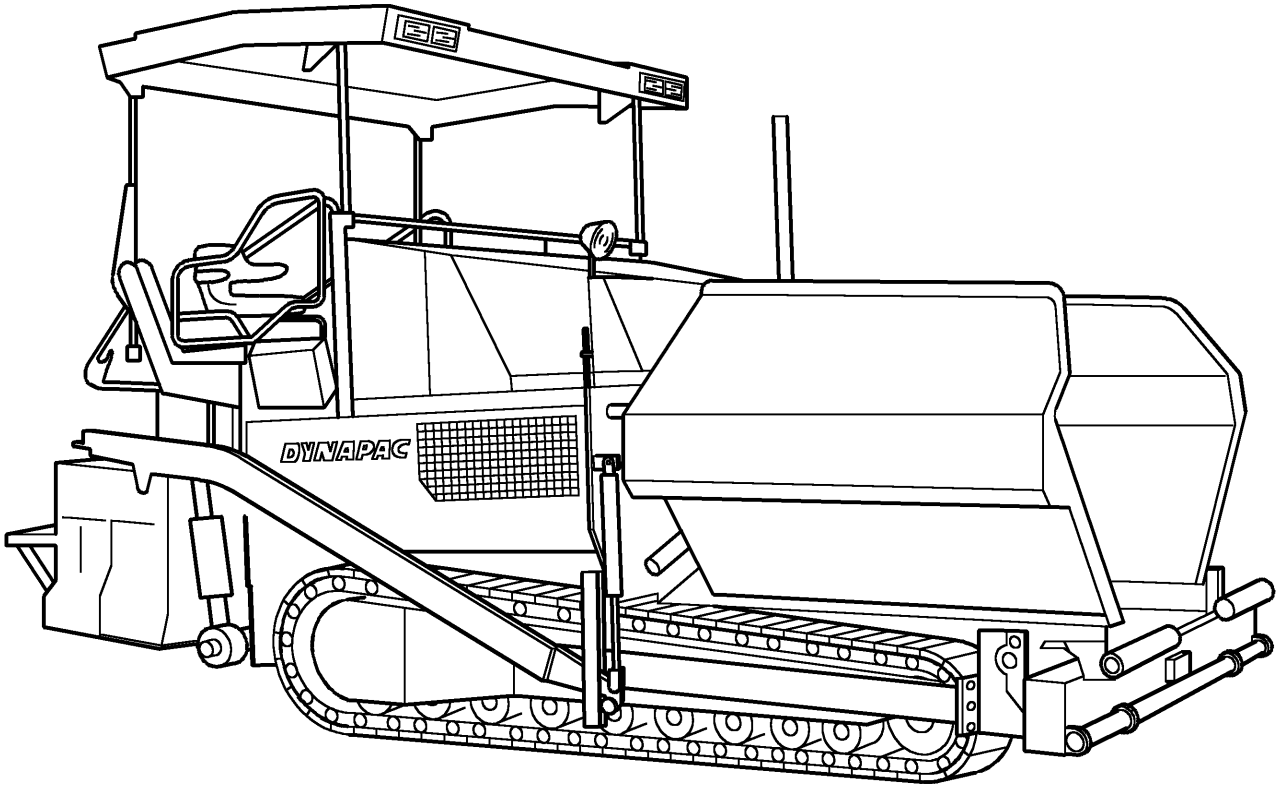
DYNAPAC



Operating instructions

GB

Paver finisher

F 181 C

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03-0506

637.....

VALUE
QUALITY
THE ORIGINAL

DYNAPAC

SPARE PARTS

Your Authorizied Dynapac Dealer:

Preface

Safe operation of the machine requires specific knowledge that is imparted by the present operating instructions. The information is provided in a concise, clearly structured form. The individual chapters are arranged in alphabetical order and every chapter starts with page 1. The individual pages are identified by the chapter letter and the page number. Example: Page B 2 is the second page of chapter B.

These operating instructions cover various machine options. Make sure that during operation and maintenance work the description appropriate to the machine option is used.

Safety instructions and important notes are identified by the following pictograms:

Precedes safety instructions that must be observed in order to prevent danger to personnel.

Precedes notes that must be observed to prevent damage to equipment.

Precedes general notes and explanations.

- ● Used to indicate standard equipment.
- ○ Used to indicate optional equipment.

In the interest of continued development, the manufacturer reserves the right to make changes to the machine (which will not, however, change the essential features of the type of machine described) without updating the present operating instructions at the same time.

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D Operation 1

A Correct use and application

The “Guidelines for the Correct Use and Application of Paver Finishers” compiled by Dynapac are included in the scope of delivery for the present machine. The guidelines are part of the present operating instructions and must always be heeded. National regulations are fully applicable.

The road construction machine described in the present operating instructions is a paver finisher that is suited for laying mixed materials, roll-down concrete or lean-mixed concrete, track-laying ballast and unbound mineral aggregates for foundations for paving.
The paver finisher must be used, operated and maintained according to the instructions given in the present operating instructions. Any other use is regarded as improper use and can cause injury to persons or damage to the paver finisher or other equipment or property.

Any use going beyond the range of applications described above is regarded as improper use and is expressly forbidden! Especially in those cases where the paver finisher is to be operated on inclines or where it is to be used for special purposes (construction of dumps, dams), it is absolutely necessary to contact the manufacturer.

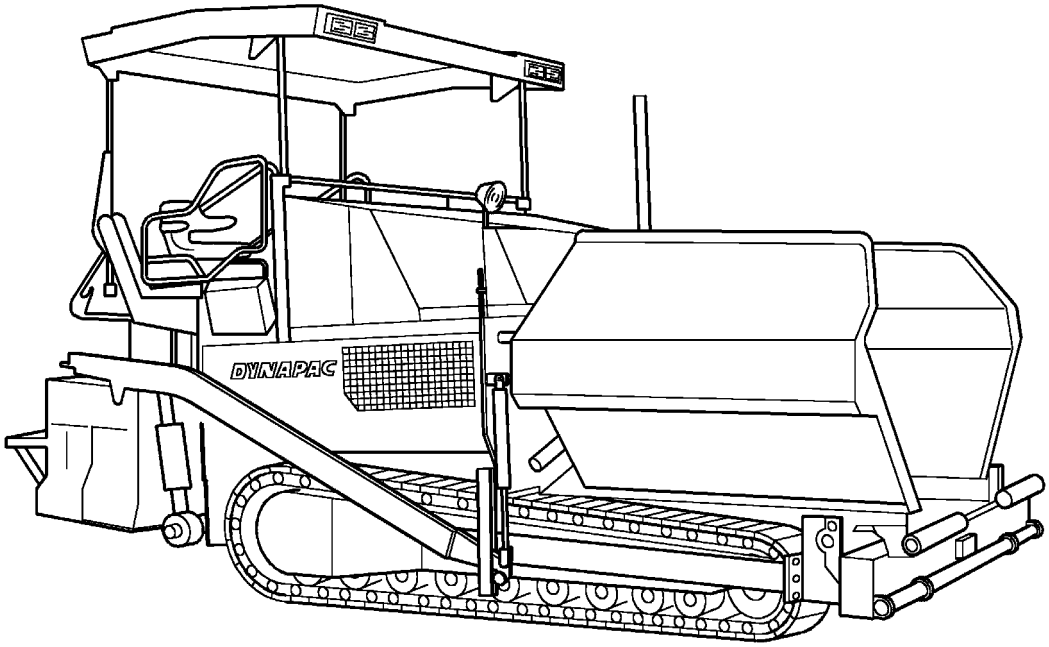
Duties of the user: A “user” within the meaning of the present operating instructions is defined as any natural or legal person who either uses the paver finisher himself, or on whose behalf it is used. In special cases (e.g. leasing or renting), the user is considered the person who, in accordance with existing contractual agreements between the owner and the user of the paver finisher, is charged with the observance of the operating duties.
The user must ensure that the paver finisher is only used in the stipulated manner and that all danger to life and limb of the operator, or third parties, is avoided. In addition to this, it must be ensured that the relevant accident prevention regulations and other safety-related provisions as well as the operating, servicing and maintenance guidelines are observed. The user must also ensure that all persons operating the paver finisher have read and understood the present operating instructions.

Mounting of attachments: The paver finisher must only be operated in conjunction with screeds that have been approved by the manufacturer. Mounting or installation of any attachments that will interfere with or supplement the functions of the paver finisher is permitted only after written approval by the manufacturer has been obtained. If necessary, the approval of local authorities has to be obtained.
Any approval obtained from local authorities does not, however, make the approval by the manufacturer unnecessary.

B Vehicle description

1 Application

The DYNAPAC F181 C is a caterpillar paver finisher that is used for laying bituminous mixed material, roll-down or lean-mixed concrete, track-laying ballast and unbound mineral aggregates for foundations for paving.



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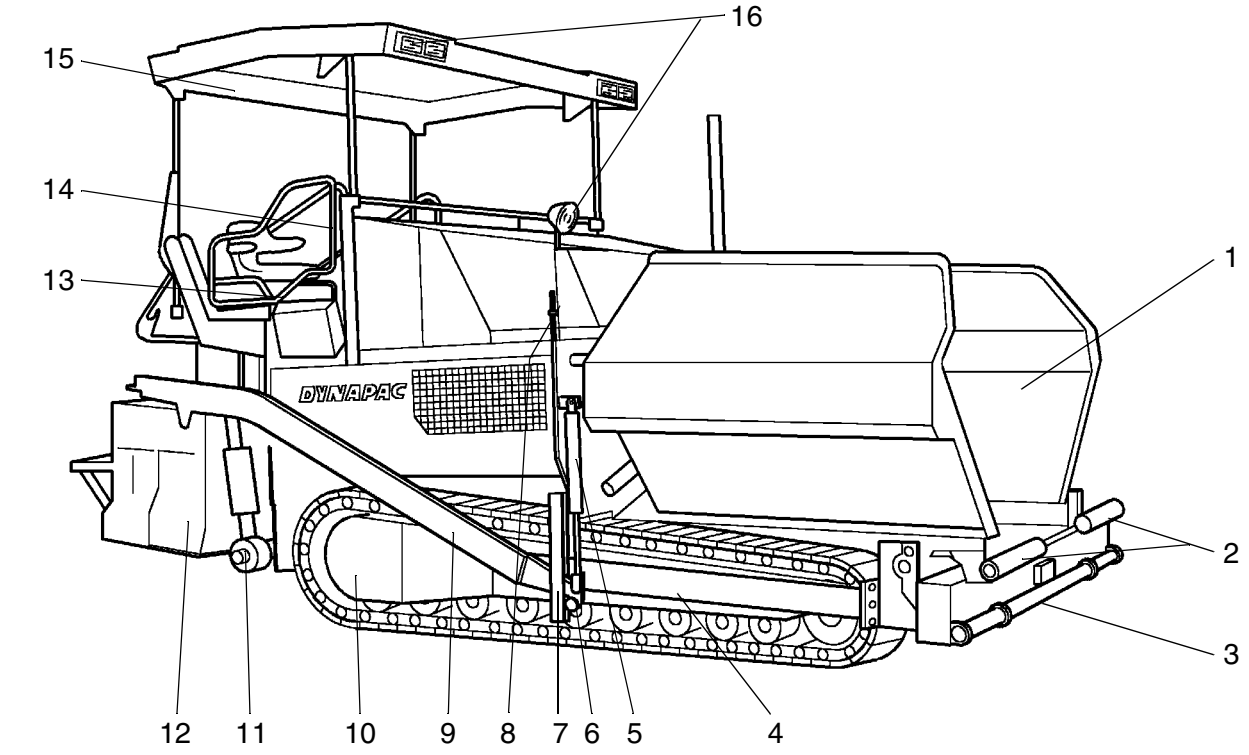
2 Description of assemblies and functions



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Item		Designation
1	●	Material compartment (hopper)
2	●	Truck push rollers
3	●	Tube for sensor rod (direction indicator) and holder for levelling shoe
4	●	Caterpillar drive
5	●	Levelling cylinder for paving thickness
6	●	Traction roller
7	●	Traction arm rail
8	●	Paving thickness indicator
9	●	Arm
10	●	Traction drive of the caterpillar drive
11	●	Auger
12	●	Screed
13	●	Operator’s platform
14	●	Operating panel (can be moved to either side)
15	○	Protective roof
16	○	Working lights

● = Standard equipment	○ = Optional equipment

2.1 Vehicle

Construction

The paver finisher has a welded steel frame on which the individual components are mounted.

The caterpillar drives (4) compensate uneven areas on the ground; the suspension of the attached screed (12) additionally helps to attain a high paving precision. The continuously adjustable hydrostatic traction drive (10) allows the speed of the paver finisher to be matched to all work conditions.

Operation of the paver finisher is faciliated by the automatic material handling system (1), the separate traction drives (10) and the clearly structured operating and control elements (15).

The following extra equipment (option) is available:

○ Automatic levelling/slope control system

○ Ultrasonic sensors for material transport (controller)

○ Additional cut-off shoe

○ Larger working widths

○ Automatic central lubrication system for the finisher and/or the screed

○ Protective roof (16)

○ Further equipment and upgrade options on request

Engine The paver finisher is equipped with a water-cooled 6-cylinder Cummins diesel engine. For further information please refer to the operating instructions for the engine.

Caterpillar drive: Both caterpillar drives are directly driven by separate drives without any drive chains that would require maintenance and servicing.
The tension of the caterpillar chains can be readjusted using tensioners.

Hydraulic system: The diesel engine drives the hydraulic pumps for all main drives of the paver finisher via the attached distribution gear and its auxiliary drive shafts.

Traction drive: The continuously adjustable traction drive pumps are connected to the traction motors by means of high pressure hydraulic hoses.
These oil motors drive the caterpillar chains via planetary gears that are mounted directly inside the drive wheels of the caterpillar chains.

Steering system/operator's platform: The independent hydrostatic traction drives allow the finisher to be turned on the spot.
The electronic synchronisation, controlled from the operating panel, ensures that the finisher runs straight ahead.
The operating panel can be secured in a position at the left-hand or the right-hand side of the paver finisher by means of a latch accessible from above.

Push roller cross bar: The push rollers for material trucks are fastened to a cross bar that is pivoted at its center.
This cross bar allows to compensate for different distances to the rear wheels of material trucks. The paver finisher thus deviates less from its course and paving in curves is made easier.

Material compartment (hopper): The hopper inlet is equipped with a conveyor system that empties the hopper and transfers the material to the auger.
The hopper can hold ca. 12.5 tons.
To facilitate emptying and to improve material transport, each of the lateral covers of the hopper can be hydraulically moved (option).

Material transfer: The paver finisher is equipped with two conveyors driven separately that transfer the material from the hopper to the augers.
By scanning the filling height during the paving procedure, the transfer amount or speed is regulated fully automatically.

Augers: The augers are driven and actuated independently from the conveyors. The left-hand and the right hand half of the auger can be controlled separately. The drive system is fully hydraulic.
The conveying direction can be changed towards the center or towards the outside. This ensures that there is always a sufficient supply with material even if an excessive amount of material is required at one side. The auger speed is continuously controlled by sensors that monitor the material flow.

Height adjustment and extension of augers: Height adjustment and extension of augers ensure optimum adaptation to a wide range of paving thicknesses and widths.

The basic configuration allows the height to be adjusted by attaching chains to the side arms and by actuating the hydraulic screed lifting device.
When using ratchets for height adjustment (option), barrel nuts at the guide supports in the rear wall are used to adjust the height.
Another variant allows the height to be regulated at the control panel by means of hydraulic cylinders (option).

Auger segments of different lengths can be attached to easily adapt to the different paving widths.

Levelling system/slope control system The slope control system (option) allows the traction point to be regulated at the left-hand or the right-hand side with a defined difference to the opposite side.
To determine the actual value, the two traction arms are linked with a slope control rod.

The slope control system always operates in conjunction with the screed height adjustment of the opposite side.

By adjusting the height of the traction point of the arm (traction roller), the paving height of the material or the laying height of the screed can be controlled.
Actuation occurs electro-hydraulically on both sides and can be controlled manually by means of toggle switches or automatically by means of an electronic grade control system.

Screed lifting device: The screed lifting device is used to lift the screed during transportation. Lifting occurs electro-hydraulically on both sides by actuating the hydraulic cylinders on the arms and is controlled by means of toggle switches on the operating panel.

Automatic screed stop and screed charging/relieving device: The automatic screed stop prevents the formation screed marks caused by a stopped screed. When the paver finisher stops (during a truck change), the control valves set to the floating position are shut and locked, thus preventing the screed from sinking during the stop.

The screed relieving device puts a higher load on the chassis, thus increasing the traction. Activating the screed charging device can improve the compacting result under certain conditions.

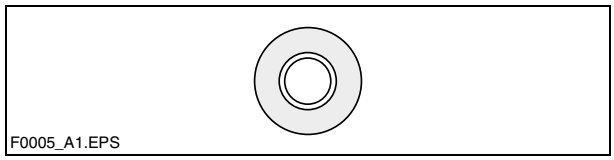
3 Safety devices

Safe operation is only possible when all operating and control elements are functioning correctly and when all safety devices are in position.

☞ Check the function of these devices at regular intervals.
(see chapter D, section 2.1).

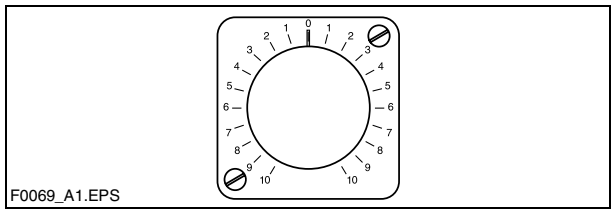
3.1 Emergency stop button

- on the operating panel
- on the two remote control units (option)



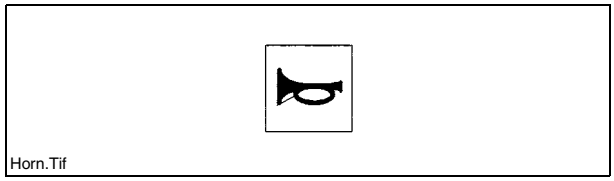
⚠ Pressing the emergency stop button switches off the engine, the drives and the steering system. Corrective measures that might be necessary (anti-collision maneuvers, lifting the screed, etc.) are not possible in this case! Danger!

3.2 Steering system

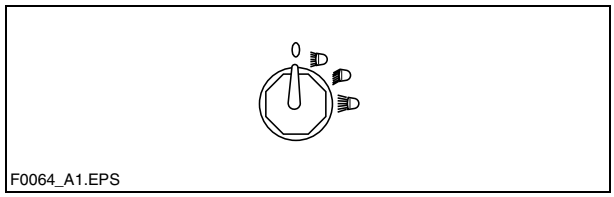


3.3 Horn

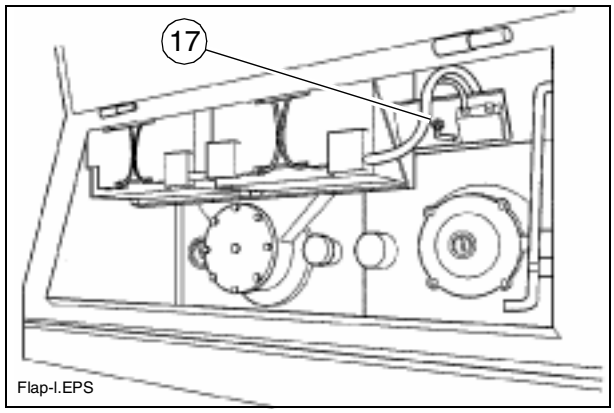
- on the operating panel
- on the two remote control units (option)



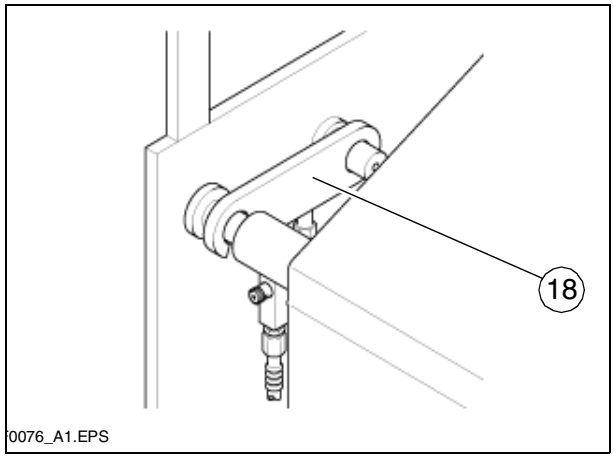
3.4 Ignition key / lights



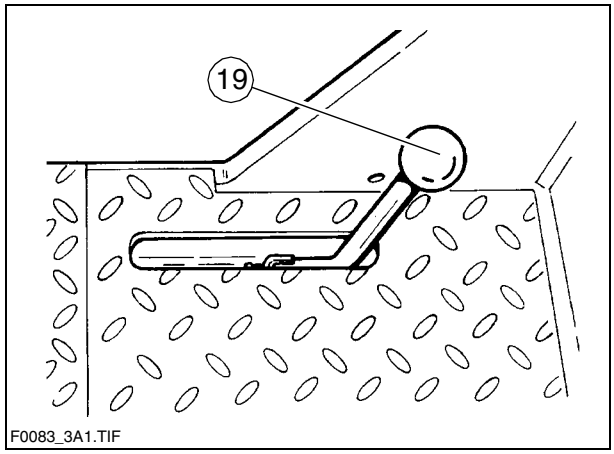
3.5 **Main switch** (17)



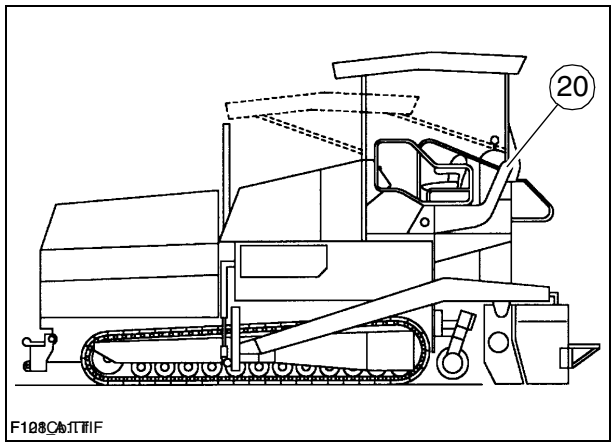
3.6 **Hopper transport safeguards** (18)

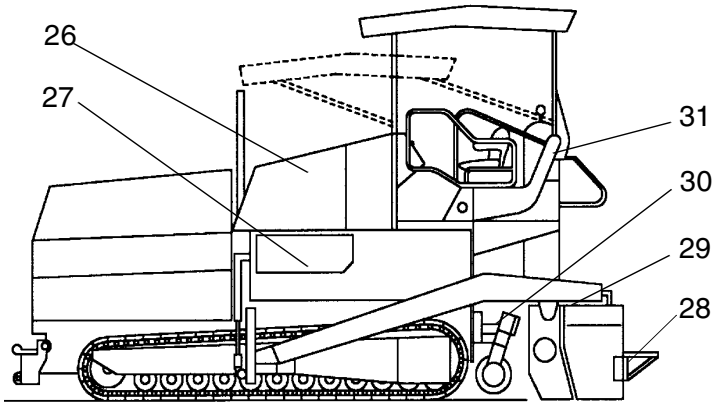


3.7 **Screed transport safeguard** (19)



3.8 **Latch for protective roof** (20)





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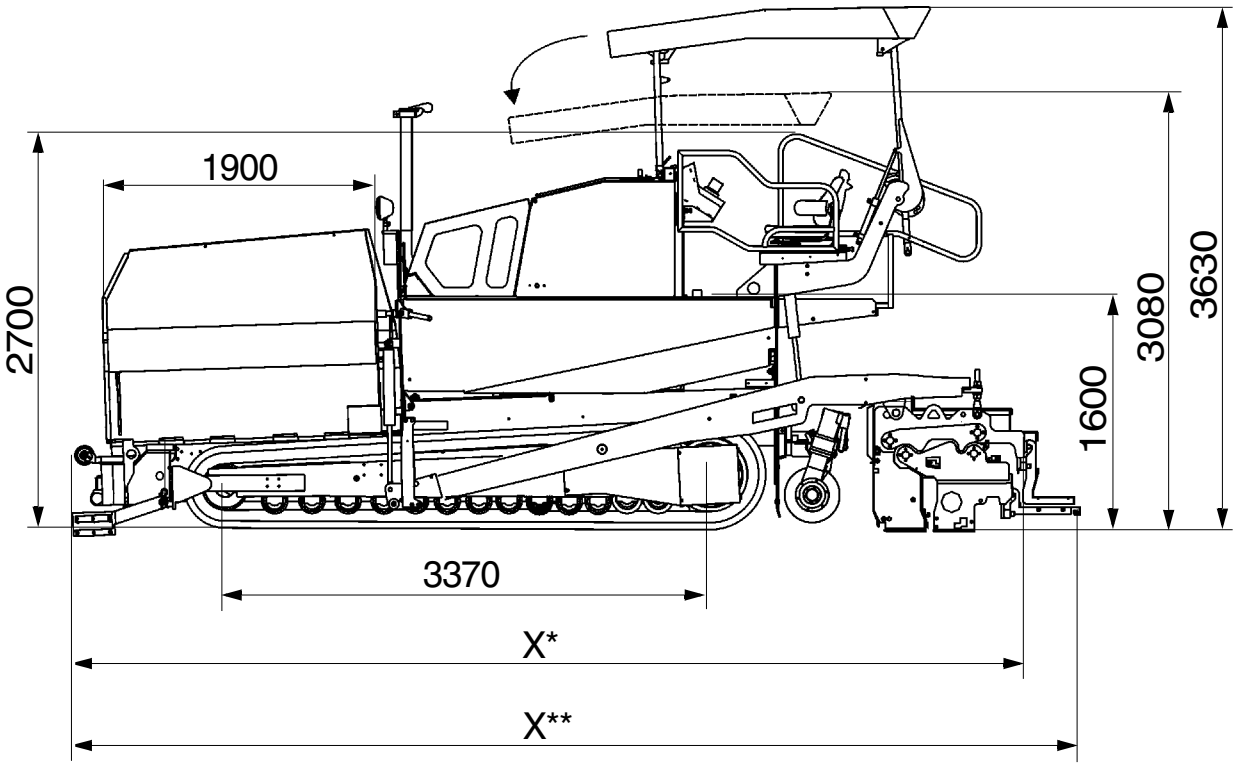
Item	Designation
26	Engine hood
27	Lateral flaps
28	Walkway
29	Screed coverings
30	Hazard warning lights of the screed
31	Auger covers

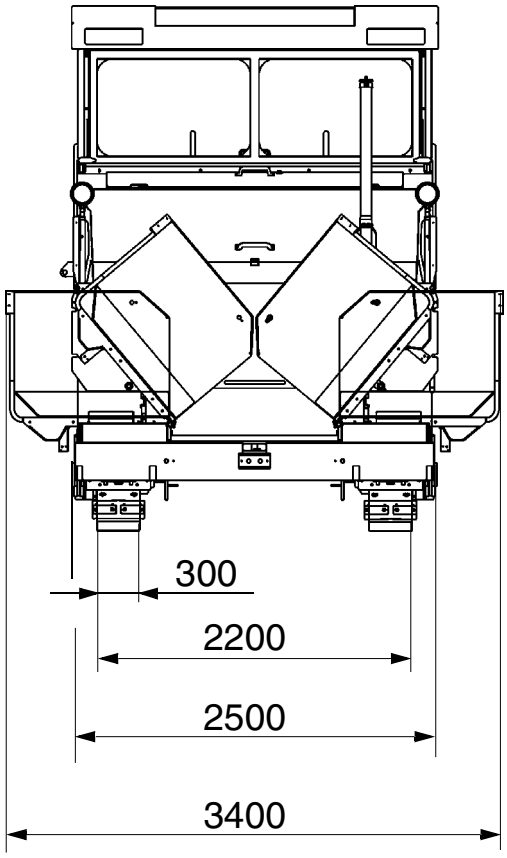
Accessories:

- Wedges
- Warning triangle (○)
- First-aid kit (○)

4 Technical data, standard configuration

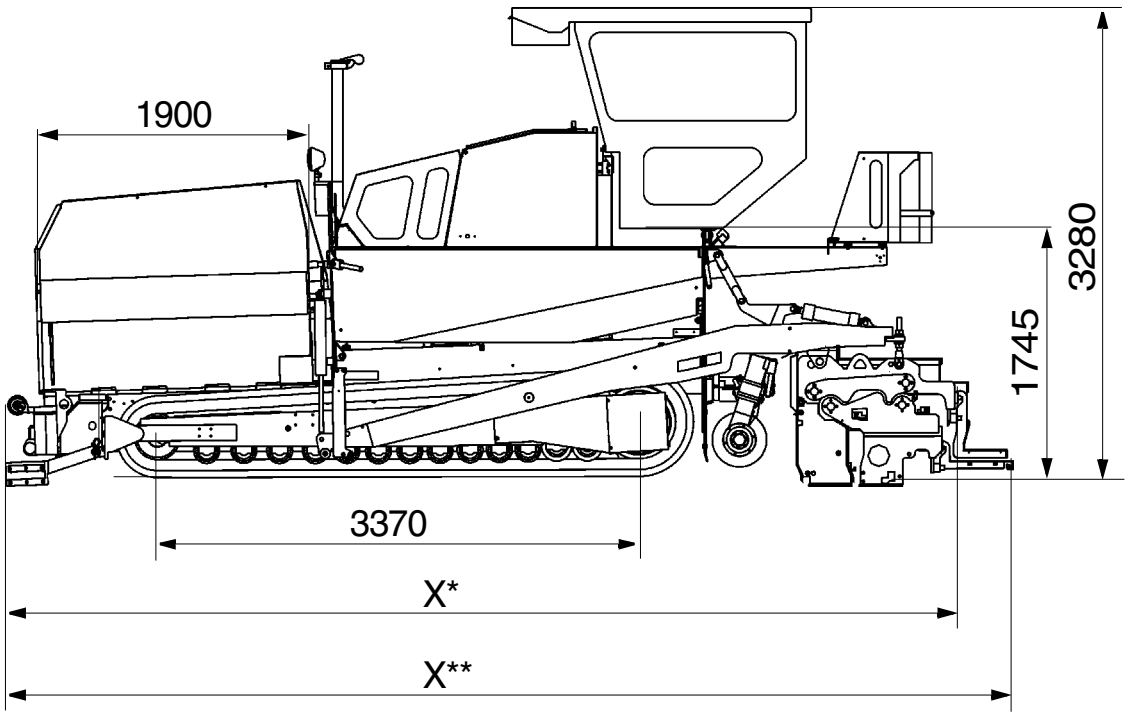
Dimensions (all dimensions in mm)

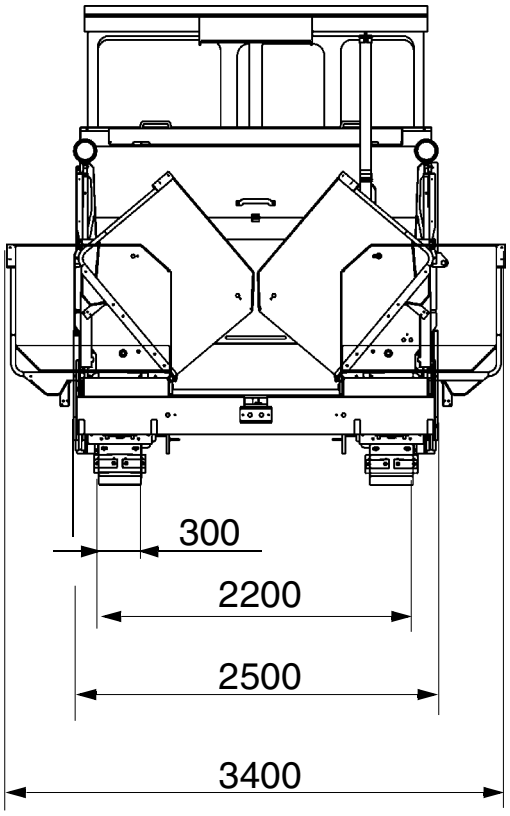




637_side.bmp,637_front.bmp

* VB805 = 6880
* VB850 = 6640
* SB1250 = 6590
** VB850 = 7200
** VB850 = 6910
** SB1250 = 6930





* VB805 = 6880
* VB850 = 6640
* SB1250 = 6590
** VB850 = 7200
** VB850 = 6910
** SB1250 = 6930

637_side_cab.bmp,637_front_cab.bmp

☞ For the technical data of the screed, see the operating instructions of the screed.

4.1 **Weights** (all weights in t)

Paver finisher without screed	ca. 18.15
Paver finisher with screed: - VB 850 T/TV - VB 851 T/TV - VB 805 T/TV - VB 805 TV Plus - VB 1000 T/TV - VB 1105 T/TV - VB 1105 TV Plus - SB 1250 T/TV	 ca. 21.40 ca. 21.40 ca. 21.47 ca. 21.50 ca. 21.90 ca. 21.72 ca. 21.92 ca. 20.55
With extensions for max. working width additionally max.	ca. 1.4
With filled hopper additionally max.	ca. 12.5

☞ For the weights of the screed and the screed attachments, see the operating instructions for the screed.

4.2 Performance data

Screed used	Basic width (without cut-off shoes)	minimum paving width (with cut-off shoe)	continuously hydraulically adjustable up to	Maximum paving widths (with attachments)	
VB 850 T/TV	2,50	2,00	4,75	8,50	m
VB 851 T/TV	2,50	2,00	4,75	8,50	m
VB 805 T/TV	2,50	2,00	5,00	8,00	m
VB 805 TV Plus	2,50	2,00	5,00	8,00	m
VB 1000 T/TV	3,00	2,50	5,75	9,00	m
VB 1105 T/TV	3,00	2,50	6,00	9,00	m
VB 1105 T/TV Plus	3,00	2,50	6,00	8,20	m
SB 1250 T/TV	3,00	2,10	-	12,50	m

Transport speed	0 - 3.8	km/h
Working speed	0 - 20	m/min
Layer thickness	0 - 300	mm
Max. grain size	40	mm
Theoretical paving performance	800	t/h

4.3 Traction drive/chassis

Drive	Hydrostatic drive, continuously controllable
Caterpillar drive	Two separately driven caterpillar drives with rubber grouser chains.
Turning capacity	Turning on the spot
Speed	See above

4.4 Engine

Make/type	Cummins QSB 6.7 C205
Model	6-cylinder diesel engine (water-cooled)
Performance	153 KW / 208 PS (@ 1800 rpm)
Volume of fuel tank	(see chapter F)

4.5 Hydraulic system

Pressure generation	Hydraulic pumps via distribution gear (directly flanged to the engine)
Pressure distribution	Hydraulic circuits for: - Traction drive - Material conveying and distribution - Screed lifting drives for tamper / vibration (option) - Cylinder actuators for steering, hopper, levelling, screed lifting, extending/retracting screed parts, auger lift (option)
Hydraulic oil reservoir - volume	see chapter F

4.6 Material compartment (hopper)

Volume	ca. 5.7 m^3 = ca. 12.5 t
Minimum inlet height, center	480 mm
Minimum inlet height, outside	600 mm

4.7 Material conveying

Conveyors	Left and right auger separately controllable
- Drive	Hydrostatic, continuously controllable
- Conveying volume controller	Fully automatic via configurable switching points

4.8 Material distribution

Augers	Left and right auger separately controllable
- Drive	Hydrostatic external drive, continuously controllable independent from the conveyor Auger halves can be switched to opposite directions
- Conveying volume controller	Fully automatic via configurable switching points
- Auger height adjustment	mechanically via chain - mechanically (option) - hydraulically (option)
- Auger extension	With extension parts (see auger extension chart)

4.9 Screed lifting device

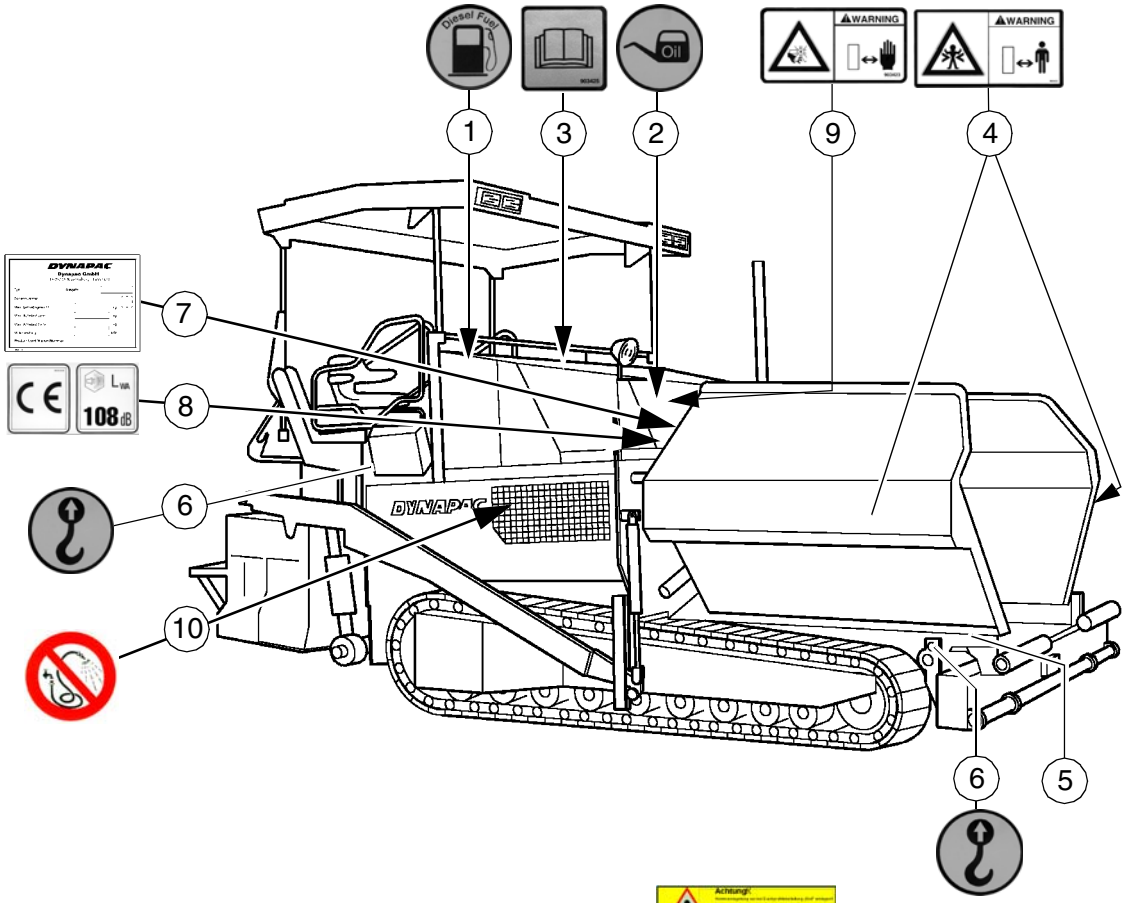
Special functions	At standstill: - Screed stop - Screed stop with pretensioning (max. pressure 50 bar) During paving: - Screed charging - Screed relieving (max. pressure 50 bar)
- Levelling system	Mechanical grade control, optional systems with and without slope control

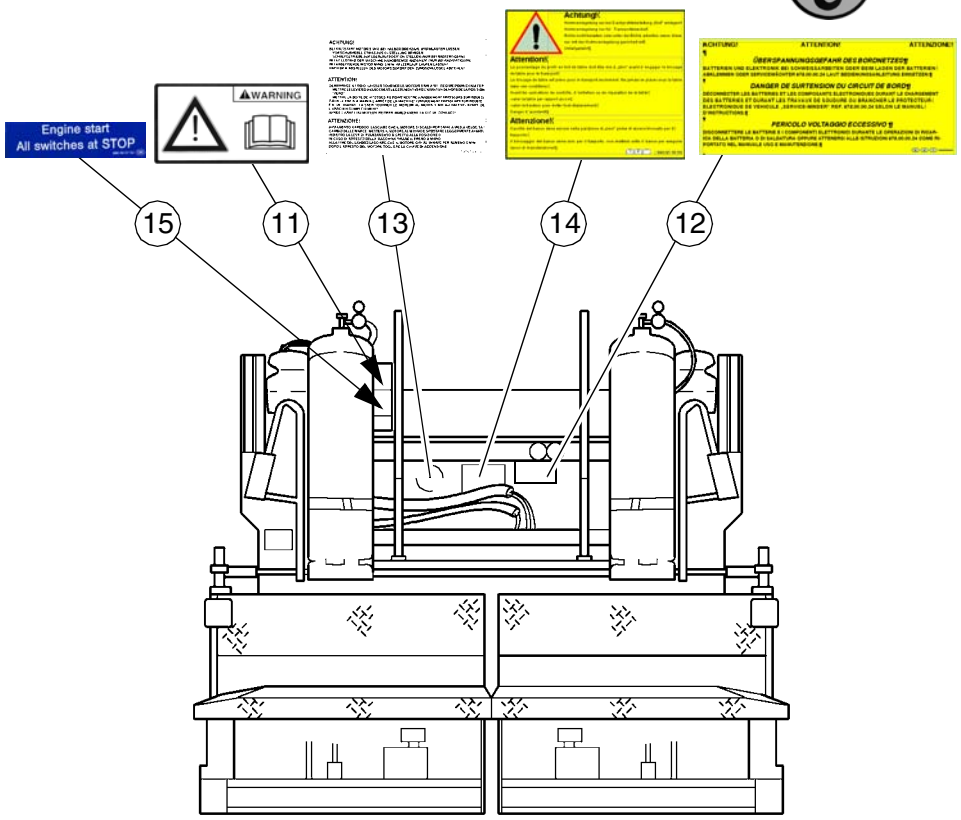
4.10 Electrical system

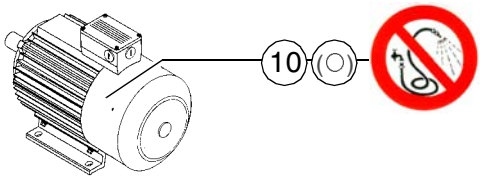
On-board voltage	24 V
- Batteries	2 x 12 V, 88 Ah
- Alternator (○)	17 kVA / 400 V
- Fuses	see chapter D, section 3

☞ For the filling volumes of lubricating and operating agents, see chapter F,

5 Location of instruction labels and identification plates







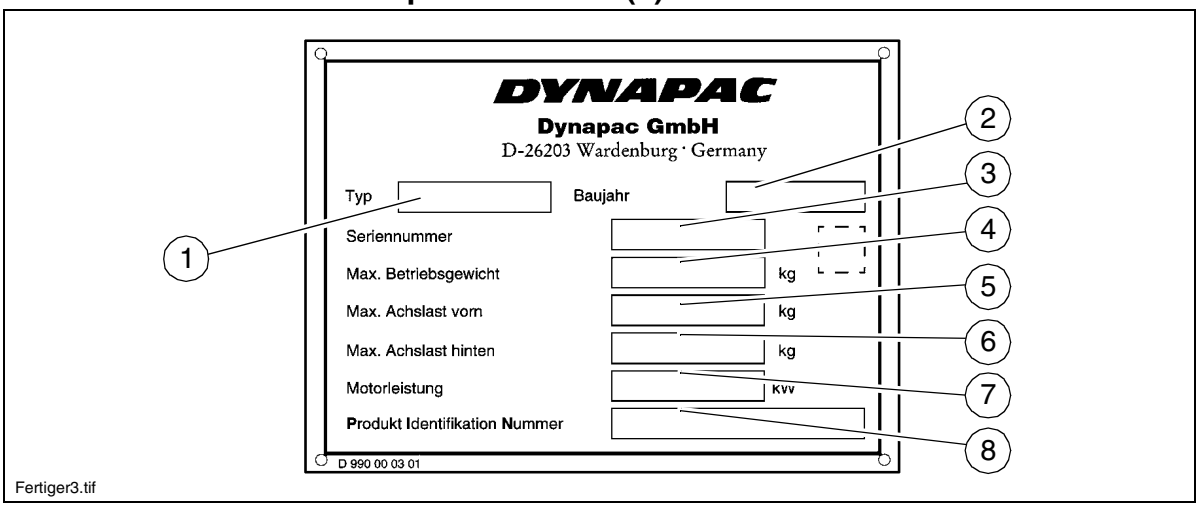
Item	Designation
1	Label ”Filler neck for diesel fuel” *
2	Label ”Filler neck for engine oil” *
3	Label „Heed the operating instructions!“
4	Warning label ”Danger of squeezing!” **
5	Punched vehicle identification number
6	Label ”Securing or fixing points for crane transportation”**
7	Paver finisher identification label
8	"CE + noise level" plate (O)
9	"Fan danger!" warning plate
10	"Spraying with water prohibited" plate
11	Label „Heed the operating instructions!“***
12	Label ”High voltage!”
13	Label ”Operating instructions for the engine”
14	"Crossbeam lock" plate
15	"All switches to STOP" plate ***

* Labels are located beneath the engine hood / maintenance flap

** Labels are located on both sides of the paver finisher

*** Label is located on the operating panel, above the steering wheel

5.1 Identification label for the paver finisher (7)



Item	Designation
1	Paver finisher type (e.g. F 181 C)
2	Year of manufacture
3	Serial number of the paver finisher series
4	Max. permissible operating weight, incl. all attachments, in kg
5	Max. permissible load on the front axle, in kg
6	Max. permissible load on the rear axle, in kg
7	Rated performance in kW
8	Product identification number (PIN)

☞ The punched vehicle identification number on the paver finisher must match the product identification number (8).

6 EN standards

6.1 Continuous sound level

⚠ The operator always must use ear protection. The emission value at the ear of the driver varies depending on the materials used for paving and may even rise above 85 dB (A). If no ear protection devices are used, hearing can be impaired.
The noise emission level of the finisher has been measured under free-field conditions according to prEN 500-6, dated March, 1997, and ISO 4872 at a normal engine speed of 2100 rpm.

Sound pressure level at the operator's position (at the height of the head): L_{AF} = 82,6 dB(A)

Sound capacity level: L_{WA} = 109,0 dB(A)

Sound pressure level at the machine

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

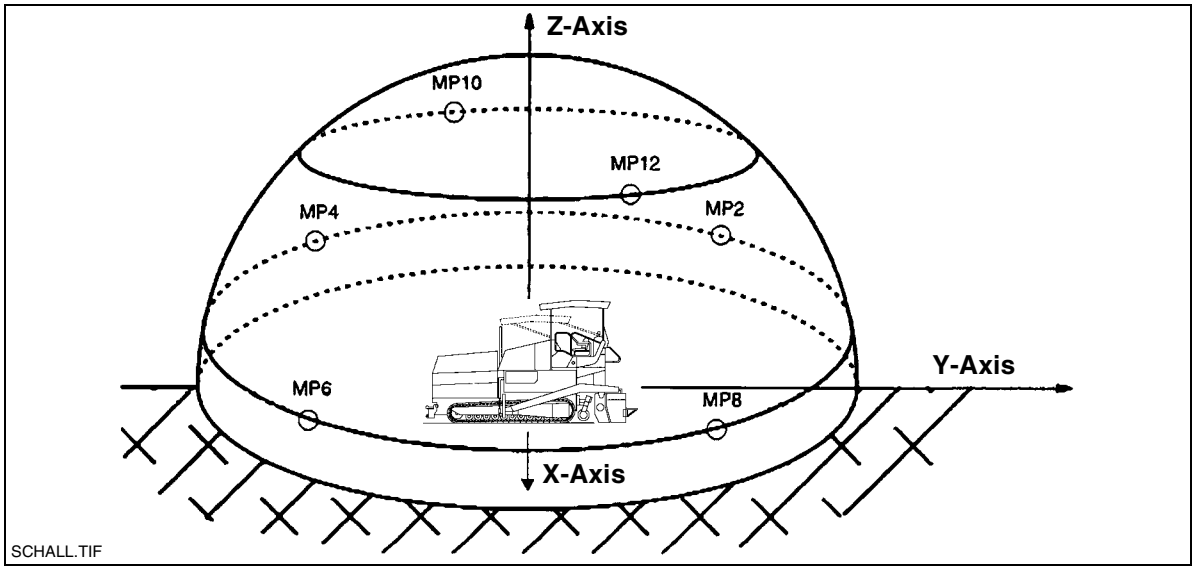
6.2 Operating conditions during measurement

The diesel engine was running at maximum speed. The screed was arrested in the transportation position. Conveyors, augers, tampers and vibration were running at least at 50% of the maximum speed.

6.3 Measuring point configuration

Semi spherical measuring surface with a radius of 16 m. The machine was at the center. The measuring points had been assigned the following coordinates

	Measuring points 2, 4, 6, 8			**Measuring points 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



6.4 Vibration acting on the entire body

When the machine is used properly, the weighted effective acceleration values at the driver's seat of $a_w = 0.5\ m/s^2$ according to prEN 1032-1995 are not exceeded.

6.5 Vibrations acting on hands and arms

When the machine is used properly, the weighted effective acceleration values at the driver's seat of $a_{hw} = 2.5\ m/s^2$ according to prEN 1033-1995 are not exceeded.

6.6 Electromagnetic compatibility (EMC)

The following limit values are observed according to the stipulations of the EMC guideline 89/336/EEC/08.95:

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

- interference immunity against electrostatic discharge according to DIN EN 61000-4-2/03.96 (ESD):
  The paver finisher did not show any discernible reactions to contact discharges of ± 4 KV and to air discharges of ± 8 KV.
  The modifications according to test criterion „A" are being met, i.e. the paver finisher continues to work without malfunction during the test.

☞ Electrical or electronic components and their arrangement may only be modified after written approval by the manufacturer has been obtained.

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 (see chapter E, section 2.5).

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!

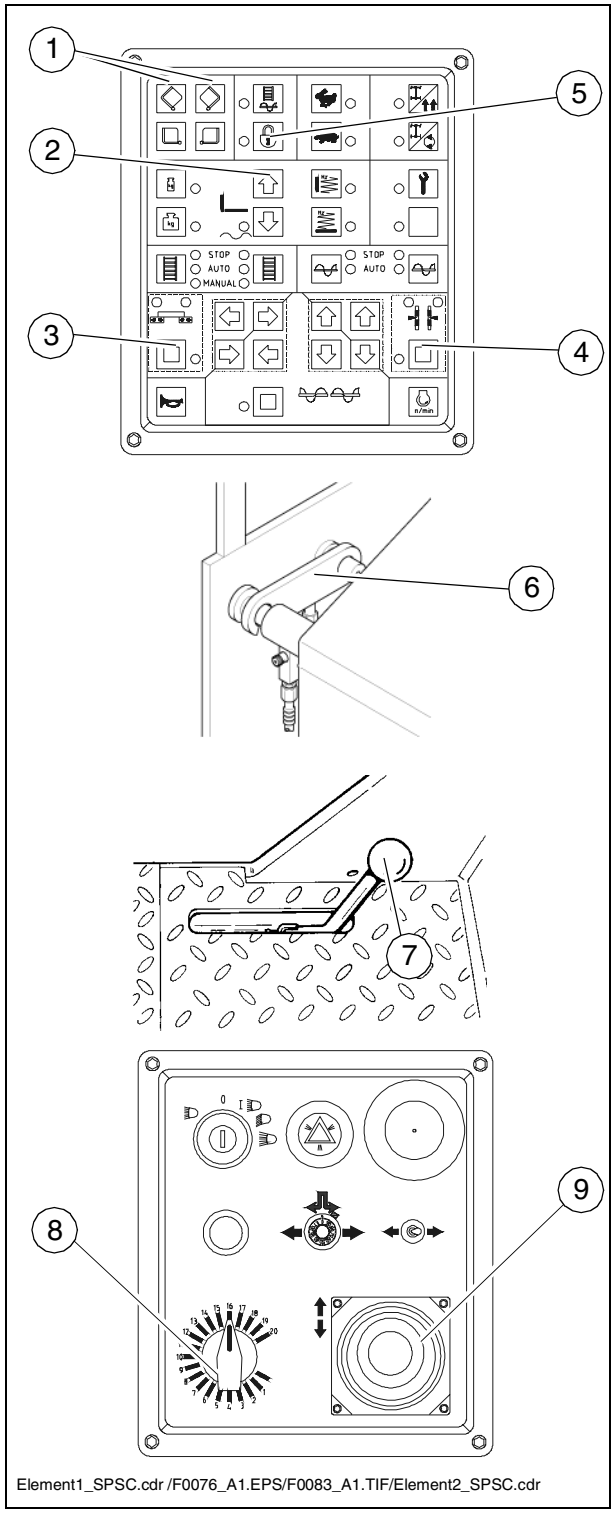
If necessary, the operator must be assisted by a second person when driving on public roads – especially at road crossings and junctions.

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.
- Removeallprotrudingorloosepartsfrom 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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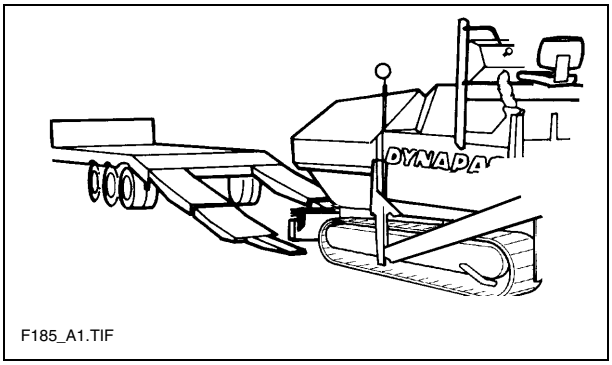
2.2 Driving onto the low-bed trailer

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.



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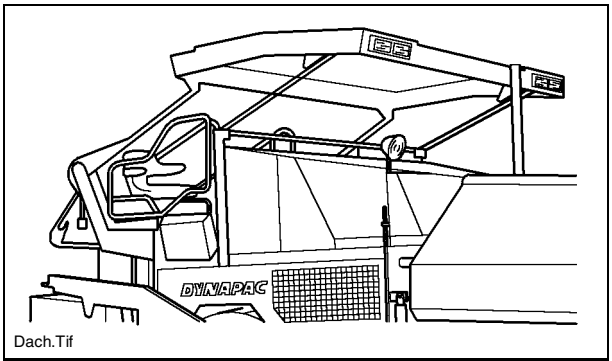

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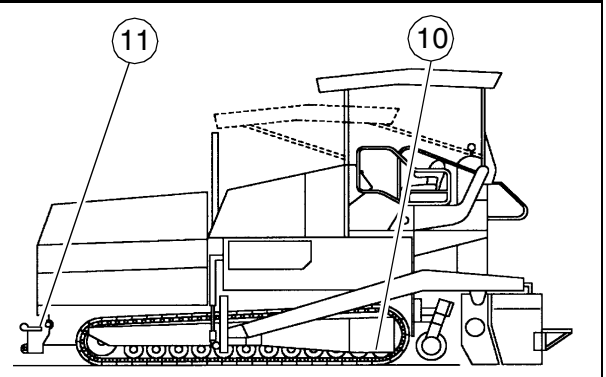
- Secure the paver finisher to the low-bed trailer:
  - Use only appropriate, approved attachment devices.
  - Use the four securing points provided (10,11).



F121b.Tif

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

2.3 After transportation

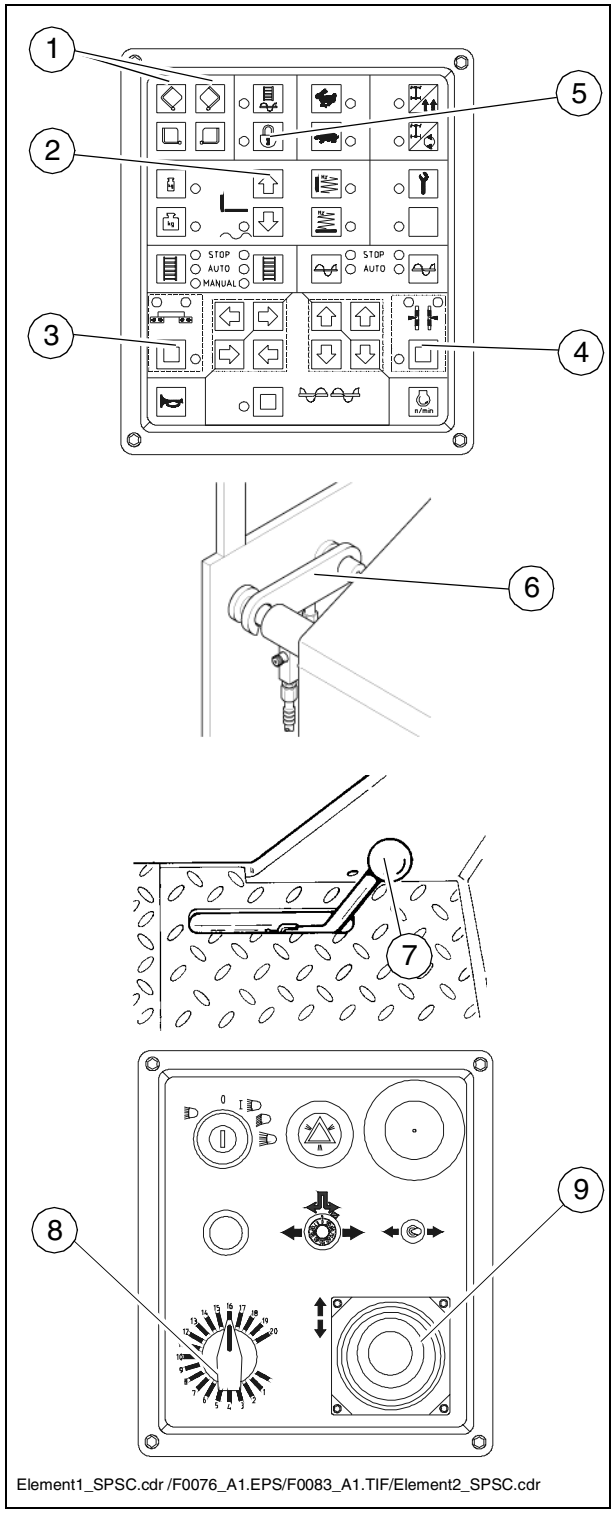
- Remove the attachment devices.
- Swing up the protective roof. Take out the bolts, push the protective roof forward to raise it and insert the bolts to lock it again.
- Mount the protective tarpaulin if it has been removed.
- Lift the screed to the transportation position and lock it.
- Start the engine 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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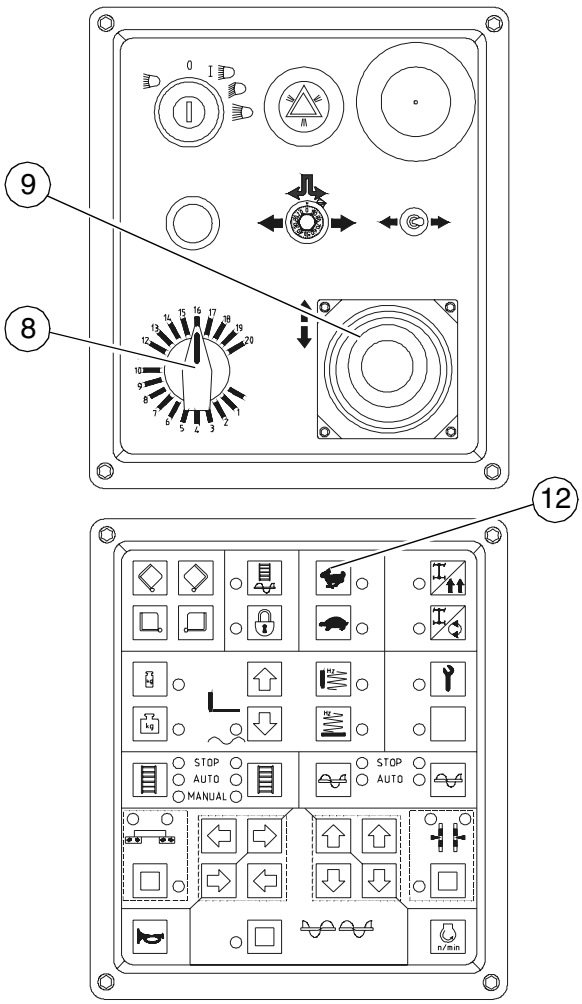
3.2 Driving on public roads

- 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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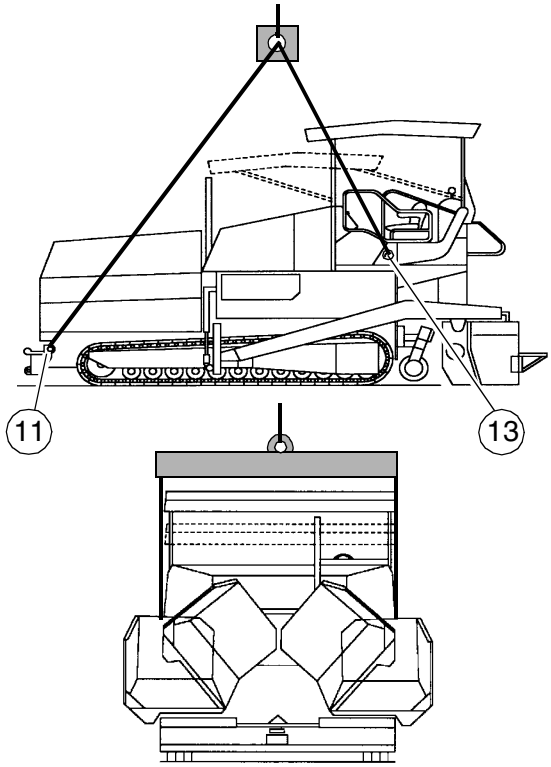
4 Loading by crane

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

☞ Four lifting eyes (11,13) 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 (11,13).



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

5 Crawlers

A hydraulic cylinder can be used to raise or lower the front section of the entire vehicle frame for the following purposes:

- Adapting to the chute height of the mixed materials transporter and/or to its tyre size
- To approach the trailer

Danger of squeezing! Close the hopper before actuating the shut-off cocks.
Insert the hopper transport safeguard!

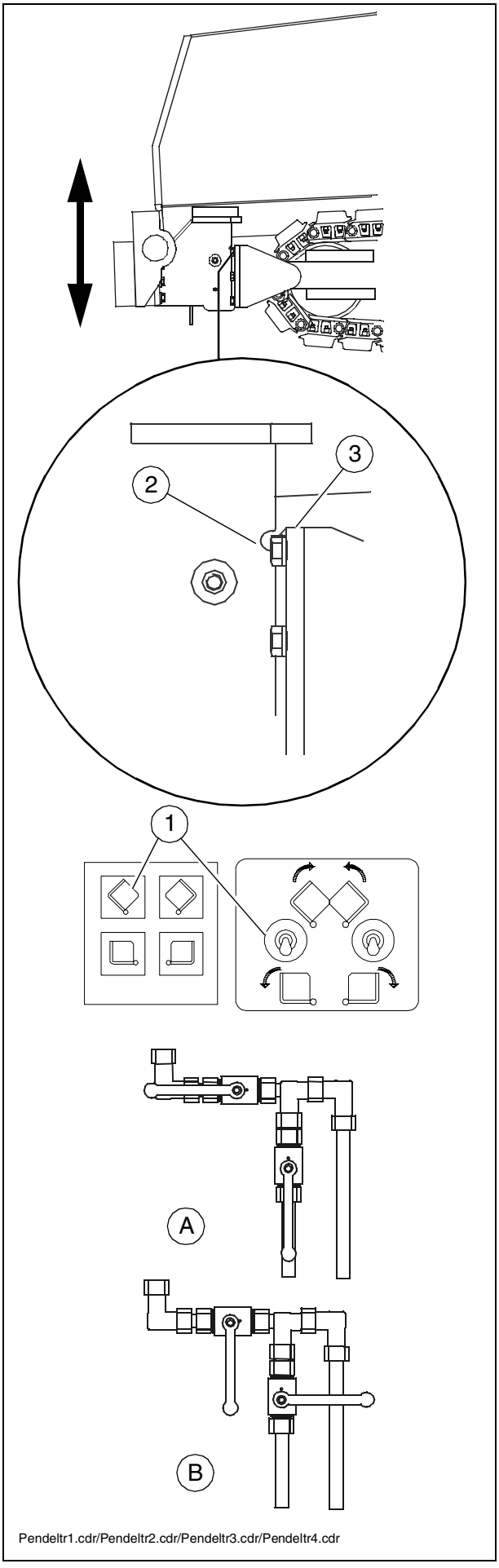
Raising the frame:

- Close hopper by pressing switch/button (1) and insert hopper transport safeguard.
- Open both shut-off cocks (A) and press switch / button (1) until the height required is reached.
- Close both shut-off cocks (B).

Lowering the frame

- Close hopper by pressing switch / button (1) and insert hopper transport safeguard.
- Open both shut-off cocks (A) until the frame has lowered to the height required.
- Close both shut-off cocks (B).

The neutral position is reached when the notch (2) of the guide frame is at the upper edge of the guide plate (3).



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6 Towing

Heed all regulations and apply all safety measures applicable for towing heavy construction machines.

The towing vehicle must be capable of securing the paver finisher, even on slopes.

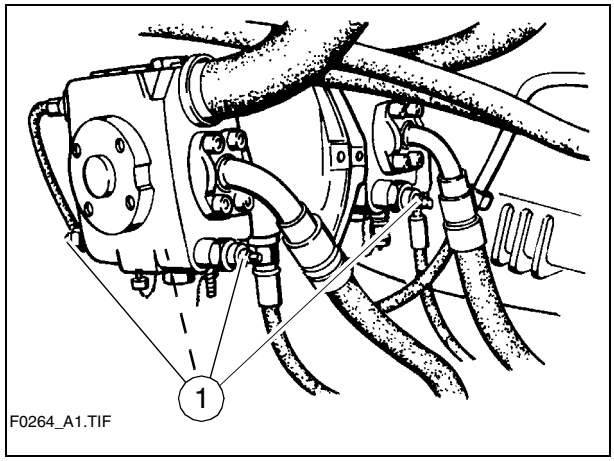
Use only approved tow bars!

If necessary, remove nay attachments and accessories from the paver finisher and the screed until the basic width has been attained.

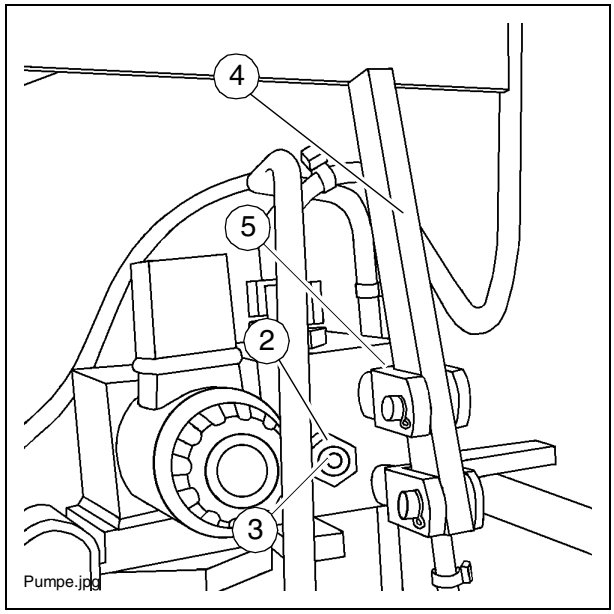
A hand pump is located behind the left lateral flap that must be actuated to be able to tow the machine.
Pressure for releasing the traction system brakes is built up with the hand pump.

Only release the traction system brakes when the machine is sufficiently secured against accidental rolling or is already properly connected to the towing vehicle.

- The high pressure cartridges (4 items) (1) of the propulsion drive pump must all be unscrewed by around 3 turns.



- Release lock nut (2), screw threaded dowel (3) into pump as far as possible and secure with lock nut.
- Actuate lever (4) of hand pump until sufficient pressure has been built up and traction system brakes have been released.

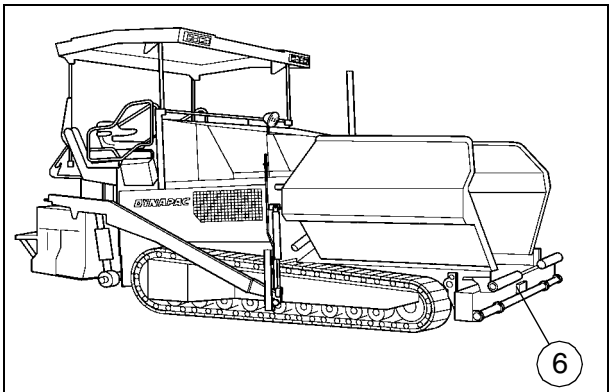


Now carefully and slowly tow the paver finisher out of the construction area.

Always only tow the shortest distance to the means of transport or the next parking possibility.

Following towing, unscrew the threaded dowel (3) a few turns again and lock with the lock nut (2).
The high pressure cartridges (1) have to be fully screwed back in to make the machine usable again after repairs.
The traction system brakes are no reactivated and the machine is secured against rolling.
The pump lever should be locked when the upper cylinder (5) is

- Attach the tow bar to the coupling (6) located in the bumper.
- Carefully and slowly tow the paver finisher out of the construction site or the danger area (use the shortest possible distance).



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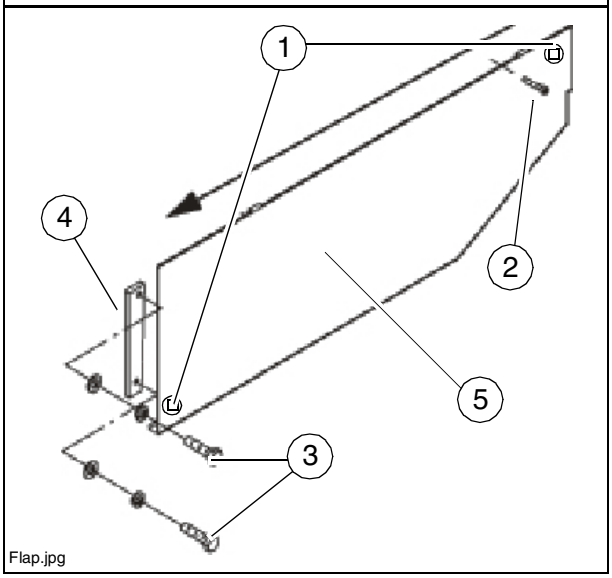
7 Removing lateral flaps with screed raised.

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.



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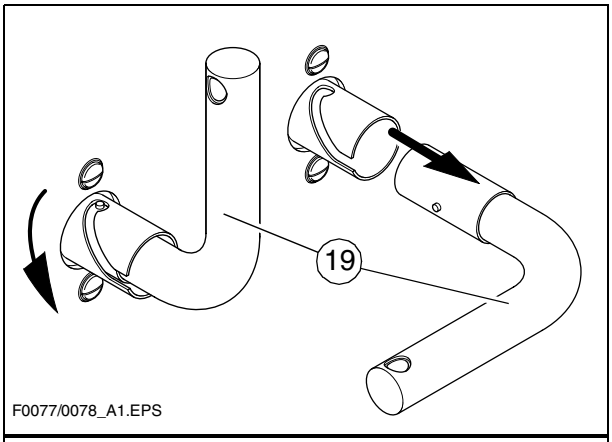
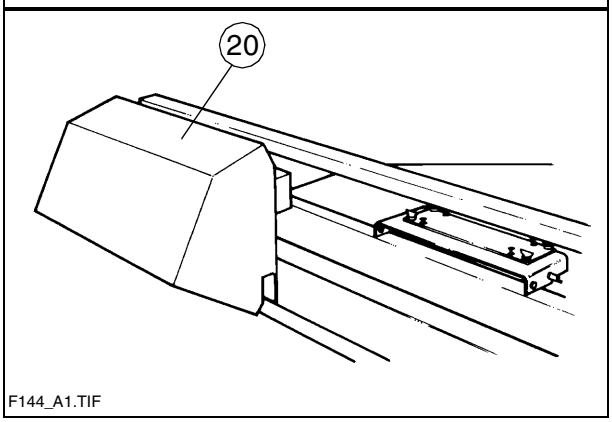
8 Safely parking the vehicle

⚠ 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.

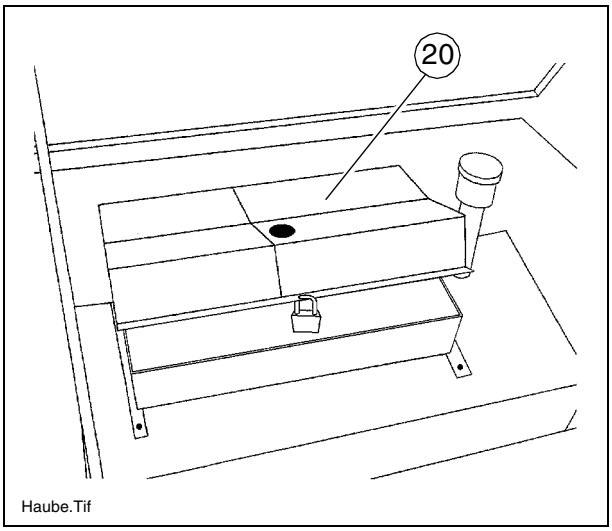
- Pull off the ignition key and the main switch (19) and take it with you – do not hide them somewhere on the machine.



- 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!

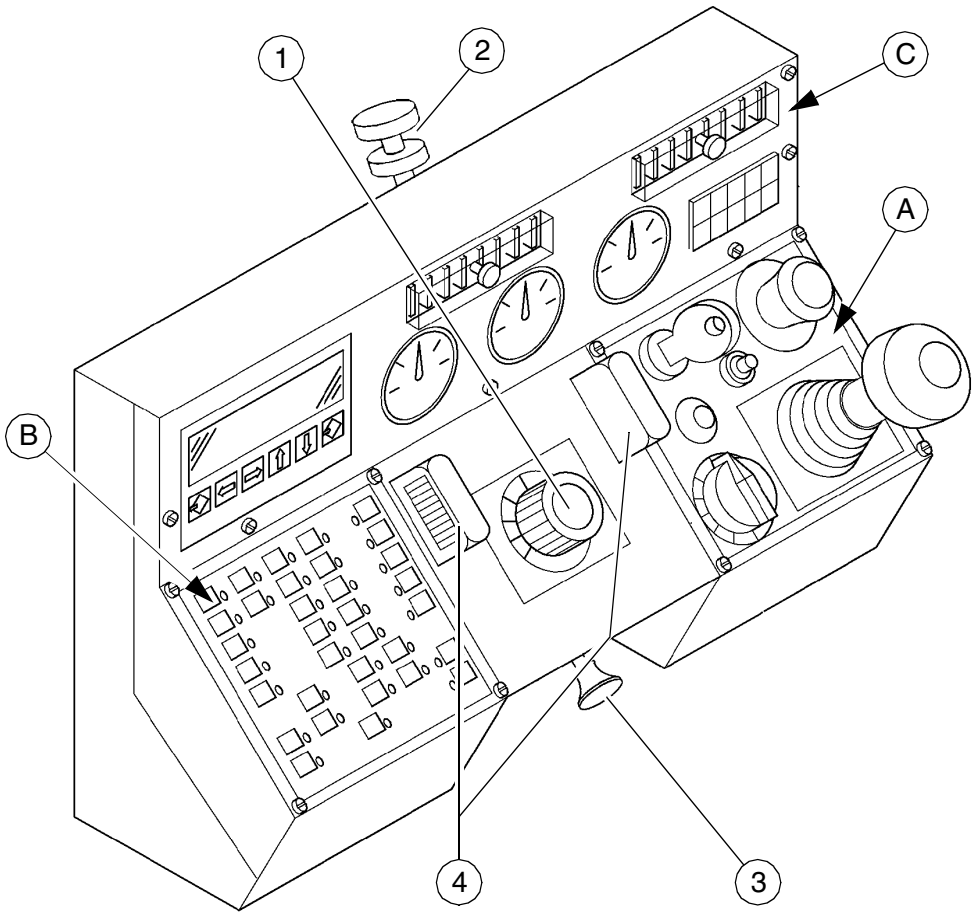
Never crawl into the auger tunnel or step into the hopper or onto the conveyor. Danger to life and limb!

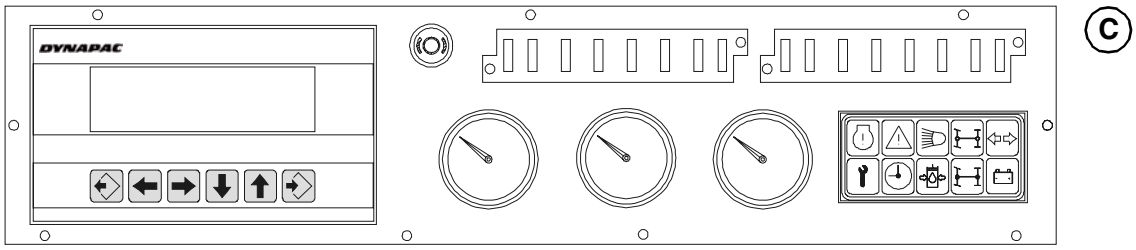
- Always make sure during operation that no-one is endangered by the machine!
- Ensure that all protective covers and hoods are fitted and secured accordingly!
- When damages are detected, eliminate them immediately! Operation must not be continued when the machine is defective!
- Do not let any persons 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.

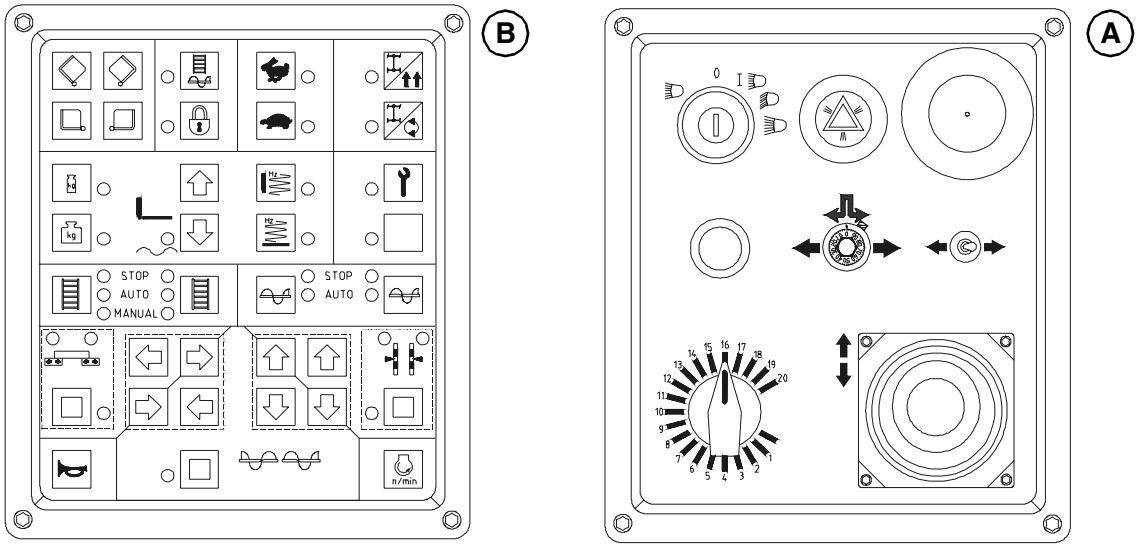
Always be the master over the machine; never try to use it beyond its capacities!

2 Operating elements

2.1 Operating panel







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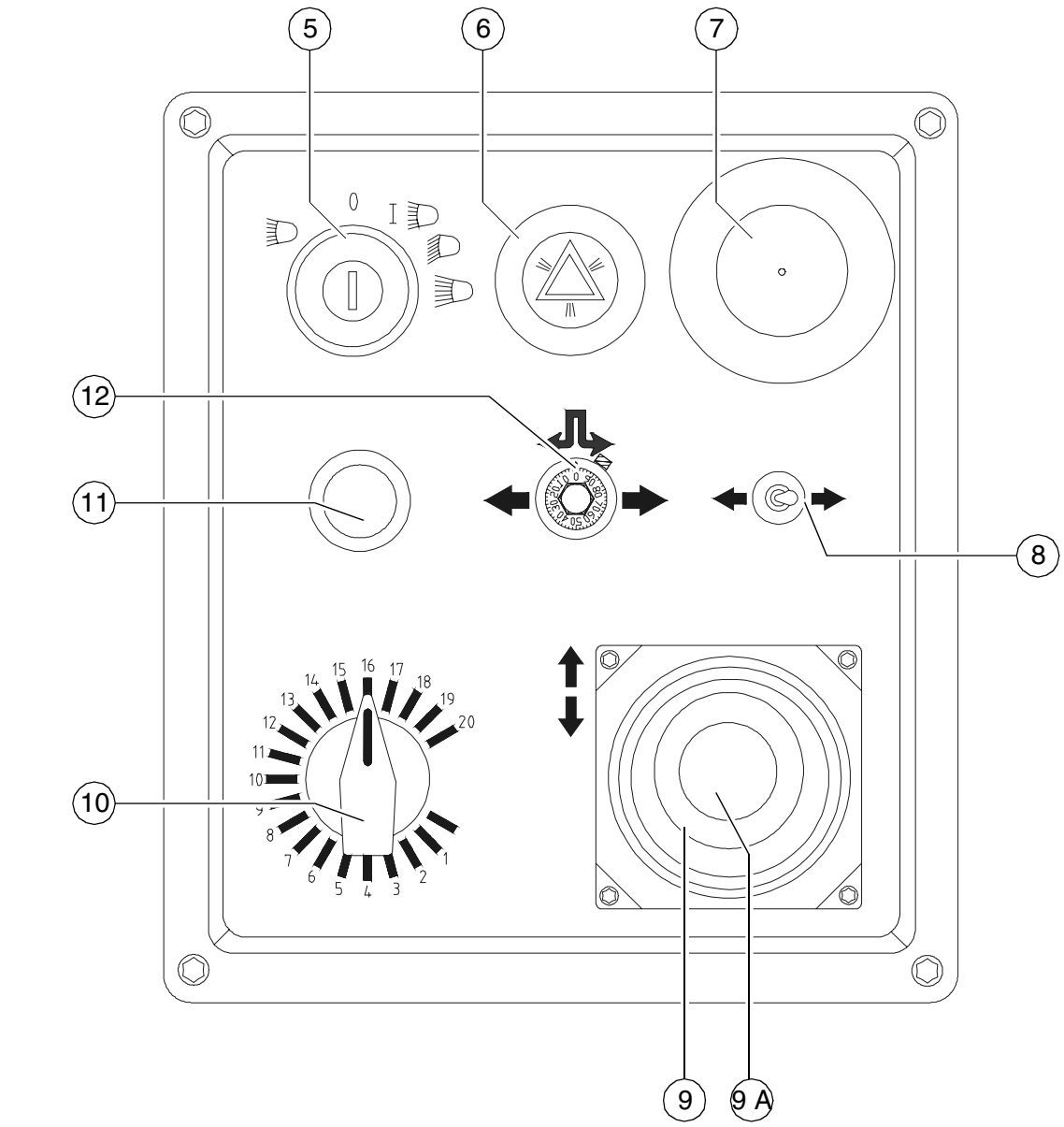
⚠ General notes on the observation of CE regulations

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.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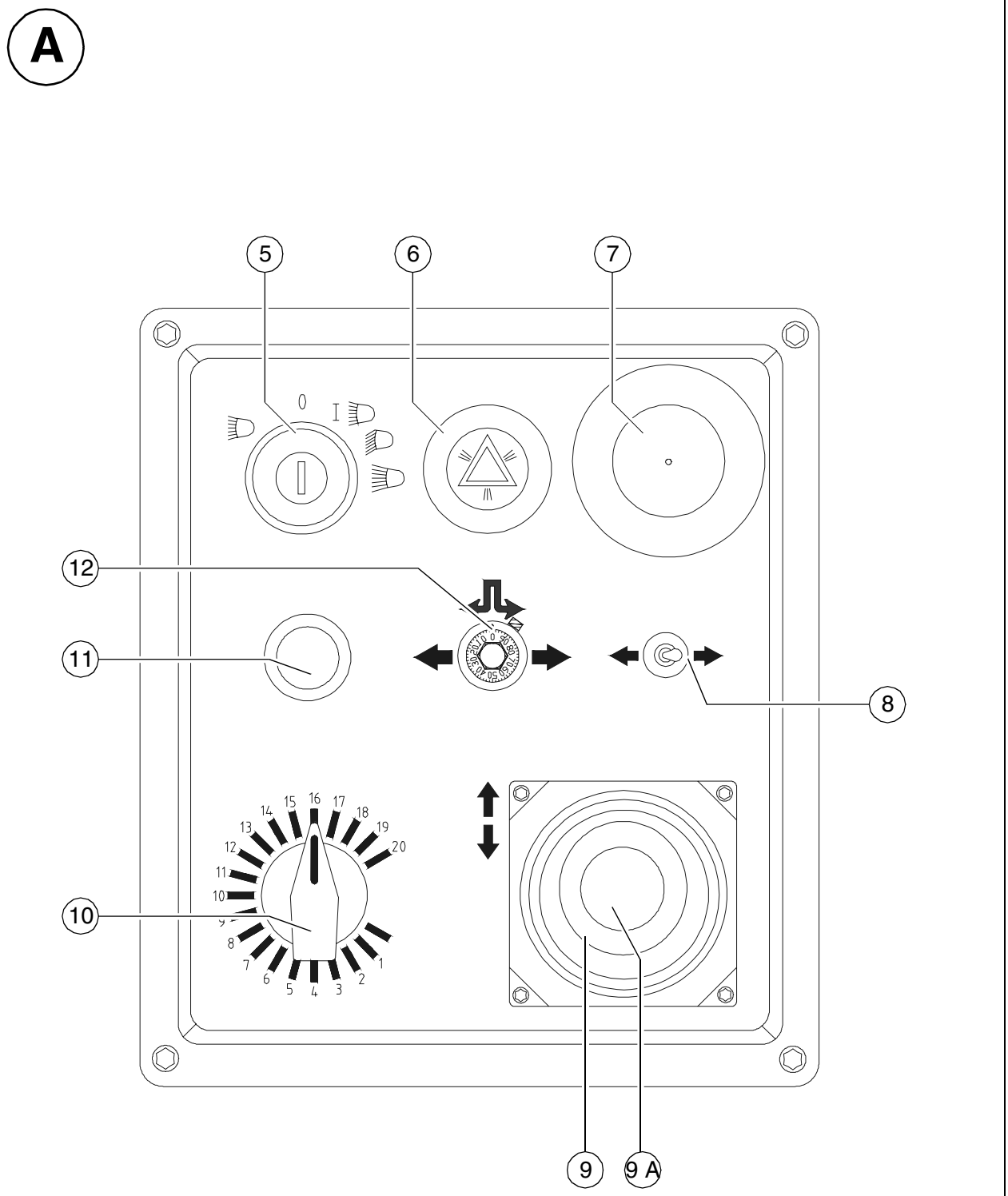
Item	Designation	Brief description
5	Ignition lock and illumination switch	Positions: 0 Ignition and light off 1 Ignition on  Parking/rear lights, instrument panel illumination, working lights (if applicable)  Driving light  High beam
6	Not used	
7	Emergency stop button	In the case of an emergency (danger 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	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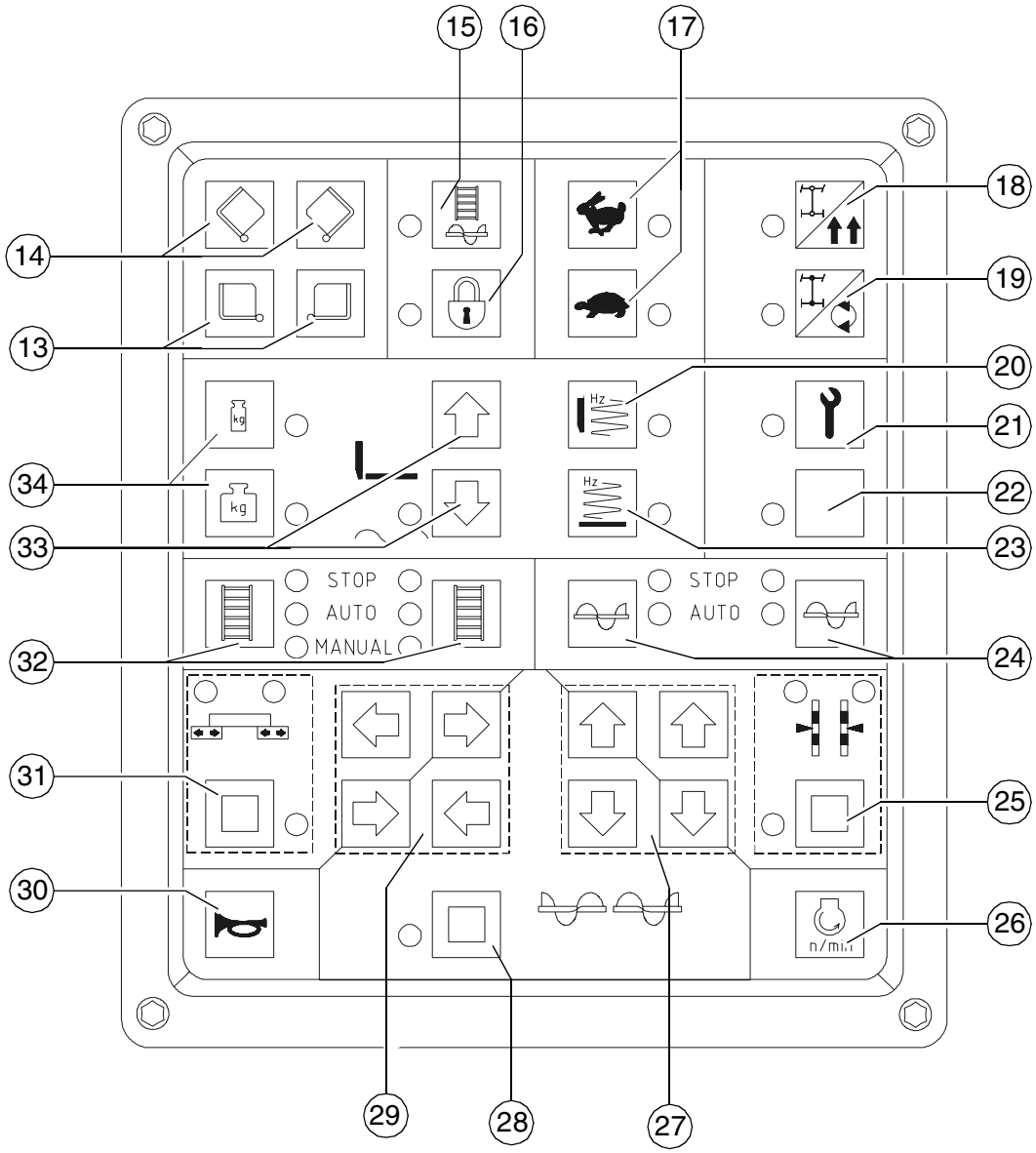
Item	Designation	Brief description
9	Drive lever (forward - reverse)	For switching on the paver finisher functions and for continuously regulating the traction speed – forward or reverse. Zero position: starting is possible; engine at idling speed; no traction drive Depending on the position of the drive 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



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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 (○): Isrequiredwhenpavinginspaceswherethereisonlylimitedspace 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	Mainfunctionswitch	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.

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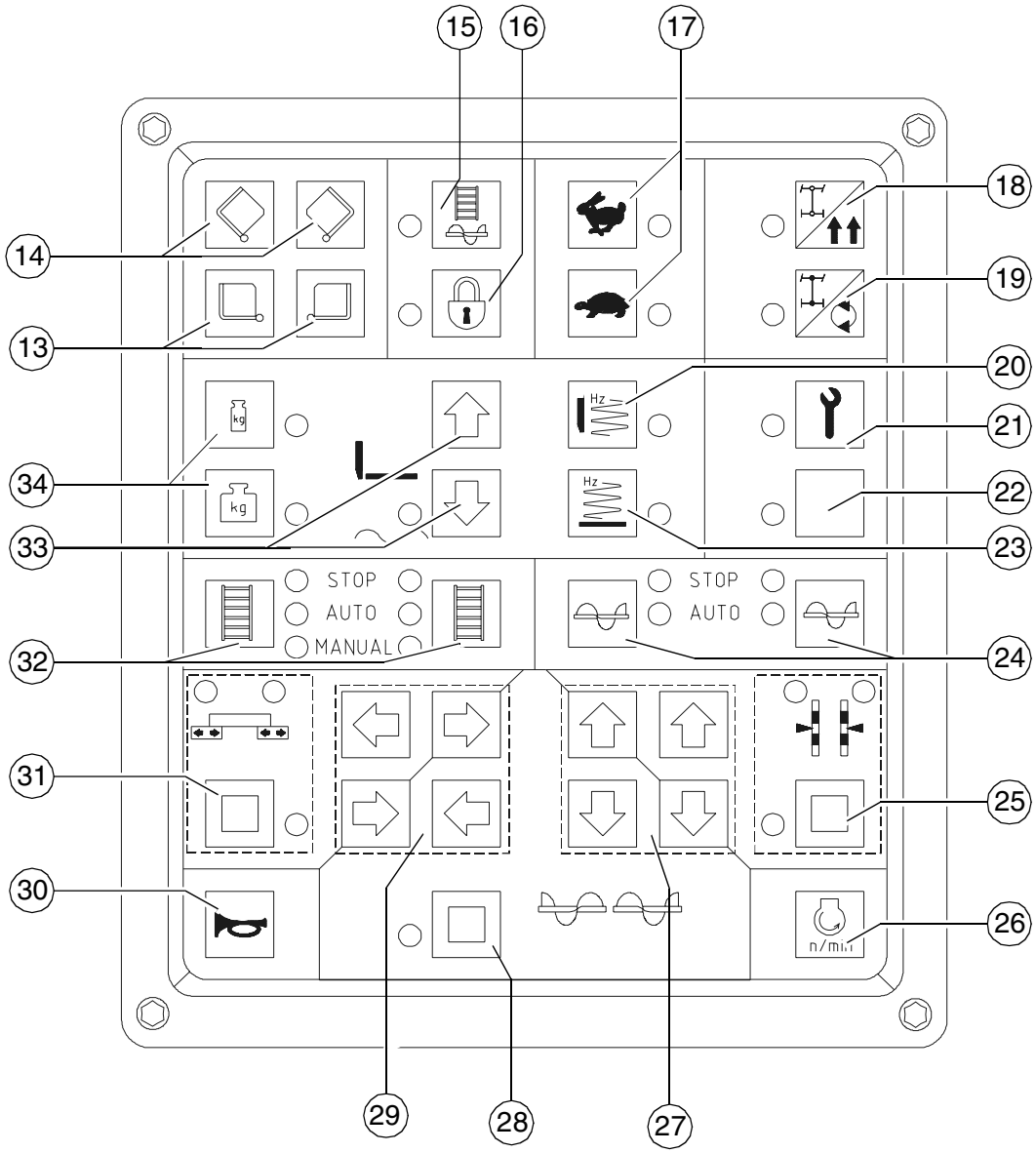

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Item	Designation	Brief description
17	Traction drive fast/slow	Self-engaging buttons with LED indication **Hare:** transport speed When button 16 is set to OFF (stands for paving), button 17 has to be set to „tortoise". **Tortoise:** operating speed 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.

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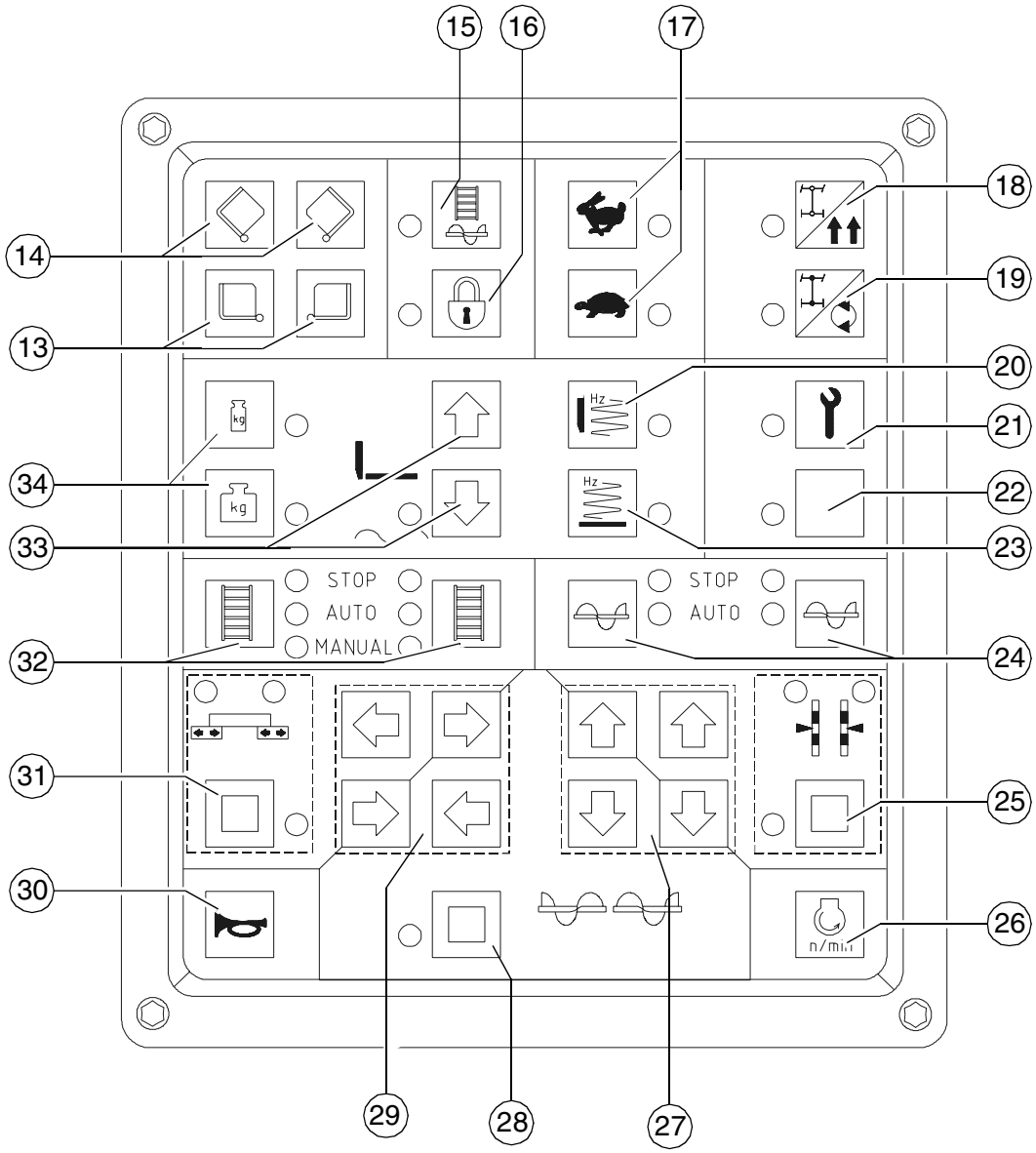

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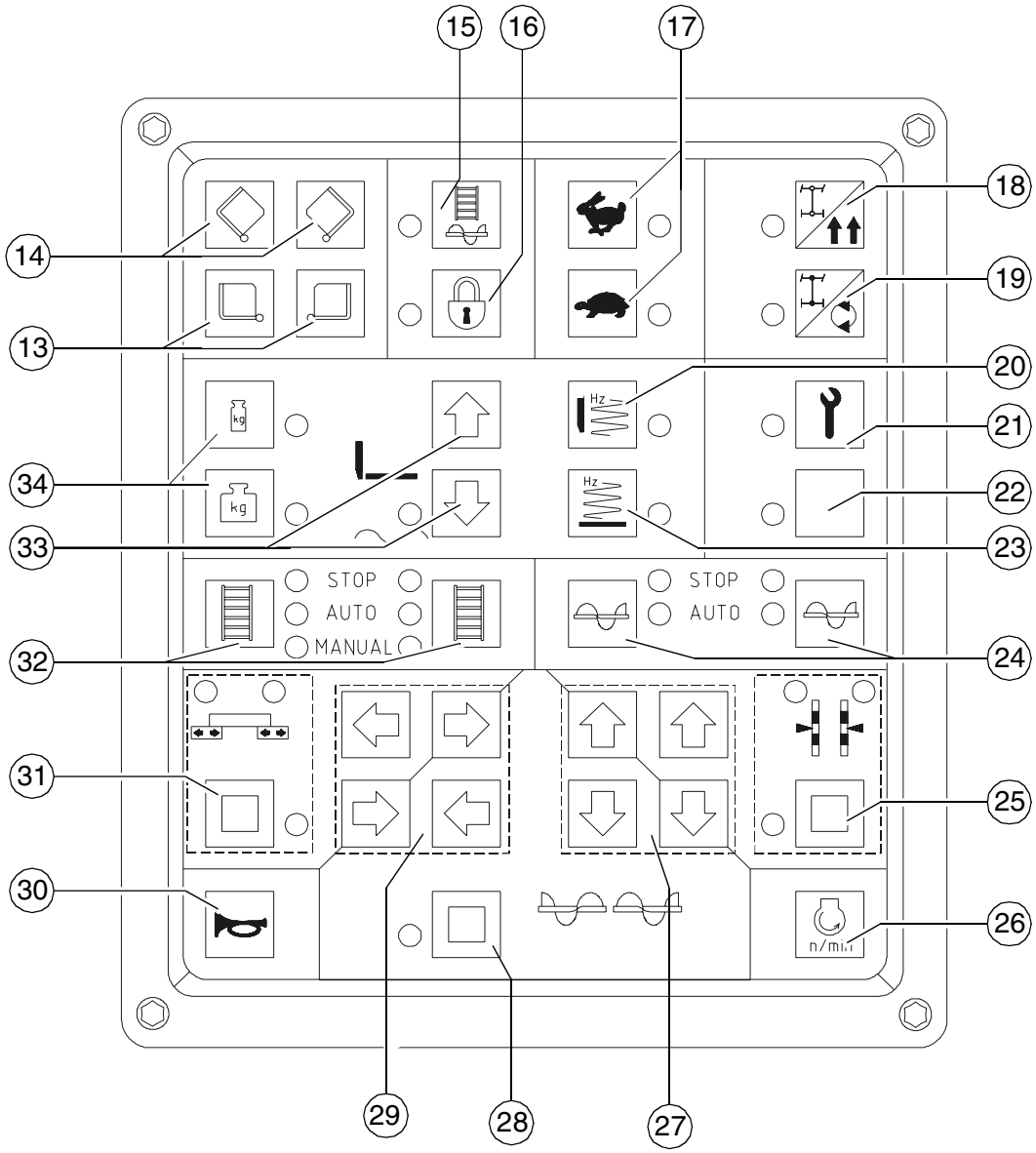
Item	Designation	Brief description
22	Vibration	Operation and application: see button (20).
23	Not used	
24	Auger left/right	Self-engaging buttons with LED indication Toggling between two switching conditions. **Stop:** Operational readiness Auto Reset to STOP in case of an emergency stop or a restart. 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.

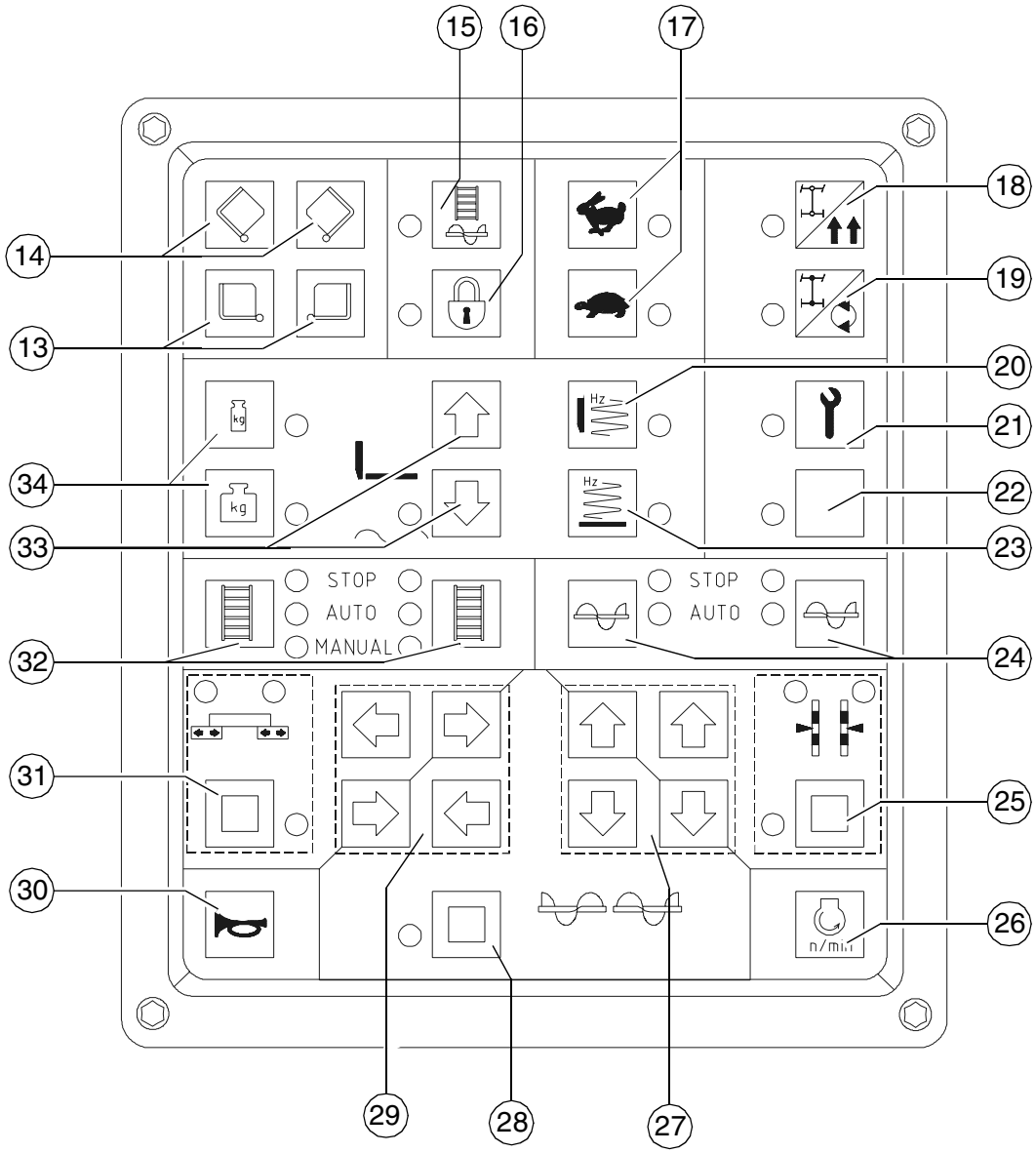
B



Element1_SPSC.cdr

Item	Designation	Brief description
28	„MANUAL" auger operationandlifting/ 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.

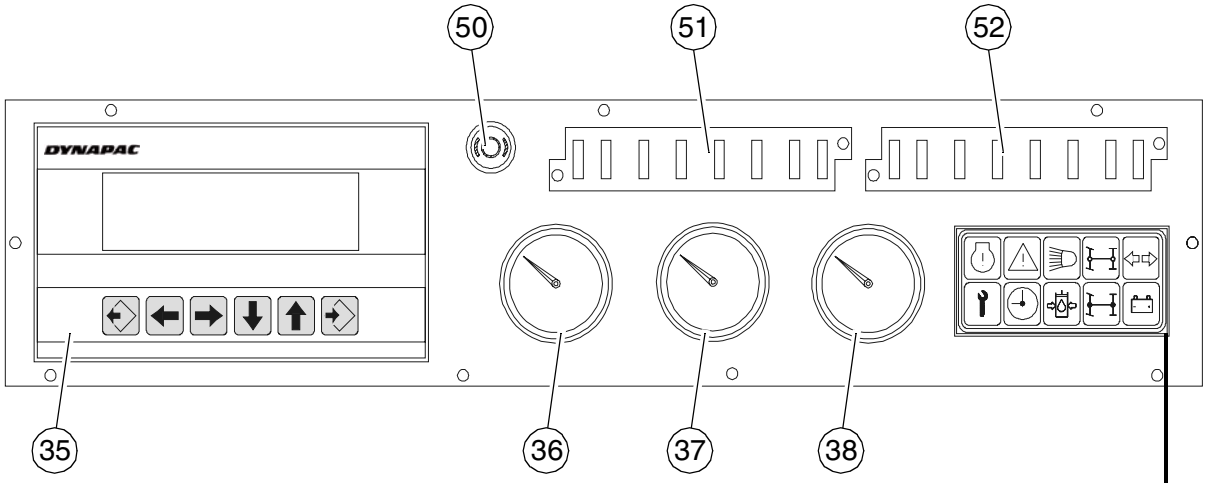
B

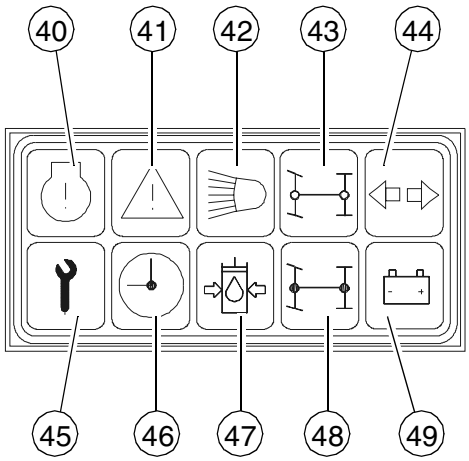


Element1_SPSC.cdr

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

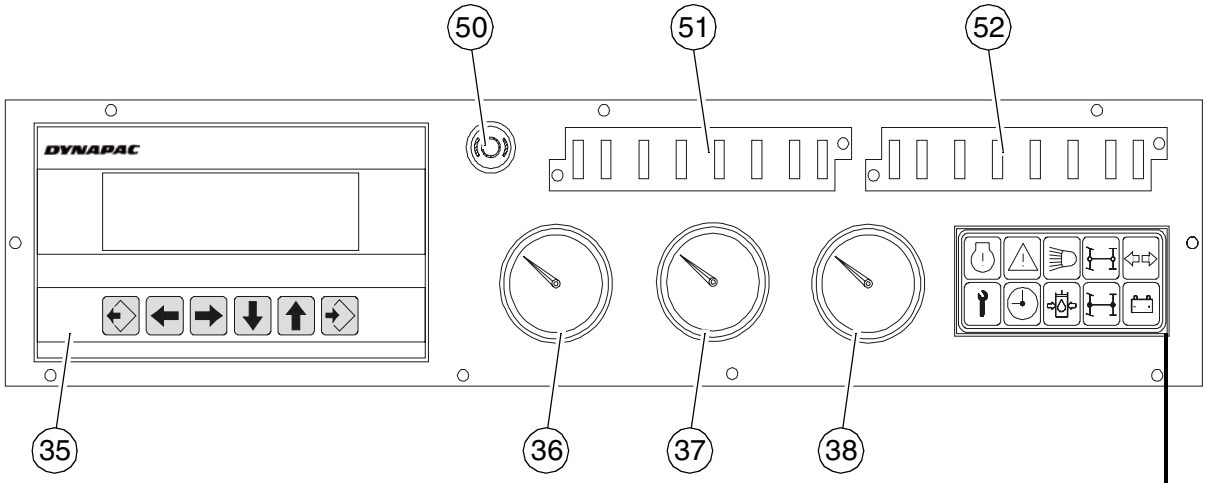


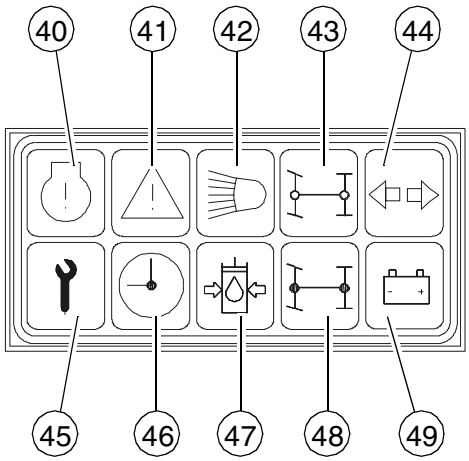


Element3_SPSC.cdr, Kontrollleucht_SPSC.cdr

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	Engine temperature	Green area: normal temperature. ⚠ Stop the paver finisher (drive lever (9) to the center position) when the needle is near or in the red area and let the engine cool down while idling. Determine the cause and correct it if necessary.
38	Fuel gauge	Always heed the fuel gauge. ⚠ Do not completely empty the diesel tank! Otherwise, the entire fuel system must be ventilated.

C

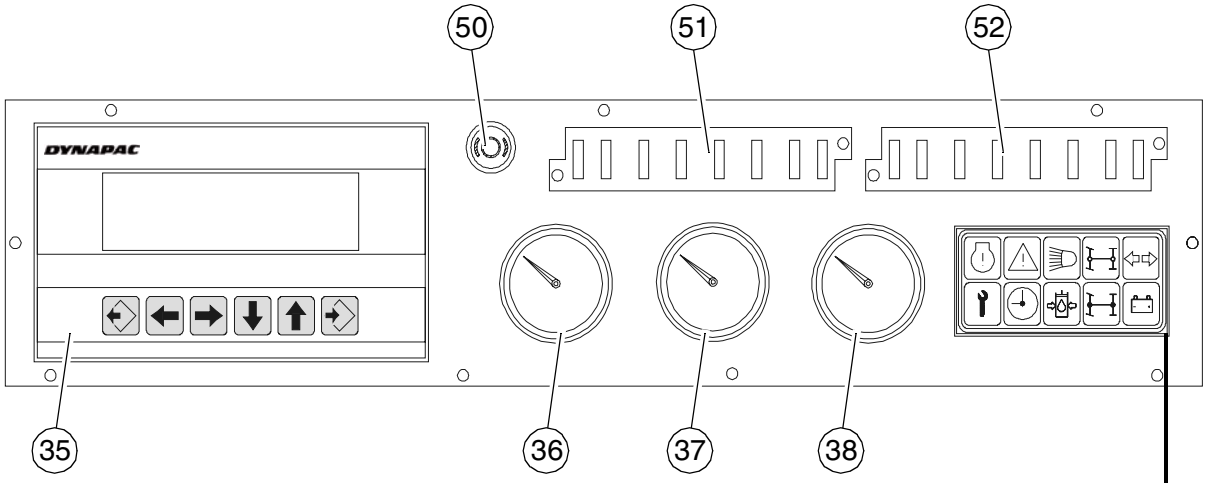


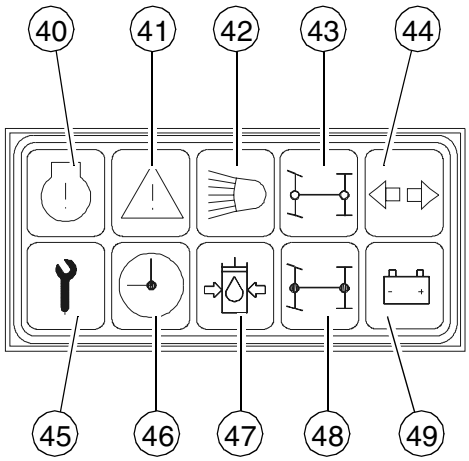


Element3_SPSC.cdr, Kontrollleucht_SPSC.cdr

Item	Designation	Brief description
40	Error message with engine stopped (red)	Lights up when a serious error has occurred on the engine. For reasons associated with safety, the engine is automatically switched off. ☞ Lights up for a few seconds once the ignition has been switched on for checking purposes.
41	Error message (yellow)	Indicates that there is an error on the engine. The machine can continue to be operated for the time being. In order to prevent further damage, the error should however be rectified as soon as possible. ☞ Lights up for a few seconds once the ignition has been switched on for checking purposes.
42	High beam indicator (blue)	Lights up when the high beam is switched on (at the ignition key (18)). STOP Avoid blinding the oncoming traffic!
43	Not used	
44	Not used	
45	Maintenance (yellow)	Signals that the engine coolant (water) level is too low. ⚠ To prevent damaging the engine, top up the coolant (water) level immediately as specified. ☞ Lights up for a few seconds once the ignition has been switched on for checking purposes.
46	Preheat indicator lamp (yellow)	Lights up once ignition has been started and remains lit up until the combustion air of the engine has been preheated to the correct temperature. ⚠ Only start engine once the indicator lamp has gone out to reduce wear and ensure better starting characteristics.
47	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.
48	Not used	
49	Battery charge indicator (red)	Must go out after starting when the engine revs up. - Switch off the engine.

C

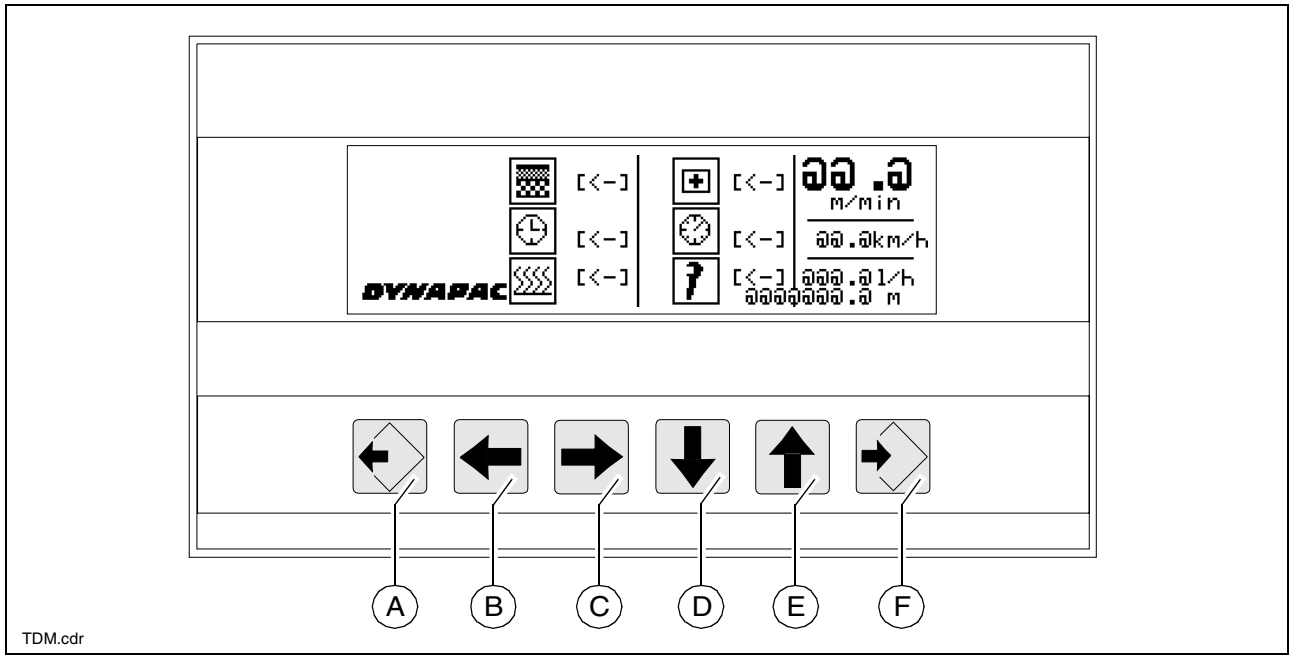




Element3_SPSC.cdr, Kontrollleucht_SPSC.cdr

Item	Designation	Brief description
50	Not assigned	
51	Fuse box	☞ For assignment of fuse strips, refer to chapter F.
52	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“

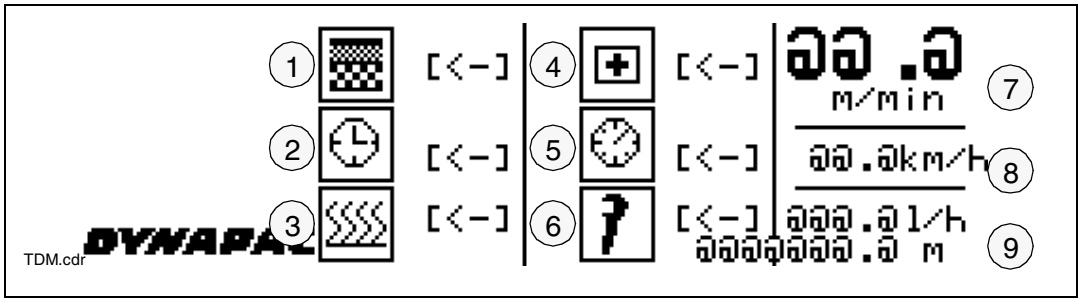
(D)/(F) Buttons „Scroll up/down“

(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)

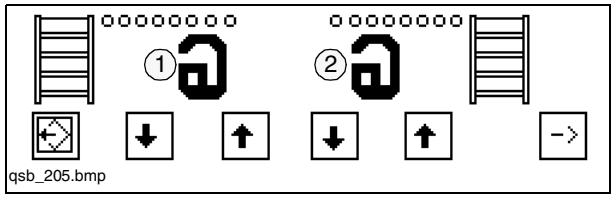
Push button (F) to select one of the subordinates, choose one of the subordinates by pressing push button (D/E) (the arrow becomes black) and enter by pressing push button (F).

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)

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)

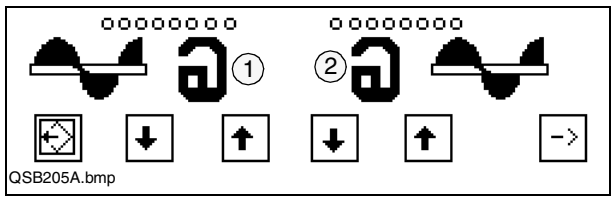
The speed can be set to 8 different stages. The speed stage set for each conveyor is shown in displays (1) and (2).

Basic settings for the individual types of layers:

- Top layer: 4
- Binding layer: 6
- Load-bearing layer: 8

Press the button (F) to jump into the sub-menu for setting the auger feed volume. Press button (A) to jump back to the main menu.

Transport volume of auger



As with the two remote controls, the feed speed of the two auger halves can be set separately.

- Reduce speed, left auger half - Taste (B)
- Increase speed, left auger half - Taste (C)
- Reduce speed, right auger half - Taste (D)
- Increase speed, right auger half - Taste (E)

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

Basic settings for the individual types of layers:

- Top layer: 4
- Binding layer: 6
- Load-bearing layer: 8

(O) A sub-menu for setting up the screed stop / screed start can be selected for each previously selected type of layer by pressing button (F). Return to main menu by pressing button (A).

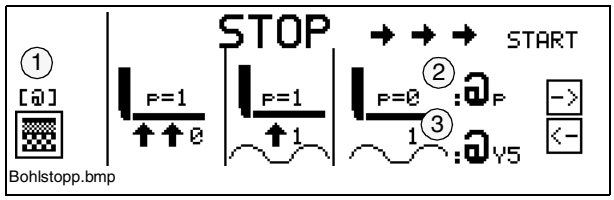
Screed stop / screed start (○)

☞ The "Screed stop" menu is assigned the priority position. The "Screed start" menu is behind it.

Screed stop

- Display (1): Type of layer
- Setting options (2), (3): Setting up screed stop

The screed stop can be individually set up to the following options using the selectable setting options P (2) and Y5 (3):



- Y5 = 0, p = 1
  Screed locked in lowering direction, relief pressure for screed stop present in accordance with valve setting.
- Y5 = 1, p = 1
  Screed unlocked in lowering direction, relief pressure for screed stop present in accordance with valve setting.

☞ The screed is held by the relief pressure for the screed stop and the material's counterpressure.

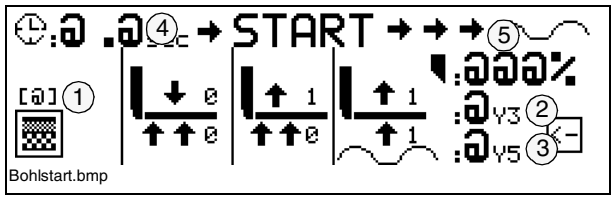
- Y5 = 1, p = 0
  Screed unlocked in lowering direction, relief pressure for screed stop not present.

☞ Even when stopped, the screed is in its floating position and is only being held by the counterpressure of the material.

Screed start (○)

- Display (1): Type of layer
- Setting options (2), (3): Setting up screed start
- Setting option (4): time lag for screed start (0-5 sec.)
- Setting option (5): Delayed tamper start

The screed start can be individually set up to the following options using the selectable setting options Y3 (1) and Y5 (2):

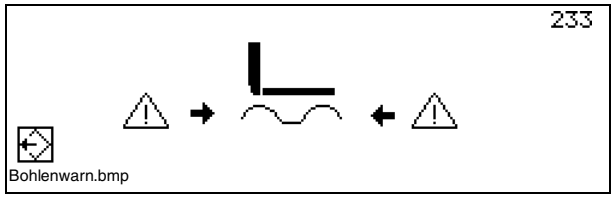


- Y3 = 0, Y5 = 0
  Screed locked in lifting and lowering directions for the preselected delay period.
- Y3 = 1, Y5 = 0
  Screed unlocked in lifting direction and locked in lowering direction for the preselected delay period.
- Y3 = 1, Y5 = 1
  Screed unlocked in lifting and lowering directions, delay for screed start not active.

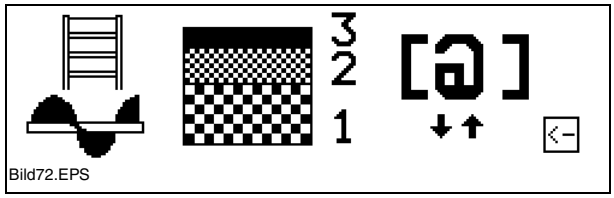
☞ The nominal value for the dynamics of the tamper start (5) can be set within a range of 0 to 100%.
The nominal specification is 50%. (delayed tamper start)

Screed error message

The screed is not in its floating position, but is being started for installation.
(Forexample,tamper,vibrationactivated).



Paving depth)



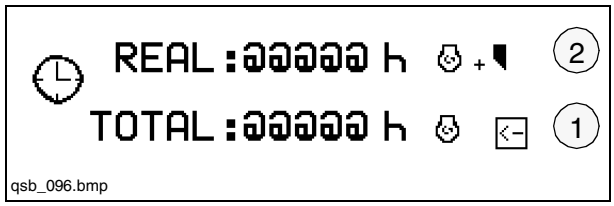
One can choose out of three preselected paving depths.

- 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)

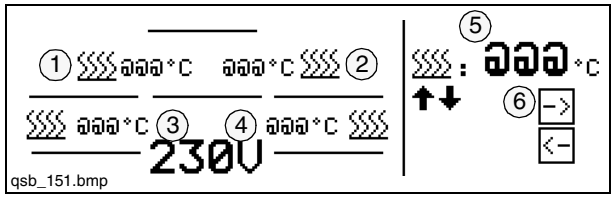


Two different operating hours values are displayed:

- 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:

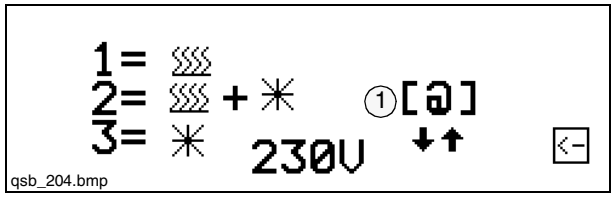
- Actual temperature value, main screed, on left (1)
- Actual temperature value, main screed, on right (2)
- Actual temperature value, extendable part, on left (3)
- Actual temperature value, extendable part, on right (4)
- Nominal temperature value set for all screed elements (5)

☞ 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



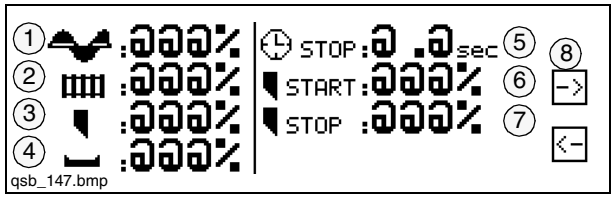
This menu sub-item is used to set which electronic elements on the screed heater (system) switch cabinet can be activated:

- 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:

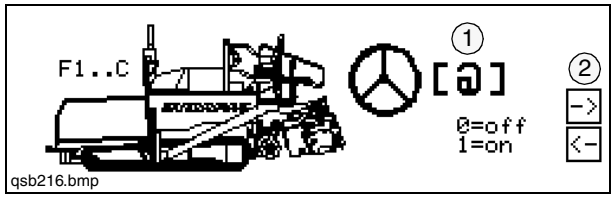
- screed stop (5) (○)
- tamper start (6) (○)
- tamper stop (7)

  - 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.

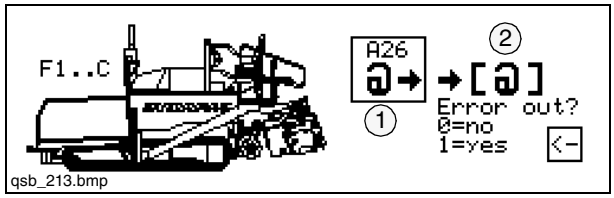
If the appropriate equipment (Sonic-Ski) is fitted, the finisher can independently travel along a reference body (e.g. securing rope) when the automatic steering unit is activated.

☞ 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



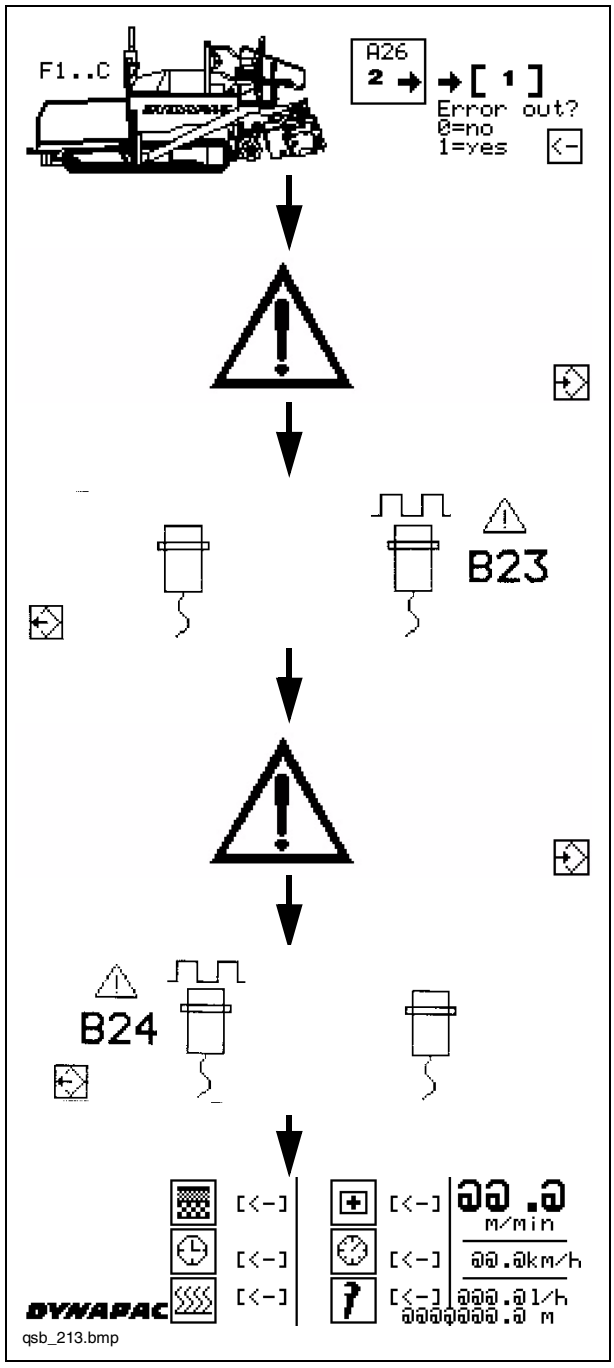
No functions are saved in the wheeled paver program in this menu sub-item!

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.

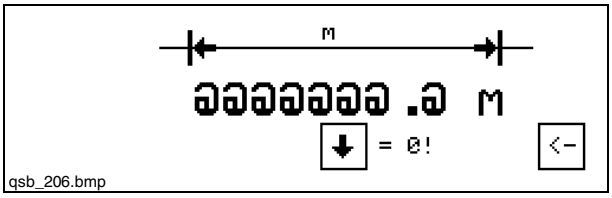
Display showing various actual engine statuses (5)

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

- Engine temperature (1)
- Fuel temperature (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

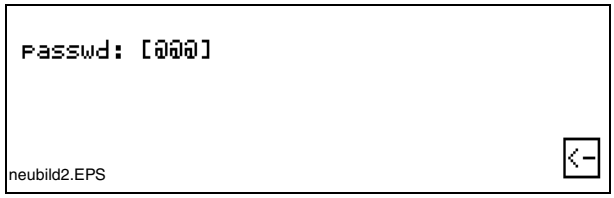


Thecountershowingdistancetravelled(on the working site in metres) which is fitted in the paver can called up in this display.

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

Service program for workshop and mechanics (6)

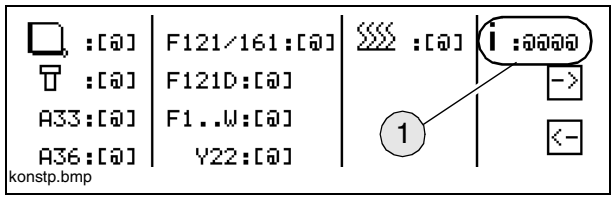
After choosing this subordinate a request for a password input appears in the display.



⚠ Only instructed personal is authorized for the further proceedings!

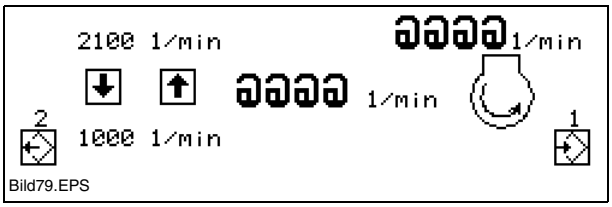
- Return to the basic menu by pressing push button (A)

- 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.

Adjustment of the RPM speed of the engine

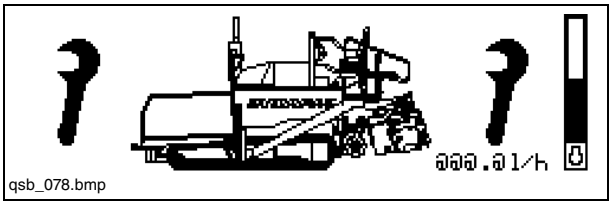


Comes up when pressing push button (26) of the operating panel.

- 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 sub-ordinate press push button (26) again.

Set-up operation

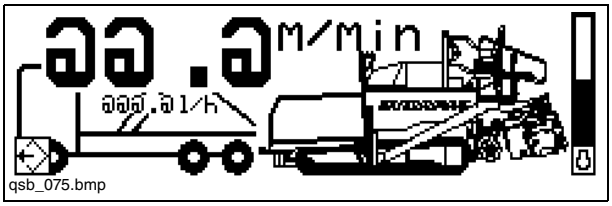


Comes up when pressing push button (21) of the operating panel. RPM speed of the engine is displayed graphically. The present fuel consumption is also displayed in l/h.

Stop

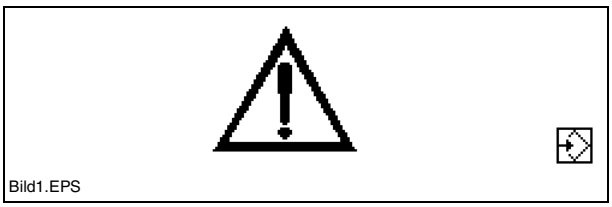
Comes up in the case of emergency button of the operating panel (7) or remote control (54○) is pressed.

Paving information



Comes up during paving and shows the actual speed of paving. RPM speed of the engine is displayed graphically.
The present fuel consumption is also displayed in l/h.

Information of malfunction



Comes up in case of malfunction.

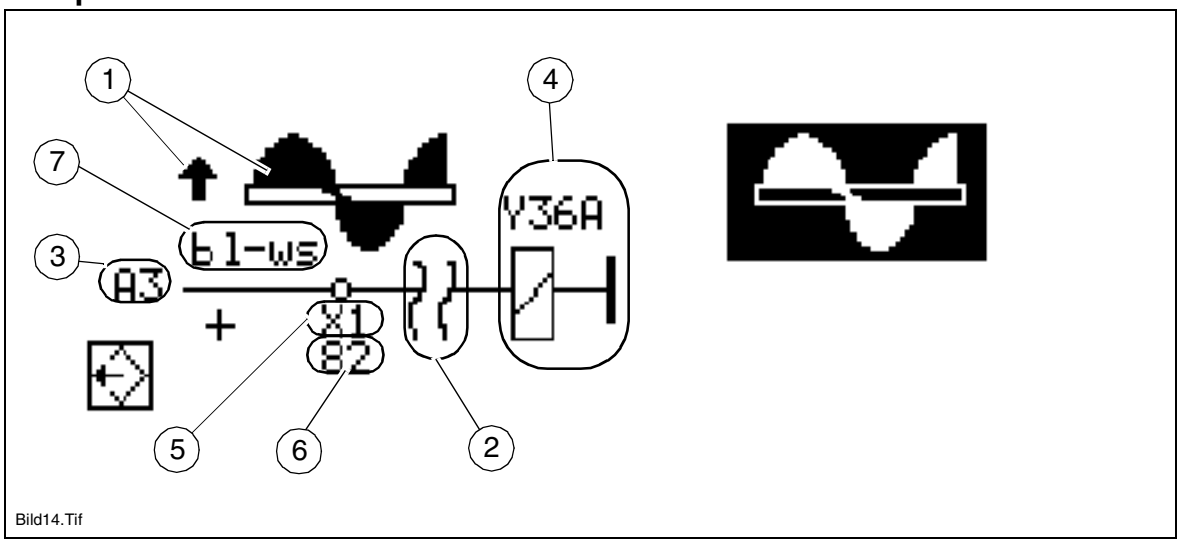
- Diagnosing and detecting of the error by pressing push button (F).
- To leave this menu press push button (A).

2.3 Diagnosing and detecting malfunction

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

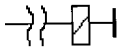
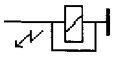
The following information is given.

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)

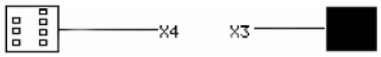
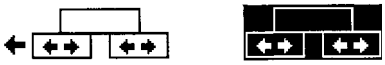
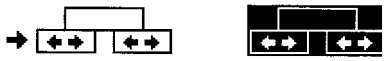
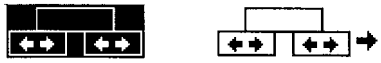
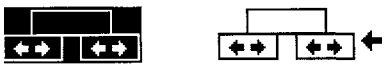
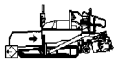
Meaning	Graphic
Parting of cable	
Short circuit	

Variations (Pos. 4)

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

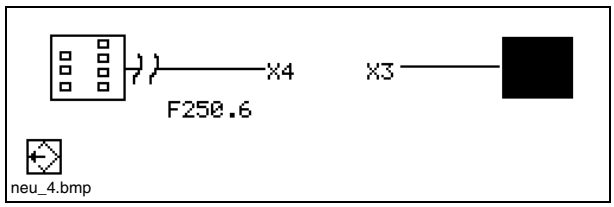
Variations of malfunction (Pos 1)

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.

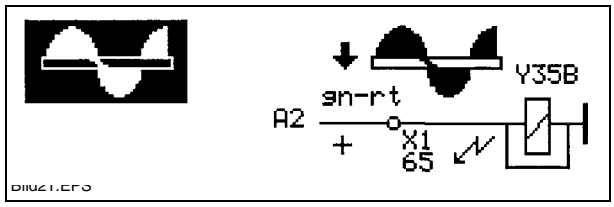


Variety of colours (Pos 7)

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

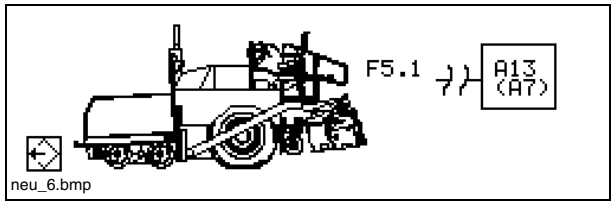
Example:

- 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.

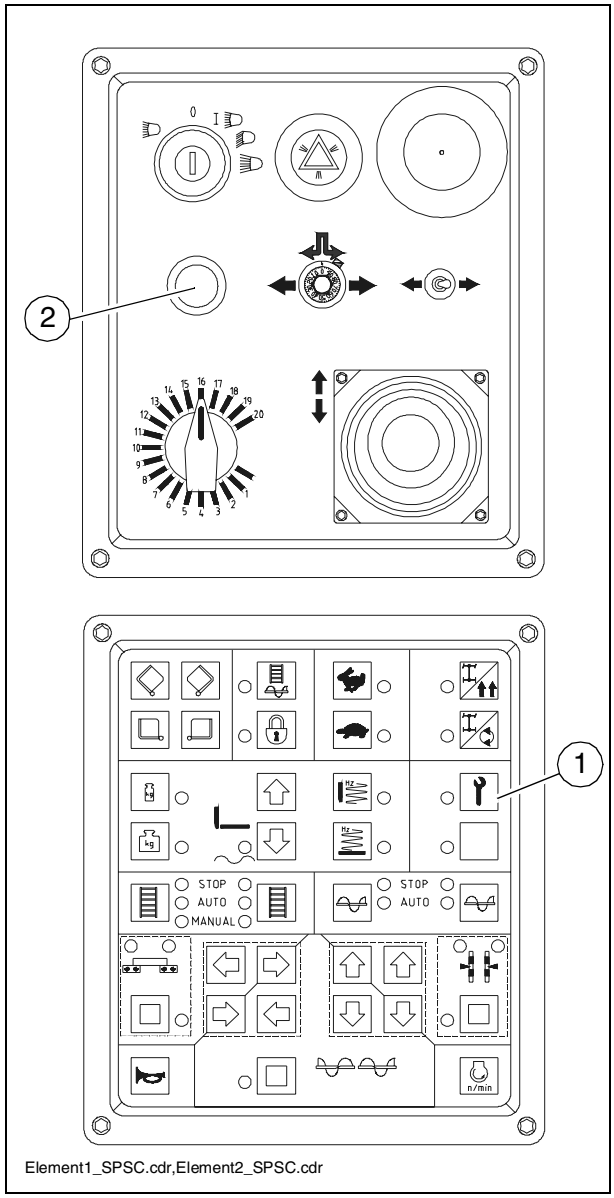


neu_6.bmp

☞ 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).

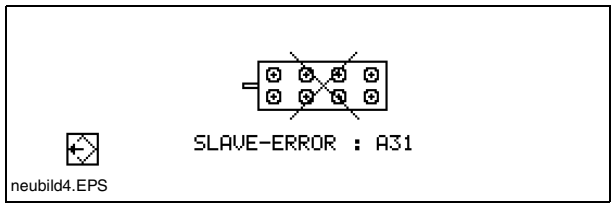


Element1_SPSC.cdr,Element2_SPSC.cdr

Further malfunction:

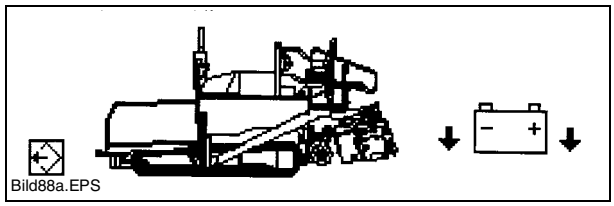
Slave error

- Slave defective (Example Slave A31)



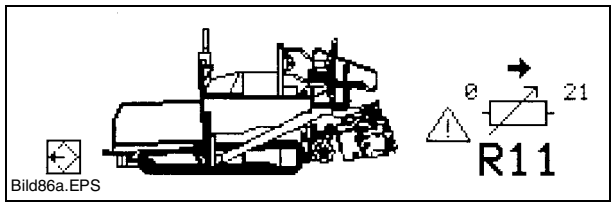
Battery

- Potential to low



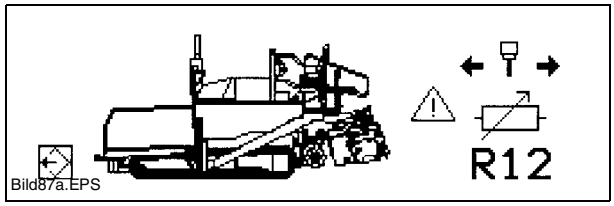
Travelling speed

- Potentiometer defective



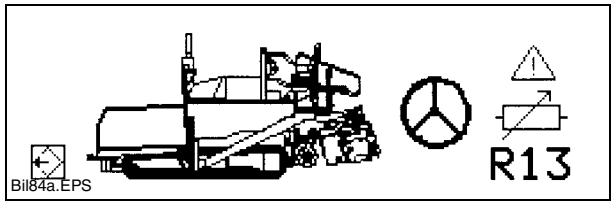
Drive lever

- Potentiometer defective



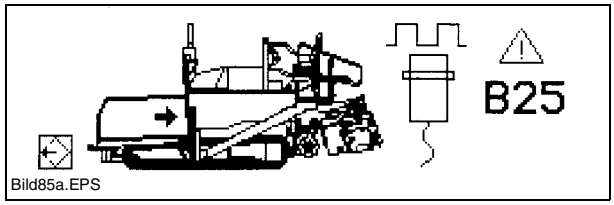
Steering potentiometer

- Potentiometer defective



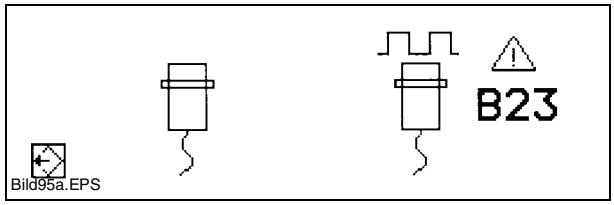
Sensor RPM engine

- Sensor defective



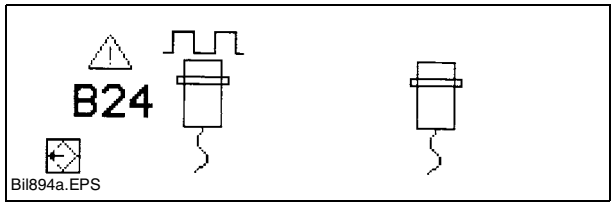
Sensor caterpillar drive right

- Sensor defective



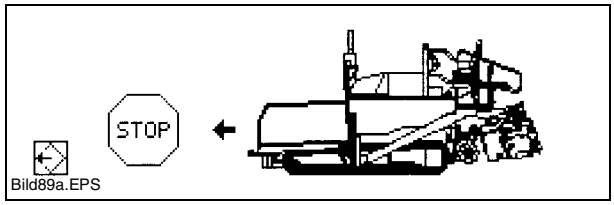
Sensor caterpillar drive left

- Sensor defect



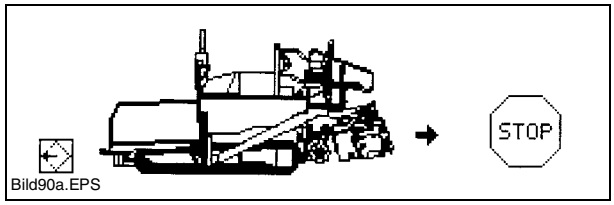
Travelling motion

- Forward blocked



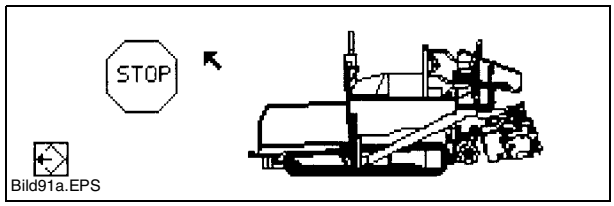
Travelling motion

- Backward blocked



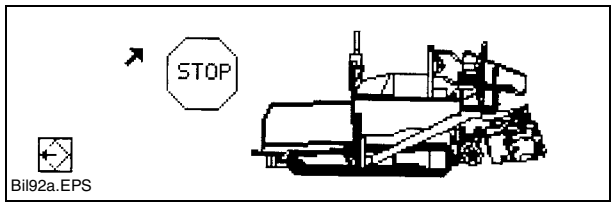
Travelling motion

- Turning left blocked



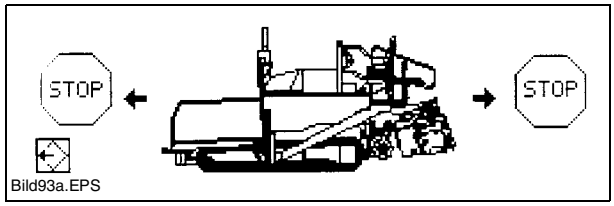
Travelling motion

- Turning right blocked



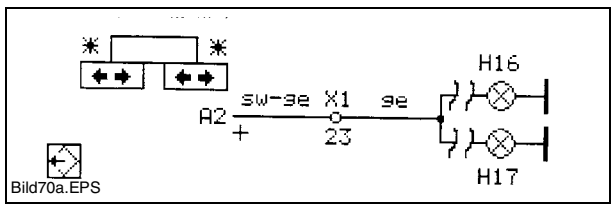
Travelling motion

- Forward + backward blocked



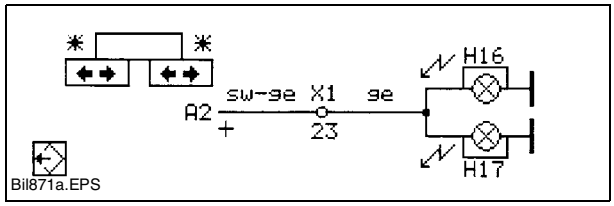
Screed warning light

- Parting of cable or lamp defective



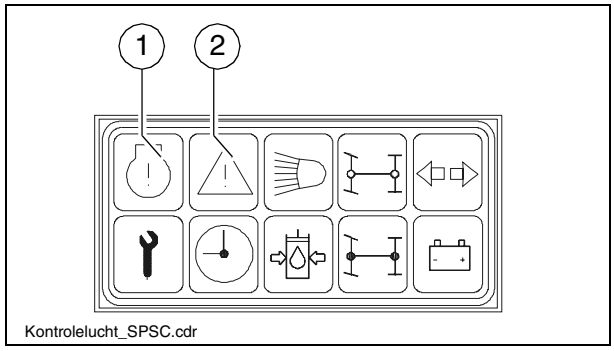
Screed warning light

- Short circuit



2.4 Cummins engine error messages

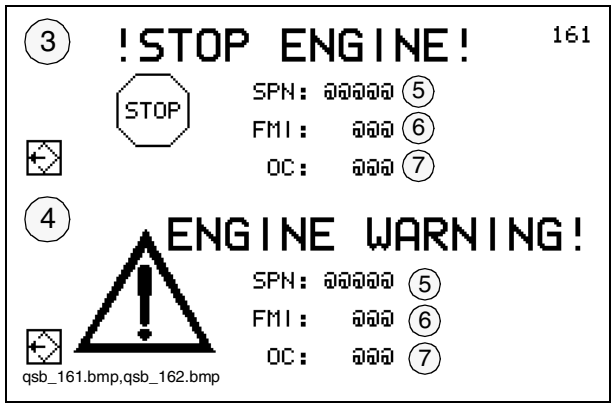
If an error has been established on the engine, this is signalled by the corresponding warning lamp and at the same time shown on the display in code.



Kontrolelucht_SPSC.cdr

- Warning lamp (1) (red) indicates a serious engine error. The engine is stopped or must be stopped immediately to prevent further damage.
- Warning lamp (2) (yellow) indicates that there is an engine error. The machine can continue to be operated temporarily. The error should however be rectified soon 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.



qsb_161.bmp,qsb_162.bmp

- „! STOP ENGINE!“ display (3) is shown together with warning lamp (1).
- „ENGINE WARNING!“ display (4) is shown together with warning lamp (2).

The SPN (5) and FMI (6) displays shown determine the component affected by the error and the type of error occurring. The OC display (7) indicates the frequency with which the error displayed has already occurred.

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

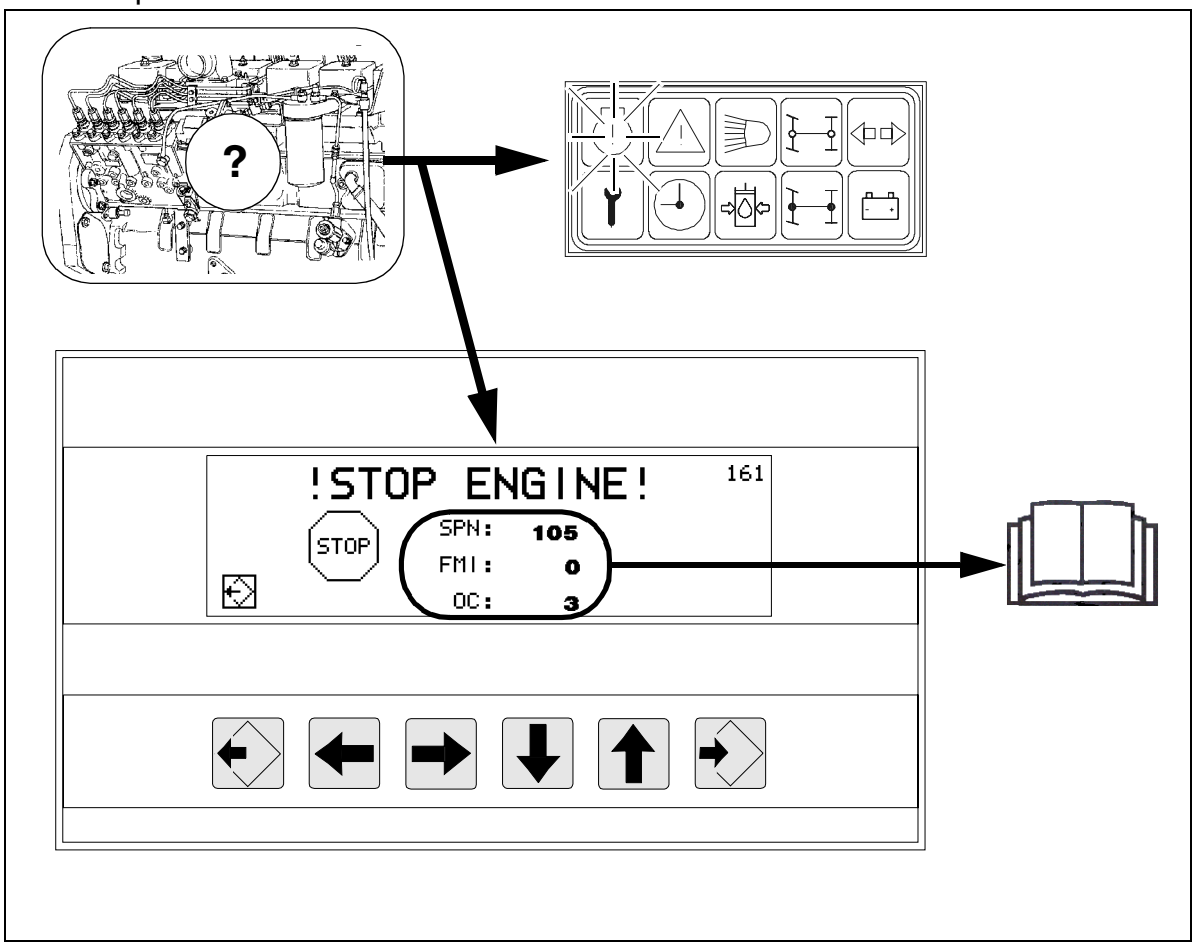
„Water in fuel“ error message

Is displayed if too high a volume of water has been found in the fuel system's water separator.

qsb_163.bmp

⚠ To avoid damaging the engine, drain off the separated water immediately as described in the Maintenance Instructions.

Example:

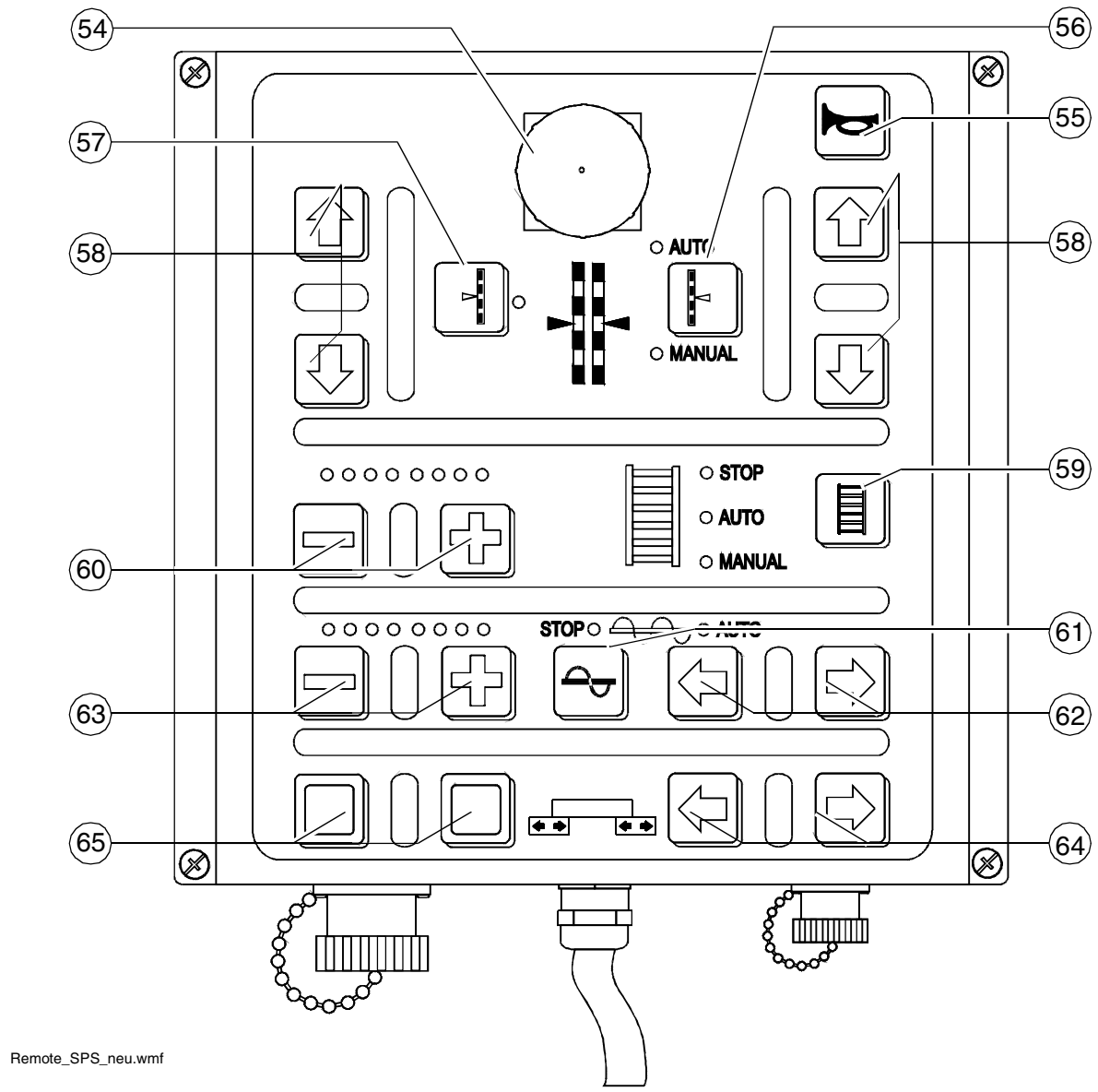


Explanation:
A warning lamp signals a serious engine error with an automatic or necessary engine stop.
Display indicator:
SPN: 105
FMI: 0
OC: 3

Cause: The intake manifold temperature signal signals that the intake manifold temperature exceeds the maximum engine protection limit.
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.

2.5 Remote control



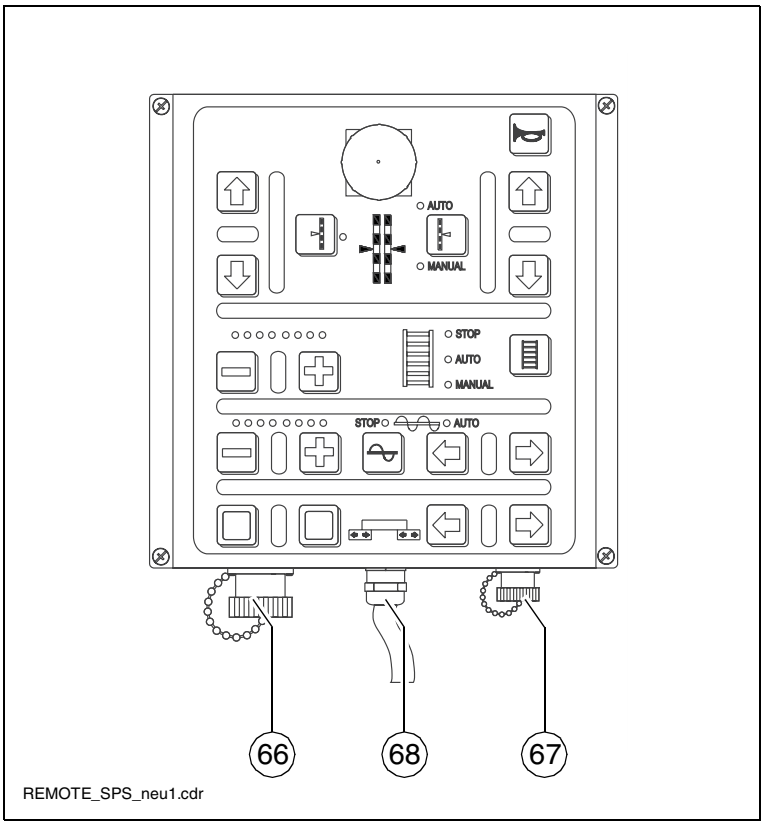
Warning! Do not disconnect remote controls with emergency-stop buttons (O) during operations! This will result in the finisher being shut down!ontrol

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	

☞ Basic feed capacity settings for auger and slat bar conveyor for the individual types of layer (number of LEDs):

- Top layer: 4
- Binding layer: 6
- Load-bearing layer: 8

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).

Emergency program for TDM-failure

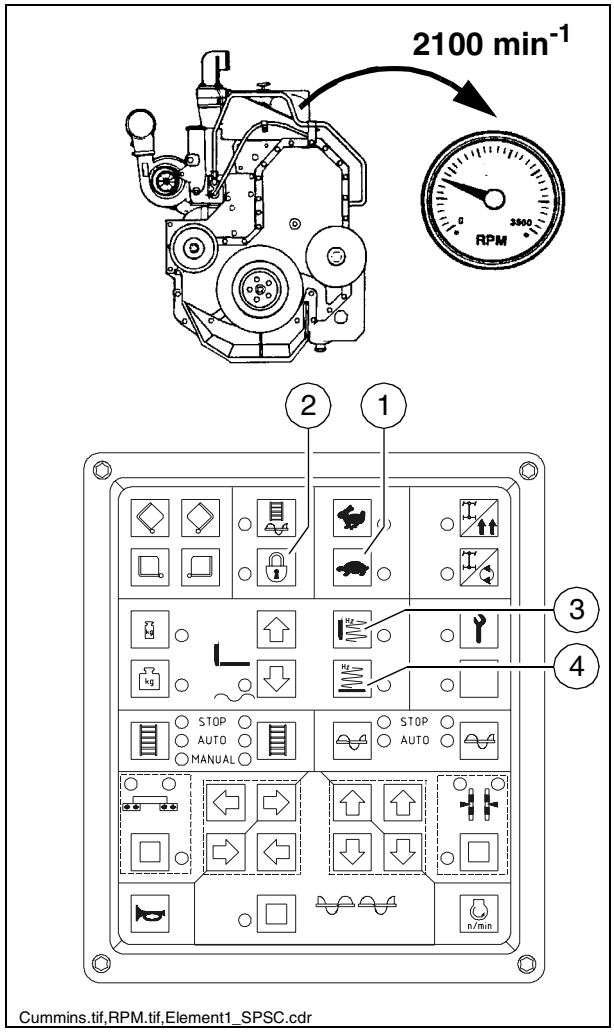
To ensure the pavers operating ability during a display failure, an emergency program will be started automatic.

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

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

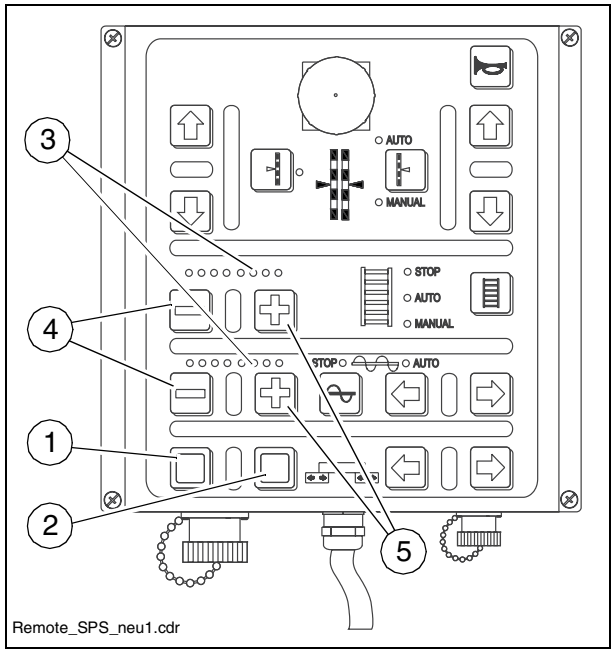
☞ Tamper and vibration can be deactivated by the associated rotary potentiometer (set to „zero“).
The frequency of the tamper and vibration can be read off the two associated displays (O).



Cummins.tif,RPM.tif,Element1_SPSC.cdr

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.
- 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.

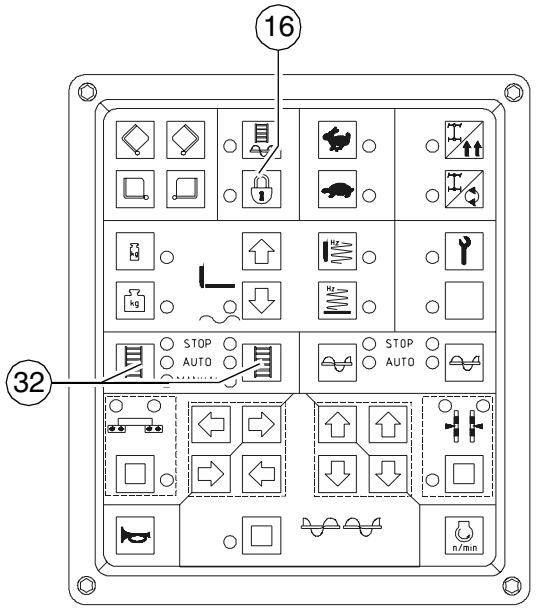


⚠ The screed will be lowered at first when the drive lever is moved out of the center position!

☞ 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



Element1_SPSC.cdr

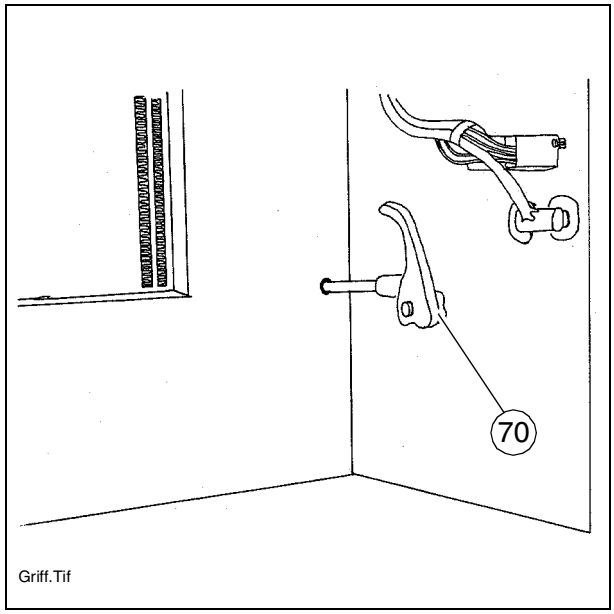
The direction of transport of the conveyor can be changed over to the opposite direction to move material located just in front of the auger back slightly. Material losses, e.g. during transport operations can therefore be avoided.

- 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

Engine hood (70)



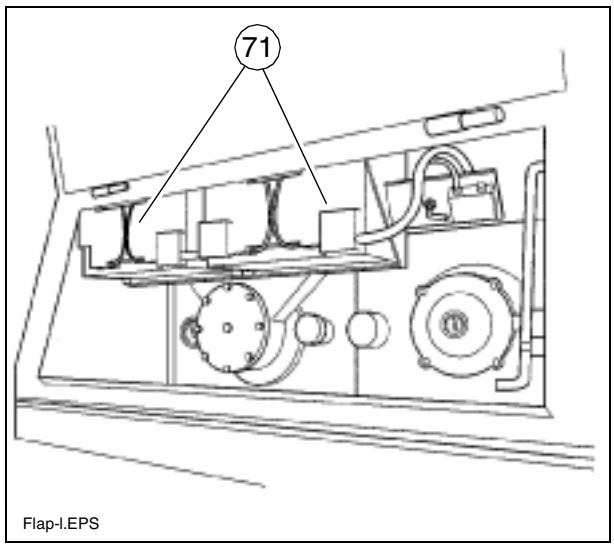
To allow easy access for control and maintenance, the entire engine hood can be lifted up. To release the hood from the hood fastener pull the release lever (70) (located behind the hinged covers on RH side). Both hopper wings should be open.

⚠ Secure the hinged side cover with the respective support rods.

STOP Open the engine hood only if the engine is stopped. Don't come into the cooler van or belt drive area if the engine is running. (See also engine instructions for safety.)

STOP Don't touch the exhaust pipe when hot! Danger of burn!

Batteries (71)



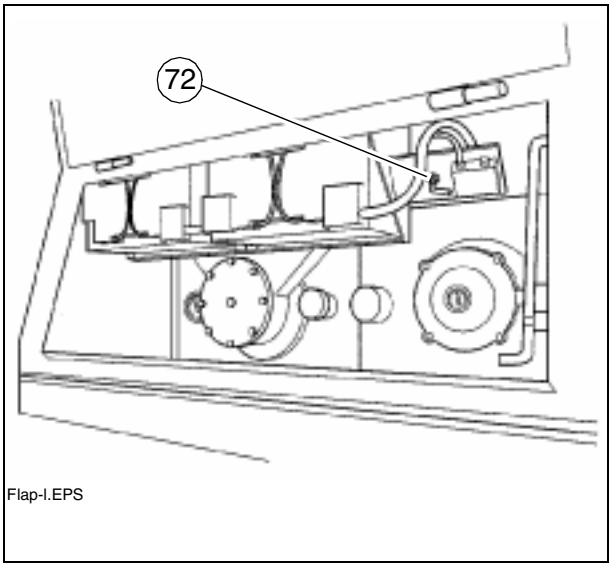
The batteries of the 24 V system are located under the left maintenance flap.

☞ 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)

The main switch interrupting the circuit between the battery and the main fuse is located under the left maintenance flap.



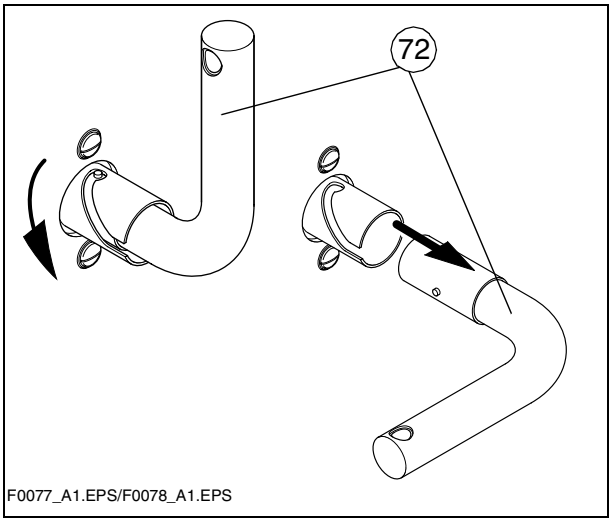
Flap-l.EPS

⚠ Secure the hinged maintenance flap with the respective support rods.

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

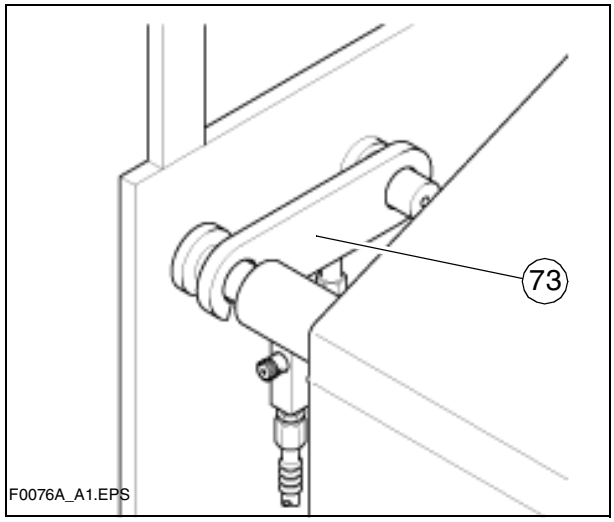
- For switching off, turn the key pin (72) to the left and pull it out.

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



F0077_A1.EPS/F0078_A1.EPS

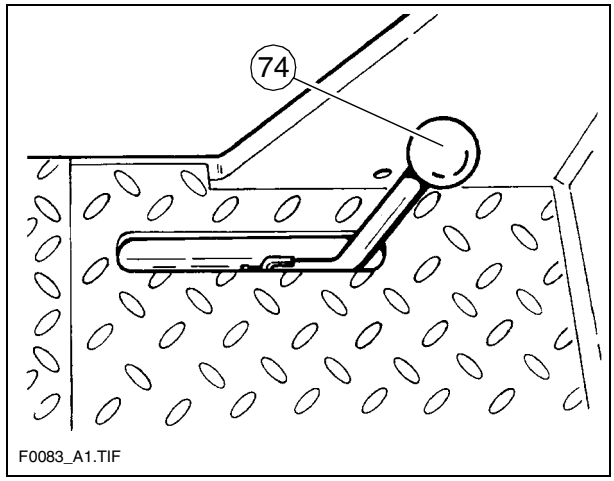
Transport safeguards for the hopper (73)



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)



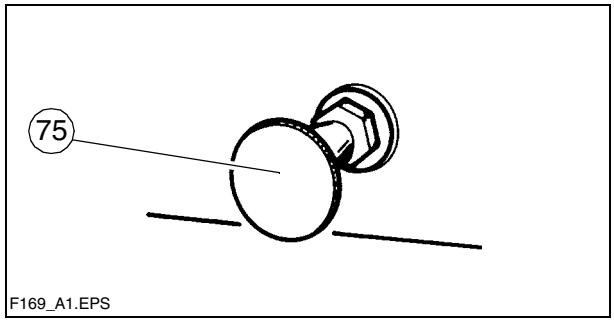
Used to protect the lifted screed from inadvertent lowering. The screed transport safeguard must be inserted before transportation and when work is finished.

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)



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!

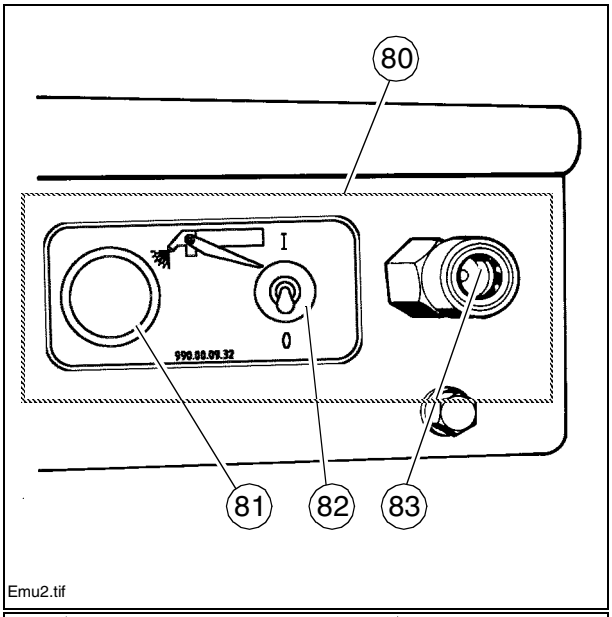
- Pull out the locking button and move the seat; let the locking button engage again.

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.

- The indicator lamp (81) lights up when the emulsion pump is running
- On/off switch (82) for the emulsion pump
- Quick-release coupling (83) for hose connection

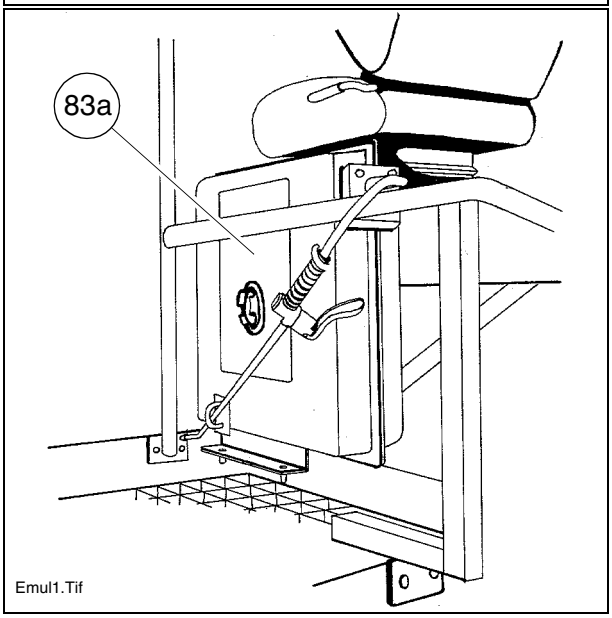


Emu2.tif

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

☞ A permanent installed hose guide (83a) for the fluid spraying system is available as an option.

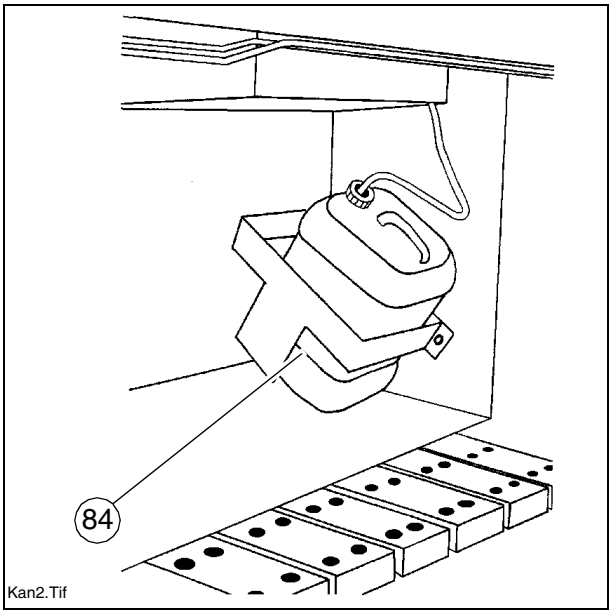
Pull hose out of the guide till there is an audible creak. The hose will engage in this position after discharging.The hose will be retracted automatic into the guide after pulling and discharging again.



Emul1.Tif

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

☞ .The spraying system is feeded by a can (84) under the side flap on R.H. side.



Kan2.Tif

STOP Refill the can only while standstill of the paver!

Further switch options for optional equipment features may be located on the central panel:

On / off switch for additional headlight in the roof (85):

Actuate switch (a) to activate.

On/off switch for 230V sockets (85a)

If equipped with a 230V system, the sockets are actuated by means of switch (a). In the „I“ switch position, the indicator lamp (b) lights up.

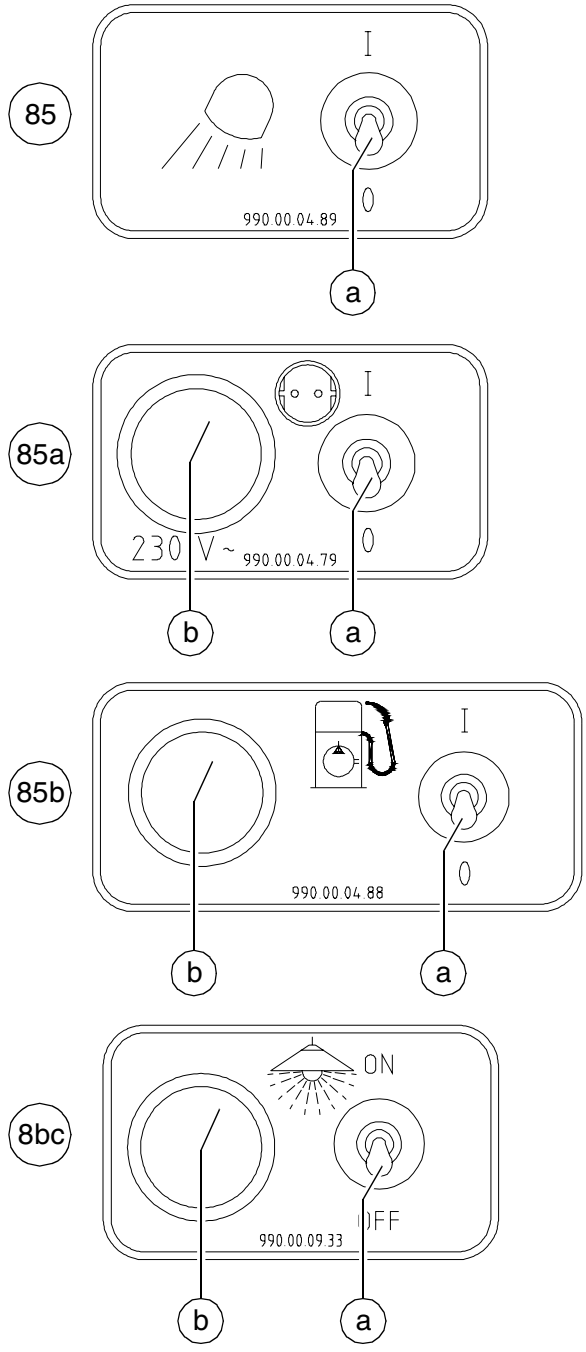
On / off switch for fuel tank filler pump (85b)

If the pump is actuated with the switch (a), the indicator lamp (b) lights up.

When fuelling, ensure that no fuel penetrates the earth. Switch off the engine and do not smoke. Do not fuel in enclosed spaces. Danger to health! Have a fire extinguisher ready.

On / off switch special lighting (85c)

If the machine is equipped with additional headlights, these are actuated by means of the switch (a). When switched to the „ON“ position, the indicator lamp (b) lights up.



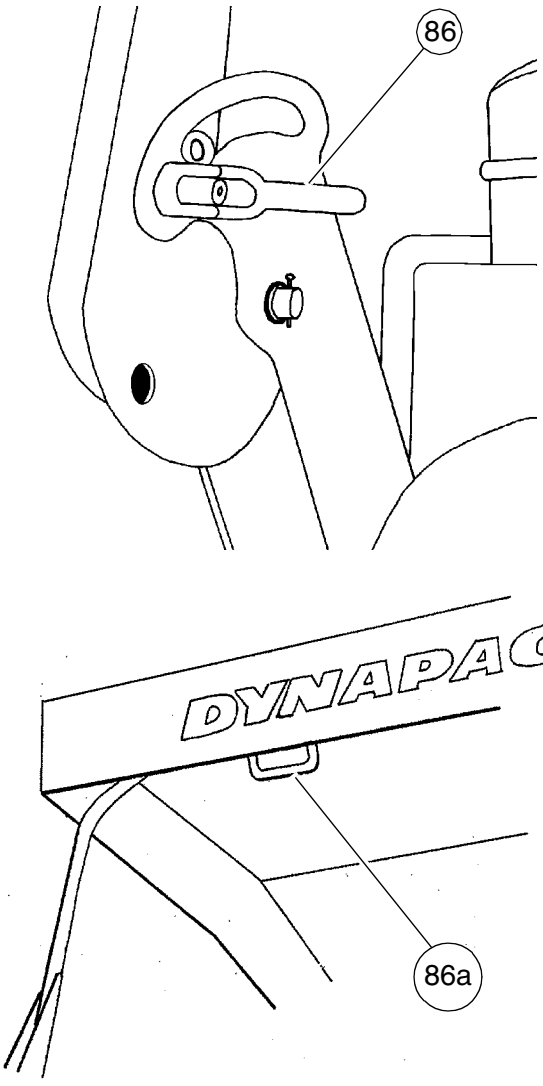
Schalt_betank.wmf/Schalt_230V.wmf/Schalt_Dachlicht.wmf/Schalt_Sonderlicht.wmf

Switch the additional headlights and special lighting off when the engine is not running, as the battery is otherwise discharged!

Locking of the collapsible roof (LH and RH on the roofs console) (86):

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

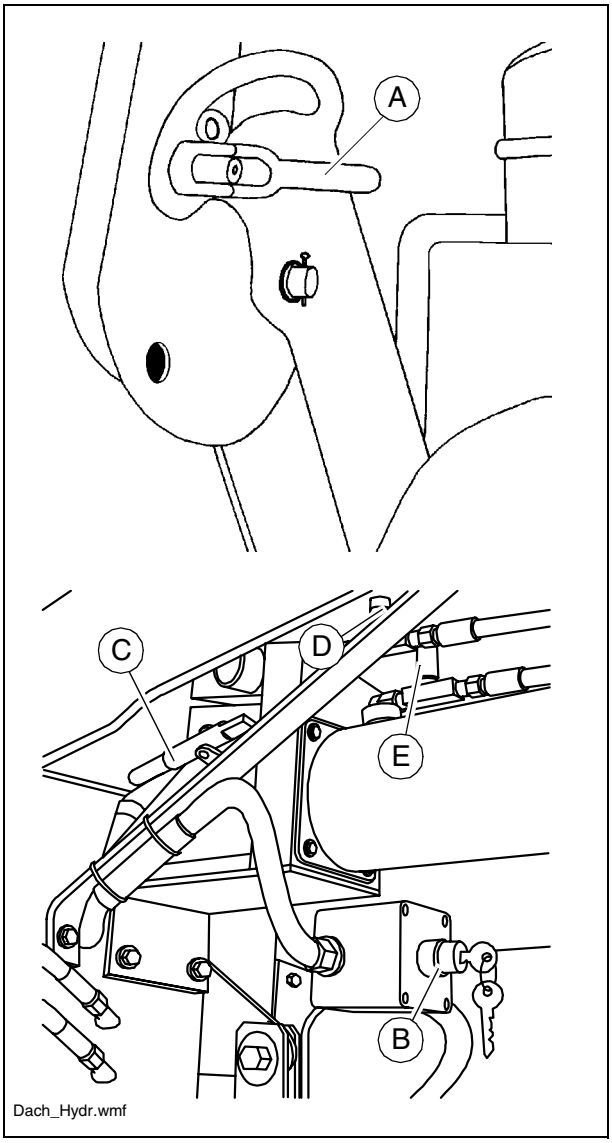
- Loose the twistlock (86)
- Draw the roof frame with the bow-type handle (86a) to the front
- Arrest the twistlock in the second locking hole.



Dach1.Tif/Dach.Tif

Hydraulic folding roof (87) (○)

The hydraulically folding roof is secured by means of a latch (A) at the rear suspension on the left and right sides of the machine. This must be released prior to lowering and raising. Once it has reached its terminal position, the roof must be secured with the latch again.
The hydraulic unit and the key-operated switch (A) for actuating the folding roof hydraulic system are located on the left side of the paver finisher's rear panel.



☞ The roof can be raised and lowered without having to start the drive motor.

- In order to lower the roof, turn the key-operated switch (B) to the right until the roof has been lowered to its minimum level.

STOP Danger of crushing! Ensure that nobody inserts their fingers or hands into the joint areas or are placed at risk by the lowering roof during the folding procedure.

- In order to raise the roof again, turn the key-operated switch (B) to the left until the roof has been raised to its maximum height.

If it is necessary to raise the roof whilst the battery is discharged, a manual pump is available on the hydraulic unit.

- Actuate the pump lever (C) until the roof can be secured with the latch bolt (A) in its uppermost position.

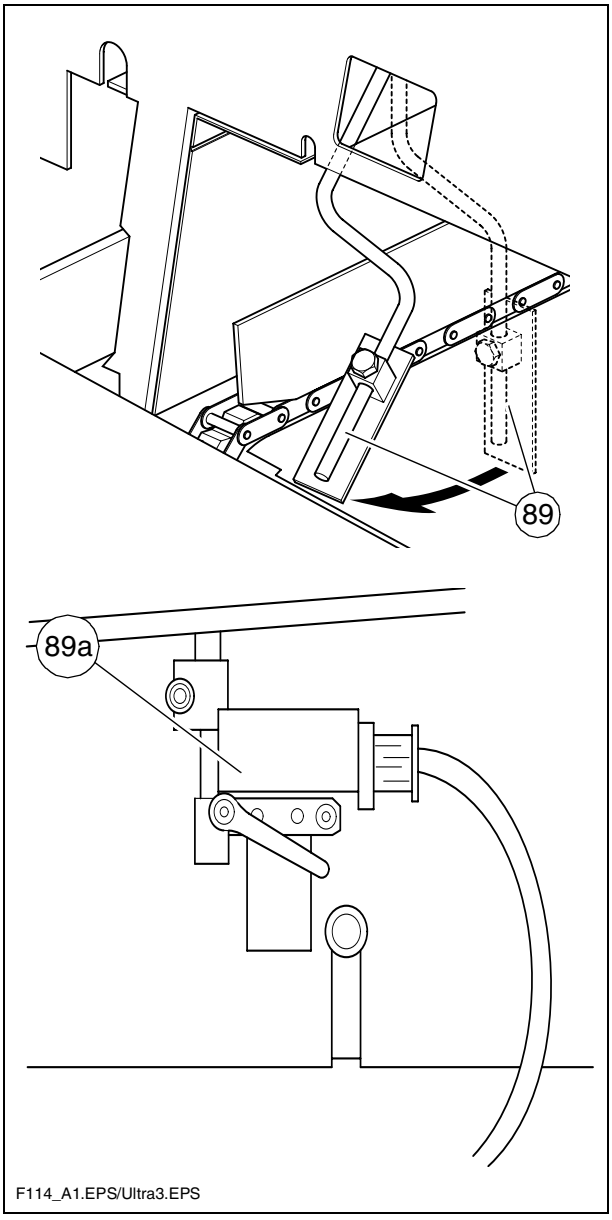
Two throttles are installed to adjust the raising and lowering speed:

- Throttle valve (D): Adjust roof raising speed.
  Turning the adjusting knob in the clockwise direction = lower speed.
  Turning anti-clockwise = higher speed.
- Throttle valve (E): Adjust roof lowering speed.
  Turning the adjusting knob in the clockwise direction = lower speed.
  Turning anti-clockwise = higher speed.

Conveyor limit switches:

The mechanical conveyor limit switches (89) or the ultrasonic conveyor limit switches (89a○) 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).



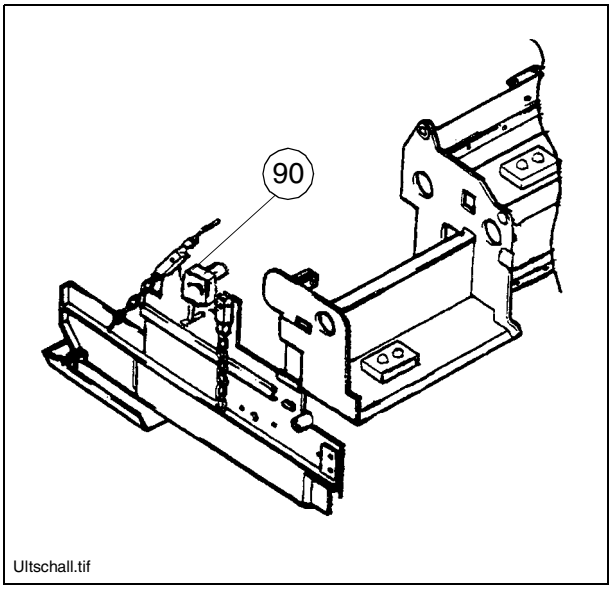
F114_A1.EPS/Ultra3.EPS

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 (socket (62)).

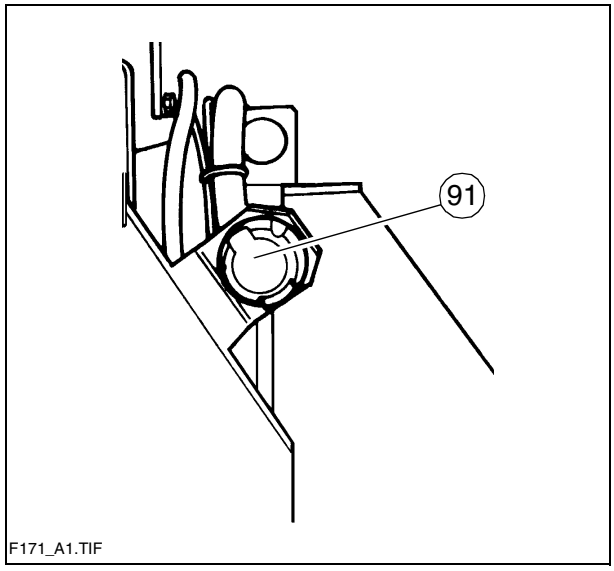
☞ We recommend to adjust the limit switch positions while the material is distributed.



Ultschall.tif

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

Connect the cable (68) of each large remote control unit to socket (91).

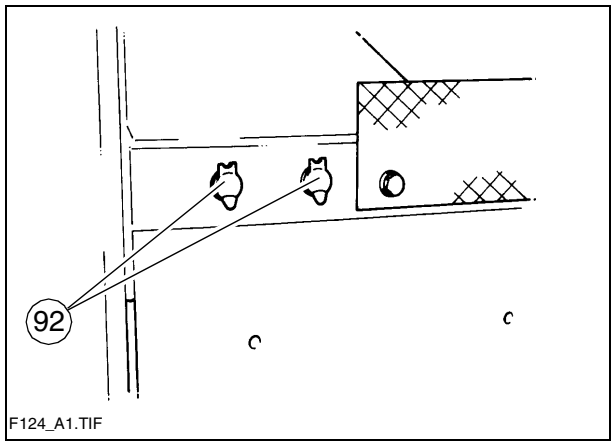


Sockets for working lights (left and right) (92)

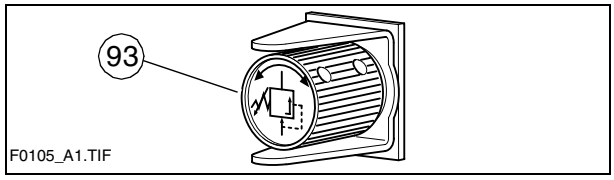
Connect the working lights (24 V) here.

- Power is present when the main switch (72) is switched on.

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



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



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

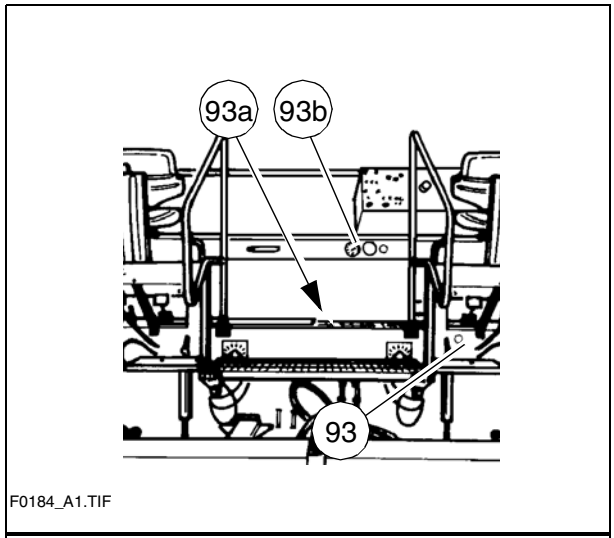
- See ”screed charging/relieving device” (34).
- Pressure display: see manometer (93b).

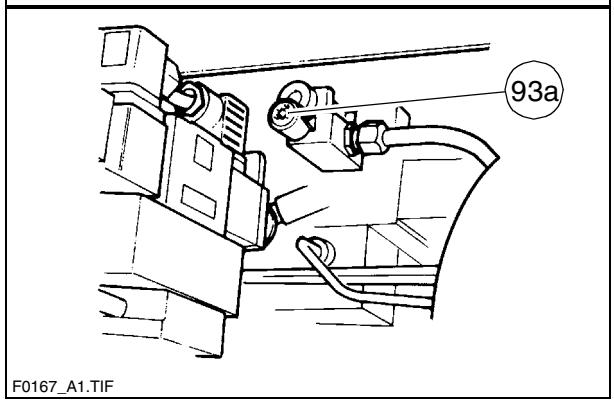
Pressure control valve for screed stop with pretensioning (93a) (○)

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

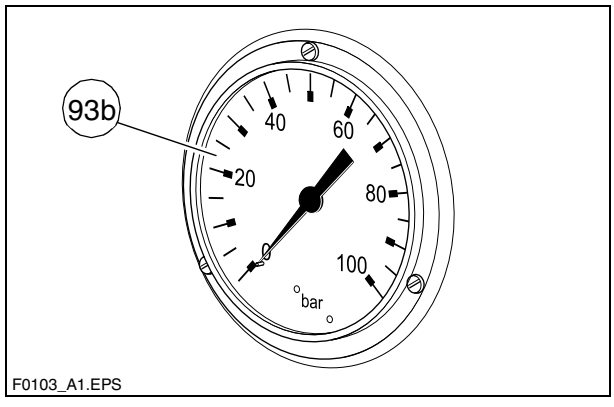
It is used to adjust the pressure for ”screed stop with pretensioning”.

- Activation: see “screed charging/relieving device” (34).
- Pressure display: see “manometer” (93b).





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



Displays the pressure for

- Screed stop with pretensioning screed stop with pretensioning when the drive lever is set to the neutral position (pressure to be adjusted using valve (93a));
- Screed charging/relieving device when the drive lever 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.
- When screed is operated with the optional gas heating system, open the closing valves and the main shut-off valve.
- 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.

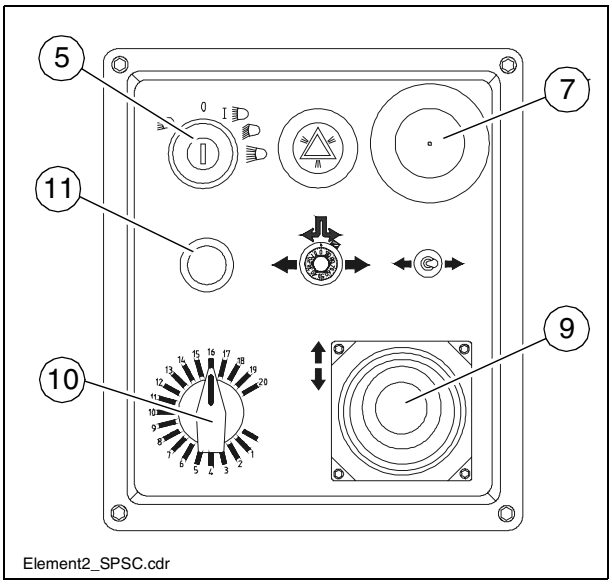
- Check the safety devices and protective devices.

„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.

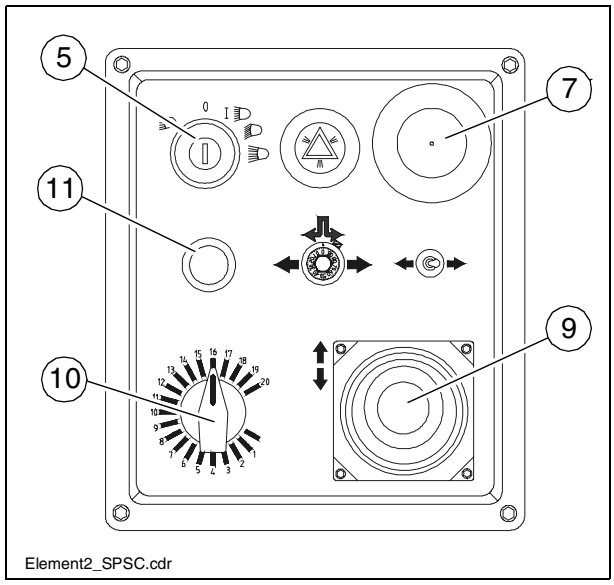
Suitable power sources are:

- 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:

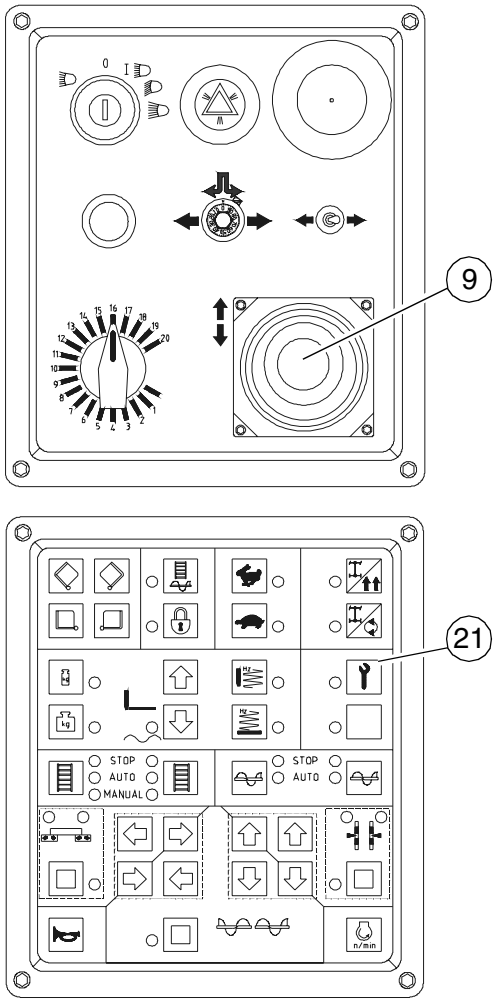
- Disconnect the power source.

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. F



Element1_SPSC.cdr,Element2_SPSC.cdr

Indicator lamps

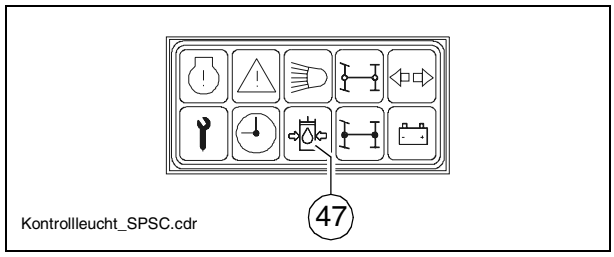
The following indicator lamps must be observed under all circumstances:

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

Oil pressure indicator lamp for the traction drive (47)

- 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.

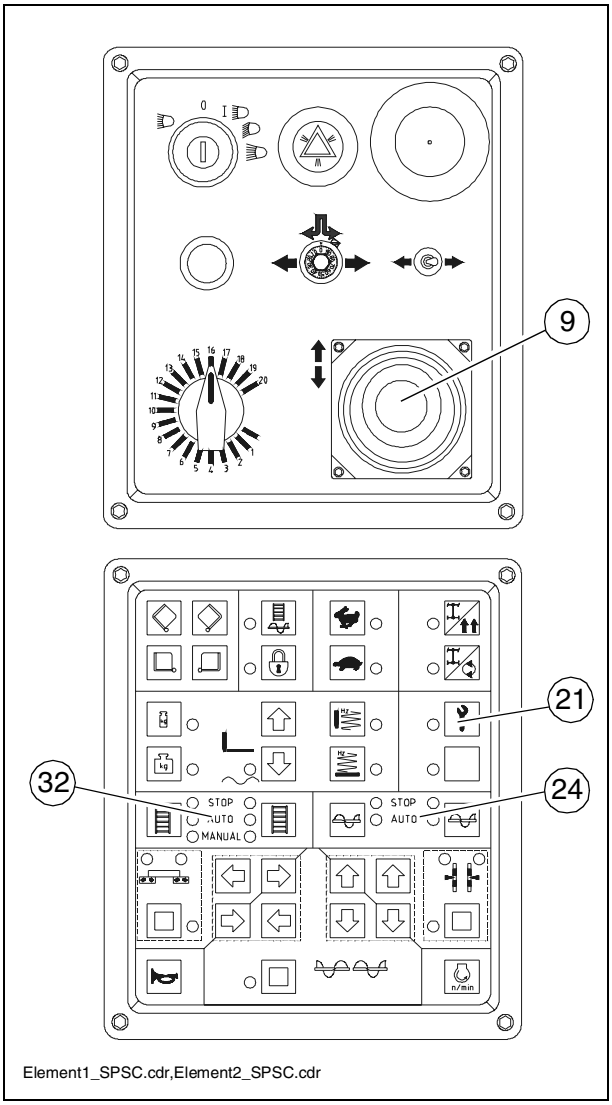


When the hydraulic oil is cold:

- 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.

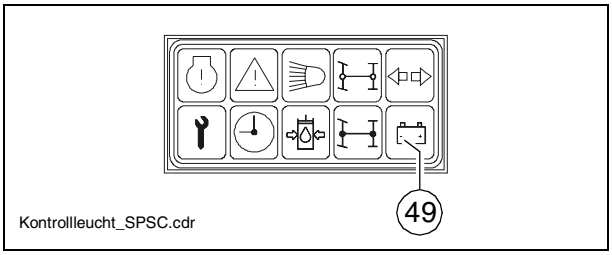


Element1_SPSC.cdr,Element2_SPSC.cdr

Battery charge indicator (49)

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.



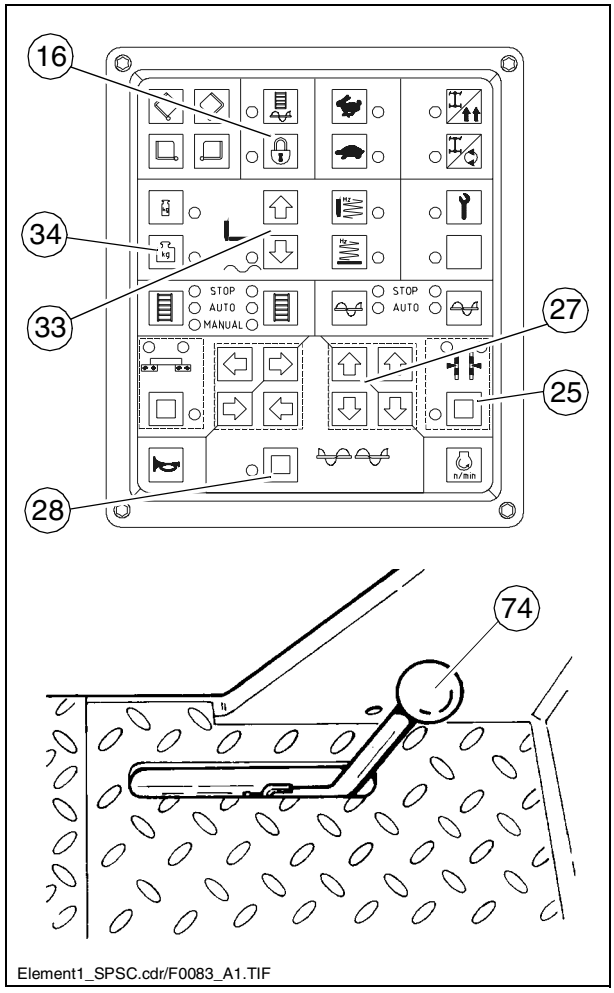
Kontrollleucht_SPSC.cdr

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)!

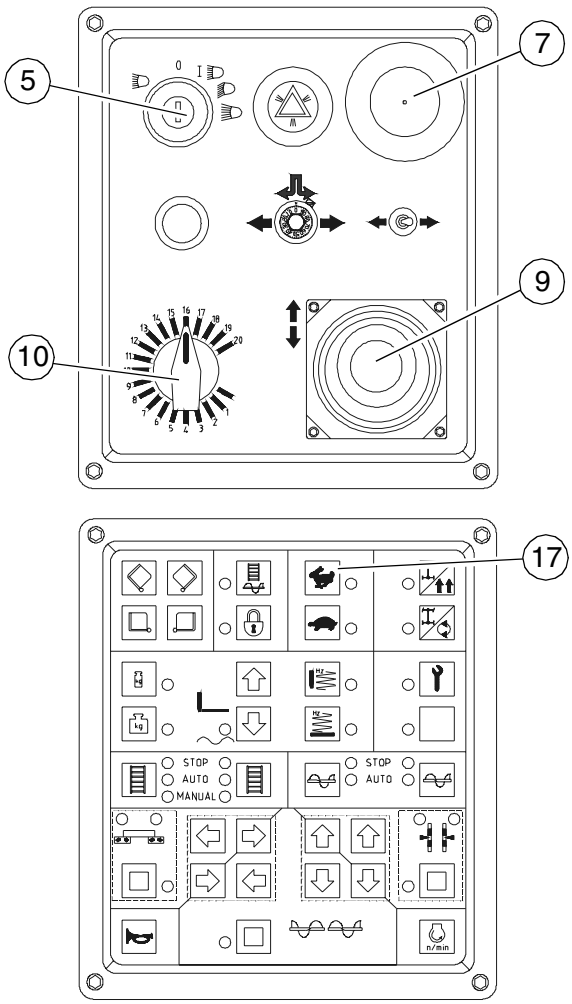
- To stop the finisher, set the drive lever (9) to the center position.

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.



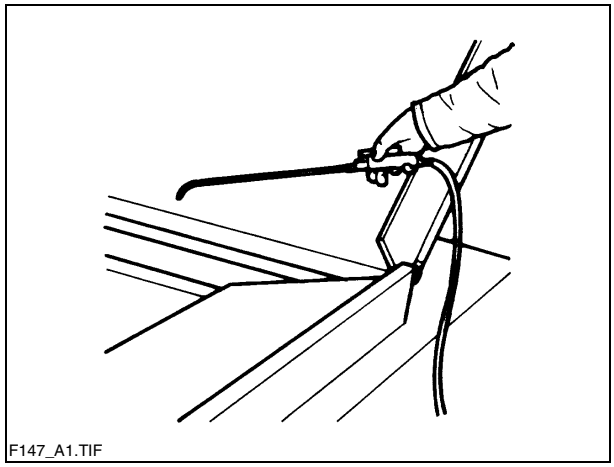
Element1_SPSC.cdr,Element2_SPSC.cdr

3.4 Preparations for paving

Separating agent

Spray the parts coming into contact with asphalt (hopper, screed, auger, push roller) with a separator emulsion.

⚠ Do not use diesel fuel as it dissolves the bitumen (prohibited in Germany!).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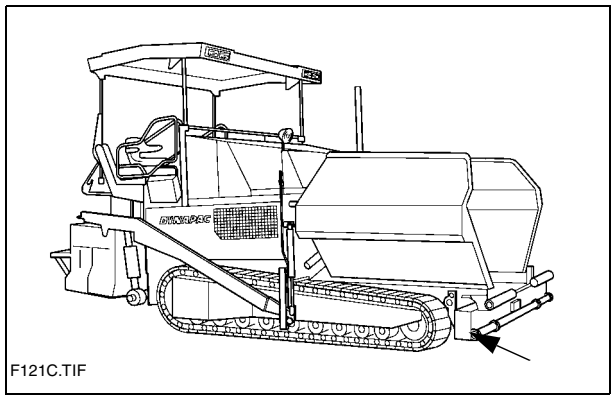
Screed heater

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.

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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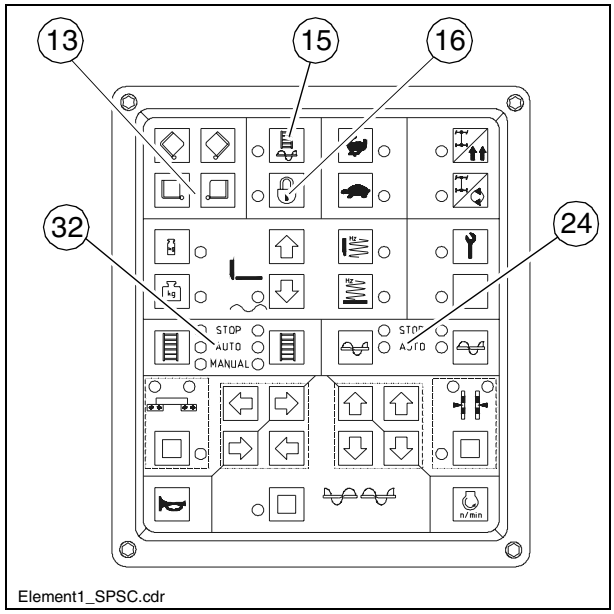
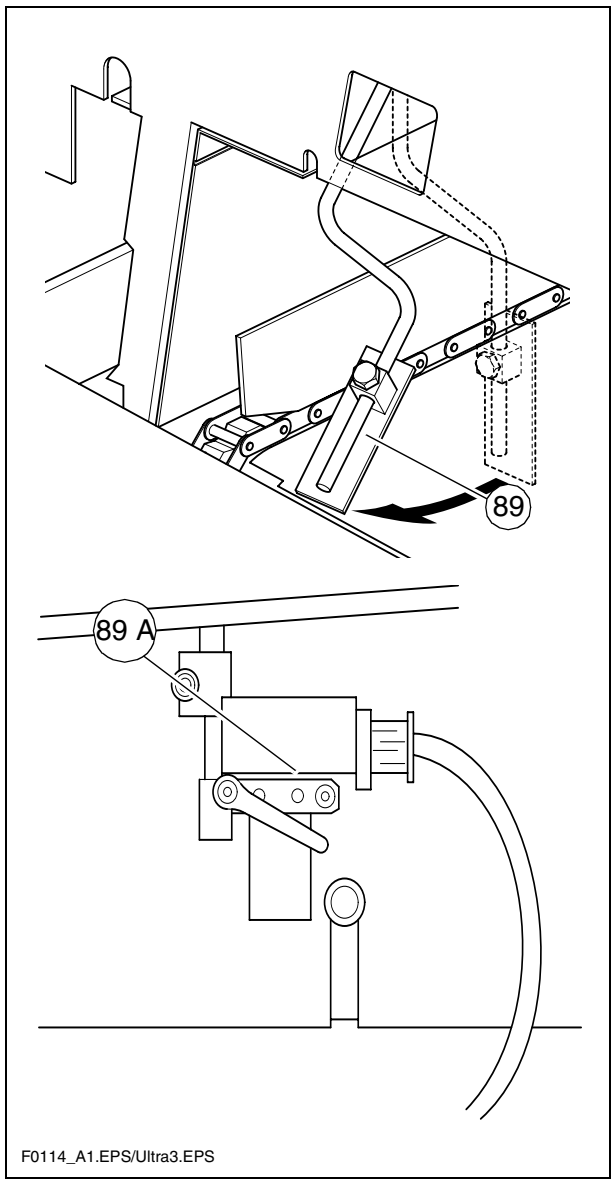
Loading/distributing material

- 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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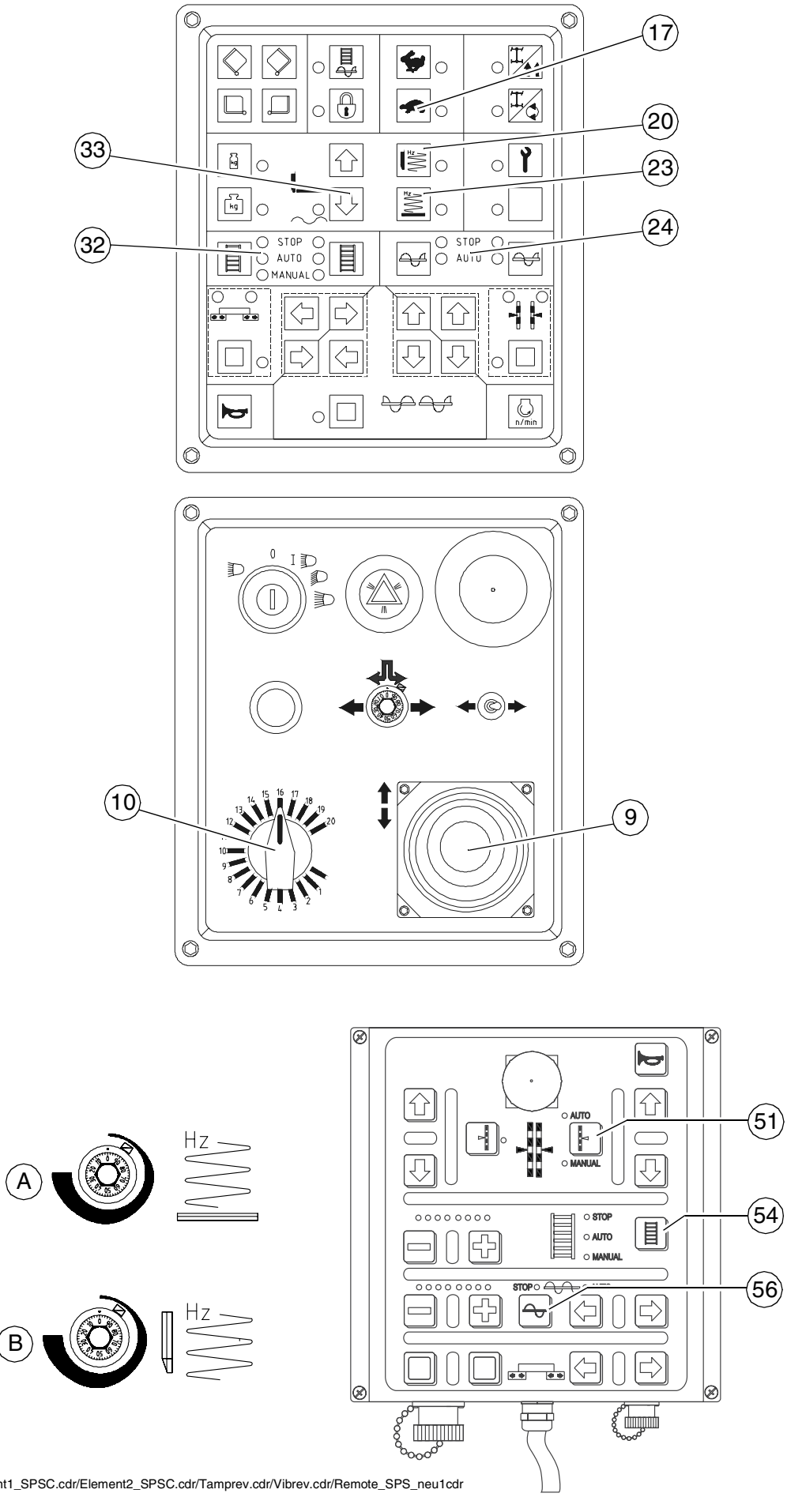
3.5 Starting for paving



Element1_SPSC.cdr/Element2_SPSC.cdr/Tamprev.cdr/Vibrev.cdr/Remote_SPS_neu1cdr

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.

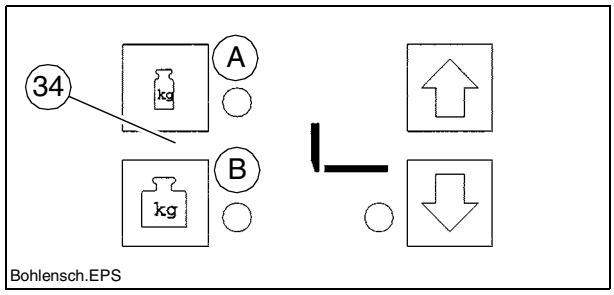
☞ Relieving reduces the screed weight and increases the traction force.
Charging increases the screed weight, reduces the traction force, but increases the compaction ratio. (To be used with light-weight screeds in exceptional cases.)

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')



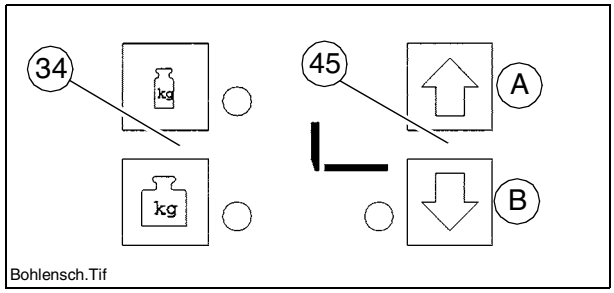
Switch positions „Screed charging/relieving" are only effective when the paver finisher moves. When the paver finisher stops, „screed stop" is automatically selected.

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.

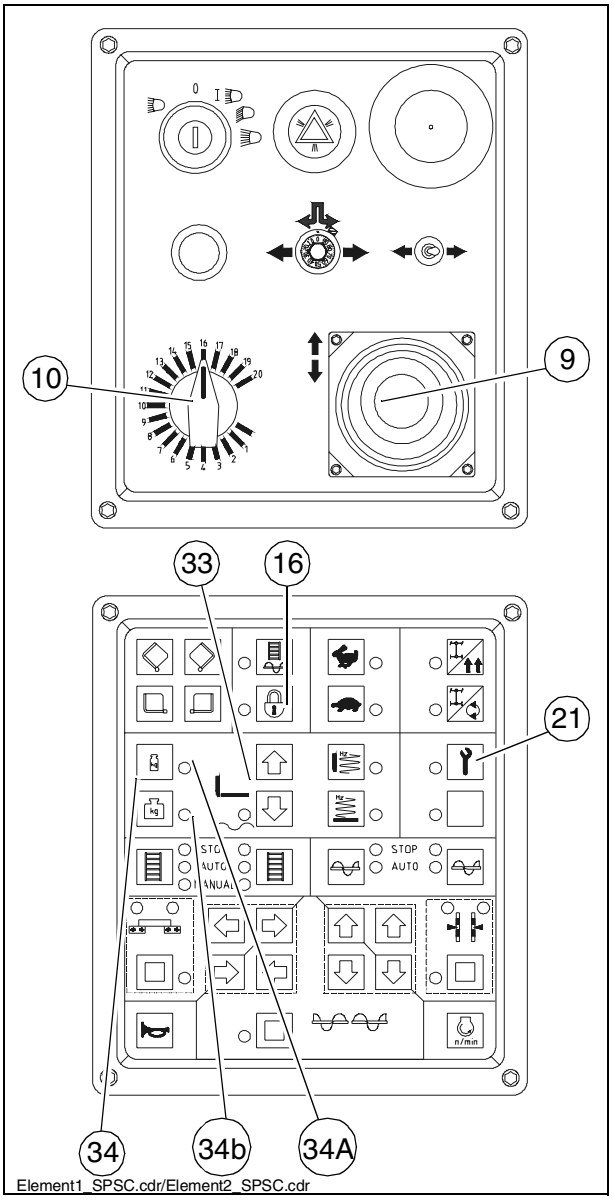
Especially in those cases where the "screed relieving" function is only briefly used as a start-up aid, there is a danger of uncontrolled floating when starting up again.

☞ 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.

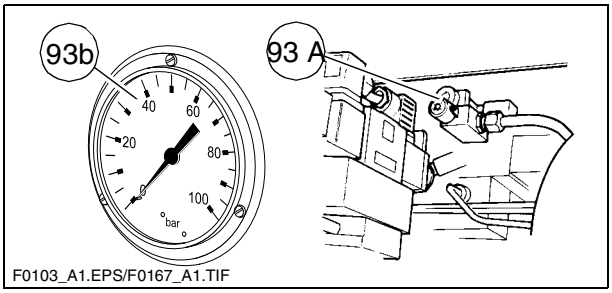


For screed stop with pretensioning

- 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)

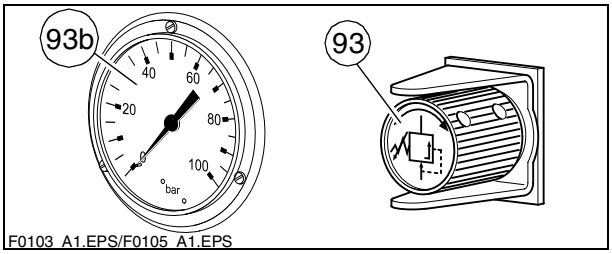
For screed charging/relieving

- 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).

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

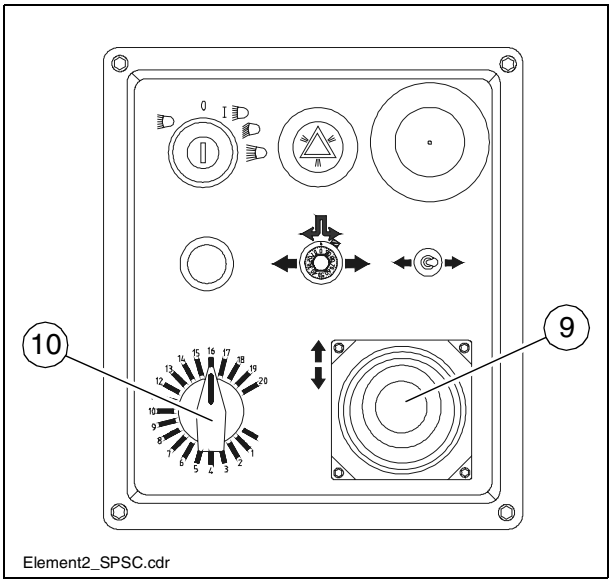


☞ The pressure can also be set or corrected during paving. (Max. 50 bar)

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.



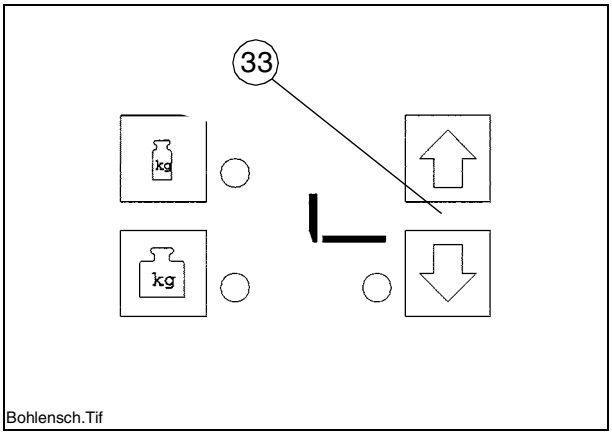
During extended interruptions

- 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.

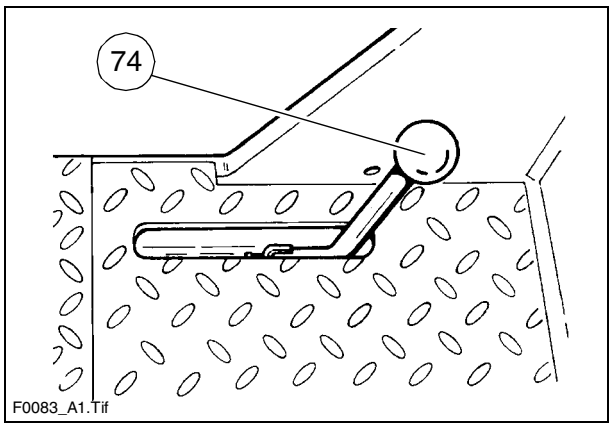
When work is finished

- 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.



Bohlensch.Tif

- 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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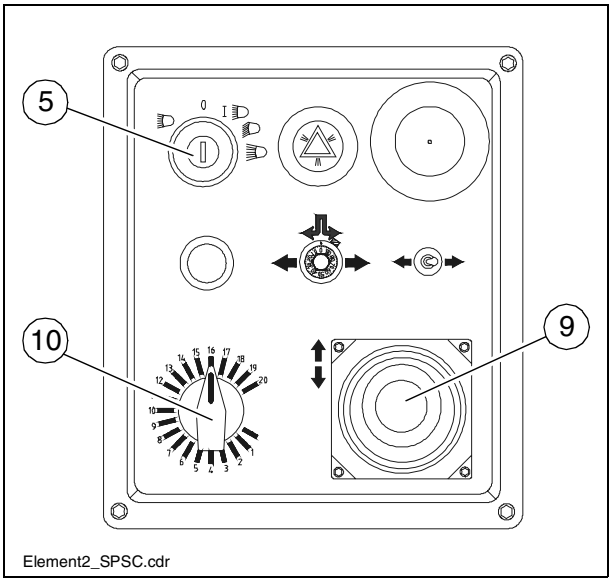
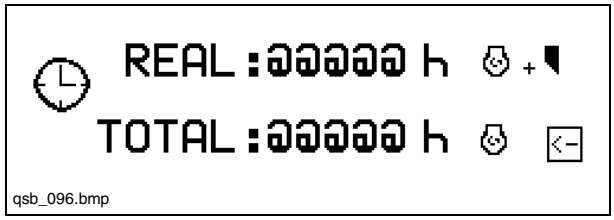
- Set the drive lever (9) to the center position and the speed adjuster (10) to minimum
- Switch off the ignition (5).
- Switch off screed heater (system).
- When screed is operated with the optional gas heating system, close the main shut-off valves and the valves of the bottles.
- Remove the levelling 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 Engine error codes

Fault Code Lamp	PID(P) SID(S) FMI	SPN (S) FMI	Reason	Effect
111* YELLOW	S254 12	629 12	ECM internal hardware error.	Possible no effect or engine may run rough or not start.
115* YELLOW	P190 2	190 2	No engine speed or position signal detected at pin 17 of the engine harness.	Engine power derate. Possible white smoke.
122 YELLOW	P102 3	102 3	High voltage detected at the boost pressure sensor signal pin 45 of the engine harness.	Engine will derate to no-boost fueling.
123 YELLOW	P102 4	102 4	Low voltage detected at boost pressure sensor signal pin 45 of the engine harness.	Engine will derate to no-boost fueling.
131 YELLOW	P091 3	091 3	High voltage detected at throttle position signal pin 30 of the OEM harness.	Engine idles when idle validation switch indicates idle and ramps up to a default set speed when the idle validation switch indicates off-idle.
132 YELLOW	P091 4	091 4	Low voltage detected at throttle position signal pin 30 of the OEM harness.	Engine idles when idle validation switch indicates idle and ramps up to a default set speed when the idle validation switch indicates off-idle.
133 YELLOW	P029 3	029 3	High voltage detected at remote throttle position signal pin 9 of the OEM harness.	Engine will not respond to remote throttle input.
134 YELLOW	P029 4	029 4	Low voltage detected at remote throttle position signal pin 9 of the OEM harness.	Engine will not respond to remote throttle input.
135 YELLOW	P100 3	100 3	High voltage detected at oil pressure signal pin 33 of the engine harness.	Default value used for oil pressure. No engine protection for oil pressure.
141 YELLOW	P100 4	100 4	Low voltage detected at oil pressure signal pin 33 of the engine harness.	Default value used for oil pressure. No engine protection for oil pressure.
143 YELLOW	P100 1	100 1	Oil pressure signal indicates oil pressure below the low minimum engine protection limit.	Power derate and possible engine shutdown if engine protection shutdown feature enabled.
144 YELLOW	P110 3	110 3	High voltage detected at coolant temperature signal pin 23 of the engine harness.	Default value used for coolant temperature. No engine protection for coolant temperature.
145 YELLOW	P110 4	110 4	Low voltage detected at coolant temperature signal pin 23 of the engine harness.	Default value used for coolant temperature. No engine protection for coolant temperature.

Fault Code Lamp	PID(P) SID(S) FMI	SPN (S) FMI	Reason	Effect
146 YELLOW	P110 0	110 0	Coolant temperature signal indicates coolant temperature has exceeded the minimum engine protection limit.	Power derate and possible engine shutdown if engine protection shutdown feature is enabled.
151 RED	P110 0	110 0	Coolant temperature signal indicates coolant temperature has exceeded the maximum engine protection limit.	Speed derate and possible engine shutdown if engine protection shutdown feature is enabled.
153 YELLOW	P105 3	105 3	High voltage detected at intake manifold temperature signal pin 34 of the engine harness.	Default value used for intake manifold temperature. No engine protection for intake manifold temperature.
154 YELLOW	P105 4	105 4	Low voltage detected at intake manifold temperature signal pin 34 of the engine harness.	Default value used for intake manifold temperature. No engine protection for intake manifold temperature.
155 RED	P105 0	105 0	Intake manifold temperature signal indicates intake manifold temperature is above the maximum engine protection limit.	Speed derate and possible engine shutdown if engine protection shutdown feature is enabled.
191	P050 11	876 11	A/C Clutch drive signal indicates a short to ground when commanded on.	Can not turn on A/C.
234 RED	P190 0	190 0	Engine speed signal indicates engine speed has exceeded the overspeed limit.	Fuel to injectors disabled until engine speed falls below the overspeed limit.
235 MAINT.	P111 1	111 1	Coolant level signal at pin 37 of the engine harness indicates coolant level is low.	Power derate and possible engine shutdown if engine shutdown feature is enabled.
241 YELLOW	P084 2	084 2	Vehicle speed signal on pins 8 and 18 of the OEM harness has been lost.	Engine speed limited to ”Max. Engine Speed without VSS”. Cruise control, gear-down protection and the road speed governor will not work. Trip information data that is based on mileage will be incorrect.
242 YELLOW	P084 10	084 10	Invalid or inappropriate vehicle speed signal indicated on pins 8 and 18 of the OEM harness indicating connection or possible tampering.	Engine speed limited to ”Max. Engine Speed without VSS”. Cruise control, gear-down protection and the road speed governor will not work. Trip information data that is based on mileage will be incorrect.
243 NONE	P121 4	513 4	Error detected in the exhaust brake relay enable control circuit at pin 42 of the engine harness.	Exhaust brake will not work.
245 NONE	S033 4	647 4	Error detected in the fan clutch relay enable circuit at pin 31 of the engine harness.	Electronic control module (ECM) can not control the engine cooling fan. Fan will remain on or off.

Fault Code Lamp	PID(P) SID(S) FMI	SPN (S) FMI	Reason	Effect
261* YELLOW	P174 0	174 0	VP44 Fuel Pump Control Module indicates the fuel temperature has exceeded the pump protection limit.	Power derate.
264 YELLOW	P174 2	174 2	High or low voltage detected at the fuel temperature sensor signal circuit inside VP44 pump controller.	Default value used for fuel temperature. Possible low power.
278* YELLOW	P073 11	1075 11	Error detected in lift pump circuit at pin 11 of the engine harness.	Possible low power, engine may die, run rough or be difficult to start.
283 YELLOW	P021 3	636 3	High voltage detected at main engine speed/position sensor voltage supply pin 8 of the engine harness.	ECM will use the VP44 pump speed as a backup. Possible white smoke and power loss.
284 YELLOW	P021 4	636 4	Low voltage detected at main engine speed/position sensor voltage supply pin 8 of the engine harness.	ECM will use the VP44 pump speed as a backup. Possible white smoke and power loss.
297 YELLOW	P223 3	1084 3	High voltage detected at OEM pressure signal pin 48 of the OEM harness.	Default value used for OEM pressure. Lose ability to control OEM pressure.
298 YELLOW	P223 4	1084 4	Low voltage detected at OEM pressure signal pin 48 of the OEM harness.	Default value used for OEM pressure. Lose ability to control OEM pressure.
319 MAINT.	P251 2	251 2	Power to the real time clock has been interrupted and is setting is no longer valid.	Time stamp in ECM powerdown data will be incorrect.
349 YELLOW	P191 0	191 0	Auxiliary device speed signal on pins 8 and 18 of the OEM harness is out of range of the ECM thresholds.	Lose ability to control speed of the Auxiliary device.
352 YELLOW	S232 4	620 4	Low voltage detected at engine position sensor +5 VDC supply pin 10 of the engine harness.	Default value used for sensors connected to this +5 VDC supply. Engine will power derate to no-boost fueling and loss of engine protection for oil pressure, intake manifold pressure, and ambient air pressure.
361 RED	S251 3	251 3	High current detected at the VP44 fuel pump control valve.	Fueling to the injectors disabled and engine is shut down.
362 YELLOW	S251 4	251 4	Low or no voltage detected at the VP44 fuel pump control valve.	Engine will lose power and may shut down.
363 YELLOW	S251 7	251 7	No fuel control valve movement detected by the VP44 fuel pump controller.	Engine power loss.

Fault Code Lamp	PID(P) SID(S) FMI	SPN (S) FMI	Reason	Effect
364* YELLOW	S233 9	1077 9	No communications or invalid data transfer rate detected on data link between ECM and VP44 fuel pump controller at pin 4 and 13 of the engine harness.	Engine will run at a backup mode set speed when throttle is off-idle.
365 YELLOW	S233 4	1077 4	Low voltage detected at VP44 fuel pump controller supply voltage circuit.	Engine may lose power and may shut down.
366 YELLOW	S233 2	1077 2	VP44 fuel pump controller battery voltage measurement is outside the range between 6 and 24 VDC.	Engine will lose power and may shut down.
367 RED	P190 11	1078 11	VP44 fuel pump speed/position sensor signal lost.	Fueling to injectors disabled and engine will shut down.
368 YELLOW	S254 8	1078 8	The VP44 fuel pump controller can not achieve the timing value being commanded by the engine ECM.	Significant engine power loss.
369 YELLOW	P190 2	1078 2	VP44 fuel pump controller does not detect engine position pulse at pin 7 of the engine harness.	Significant engine power loss. Possible white smoke.
372* YELLOW	S233 11	1077 11	VP44 fuel pump controller detects continuous voltage at idle select pin 16 of the engine harness ... OR ... fuel pump controller detects an open circuit or short circuit to ground at idle select pin 16 of the engine harness.	If communication is lost between the ECM and VP44 fuel pump controller, engine will only operate at a speed slightly higher than idle, regardless of throttle position.
373 RED	S233 3	1077 3	High voltage detected at VP44 fuel shut off signal pin 6 of the engine harness.	Fueling to injectors is disabled and engine will shut down.
374* YELLOW	S233 12	1077 12	VP44 fuel pump controller has detected an internal error.	Response will vary from some power loss to the engine shutting down.
375 YELLOW	S254 2	629 2	Engine ECM is commanding a fueling or timing value that the VP44 pump can not achieve.	Possible no effect or engine may exhibit some power loss.
376* RED	S233 13	1077 13	No calibration in the VP44 fuel pump controller.	Fueling to injectors disabled and engine will shut down.
377 YELLOW	S233 7	1077 7	VP44 fuel pump controller is not powering down when key switch power is removed from the ECM.	Equipment batteries may be drained low during long shutdown periods.

Fault Code Lamp	PID(P) SID(S) FMI	SPN (S) FMI	Reason	Effect
381* YELLOW	S237 11	626 11	Error detected in cold start aid relay 1 enable circuit at pin 41 of the OEM harness.	Intake air heater can not be fully energised by the ECM. Possible white smoke and/or hard starting.
382* YELLOW	S237 11	626 11	Error detected in cold start aid relay 2 enable circuit at pin 31 of the OEM harness.	Intake air heater can not be fully energised by the ECM. Possible white smoke and/or hard starting.
385 YELLOW	S232 3	620 3	High voltage detected at OEM harness sensor +5 VDC supply pin 10 of the engine harness.	Sensors connected to this +5 VDC supply (i.e., remote throttle position sensor) will not function.
386 YELLOW	S232 3	620 3	High voltage detected at the engine position sensor +5 VDC supply pin 10 of the engine harness.	Default value used for sensors connected to this +5 VDC supply. Engine will derate to no-boost fueling and loss of engine protection for oil pressure, intake manifold temperature, and coolant temperature.
387 YELLOW	P091 3	91 3	High voltage detected at the throttle position sensor +5 VDC supply pin 29 of the OEM harness.	Engine idles when idle validation switch indicates idle and ramps up to a default set speed when idle validation switch indicates off-idle.
391 YELLOW	S017 11	632 11	Error detected in VP44 power supply relay enable circuit at pin 43 of the engine harness.	Possible no effect on performance or engine may not run.
415 RED	P100 1	100 1	Oil pressure signal indicates oil pressure below the very low engine protection limit.	Speed derate and possible engine shutdown if engine protection shutdown feature enabled.
418 WIF	P097 0	097 0	Water-in-fuel signal indicates the water in the fuel filter needs to be drained.	Excessive water in the fuel can lead to severe fuel system damage.
422 YELLOW	P111 2	111 2	Voltage detected simultaneously on both the coolant level high and low signal pins 27 and 37 of the engine harness ... OR ... no voltage detected on either pin. (Fault is active for Switch type coolant level sensors only).	No engine protection for coolant level.
429 YELLOW	P097 4	097 4	Low voltage detected at water-in-fuel signal pin 40 of the OEM harness.	No water-in-fuel protection.
431 YELLOW	P091 2	091 2	Idle validation signals on pins 25 and 26 of the OEM harness indicate voltage detected simultaneously on both pins (Open Circuit).	No effect on performance, but loss of idle validation.

Fault Code Lamp	PID(P) SID(S) FMI	SPN (S) FMI	Reason	Effect
432 YELLOW	P091 13	091 13	Idle validation signal at pin 26 of the OEM harness indicates the throttle is at the idle position when the throttle position signal at pin 30 of the OEM harness indicates the throttle is not at the idle position ... OR ... idle validation signal at pin 26 of the OEM harness indicates the throttle is not at the idle position when the throttle position signal at pin 30 of the OEM harness indicates the throttle is at the idle position.	Engine will only idle.
433 YELLOW	P102 2	102 2	Boost pressure signal indicates boost pressure is high when other engine parameters (i.e., speed and load) indicate boost pressure should be low.	Possible overfueling during acceleration. Increase in black smoke.
434* YELLOW	S251 2	627 2	Supply voltage to the ECM fell below 6.0 VDC for a fraction of a second ... OR ... the ECM was not allowed to power down correctly (retain battery voltage for 30 seconds after key OFF).	Possible no noticeable performance effects OR engine dying OR hard starting. Fault information, trip information, and maintenance monitor data may be inaccurate.
441 YELLOW	P168 1	168 1	Voltage detected at ECM power supply pins 38, 39, and 40 of the engine harness indicates ECM supply voltage fell below 6 VDC.	Engine will die or run rough.
442 YELLOW	P168 0	168 0	Voltage detected at ECM power supply pins 38, 39, and 40 of the engine harness indicates the ECM supply voltage is above the maximum system voltage level.	None on performance.
443 YELLOW	S232 1	620 1	Low voltage detected at throttle position sensor +5 VDC supply pin 29 of the OEM harness.	Engine idles when idle validation switch indicates idle and ramps up to a default set speed when idle validation switch indicates off-idle.
444 YELLOW	S232 1	620 1	Low voltage detected at OEM harness sensor +5 VDC supply pin 10 of the OEM harness.	Sensors connected to this +5 VDC supply (i.e., remote throttle position sensor) will not function.
488 YELLOW	P105 0	105 0	Intake manifold air temperature signal indicates intake manifold air temperature is above the minimum engine protection threshold.	Power derate and possible engine shutdown if engine protection shutdown feature is enabled.
489 YELLOW	P191 1	191 1	Auxiliary device speed signal on pins 8 and 18 of the OEM harness is out of range of the ECM threshold.	Lose ability to control the speed of the auxiliary device.

Fault Code Lamp	PID(P) SID(S) FMI	SPN (S) FMI	Reason	Effect
515 YELLOW	P091 3	091 3	High voltage detected at the coolant level +5 VDC sensor supply voltage pin 49 of the engine harness.	No engine protection for coolant level.
516 YELLOW	P091 4	091 4	Low voltage detected at the coolant level +5 VDC sensor supply voltage pin 49 of the engine harness.	No engine protection for coolant level.
517 YELLOW	S251 12	1076 12	A mechanically stuck fuel control valve has been detected by the VP44 fuel pump controller.	Engine may shut down.
524 YELLOW	P113 2	113 2	Error detected on the High Speed Governor Droop selection switch input pin 24 of the engine harness.	Operator can not select alternate HSG Droop. Normal droop is used.
527* YELLOW	P154 3	702 3	Error detected in the Dual Output Driver ”A” circuit pin 5 of the OEM harness.	The device controlled by the Dual Output Driver ”A” signal will not function properly.
528 YELLOW	P093 2	093 2	Error detected on the Torque Curve Selection switch input pin 39 of the OEM harness.	Operator can not select alternate torque curves. Normal torque curve is used.
529* YELLOW	S051 3	703 3	Error detected in the Dual Output Driver ”B” circuit pin 21 of the engine harness.	The device controlled by the Dual Output Driver ”B” signal will not function properly.
551 YELLOW	P091 4	091 4	Idle validation signals on pins 25 and 26 of the OEM harness indicate no voltage on either pin.	Engine will only idle.

Fault Code Lamp	PID(P) SID(S) FMI	SPN (S) FMI	Reason	Effect
599 RED	S025 14	640 14	The dual output feature in the customer specialised calibration has initiated an engine shut-down based on operating conditions, engine sensor values, or OEM inputs to the ECM.	Engine will shut down.
611*	S151 0	1020 0	ECM detected the engine has initiated a protection shutdown or has been keyed-off while above a specified load limit.	No effect.
768 YELLOW	S009 11	923 11	Error detected in the Output Device Driver (Transmission Shift Modulation Signal) signal pin 21 on the OEM harness.	Can not control the Transmission.

4.2 Problems during paving

Problem	Cause
Wavy surface ("short waves")	- change in the material temperature, demixing - 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 - bottom plates of the screed are warped or not uniformly worn - 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 - demixing - 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 - demixing - 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 - demixing - 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

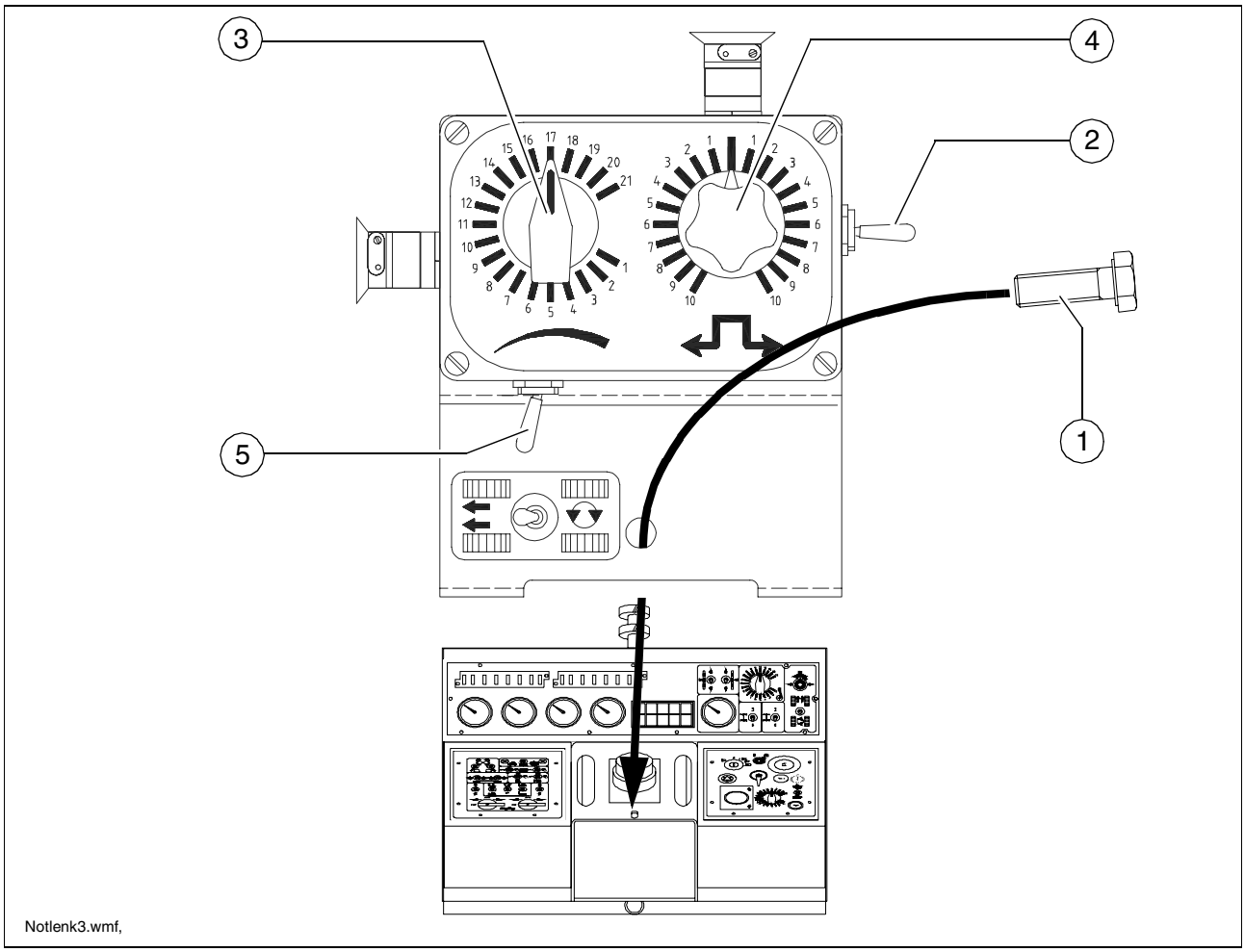
Malfunction	Cause	Remedy
At the diesel engine	Diverse	See operating instructions for the engine
Diesel engine does not start	Batteries empty	See ”External starting” (start assistance)
	Diverse	see ”Towing”
Tamper or vibration does not operate	Tamper is obstructed by cold bitumen	Properly heat the screed
	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
Traction does not work	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 95.



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Following functions are located in the steering unit:

Pos.	Designation
1	Mounting screws for holder plate
2	Switch for preselection of the zero position and forward reverse movement
3	Adjustment knob for speed control (Replace speed preselector)
4	Steering knob
5	Switch to turn the paver on the spot

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.

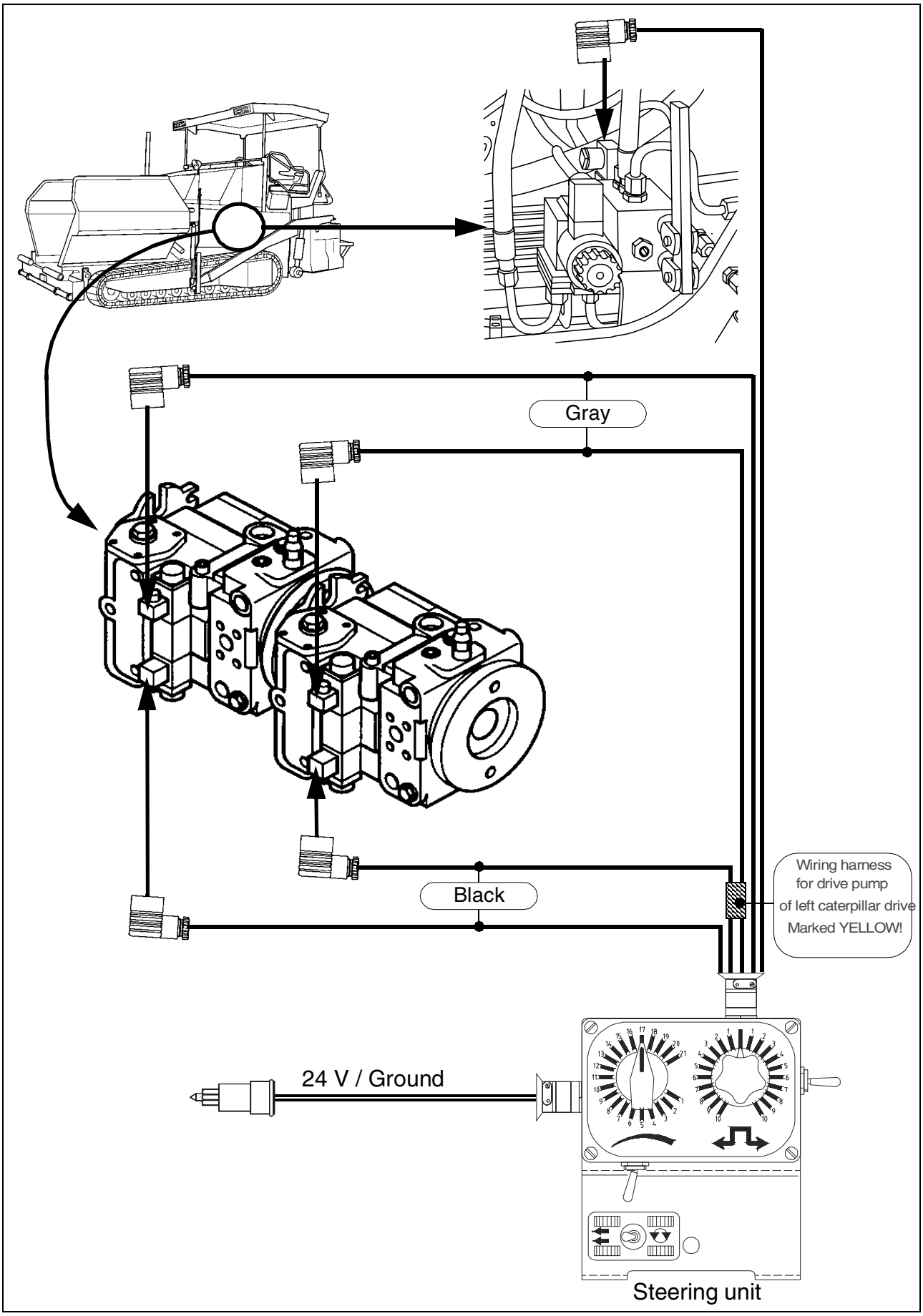
Starting up for laying

- Preselect the speed with turning knob (3)
- Push switch (2) in forward direction
- Engage forward reverse lever like under normal conditions
- All other functions (4, 5) have to be in the position described in the instruction manual (Operation)

Transport

- Adjust turning knob (3) to a low speed
- Push switch (2) to the recommended direction and engage the forward reverse lever to forward direction.
- If the recommended direction is reverse push switch in reverse, but still the forward reverse lever should be moved to forward direction
- Adjust the driving speed with turning knob (3)
- All other functions have to be in the position described in the instruction manual (Operation)

When starting the engine, switch (2) must be in the zero position since the machine would otherwise move off straightaway! Risk of accident!



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E Set-up and modification

1 Special notes on safety

Danger to personnel by inadvertent starting of the engine, the traction drive, the conveyor, the auger, the screed or the lifting units. Unless specified otherwise, work may only be performed when the engine is at a standstill!

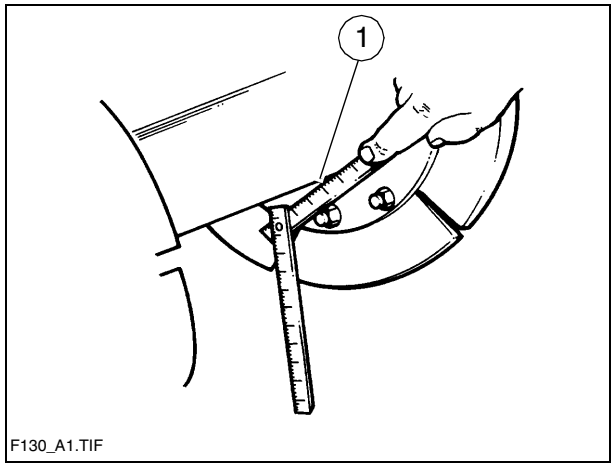
- To protect the paver finisher against inadvertent starting:
  Set the drive lever to the center position and set the preselector to zero; if applicable, remove the drive traction fuse from the operating panel; pull out the ignition key and the battery main switch.
- Secure lifted machine parts (e.g. screed or hopper) against lowering by means of mechanical supports.
- Replace parts or have them replaced as stipulated.

When connecting or disconnecting hydraulic hoses and when working on the hydraulic system, hot hydraulic fluid can spurt out at a high pressure.
Switch off the engine and de-pressurize the hydraulic system! Protect your eyes!

- Mount all protective devices before re-commissioning the paver finisher.
- The walking platform must always reach over the entire width of the screed. The hinged walkway (option for all variable screeds) may only be swung up under the following circumstances:
- When paving next to a wall or a similar obstacle.
- During transportation on a low-bed trailer.

2 Auger

2.1 Height adjustment



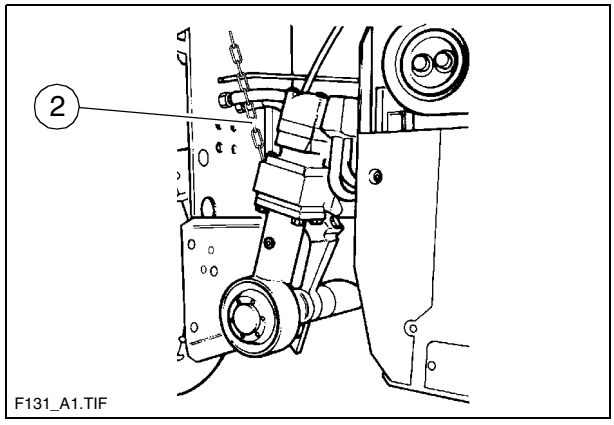
Depending on the mix of materials, when working with layer thicknesses of up to 15 cm, the height of the distribution auger (1) – measured from its bottom edge – should be around 5 cm (2 inches) above the material layer thickness (depending on its mix of materials).

Example: Layer height 10 cm
Adjustment: 15 cm from the ground

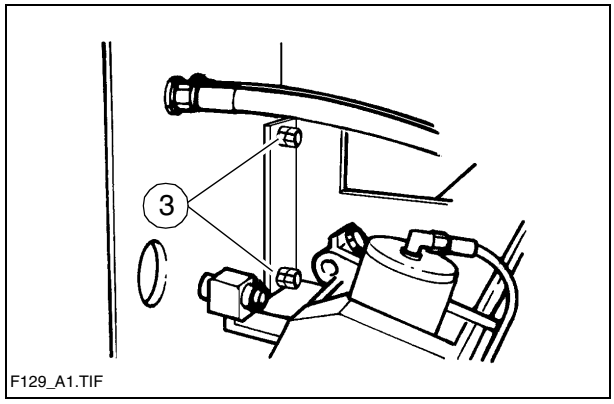
An incorrect height adjustment can result in the following problems:

- Auger too high:
  Too much material in front of the screed; material overflow. When operating with larger widths, demixing and traction problems may occur.
- Auger too low:
  Not enough material that can be precompacted by the auger. Irregularities resulting from this cannot be completely compensated for by the screed (wavy surface).
  In addition, an increased wear on the auger segments occurs.

2.2 Auger crossbeam installed in a fixed position

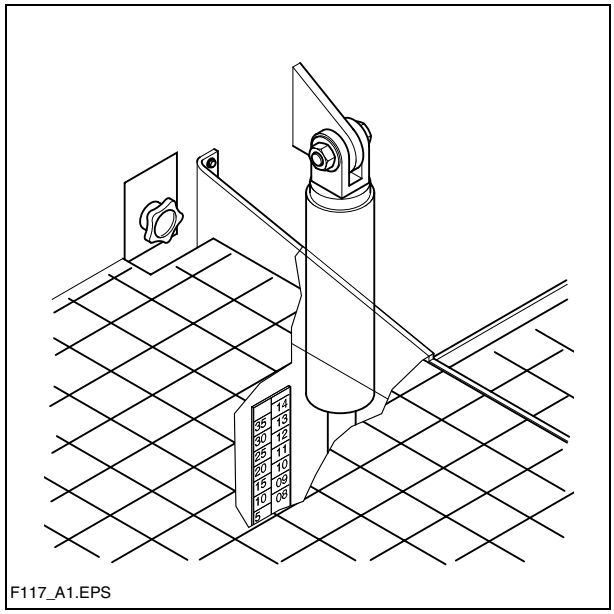


- Lower the screed onto a suitable support (e.g. squared timbers).
- Completely extend both levelling cylinders.
- Hook lifting chains (2) for lifting the auger crossbeam into the hooks of the crossbeams.
- Loosen the fixing screws (3) of the auger crossbeam.
- Retract the levelling cylinders until the auger crossbeam has reached the desired height.
- Tighten the fixing screws (3) of the auger crossbeam.



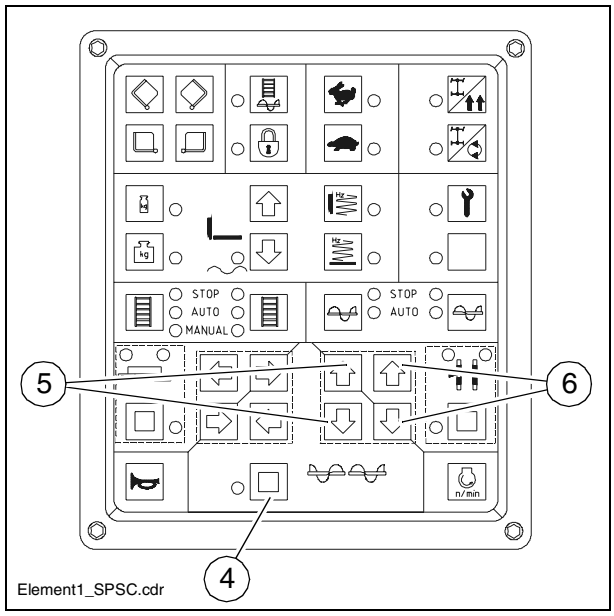
2.3 Hydraulic adjustment ○

- Determine the currently set height of the auger crossbeam (left and right) by means of the scale.
- Activate auger adjustment by pressing button (4).
- Press the buttons (5) and (6) to retract or extend the hydraulic cylinders.



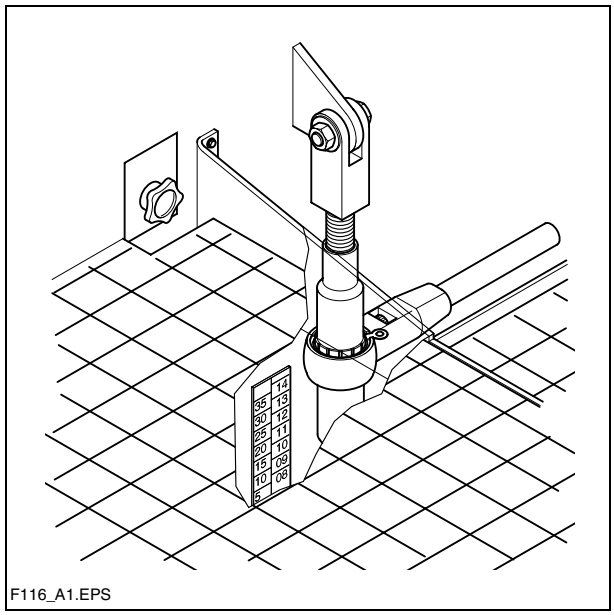
⚠ Actuate both switches simultaneously to avoid warping of the auger crossbeam.

- Check whether the heights on the left and on the right are identical.



2.4 Mechanicaladjustmentwithratchet(○)

- Set the ratchet direction lever to clockwise or anticlockwise direction. Turning anticlockwise lowers the auger, turning clockwise lifts the auger.
- Set the desired height by alternatingly adjusting the right-hand and the left-hand side.
- The current height can be read from the scale in cm or inches (cm = left-hand column, inches = right-hand column).



2.5 Auger extension

Depending on the type of screed, the most diversified working widths can be reached.

☞ Auger and screed extension must match. See the operating instructions of the appropriate screed, chapter ”Set-up and modification”, especially:
– Screed extension chart,
– Auger extension chart.

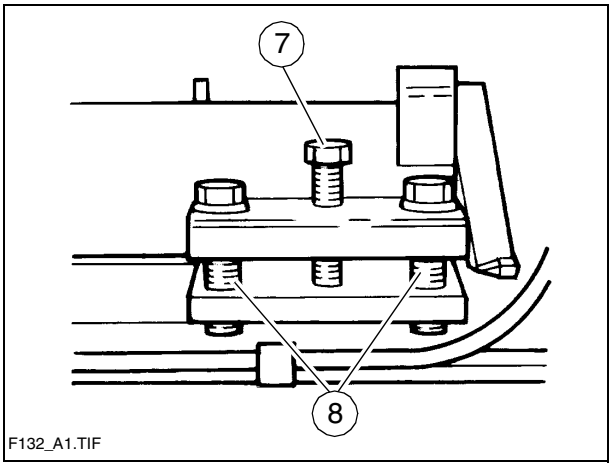
To attain the desired working width, the respective screed extensions, side plates, augers, tunnel plates or cut-off shoes must be mounted.

For widths of more than 3.00 m, the auger should be fitted with extension parts on both sides to improve material distribution and to reduce the wear.

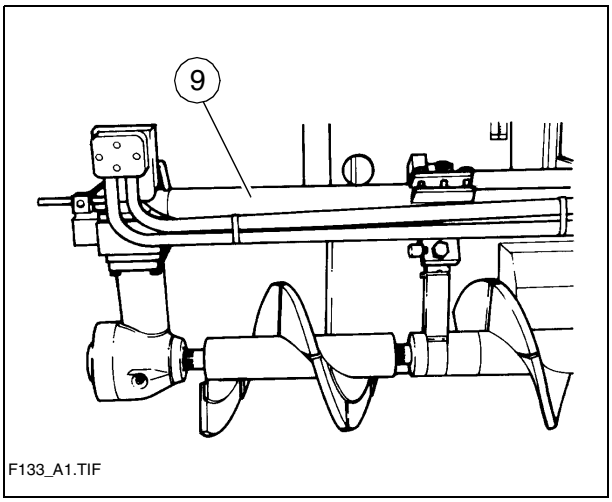
The diesel engine must be switched off whenever work is performed on the auger. Danger of injuries!

2.6 Mounting extension parts

- Loosen the clamping screws (8) on the support tube. Then turn in the center expanding screw (7) to expand the clamping joint.



- Pull the telescopic tube out of the support tube (9).
- Mount the required extension parts.



⚠ Observe the guide groove of the spline! Make sure that the shaft end is clean!

- Slide in the telescopic tube. When doing so, make sure that the drive of the auger gear is slid all the way over the shaft end of the auger extension part and that the threads of the augers match.
- Remove the expansion screw (7). Then tighten the clamping screws (8). Finally tighten the expansion screw by hand.

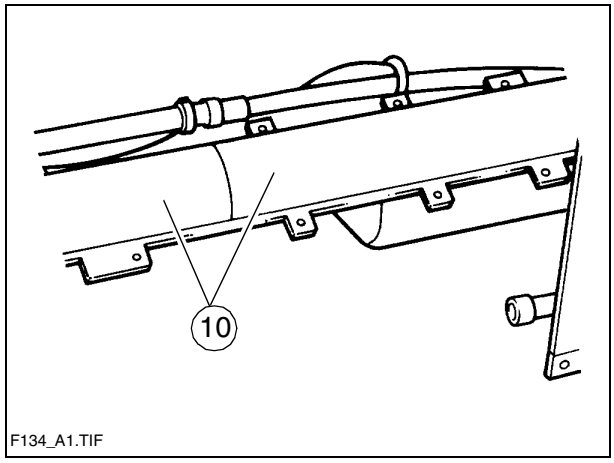
⚠ Before the clamping screws (8) can be tightened again, the expansion screw (7) must be sufficiently turned back!
Otherwise, the telescopic tube cannot be safely clamped and the splined shaft ends break.

STOP When clamped insufficiently, the telescopic tube can slide out of the support tube. Danger of accidents during transportation!

2.7 Mounting support tube extensions

If the working width exceeds 7.50 m, an auger crossbeam extension must be mounted.

The support tube extension of the auger crossbeam consists of two halves (10) and is attached to the existing support tube by using a total of 5 screws. After the two halves have been screwed to the support tube, they also must be linked to each other by means of screwed connections.



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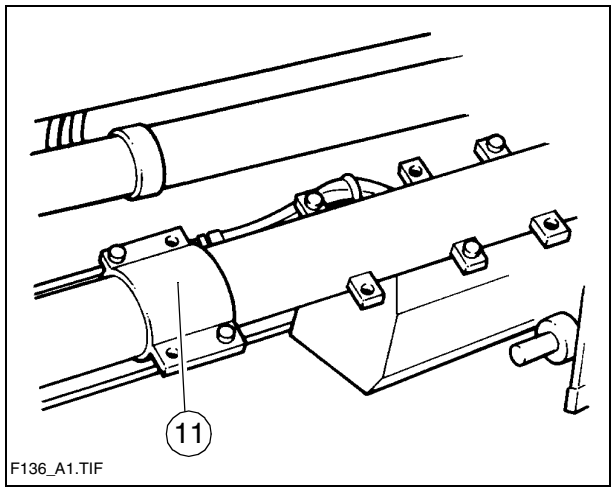
Clamping of the telescopic tube occurs by tightening the screwed connections (11) linking the support tube extension.



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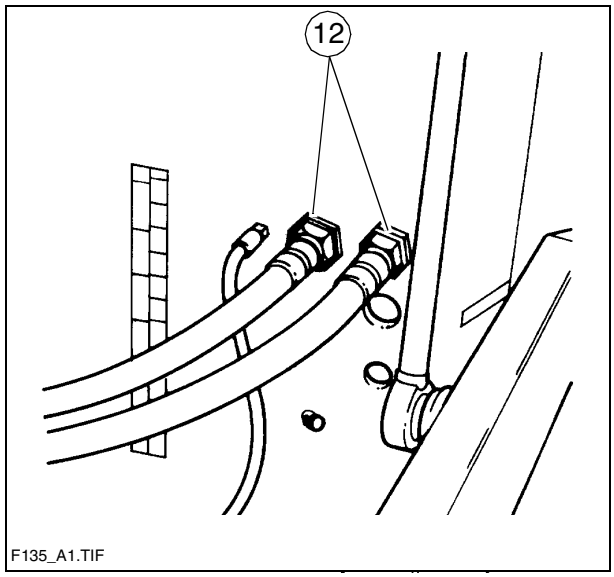
If the working width exceeds 7.50 m the hydraulic hoses (12) for the auger motors must be replaced with longer ones. These long hoses are included in the scope of delivery for this working width.

STOP When connecting or disconnecting hydraulic hoses, hydraulic fluid can spurt out at a high pressure.
Switch off the finisher and de-pressurize the hydraulic circuit! Protect your eyes!

⚠ When installing the hoses, make sure that the area around the connections is clean. Any dirt that enters the hydraulic system can cause malfunctions.



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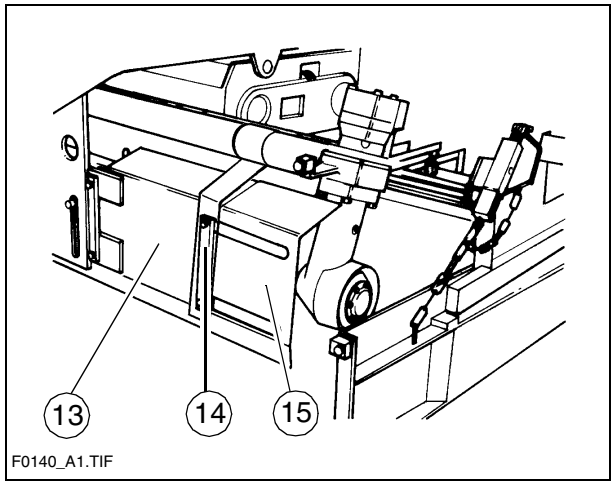
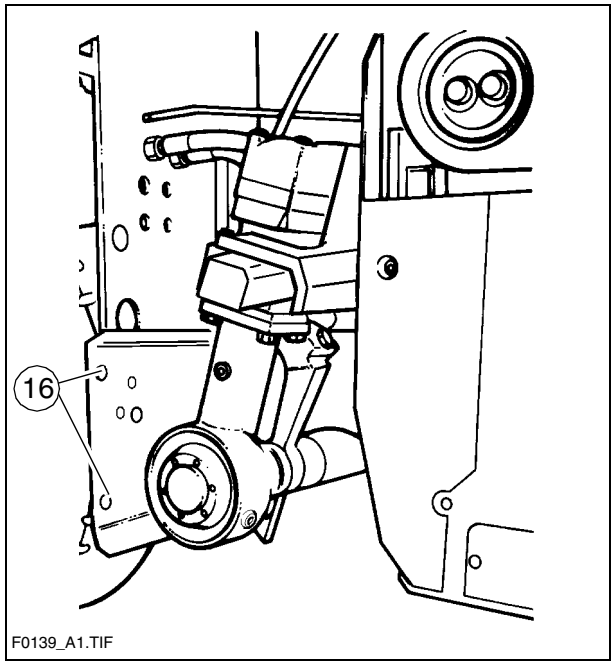
2.8 Installing tunnel plates



To ensure an optimum material flow – especially in the case of large paving widths – so-called tunnel plates (13) must be installed.
They are located directly in front of the auger distributor and – in conjunction with the auger – are an ideal system for conveying the material.

When operating with widths of more than 3.90 m, two or more combined tunnel plates (15) must be used. In this case, additional stabilizing supports (14) must be attached to the telescopic tube.



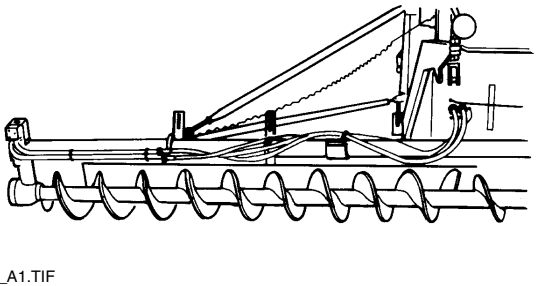
The tunnel plates must be directly screwed to the receptacles provided for this purpose (16); they are located on the auger frame sides and can thus be adjusted in height.

Refer to the auger extension chart to determine which parts of the conveyor system are required for the desired paving width.

☞ The auger extension chart is contained in the operating instructions for the respective screed.

2.9 Installing additional braces

When operating with width of more than 7.25 m the augers must be provided with an additional support.



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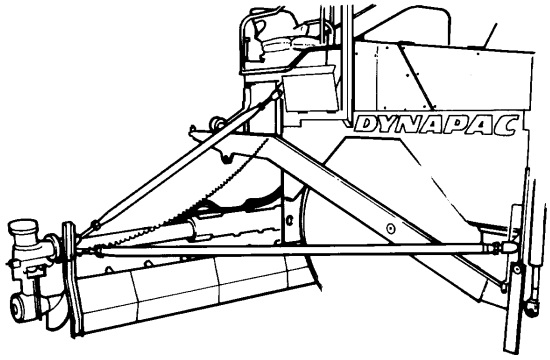
To do so, attach two braces on both the left-hand and the right-hand side, between the tunnel plate support and the bracket provided on the finisher.

The braces are included in the scope of delivery for this working width.



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3 Screed

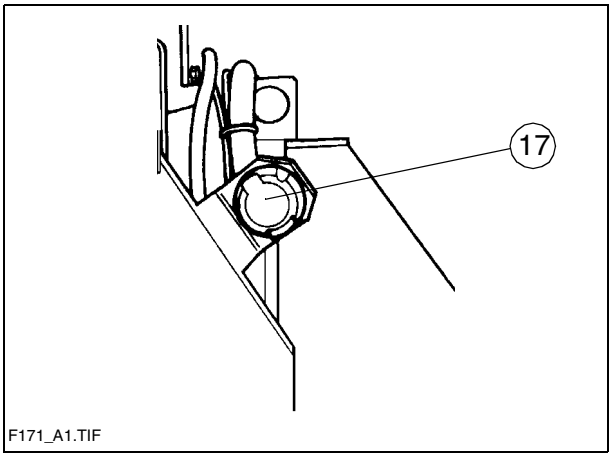
☞ The operating instructions for the screed cover all work required for mounting, setting up and extending the screed.

4 Electrical connections

Establish the following connections when the mechanical components have been mounted and set up:

4.1 Remote controls

to socket (17) (on the screed).

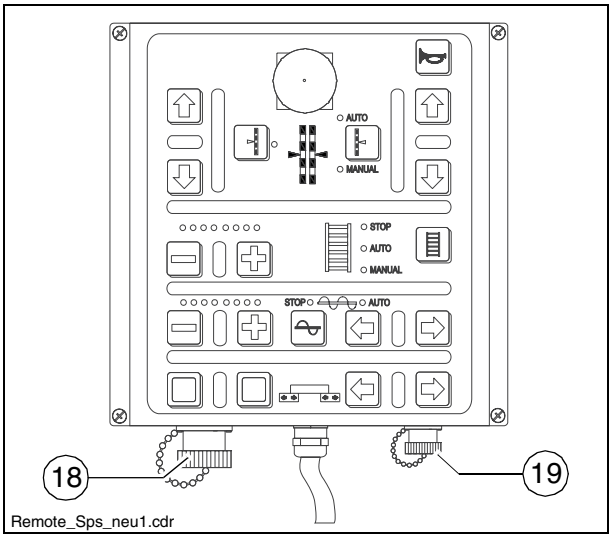


4.2 Grade control

to socket (18) (on the remote control unit)

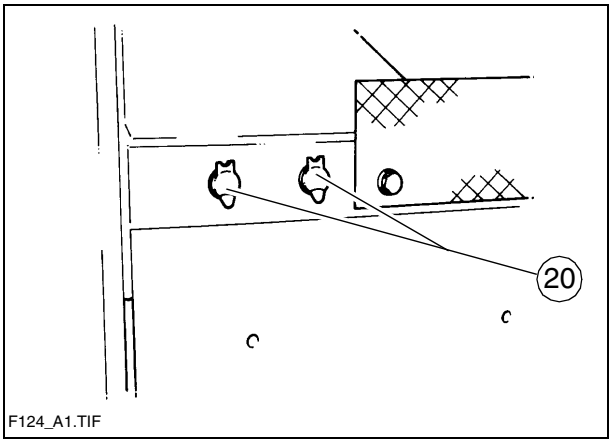
4.3 Auger limit switches

to socket (19) (on the remote control unit)



4.4 Working lights

- to sockets (20) (on the paver finisher).



F Maintenance

1 Notes regarding safety

Maintenance work: Maintenance work may only be carried out when the engine is at a standstill.

Secure the paver finisher and the attachments against inadvertent starting before beginning any maintenance work:

- Set the drive lever to the center position and the speed preselector to zero.
- Remove the traction drive fuse from the operating panel.
- Remove the ignition key and the battery main switch.

Lifting and jacking up: Secure lifted machine parts (e.g. screed or hopper) against lowering by means of mechanical supports.

Spare parts: Use only approved parts and install them according to the specifications! If in doubt, contact the manufacturer!

Re-commissioning: Mount all protective devices before re-commissioning the paver finisher.

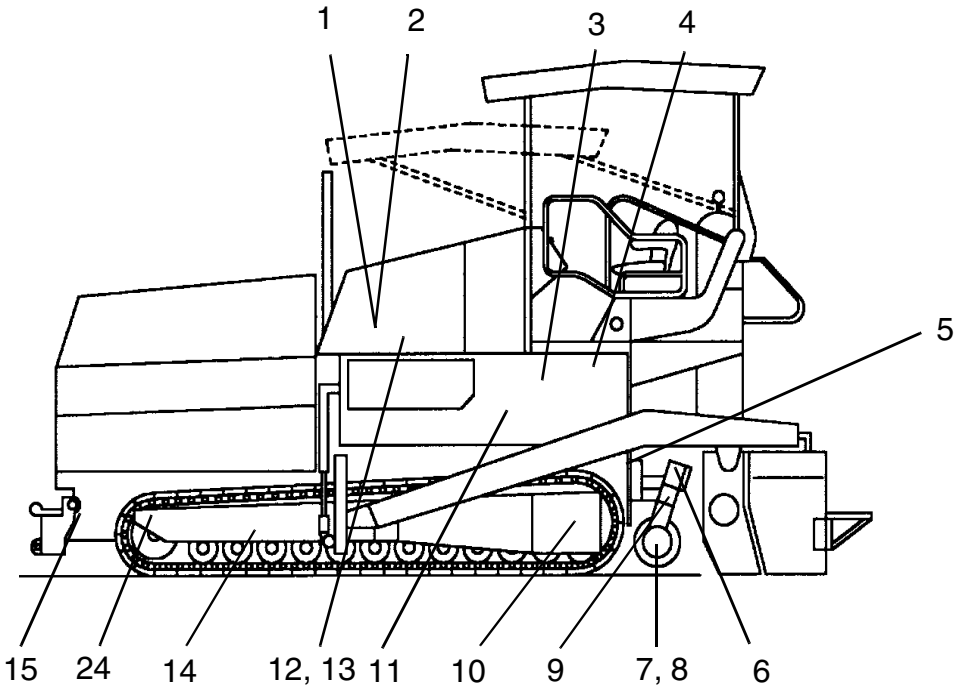
Cleaning: Cleaning must not be carried out while the engine is running.
Do not use any inflammable substances (such as petrol).
Avoid directly cleaning electrical parts and insulation material with a steam jet; cover them up beforehand.

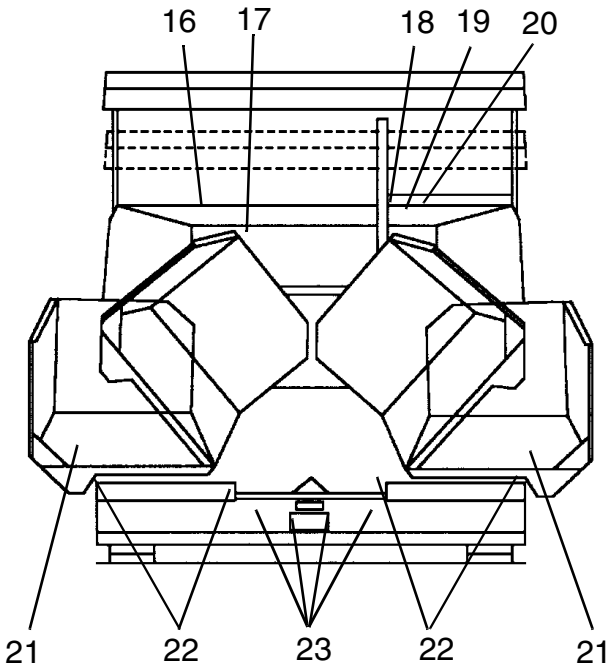
Working in closed environments: Exhaust fumes must be led into the open. Propane gas bottles must not be stored in closed rooms.

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.

Information on how to maintain the optional equipment can be found in last section of this chapter!

2 Maintenance intervals



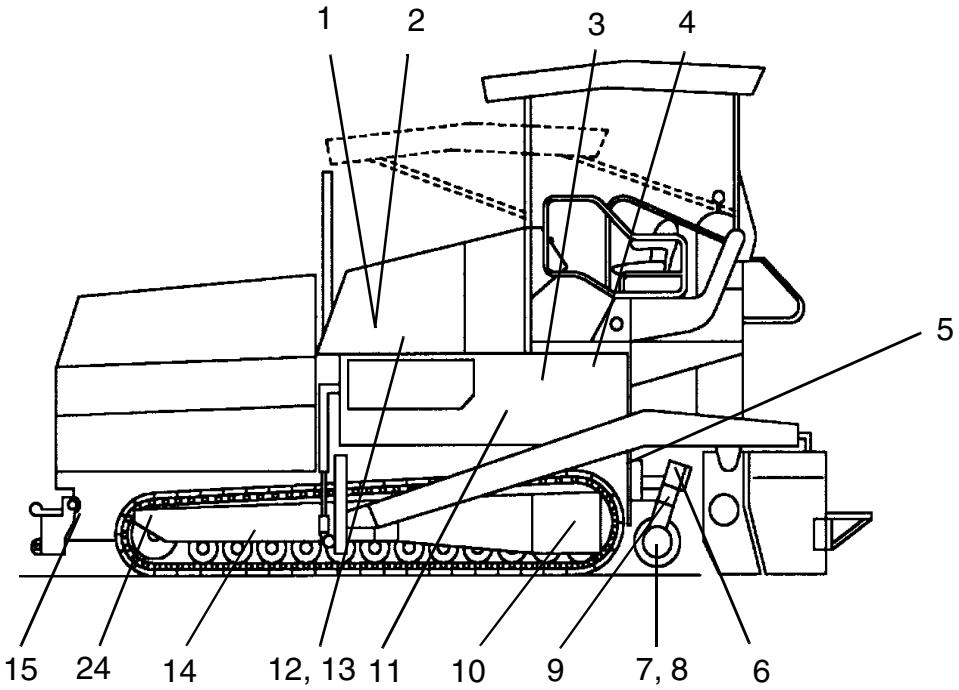


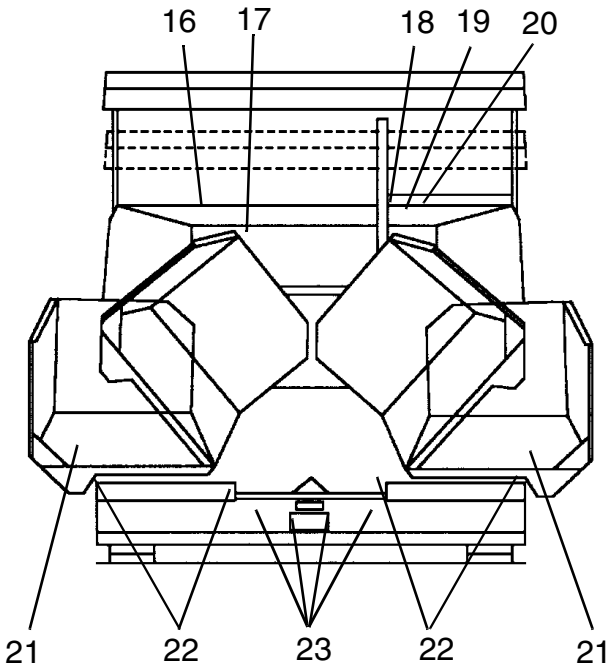
F121Cb.Tif/F121Cc.Tif

2.1 Daily (or every 10 operating hours)

Item	Maintenance point	Number	Lubrication	Check	Oil change	Filling volumes	Substance
2	Air filter	1		x			
3	High pressure hydraulic filter	5		x			
5	Conveyor - center bearing	1	x			Grease	10 strokes
6	Auger - outer bearing	2	x			Grease	5 strokes
12	Diesel engine - oil level	1		x		Engine oil	see ”Filling volumes”
14	Chain tension - conveyor	2		x		Grease	
15	Conveyor deflection roller	2	x			Grease	5 strokes
16	Fuel tank - filling level	1		x		Fuel tank	see ”Filling volumes”
17	Fuel filter (drain water separator)	1		x			
20	Hydraulicoilreservoir-filling level	1		x		Hydraulic oil	see ”Filling volumes”
23	Chain tension - conveyor	2		x			
	General security check (see section 3.1)						
	Security check						

⚠ Check the oil level twice a day during the run-in period of the diesel engine!
When work has been performed on the hydraulic system: check all filters after 20 operating hours and replace them where applicable!





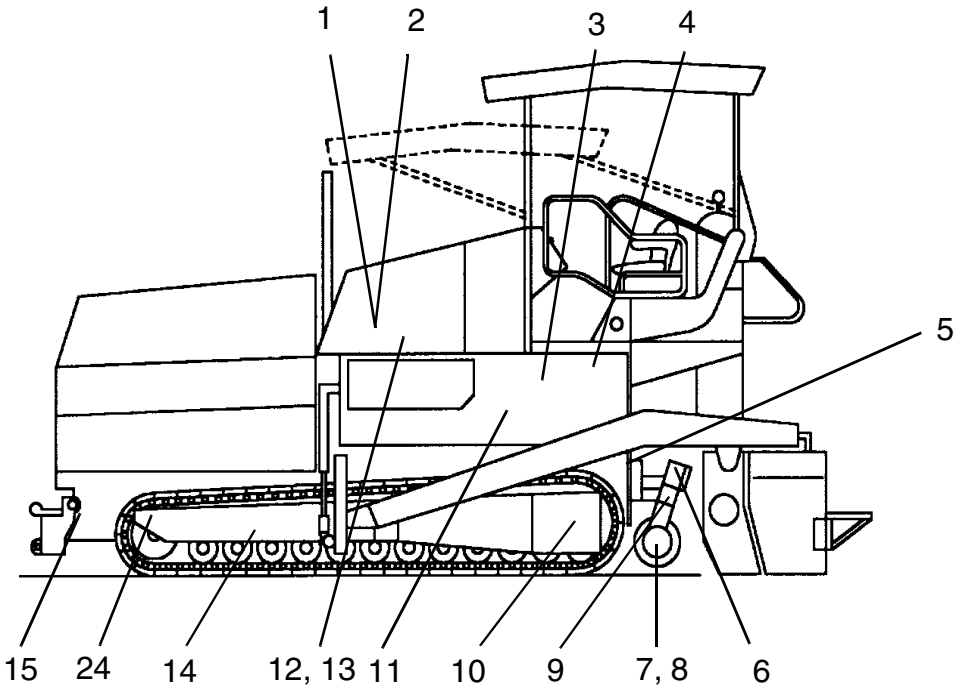
F121Cb.Tif/F121Cc.Tif

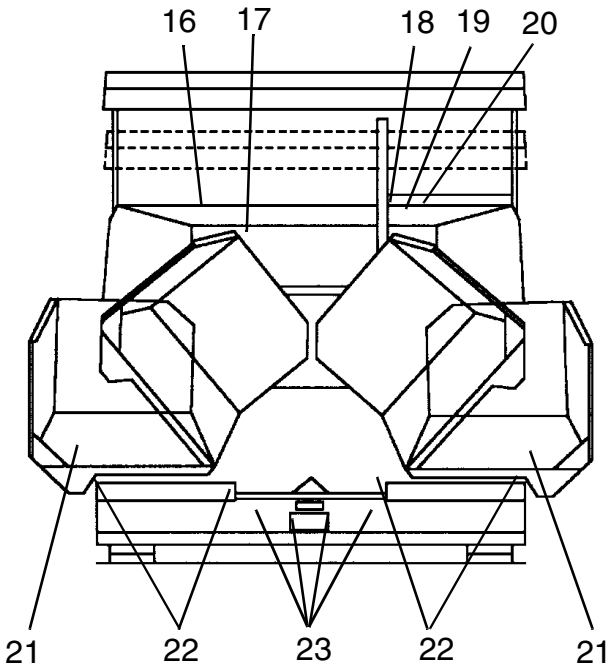
2.2 Weekly (or every 50 operating hours)

Item	Maintenance point	Number	Lubrication	Check	Oil change	Filling volumes	Substance
4	Conveyor gear	2		x		Gear oil 220	see ”Filling volumes”
8	Auger bevel gear	2		x		Gear oil 90	see ”Filling volumes”
11	Pump distribution gear	1		x		Gear oil 90	see ”Filling volumes”
21	Steel hopper flaps (option)	2	x			Grease	2 strokes
22	Push rollers	4	x			Grease	5 strokes

2.3 Every 250 operating hours

Item	Maintenance point	Number	Lubrication	Check	Oil change	Filling volumes	Substance
1	Drive belt	1		x			
7	Auger - center bearing	1	x			Grease	5 strokes
13	Water cooler – water level	1		x		Cooling fluid	
19	Batteries: - Acid level - Terminals and cables	2		x		Distilled water	

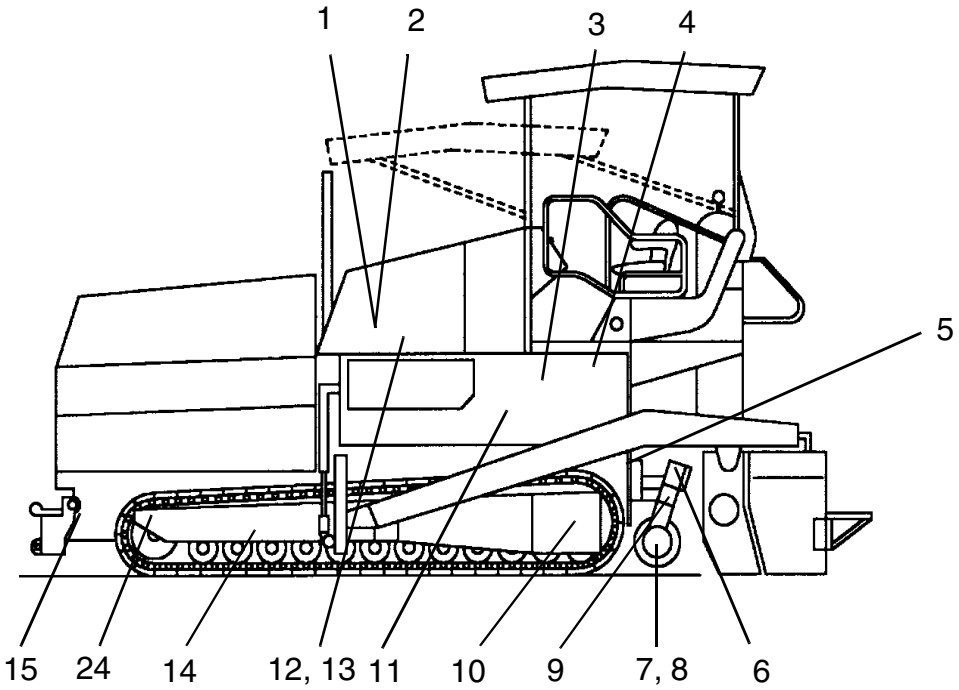


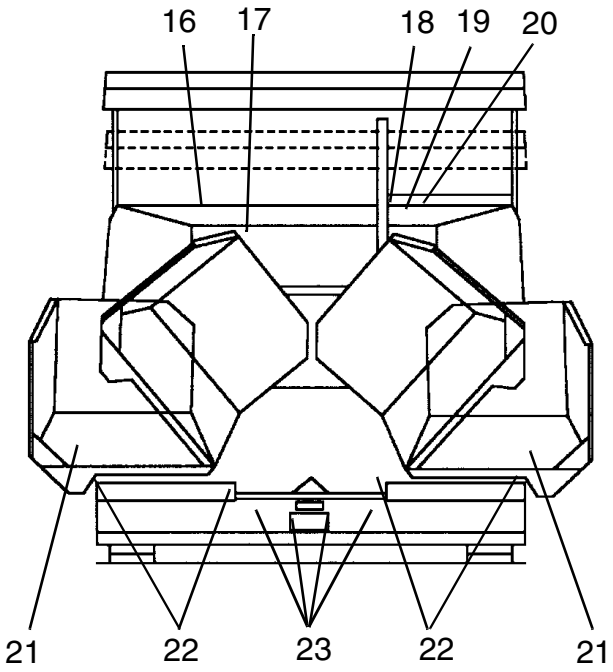


F121Cb.Tif/F121Cc.Tif

2.4 Every 500 operating hours

Item	Maintenance point	Number	Replace	Check	Oil change	Filling volumes	Substance
12	Diesel engine: - Oil change - Filter change	1		x	x	Engine oil	see ”Filling volumes”
13	Water cooler – anti-freeze agent	1		x		Cooling fluid	
17	Fuel filter	1	x				
24	Guide for crawlers	2	x			Grease	5 strokes



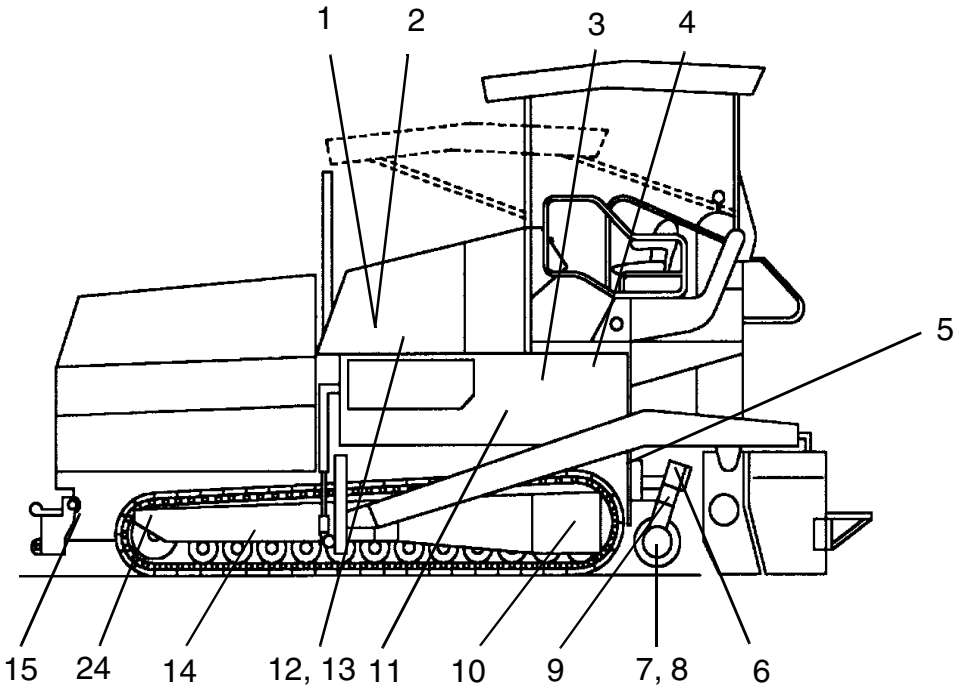


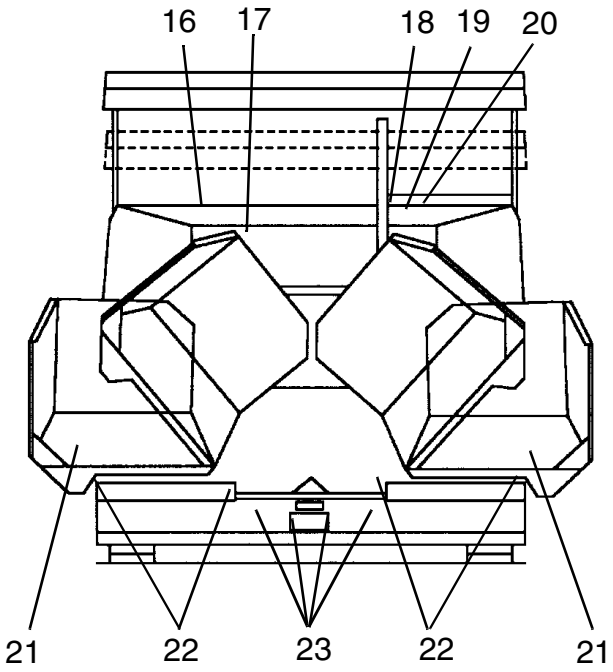
F121Cb.Tif/F121Cc.Tif

2.5 Yearly (or every 1000 operating hours)

Item	Maintenance point	Number	Lubrication	Check	Oil change	Replace	Filling volumes	Substance
1	Drive belt	1				x		
4	Conveyor gear	2		x	x		Gear oil 220	see ”Filling volmes”
8	Auger bevel gear	2		x	x		Gear oil 90	see ”Filling volmes”
9	Auger, gear neck bearing	2	x				Grease	5 strokes
10	Caterpillar drive - planetary gear *	2		x	x		Gear oil 220	see ”Filling volmes”
11	Pump distribution gear	1		x	x		Gear oil 90	see ”Filling volmes”
	Have finisher, screed and optional gas or electric system checked by a specialist – refer to Chapter 2, "Safety"			x				
	Check screw connections, particularly on driven wheels, mounting points and hydraulic system and tighten if necessary. Hydraulic screw connections only if leaky.							

*) First oil change after 1000 hours, then every 1500 hours.





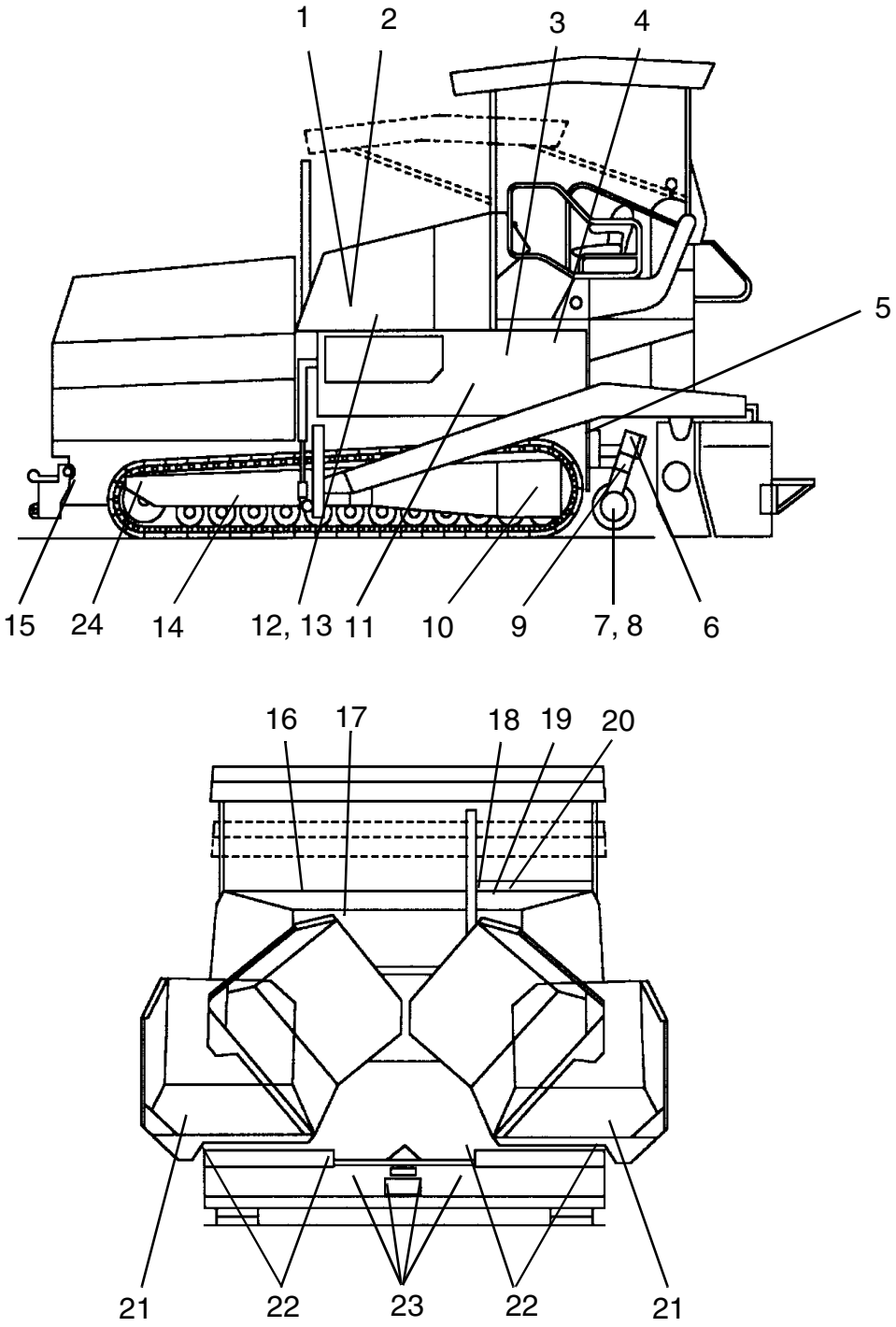
F121Cb.Tif/F121Cc.Tif

2.6 Every 2 years (or every 2000 operating hours)

Item	Maintenance point	Number	Replace	Check	Oil change	Filling volumes	Substance
13	Water cooler and entire cooling system	1		x		Cooling fluid	see ”Filling volumes”
16	Fuel tank and system	1		x			
18	Suction/return hydraulic filter *	2	x				
20	Hydraulic oil reservoir - entire filling	1		x	x	Hydraulic oil	see ”Filling volumes”
	Engine suspensions			x			

*) Only use filters with a mesh size of 10 µ = 0.01 mm!

3 Points for checking, lubricating and draining of oil



F121Cb.Tif/F121Cc.Tif

☞ The points for checking, lubricating and draining of oil are described in detail below. The item numbers given in the headers refer to the illustration above.

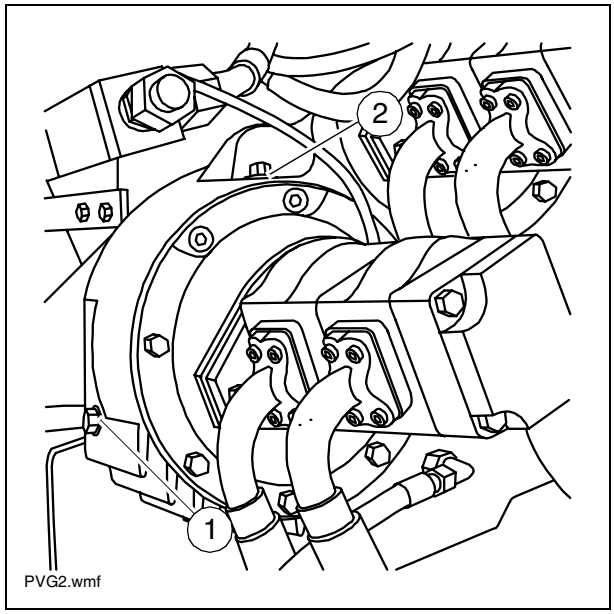
3.1 Check points

Pump distribution gear (11)

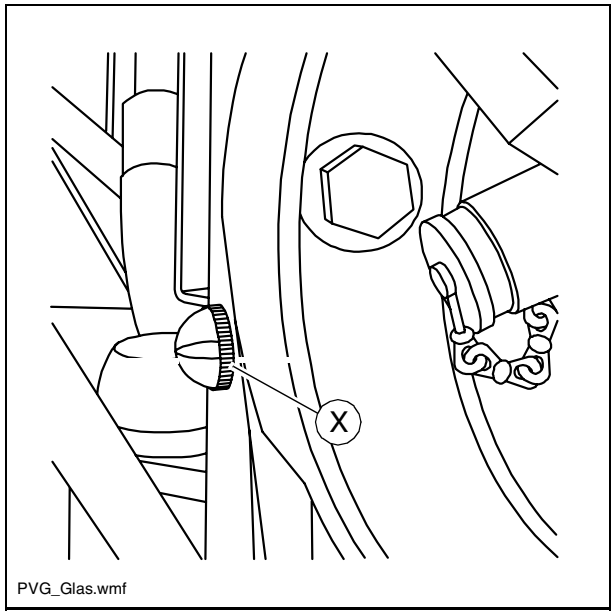
Checking the oil level:

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

☞ Ensure cleanliness!



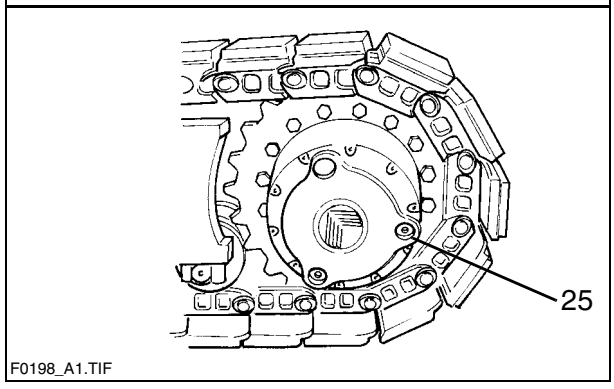
☞ If an inspection glass (X) is at the pump distribution gear instead of the control screw, oil must be filled up, until the oil level reaches up to the center of the inspection glass.



Caterpillar drive - planetary gear (10)

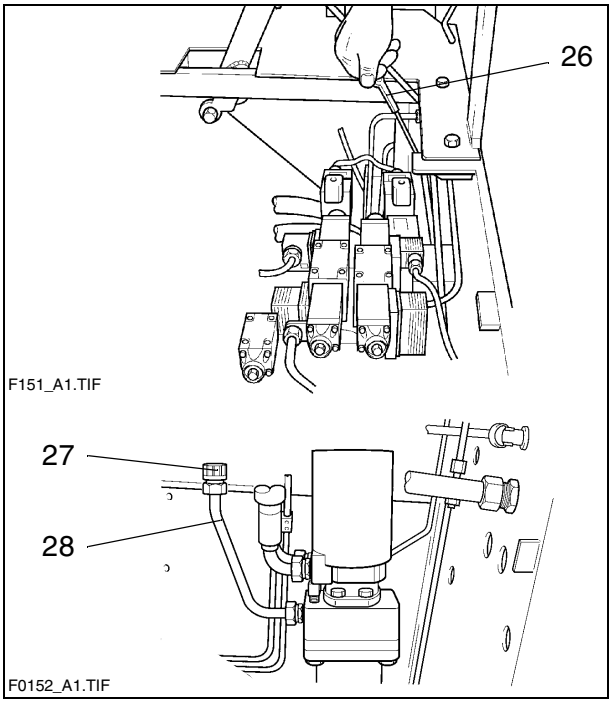
There is a checking plug (25) on the inside of the gear.
The oil level is correct if oil escapes from the inspection hole.

STOP When screwing out the plug hot oil can spurt out at high pressure. Always check the oil when the gear is cold!



Conveyor gear (left/right) (4)

The conveyor gears are beneath the footboard of the operator´s platform.
Checking the oil level only before start to work. The oil level must reach the upper notch of the dipstick (26). Top up the oil Remove the cap (27) and top up the oil through the oil filler neck (28).

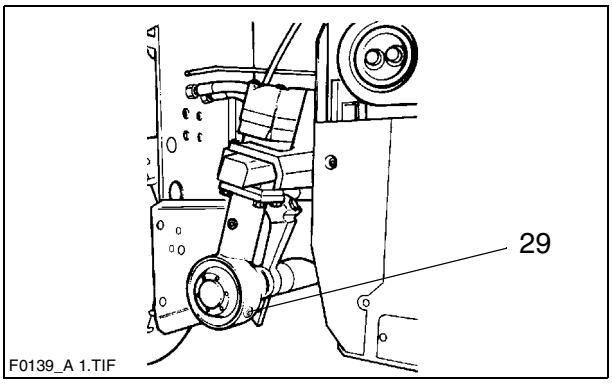


☞ 10 cm on the display equal about 0.25 l of oil. The conveyor gears are filled with Optimol Optigear 220 at the factory.
Due to the high quality of this oil, it is not necessary to replace the oil at regular intervals.
Checking the oil level in the gear at regular intervals is sufficient (see the section “Maintenance intervals”).

⚠ The above applies if Optimol Optigear 220 or oil of a similar quality from another manufacturer is used.

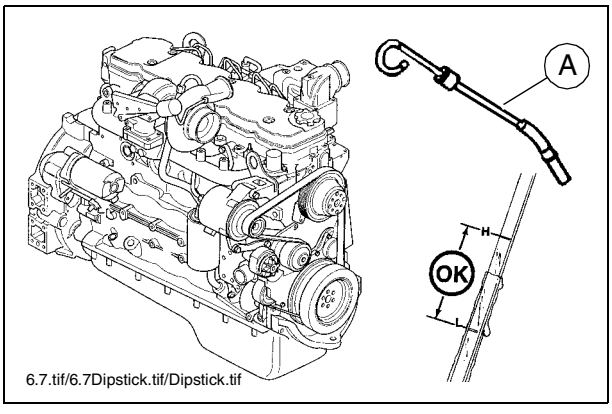
Auger bevel gear (left/right) (8)

Screw (29) is used for checking the oil level and for topping up oil.
Clean the vicinity of the screw plug before unscrewing it. The oil level is correct when a small amount of oil leaks out of the lateral opening.



Diesel engine (12)

Check the oil level with dipstick (A) every time before work is started. Only check the oil level when the finisher is in a horizontal position!



⚠ Too high an oil level destroys the seals in the engine while too low an oil level causes the engine to be overheated and destroyed.

☞ Refer to the operating instructions for the engine for the oil and filter change, fuel system ventilation and the adjustment of the valve play.

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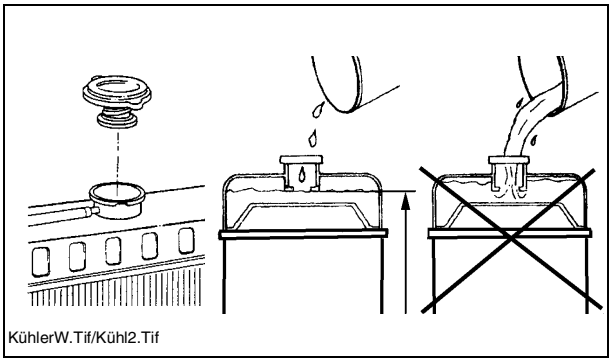
Water cooler (13)

The cooling water level must be checked when the system is cold. Make sure that the cooling water contains a sufficient amount of anti-freeze/ corrosion protection agents (-25° C).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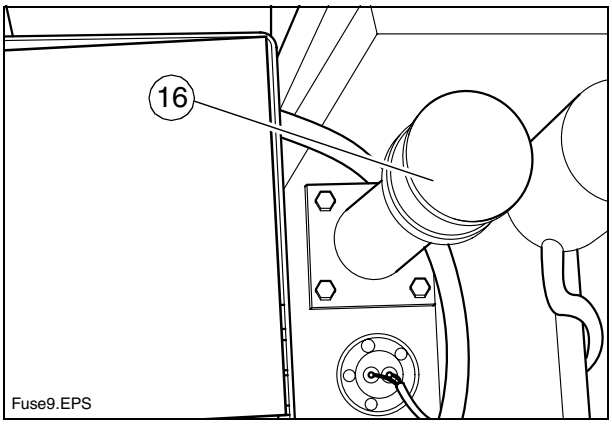
When hot, the system is under pressure. Danger of scalding when the system is opened!

Fuel tank (16)

We recommend to always top up the fuel tank before starting work to prevent the tank from"running dry" which would make it necessary to ventilate the entire fuel system.



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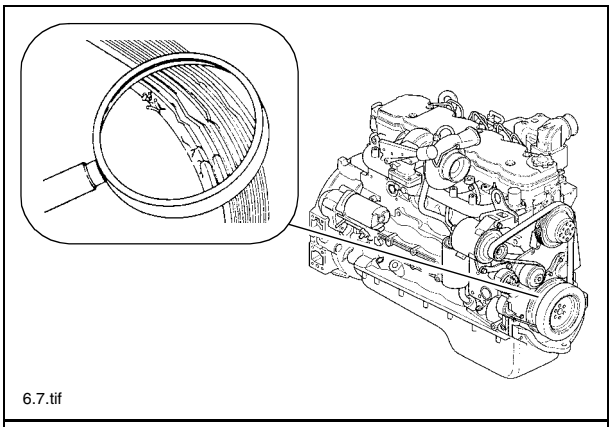
Drive belt (1)

The maintenance for the drive belt is described in the operating instructions for the engine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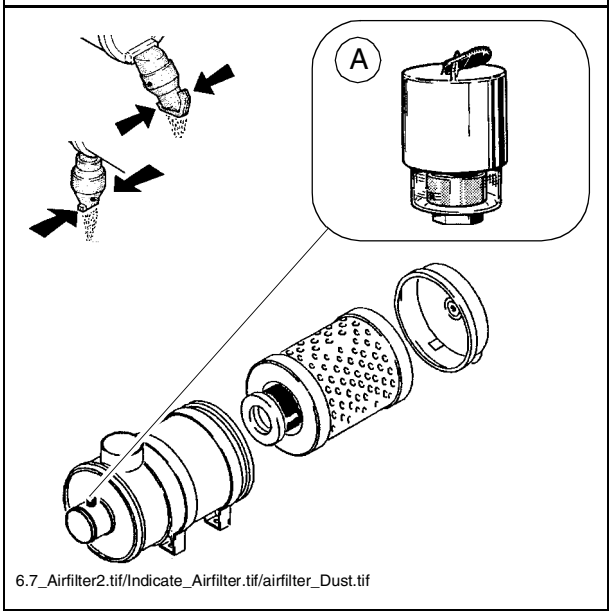
Air filter (dry air filter) (2)

The maintenance for the air filter is described in the operating instructions for the engine.



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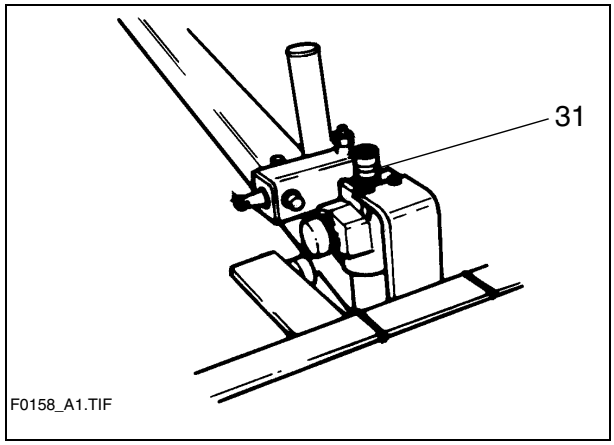
High pressure hydraulic filter (3)

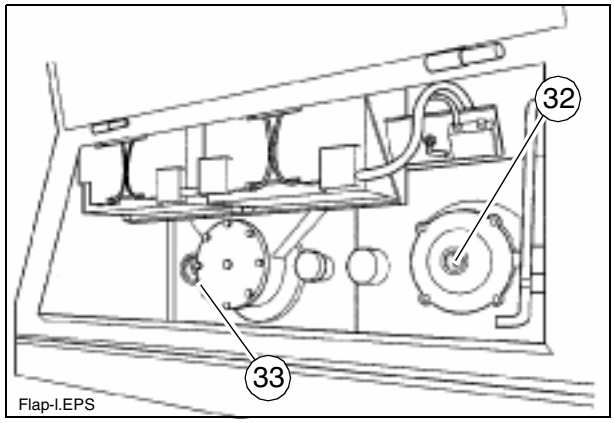


⚠ All filters of the hydraulic system must be checked and replaced where necessary 20 operating hours after repairs have been made!

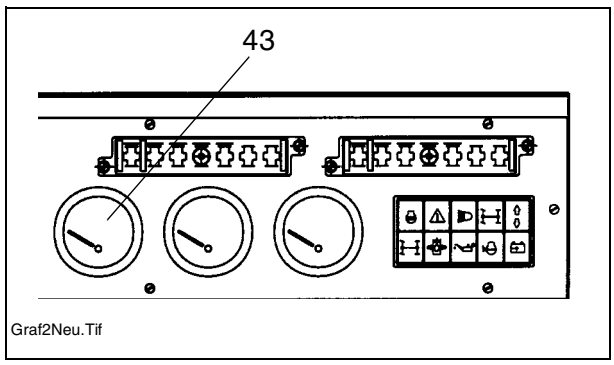
Replace filter cartridges when maintenance indicator (31) turns red.

Drain the soiled oil that leaks out after unscrewing the filter cap into a used oil container.
Take out the filter cartridge and have it disposed of by specialists (danger of environmental pollution!).
Wash out the housing, replace the O-rings and apply a thin layer of oil to them.Mount the filter housing with the filter cartridge again and tighten it properly. The red indicator (31) will then be automatically reset.

Suction/return flow hydraulic filter (18)



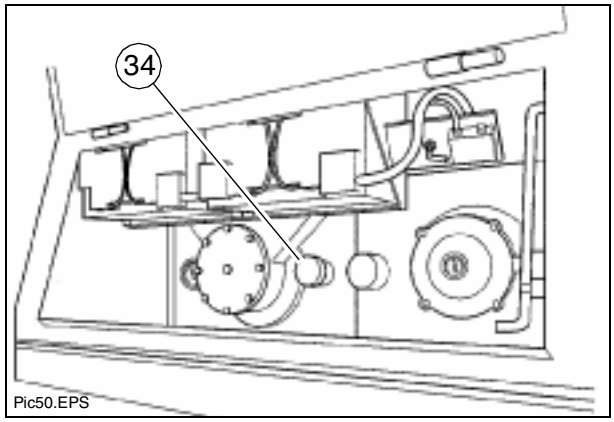
The filters must be replaced when service indicators (32) or (33) turn red. Always replacefilterswhenexchangingthehydraulic oil. The hydraulic oil temperature can be read on the temperature indicator for hydraulic oil (43) on the operating panel.
Always replace filters when exchanging the hydraulic oil.



Unscrew the lid of the filter housing on the hydraulic oil reservoir and replace the filter cartridge.

Never clean and reuse old filters! Always use a new filter catridge.

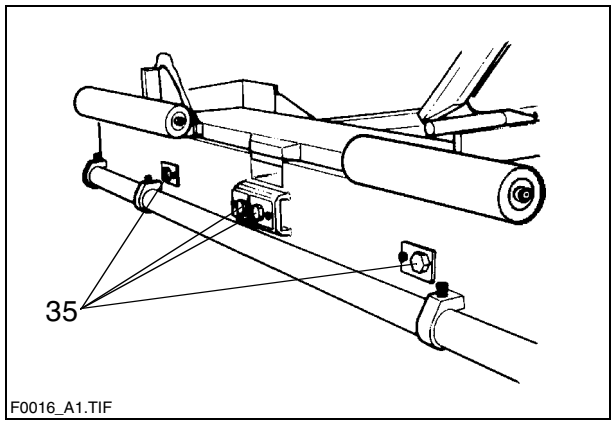
Hydraulic oil reservoir (20)



Use dipstick (34) to check the oil level. With retracted cylinders, the oil level must reach the upper mark. Regularly clean the oil reservoir ventilation. Clean the oil cooler surface (also refer to the “operating instructions for the engine”)

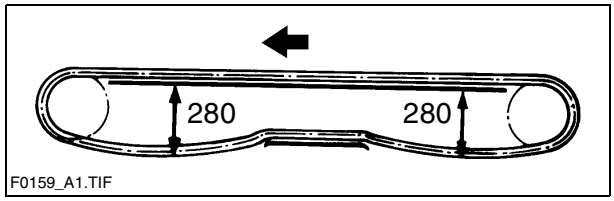
⚠ Use recommended hydraulic oils only (see the section”Recommended hydraulic oils”).

Chain tension, conveyor (23)



☞ Adjusting screws (35) are located at the front of the crossbeam.

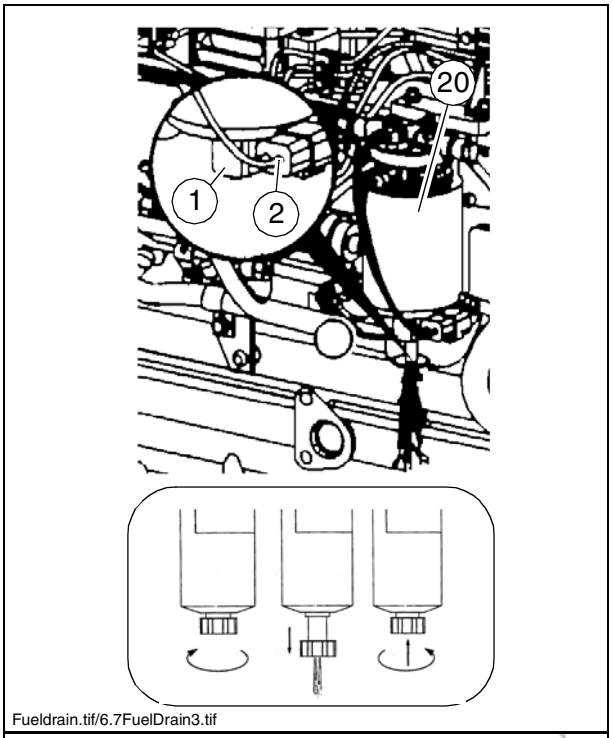
The chains should not be too tight or too slack. Too tight a chain can cause the chain to be stopped or to break when material falls into the space between the chain and the sprocket wheel.
Too slack a chain can be caught at protruding objects and can thus be destroyed.



For the daily visual check, peer horizontally below the bumper. The chain must not hang below the bottom edge of the bumper.
When the chain must be adjusted, measure the distance between the lower edge of the bottom plate and the bottom edge of the chain when the chain is not under a load (see the illustration).

Fuel filter (17)

☞ For maintenance of fuel filter / draining of separated water and deposits, refer to engine's Operating Instructions.



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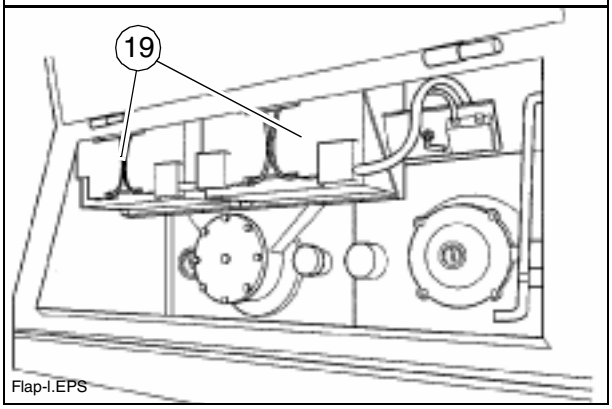
Batteries (19)

When supplied, the batteries are filled with the correct amount of acid.
The acid level should reach the upper mark.
If necessary, top up with distilled water!
The poles must be free of oxide. Protect them with special pole grease.



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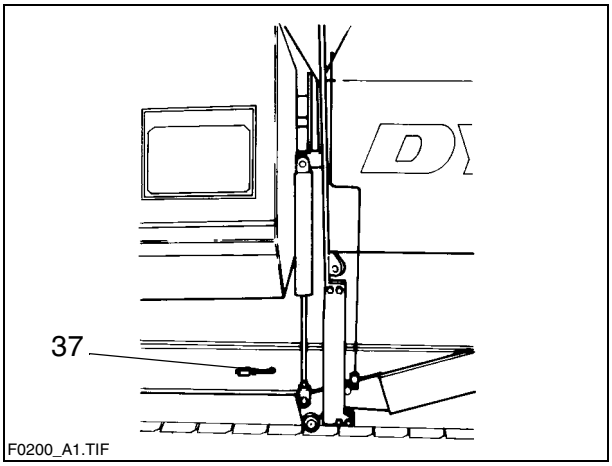
Chain tension - caterpillar drive (14)

The chain tensioner for the caterpillar drive chain is filled via the grease nipple (37) provided on the side of the caterpillar drive.



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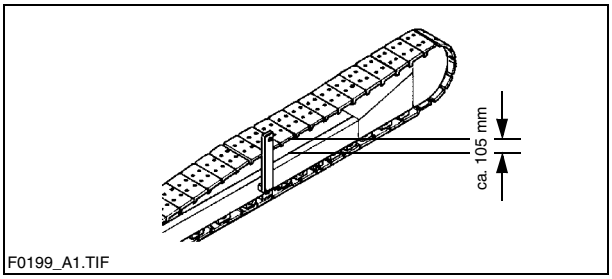
The chain tension is correct if the chain sags by approx. 105 mm between the chain plates and the chassis.

Move the finisher forward or backward and measure again to check the setting.



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General visual checks

The daily routine should comprise a visual inspection around the entire paver finisher. The following items must be checked:

- Are components or controls damaged?
- Are there leaks on the engine, the hydraulics, the gear box, etc.?
- Are all fastening points (conveyor, auger, screed, etc.) in order?

⚠ Immediately take actions to correct any detected malfunction to avoid damages, dangers or environmental hazards!

Checks by a specialist

☞ Have finisher, screed and optional gas or electric system checked by a trained specialist.

- when required (according to the operating conditions and the nature of application),
- but at least once a year.

Additional Checks

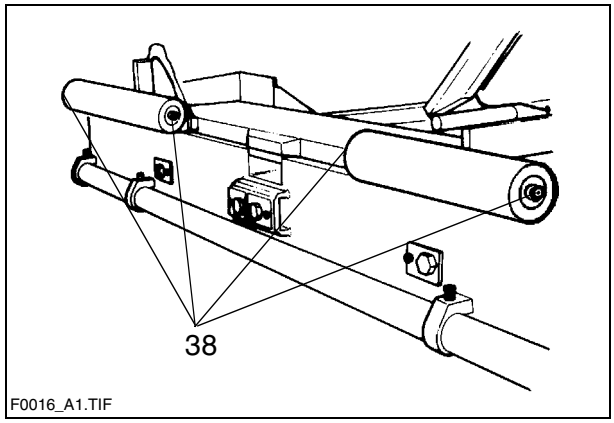
⚠ After the machine is delivered and following the break-in time, the mounting bolts of the drive wheels must always be checked and tightened to the corresponding torque if necessary.

3.2 Lubrication points

Push rollers (22)

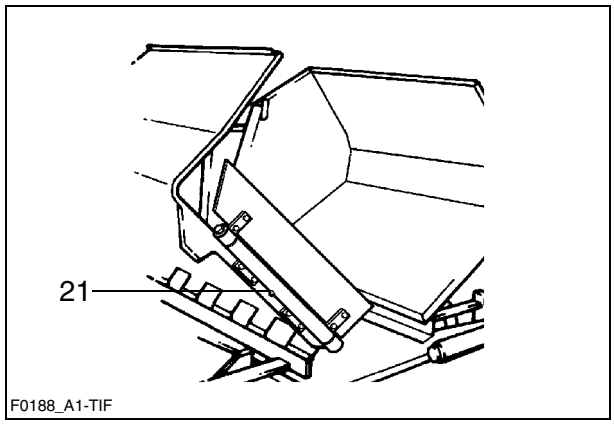
Lubricate the push rollers on both sides (38).

☞ The crossbeam is pivoted at the center and needs not be lubricated.



Steel hopper flaps (option) (21)

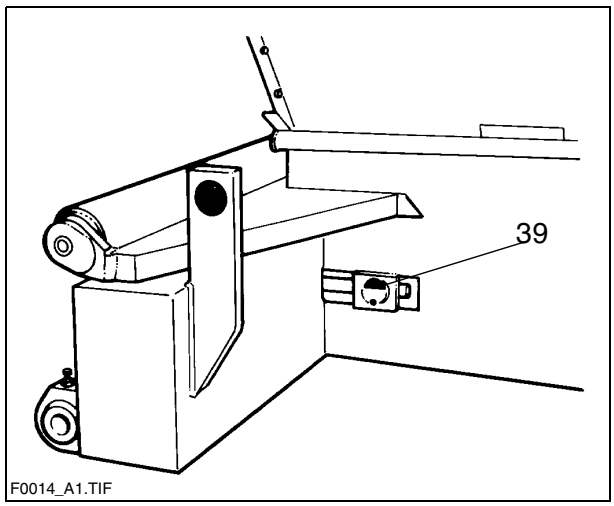
Each of the spring-loaded steel hopper flaps is equipped with a grease nipple in its center.



Conveyor deflection rollers (15)

The deflection rollers for the conveyor are lubricated with grease nipples (39) located behind the cross beam.

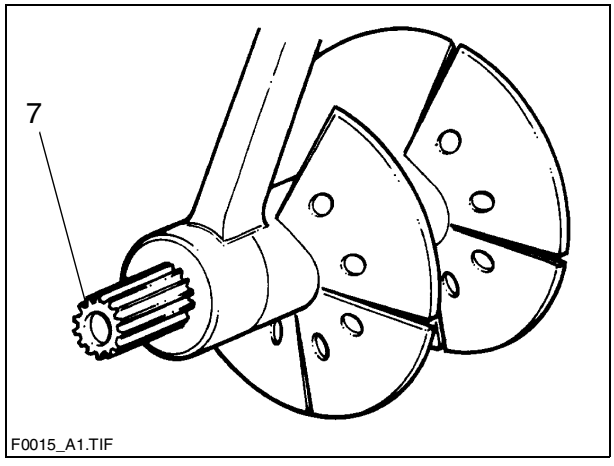
☞ The center bearings are lubricated via the outer grease nipples.



Center auger bearing (7)

The center bearing must be lubricated on the left-hand side of the auger.
To do so, the bevel gear unit must be pulled off.

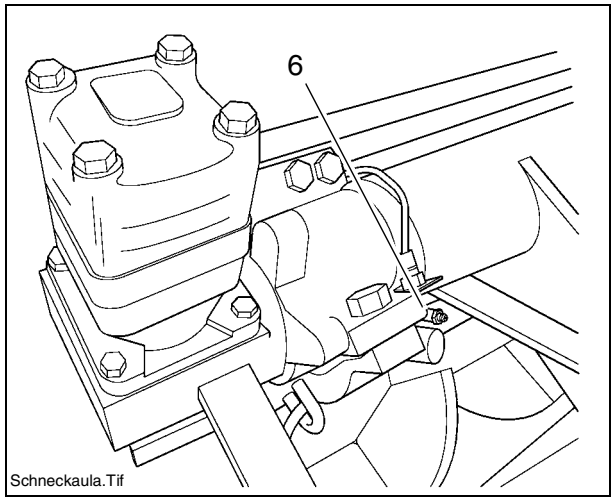
☞ The center bearing must be lubricated when in a warm state to force out any bitumen residues.



Outer auger bearing (6)

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.

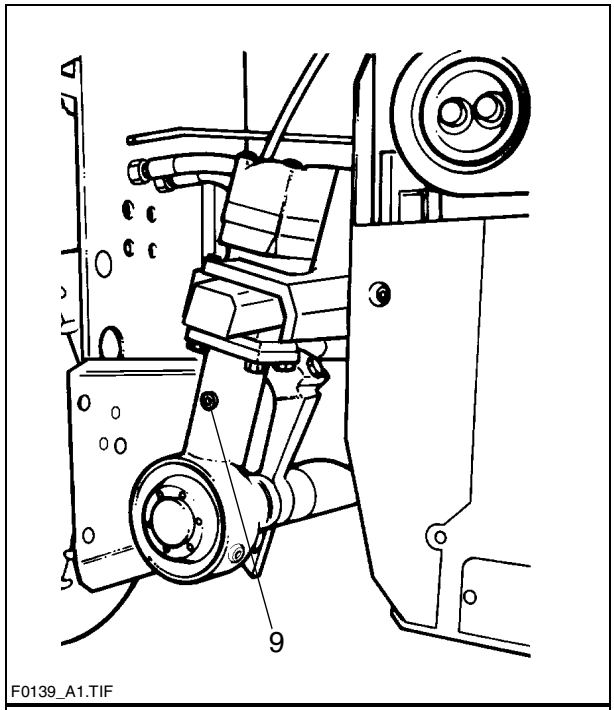
☞ Lubricate the outer auger bearing while they are warm to force out any bitumen residues.



Auger, gear neck bearing (9)

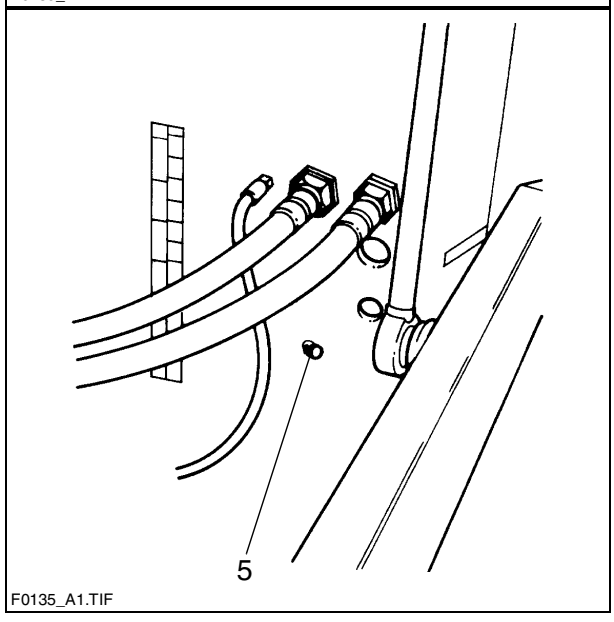
Remove the socket head cap screw plug on the gear neck and replace the screw locatedunderneathwitha10x1greasenipple. Using a grease gun, inject 10 strokes into it.

☞ Remove the grease nipple and screw both screws back in. The gear bearing is sealed at the underside and is exclusively lubricated with grease.



Center conveyor bearing (5)

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.



3.3 Oil drain points

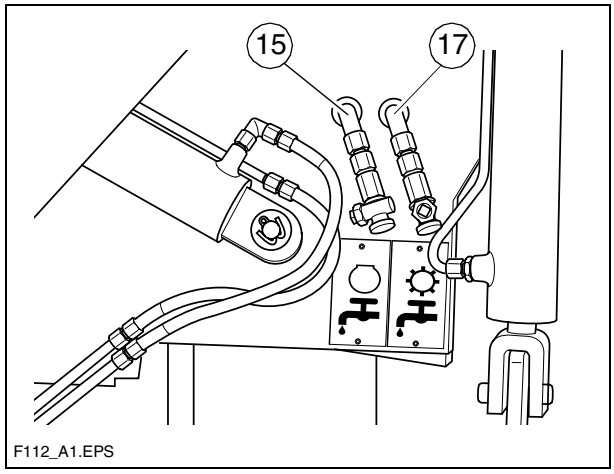
⚠ Collect used oil and have it disposed of properly.

☞ For the filling volumes, see the section „Filling volumes”.

Pump distribution gear (11)

Draining the oil:

- Unscrew the protective cap.
- Attach the hose supplied with the accessories. Route the hose end into a used oil container.
- Open the shut-off valve with a wrench and completely drain the oil.



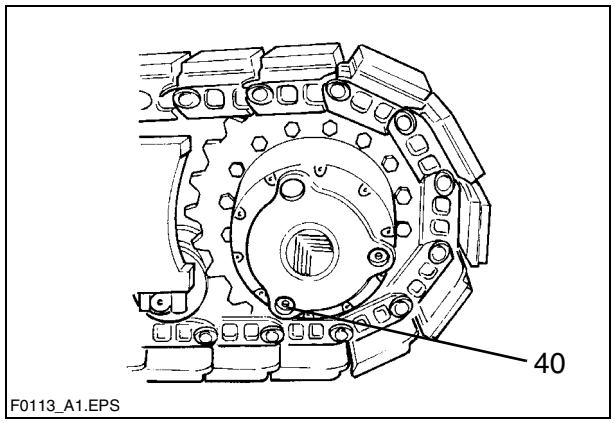
☞ For filling in oil, pág. 13.

Diesel engine (12)

- Drain the gear oil in the same manner as the pump distribution gear (see above).
- Replacing the engine oil filter.

Caterpillar drive - planetary gear (10)

Screw out the oil drain plug (40) and collect the used oil in a container.

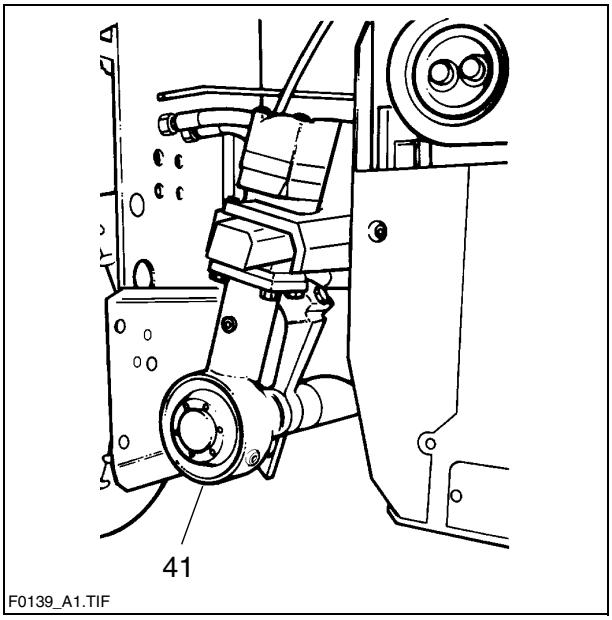


Auger - bevel gear (8)

To drain the oil, unscrew the lower screw (41).
When returning the screw make sure to use a new seal.

⚠ Make sure to clean the screw and the vicinity of the drain bore!

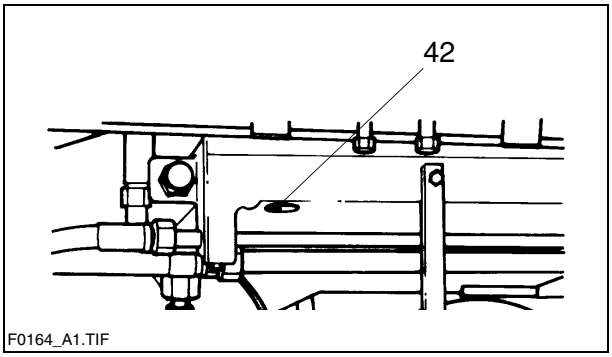
☞ For filling in oil, refer to the section “Check points/pump distribution gear”.



Hydraulic oil reservoir (20)

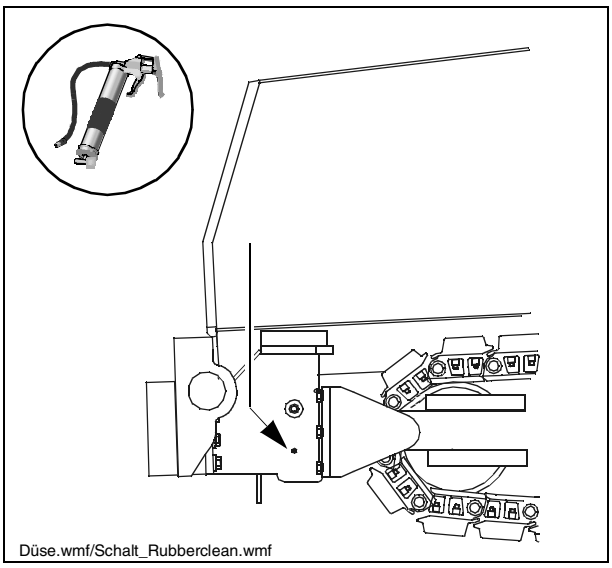
To drain the hydraulic oil, unscrew drain plug (42) and collect the oil in a suitable container using a spout.
When returning the screw, make sure to use a new seal.

☞ For filling in oil, refer to the section “Check points/hydraulic oil reservoir”.



Guide for crawlers (24)

Grease the guides on both sides.

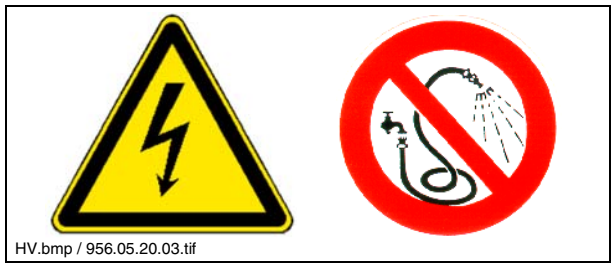


4 Maintenance - optional equipment (○)

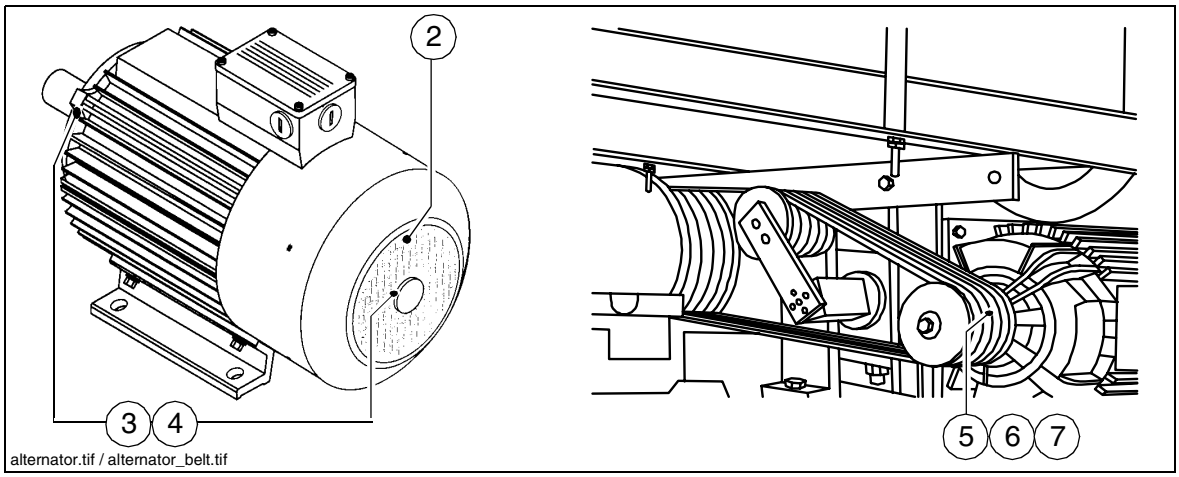
4.1 Electrical system - alternator

Danger resulting from electrical voltage

Failure to comply with the safety precautions and safety regulations can result in electrical shock injuries from the electrical system.
Danger to life!
All maintenance and repair work on the screed's electrical system must always be carried out by an electrician!


HV.bmp / 956.05.20.03.tif

Never direct the jet of high pressure cleaners straight onto the alternator or its components! Danger to life resulting from electric shock or risk of destruction!
When using cleaning agents, check compatibility with insulation!



alternator.tif / alternator_belt.tif

Pos.	Interval					Maintenance location	Note
	10	250	1000	5000	20000		
1	■					- Insulation monitoring, check electric system is functioning	Also refer to Screed operating instructions
2		■				- Visual inspection for dirt or damage - Check cool air apertures for dirt and blockages, clean if necessary	
3				■		- Undertake "audio test" to check ball bearings, replace if necessary	
4					■	- Replace ball bearings	
5		■				- Check drive belt (○) for damage, replace if necessary	
6	▼	■				- Check drive belt (○) tension, adjust if necessary.	Refer to "Checking belt tension" and "Setting belt tension"
7			■			- Replace drive belts (○)	

Maintenance	■
Maintenance during run-in period	▼

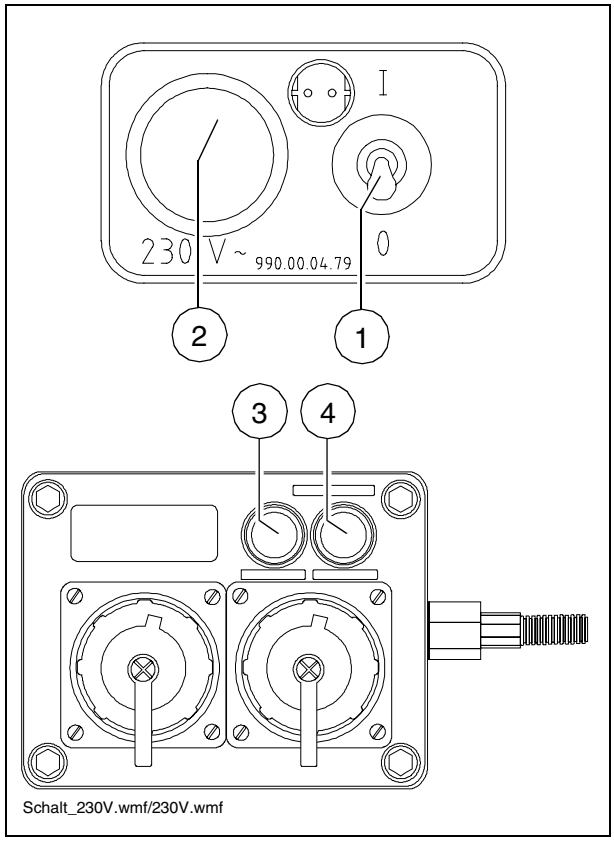
All maintenance and repair work on the screed's electrical system must always be carried out by an electrician!

Do not spray with water!

Insulation monitoring of electrical system

The insulation test must be undertaken every day when the machine is running and the sockets are activated.

- Activate electrical system using switch (1), telltale (2) lights up.
- Press test button (3) - "Insulation error" display must light up.
- Press delete button (4) - display for insulation error goes out.



Schalt_230V.wmf/230V.wmf

If the test is completed successfully, work can proceed with the electrical system and external consumers can be used.
However if the "Insulation error" indicator lamp displays an error even before the test button is pressed, work cannot proceed with the electrical system or with the external equipment connected up. If an insulation error occurs, the sockets are automatically de-energised (i.e. electrically isolated).
If no errors are displayed during simulation, do not carry out any work on the electrical system.

If malfunctions arise, the electrical system must be checked by an electrician and/or repaired. This must be done before work can proceed on this system and the equipment.

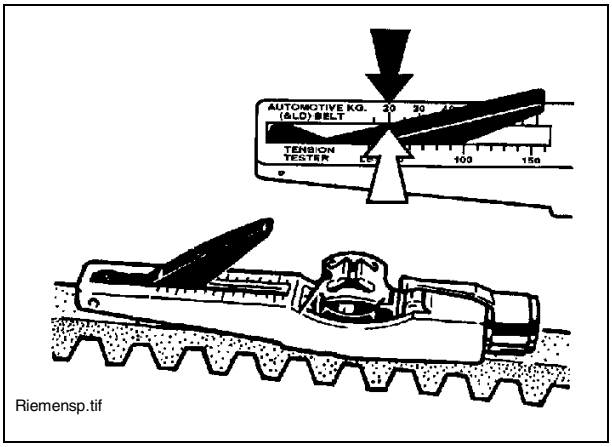
Danger from electric voltage
Failure to comply with the safety precautions and safety regulations can result in electrical shock injuries from the electrical system.
Danger to life! All maintenance and repair work on the screed's electrical system must always be carried out by an electrician.

Checking belt tension

The tension of each individual belt must be checked using a preload measuring device.

Specified tension:

- for initial assembly: 550 N
- after run-in period / maintenance interval: 400 N



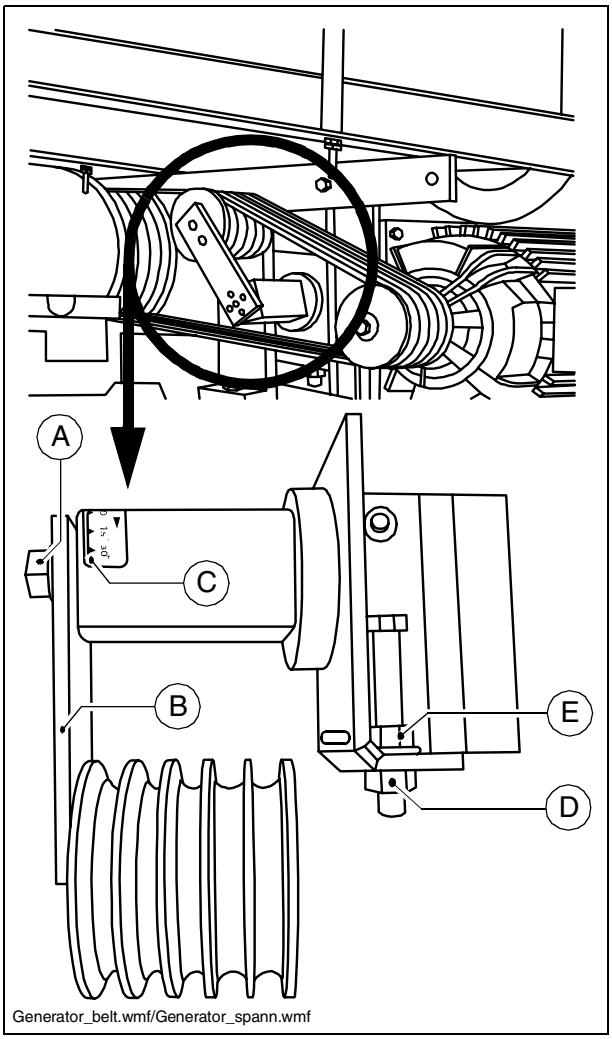
Riemensp.tif

☞ Information on checking the level of tension can be found in the instructions for your preload measuring device!

☞ A preload measuring device can be ordered under item number 532.000.45!

Setting belt tension

- Loosen fixing screw (A) so that the tensioning roller holder (B) moves into its zero position (scale (C) = 0°).
- To adjust the tensioning fixture, loosen and/or turn the corresponding nut (D) or lock nut (E) until the tensioning roller makes contact with the slack top belt.
- To set the correct tension, turn the tensioning roller holder (B) towards the top belt (scale (C) = 15°).
- Retighten fixing screw (A).
- Retighten the previously loosened nut (D) or (E).



Generator_belt.wmf/Generator_spann.wmf

5 Lubricating agents and operating substances

Use only the lubricants listed below or comparable qualities of well-known brands.

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

☞ Heed the filling volumes (see the section ”Filling volumes”).

⚠ Incorrect oil or lubricant levels increase the wear and cause the paver finisher to fail.

	BP	Esso	Total Fina (Total)	Mobil	Renault	Shell	Wisura
Grease	Multi-purpose grease L2	ESSO Multi-purpose grease	Total Multis EP 2	Mobilux 2 Mobiplex 47	Multi-purpose grease	SHELL Alvania Grease EP (LF) 2	Retinax A
Engine oil	See the operating instructions for the engine. Shell Rimula Super-FE 10 W 40 has been filled in at the factory.						
Hydraulic oil	See section 4.1 Shell Tellus Oil 46 has been filled in at the factory.						
Gear oil 90	BP Multi EP SAE 90	ESSO GP 90	Total EP 90	MOBIL GX 90	Tranself EP 90	SHELL Spirax G 80 W - 90	
Gear oil 220	BP Energol GR-XP 220	ESSO Spartan EP 220	Total Carter EP 220	MOBIL Mobilgear 630 Mobil-gear SHC 220	Chevron NL Gear Compound 220	SHELL Omala 220	Optimol Optigear 220
	Optimol Optigear 220 has been filled in at the factory.						
Distilled water							
Diesel fuel							
Brake oil/ Brake fluid	BP Blue original Brake fluid	Ate Disk brake fluid	Total HB F 4	ELF			
Cooling liquid	Cooling liquid (anti-freeze and corrosion protection)						

5.1 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
Total Fina Elf	Total Biohydran SE 46

b) Mineral oils

Manufacturer	ISO category of viscosity VG 46
Shell	Tellus Oil 46
Total Fina Elf	Total Azolla ZS 46

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

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

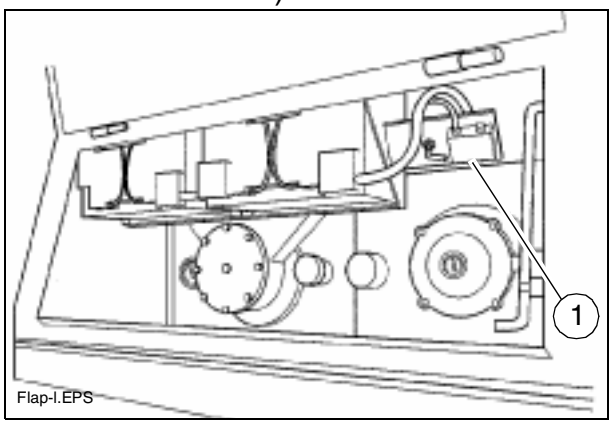
5.2 Filling volumes

	Filling volumes	Substance
Volume	Diesel fuel	210 liters 55.4 US gallons 46.1 British gallons
Hydraulic oil reservoir	Hydraulic oil	185 liters 48.8 US gallons 40.6 British gallons
Diesel engine (with oil filter change)	Engine oil	See the operating instructions for the engine
Cooling system	Cooling fluid	See the operating instructions for the engine
Pump distribution gear	Gear oil 90	4.5 liters 1.2 US gallons 0.98 British gallons
Caterpillar drive - planetary gear *	Gear oil 220	4.0 liters 1.05 US gallons 0.88 British gallons
Conveyor gear (each side)	Gear oil 220	1.5 liters 0.4 US gallons 0.32 British gallons
Auger bevel gear (each side)	Gear oil 90	0.6 liters 0.15 US gallons 0.13 British gallons
Central lubrication unit (option)	Grease	
Batteries	Distilled water	

☞ For the different types of operating agents, see ”Lubricating agents and operating substances”,pág. 28.

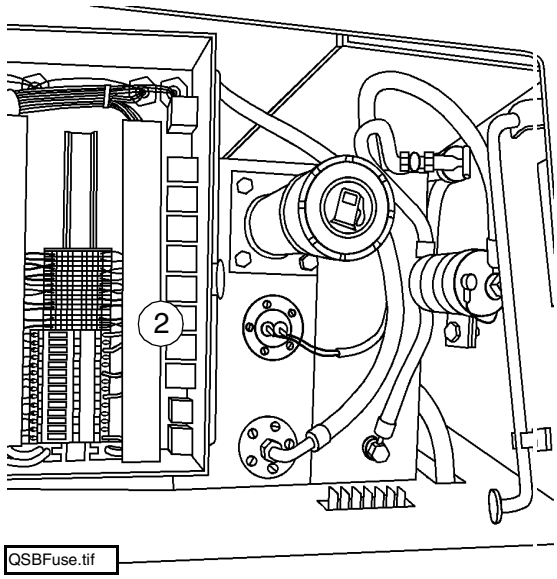
6 Electric fuses

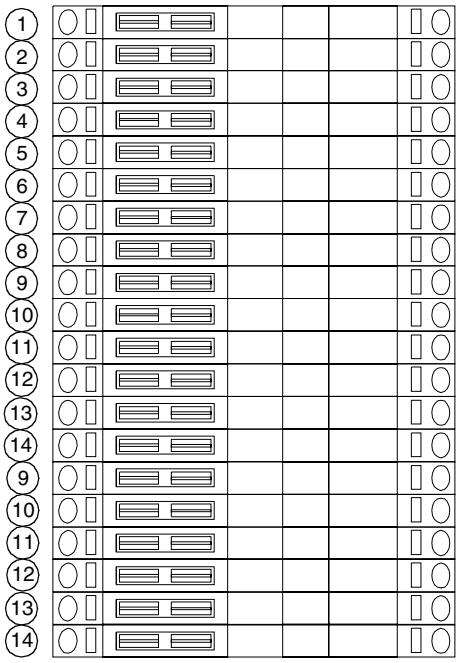
6.1 Main fuses (1) (beside the batteries)



1.	- F3.1 Terminal box, start relay - F3.2 Engine preheating	50 A 100 A

6.2 **Fuses in the terminal box** (beside the fuel tank)

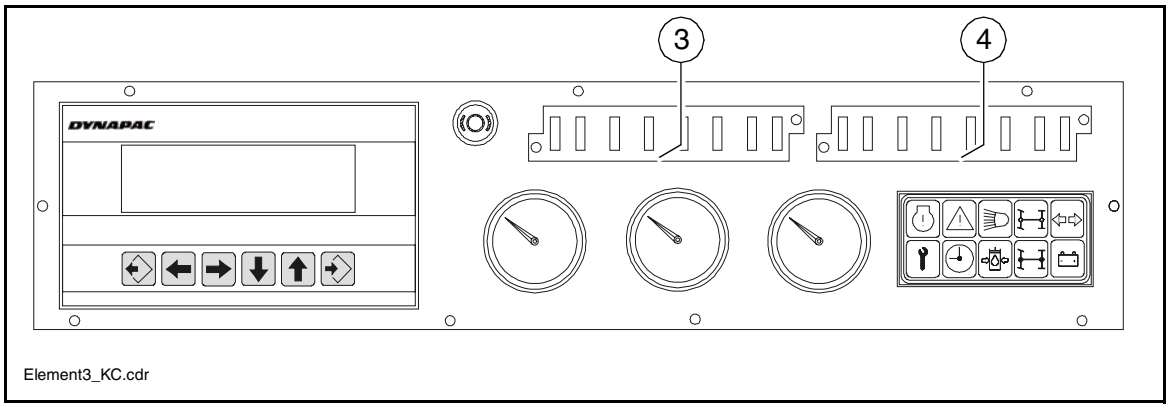




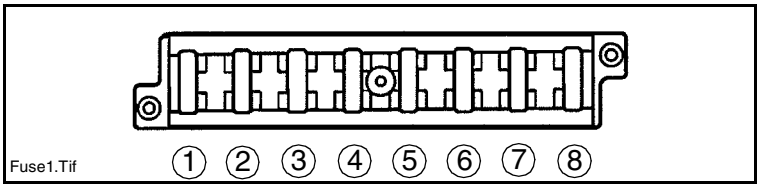
Fuse carrier (2)

No.	F5.1 - F5.8	A
1.	Traction drive	10
2.	Traction drive	1
3.	not used	
4.	Heatingboxforscreed,230Voltsystem(○),emulsionspraysystem/ dieselsprayingsystem,fuellingequipment(+additionalheadlight)	3 (25)
5.	Sockets	10
6.	Sockets	10
7.	Sockets	10
8.	Sockets	10
No.	F7.1 - F7.8	A
9.	Slave module A31	10
10.	Slave module A32	10
11.	Slave module A33	10
12.	Slave module A34	10
13.	Slave module A35	10
14.	Slave module A36 (reserve)	10
No.	F41.1 - F41.5	A
15.	Electronic engine control	7.5
16.	Electronic engine control	7.5
17.	Electronic engine control	7.5
18.	Electronic engine control	7.5
19.	Electronic engine control	7.5
No.	F44	A
20.	Traction drive	1

6.3 Fuses on the operating panel

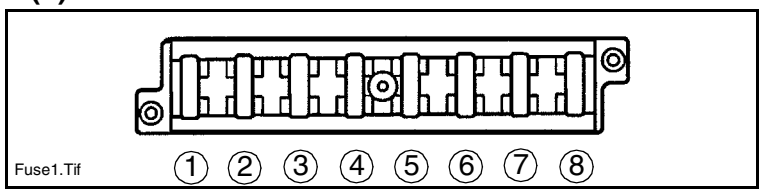


Fuse carrier (3)



No.	F1.1 - F1.8	A
1.	Engine start, horn, emergency stop	5
2.	Battery charge control, control indicators, electr. engine control	3
3.	Power supply master module A1	10
4.	Power supply slaves (A31, A32, A33)	10
5.	Power supply slaves (A34, A35), (A38,A39) E heating (○)	10
6.	not used	
7.	Power supply switch box for screed heating, remote control, centralized lubricating (○)	5
8.	Power supply gateway A23	5

Fuse carrier (4)

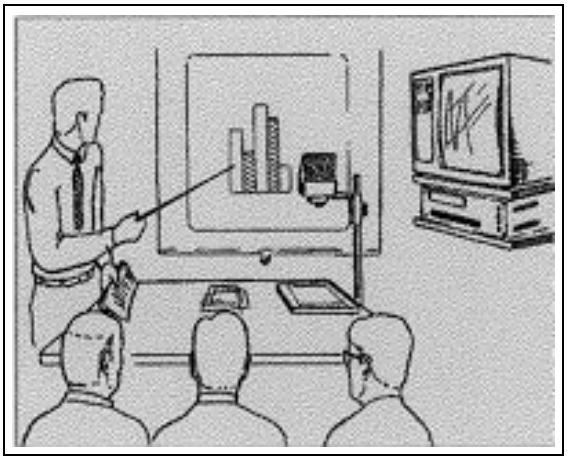


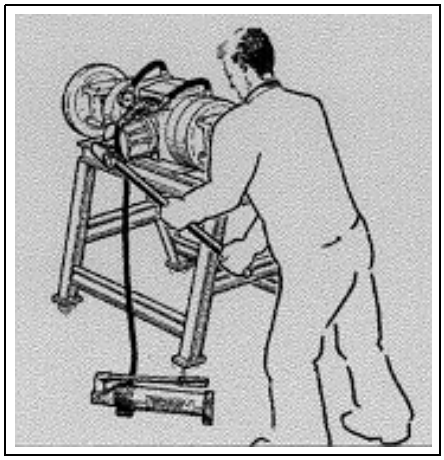
No.	F2.1 - F2.8	A
1.	not used	
2.	Horn	3
3.	E heating (○)	3
4.	High beam light	7,5
5.	Driving light RH side	3
6.	Driving light LH side	3
7.	Parking light RH side	3
8.	Parking light LH side, dashboard lamps, range selector Q2	3

DYNAPAC AFTERSALES

TRAINING

As Your Dynapac dealer we can offer You various training programmes, such as; driving, service and application training. Give us a call - it will give you even more out of your Dynapac paver and planer!





SERVICE

Always use Your Dynapac workshop for service and maintenance. We can give You the best service to the right price. The workshop also has all the required tools and special equipments to carry out all types of repair if you are in need of that.

INFORMATION

The easiest way to solve a minor problem out in the field, is to contact Your Dynapac dealer for trouble-
shooting and advise. Make us a visit to inform Yourself about the whole range of Dynapac pavers, planers and "Know how".

DYNAPAC

Don’t hesitate to contact
your local dealer for:

service
spare parts
documentation
accessories
and
information
about the complete
Dynapac
paving and planing
range