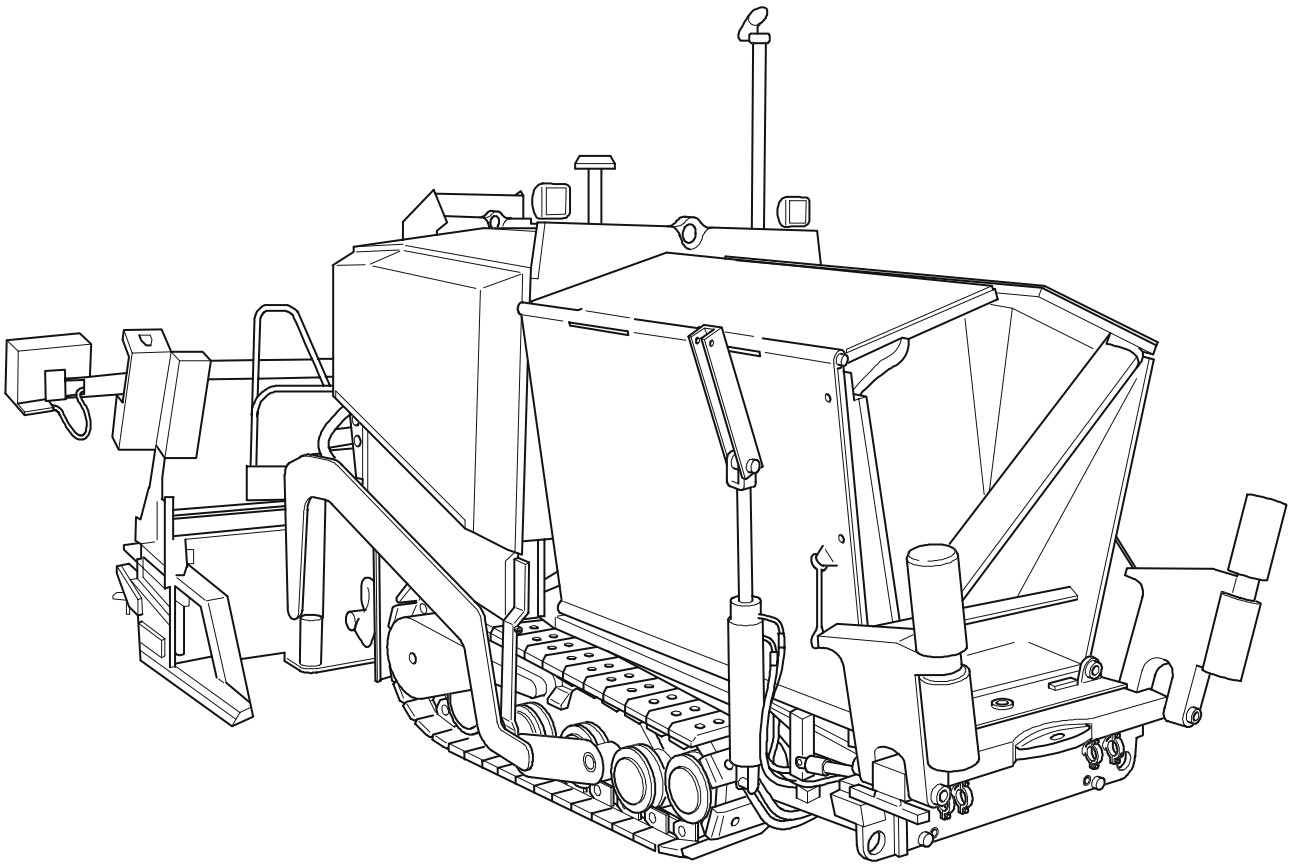
DYNAPAC



Operating instructions

GB

Paver finisher
F 5 CS

04-0906

900 98 11 61

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.

Dynapac GmbH
Wardenburg

Ammerländer Strasse 93
D-26203 Wardenburg / Germany
Telefon: +49 / (0)4407 / 972-0
Fax: +49 / (0)4407 / 972-228
www.dynapac.com

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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.

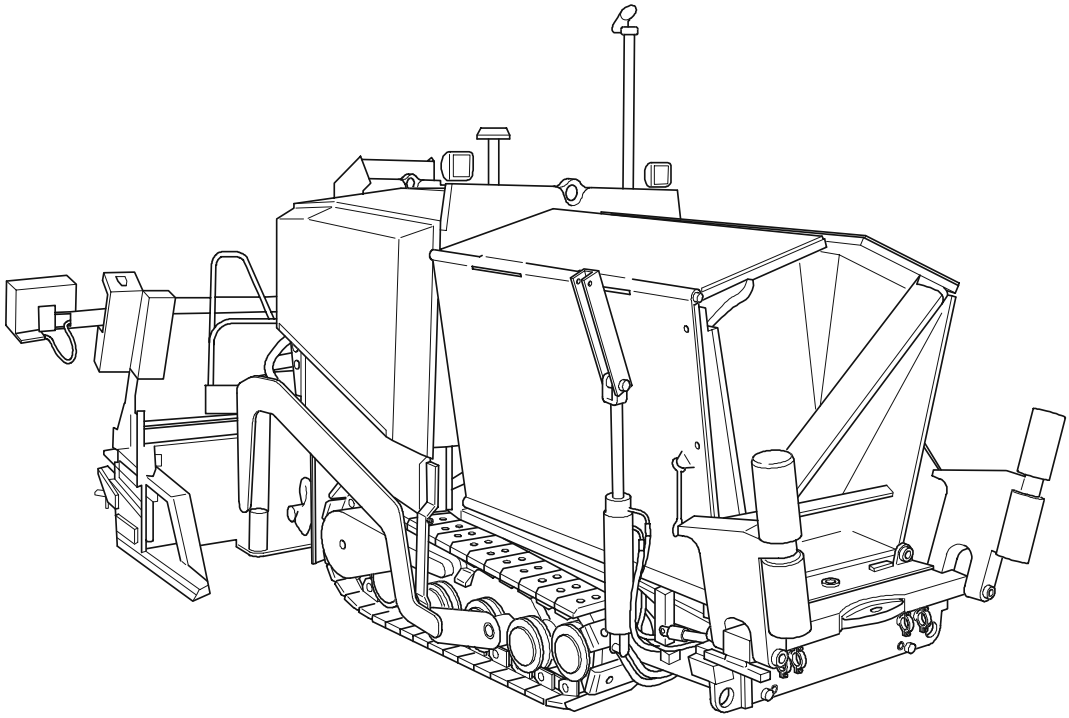
Duties of the user: A “user” within the meaning of the present operating instructions is defined as any natural or legal person who either uses the paver finisher himself, or on whose behalf it is used. In special cases (e.g. leasing or renting), the user is considered the person who, in accordance with 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 F 5 CS 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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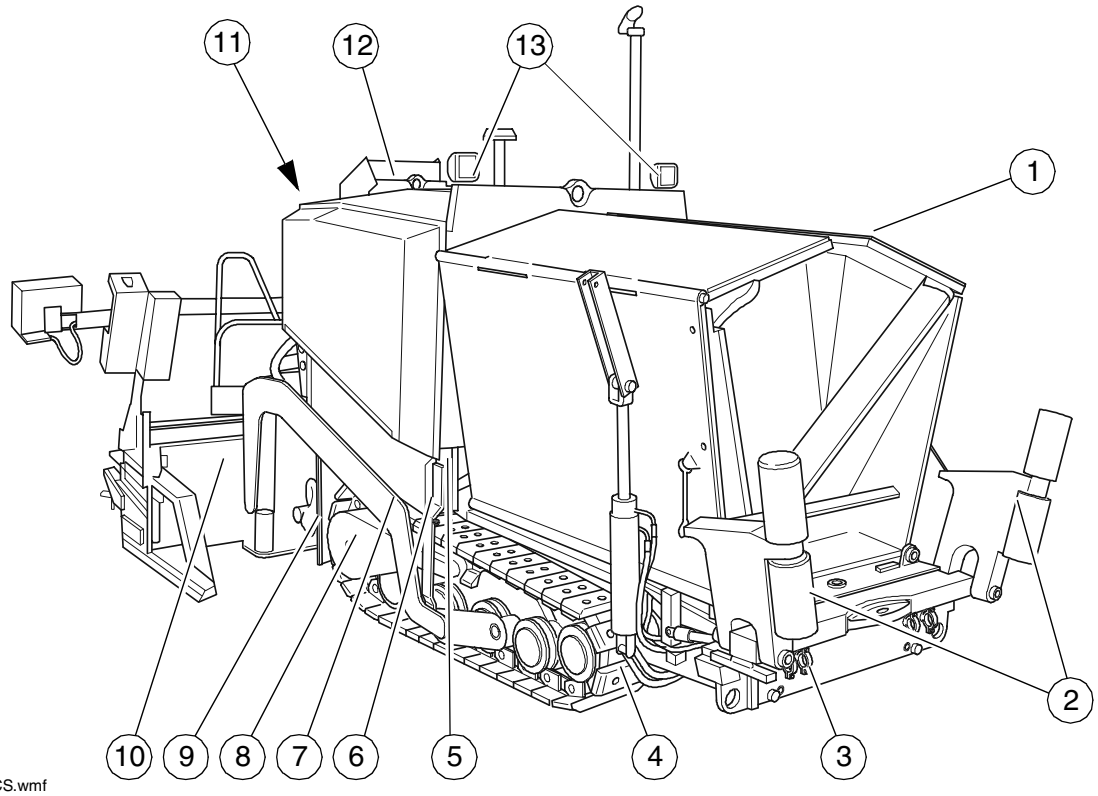


F4_F5CS.wmf

Item		Designation
1	t	Material compartment (hopper)
2	t	Truck push rollers
3	t	Tube for sensor rod (direction indicator) - holder
4	t	Caterpillar drive
5	t	Levelling cylinder for paving thickness
6	t	Paving thickness indicator
7	t	Arm
8	t	Traction drive of the caterpillar drive
9	t	Auger
10	t	Screed
11	t	Operator’s platform
12	t	Operating panel
13	t	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 compensate uneven areas on the ground; the suspension of the attached screed additionally helps to attain a high paving precision. The continuously adjustable hydrostatic traction drive allows the speed of the paver finisher to be matched to all work conditions.

Operating the paver finisher is made considerably easier thanks to the separate travel drives, clearly laid out operating and inspection elements and optional remote control.

The following extra equipment (option) is available:

○ Automatic levelling

○ Ultrasonic sensors for material transport (controller)

○ Additional cut-off shoe

○ Larger working widths

○ Chute for hopper

○ Hopper infeed flaps

○ Generator for electric heater

○ Further equipment and upgrade options on request

Engine The paver finisher is equipped with a air-cooled 3-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.
The tension of the drive chains can be mechanically adjusted.

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.

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.
To reduce transport width, the truck push roller can be swivelled upwards together with the hopper.

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. 5 tons.
To facilitate emptying and to improve material transport, each of the lateral covers of the hopper can be hydraulically moved.

Material transfer: The paver finisher is fitted with a conveyor belt which transports the mixed materials from the hopper to the distribution augers
The delivery volume is regulated during paving operations through fully automatic sensing of fill depth.

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.

Levelling system/slope control system As standard, the finisher is prepared for the electrical and hydraulical connection to an automatic levelling system.

The levelling system is intended to monitor the laying height and to automatically correct deviations from the set point value.

The system is optionally equipped with:

- one or two height regulators
- one transverse grade regulator
- two connection cables

The slope control always operates in combination with the levelling cylinder on the opposite side.

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, 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.

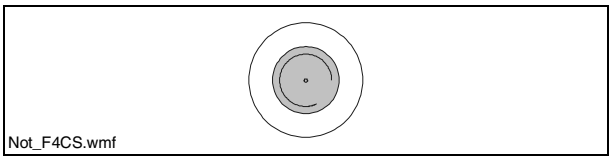
Screed lifting device: The screed lifting device is used to lift the screed during transportation. This is performed electro-hydraulically on both sides by connecting up the hydraulic cylinder to the crossbeam and is operated via a lever on the operating panel.

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).

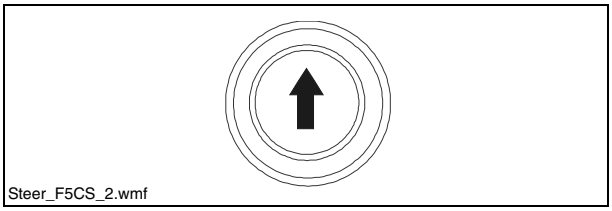
3.1 Emergency stop button



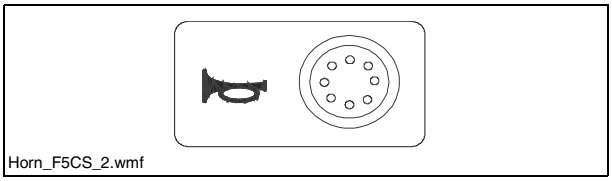
- on the operating panel

⚠ 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

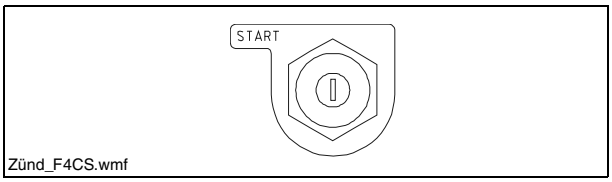


3.3 Horn

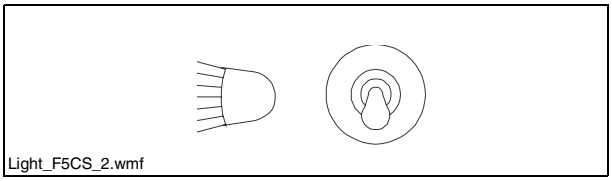


- on the operating panel

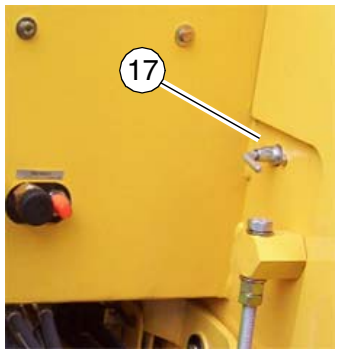
3.4 Ignition key



3.5 Lights



3.6 Main switch (17)



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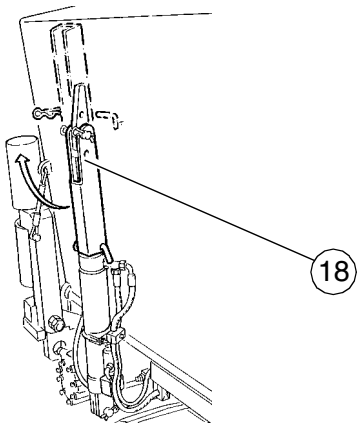
3.7 Hopper transport safeguards (18)



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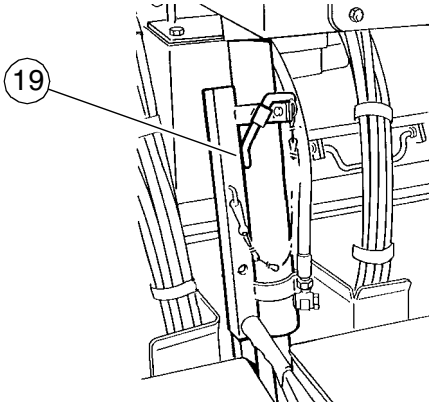
3.8 Screed transport safeguard (19)



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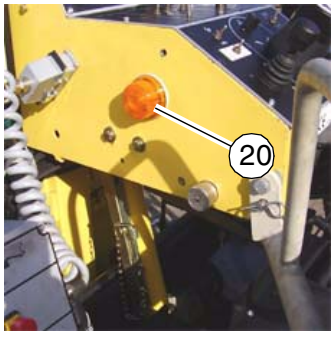
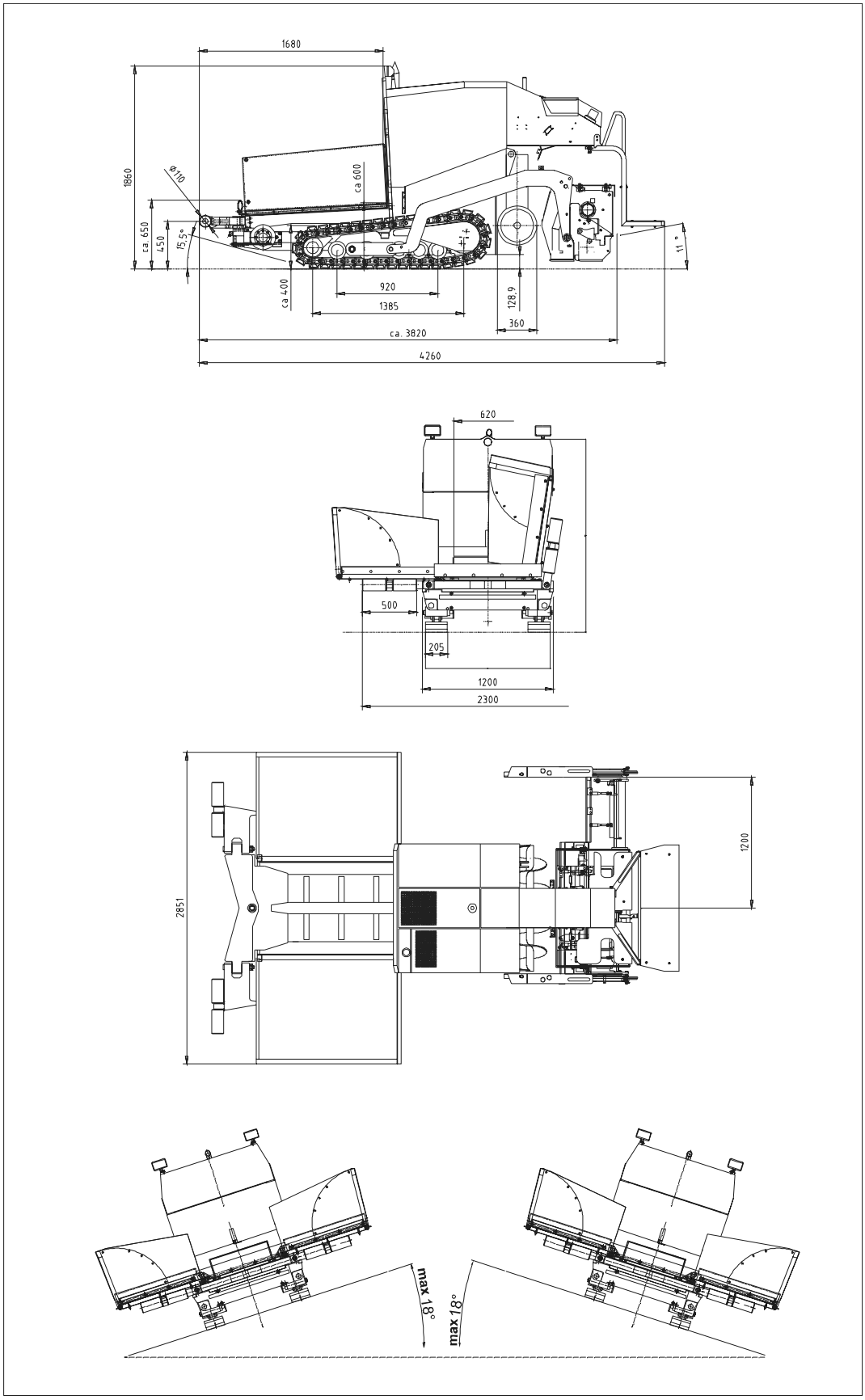
3.9 Hazard warning lights of the screed (20)



Screed_flash.jpg

4 Technical data, standard configuration

4.1 Dimensions (all dimensions in mm)



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

4.2 Weights (all weights in t)

Paver finisher without screed	ca. 4,4
Paver finisher with screed: - VB 125 TV	ca. 5,0
With filled hopper additionally max.	ca. 5,0

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

4.3 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 125 TV	1,20	0,30	2,40	3,10	m

Transport speed	0 - 3,0	km/h
Working speed	0 - 16	m/min
Layer thickness	0 - 200	mm
Theoretical paving performance	300	t/h

4.4 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

4.5 Engine

Make/type	Deutz BF3L 2011
Model	3-cylinder diesel engine (air-cooled)
Performance	39 KW / 53 PS (à 2300 1/min)
Volume of fuel tank	(see chapter F)

4.6 Material compartment (hopper)

Volume	ca. 2,3 m^3 = ca. 5,0 t

4.7 Material conveying

Conveyors	Reversible
Drive	Hydrostatic, continuously controllable
Conveying volume controller	Fully automatic via configurable switching points

4.8 Material distribution

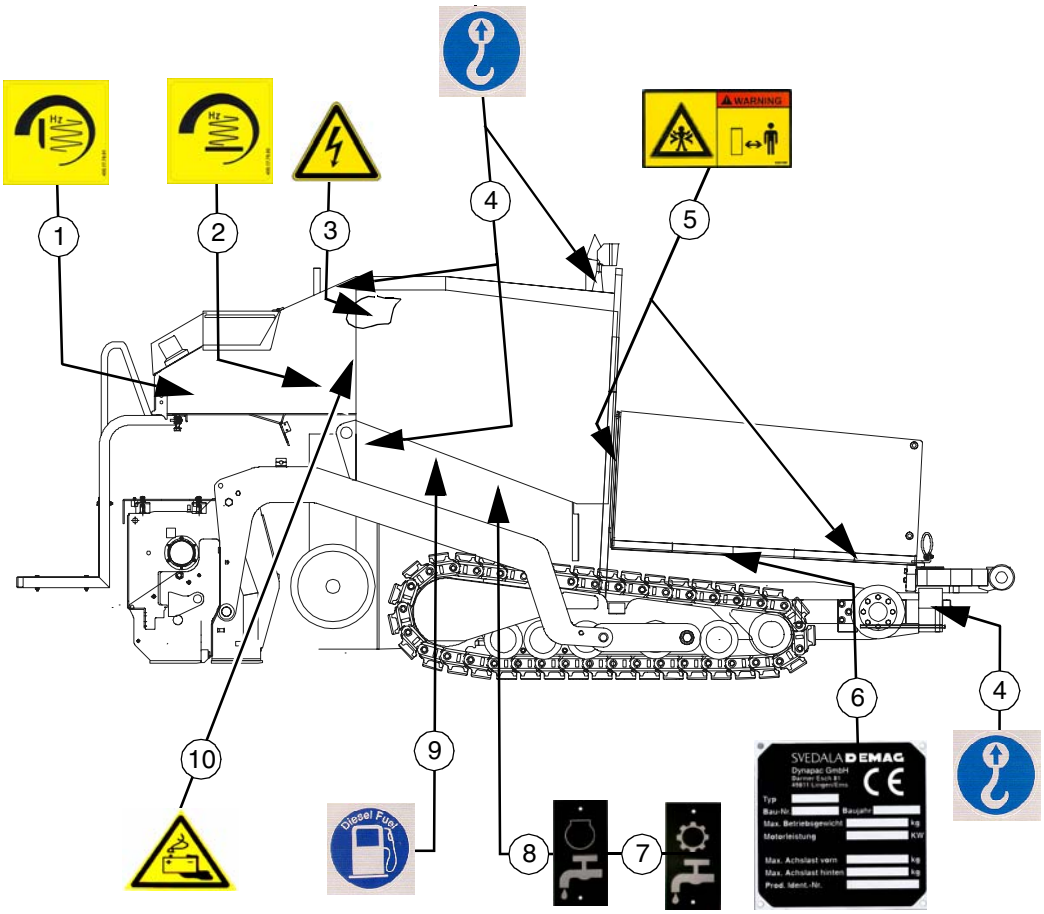
Augers	Left and right auger separately controllable Ø 360
Drive	For left and right operation Hydrostatic central drive, infinitely variable speed
Conveying volume controller	Fully automatic via configurable switching points
Auger height adjustment	- mechanically
Auger extension	With extension parts

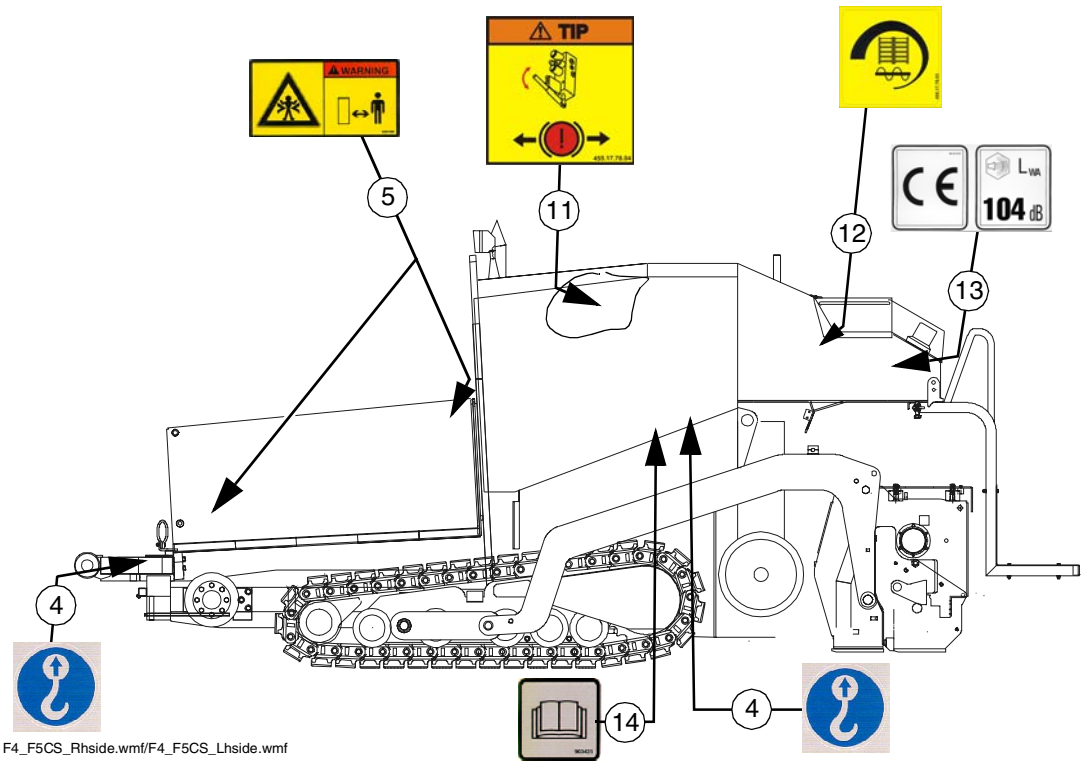
4.9 Electrical system

On-board voltage	24 V
Batteries	2 x 12 V, 60 Ah
Alternator (○)	8,5 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





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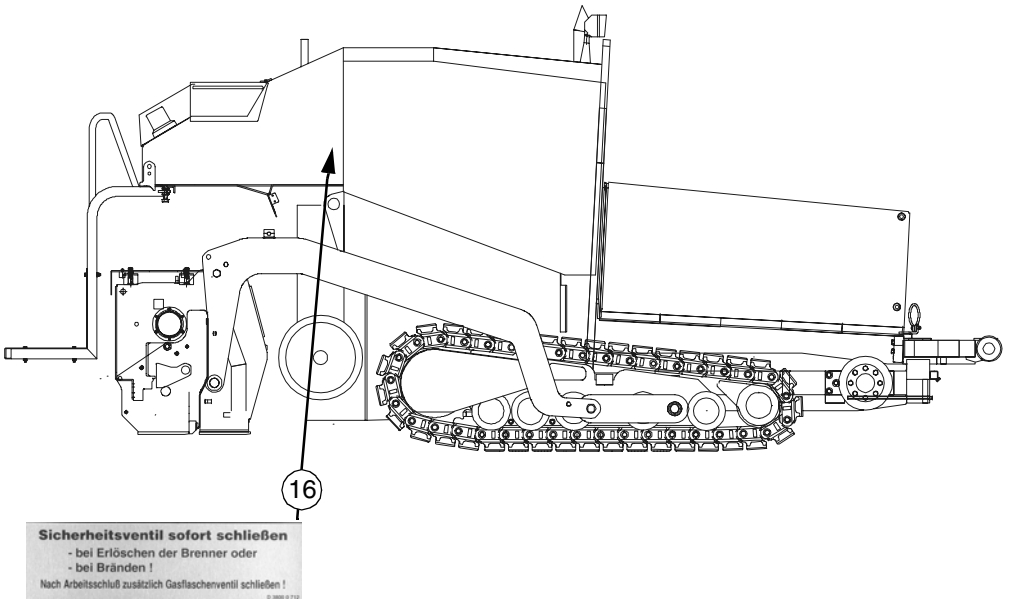
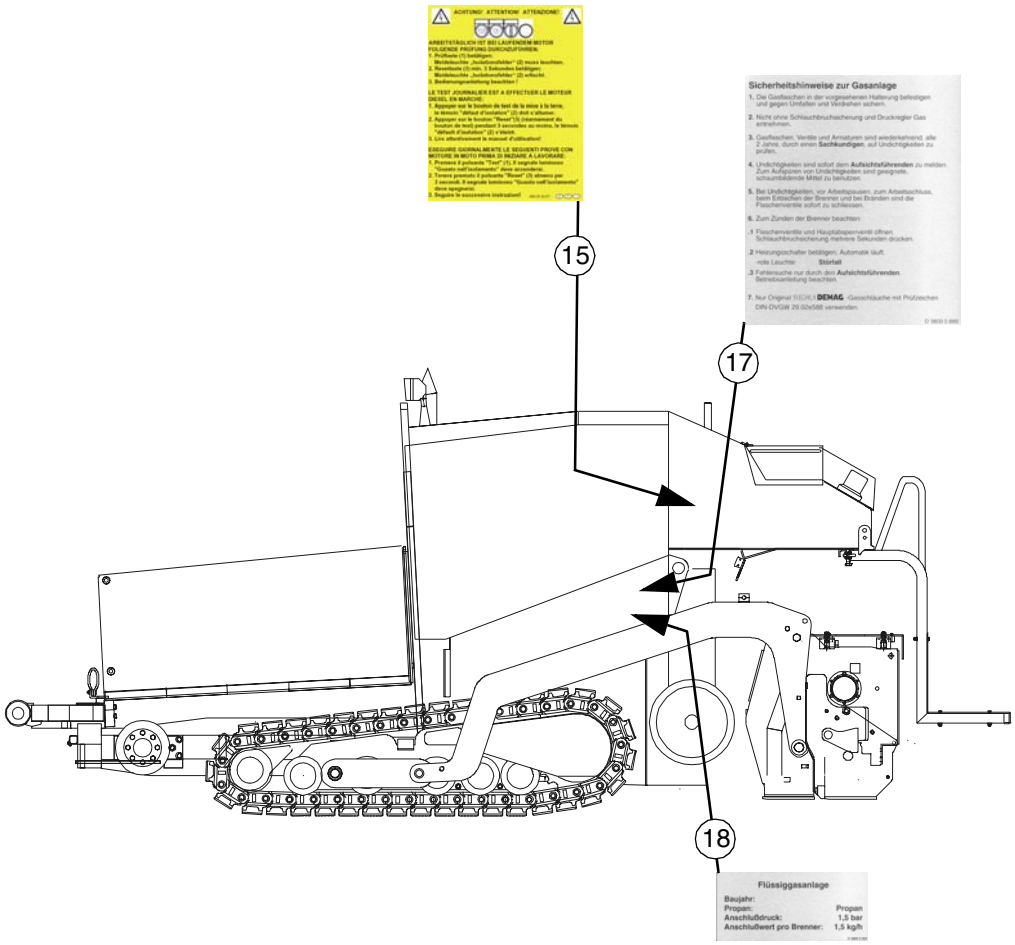
5.1 Location of instruction labels gas heater system / electrical system (○)





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2	455.17.78.02	
3	956.04.60.00	
4	990.00.02.25	
5	956.04.49.00	
6		
7	990.00.02.23	
8	990.00.02.21	
9	990.00.02.15	
10	956.05.20.09	
11	455.17.78.04	
12	455.17.78.03	
13	956.05.30.56	
14	956.04.51.00	
15 (○)	956.05.30.57	D, F, I
	956.05.30.58	D, F, NL
	956.05.30.59	GB, E, P
	956.05.30.60	S, N, DK
	956.05.30.61	S, N, FIN
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	38 00 08 36	FL
	38 00 08 37	S
	38 00 08 38	N
	38 00 08 39	DK

17	38 00 08 89	D
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	38 00 08 28	E
	38 00 08 29	NL
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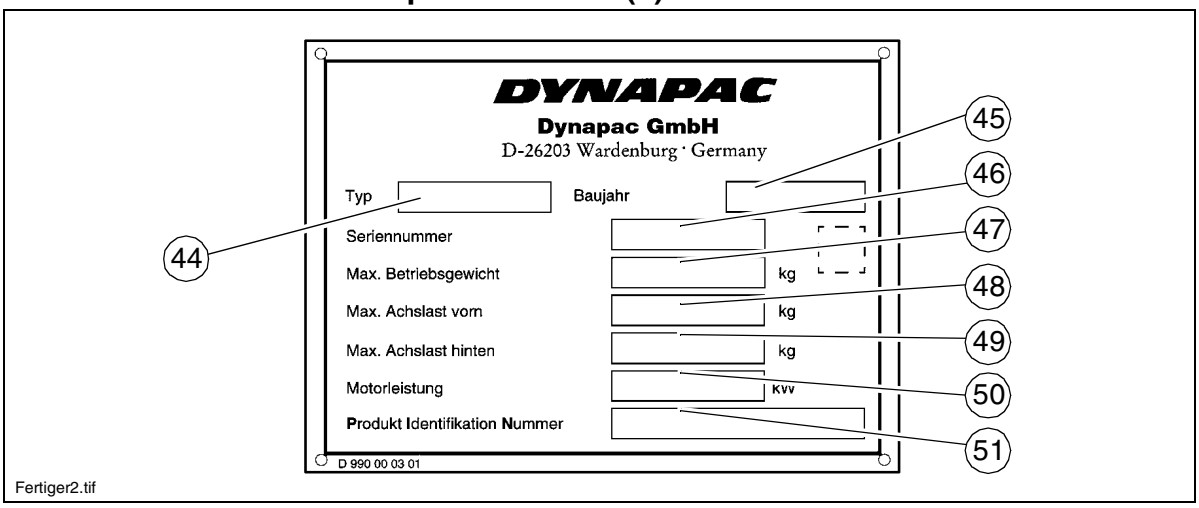
	38 00 08 32	N
	38 00 08 33	DK

5.2 Identification label for the paver finisher (6)



Item	Designation
44	Paver finisher type
45	Year of manufacture
46	Serial number of the paver finisher series
47	Max. permissible operating weight, incl. all attachments, in kg
48	
49	
50	Rated performance in kW
51	Product identification number (PIN)

☞ The punched vehicle identification number on the paver finisher must match the product identification number (51).

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} = 84,5 dB(A)

Sound capacity level: L_{WA} = 102,2 dB(A)

Sound pressure level at the machine

Measuring point	2	4	6	8	10	12
Sound pressure level L_{AFeq} (dB(A))	73,3	73,7	73,5	71,9	73,5	73,1

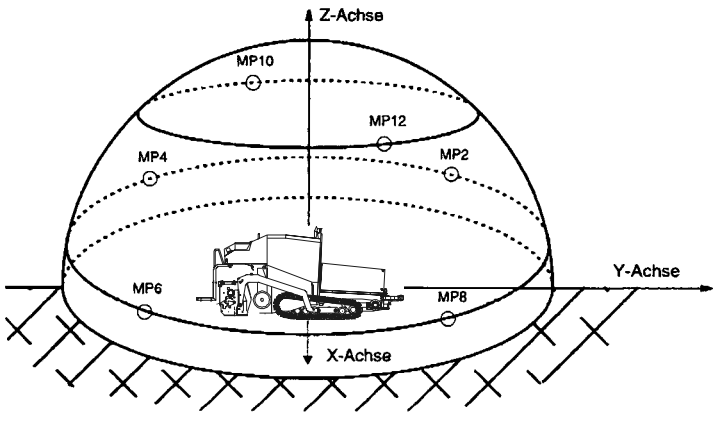
6.2 Operating conditions during measurement

The diesel engine operates at max. speed, conveyor at 40%, augers at 40%, tamper and vibration at no less than 50% of their maximum speed.

6.3 Measuring point configuration

Semispherical measuring surface with a radius of 10 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
	±7	±7	1,5	- 2,7 +2,7	+6,5 -6,5	7,1 7,1



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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.

Stow all components not securely attached to finisher and screed in the boxes provided.
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 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

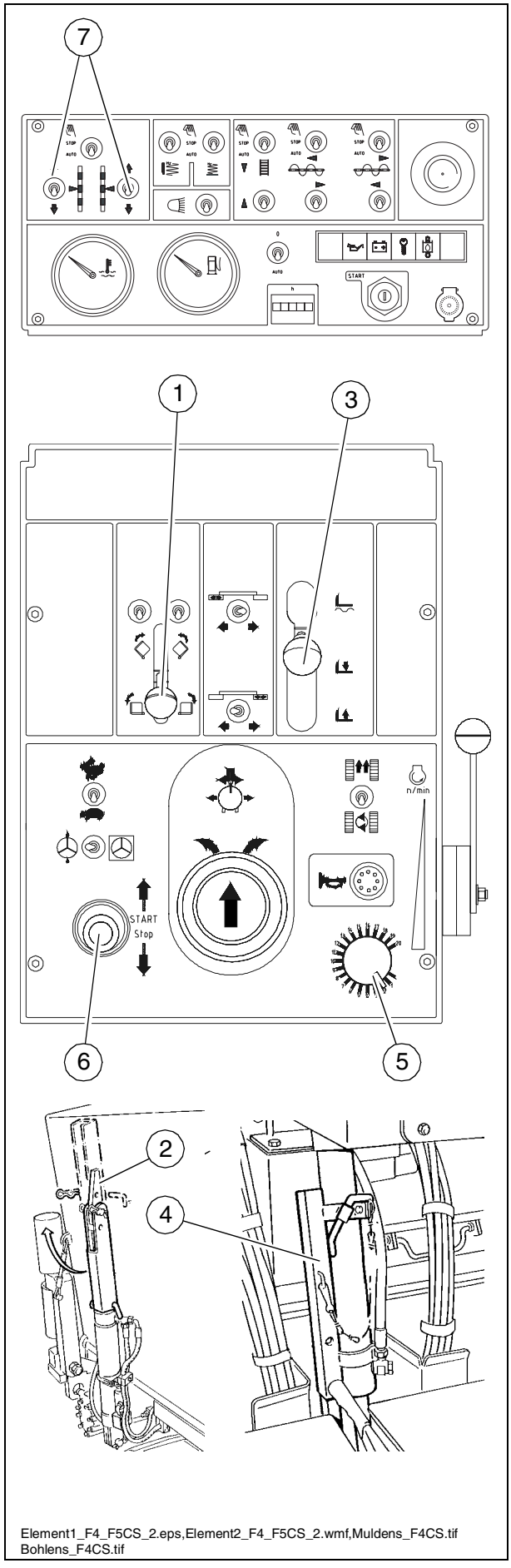
⚠ Reduce the paver finisher and the screed to their basic widths; also remove any attached side plates. To prevent damages to the screed, the inclination of the ramp to be used must not exceed 11° (19%).

2.1 Preparations

- Prepare the paver finisher for operation (see chapter D).
- Use lever (1) to close the hopper lids. Engage both hopper transport safeguards (2).
- Use lever (3) to lift the screed. Engage the screed transport safeguard (4).
- To extend the levelling cylinders:
  - Turn the preselector (5) to ”zero”. Move the drive lever (6) forward. Push the switches (7) downward until the levelling cylinders are completely extended.
  - Set the drive lever (6) 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 valve and the bottle valves.
  - Unscrew the valves on the bottles and remove the gas bottles from the paver finisher.
  - Transport the gas bottles on a second vehicle; heed all pertaining safety regulations.



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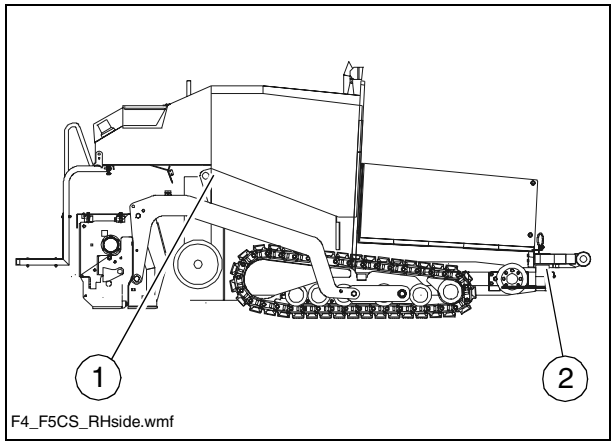
Bohlens_F4CS.tif

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



F4_F5CS_RHside.wmf

2.3 After transportation

- 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 Transport in the construction site area

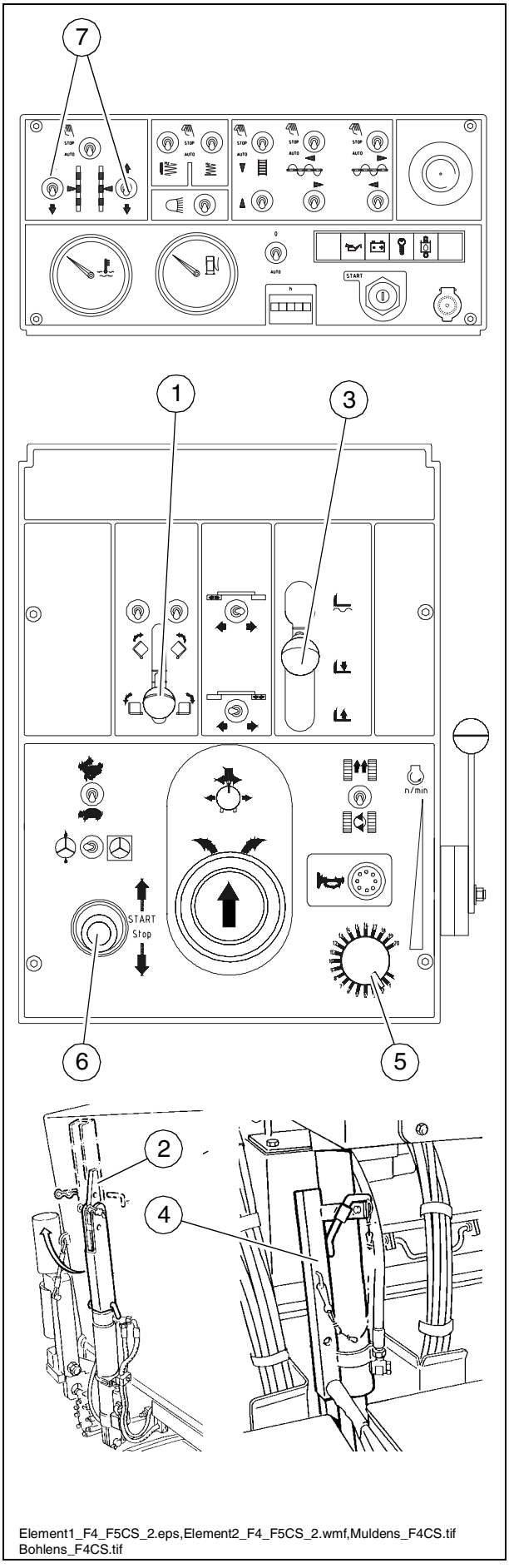
⚠ Reduce the paver finisher and the screed to their basic widths; also remove any attached side plates.

3.1 Preparations

- Use lever (1) to close the hopper lids. Engage both hopper transport safeguards (2).
- Use lever (3) to lift the screed. Engage the screed transport safeguard (4).
- To extend the levelling cylinders:
  - Turn the preselector (5) to ”zero”. Move the drive lever (6) forward. Push the switches (7) downward until the levelling cylinders are completely extended.
  - Set the drive lever (6) 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 valve and the bottle valves.
  - Unscrew the valves on the bottles and remove the gas bottles from the paver finisher.
  - Transport the gas bottles on a second vehicle; heed all pertaining safety regulations.

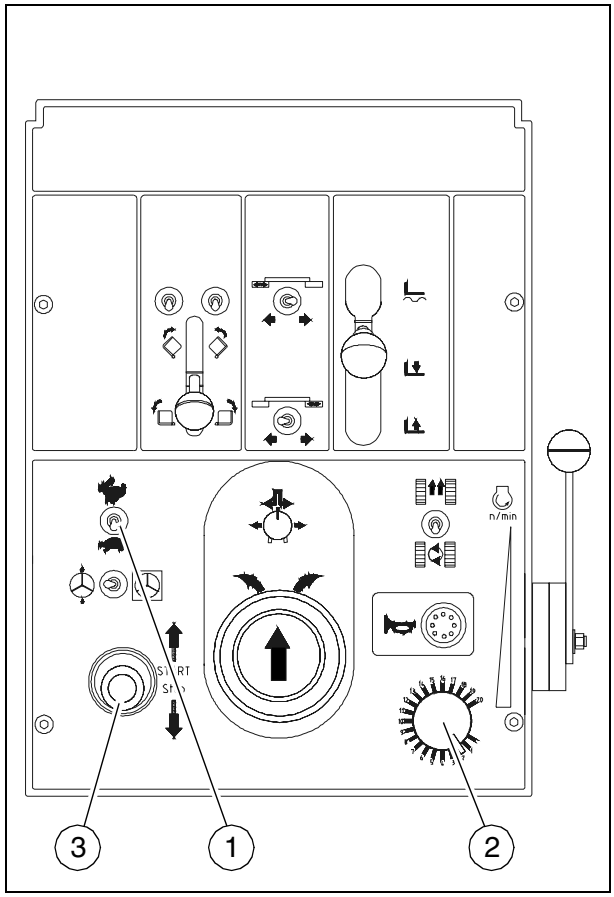


Element1_F4_F5CS_2.eps,Element2_F4_F5CS_2.wmf,Muldens_F4CS.tif
Bohlens_F4CS.tif

3.2 Driving on public roads

- Set the Fast/Slow switch (1) to “Hare”.
- Turn the preselector (2) to maximum.
- Use the drive lever (3) to regulate the speed.
- Press the emergency stop button when a dangerous situation arises!

☞ During operation and drive let the engine run at full speed.

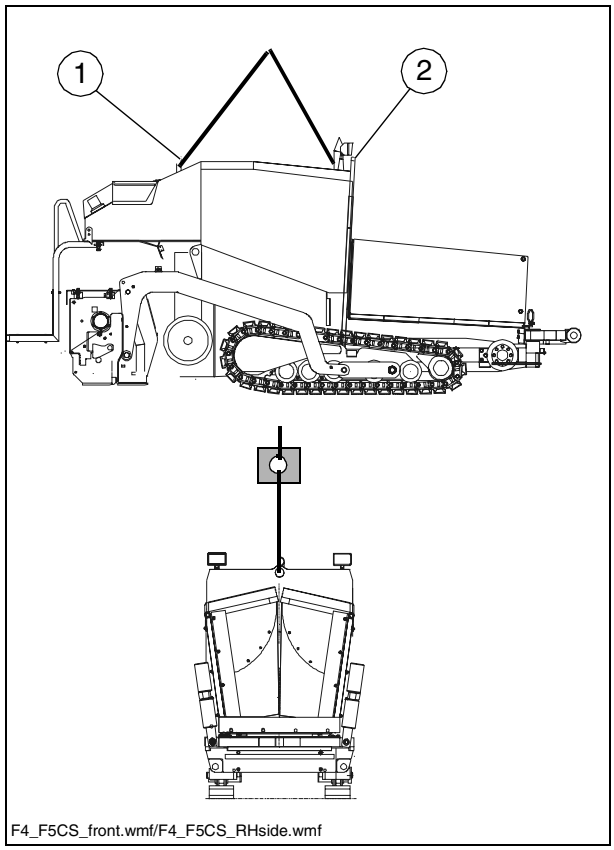


4 Loading by crane

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

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

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



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

5 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.

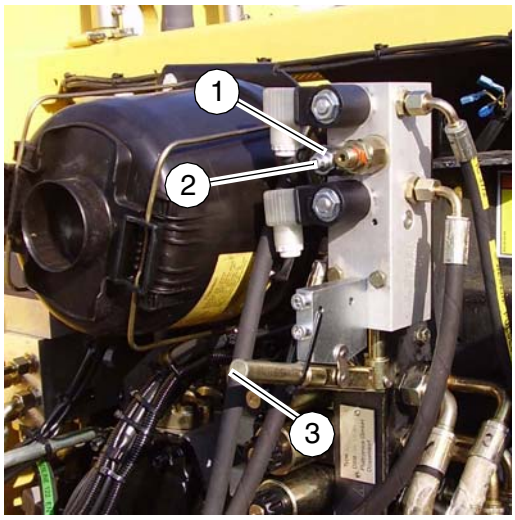
Use only approved tow bars!

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

There is a hand pump behind the side flap which must be actuated in order to tow the vehicle.
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

- Release lock nut (1), screw threaded dowel (2) into pump as far as possible and secure with lock nut.
- Actuate lever (3) of hand pump until sufficient pressure has been built up and traction system brakes have been released.



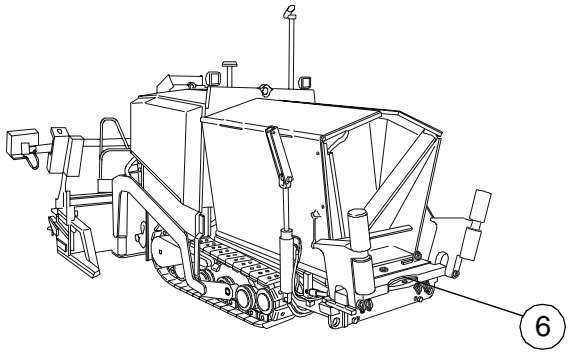
Pump_F5CS_2.jpg

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

- 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).

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

- Following towing, unscrew the threaded dowel (2) a few turns again and lock with the lock nut (1).
  The traction system brakes are no reactivated and the machine is secured against rolling.

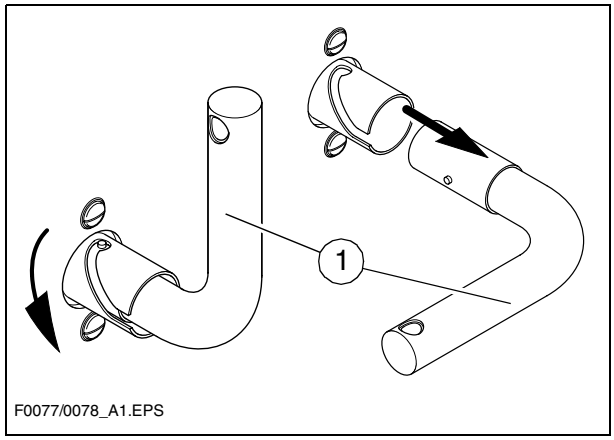


F4_F5CS.wmf

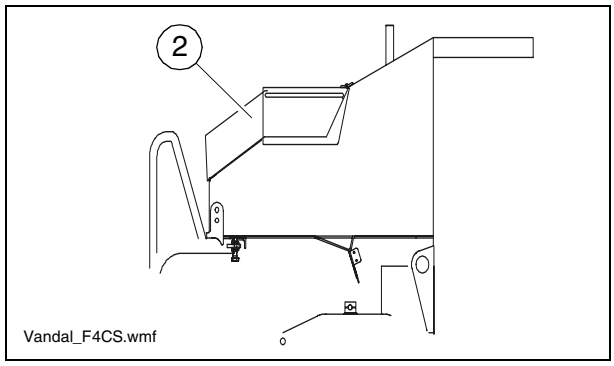
5.1 Safely parking the vehicle

⚠ 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 (1) and take it with you – do not hide them somewhere on the machine.



- Protect the operating panel with the dust cover (2) and lock it.
- Store loose parts and accessories in a safe place.



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!

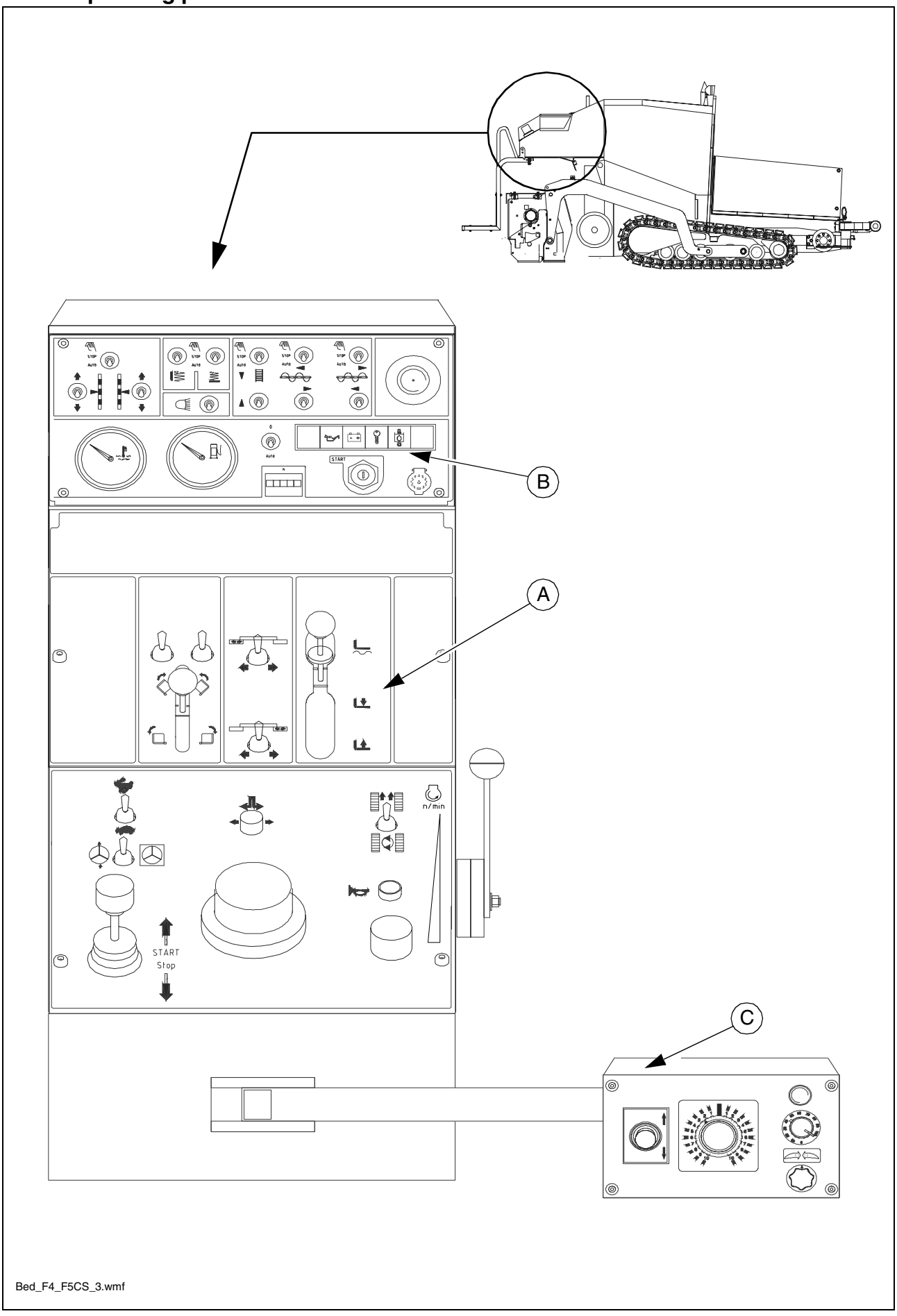
Never crawl into the auger tunnel or step into the hopper or onto the conveyor. Danger to life and limb!

- 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!
- 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 Controls

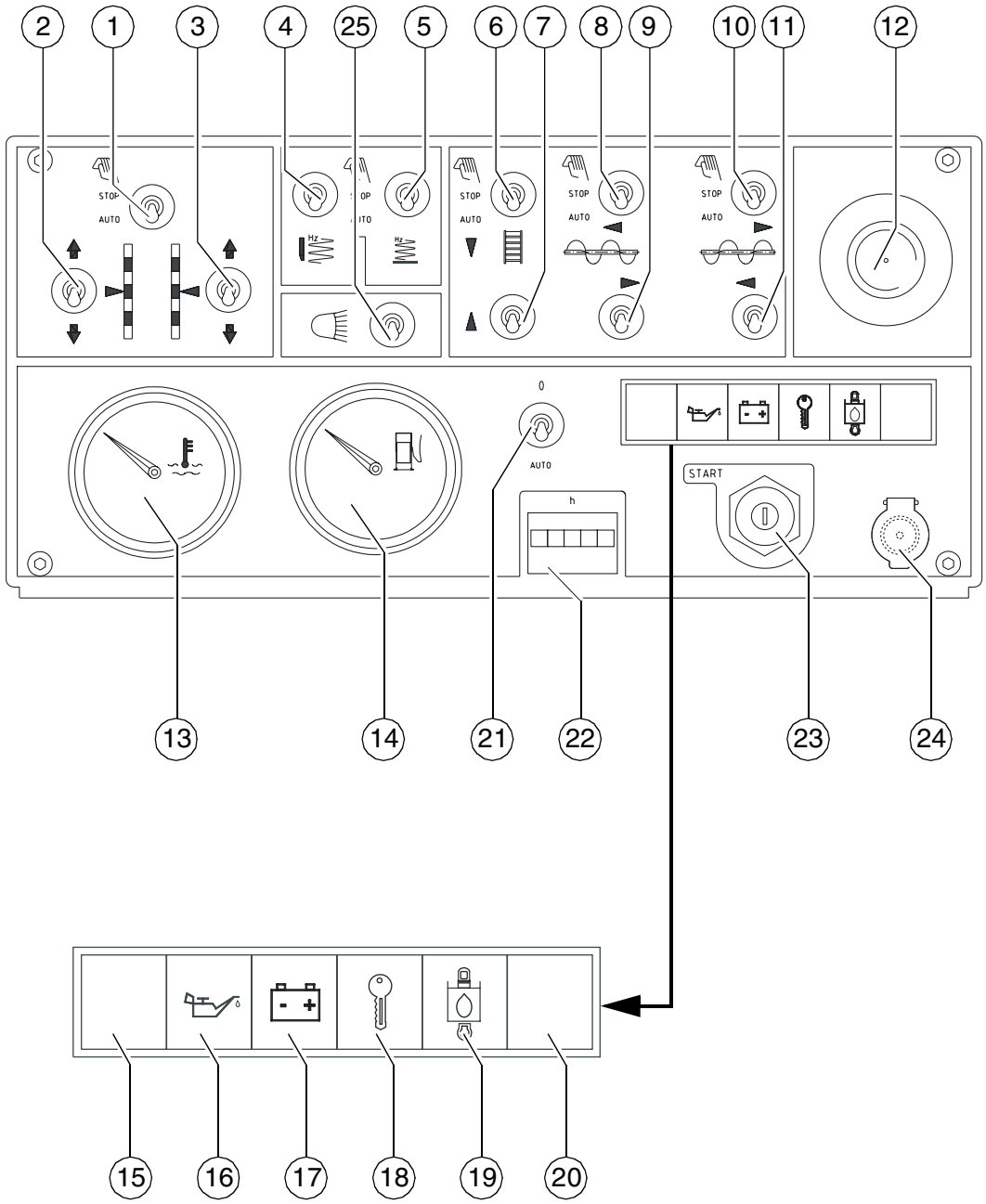
2.1 Operating panel



Bed_F4_F5CS_3.wmf

Pos.	Brief description
A	Main operating panel - operating and control element
B	Main operating panel - operating and inspection element
C	Rammelte control (O) - to operate outwith operator’s control station

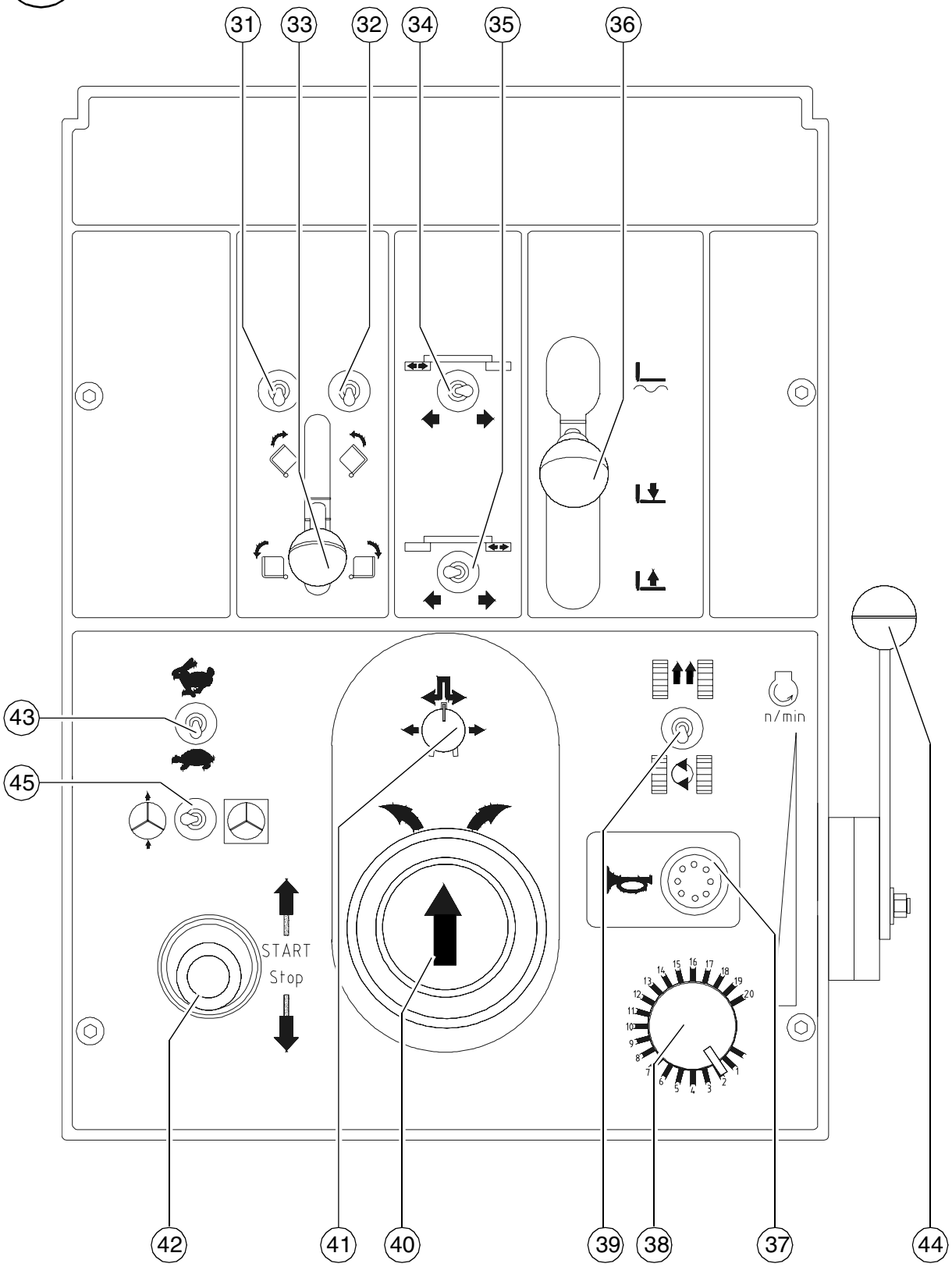
A



Element1_F4_F5CS_2.eps/Kontrollleucht_F4F5_2.eps

Pos.	Brief description
1	Toggle switch levelling/manual/automatic*
2	Toggle switch, LH levelling cylinder
3	Toggle switch, RH levelling cylinder
4	Toggle switch tamper manual/automatic*
5	Toggle switch, vibration, manual/automatic*
6	Toggle switch, grid, manual/automatic*
7	Toggle switch grid, reversing mechanism
8	Toggle switch, LH worm, manual/automatic*
9	Toggle switch, LH worm, inward conveying
10	Toggle switch, RH worm, manual/automatic*
11	Toggle switch, RH worm, inward conveying
12	Emergency Stop switch, travelling drive, worm, grid
13	Engine temperature display
14	Fuel reserve display
15	Indicator lamp for gas heater ON / OFF (○)
16	Engine oil pressure control lamp
17	Battery charge control lamp
18	Start release control lamp
19	Indicator lamp for engine temperature
20	Pre-glow check - diesel engine (○)
21	Heater, ON/OFF
22	Operating hour counter
23	Ignition lock
24	Socket
25	Toggle switch, lighting

*Manual mode allows these functions to be carried out even when the machine is stationary. This is not the case in automatic mode.


B
31
33
32
34
35
36
43
45
n/min
START
Stop
42
41
40
39
38
37
44
Element2_F4_F5CS.wmf

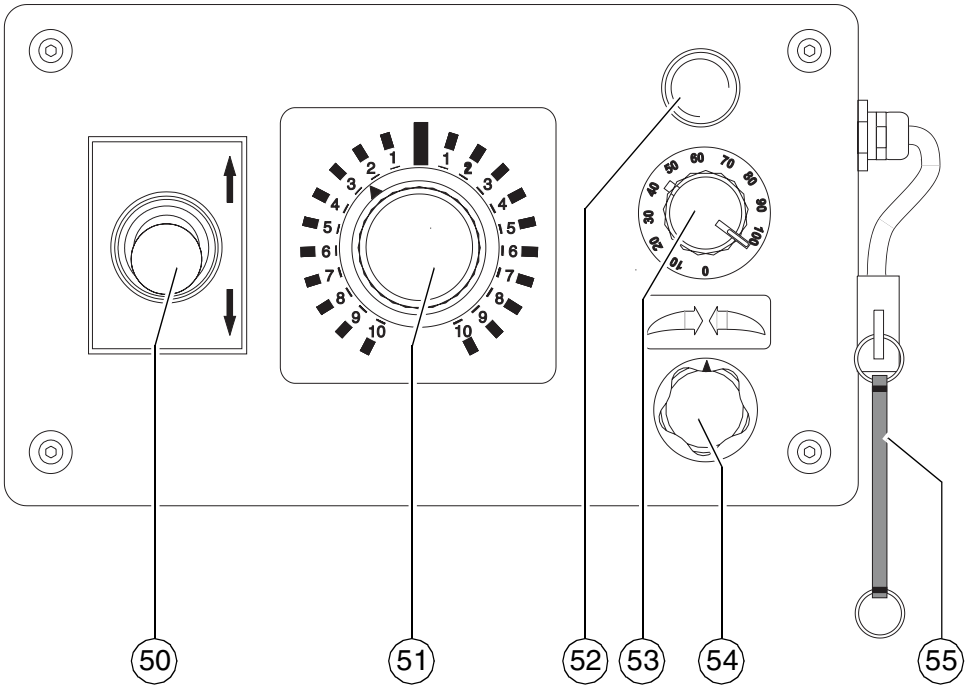
Pos.	Brief description
31	Hopper switch, left OFF/ON
32	Hopper switch, right OFF/ON
33	Lever, hopper lower/lift
34	Switch, screed left, retract/extend
35	Switch, screed right, retract/extend
36	Lever screen control Lift/Lower/Float position
37	Horn
38	Speed selector
39	Switch, turning on the spot left/right
40	Steering knob
41	Potentiometer, directional of stability compensation
42	Hand throttle
43	Rapid/operating speed hopper
44	Engine speed regulation
45	Switch, remote control OFF/ON

Remote control (○)

The remote control allows the finisher to be operated eccentrically and provides the driver with a better view.

☞ For set-up of remote control, see chapter E

C



Element3_F4_F5CS_2.eps

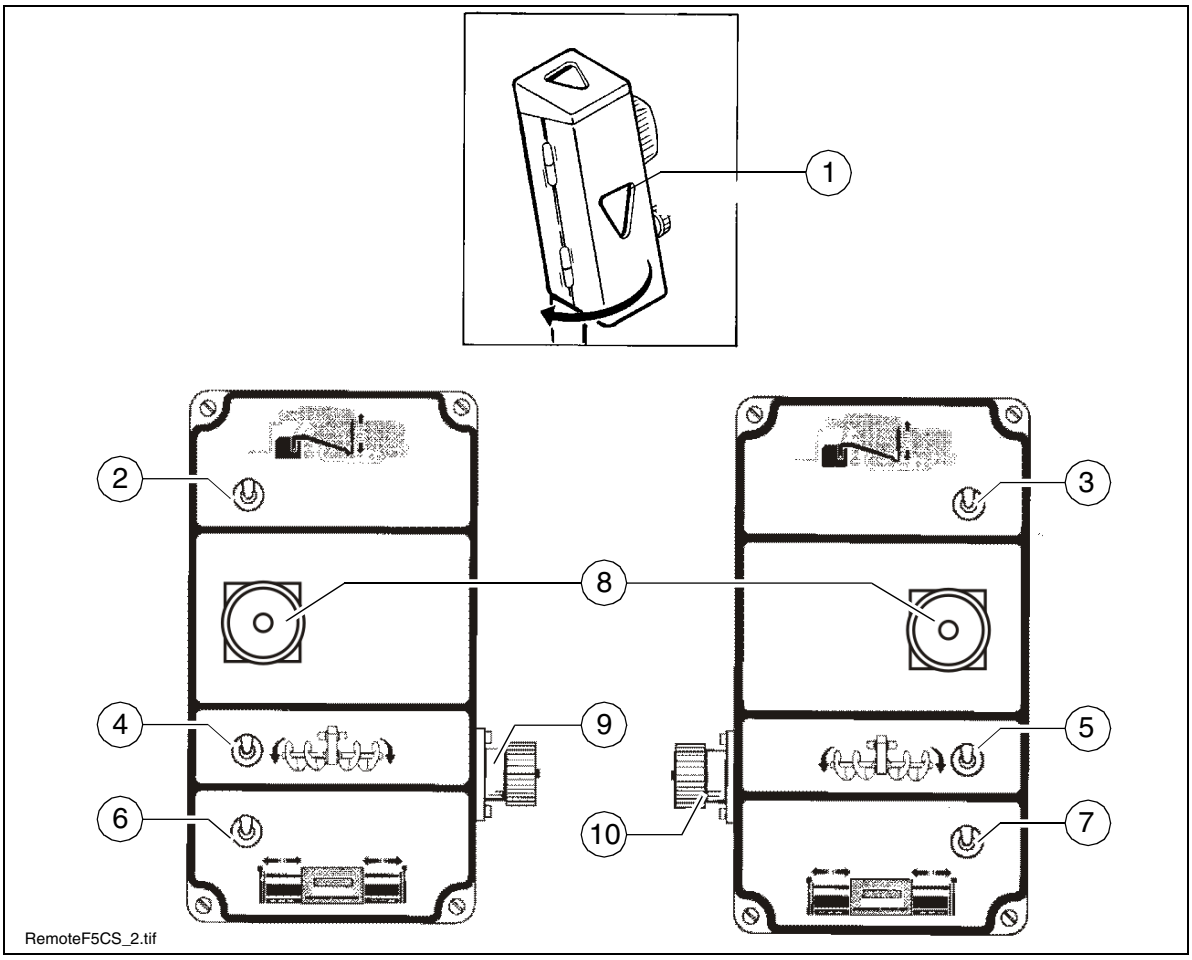
Pos.	Brief description
50	Hand throttle
51	Steering knob
52	Push button, drive releasen
53	Speed selector
54	Potentiometer, directional of stability compensation
55	Safety switch

When the remote control is being used, the safety switch (55) should always be attached to the clothing or wrist of the operator. If the operator moves too far away from the machine (e.g. in the case of a fall), the switch will be pulled and the travel drive will automatically shut off.

After a safety shut-off has taken place, approval must be re-issued with pushbutton (52).

2.2 Remote control

Two remote control units – to the left and to the right of the screed – allow the functions of the respective side of the paver finisher to be controlled.



Pos.	Brief description
1	Housing for external control
2	Levelling cylinder, LH, lifting/lowering
3	Levelling cylinder, RH, lifting/lowering
4	LH worm, ON/OFF
5	RH worm, ON/OFF
6	LH screed, moving in and out
7	RH screed, moving in and out
8	Emergency stop button (○)
9	Connection socket, levelling system, LH
10	Connection socket, levelling system, RH

2.3 Operating elements on the paver finisher

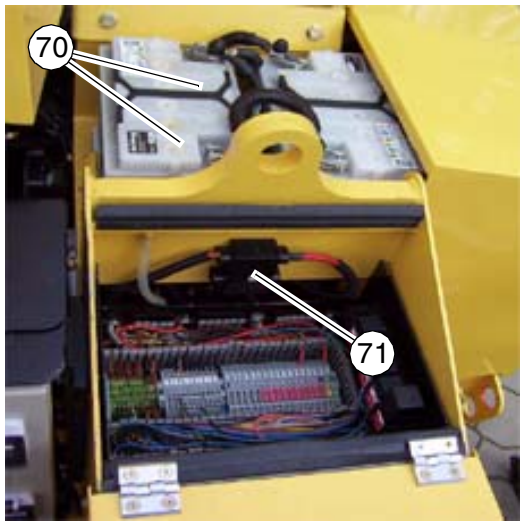
Batteries (70)

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)“).

☞ For the specifications of all fuses, see chapter F



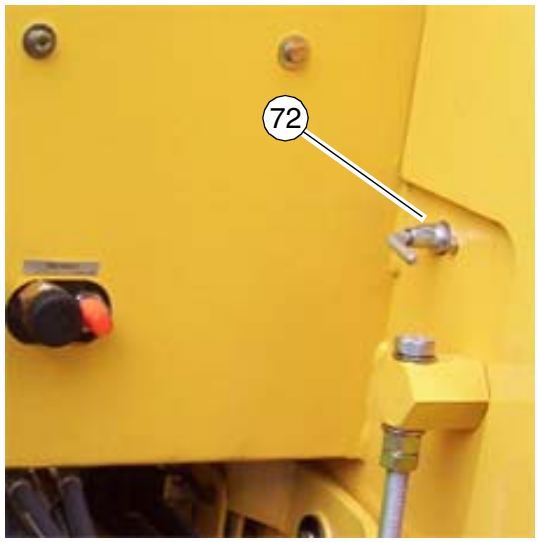
Batt_F4CS.jpg

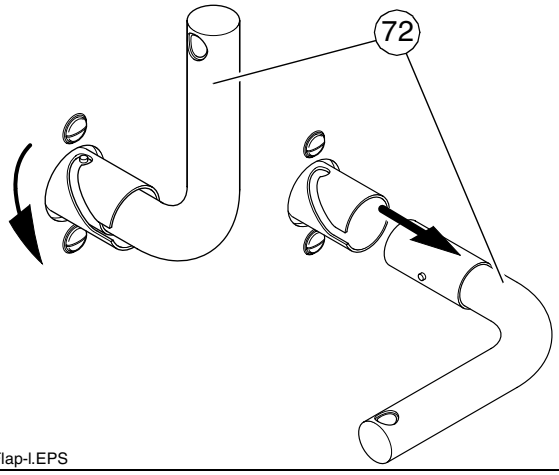
Battery main switch (72)

The main switch is located on the right-hand side of the machine; this interrupts the circuit from the battery to the main fuse.

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

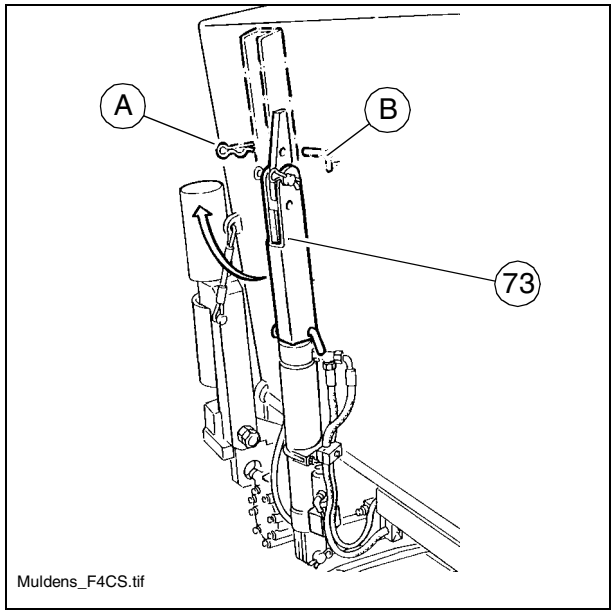
☞ Do not lose the key pin as in this case the paver finisher can no longer be moved!





Flap-l.EPS

Transport safeguards for the hopper (73)

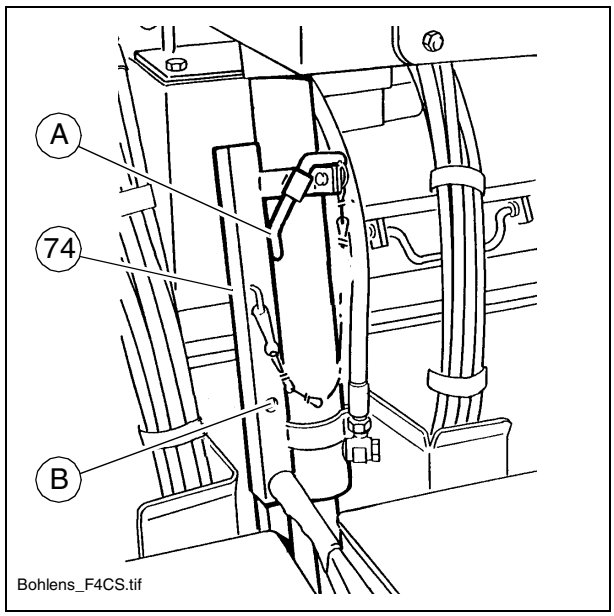


Before parking or transporting the paver finisher, the hopper halves must be swung upwards and the transport safeguards for the hopper must be inserted.

- Pull out the spring cotter (A) and pin (B).
- Swing transport safeguard (73) into lower position.
- Replace spring cotter (A) and pin (B) in lower position.

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 (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!

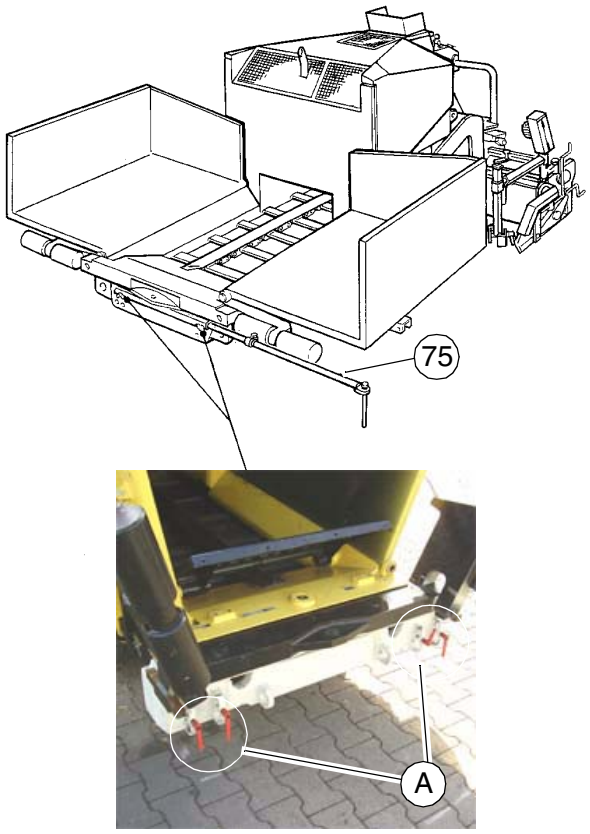
- Lift the screed.
- Insert pin (A) on both screed-lifting cylinders in retaining bore (B).

ATTENTION!
Do not enter or work under screed only secured with screed lock for transportation!
Danger of accident!

Visual gauge (75)

Install the visual gauge (75) for the driving direction optionally on the left-hand or right-hand front side of the machine.

The visual gauge can be shifted and clamped in the desired position using wing screws (A).



Peilstab_F4CS.tif/Peil_DF45CS_2.jpg

Paving thickness indicator (76)

On the levelling cylinder on the left- and right-hand sides of the machine is a scale and needle indicating the layer thickness.

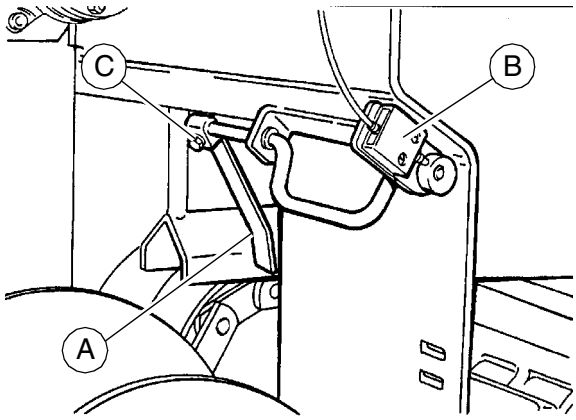
Einbaust_F4CS.jpg

Conveyor limit switch (paddle)(77)

The grids can be switched ”ON” or ”OFF” via paddle (A) and limit switch (B)

The paddles can be adjusted as required.

This can be done by loosening screw (C) and rotating the paddle on the shaft until the required operating point is reached.



Paddel.tif

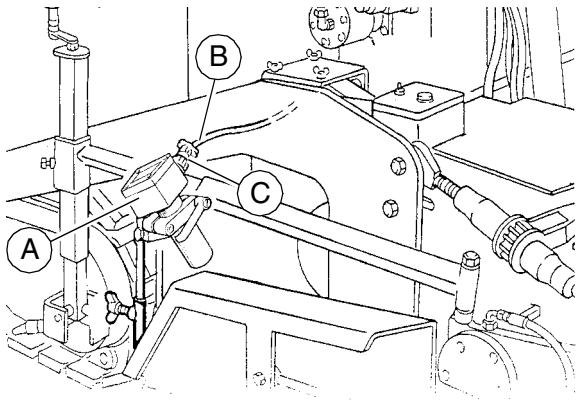
Auger limit switch(78)

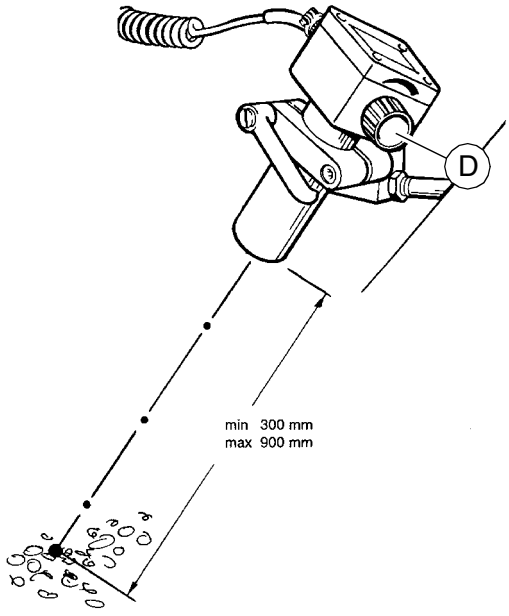
The control of the spreaders takes place via sensors.

Fitting the sensors:

Attach the sensors to the side plate (1 sensor per spreader) in the jaw assembly provided.

⚠ Always mount the sensors (A) such that damage to the sensors is excluded when extending and retracting the screed.
Connect cable (B) to connections (C) using the screw connections.





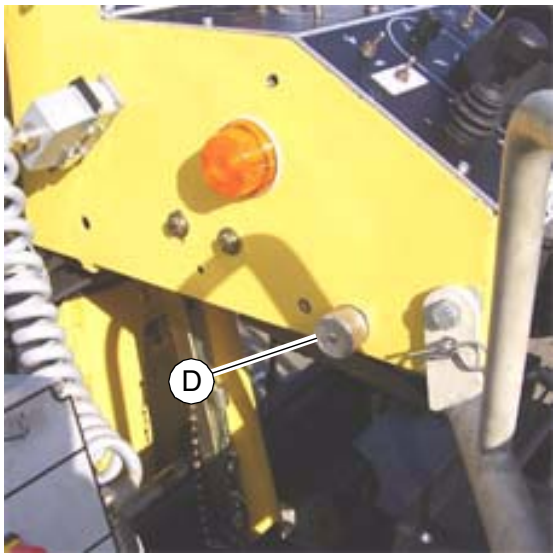
Adjusting the capacity flow

Set the sensors (A) in the direction of the mix material in front of the auger.The acoustic waves should hit the mix material in the right angle.

Adjust the point of switching of at the needed height of material by using the potentiometer (D)

Repeat this work daily prior to starting work.

Adjust the conveying speed of conveyor and auger using button (E).
CW turning - to increase the amount of material.
CCW turning - to reduce the amount of material.



Ultra_F4CS.tif/Ultra2_F4CS.tif/Conveyor_auger.jpg

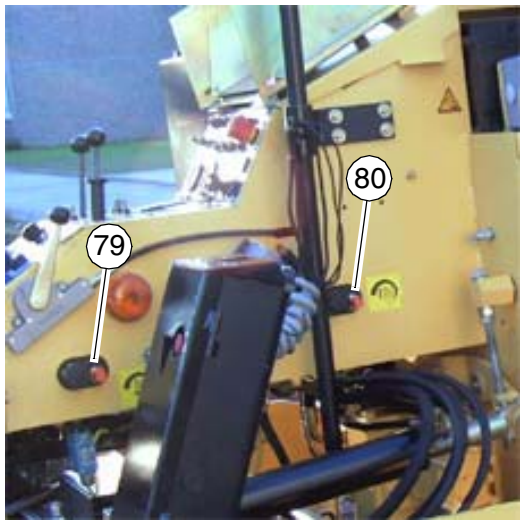
☞ Always keep the sensors perfectly clean.

This sensor control guarantees a consistent material flow in front of the screed.

Best try to set the sensor during mix material distribution.

Speed control, tamper (79)

Speed control, vibration (80)



Tamp_Vibr_DF45CS_2.jpg

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:

- Diesel fuel
- Engine oil and hydraulic oil, lubricants
- Separating agents (emulsion) and manual injector
- For optionally operated screed with gas heating system, a full propane gas bottle
- 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 values 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	Push in the button. The diesel engine and all running drives must stop immediately.
Safety switch for remote control (○)	Pull switch. The travel drive should stop immediately.
Steering - on operating panel - on remote control (○)	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, walk around finisher and inspect, 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. Warning lights should flash.
Gas heater system ○: - Bottle holders - Bottle valves - Pressure reducer - Hose break safety devices - Shut-off valves of dual branch piping - 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 raised, the fuses must be secured via the cylinder flaps and with a pin and spring cotter.
Hopper transport safeguard	When the hopper is closed, the fuses must fit over the cylinders on both halves of the hopper and be secured with a pin and spring cotter.
Miscellaneous: - Engine hood - Lateral flaps	Check that the hoods and flaps are securely seated.

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.

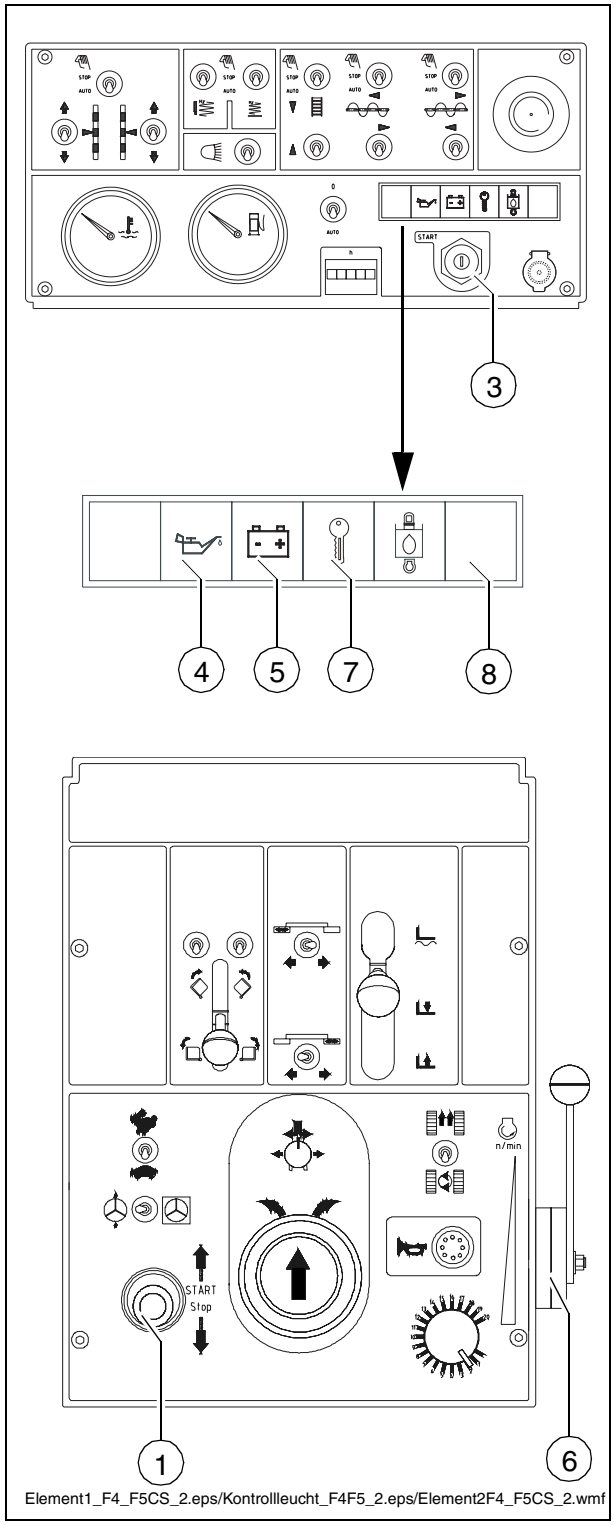
- Check the safety devices and protective devices.

Starting

☞ Precondition for starting the engine: Travelling lever (1) all switches and the steering knob (2) must be turned to zero. The start release control lamp (7) “START” must be extinguished.

How to start the engine:

- Turn ignition key (3) to “1” position. The charging current (5) lamp/engine oil pressure control lamp (4) must now be lit.
- Travelling lever (1) in zero position. Steering knob, switch for grid/spreader in zero position. Control lamp for start release (7) must be extinguished.
- Speed adjustment lever (6) in position (idling” **“min”**.
- Wait until pre-glow telltale (8) (○) goes out.
- Turn ignition key to “3” until the engine starts.



Element1_F4_F5CS_2.eps/Kontrollleucht_F4F5_2.eps/Element2F4_F5CS_2.wmf

⚠ Release starter switch as soon as the engine starts. Under no circumstances actuate starter with the engine running.

- With the engine running, keep speed adjustment lever/(6) in the “idling” “min” position until the control lamp/indicating the engine oil pressure (4) and the control lamp indicating the charging current (5) have extinguished.

☞ Switch off the engine immediately if the engine oil pressure control lamp does not extinguish with the engine running.

- Then, if necessary, turn the speed adjustment lever (6) to the “full load” **“max”** position.

⚠ If the engine oil pressure control lamp (4) does not extinguish after starting, immediately switch off the engine and check engine oil level.

☞ Do not keep the starter actuated without interruption for more than 10 sec.

Prior to starting another attempt, wait for approx. 60 sec. Turn start switch again to zero position, then start.

Should the engine not start, determine the reason of the malfunction on the basis of the operating instructions of the engine manufacturer.

After starting, please observe the following points:

Do not let the engine run with the battery disconnected. This can lead to damage to the three-phase electric generator.

☞ Stop the engine immediately, if

- capacity and speed drop without any changes having been made to speed and operating conditions
- heavy smoke formation
- excessive engine temperature
- abnormal engine noise

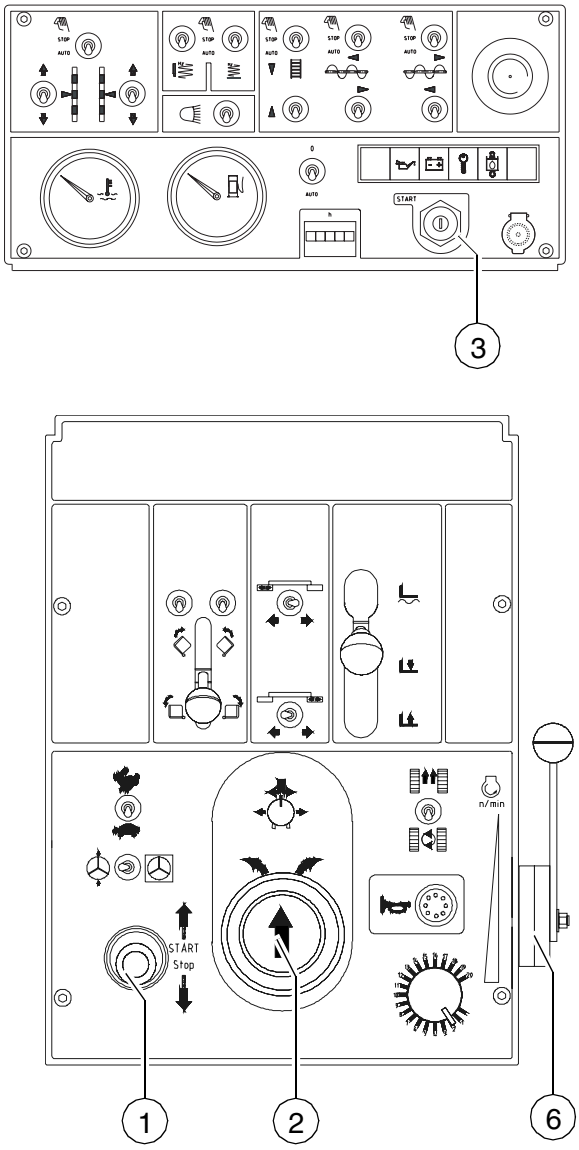
Stopping

☞ Never stop the engine abruptly from full load operation. Havethe engine briefly run idle before switching off. Do notaccelerate briefly before stopping the engine.

Stopping the engine

Proceed as follows:

- Turn travelling lever (1), steering knob (2) to zero position.
- Turn speed adjustment lever (6) from position “full load” “max” to position “idling” “min” and allow the engine to run for a brief period.
- Stop engine using the ignition key.
- Remove ignition key (3) from the ignition lock.



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Steering the finisher

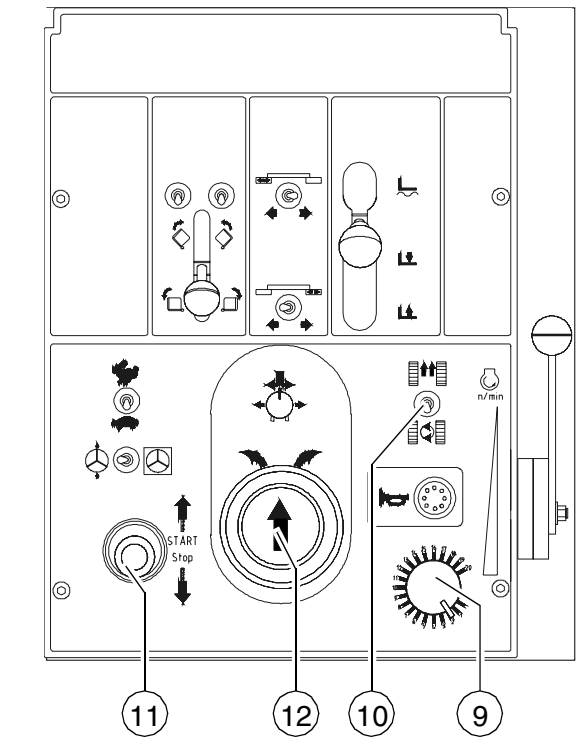
Using steering knob (12) and in conjunction with the travelling lever (11) you can execute all required steering movements.

Turning without forward movement

The direction of rotation can be selected with the toggle switch (10).

The speed preselection potentiometer (9) must not be set to ”0”.

If the steering knob and hand throttle are operated with the engine running, the finisher turns on the spot.



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Driving

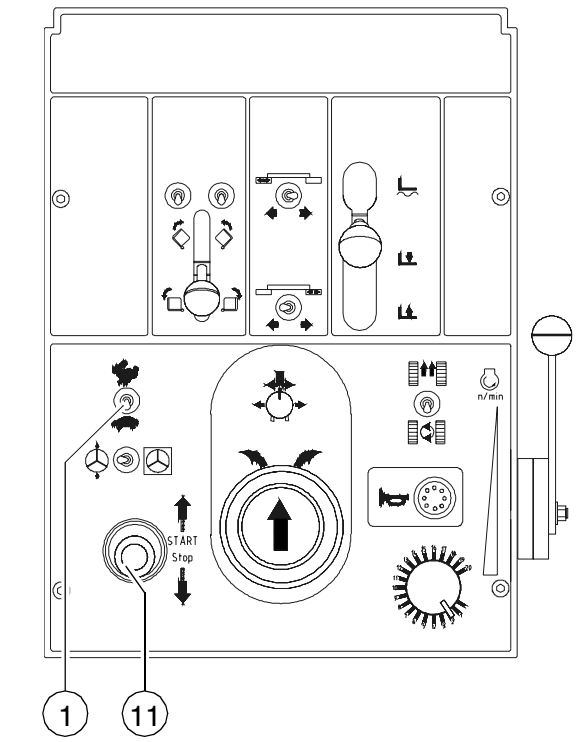
The driving direction is determined by the travelling lever (11) position.
Move forward = forward drive direction

Hand throttle beyond zero position, pull backward = backward drive direction

The driving speed changes as the travelling lever is swung out.

In order to regain the set speed, e.g. following a halt, set the stop (2) of the travelling lever to the selected position and secure with hand wheel (3).

During operation and drive let the engine run at full speed.



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Braking the finisher

With the diesel engine running, the finisher is braked with the travelling hydraulic group. The volumes delivered by the pump will also reduce, when the travelling lever (11) is swung back to the zero position. Deceleration is continued until the finisher comes to a standstill.

Driving speeds

- Lever (1) in fast speed position when moving within the construction site.
- Lever (1) in travelling speed position during laying.

☞ Different travelling speeds result in different pre-compression rates.

How to drive

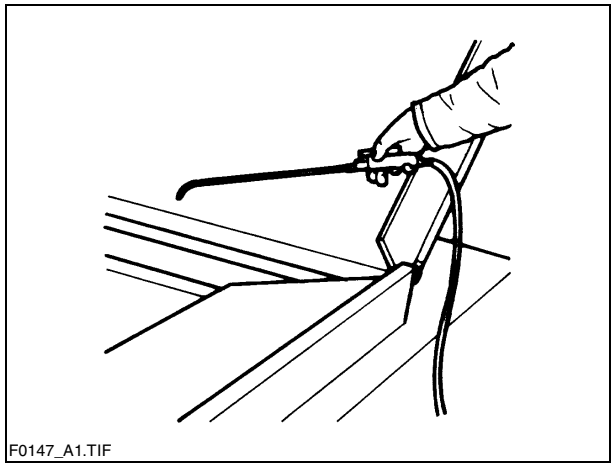
- During transport lift the screed into transport position.
- Turn the screed lever ‘raising/lowering’ to zero position. The floating position is thus disabled.
- Prior to driving on a bridge, make sure that the load carrying capacity of the bridge will be sufficient for the operating weight of the finisher.
- Observe the safety regulations in chapter 2.
  Observe ample clearances, otherwise let yourself be guided.
- When loading the finisher, one person must instruct the truck driver.
- Never turn the finisher on a surface just laid.

3.3 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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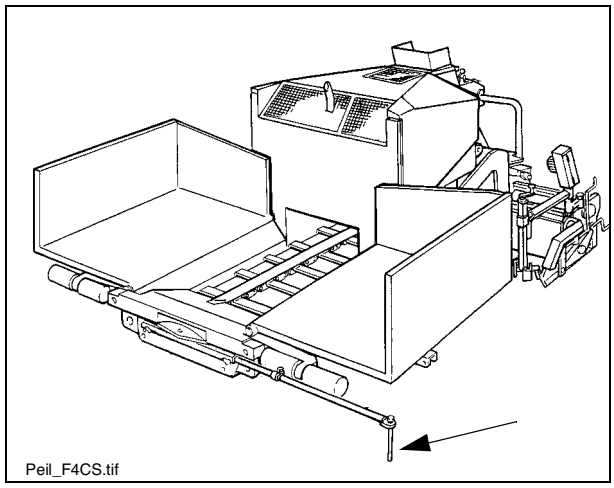
Screed heater

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).

- Pull the direction indicator out of the bumper (arrow) and adjust it accordingly.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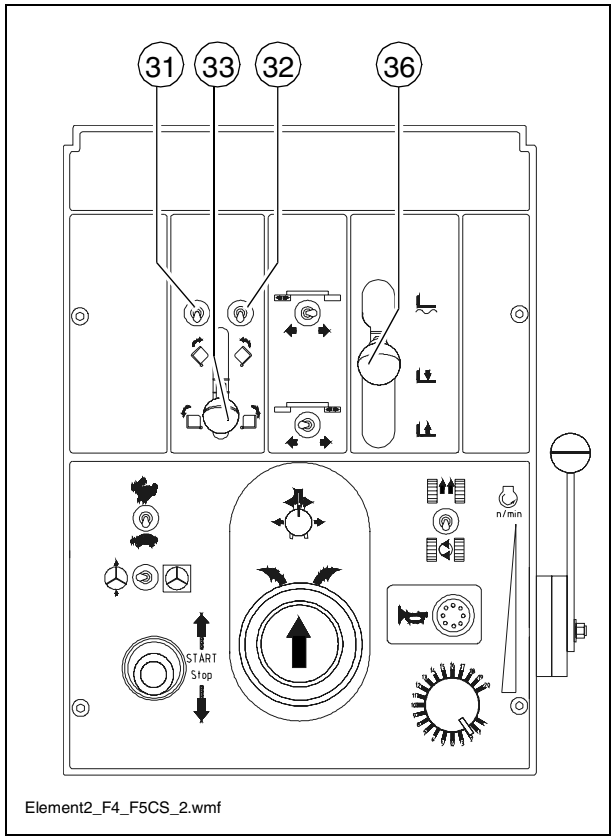
Prepare the finisher for operation



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- Start the engine.
- Unlock the screed.
- Operate the “lift screed” lever (36) and lift the screed.
- Move the screed to the required width.
- Operate the “lower screed” lever (36) and lower the screed onto the squared timbers. Their thickness should be as thick as the bituminous layer which you intend to lay.
- Unlock the material containers (mechanical locking at the material containers and using switches (31, 32).
- Actuate lever (33) and lower the side walls of the material container.

⚠ Make sure that nobody is within the danger zone.

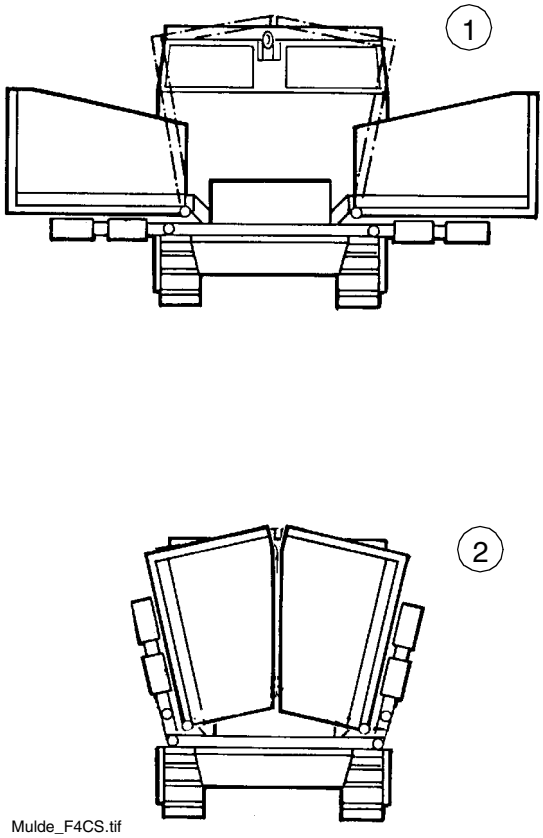
- Unload the accessories you carry with you.
- Engine stop.
- Set the ultrasonic sensors for grid and distributor worms.
- Mount the propane gas cylinder, do not forget to attach the cylinder securing element.
- Fit the side limitation plate on the LH and RH side (see screed operating instructions).

⚠ Do not stand close to the worms.

Loading the hopper

Loading by truck/lorry

- Approach lorry up to the push rollers, assist the driver.
- Make sure that no material will be spilt in front of the finisher.
- Assure that the lorry wheels can always turn freely during push-loading.
- Side covers open (1)
- Side covers closed (2)
- Close the covers when the grid is no longer covered by material.
- When the side covers are clear, the material hopper can be opened again and reloaded.
- Spray the hopper occasionally with release agent to prevent material from adhering to the hopper wall.
- If the finisher is loaded from above, fit the engine protection cover and the chute (special equipment).



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Function and operation of the material supply

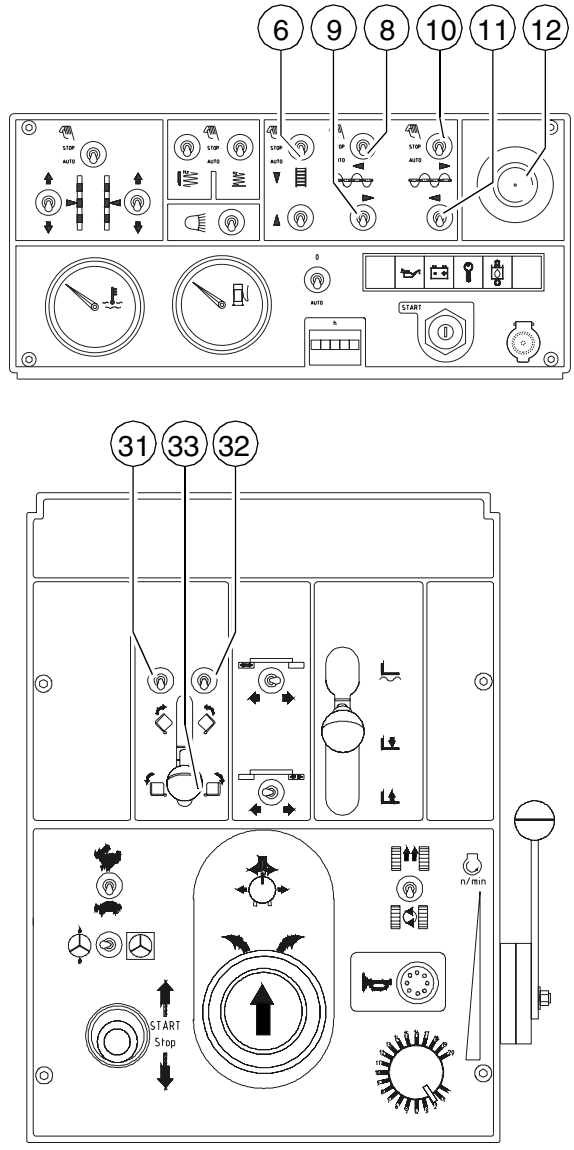
From the hopper the material is conveyed to the rear towards the worm spreaders by passing the grid.

- Conveyor belt (6) **Manual - OFF - Auto**
- LH distributor worm (8) **Manual - OFF - Auto**
- RH distributor worm (8) **Manual - OFF - Auto**
- LH distributor worm (9) reversal
- RH distributor worm (11) reversal
- Emergency stop switch for conveyor belts and worms (12).
- Hopper, left (31) ON/OFF
- Hopper, right (32) ON/OFF
- Lever (33), hopper lower/lift

The distributor screws can also be used for mixing operation. This means that you can control one worm in manual mode and the other in automatic mode.

☞ Adjust the paddle for the material feed of the grid so that no material can accumulate in the area of the grid.

⚠ Do not stand next to the worms.



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Start laying

Proceed as follows:

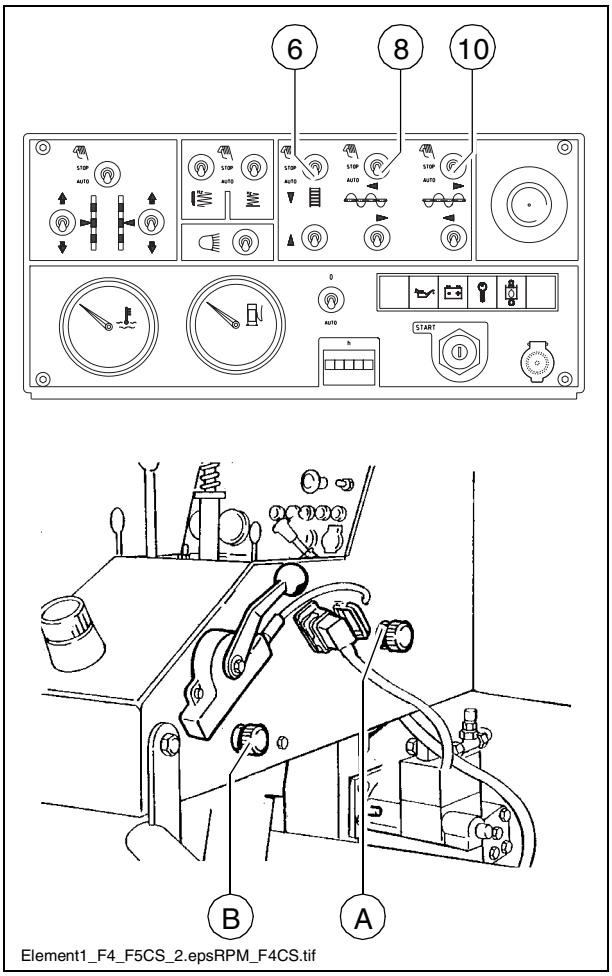
In manual mode **Manual**, preselected at the toggle switches (6) of the grid and the distributor worms (8), (10), the material is conveyed in front of the screed.

Then switch the toggle switch for the grid (6), the distributor/worms (8), (10), vibration (5) and the tamper (4) (O) to **Auto**.

Set speeds at (A) for the vibration at the unit holder in accordance with the material and the precompaction.
Set the tamper frequency (O) (B).

☞ Bring the engine to maximum speed, then push the driving lever upward until the laying conditions are matched to the travelling speed.

When you have to tow the finisher make sure that the speed of the towing vehicles is adapted to that of the finisher.



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3.4 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.

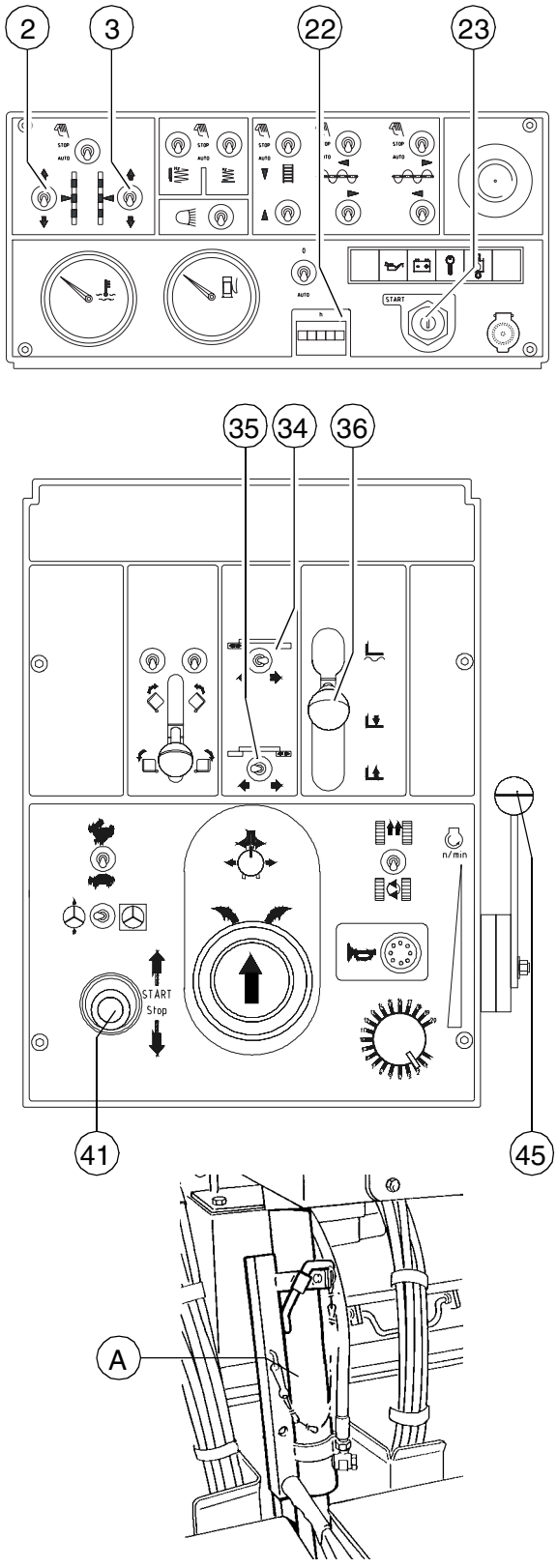
Quality of the layer

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

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

When work is finished

- Run the paver finisher empty and stop it.
- Raise the screed: move the lever (36) to the lowest position.
- Retract the screed to the basic width (34,35) and fully extend the levelling cylinder (2,3) if necessary.
- Insert the mechanic screed transport safeguard (A).
  - While operating the tampers at a low speed, let any material residues drop out.
- Set the drive lever (41) to the center position and the speed adjuster (45) to minimum.
- Switch off the ignition (23).
- 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.
- Read and check the operating hour meter (22) 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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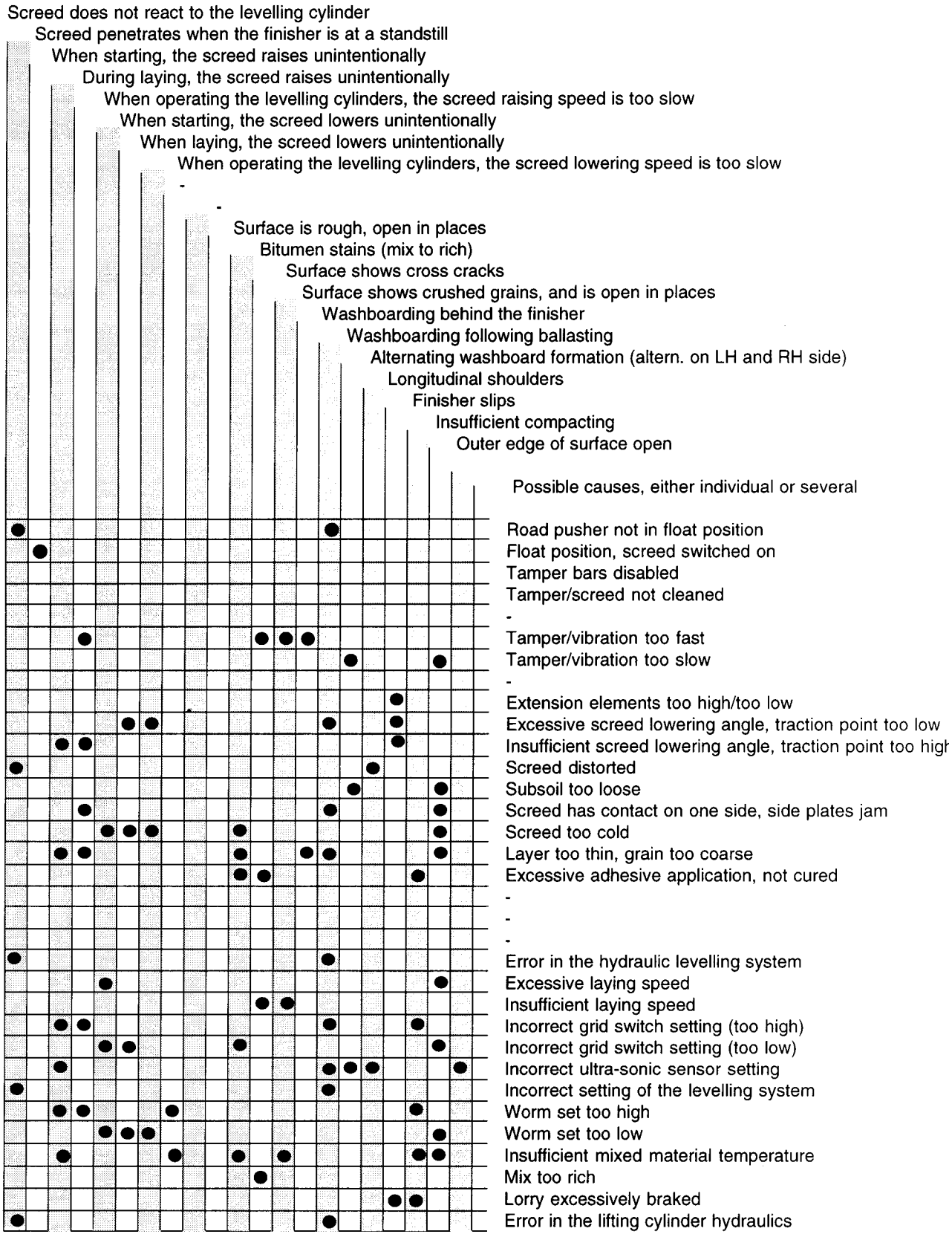

Screed does not react to the levelling cylinder
Screed penetrates when the finisher is at a standstill
When starting, the screed raises unintentionally
During laying, the screed raises unintentionally
When operating the levelling cylinders, the screed raising speed is too slow
When starting, the screed lowers unintentionally
When laying, the screed lowers unintentionally
When operating the levelling cylinders, the screed lowering speed is too slow
-
-
Surface is rough, open in places
Bitumen stains (mix to rich)
Surface shows cross cracks
Surface shows crushed grains, and is open in places
Washboarding behind the finisher
Washboarding following ballasting
Alternating washboard formation (altern. on LH and RH side)
Longitudinal shoulders
Finisher slips
Insufficient compacting
Outer edge of surface open
Possible causes, either individual or several
Road pusher not in float position
Float position, screed switched on
Tamper bars disabled
Tamper/screed not cleaned
-
Tamper/vibration too fast
Tamper/vibration too slow
-
Extension elements too high/too low
Excessive screed lowering angle, traction point too low
Insufficient screed lowering angle, traction point too high
Screed distorted
Subsoil too loose
Screed has contact on one side, side plates jam
Screed too cold
Layer too thin, grain too coarse
Excessive adhesive application, not cured
-
-
-
Error in the hydraulic levelling system
Excessive laying speed
Insufficient laying speed
Incorrect grid switch setting (too high)
Incorrect grid switch setting (too low)
Incorrect ultra-sonic sensor setting
Incorrect setting of the levelling system
Worm set too high
Worm set too low
Insufficient mixed material temperature
Mix too rich
Lorry excessively braked
Error in the lifting cylinder hydraulics

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!

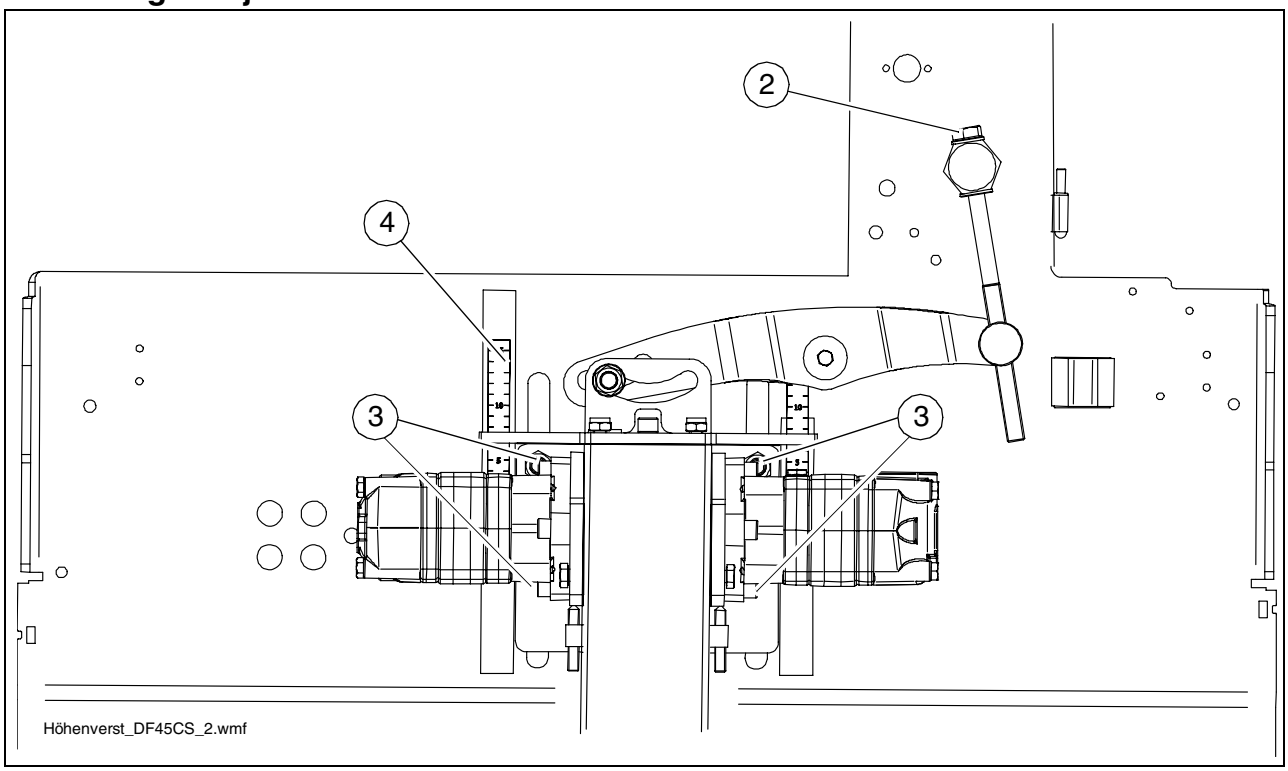
- To protect the paver finisher against inadvertent starting:
  Set the drive lever to the center position and set the preselector to zero; pull out the ignition key and the battery main switch.
- Secure lifted machine parts (e.g. screed or hopper) against lowering by means of mechanical supports.
- 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 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



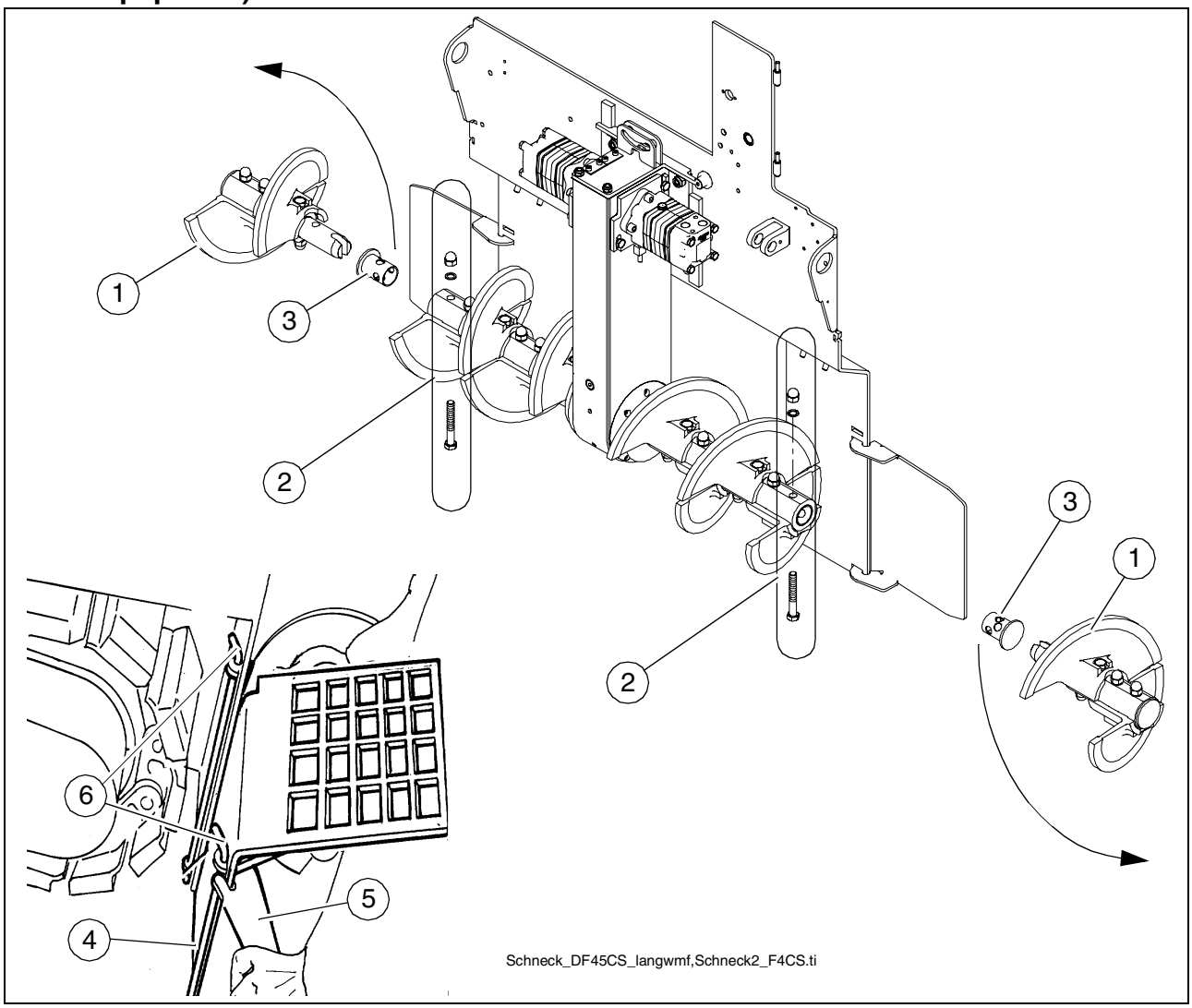
Depending on the material, the height of the auger (1) – measured from its lower edge – should be at least 50 mm (2 inches) above the height of the material layer.

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.
- Unfasten the 4 fastening bolts (3).
- Set the auger height by means of the adjusting spindle (2) according to the direction of adjustment.
- Check auger height on the scale and needle (4).
- Tighten the fastening bolts (3) to their correct torque.

2.2 Spreader worm enlargement and material shaft with protection cover (special equipment)



To fit auger extensions, an additional auger segment (1) is fitted to the auger shaft.

Installation

- Remove the outermost bolt connection (2) on the basic auger.
- Remove the plugs (3).
- Fit the auger extension (1).
- Fit the bolt connection (2).

Mount the attendant material shaft with each worm extension.

Material shaft, protection cover

Suspend the material shaft (4) and (5) from the holder provided at the base unit and secure with rod (6).

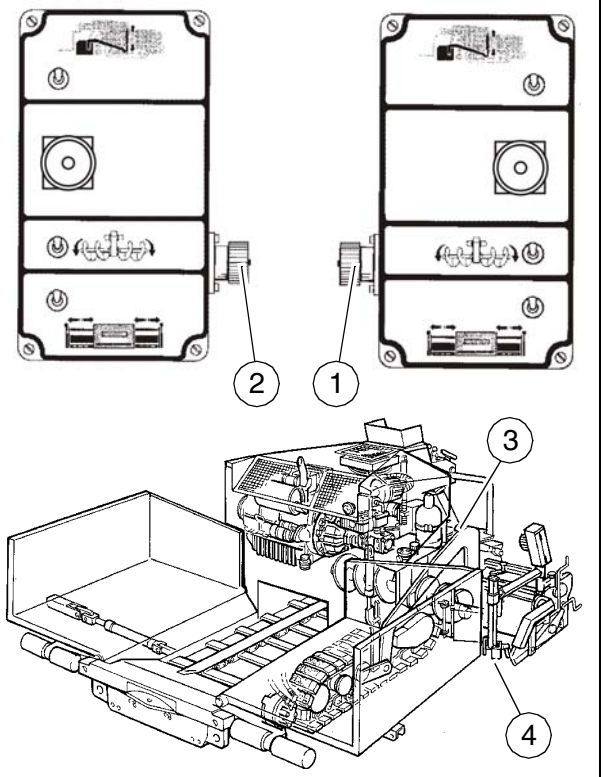
- Remove original shaft (5)
- Fit extension shaft (4)
- Fit original shaft (4) to extension shaft (5).

⚠ When working at the equipment, ensure that the engine is switched off and the unit secured.

3 Connection of the automatic levelling system

The finisher is equipped with two regulating circuits for the automatic levelling system, i.e. one for the right-hand and one for the left-hand side.

Make sure that the wiring is made correctly!



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Use of the slope controller

Connect the spiral cable of the automatic system to the outlets as follows:

- for the right-hand finisher side
- for the left-hand finisher side

Use of the grade controller

Connect the spiral cable of the automatic system to the outlets as follows:

- for the right-hand finisher side
- for the left-hand finisher side

If cables are changed over, the automatic leveller operates in/the opposite direction.

- Slope controller holder
- Grade controller holder on the RH and LH side each

4 Working with the remote control (O)

☞ If the finisher is to be operated via the remote control, the following points should be observed:

- Swivel the remote control into the required position and secure with locking device (A).
- Insert the connector of the dummy coupling (B) into the remote control (C).
- Move the switch (40) to the 'Remote control' position (right).
- Attach the safety switch to the operator with the belt (55).
- Set speed to working speed (30).

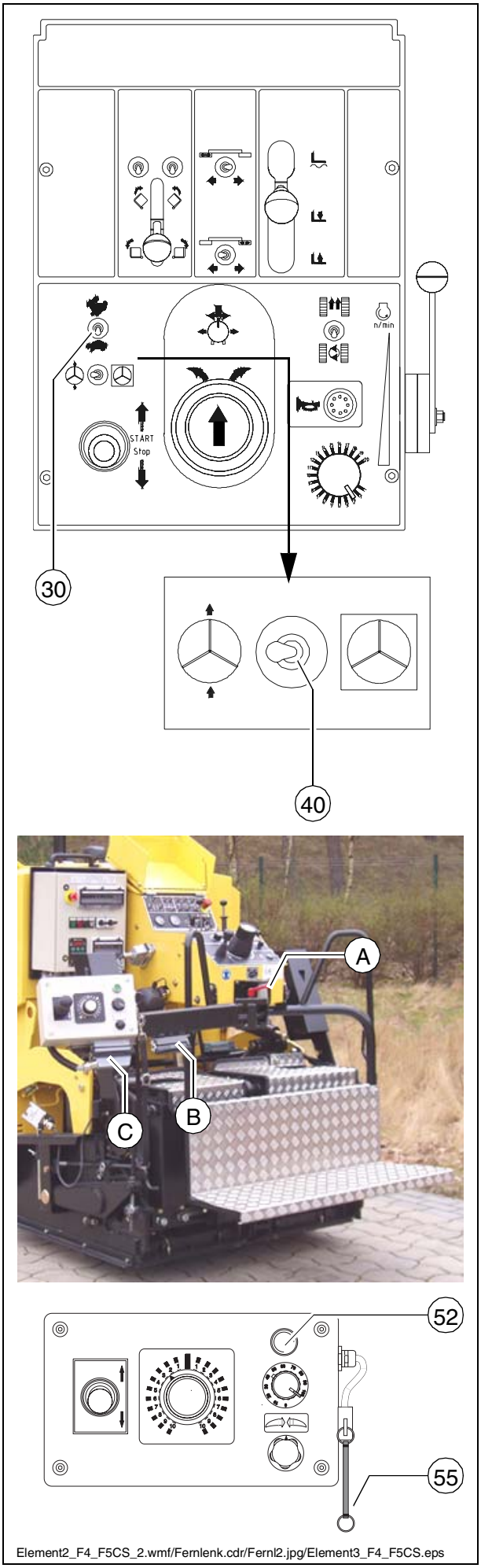
☞ In transportation mode, the travel drive is locked automatically.

STOP For safety reasons it is forbidden to work with the remote control if the safety shut-off belt is not attached to the operator.

☞ After a safety shut-off has taken place, approval must be re-issued with push-button (52).

Switching to normal control

- Swivel the arm of the remote control into the park position and secure with locking device (A).
- Insert the connector of the remote control (C) into the dummy coupling (B).
- Move the switch (40) to the 'Normal control' position (left).



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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!

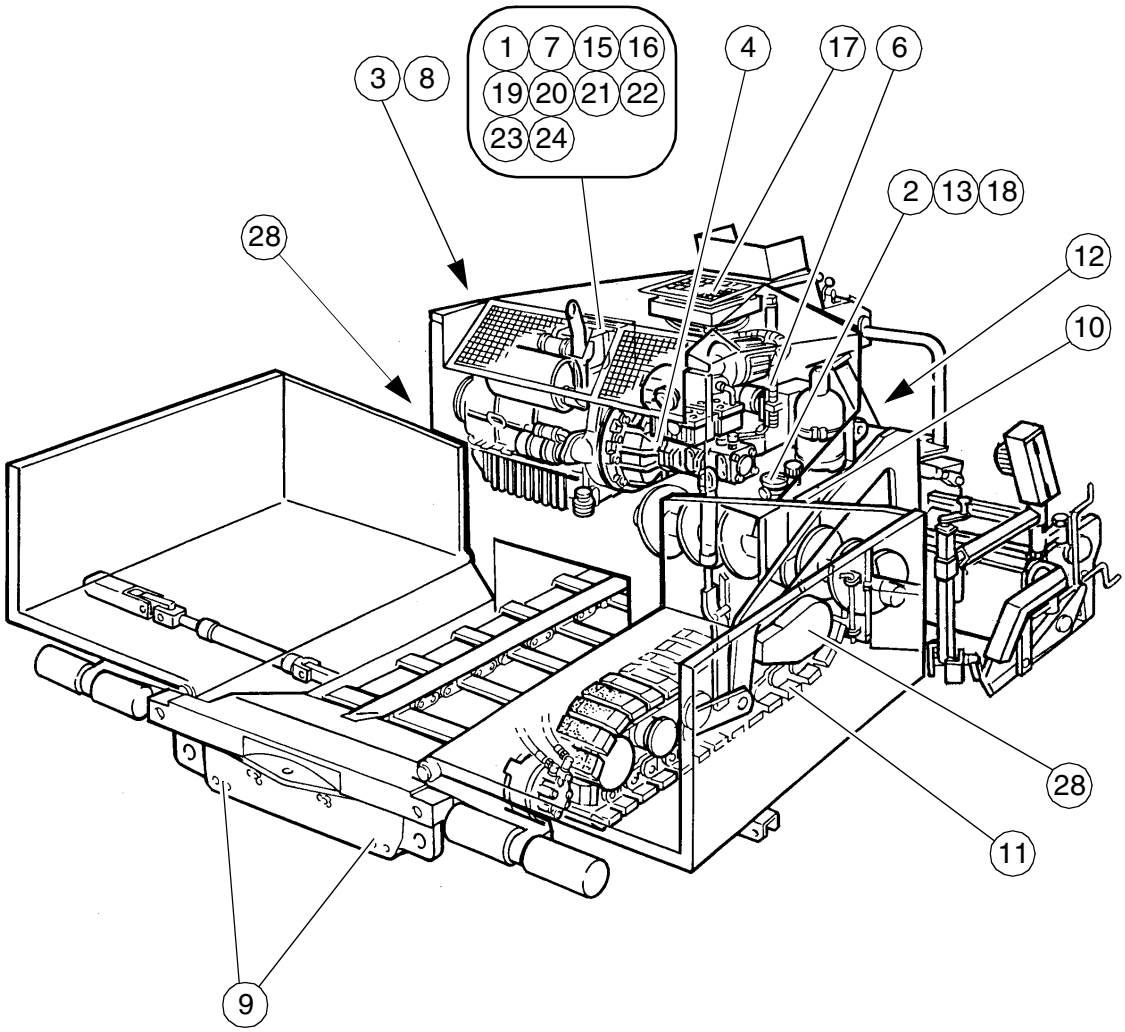
Re-commissioning: Mount all protective devices before re-commissioning the paver finisher.

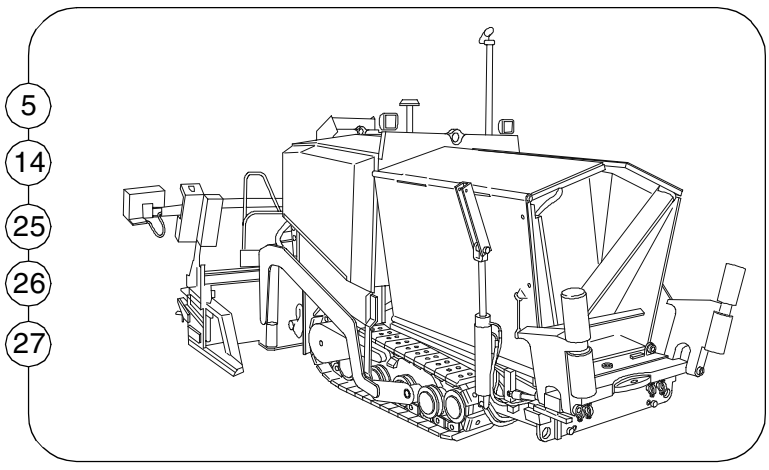
Cleaning: Cleaning must not be carried out while the engine is running.
Do not use any inflammable substances (such as petrol).
Avoid directly cleaning electrical parts and insulation material with a steam jet; cover them up beforehand.

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.

2 Maintenance intervals





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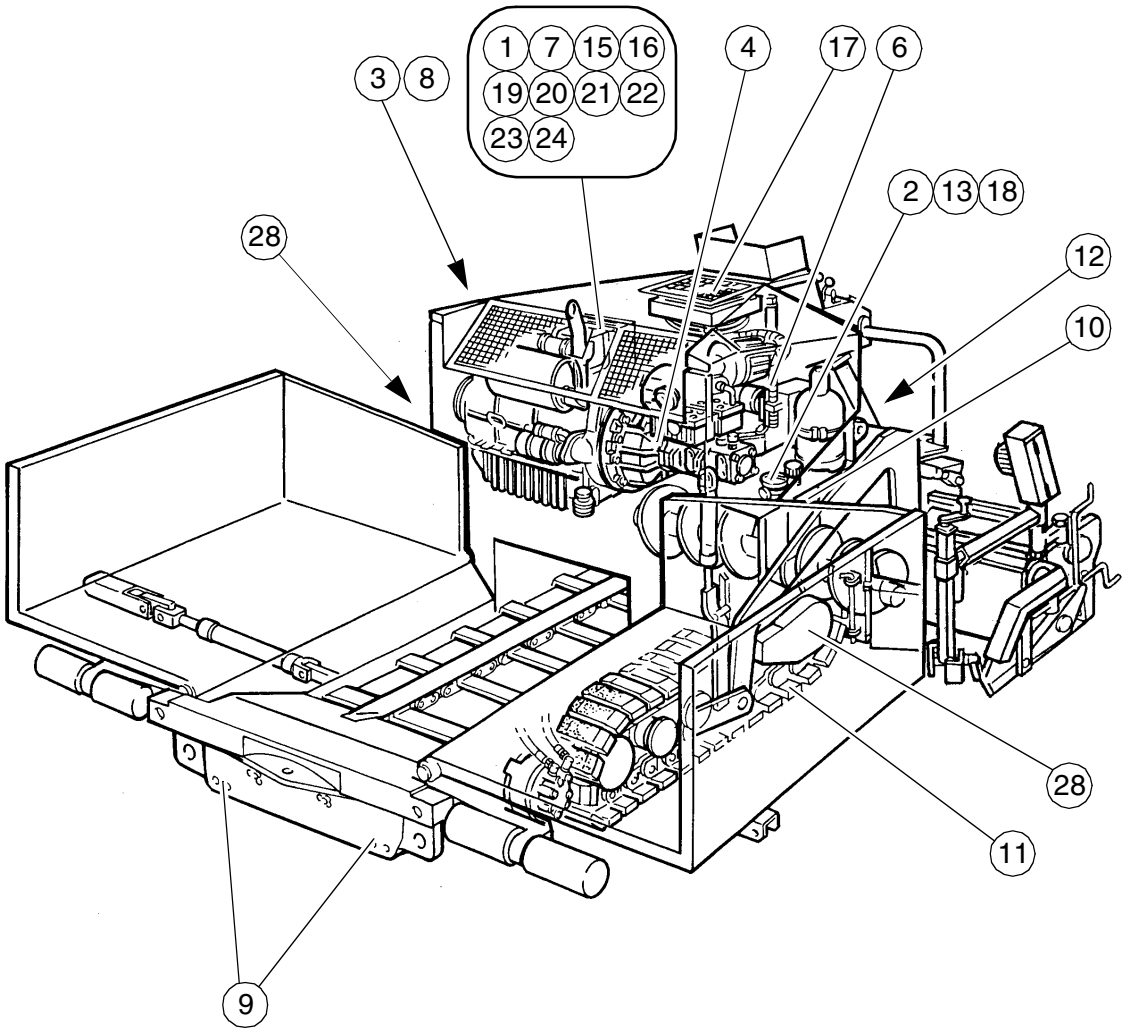
2.1 Daily (or every 10 operating hours)

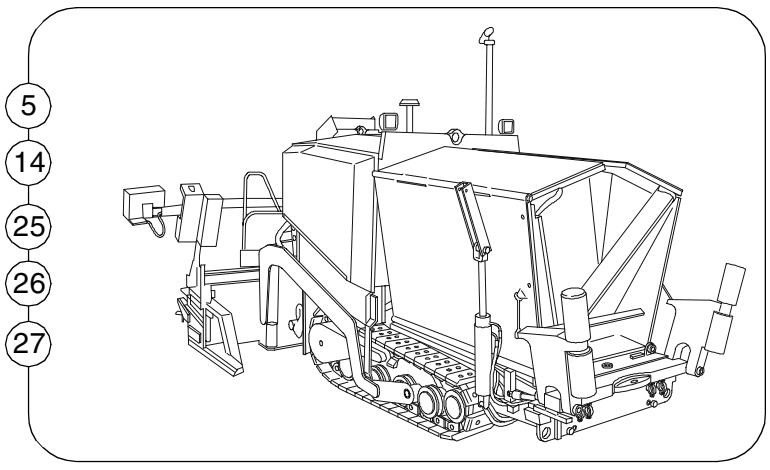
Item	Maintenance point	Number	Lubrication	Check	Oil change	Filling volumes	Substance
1	Diesel engine - oil level	1		x		Engine oil	see ”Filling volumes”
2	Hydraulic oil reservoir - filling level	1		x		Hydraulic oil	see ”Filling volumes”
3	Fuel tank - filling level	1		x		Fuel tank	see ”Filling volumes”
4	Pump distribution gear	1		x		Gear oil 90	see ”Filling volumes”
5	General security check						
6	High pressure hydraulic filter	3		x			

⚠ 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!

2.2 Every 100 operating hours

Item	Maintenance point	Number	Lubrication	Check	Oil change	Filling volumes	Substance
8	Cooler Engine (1) and hydraulics	1		x			
9	Grid chain	1		x			
10	Drive chains of conveyor worms	2		x			
11	Track group chains	2		x			





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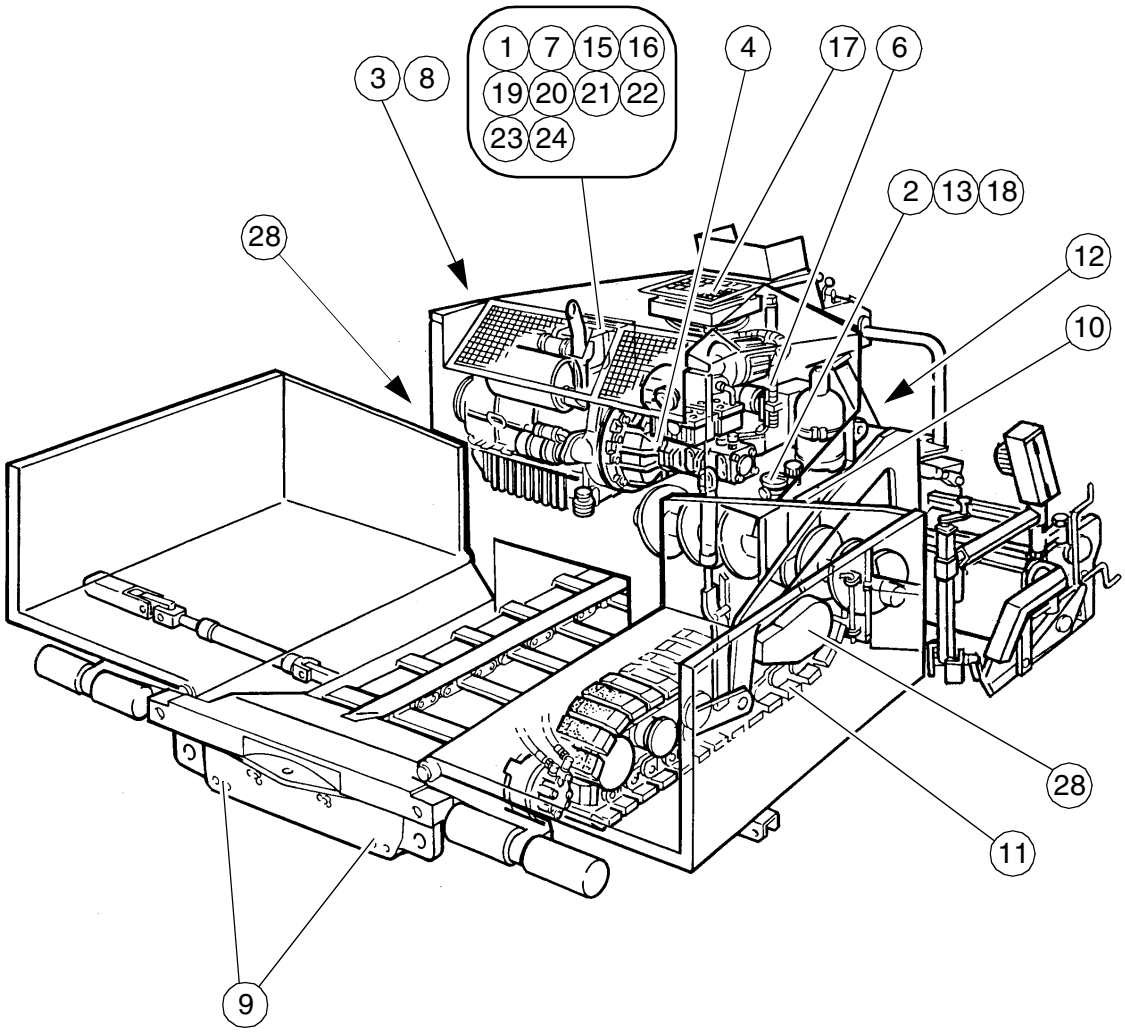
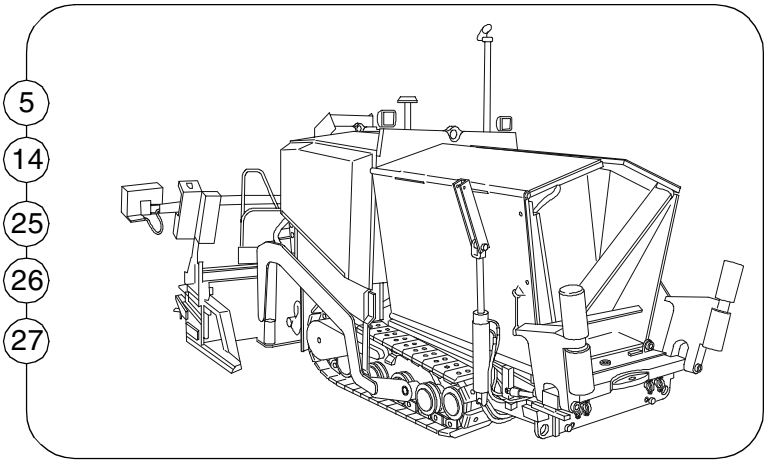
2.3 Every 500 operating hours

Item	Maintenance point	Number	Replace	Check/Clean	Oil change	Filling volumes	Substance
13	Hydraulic tank - vent filter	1		x			
14	Screws and nuts			x			
15	Lubrication oil	1			x		
16	lubricating oil cartridge	1	x				
17	Batteries: - Acid level - Terminals and cables	2		x		Distilled water	





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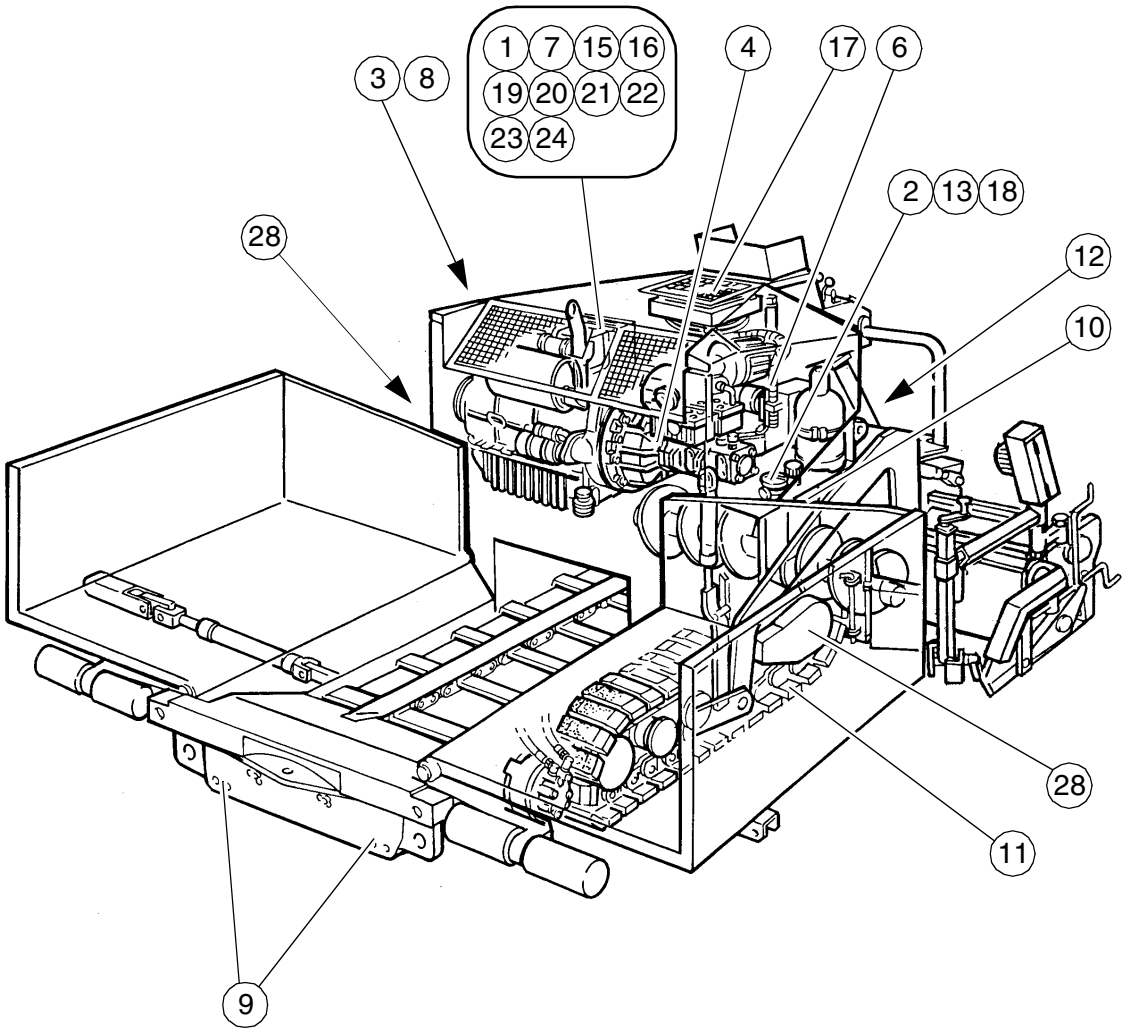
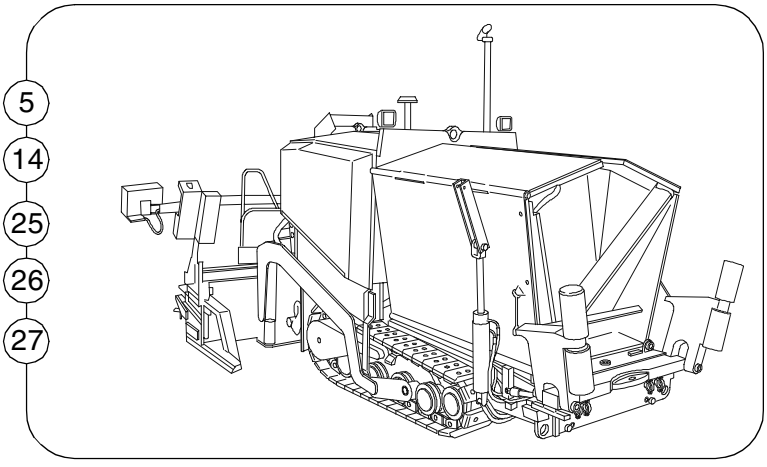
2.4 Yearly (or every 1000 operating hours)

Item	Maintenance point	Number	Lubrication	Check	Oil change/Replace	Filling volumes	Substance
6	High pressure hydraulic filter	4			x		
18	Hydraulic system - Central filter				x		
19	Fuel filter				x		
20	Air filter			x			
21	Upstream fuel filter			x			
22	Valve clearance			x			
23	Fan			x			
24	Engine mounting			x			
25	Hoses and hose connections			x			
26	Hydraulic cylinder		x				
27	Check screw connections, particularly on driven wheels, mounting points and hydraulic system and tighten if necessary. Hydraulic screw connections only if leaky.						





F4_F5CS.wmf/F4_F5_xray.tif

2.5 Every 1500 operating hours

Item	Maintenance point	Number	Replace	Clean	Oil change	Filling volumes	Substance
4	Pump distributor gear				x		
28	Conveyor drive transmis-sion				x		

2.6 Every 2 years (or every 2000 operating hours)

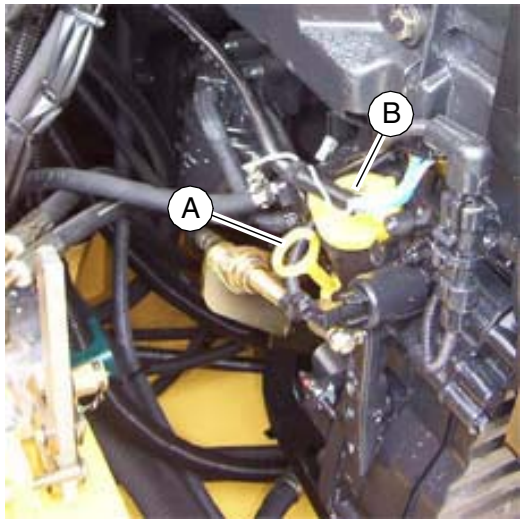
Item	Maintenance point	Number	Replace	Clean	Oil change/Replace	Filling volumes	Substance
3	Fuel tank and system			x			
20	Air filter				x		

Diesel engine - oil level (1)

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.

Refill oil via the filler opening (B) as required.



Öl_F4CS.jpg

Hydraulic tank (2)

Check oil level

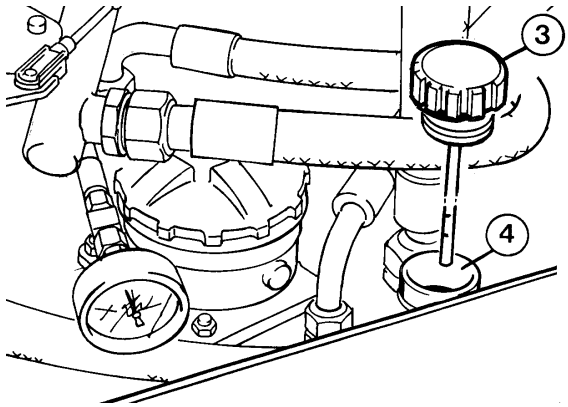
The hydraulic tank is arranged on the LH machine side.

Use the dipstick at the infill socket.

The finisher must stand horizontal, all hydraulic cylinders must have moved in.

Pull the dipstick.

The dipstick (3) should be covered with oil up to its uppermost mark.



Hydöl_F4CS.tif

Top up oil at the infill sockets (4) if the level is insufficient, until the upper oil level mark is reached.

☞ Fill the pumps with hydraulic oil following repair work at the hydraulic group or at the hydraulic pumps.

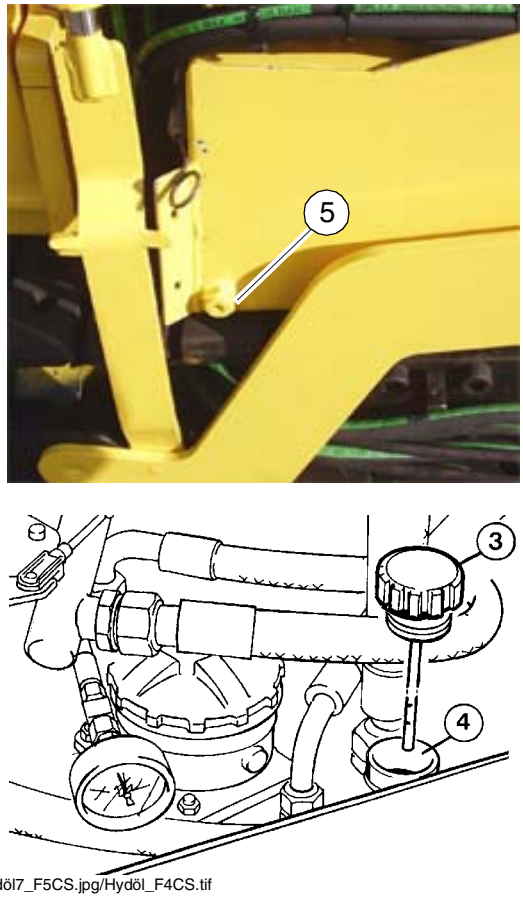
Change oil

Observe instructions on ester based hydraulic fluids.

When changing oil, proceed as follows:

- Move in the pistol rods of the hydraulic cylinders.
- Place a suitable collection container underneath.
- Loosen the drain screw (5) and drain the oil when still at operating temperature.
- Retighten the drain screw (5).
- Fill the hydraulic tank with fresh hydraulic oil up to the top dipstick (3) mark.
- Vent hydraulic oil cooler with the engine running, top up oil, if necessary.

☞ When changing the hydraulic oil, always replace the central filter and the 4 high-pressure filters on tamper, auger - conveyor, vibration unit and hydraulic lifting unit.



Hydöl7_F5CS.jpg/Hydöl_F4CS.tif

Fuel tank (3)

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.

Drain water and remove sediment from the tank.

To this effect undo the drain screw (A) and drain approx. 1 l fuel.

☞ Collect fuel and dispose of in accordance with the regulations.

Tank_F5CS_2.jpg/Ablass_F5CS.jpg

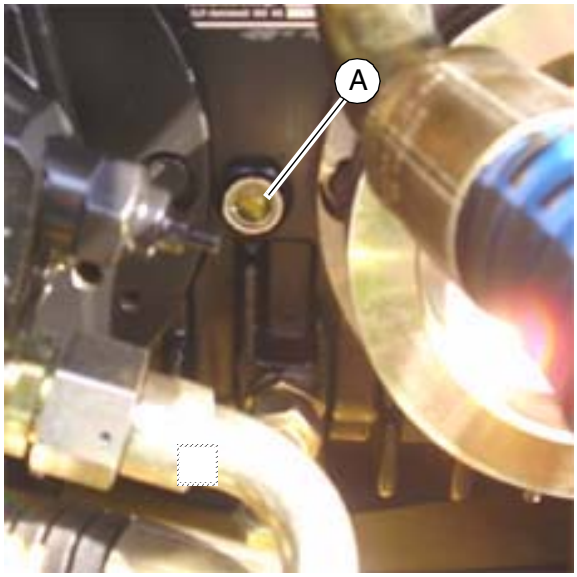
Pump distributor gear (4)

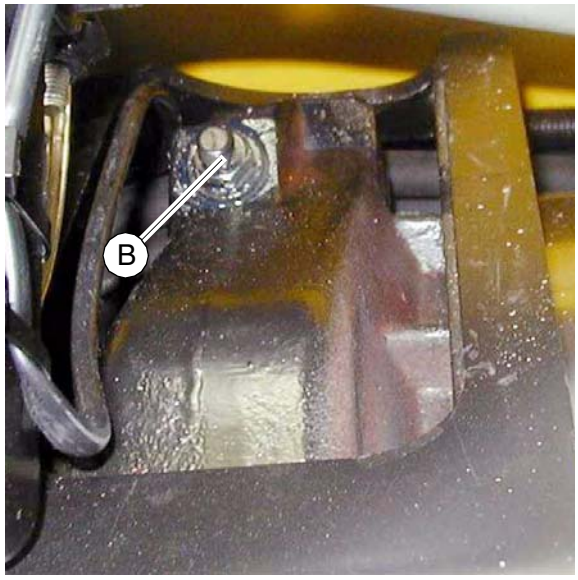
Checking the oil level

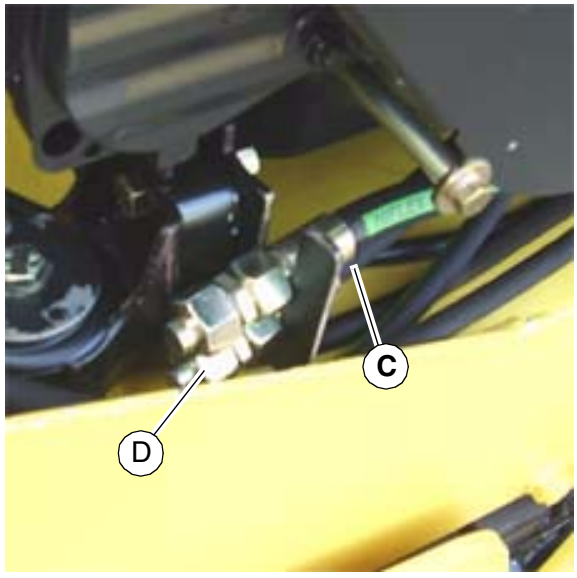
- The oil level must reach the midpoint on the gear housing sight glass (A).
- If necessary, remove the screw plug (B) and top up with oil.
- Then tighten the screw plug (B) back in properly.

Oil change

- Place drain hose (C) in collection container.
- Open the protective cap (D) and drain oil at operating temperature.
- Clean pump distributor gear with flushing oil.
- Tighten down protective cap (C) and top up with oil to midpoint of sight glass (A).







PVG_F4CS.tif/PVG3_F5FS.jpg/Ablass_F5CS.jpg

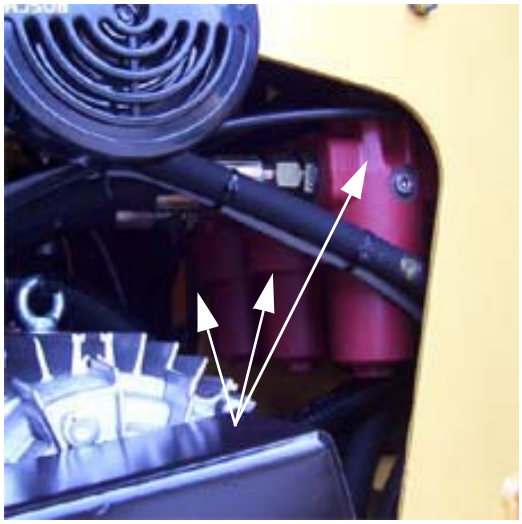
General visual checks (5)

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!

High pressure hydraulic filter (6)



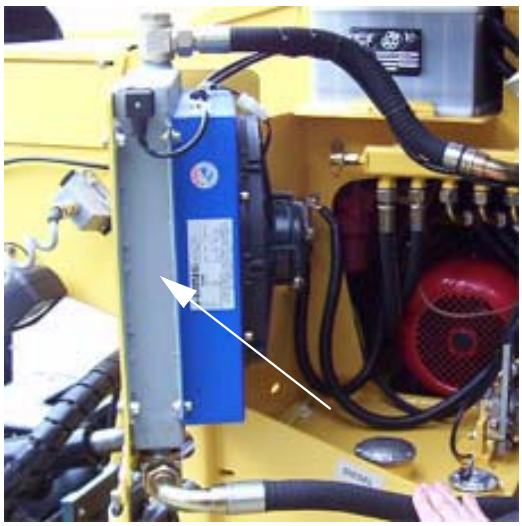
HDHF_F4CS.jpg

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 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 will then be automatically reset.

Cooler for engine and hydraulic group (8)



Kühl_F4CS.jpg

The engine is air cooled.

Perform maintenance in accordance with the engine manual and the operating instructions.

As standard, the finisher is equipped with a hydraulic oil cooler. This cooler is of a decisive significance for the operating safety of the entire hydraulic group.

Soiled oil coolers entail:

- Inadmissibly high oil temperatures
- faster oil ageing
- oil thinning
- loss of lubricating properties and thus high wear on seals, O-ring, pumps and engine leakages

Check for hydraulic cooler soiling at regular intervals.
Clean the engine cooling system.

Engine must have cooled down.

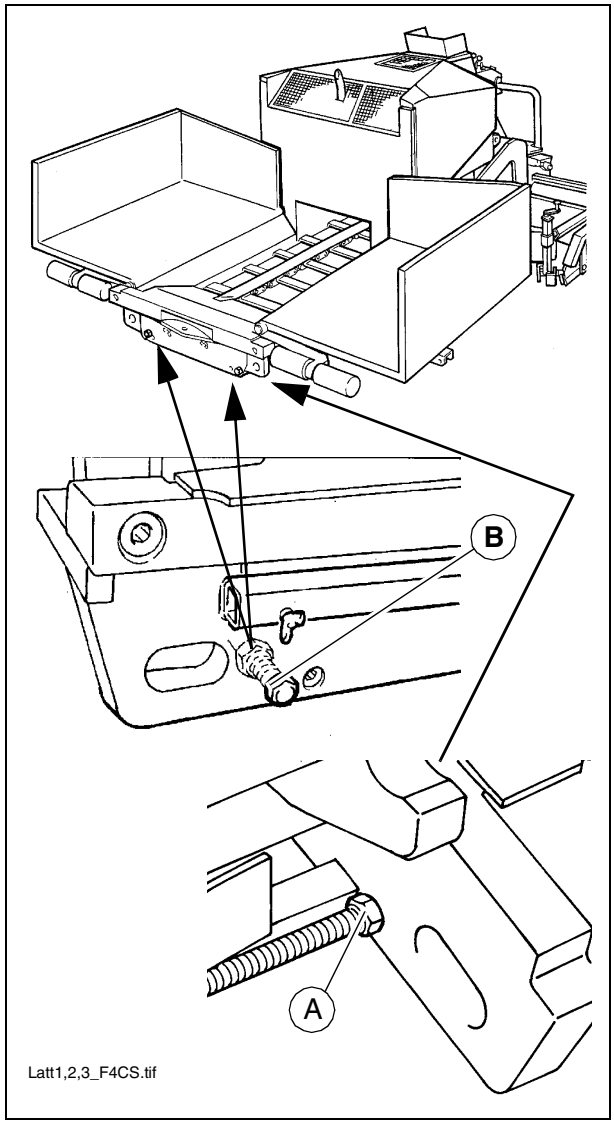
Grid chain (9)

When the grid chain is correctly tensioned, its ‘sag’ amounts to approx. 5 to 10 mm.

If necessary, retension chain

To this effect, undo the lock nuts (A) and adjust the correct chain tension using ball screws (B).

Retighten lock nut (A).



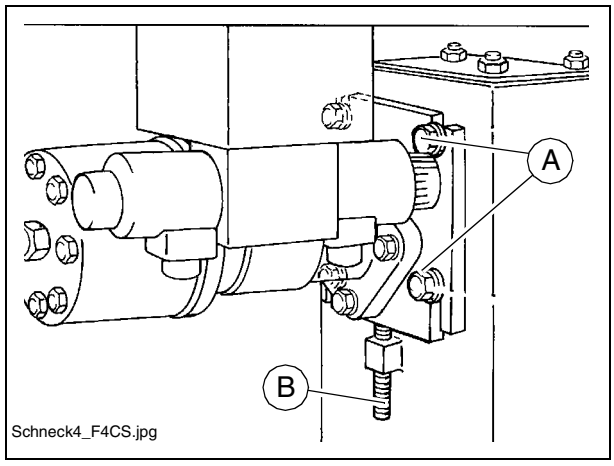
Latt1,2,3_F4CS.tif

Drive chains of the conveyor worms (10)

STOP For safety reasons switch off the engine prior to starting this work.

Check tension

Turn both worms manually from right to left. This play of movement should be 3 to 4 mm, measured on the worm circumference.



Schneck4_F4CS.jpg

Retention chains

Proceed as follows:

- Loosen fixing screws (A).
- Correctly set the chain tension using screws (B).
- Retighten fixing screws.

Track group chains (11)

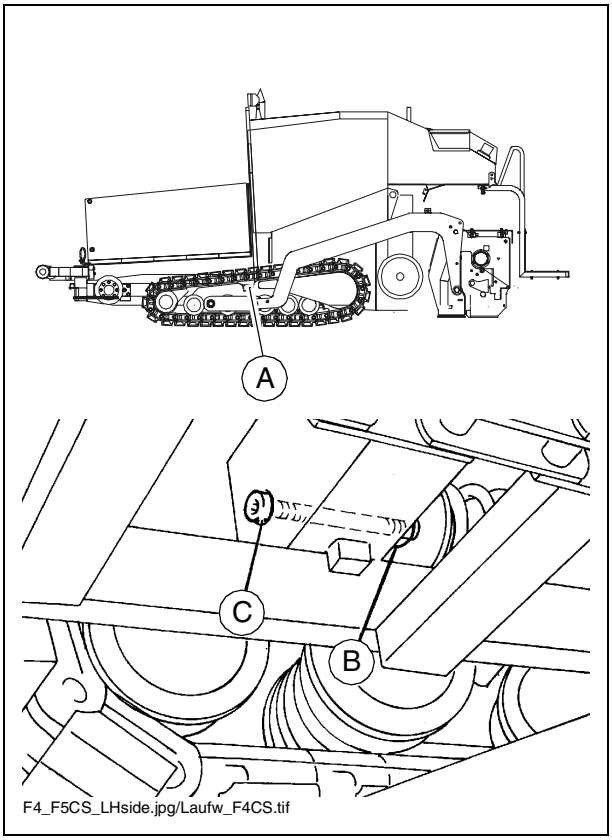
Check tension

Move finisher forward in order to relieve the track group chain.

☞ The sag of the track group chain should be approx. 10 mm at “A”.

Tension track group chains

Move the finisher on to a maintenance pit, loosen lock nut (B) and set the required chain tension using spindle (C). The cain sag should be approx. 10 mm at “A”.



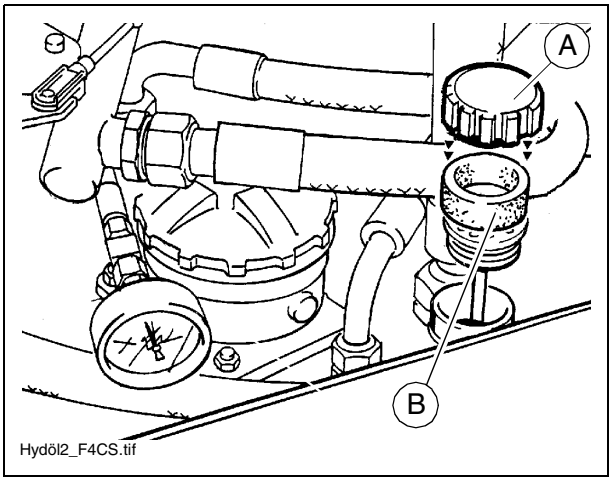
Hydraulic tank, Clean vent filter (13)

Proceed as follows:

Remove vent filter (A)

Take out complete filter element (B) and clean.

Reassemble in the reverse order.



Nuts and bolts (14)

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

Oil change (15)

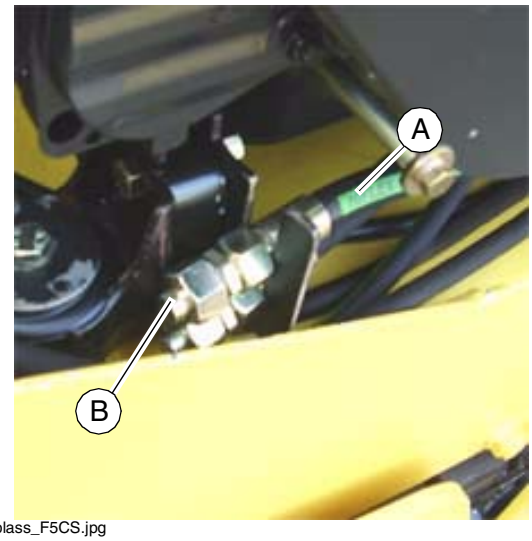
Place engine oil drain hose (A) into the collection vessel.

Undo screw plug (B), drain oil when at operating temperature.

Exchange lubricating oil cartridge (see engine manual)

Retighten screw plug (B).

Top up engine oil featuring the specified quality, viscosity and quantity.



Ablass_F5CS.jpg

Start engine and let engine run idle.

Observe the oil pressure gauge and check if properly sealed during the trial run after having fitted the oil filter.

Switch off engine. Check oil level once again and top up, if necessary

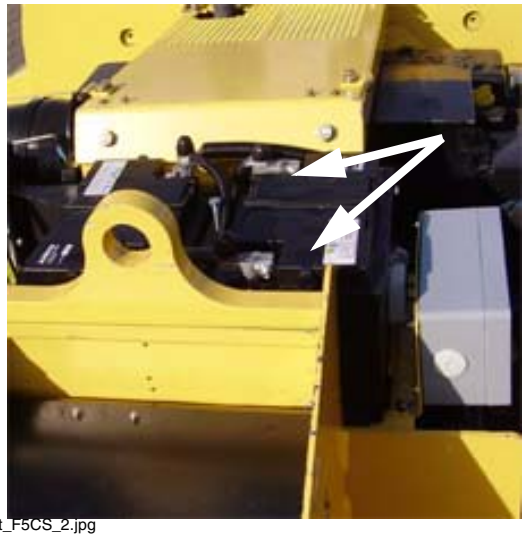
lubricating oil cartridge (16)

☞ see engine's operating instructions


Öl3_F4CS.jpg

Batteries (17)

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.



Batt_F5CS_2.jpg

Hydraulic group (18) Central filter

Change central filter in the tank. This becomes necessary, independent of the time interval, whenever the pressure gauge (A) indicates that maintenance is due.

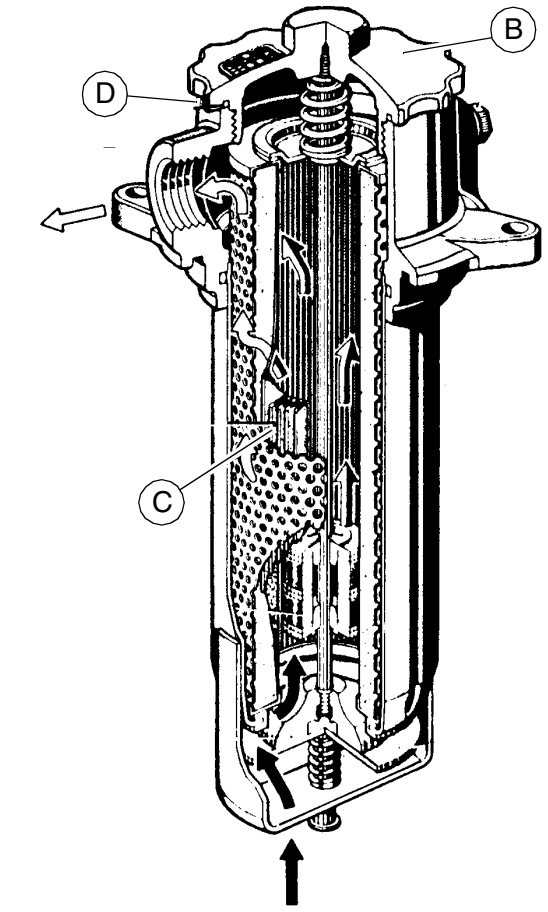
Proceed as follows:

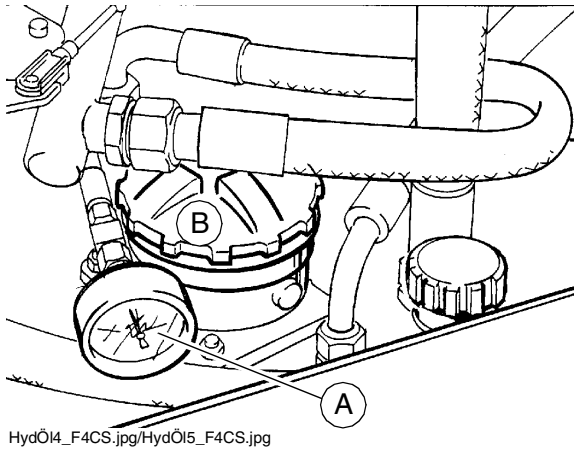
Undo and remove lid (B).

Remove and replace filter (C).

Renew seal (D).

Reassemble in the reverse order.





HydÖl4_F4CS.jpg/HydÖl5_F4CS.jpg

Fuel filter (19)

☞ see engine's operating instructions

Öl3_F4CS.jpg

Air filter (20)

☞ see engine's operating instructions

Lufi_F4CS.jpg

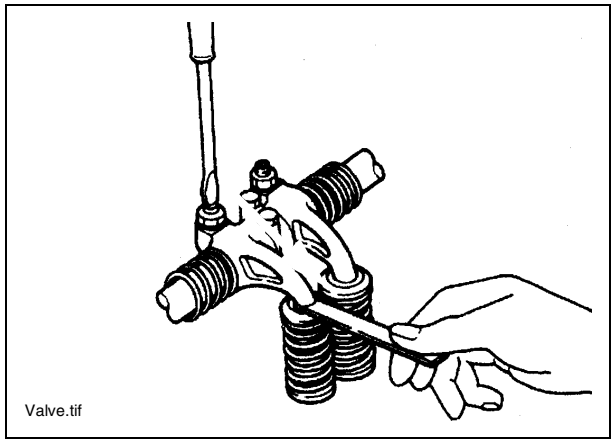
Upstream fuel filter (21)

☞ see engine's operating instructions

Fuel1_F5CS_2.jpg

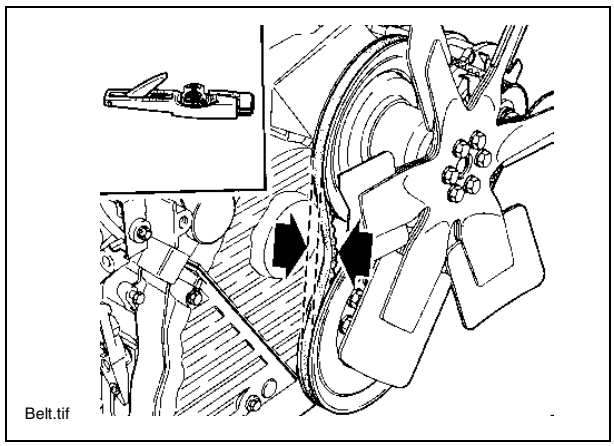
Valve clearance (22)

☞ see engine's operating instructions



Fan (23)

☞ see engine's operating instructions



Engine mounting (24)

☞ see engine's operating instructions

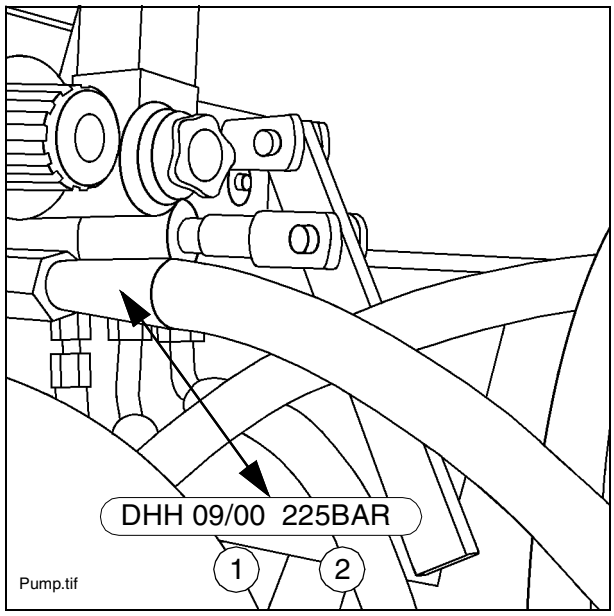
Hoses and hose connections (25)

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

⚠ Replace any damaged hoses immediately.

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

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

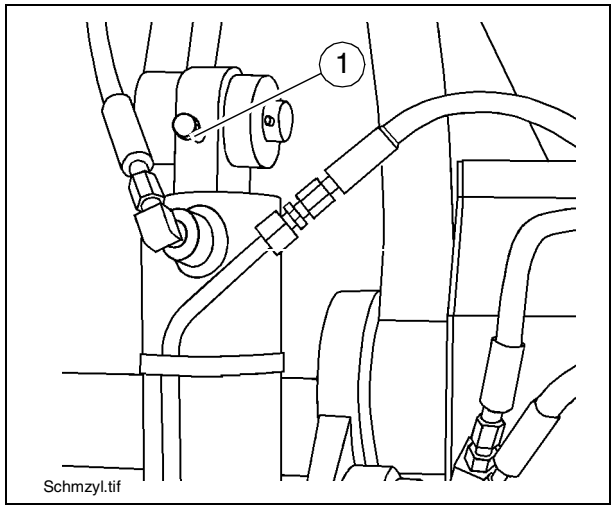


☞ Never fit overlapped hoses and note the permissible pressure level.

Hydraulic cylinder (26)

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

☞ Apply 3 strokes of grease from a grease gun.



Nuts and bolts (27)

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

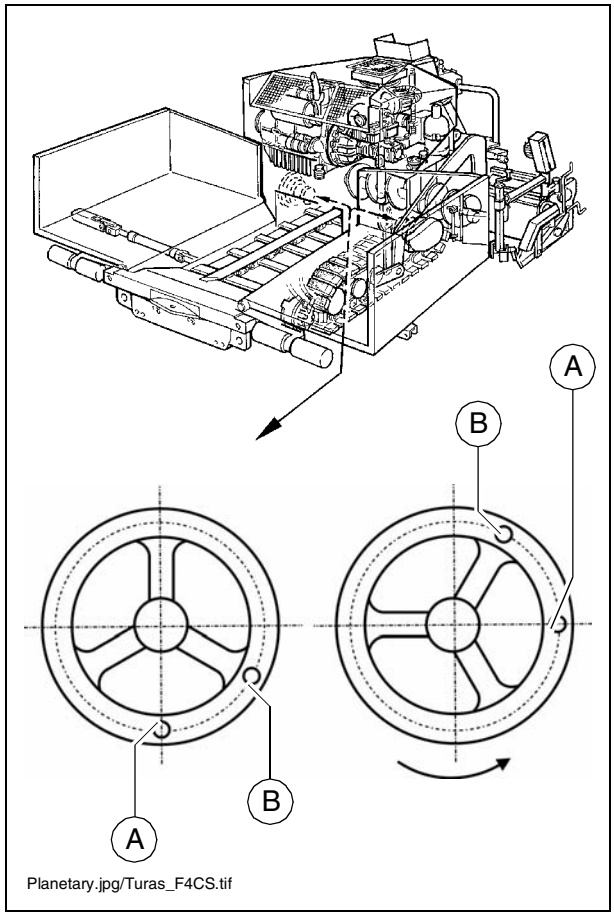
Tightening torques

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

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

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

Turas (28)



Planetary.jpg/Turas_F4CS.tif

Oil change

Place the paver on a maintenance pit.

Turn the Turas in a way that the drainage screw (A) is in lower position.

Remove the drainage screw an the ventilating screw and let the oil drain off.

Clean the Turas with scavenging oil.

Check and, if necessary, replace the seals of the drain

screw and the ventilating screw

To fill in new oil turn the gear 90° CCW by moving the paver.

To pup oil level up to the infill hole (A) and screw in drainage (infill) screw (A) and ventilating screw (B).

For oil check the gear must be in the same position.

The level of oil should reach the infill (drainage) screw.

Oil level check

Turn Turas such that an oil level hole is in horizontal position.

Undo the infill screw (A).

The oil level must reach the oil level hole.

If necessary, top up oil.

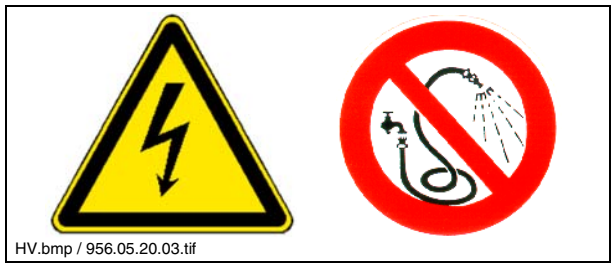
Turn in infill screw.

4 Maintenance - optional equipment (○)

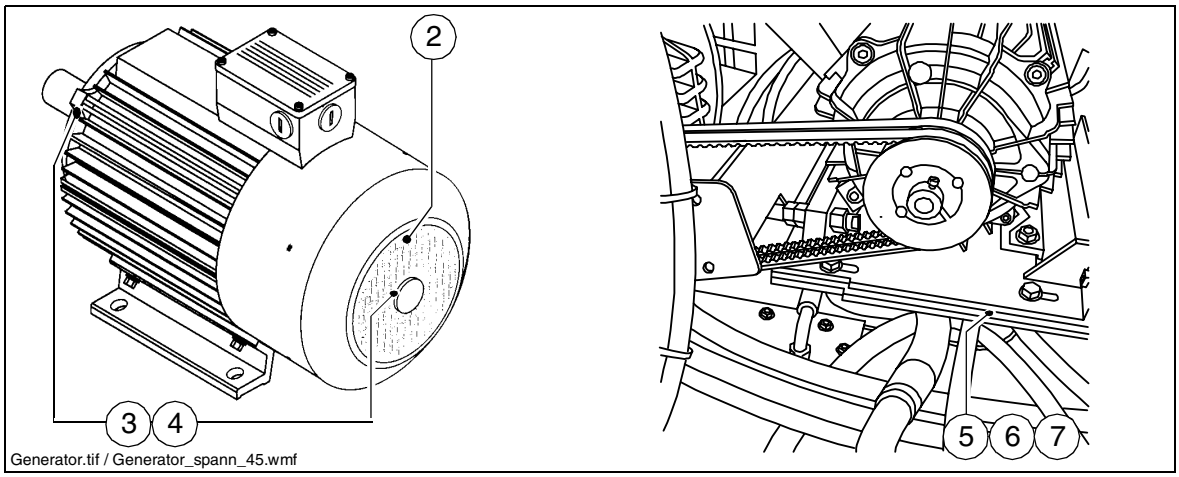
4.1 Electrical system - alternator (12)

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!



Generator.tif / Generator_spann_45.wmf

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!

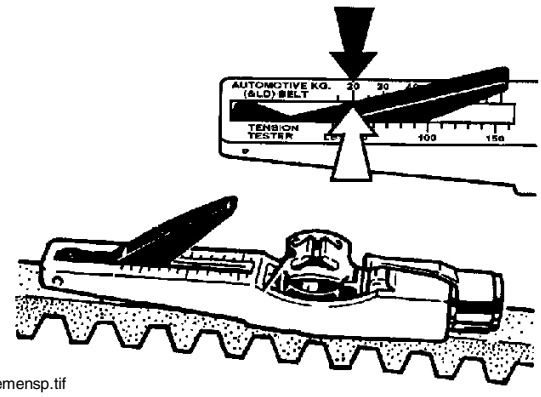
Do not spray with water!

Checking belt tension

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

Specified tension:

- for initial assembly: 400 N
- after run-in period / maintenance interval: 350 N



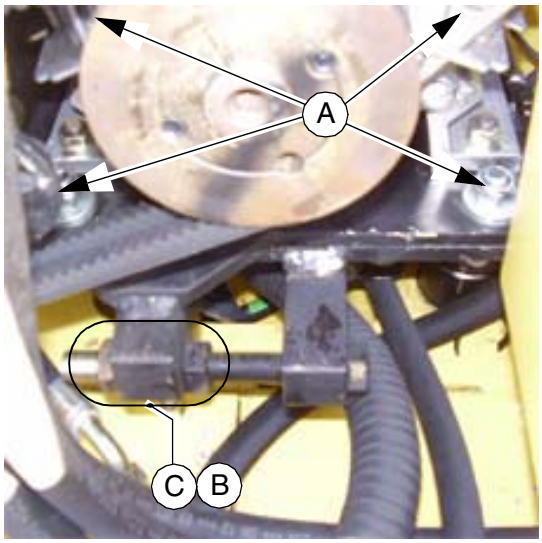
Riemensp.tif

☞ 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 the four fastening bolts (A) on the alternator carriage
- Loosen lock nuts (B) on tensioning fixture.
- Use adjusting screw (C) to set the belt tension required.
- Retighten lock nuts (B) and fastening bolts (A).



Generator_spann_45.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.

	Aral	BP	Esso	Total Fina (Total)	Mobil	Shell	Wisura
Grease		Multi-purpose grease L2	ESSO Multi-purpose grease	Total Multis EP 2	Mobilux 2 Mobiplex 47	SHELL Alvania Grease EP(LF)2	Retinax A
High-temperature grease (auger)			Norva HT2 order No. 956.90.10.05				
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 Hydroma 68 has been filled in at the factory.					
Gear oil 90		BP Multi EP SAE 90	ESSO GP 90	Total EP 90	MOBIL GX 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	SHELL Omala 220	Optimol Optigear 220
	Aral Degol BG220	Aral Degol 220 has been filled in at the factory.					
Distilled water							
Diesel fuel							
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!

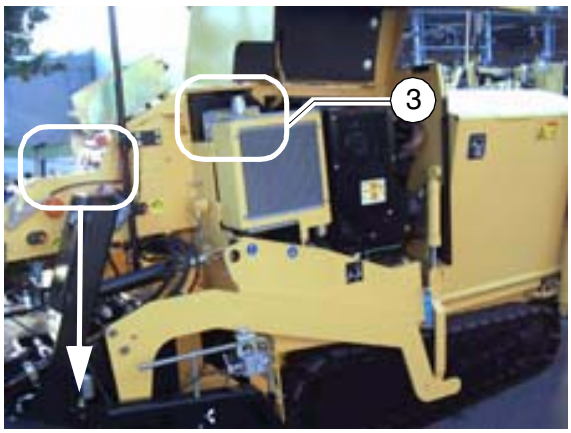
☞ Use only clean containers (inside and outside) for filling in oil or fuel.

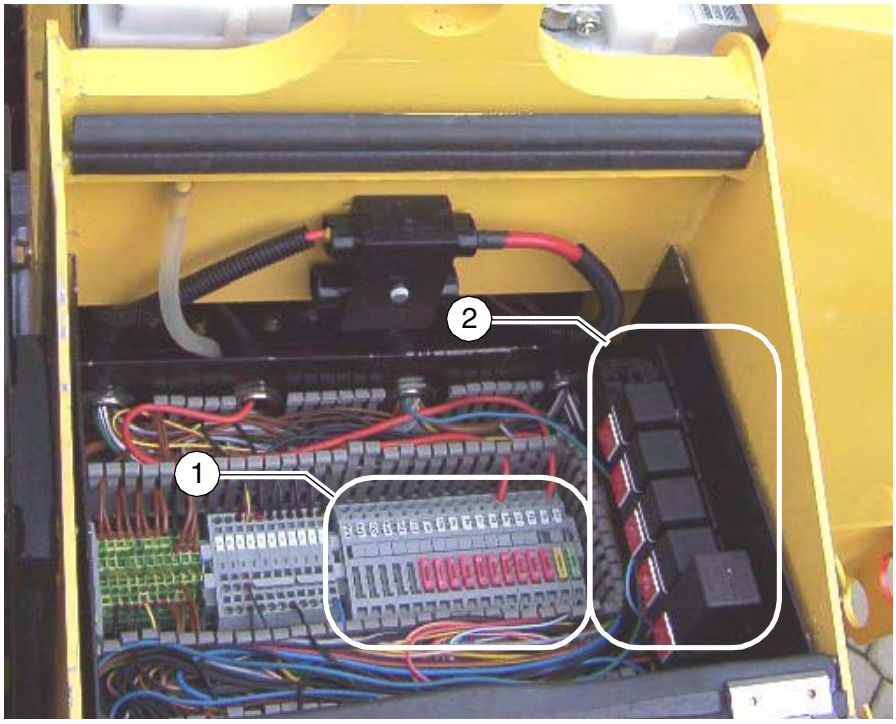
5.2 Filling volumes

	Filling volumes	Substance
Volume	Diesel fuel	80 liters
Hydraulic oil reservoir	Hydraulic oil	70 liters
Diesel engine (with oil filter change)	Engine oil	See the operating instructions for the engine
Pump distribution gear	Gear oil 90	1.70 liters
Caterpillar drive - planetary gear *	Gear oil 220	0.8 liters
Auger case	Low-viscosity grease	2.5 liters
Batteries	Distilled water	

☞ For the different types of operating agents, see “Lubricating agents and operating substances” of page 29.

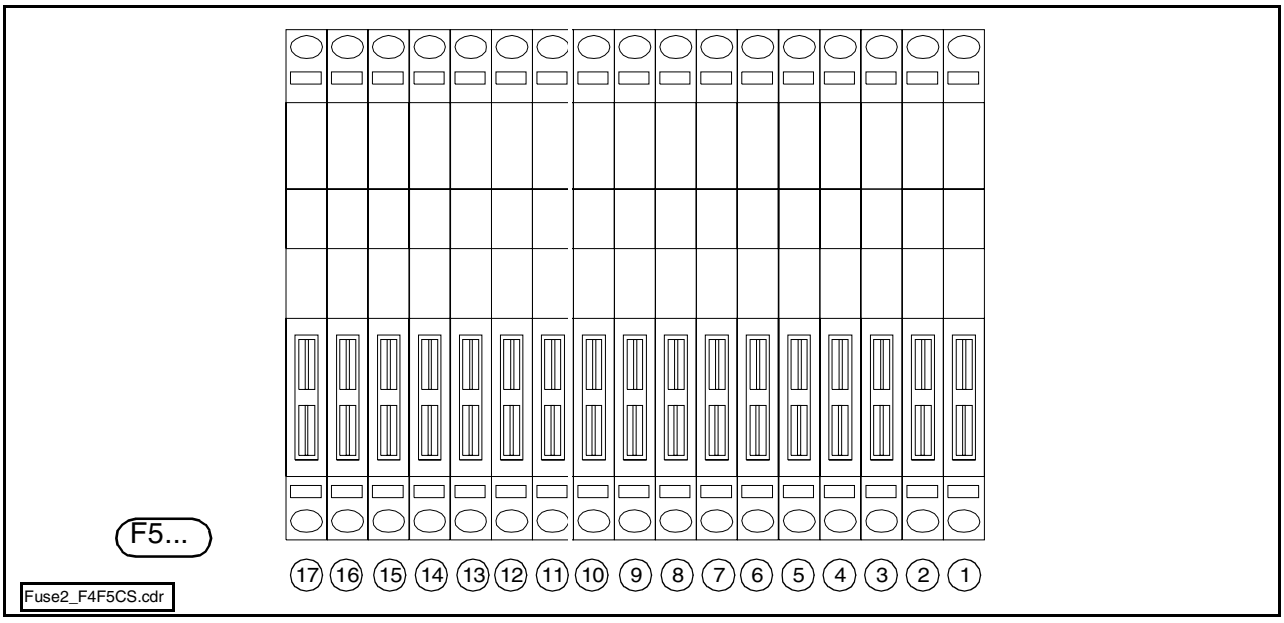
6 Electric fuses





Fuse1_F4F5CS.jpg

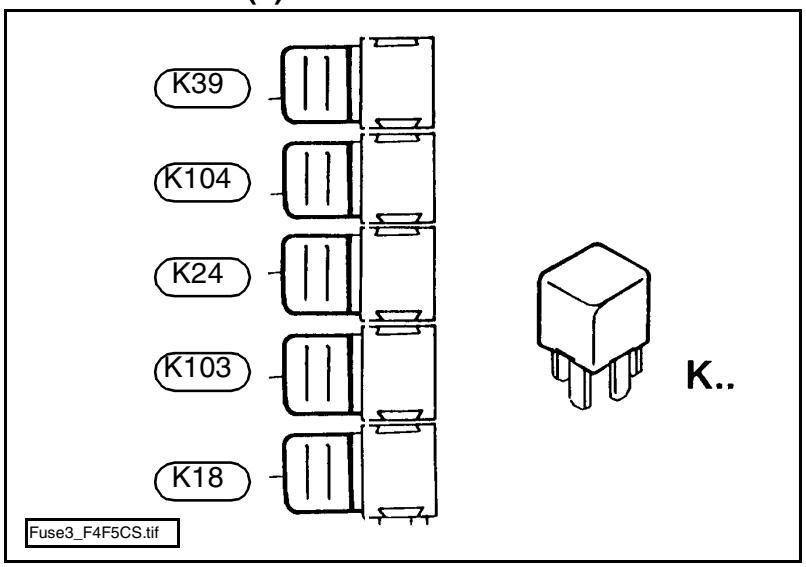
6.1 **Fuses in the terminal box**



Fuse carrier (1)

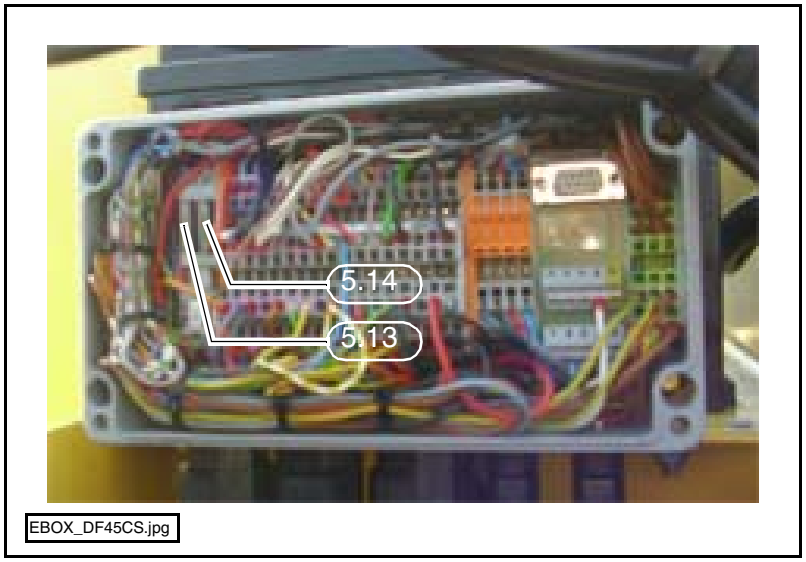
No.	F5.1 - F5.17	A
5.1	**Main fuses** 2	30
5.2	Fan -Oil cooler	20
5.3	Traction drive, brake	10
5.4	Levelling system	10
5.5	Floodlight ☞ 10A (for 2 lights) 20 A (for 4 lights)	10 / 20
5.6	Shut-off valve, socket on instrument panel	10
5.7	Indicator lamps	10
5.8	Instrument panel, horn, Emergency stop, pre-glow check (O)	10
5.9	Tamper, vibration	10
5.10	Main fuse, heater system	10
5.11	Auger, conveyor	10
5.12	Retract/extend screed, warning light system, mix material hopper	10
5.13	Heater, basic screed on left (gas heater only)	5
5.14	Heater, adjustment part on left (gas heater only)	5
5.15	Heater, basic screed on right (gas heater only)	5
5.16	Heater, adjustment part on right (gas heater only)	5

6.2 Relay in the terminal box (2)



No.	
K39	Starter interlock
K104	Automatic control for tamper/vibration
K24	Fan
K103	Levelling system
K18	Flashing relay

6.3 'Traction drive computer' fuses (3)



Nr.	
5.13	Sensors / BB3
5.14	RC4 / control fuse