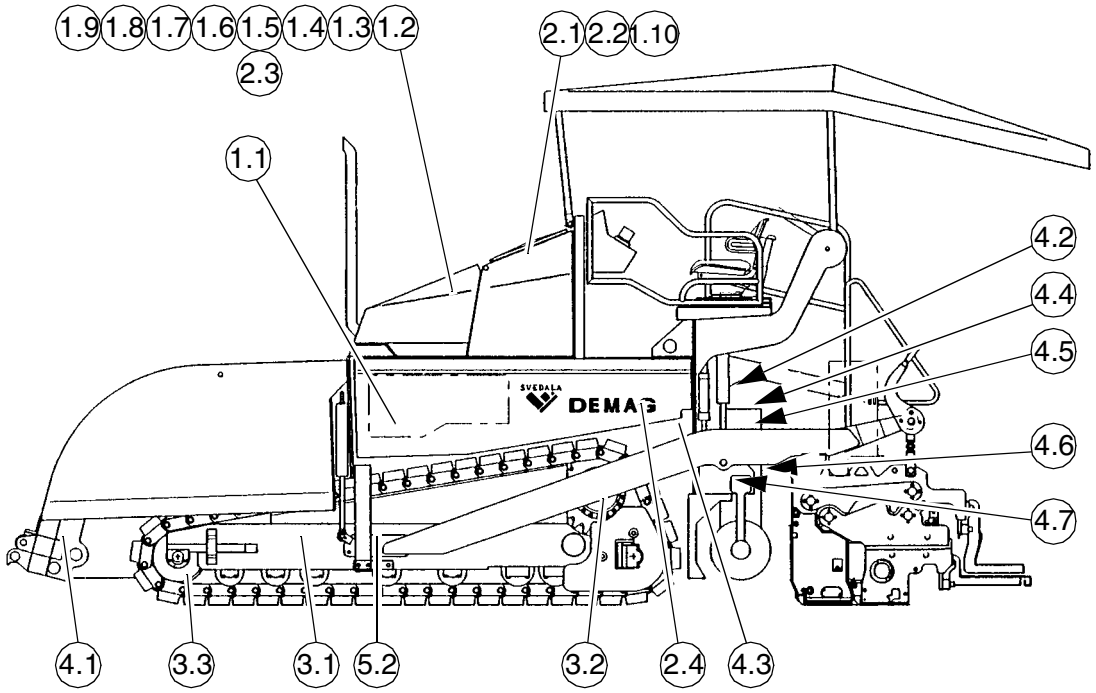
Pos.	Maintenance location	
1	**Engine**	
	1.1	Pump distribution gear
	1.2	Engine - lubricating oil
	1.3	Oil filter
	1.4	Air cleaner
	1.5	Water cooler
	1.6	Upstream fuel filter / fuel filter
	1.7	V-belt
	1.8	Engine mounting
	1.9	Hoses and hose connections
	1.10	Fuel tank
2	**Hydraulic system**	
	2.1	Hydraulic tank
	2.2	Main filter / return flow filter
	2.3	Oil cooler
	2.4	High pressure hydraulic filter
	2.5	Hydraulic cylinder
3	**Travel drive**	
	3.1	Chassis chains
	3.2	Conveyor drive transmission
	3.3	Idler wheel
4	**Material supply**	
	4.1	Conveyor chain
	4.2	Conveyor-center bearing
	4.3	Gear for conveyor drive
	4.4	Auger planetary gear
	4.5	Auger drive chains
	4.6	Auger box
	4.7	Auger-outer bearing

Pos.	Maintenance location	
5	**Miscellaneous**	
	5.1	Visual inspection
	5.2	Crossbeam guide
	5.3	Nuts and bolts
	5.4	Moving parts
6	**Electrical system**	
	6.1	Batteries



2.2 First maintenance (100 operating hours)

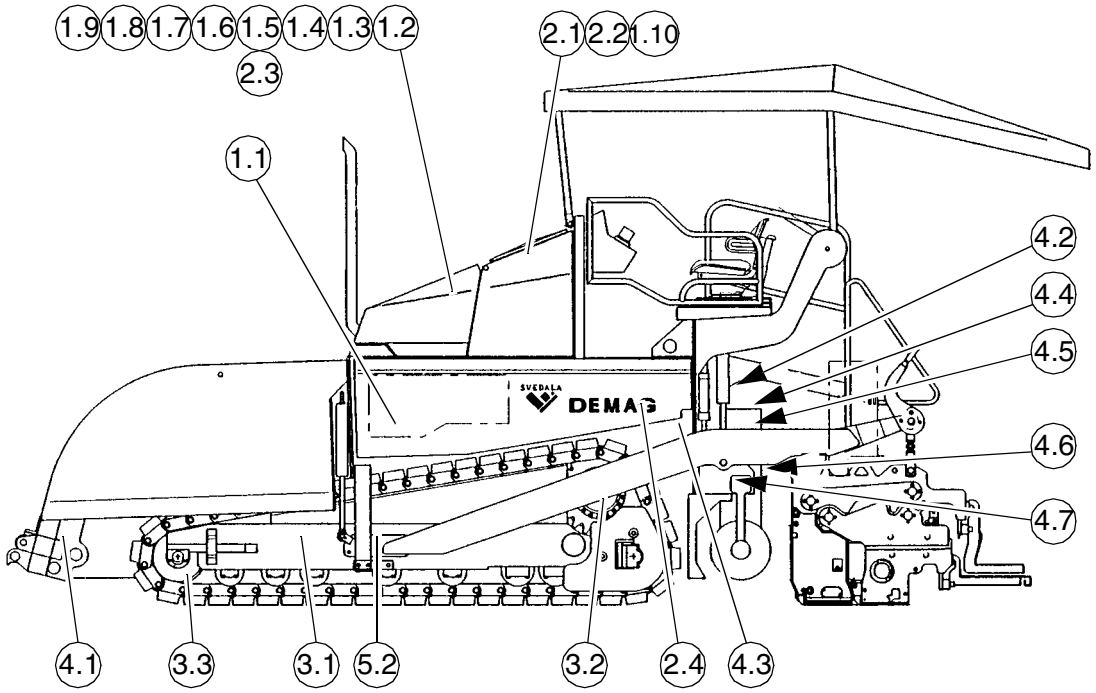
Item	Maintenance point	Maintenance work
1.1	Pump distribution gear	Change oil
1.9	Hoses and screw connections	Visual inspections
2.2	Hydraulic tank	Change main filter
2.4	High pressure filter	Change main filter
3.1	Track groups	Check tension
3.2	Conveyor drive transmission	Change oil
4.1	Conveyor chain	Check tension
4.4	Planetary gear Augers	Change oil
4.5	Drive chains of conveyor augers	Check tension
4.6	Auger box	Check oil level
5.4	Movable parts	Lubrication



2.3 Daily (or every 10 operating hours)

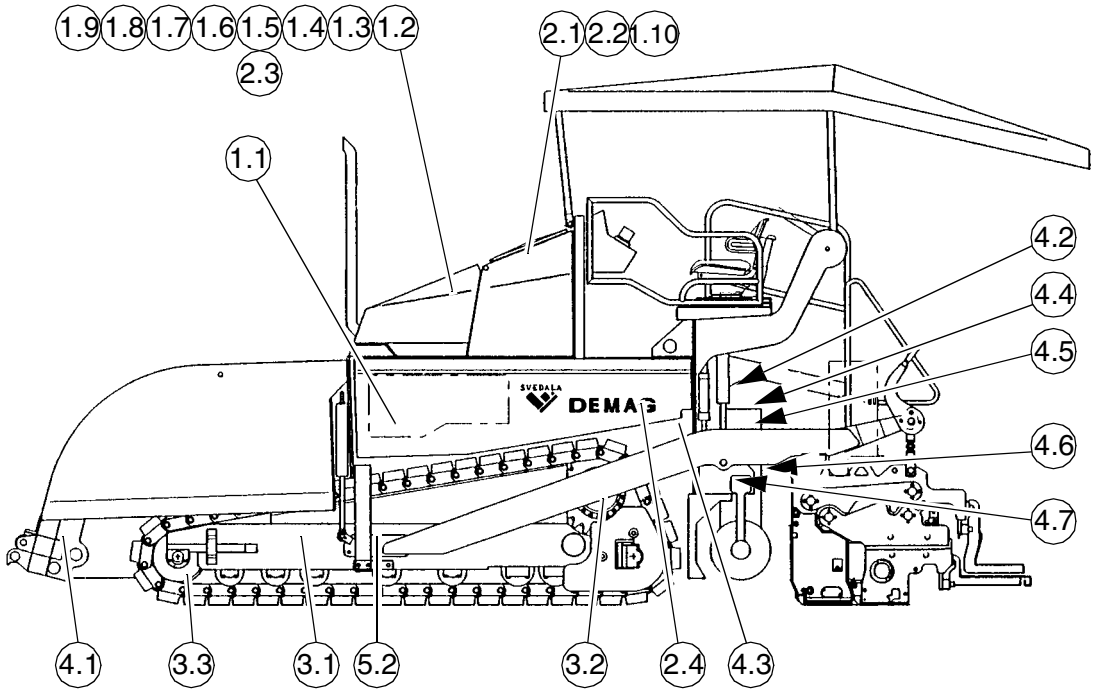
Item	Maintenance point	Maintenance work
1.2	Engine - lubricating oil	Check oil level
1.4	Air filter	Check function, clean
1.5	Water cooler	Check fluid level
2.1	Hydraulic tank	Check oil level
2.4	High pressure filter	Inspect for fouling, change filter
4.2	Center conveyor bearing	Lubrication
4.7	Outer auger bearing	Lubrication
5.1	Visual inspections	Inspect complete finisher for damage

⚠ During the diesel engine run-in time (200 operating hours), check the oil level twice a day!
When working on the hydraulic system, inspect all filters after 20 operating hours and renew if necessary!



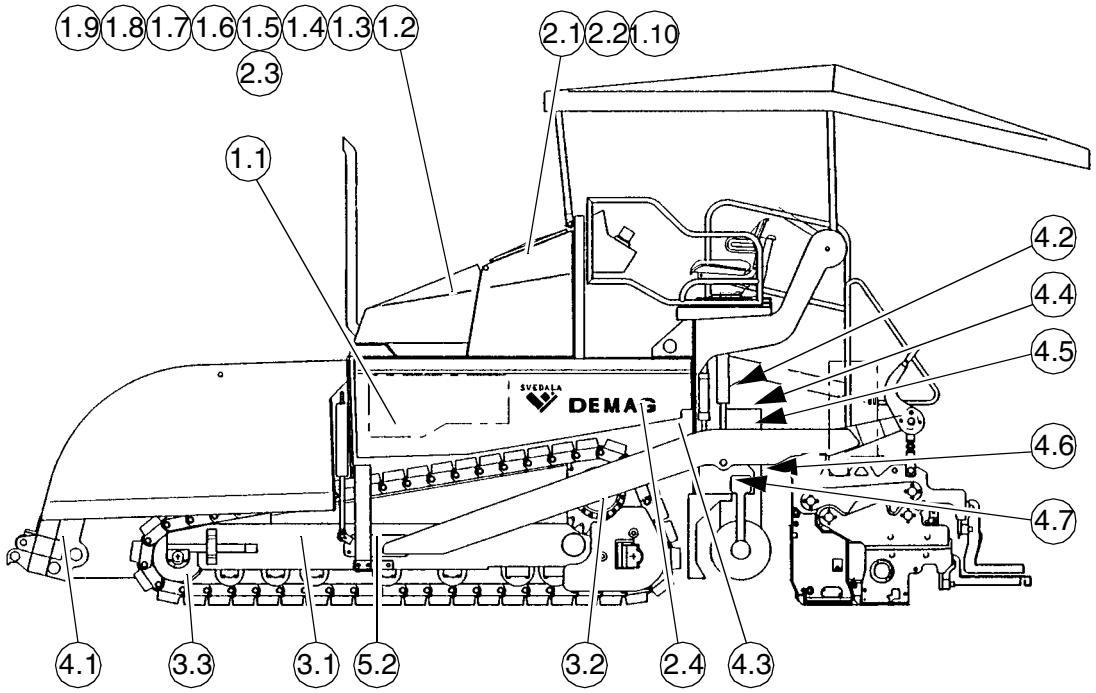
2.4 Weekly or every 50 operating hours

Item	Maintenance point	Maintenance work
1.1	Pump distributor gear	Check oil level and refill if necessary
1.6	Fuel filter	Check and if necessary drain water
4.3	Flight bar conveyor gear	Check oil level and refill if necessary
5.2	Side bar guide	Clean



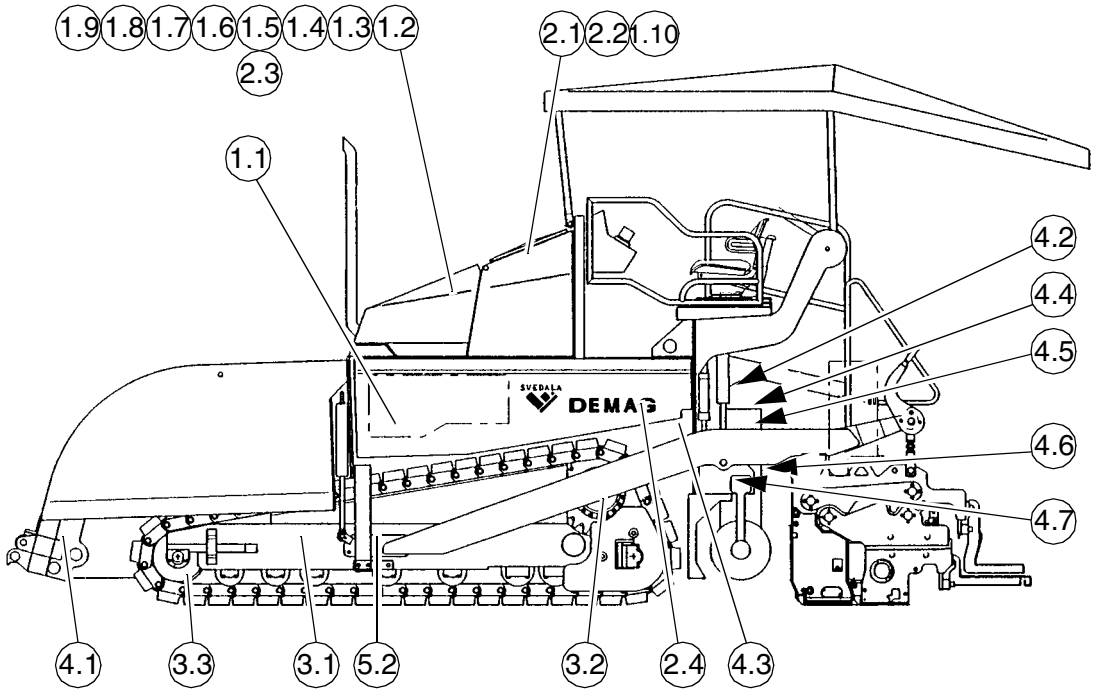
2.5 14 daily or every 100 operating hours

Item	Maintenance point	Maintenance work
1.5	Engine cooling system and hydraulics	Check function, clean maintenance according to engine manufacturer's documentation
3.1	Track groups	Check tension
4.1	Conveyor chain	Check tension
4.4	Planetary gear - Spreader	Check oil level
4.5	Drive chains of conveyor augers	Check tension



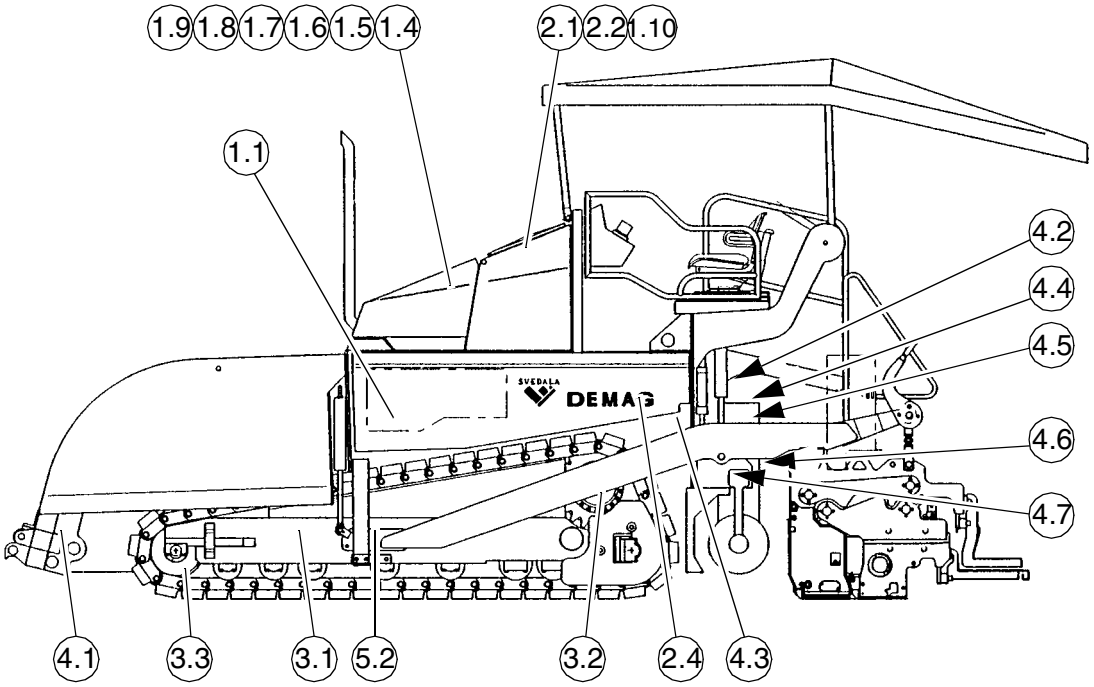
2.6 Monthly or every 250 operating hours

Item	Maintenance point	Maintenance work
1.8	Engine suspensions	Check
3.2	Conveyor drive transmission	Check oil level
4.6	Auger box	Check oil level



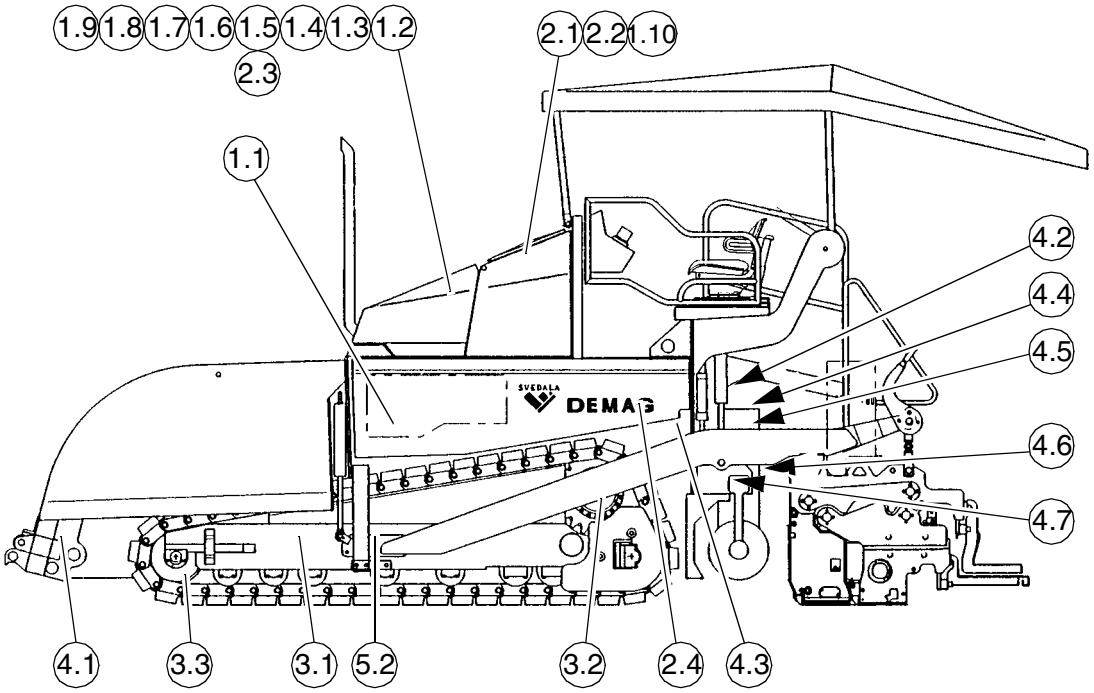
2.7 Every 3 months or every 500 operating hours

Item	Maintenance point	Maintenance work
1.2	Engine - lubricating oil	Change oil
1.3	Oil filter (cups)	Change filter cartridge
2.1	Hydraulic tank	Clean filling and vent filter
5.3	Nuts and bolts	Check all operating-relevant nuts and bolts for tightness and retighten if necessary. ⚠ Observe tightening torques!



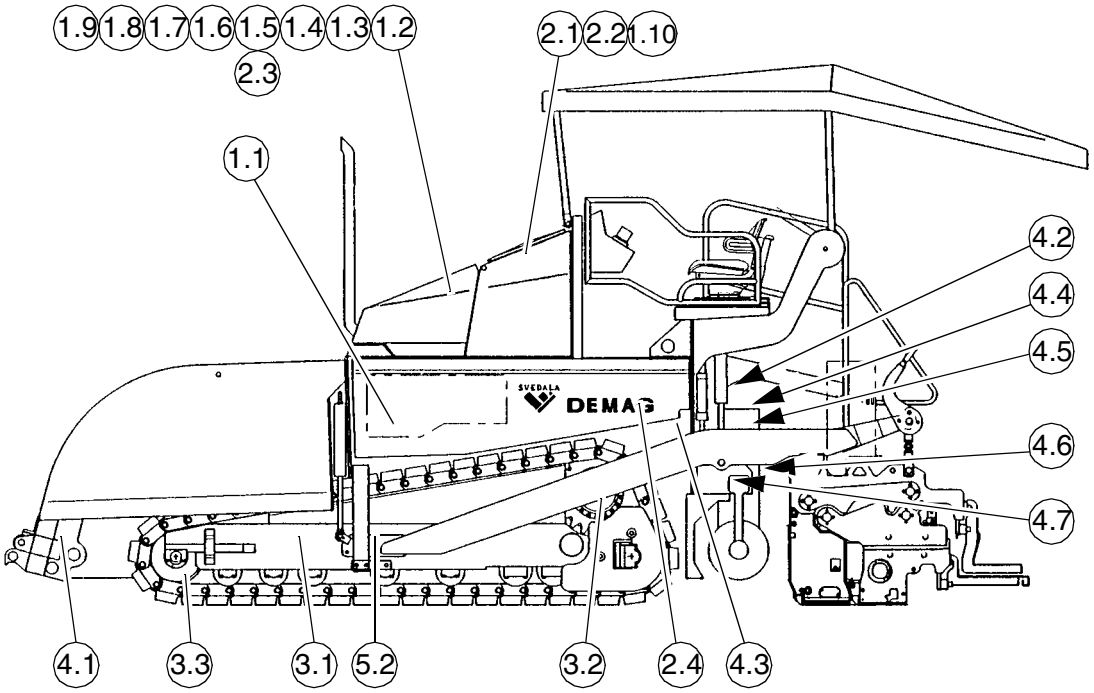
2.8 Annually or every 1000 operating hours

Item	Maintenance point	Maintenance work
1.1	Pump distributor gear	Change oil
1.4	Air filter	Change filter insert
1.6	Fuel filter Upstream fuel filter	Change fuel filter cartridge and/orfilter element
1.7	Fan and alternator belt	Check tension, if necessary replace
1.9	Hoses and screw connections	Check, replace if necessary
2.2	Hydraulic tank	Change main filter
2.5	Hydraulic cylinder	Lubrication
3.2	Conveyor drive transmission	Change oil
4.3	Planetary gear flight bar conveyor	Change oil
4.4	Planetary gear auger	Change oil
5.3 5.4 5.5	Check screw connections, particularly on driven wheels, mounting points and hydraulic system and tighten if necessary. Hydraulic screw connections only if leaky.	



2.9 Every 2 years or every 2000 operating hours

Item	Maintenance point	Maintenance work
1.4	Air filter	Change safety cartridge
1.5	Water cooler	Replace coolant
1.7	Fan and alternator belt	Replace belt
2.1	Hydraulic tank	Change oil

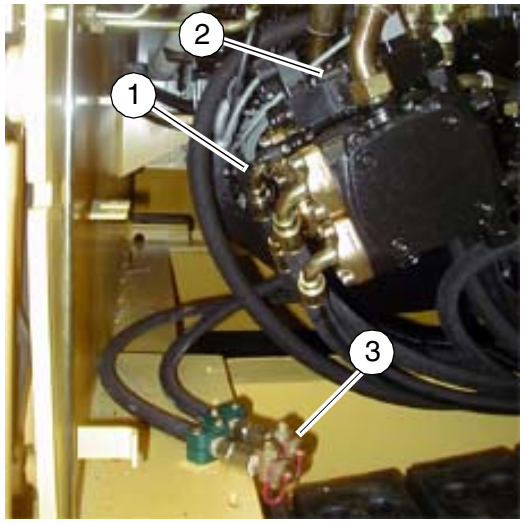


2.10 If necessary

Item	Maintenance point	Maintenance work
3.2	Conveyor drive transmission	Refill oil
1.10	Fuel tank	Drain water and sediment
3.3	Idler	Check and refill oil

2.11 Inspection and lubrication points

Pump distributor gear (1.1)



PVG_115.jpg

The check screw (1) serves for checking the oil level.
Once the screw has been unscrewed, a little oil should run out. If this is not the case, top up oil via filler aperture (2).

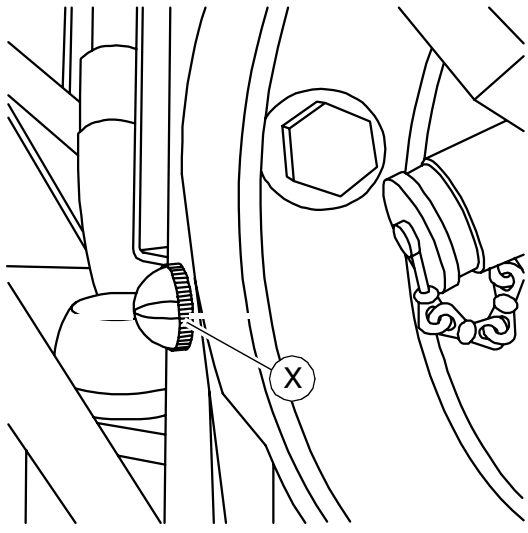
Cleanliness must be observed!

Oil change:

☞ The oil change should take place at operating temperature.

- Unscrew seal cap of oil drain point (3) and screw on hose provided in accessories.
- Place end of hose in collection container.
- Use a wrench to open the shutoff valve and allow all oil to drain out.
- Close shutoff valve, remove hose and screw seal cap back on.
- Fill oil (of the specified quality) through filler aperture on gear (2) until oil level reaches bottom edge of check screw opening (1).

☞ If an inspection glass (X) is at the pump distribution gear instead of the control screw, oil must be filled up, until the oil level reaches up to the center of the inspection glass.



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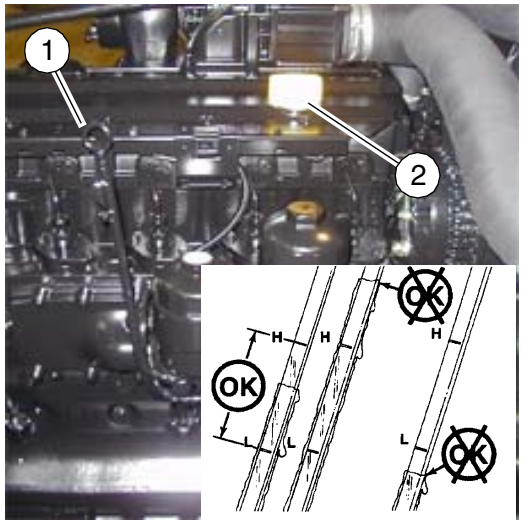
Lubricating oil - engine (1.2)

Oil level check

Before starting work, always use dipstick (1) to check oil level in engine.
Undertake oil check with paver finisher on level ground!

- If necessary, fill up oil via filler aperture (2).

⚠ Too much oil in engine damages gaskets; too little oil results in overheating and engine destruction.

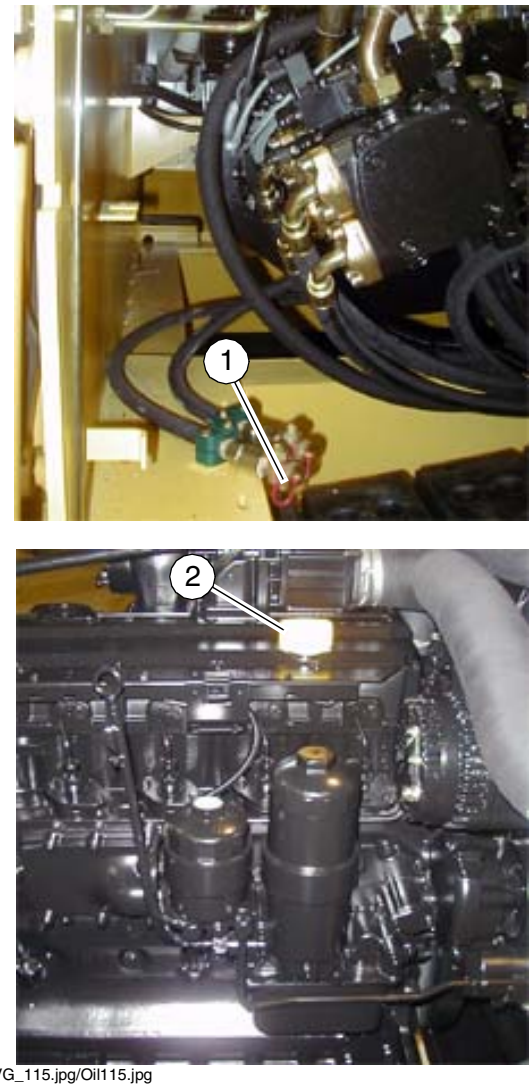


PVG_115.jpg/Oil115.jpg

Oil change:

The oil change should take place at operating temperature.

- Unscrew seal cap of oil drain point (1) and screw on hose provided in accessories.
- Place end of hose in collection container.
- Use a wrench to open shutoff valve and allow all oil to drain out.
- Close shutoff valve, remove hose and screw seal cap back on.
- Pour engine oil into the filling hole in the motor compartment (2) in the prescribed quality, viscosity and quantity.
- Start engine and allow to idle.
- Switch off the engine again. Recheck the oil level and correct if necessary.



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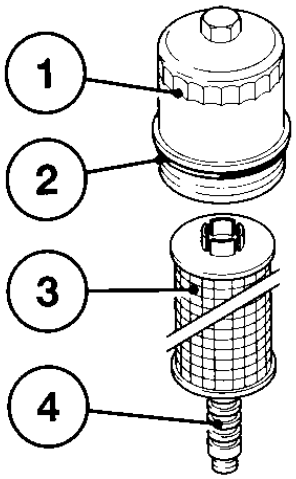
Engine - oil filter (1.3)

☞ The new filter is inserted during an oil change once the used oil has been drained out.

- Use a filter belt or wrench on hex to loosen lubricating oil filter cover (1) and unscrew (turn anti-clockwise).
- Carefully loosen paper filter cartridge (3) from guide (4) by moving upwards.
- Collect any oil which escapes.
- Change paper filter cartridge (3).
- Clean any dirt which has accumulated from sealing faces of filter carrier (1) and guide (4).
- Replace rubber gasket (2) and oil in (only use a little oil).
- Carefully place new paper filter cartridge (3) in guide (4).
- Screw down lubricating oil filter cover (1) (turn clockwise) (25 Nm)
- Once the oil filter has been fitted, during the test run keep an eye on the oil pressure display and ensure good sealing. Check oil level again.



Oil115.jpg/Becherfilt.tif

Air cleaner (1.4)

The level of air cleaner (1) contamination depends on the dust content of the air.

Filter maintenance is needed if the red service box (3) can be clearly seen on the maintenance indicator (2) when the engine is at a standstill.

Dust removal valve:

- Empty dust removal valve (4) by pressing the outfeed slot together in the direction indicated by the arrow.
- Remove any dust deflectors by pressing together the upper valve section.

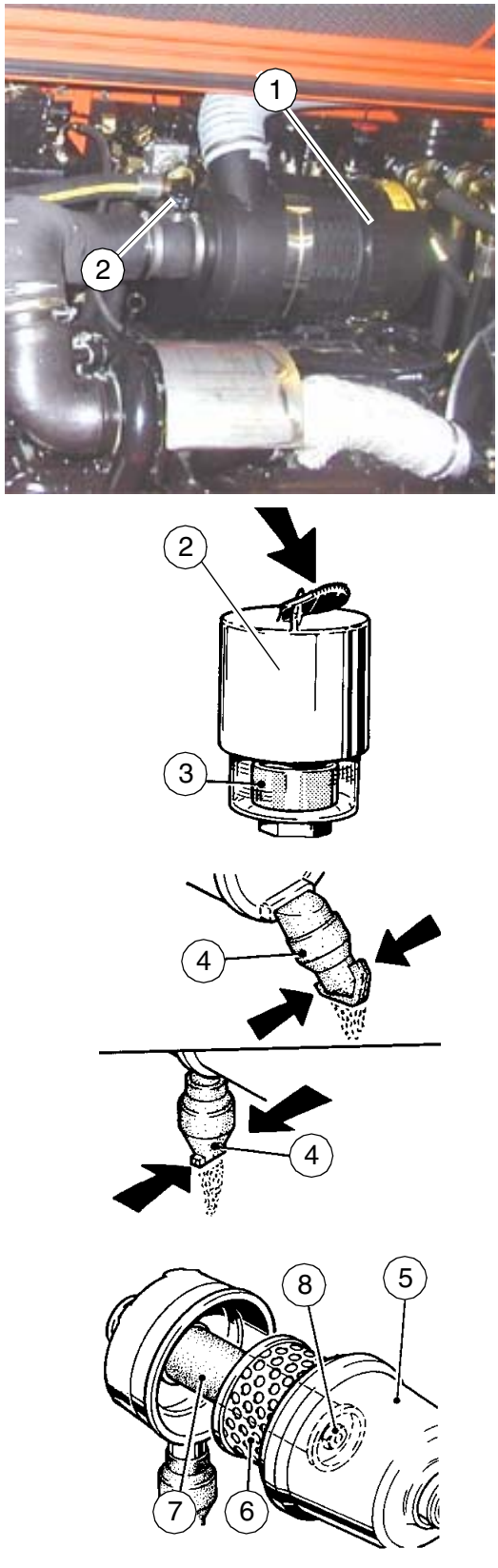
☞ Clean outfeed slot occasionally.

Filter cartridge:

- Open air filter housing (1)
- Take out filter cover (5) and remove filter cartridge (6).
- Clean filter cartridge or if necessary replace.
  - Cleaning filter cartridge:
  - Use dry compressed air (max. 5 bar) to blow out from inside out,
  - in an emergency, carefully tap cartridge. Do not damage cartridge when doing so.
- Check cartridge for damage to filter paper and gaskets, if necessary replace.

Safety cartridge:

- To change, loosen hex nut (8) and pull out cartridge (7).
- Insert new cartridge, refit hex nut and tighten.
- Insert filter cartridge (6) and close air filter housing (1).



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☞ After air filter maintenance, always press the reset button on the maintenance indicator (2).

- Observe engine's operating instructions.

Cooling system engine and hydraulics (1.5)

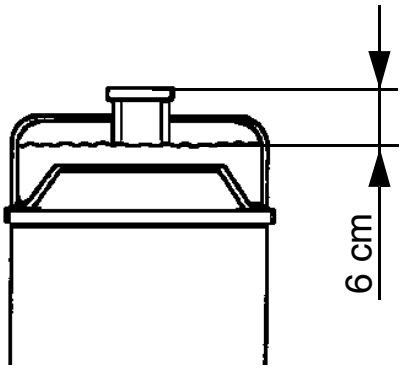
☞ The machine is fitted with water, hydraulic and charged air coolers.

Water cooler

Always check the coolant (water) level when cold. Ensure there is sufficient antifreeze and anti-corrosion agent (-25°C).

The perfect level is 6 cm below the sealing face of the seal cover.

☞ System is pressurised when warm! Risk of scalding when opening!



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Hydraulic cooler

The finisher is fitted with a hydraulic oil cooler as standard. This cooler is of decisive importance for the operating reliability of the complete hydraulic system.

A fouled oil cooler can cause the following damage:

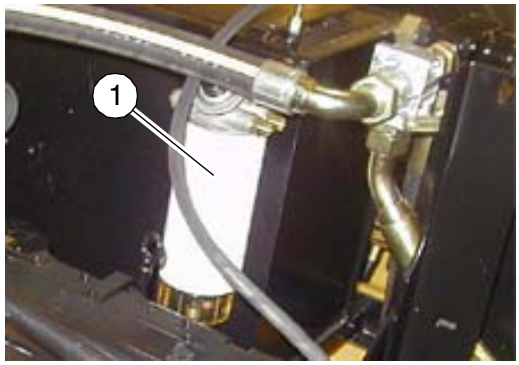
- Inadmissibly high oil temperature
- Quicker oil ageing
- Oil thinning
- Loss of lubricity and in turn hear wear on seals, O-rings, pumps and motors.
- Leakages
- Regularly check the hydraulic oil cooler, cooling coil and engine cooling for fouling.
- Clean engine cooling system if necessary.

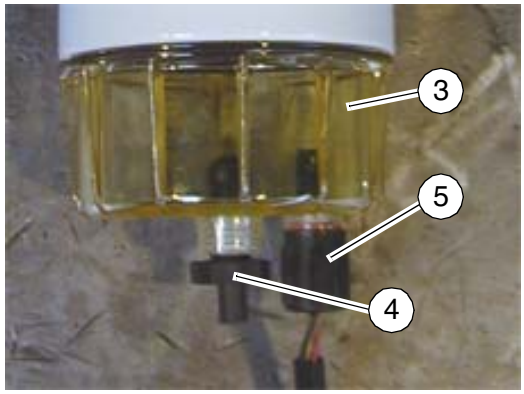
STOP Only carry out cleaning with the engine cooled down!

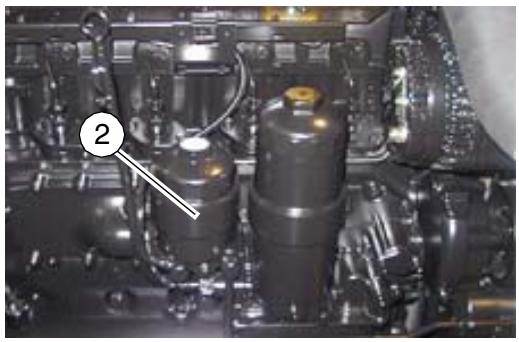
Engine - fuel filter (1.6)

The fuel filter system consists of two filters:

- Upstream filter with water separator (1) on fuel tank
- Main filter (2) on engine block







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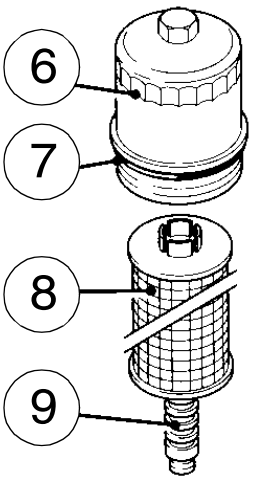
Draining upstream filter - water:

The upstream filter has a tank (3) in which the water collected is captured.
Use drain valve (4) to drain the tank regularly or when the engine electronics report an error message.

Replacing upstream filter - filter cartridge

- Drain off separated water
- Pull connector off water sensor (5)
- Use a filter wrench or filter belt to loosen the filter cartridge and tank and unscrew
- Unscrew tank (3) from filter cartridge and if necessary clean.
- Clean sealing face of filter bracket
- Oil in tank gasket (only use a little oil) and screw (handtight) under the new filter cartridge
- Oil in filter cartridge gasket (only use a little oil) and screw (handtight) under the bracket.
- Re-establish plug connection of water sensor (5).

Main filter - replacing filter cartridge



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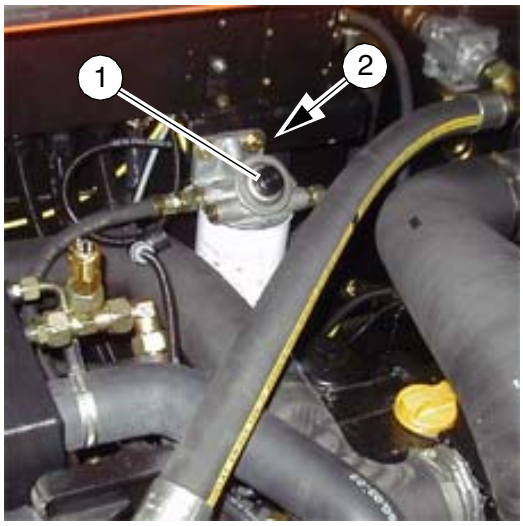
- Use a filter belt or wrench to loosen fuel filter cover (6) on hex and unscrew (anti-clockwise).
- Carefully loosen paper filter cartridge (8) from guide (9) by moving upwards
- Collect any fuel which escapes.
- Change paper filter cartridge (8).
- Remove any dirt which may have accumulated on sealing face of filter carrier and fuel filter cover (6) and guide (9).
- Replace rubber gasket (7) and oil in (only use a little oil).
- Carefully place new paper filter cartridge (8) in guide (9).
- Screw down fuel filter cover (6) (turn clockwise) (25 Nm)

☞ Once the fuel filter has been fitted, during the test ensure good sealing.

⚠ Once the new filter cartridge has been fitted, check seal integrity with engine running.

Venting fuel system

If the upstream fuel filter has been replaced, the fuel system will have to be vented.



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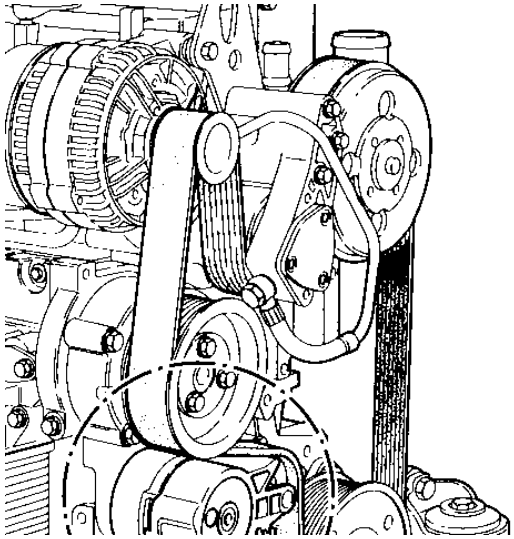
- Loosen vent screw (Allen screw) (2) from rear right of filter bracket.
- Activate hand pump (1) until fuel containing no bubbles exits vent screw.
- Retighten vent valve (1).

☞ To vent the fuel system after replacing the main filter, see engine's operating instructions

V-belt and notched v-belt (1.7)

- For checking and adjusting the belts see engine's operating instructions.

☞ New V-belts stretch and must be retensioned after an operating time of 15-20 minutes.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Engine mounting (1.8)

Check the engine mounting specifically for damage and secure fixture.
If necessary, any damaged parts should be replaced.

☞ Observe engine's operating instructions.

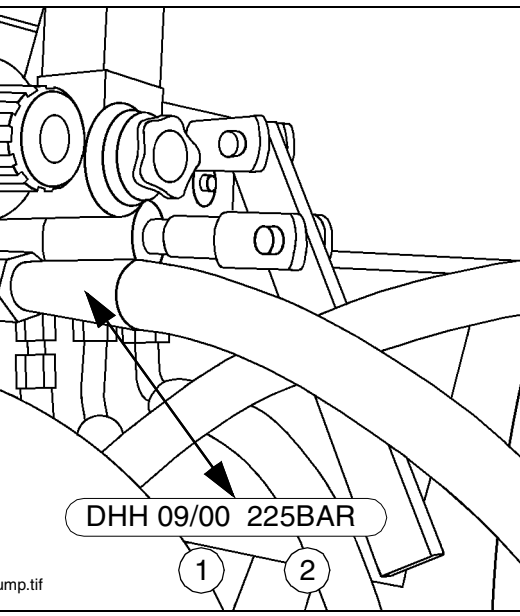
Hoses and screw connections (1.9)

Check all hoses on engine and all hydraulic hoses specifically for damage and correct fixture.

⚠ Replace any damaged hoses immediately.

STOP Aged hoses become porous and may burst! Risk of accident!

☞ A number stamped onto the hydraulic hose screw connection provides information about the date of manufacture (1) and the maximum pressure permitted for this hose (2).



Pump.tif

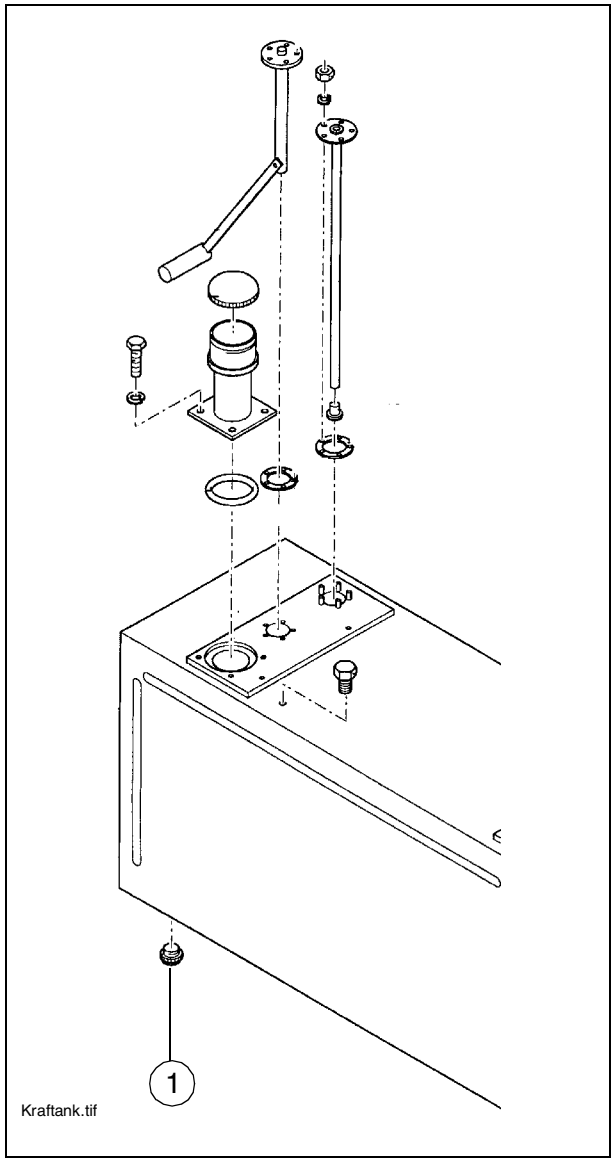
STOP Never fit overlapped hoses and note the permissible pressure level.

Fuel tank (1.10)

To drain water and sediment:

- Provide collecting container.
- Unscrew drain screw (87).
- Drain about 1 l fuel into the collecting container.

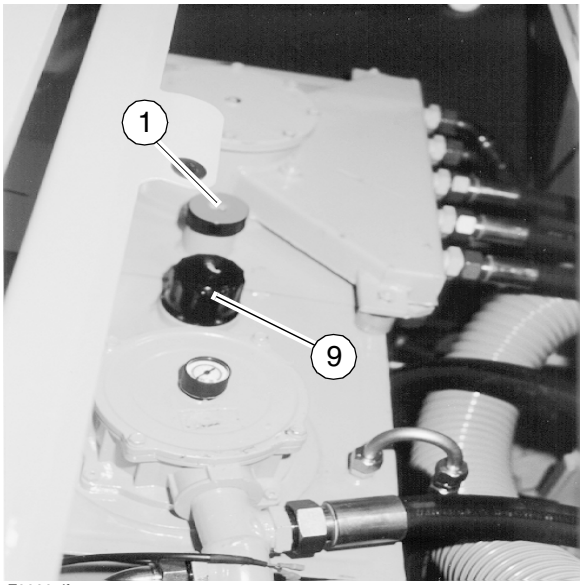
Collected fuel must be disposed off in accordance with the national regulations.



Hydraulic oil tank (2.1)

Check the oil level at the dipstick (1). The oil must be at the upper notch with the cylinders retracted.
The oil tank vent must be cleaned regularly to remove dust and dirt. Clean oil cooler surfaces (see also engine operation instructions).

⚠ Only use recommended hydraulic oils (see Section „Hydraulic oil recommendations).



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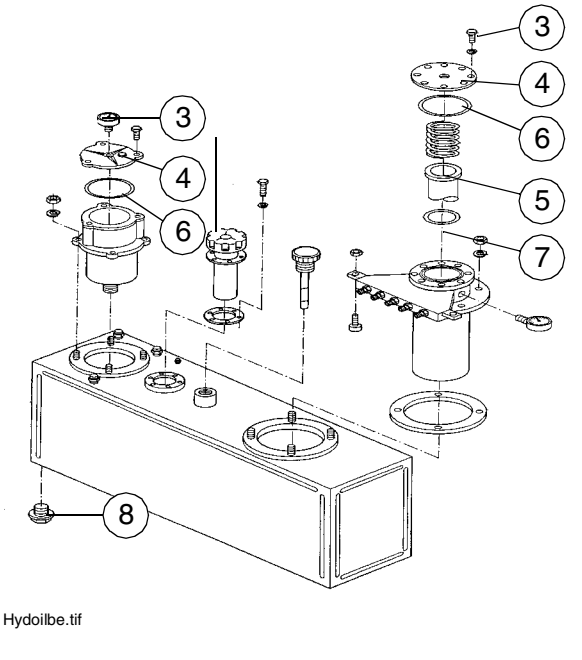
Changing main filter/return filter (2.2)

- Loosen nuts (3).
- Remove cover (4).
- Remove filter (5).
- Fit new filter.
- Renew gasket (6) and O-ring (7).
- Refit cover (4).
- Close cover by tightening nuts (3).



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Oil change

- Retract piston rods of hydraulic cylinders.
- Fit hose over the drain screw (8) and place the end of the hose in the collecting container.
- Loosen drain screw (8), **do not** fully unscrew.
- Drain oil into the collecting container.
- Retighten drain screw(8) and remove the hose.
- Fill hydraulic oil into filling hole (9) until the upper mark on the dip stick is reached.

☞ The main filter must also be changed with each oil change (see above).

Oil cooler (2.3)

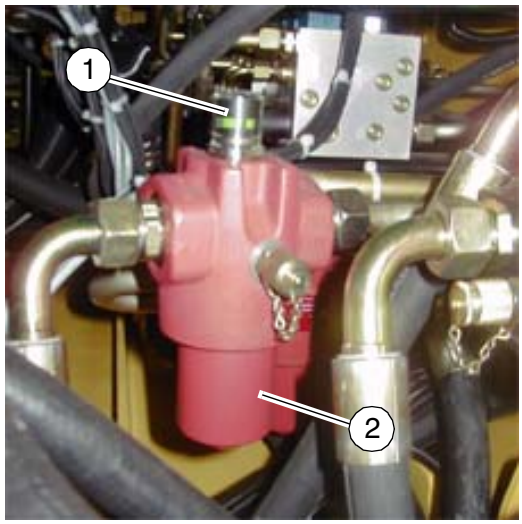
☞ see section 1.5

High pressure filter (2.4)

A total of 5 high pressure filters can be found at several places in the hydraulic system (behind bottom lid, side flaps).

The filter elements should be replaced when the maintenance indicator (1) is displaying red.

- Unscrew filter housing (2).
- Remove filter element.
- Clean filter housing.
- Fit new filter element.
- Renew gasket at filter housing.
- Loosely screw filter housing manually and tighten with a wrench.
- Start trial run and check filter for leaks.



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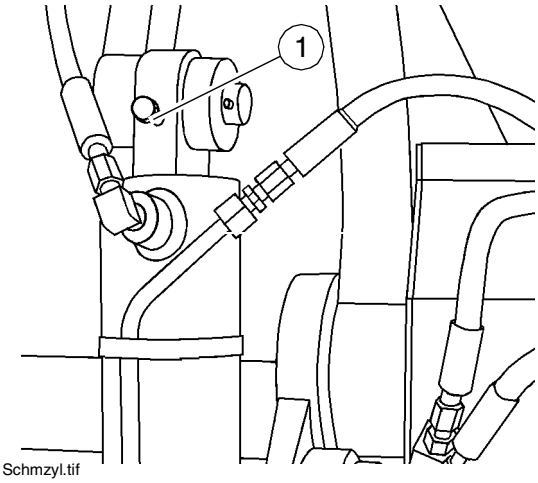
☞ The gasket must be changed each time the filter element is replaced.

☞ The red mark in the maintenance indicator (1) is automatically reset to green once the filter element has been changed.

Hydraulic cylinder (2.5)

There is one grease nipple at each bearing point of the hydraulic cylinder (top and bottom)

☞ Apply 3 strokes of grease from a grease gun.



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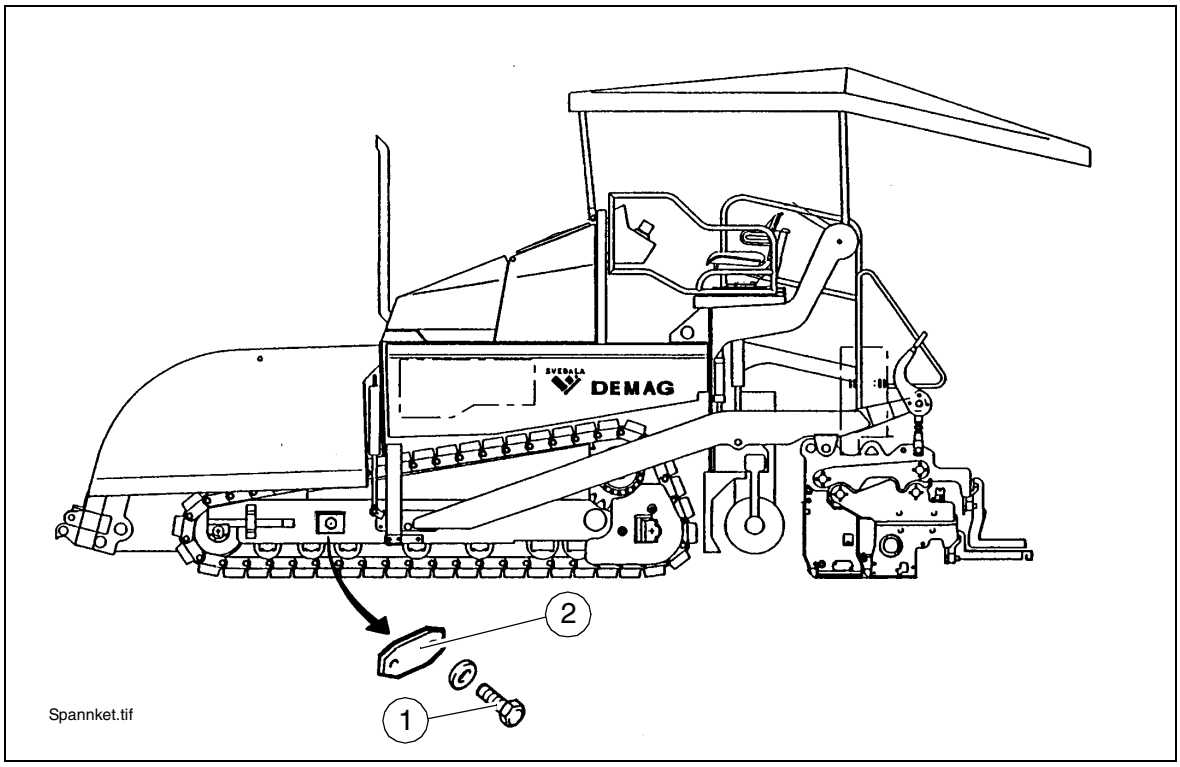
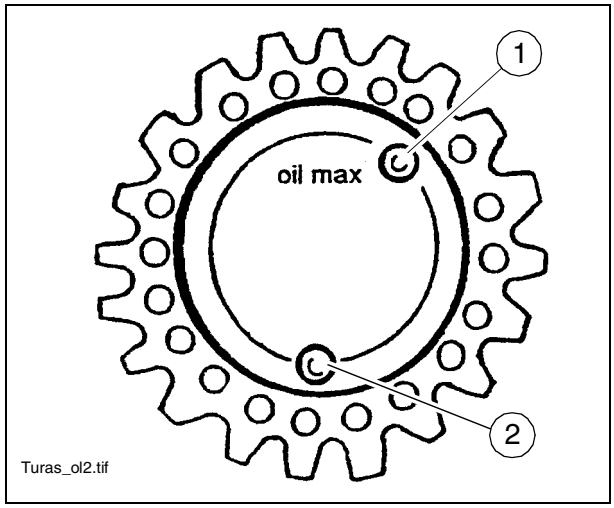
Track group (3.1)



Only carry out maintenance work on the track group with the engine switched off.

- Unscrew screws (1).
- Remove cover (2).
- Screw head piece for flat nipple (tool box) to the grease gun.
- Inject grease into the chain tensioner with the grease gun until the grease starts to discharge from the pressure control valve.
- Refit cover.

Conveyor drive transmission (3.2)



- To **check the oil level,** unscrew check screw (1).

☞ With the correct oil level, the oil is just below the bottom edge of the check hole or only a small amount of oil discharges from the opening.

To **fill** oil:

- Unscrew filling screw (1).
- Pour prescribed oil into the filling hole at (1) until the oil is just below the bottom edge of the filling hole.
- Retighten filling screw (1).

To **change oil**:

- Turn conveyor drive transmission so that the „oil max" mark is horizontal and drain screw (2) is located at the bottom.
- Unscrew drain screw (2) and filling screw (1) and drain oil.

☞ Before filling with new oil, the gear must be cleaned using rinse oil.

- Check gaskets of both screws and replace if necessary.
- Tighten drain screw (2).
- Fill new oil into the filling hole until the "oil max" mark is reached.
- Tighten filling screw (1)

Idler wheel (3.3)

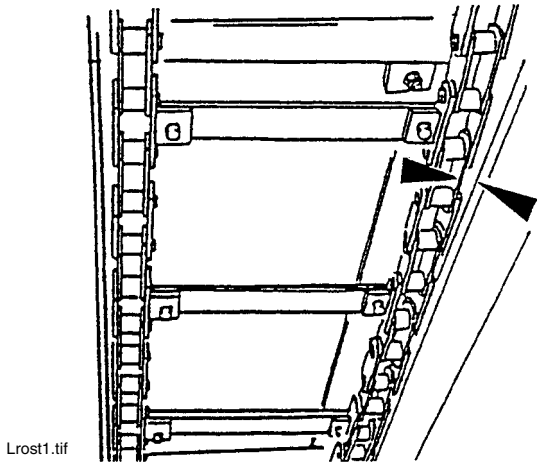
The idler wheel has a lifelong oil fill.

Conveyor chain (4.1)

☞ With a correctly tensioned conveyor chain, the bottom edge of the chain is located about 4 cm below the frame bottom edge.

For **retensioning** the chains, fill the tensioner at the lubricating nipple (1) on the left and right with the grease gun until the necessary chain tension is reached.

Do not tension chains one-sided!



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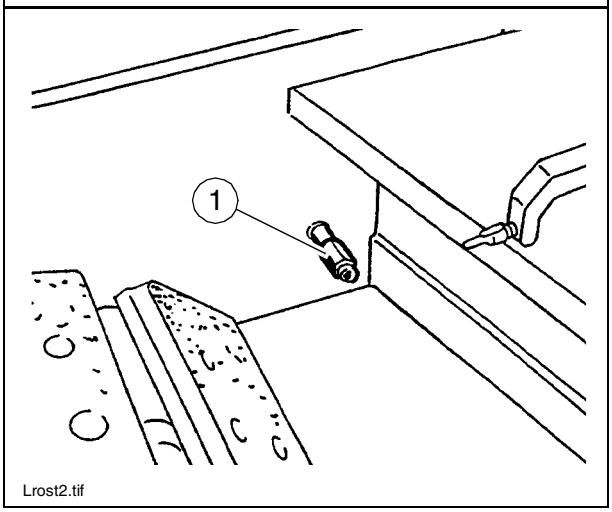
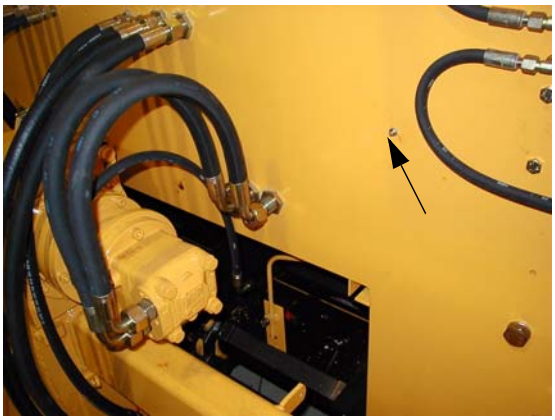


Lrost2.tif

Center conveyor bearing (4.2)

The grease nipple is located on the right-hand side of the rear wall, above the conveyor gear. From this nipple, a lubrication line leads to the bearing. Lubricating the bearing is thus facilitated.

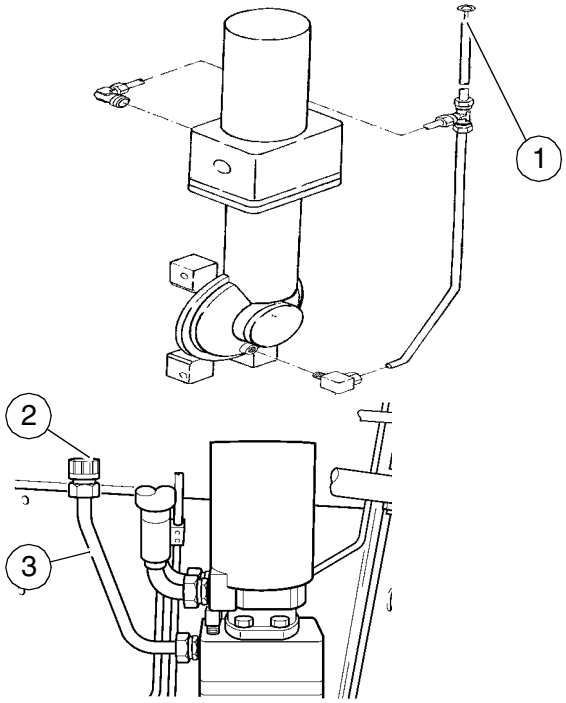


P1250001.jpg

Conveyor drive transmission (4.3)

The conveyor gears are located under the footplate of the control panel.
Check oil level: Only before start of work.
The oil level must reach the top notch of the dipstick (1).
Top up oil: Through oil filler neck (3) once seal cover (2) has been removed.

10 cm on the dipstick corresponds to around 0.25 l of topped up oil.
Regular oil changes are not needed if the oil filled is of a high quality.
It is sufficient to regularly check the gear oil level.



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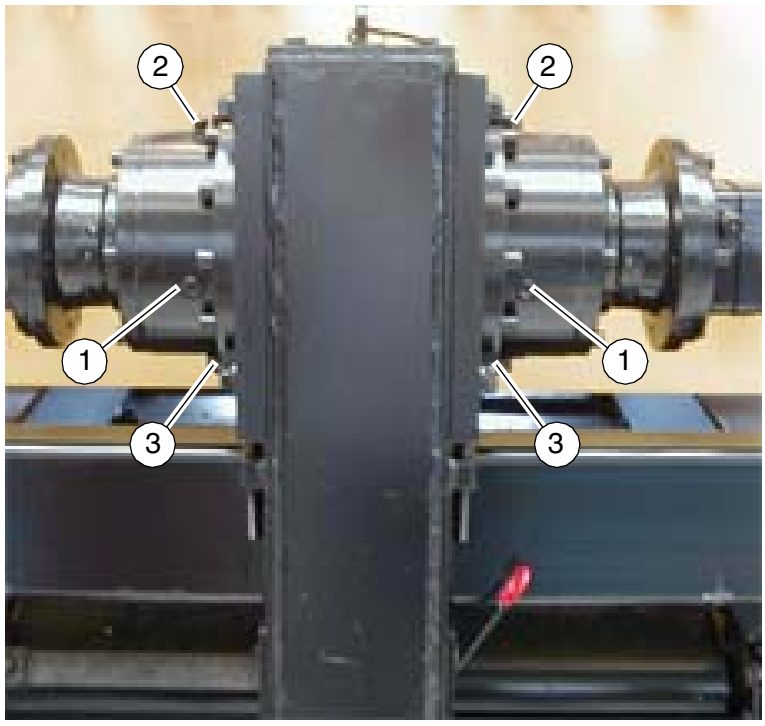
Auger planetary gear (4.4)



Schneckantr..jpg

- To **check the oil level**, unscrew check screw (1).

☞ With a correct oil level, the oil is just below the bottom edge of the check hole or only a small amount of oil discharges from the opening.

To **top up** oil:

- Unscrew check screw (1) and filling screw (2).
- Pour prescribed oil into filling hole (2) until the oil is just below the bottom edge of the check hole (1).
- Tighten filling (2) and check screw (1).

To **change** oil:

☞ The oil change should take place at operating temperature.

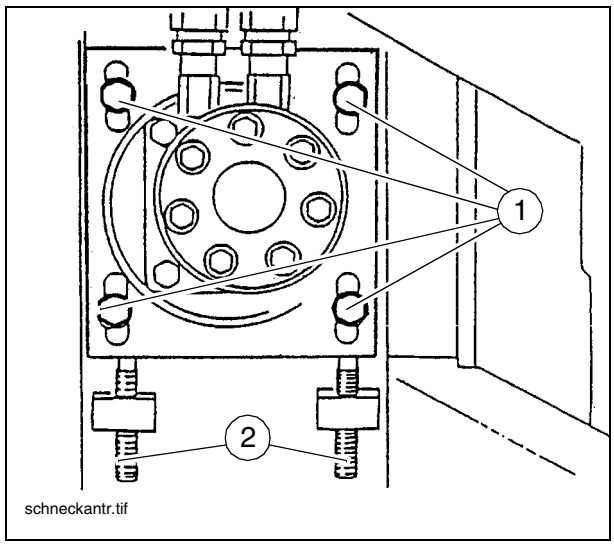
- Unscrew filling screw (2) and drain screw (3).
- Drain oil.
- Tighten drain screw (3).
- Unscrew check screw (1).
- Pour prescribed oil into filling hole at (2) until the oil is just below the bottom edge of the check hole (1).
- Retighten filling (2) and check screw (1).

Conveyor auger drive chains (4.5)

Only carry out maintenance work on the drive chains with the engine switched off.

To **retension the chains**:

- Loosen fixing screws (1).
- Adjust correct chain tension with screws (2).
  - Tighten threading dowels with a torque wrench to 20 Nm.
  - Then loosen the threading dowels by one complete turn.
- Retighten screws (1).



schneckantr.tif

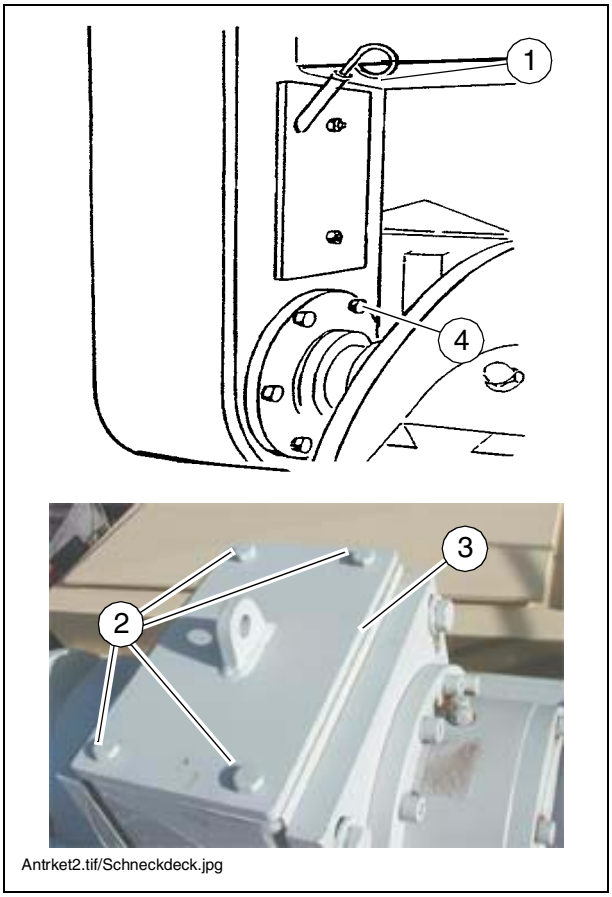
Auger box (4.6)

Check oil level

☞ When the oil level is between the two marks on the dipstick (1) it is correct.

To **fill up** oil:

- Unscrew screws (2) from top cover of auger box.
- Take off cover (3).
- Fill up oil to correct level.
- Refit cover.
- Use dipstick to check level again.



Antrket2.tif/Schneckdeck.jpg

Change oil

☞ The oil change should take place at operating temperature.

- Place a suitable collecting container under the auger box.
- Loosen screws (4) from circumference of worm shaft flange.

☞ The oil runs out between the flange and auger box.

- Drain out all oil.
- Correctly retighten flange screws (4) crosswise.
- Tip specified oil in through open top cover (3) of auger box until oil level has reached correct height on dipstick (1).
- Correctly refit cover (3) and screws (2).

Outer auger bearing (4.7)

The grease nipples are located on each side at the top of the outer auger bearings.
These nipples must be lubricated each time work is finished to force out any bitumen residues that might have entered and to supply the bearings with a fresh filling of grease.

Apply 6 strokes of grease using a grease gun.


P1250002.jpg

☞ When extending the auger, during the initial lubrication of the outer bearing points, the outer races should be loosened slightly to ensure better aeration when lubricating.
After lubricating, the outer races must be correctly re-secured.
New bearings must be filled with 60 strokes of grease using a grease gun.

Visual inspections (5.1)

- Inspect the diesel engine for oil and fuel patches and fouling.
- Inspect the complete hydraulic system, pumps, motors and cylinders for damage and leaks.
- Check tension and lubrication of the drive chains.
- Check tension of the track group.
- Check cover and coverings for damage, loose or missing screws.
- Check oil cooler for leaks and fouling.
- Check propane gas system for leaks and hoses for damage. Spray connections with a foaming agent.
- Check instruments and indicators for damage.
- Check tension of conveyor chains.
- Check augers for smooth operation.
- Check spreader and flight bar conveyor limit switch setting and test for smooth operation.
- Check protective devices such as rail, catwalks, roof braces for completeness.

Crossbeam guide (5.2)

In order to ensure good guidance for the crossbeams, these should be cleaned regularly.
If necessary, a brush can be used to apply some grease around the guide.

Nuts and bolts (5.3)

Check bolt connections, especially on driven gears as well as securing points and hydraulics, if necessary tighten.

Tightening torques

☞ Maximum tightening torque for shaft bolts with metric ISO standard threads

						
	Preload (N)	Tightening torque (Nm)	Preload (N)	Tightening torque (Nm)	Preload (N)	Tightening torque (Nm)
M3	2250	1,3	3150	1,9	3800	2,3
M4	3900	2,9	5450	4,1	6550	4,9
M5	6350	6,0	8950	8,5	10700	10
M6	9000	10	12600	14	15100	17
M8	16500	25	23200	35	27900	41
M10	26200	49	36900	69	44300	83
M12	38300	86	54000	120	64500	145
M14	52500	135	74000	190	88500	230
M16	73000	210	102000	295	123000	355
M18	88000	290	124000	405	148000	485
M20	114000	410	160000	580	192000	690
M22	141000	550	199000	780	239000	930
M24	164000	710	230000	1000	276000	1200
M27	215000	1050	302000	1500	363000	1800
M30	262000	1450	368000	2000	442000	2400

☞ Tightening torques for nuts and bolts: see engine's operating instructions.

Moving parts (5.4)

Check all moving parts and joints regularly, clean and if necessary lubricate using a grease gun or use brush to apply grease.

Hydraulic screw connections (5.5)

Tighten leaking hydraulic screw connections noting point 1.9 until seal integrity is ensured.

Avoid skin coming into contact with hydraulic oil.

Battery (6.1)

The zero-maintenance batteries can be found under the right-hand lateral flap

- Check cable connections (securing, pin grease).

Bat115.jpg

3 Fuels and lubricants

Only use the specified lubricants or equivalent qualities of known brands.

Only use containers to fill oil or fuel that are clean inside and out.

☞ Observe capacities (see Section”Capacities”)

⚠ Incorrect oil or lubricant levels promote rapid wear and machine failure.

	BP	Esso	Fina	Mobil	Renault	Shell	Wisura
Grease	BP Multipur-pose L2	ESSO Beacon EP2	FINA Marson L2	Mobilux 2 Mobiplex 47	Multipurpose	SHELL Alvania Grease R 3	Retinax
Hot bearing grease (auger-outer bearing)		Norva HT2					
Hot bearing grease		Unirex S2				Aeroshell Grease 22	
Engine oil	See engine operating instructions SAE 15W40 API CF-4 is filled in the factory						
Hydraulic oil	See section 3.1 Shell Tellus 46 is filled in the factory.						
Transmission oil 90	BP Multi EP SAE 90	ESSO GP 90	FINA Ponionic N SAE 90	MOBIL GX 90	Tranself EP 90	SHELL Spirax EP 90 Hypoit GL 4	
Transmission oil 220	BP Energol GR-XP 220	ESSO Spartan EP 220	FINA Giran L 220	MOBIL Mobilgear 630 Mobil-gear SHC 220	Chevron NL Gear Compound 220	SHELL Omala 220	Optimol Optigear 220
	Aral Degol BG 220 is filled in the factory						
Gear oil 460		ESSO Glycolube 460					
Dest. water							
Dieselfuel							
Coolant	Coolant (anti-freeze with rust protection)						

3.1 Hydraulic oils

Preferred hydraulic oils:

a) Synthetic hydraulic liquids based on ester, HEES

Manufacturer	ISO category of viscosity VG 46
Shell	Naturelle HF-E46
Panolin	HLP SYNTH 46
Esso	HE 46

b) Mineral oils

Manufacturer	ISO category of viscosity VG 46
Shell	Tellus Oil 46

⚠ When changing over from mineral oil to biodegradable oils, please cotact the advice service of our company!

☞ Use only clean containers (inside and outside) for filling in oil or fuel.

3.2 Capacities

	Fuel/lubricant	Quantity
Fuel tank	Diesel fuel	210 litre
Hydraulic oil tank	Hydraulic oil	240 litre
Diesel engine (with oil filter replacement)	Engine oil	13.0 litre
Pump distributor gear	Gear oil 90	5.5 litre
Planetary gear Track group	Gear oil 220	3.5 litre
Conveyor chain gear (per side)	Gear oil 220	1.5 litre
Auger box	Gear oil 460	2.5 litre
Planetary gear Augers (each side)	Gear oil 90	0.5 litre
Coolant	40 % antifreeze	18 litre
Clamping cylinder on travelling drive (each side)	Multipurpose grease	1000 grammes
Clamping cylinder on conveyor (each side)	Multipurpose grease	250 grammes
Outer auger bearing (each bearing)	Hot bearing grease	115 grammes
Central conveyor bearing	Hot bearing grease	150 grammes
Conveyor deflection roller (each bearing)	Hot bearing grease	250 grammes

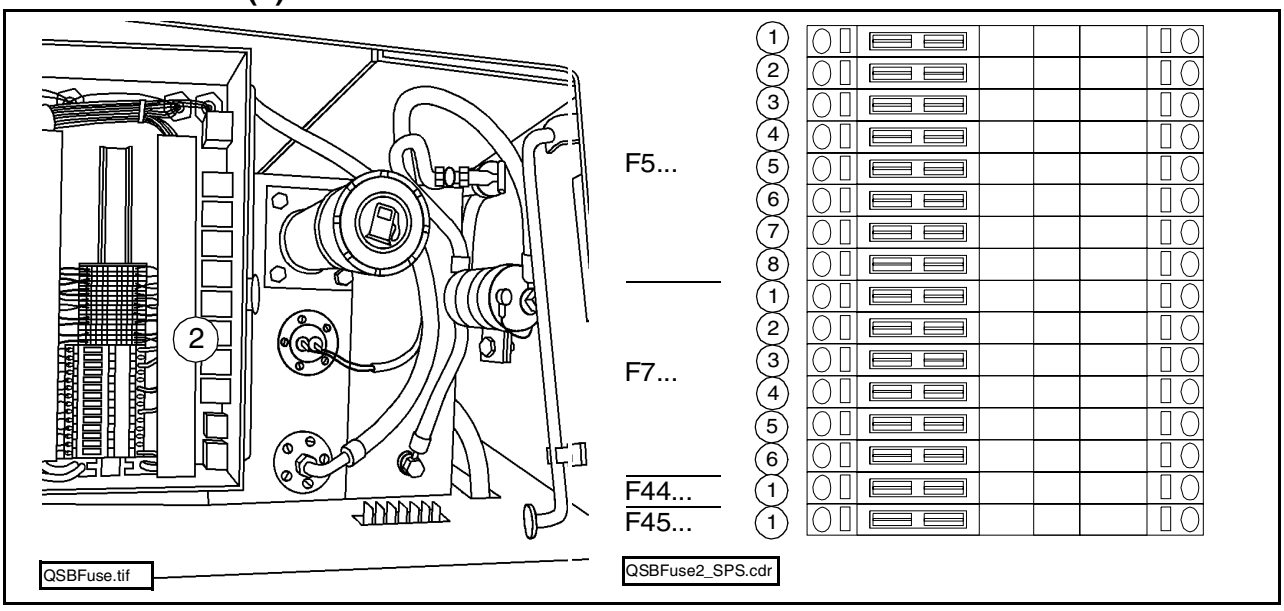
4 Electric Fuses

4.1 Main fuses (next to the batteries)

1.	- F3.1 Overall electric system - F3.2 not in use	50 A

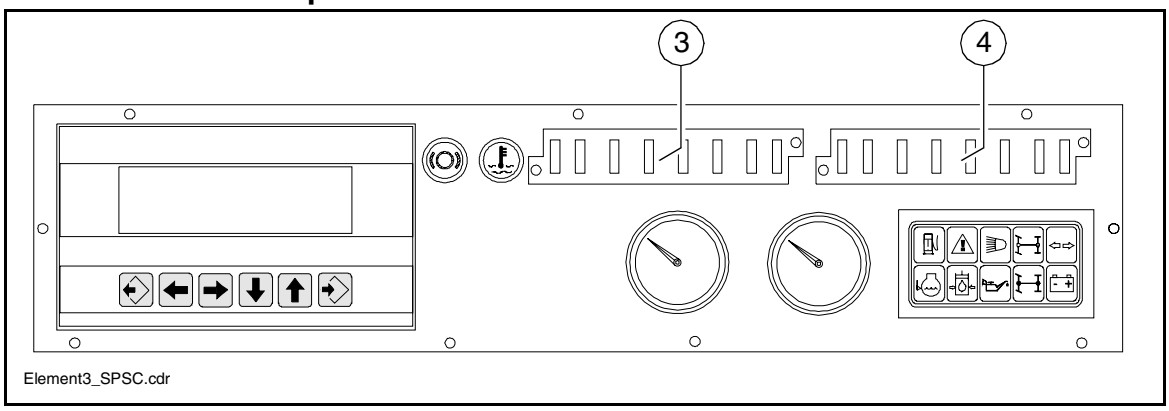
4.2 Fuses in main terminal box (next to fuel tank)

Fuse box (2)

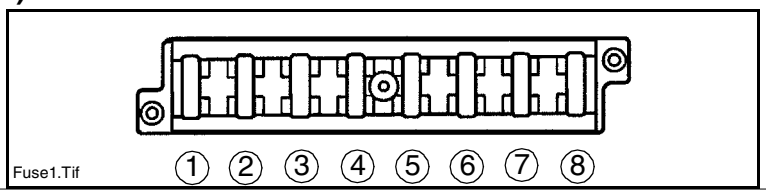


No.	F5.1 - F5.8	A
1.	Travel drive	15
2.	Sensors / BB3	1
3.	Starter	10
4.	Heater	10
5.	1st electrical outlet, rear left	10
6.	2nd electrical outlet, rear left / scale illumination	10
7.	1st electrical outlet, rear right	10
8.	2nd electrical outlet, rear right / scale illumination	10
No.	F7.1 - F7.8	A
1.	Slave 1	5
2.	Slave 2	5
3.	Slave 3	5
4.	Slave 4	5
5.	Slave 5	5
6.	Slave 6	5
No.	F44	A
1.	MC6 H/Travel drive	1
No.	F45	A
1.	Gateway / Engine control	5

4.3 Fuses on control panel

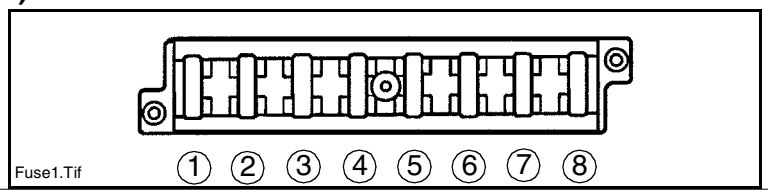


Fuse box (3)



No.	F1.1 - F1.8	A
1.	Combustion engine / EMERGENCY-STOP	5
2.	Indicator lamps	3
3.	Control module A1 / display / voltage converter / Conveyor controller	10
4.	Back-up fuse Slave 1-3	10
5.	Back-up fuse Slave 4-6	10
6.	Roof-mounted headlight (○)	10
7.	Remote control / slope / Back-up fuse for display ST/VIB	5
8.	EMR control unit	10

Fuse box (4)



No.	F2.1 - F2.8	A
1.	not in use	5
2.	Horn	3
3.	Windscreen wiper	3
4.	not in use	7,5
5.	Headlight, front right	3
6.	Headlamp, front left / fittings lighting	3
7.	not in use	3
8.	not in use	3