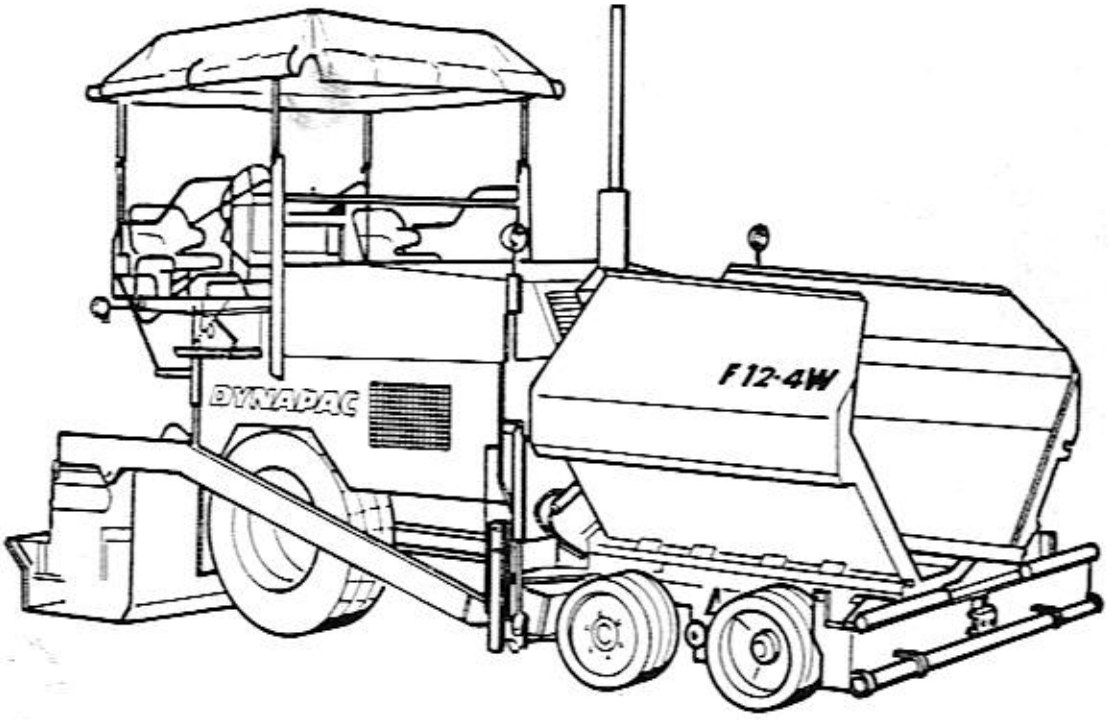
SVEDALA

DYNAPAC
STRASSENFERTIGER
PAVER FINISHER / FINISSEUR
F 12 W
F 12 – 4 W
(Type 754)



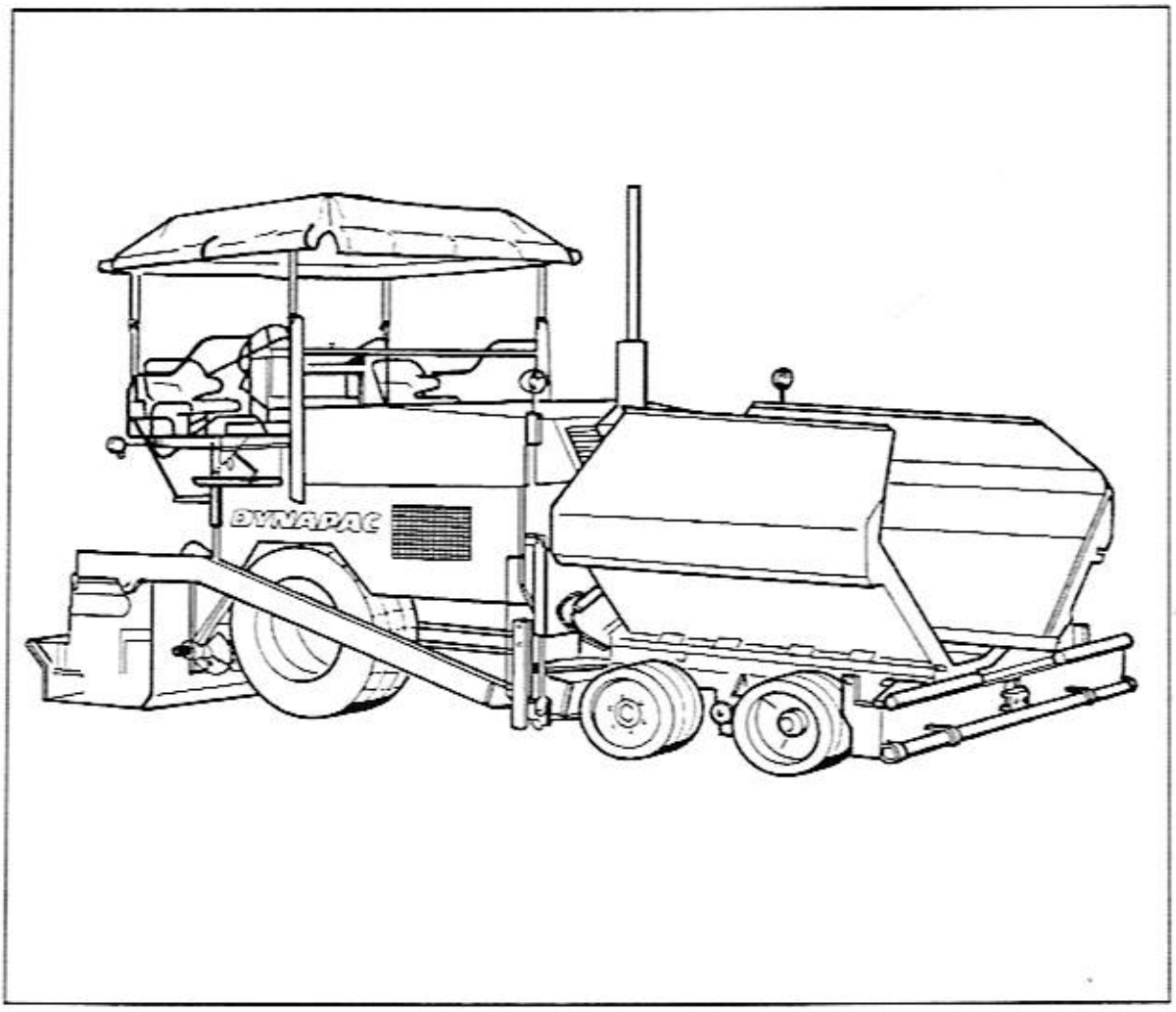
Betriebsanleitung
Instruction manual
Manuel d'entretien

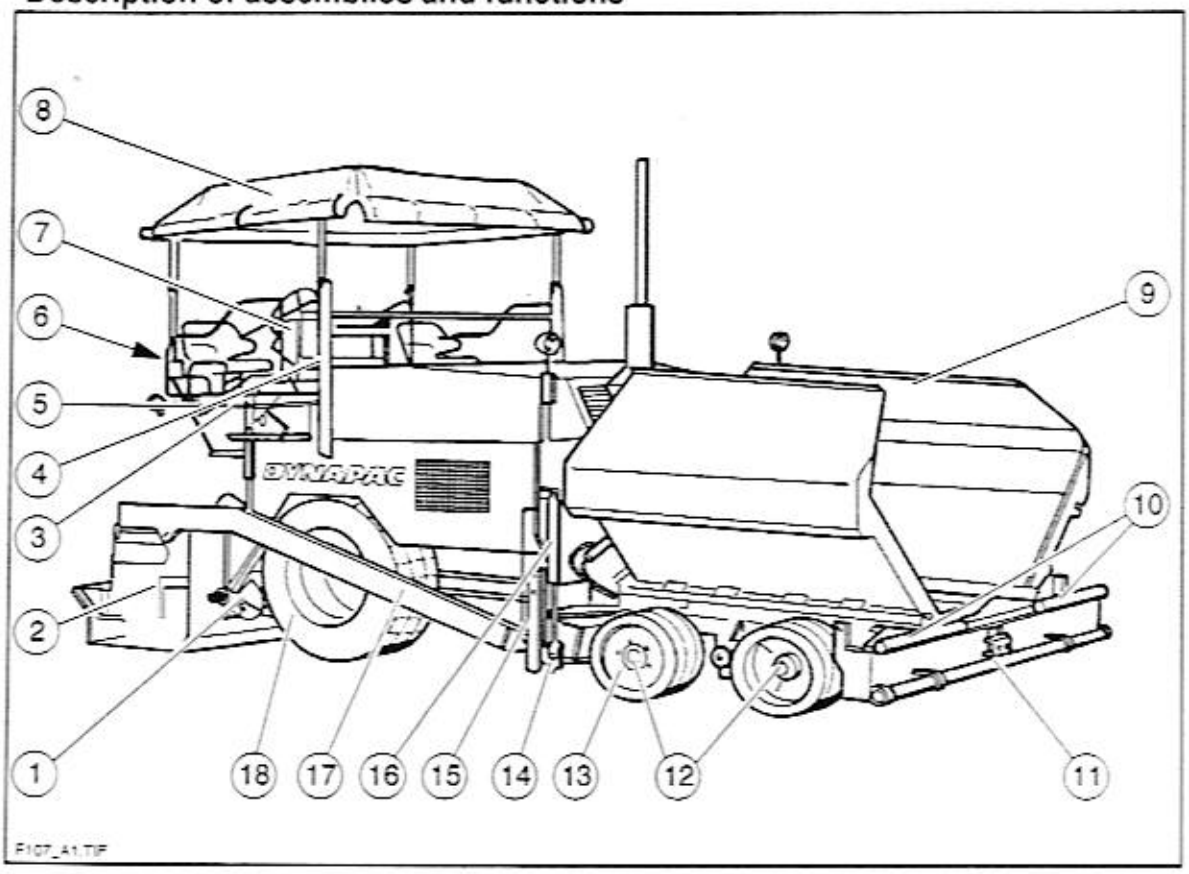
Svedala Strassenfertiger GmbH
Ammerländer Strasse 93 · D-26203 Wardenburg
Tel. Int.: +49 44 07 9 72-0 · Telex 254 997 dynw d · Fax Int.: +49 44 07 97 22 28
Germany

B Vehicle description

1 Application

The SVEDALA DYNAPAC F 12 W / F 12-4 W is a paver finisher running on rubber tires thais used for laying bituminous mixed material, roll-down or lean-mixed concrete, track-laying ballast and unbound mineral aggregates for foundations for paving.





Item		Designation
1	●	Auger
2	●	Screed
3	●	Operator's platform
4	●	Paving thickness indicator
5	●	Compartment for tool box, left/right
6	●	Control box for screed heating
7	●	Operating panel (can be moved to either side)
8	○	Protective roof
9	●	Material compartment (hopper)
10	●	Truck push rollers
11	●	Tube for sensor rod (direction indicator) and holder for leveling shoe
12	●	Tandem front axle
13	●	Axle with front-wheel drive (F 12-4 W)
14	●	Traction roller
15	●	Traction arm rail
16	●	Leveling cylinder for paving thickness
17	●	Arm
18	●	Rear wheels

● = Standard equipment	○ = Optional equipment

2.1 Vehicle

Construction

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

The large drive wheels (18) and the tandem front axle compensate uneven areas on the ground; the suspension of the attached screed (2) additionally helps to attain a high paving precision.
The continuously adjustable hydrostatic traction drive (18) allows the speed of the paver finisher to be matched to all work conditions.

Operation of the paver finisher is facilitated by the automatic material handling system, the separate traction drive (18) and the clearly structured operating and control elements (3).

The following extra equipment (○) is available:

- Additional front wheel drive (F 12-4 W) with or without anti-slip control
- Automatic leveling/slope control system
- Ultrasonic sensors for material transport by the auger (controller)
- Electrical speed regulation
- Additional cut-off shoe
- Larger working widths
- Protective roof

Further equipment and upgrade options on request.

Engine: The paver finisher is equipped with an air-cooled 6-cylinder Deutz diesel engine. For further information please refer to the operating instructions for the motor.

Chassis: The front axle is a tandem swing axle. Due to the fact that the wheels are mounted on pivot arms of different lengths, the second front wheel (at the shorter pivot arm) bears a higher load.
This solution provides increased steering and load-bearing capabilities, especially on soft grounds. The tires are solid rubber tires at the front axle and large, tubeless pneumatic tires at the rear axle (water filling - ○).
When equipped with an additional front wheel drive (F 12-4 W), the second front axle can be used as a second drive axle.

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 pump is connected to the traction motors by means of high pressure hydraulic hoses.
The oil motor drives the rear wheels via a two-step switch gear and roller chains. The switch gear has an integrated differential gear and a differential gear lock.

Steering system/operator's platform: The fully hydraulic Danfoss-Orbitrol steering system ensures easy maneuverability.
The operating panel can be secured in a position at the left-hand or the right-hand side of the paver finisher by means of a latch accessible from above.

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

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

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

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

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

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

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

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

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

By adjusting the height of the traction point of the arm (traction roller), the paving height of the material or the laying height of the screed can be controlled.
Actuation occurs electro-hydraulically on both sides and can be controlled manually by means of toggle switches or automatically by means of an electronic grade control system. For further information, please refer to the operating instructions for "Leveling Systems".

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

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

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

Control box for the screed heating system: Operation and monitoring of the screed heating system occurs via the control box on the paver finisher.

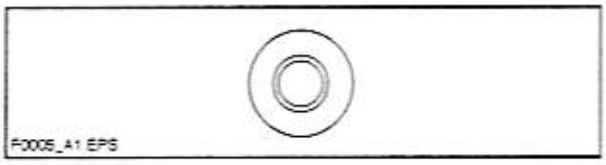
3 Safety devices

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 "Check list for the machine operator").

3.1 Emergency stop button

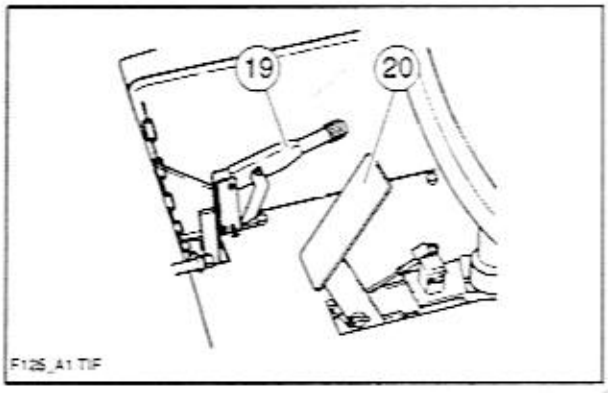
- on the operating panel
- On the two remote control units (○)



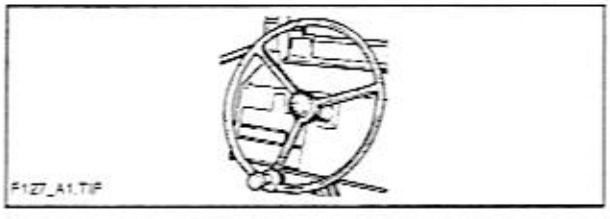
⚠ Pressing the emergency stop button switches off the engine, the drives and the steering system. Corrective measures that might be necessary (anti-collision maneuvers, lifting the screed, etc.) are not possible in this case! Danger!

3.2 Parking brake ("hand brake") (19)

3.3 Service brake ("foot brake") (20)

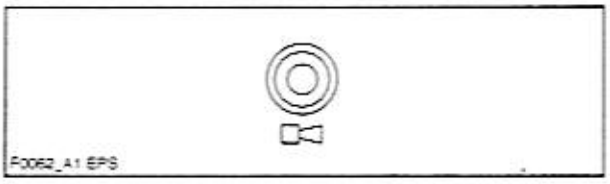


3.4 Steering system

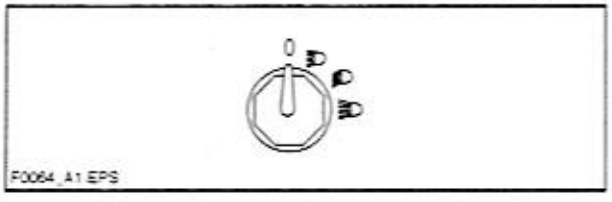


3.5 Horn

- on the operating panel
- On the two remote control units (○)

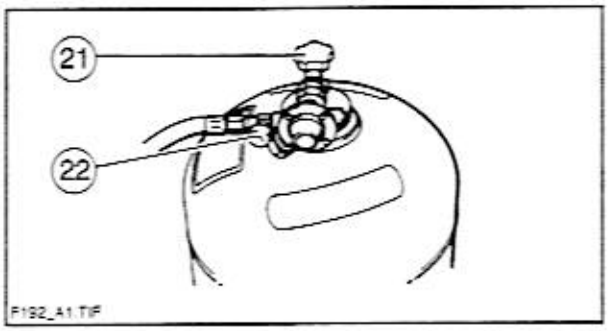


3.6 Ignition key / lights

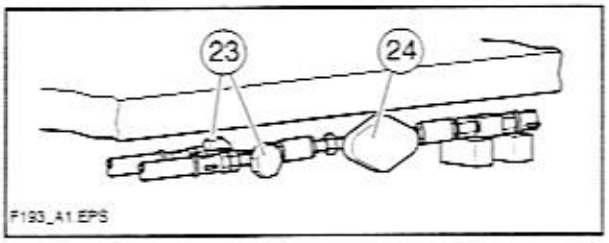


3.7 Safety devices on the gas heater system

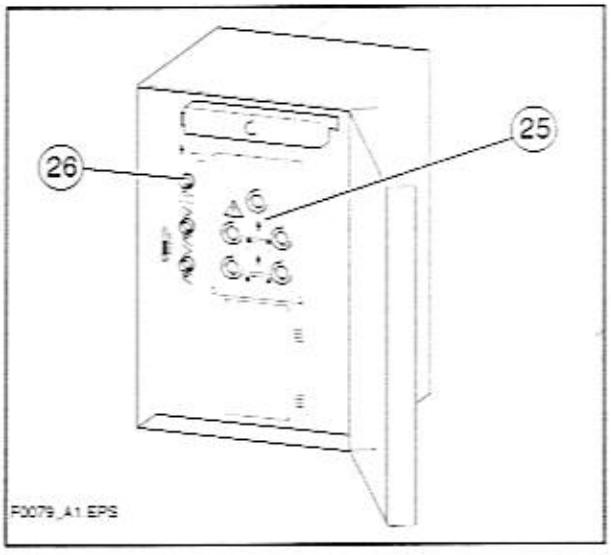
- Bottle valves (21)
- Hose rupture protection (22)



- Shut-off valves of dual branch piping (23)
- Main shut-off valve (24)

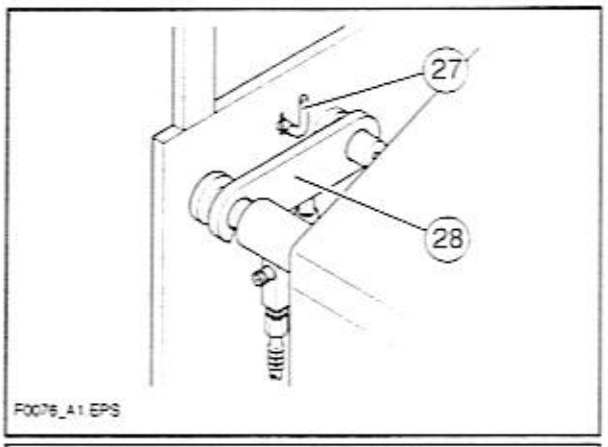


- Indicator lamps (25) on the control box
- On/Off switch in the control box (26).

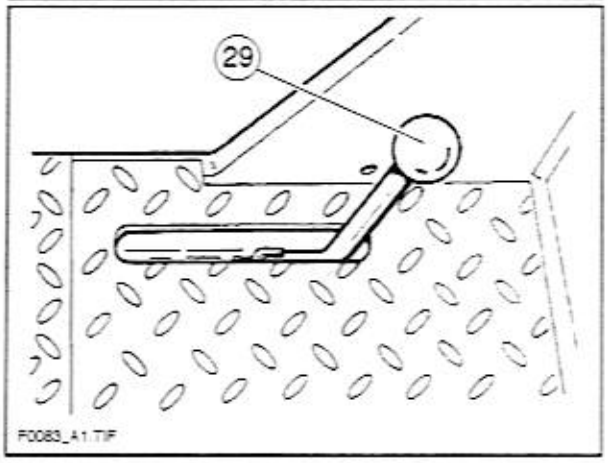


3.8 Main switch (27)

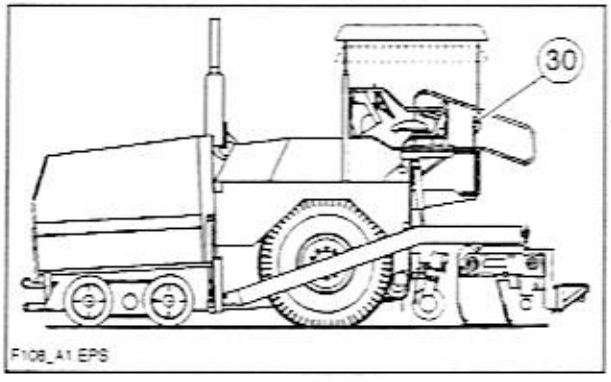
3.9 Hopper transport safeguards (28)



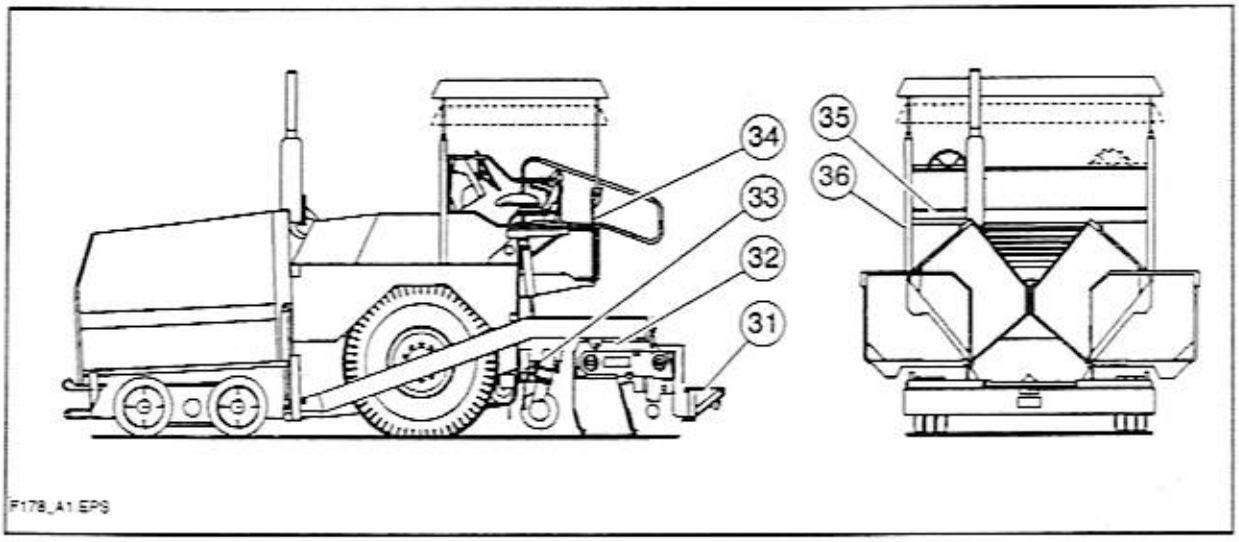
3.10 Screed transport safeguards (29)



3.11 Latch for protective roof (30)



3.12 Additional safety devices



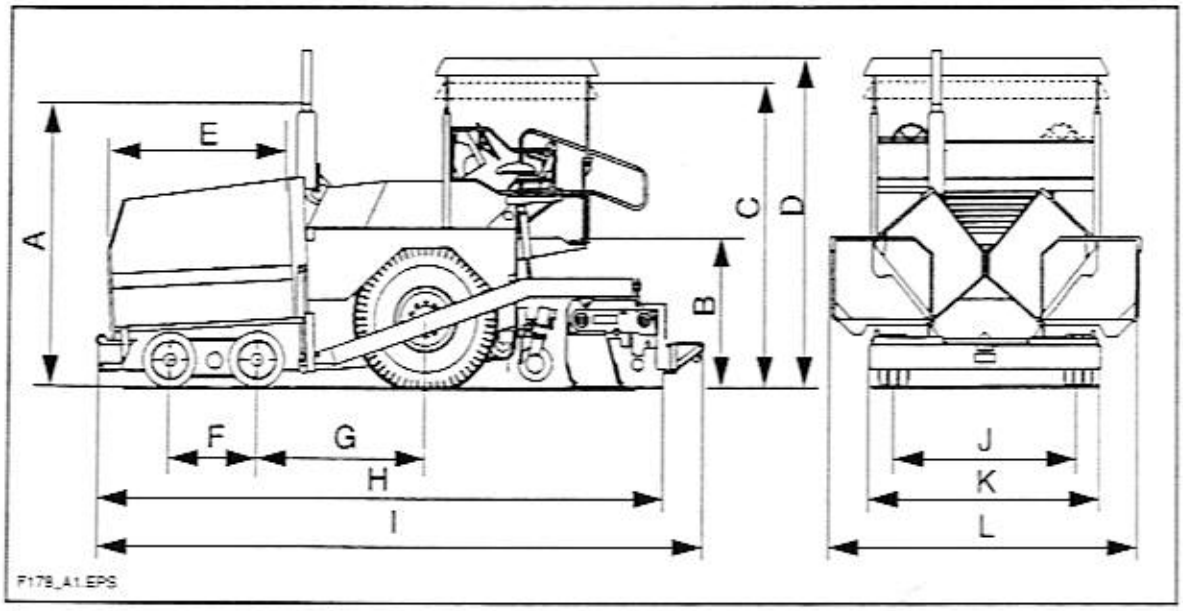
Item	Designation
31	Walkway
32	Screed coverings
33	Auger covers
34	Hazard warning lights of the screed
35	Engine hood
36	Lateral flaps

3.13 Miscellaneous equipment

- Wedges
- Warning triangle
- First-aid kit

4 Technical data, standard configuration

4.1 Dimensions



	Designation	Standard	
A	Min. transportation height without roof	2825	mm
B	Operator's platform height	1600	mm
C	Transportation height with roof swung down	3100	mm
D	Overall height with roof	3400	mm
E	Hopper length	1900	mm
F	Axle spacing, front	925	mm
G	Axle spacing, rear	2020	mm
H	Length without screed walkway with VB 850 T/TV screed	6180	mm
	Length without screed walkway with VB 851 T/TV screed	6180	mm
	Length without screed walkway with SB 750 T/TV screed	6263	mm
	Length without screed walkway with VB 500 V screed	6140	mm
I	Max. length with VB 850 T/TV screed	6450	mm
	Max. length with VB 851 T/TV screed	6600	mm
	Max. length with SB 750 T/TV screed	6263	mm
	Max. length with VB 500 V screed	6588	mm
J	Track width	2016	mm
K	Overall/transportation width	2500	mm
L	Max. width with open hopper	3400	mm
	Turning circle	ca. 12.8	m

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

BF12WGB10-20 0898

4.2 Weights

Designation	F 12 W	F 12-4 W	
Paver finisher without screed	ca. 10.9	ca. 11.2	t
Paver finisher with screed (incl. side shields) VB 850 T/TV VB 851 T/TV SB 750 T/TV VB 500 V	 ca. 14.2 ca. 14.4 ca. 12.4 ca. 13.4	 ca. 14.4 ca. 14.6 ca. 12.7 ca. 13.7	t
extensions for max. working width, additionally max.	ca. 0.9		t
With filled hopper: additionally max.	ca. 12.5		t
Permitted overall weight for transportation (w/o load)	ca. 16.0		t
Max. front axle load for transportation	ca. 3.5		t
Max. rear axle load for transportation	ca. 13.0		t

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

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 850 T/TV	2.50	2.00	4.75	7.00	m
VB 851 T/TV	2.50	2.00	4.75	7.00	m
SB 750 T/TV	2.50	2.00	-	7.50	m
VB 500 V	2.50	2.00	4.50	5.50	m

Transport speed	0 - 19.5	km/h
Working speed	0 - 32.0	m/min
Layer thickness	0 - 300	mm
Max. grain size	40	mm
Theoretical paving performance	500	t/h

4.4 Traction drive/chassis

Drive	Hydrostatic drive with pump and motor, continuously adjustable
Transmission	Via two-step switch gear with differential compensation, differential lock and 2 roller chains
Speeds	(see above)
Drive wheels	2 x 14.00 R-25 (pneumatic tires) (water filling ○)
Steered wheels	4 x 560 / 390 - 300 (solid rubber tires)
Front wheel drive F 12-4 W (○)	2 wheel hub oil motors, to be switched on as desired, variable performance, anti-slip control (○)
Brakes	Traction drive brake, 2 hydraulic disc brakes, mechanical parking brake

4.5 Engine

Make/type	Deutz BF6M 1012
Model	6-cylinder diesel engine (water-cooled)
Performance (acc. to DIN 6270)	78 kW / 105 PS (at 2300 rpm)

4.6 Hydraulic system

Pressure generation	Hydraulic pumps via distribution gear (directly flanged to the engine)
Pressure distribution	Hydraulic circuits for: Traction drive Material conveying and distribution Screed lifting drives for tamper / vibration (○) Cylinder actuators for steering, hopper, leveling, screed lifting, extending/retracting screed parts, auger lift (○)
Hydraulic oil reservoir - volume	185 l

4.7 Material compartment (hopper)

Volume	ca. 5.7 m^3 = ca. 12.5 t
Minimum inlet height, center	475 mm
Minimum inlet height, outside	595 mm

4.8 Material conveying

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

4.9 Material distribution

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

4.10 Screed lifting device

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

4.11 Electrical system

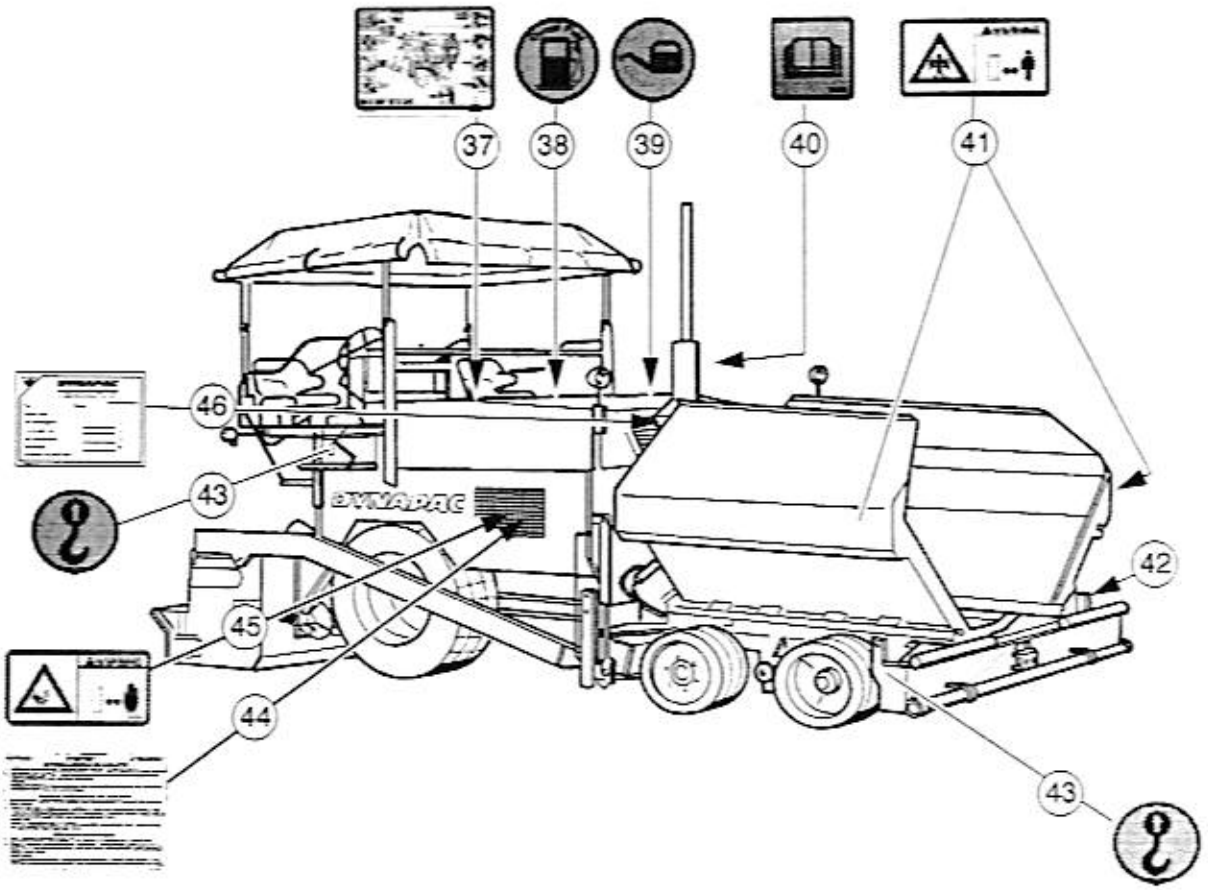
On-board voltage	24 V
Batteries	2 x 12 V, 88 Ah
Fuses	See chapter D, section "Malfunctions"

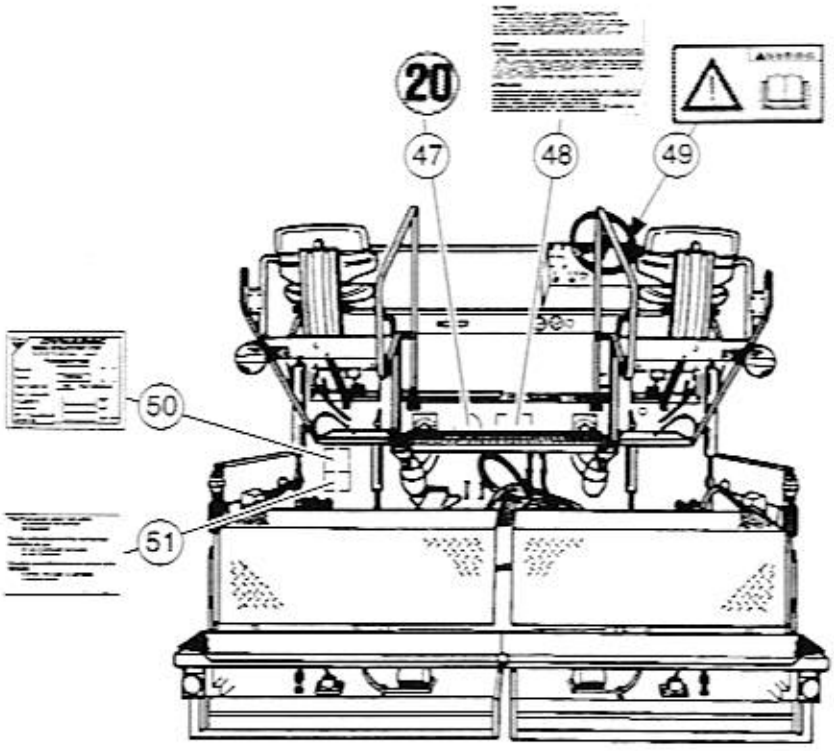
4.12 Gas heating system for the screed

Fuel (liquefied gas)	Propane gas
Gas bottles: Filling volume per bottle Gross weight per bottle	2 bottles 70 l 33 kg
Operating pressure (behind pressure reducer)	ca. 1.5 bar
Additional data	See operating instructions for the screed

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

5 Location of instruction labels and identification plates





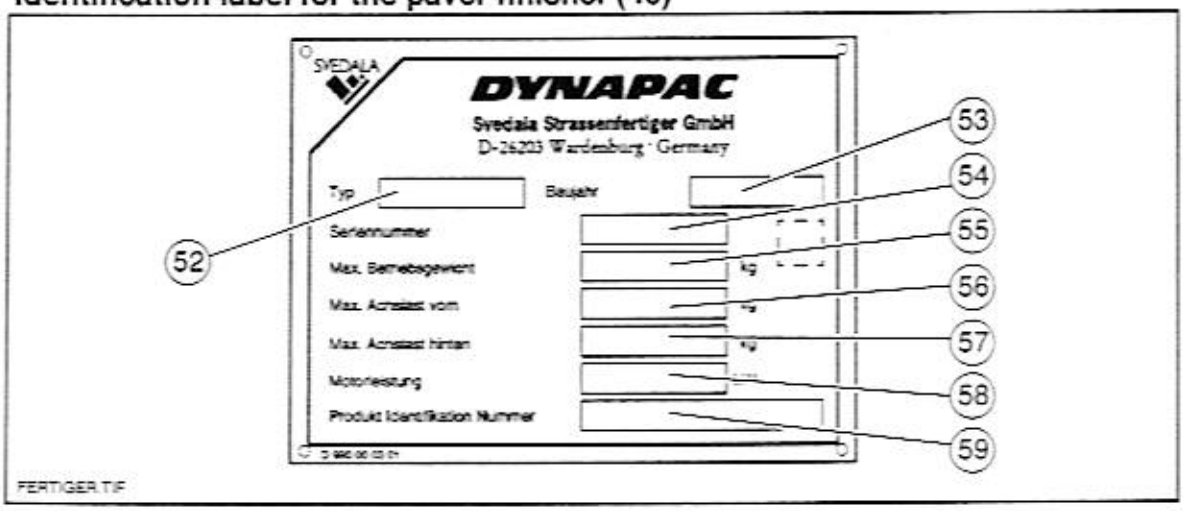
Item	Designation
37	Label "Overview of operating materials for engine" *
38	Label "Filler neck for diesel fuel" *
39	Label "Filler neck for engine oil" *
40	Label "Heed the operating instructions!"
41	Warning label "Danger of squeezing!" **
42	Punched vehicle identification number
43	Label "Securing or fixing points for crane transportation"
44	Label "High voltage!"
45	Warning label "Danger of being pulled in!"
46	Paver finisher identification label
47	Label "maximum permissible speed 20 km/h" for self-propelled operation
48	Label "Operating instructions for the engine"
49	Label "Heed the operating instructions!" ***
50	Identification label for liquefied gas system
51	Label "Close valves of bottles immediately"

* Labels are located beneath the engine hood

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

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

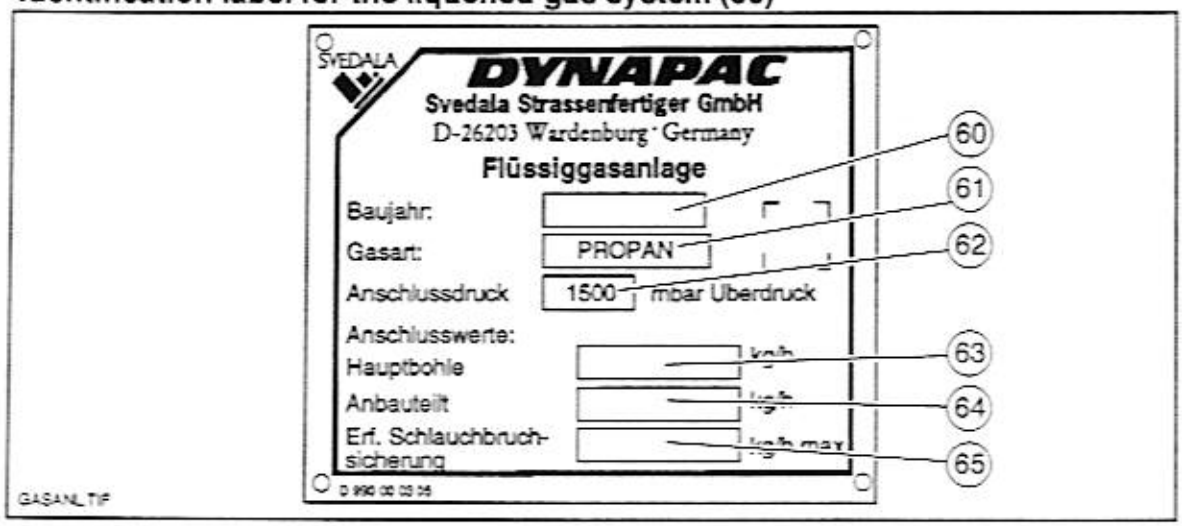
5.1 Identification label for the paver finisher (46)



Item	Designation
52	Paver finisher type (e.g. F 12-4 W)
53	Year of manufacture
54	Serial number of the paver finisher series
55	Max. permissible operating weight, incl. all attachments, in kg
56	Max. permissible load on the front axle, in kg
57	Max. permissible load on the rear axle, in kg
58	Rated performance in kW
59	Product identification number (PIN)

☞ The punched vehicle identification number on the paver finisher must match the product identification number (59).

5.2 Identification label for the liquefied gas system (50)



Item	Designation
60	Year of manufacture
61	Type of gas to be used
62	Rated pressure, in mbar
63	Average gas consumption of the installed screed, in kg/h
64	Average gas consumption of the screed attachments, in kg/h
65	Maximum permissible mass flow of the installed hose rupture protection in kg/h

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.

Sound pressure level at the operator's position (at the height of the head): L_{AF} = 83,5 dB(A)

Sound pressure level at the machine

Measuring point	2	4	6	8	10	12
Sound pressure level L_{AFeq} (dB(A))	72,9	71,4	75,8	74,4	73,3	74,2

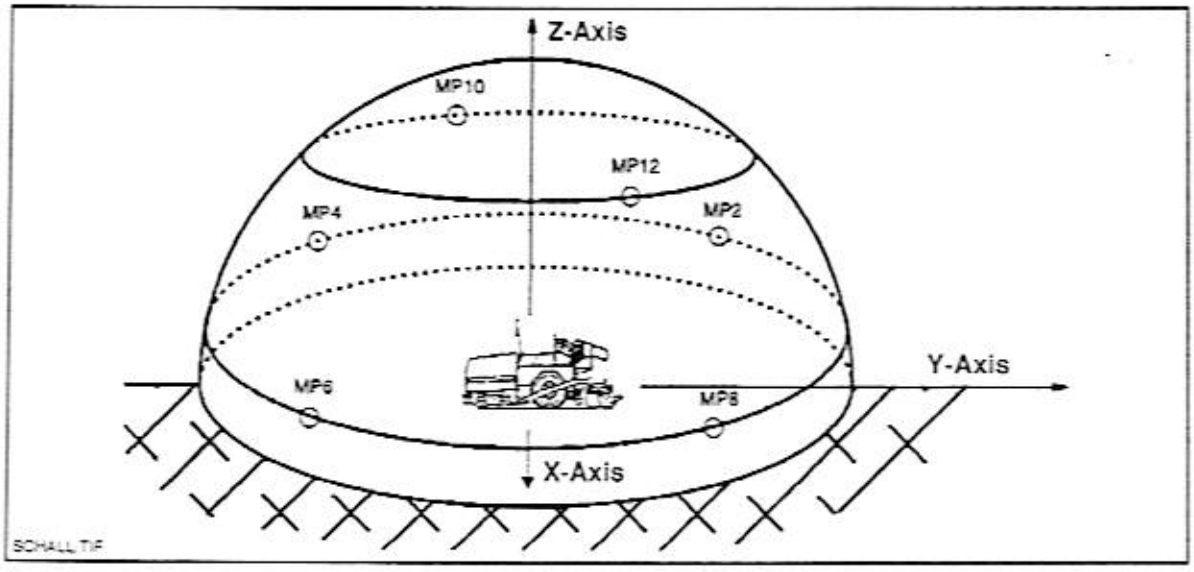
6.2 Operating conditions during measurement

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

6.3 Measuring point configuration

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

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



6.4 Vibration acting on the entire body

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

6.5 Vibrations acting on hands and arms

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

6.6 Electromagnetic compatibility (EMC)

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

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

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

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

B F12W GB20-20 0898

C Transport

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 leveling device, auger limit switches, aprons, etc.). When transporting under a special permit, secure these parts!

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

Check that the clamping device for the auger frame is fastened and that the telescopic tube cannot slide out (see chapter E, section 2).

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

In Germany, gas bottles must not be transported on the paver finisher.
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, wheeled pavers may only be driven over short distances on public roads.
Note that in other countries different regulations may apply.

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

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

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

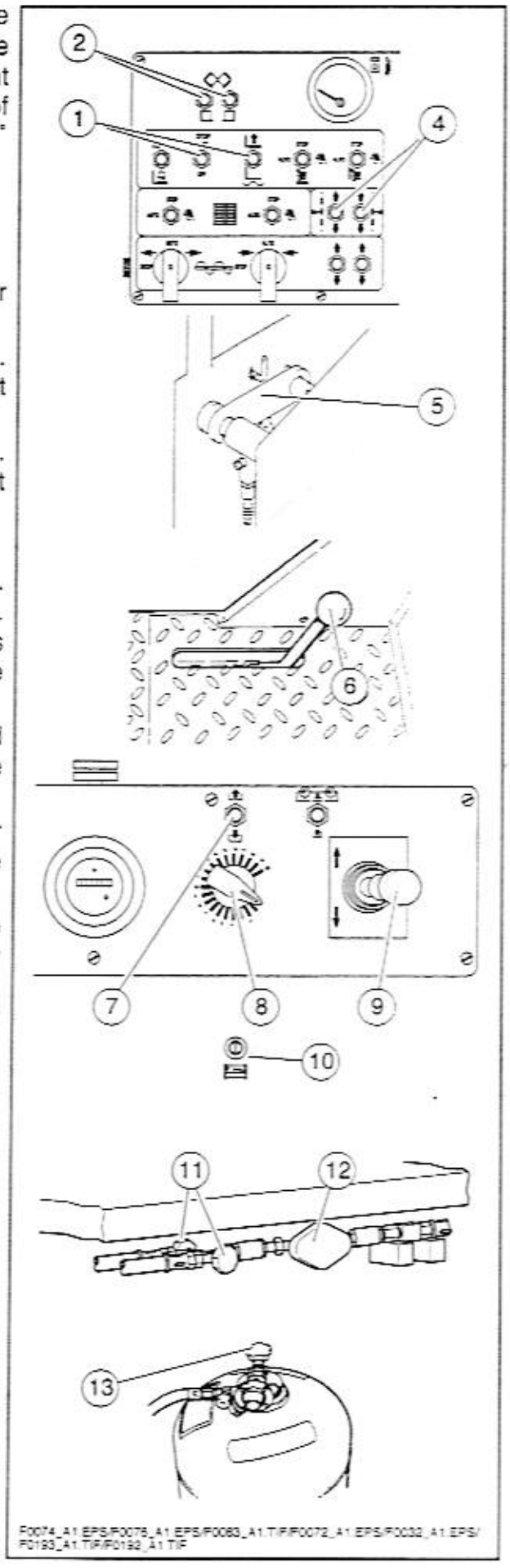
If necessary, the operator must be assisted by a second person when driving on public roads – especially at road crossings and junctions.

2 Transportation on low-bed trailers

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

2.1 Preparations

- Prepare the paver finisher for operation (see chapter D, section 3).
- Use switch (2) to close the hopper lids. Engage both hopper transport safeguards (5).
- Use switch (1) to lift the screed. Engage the screed transport safeguard (6).
- To extend the leveling cylinders:
  - Turn the preselector (8) to "zero". Move the drive lever (9) forward. When the paver finisher starts crawling, take out the traction drive fuse (10).
  - Push the switches (4) downward until the leveling cylinders are completely extended.
  - Set the drive lever (9) to the center position. (If necessary, insert the traction drive fuse (10) again.)
- 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.
- Remove the gas bottles for the screed heating system:
  - Close the main shut-off valve (11), the shut-off valves on the dual branch piping (12) and the bottle valves (13).
  - 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.

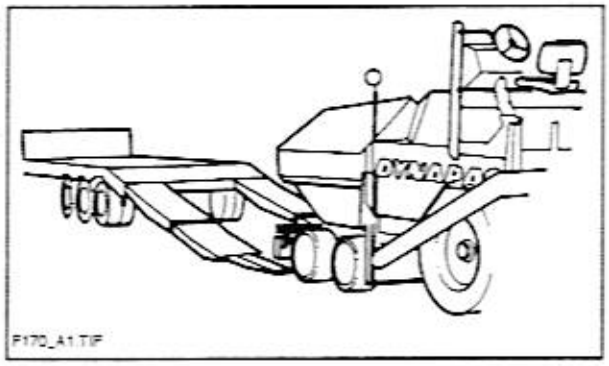


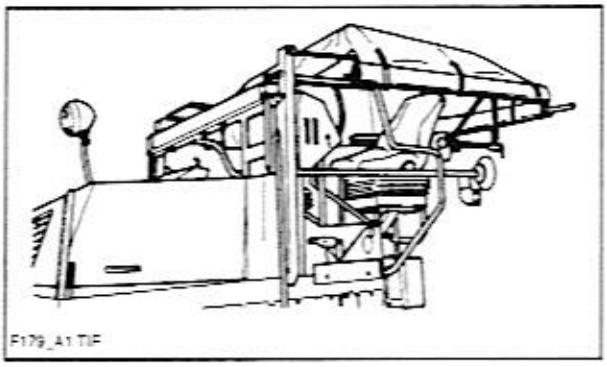
F0074_A1 EPS/F0075_A1 EPS/F0083_A1 T/F/F0072_A1 EPS/F0032_A1 EPS/F0193_A1 T/F/F0192_A1 T/F

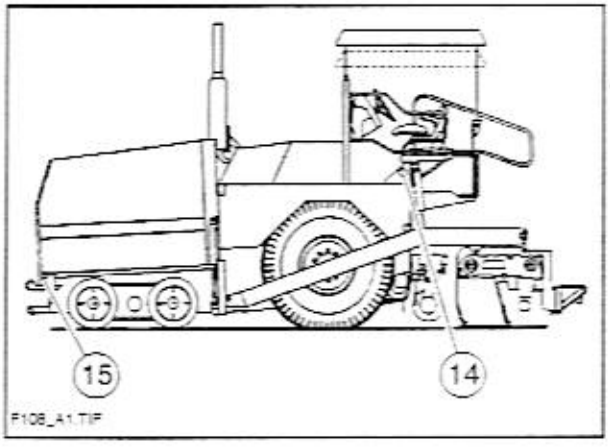
2.2 Driving onto the low-bed trailer

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

- Use the work gear and low engine speeds to drive onto the low-bed trailer.
- Lower the screed onto wooden blocks on the low-bed trailer.
- Switch off the paver finisher.
- Attach and secure the protective hood to protect the operating panel.
- If necessary, swing down the protective roof:
  - Take out the bolts and pull the roof to the rear by gripping it in the middle. When it is in the lower position, secure it with the bolts.
  - Take the protective roof tarpaulin off when covering longer distances.
- Secure the paver finisher to the low-bed trailer:
  - Use only appropriate, approved attachment devices.
  - Use the four securing points provided (14, 15).
  - Wait until the exhaust extension tube has cooled down; then remove it and store it.







2.3 After transportation

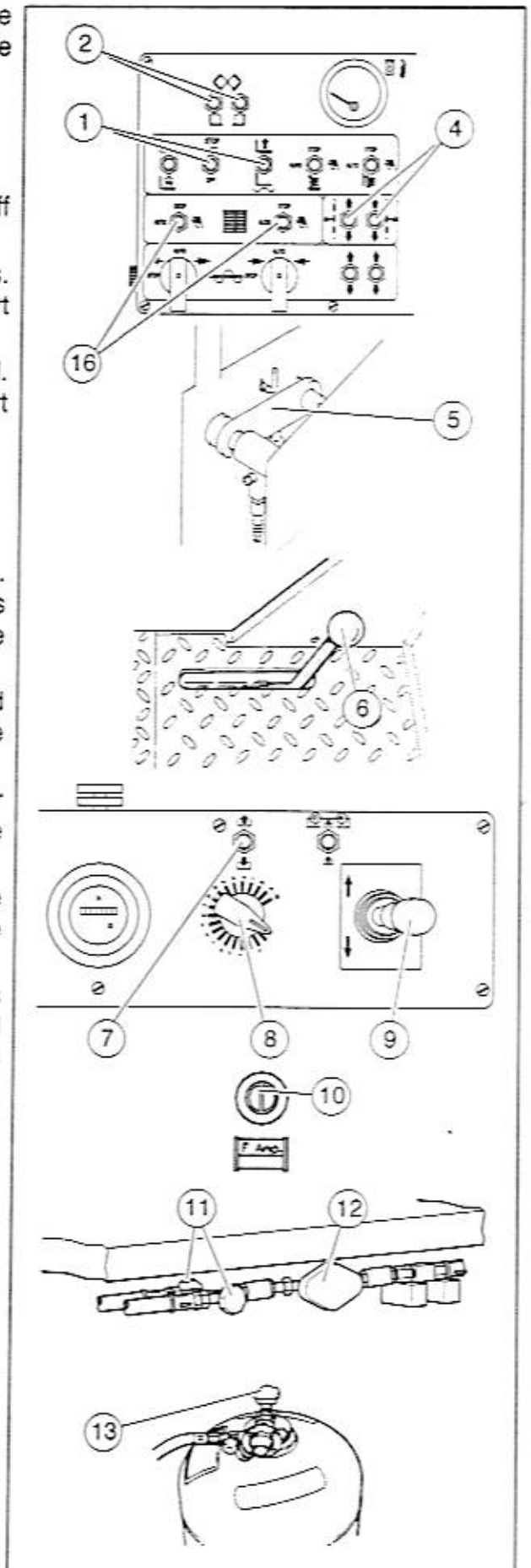
- Remove the attachment devices.
- Swing up the protective roof, where applicable:
  - Take out the bolts, push the protective roof forward to raise it and insert the bolts to lock it again.
  - Mount the protective tarpaulin if it has been removed.
- Lift the screed to the transportation position and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

3 Transportation on public roads

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

3.1 Preparations

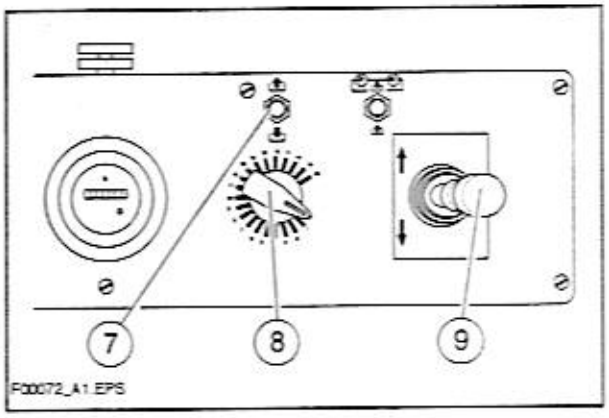
- Set switch (16) to "Stop" to switch off the conveyor drive.
- Use switch (2) to close the hopper lids. Engage both hopper transport safeguards (5).
- Use switch (1) to lift the screed. Engage the screed transport safeguards (6).
- To extend the leveling cylinders:
  - Push switch (7) downward.
  - Turn the preselector (8) to "zero". Swivel the drive lever (9) forward. When the paver finisher starts crawling, take out the traction drive fuse (10).
  - Push the switches (4) downward until the leveling cylinders are completely extended.
  - Set the drive lever (9) to the center position. (If necessary, insert the traction drive fuse (10) again.)
- 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.
- Remove the gas bottles for the screed heating system:
  - Close the main shut-off valve (11), the shut-off valves on the dual branch piping (12) and the bottle valves (13).
  - 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.



F0074_A1 EPS/F0079_A1 EPS/F0083_A1 TIF/F0072_A1 EPS/F0092_A1 EPS/F0193_A1 TIF/F0192_A1 TIF

3.2 Driving on public roads

- Set the On/Off switch (7) for the preselector (8) to "Off".
- Use the drive lever (9) to regulate the speed.



Danger of accidents!
- Do not drive the paver finisher with the differential lock engaged.
- Observe the steering wheel angle in narrow curves. 2.5 – 3 revolutions of the steering wheel are required.

- Press the emergency stop button when a dangerous situation arises!

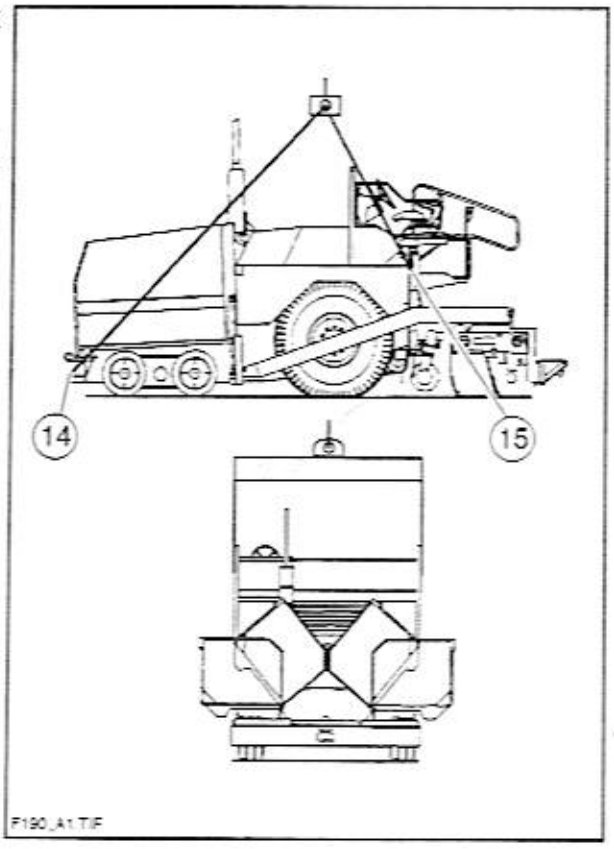
Pressing the emergency stop button causes the paver finisher to be strongly braked. The engine is switched off and the steering wheel becomes very hard to turn. This can cause accidents!

4 Loading by crane

⚠ Use only lifting gear that can bear the load.
(For the weights and dimensions, see chapter B, sections 4.1 and 4.2)

☞ Four lifting eyes (14, 15) 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 four lifting eyes (14, 15).



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

5 Towing

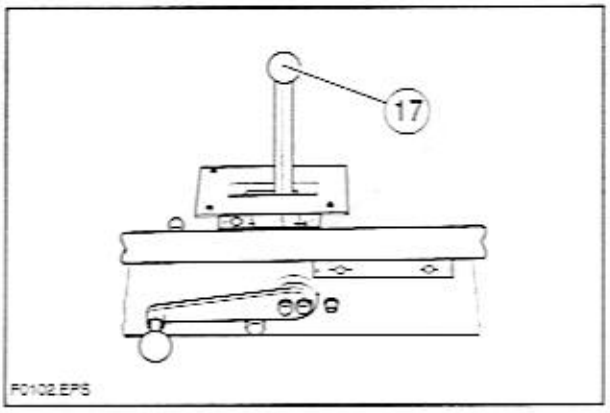
Heed all regulations and apply all safety measures applicable for towing heavy construction machines.

The towing vehicle must be capable of securing the paver finisher, even on slopes. Use only approved tow bars!

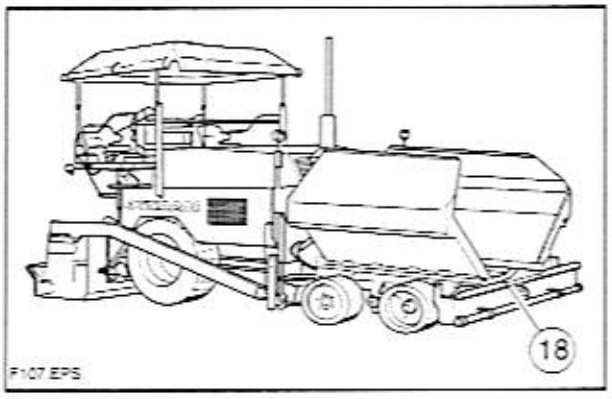
If necessary, remove nay attachments and accessories from the paver finisher and the screed until the basic width has been attained.

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

Use the lever (17) to set the two-gear transmission to neutral ("0").

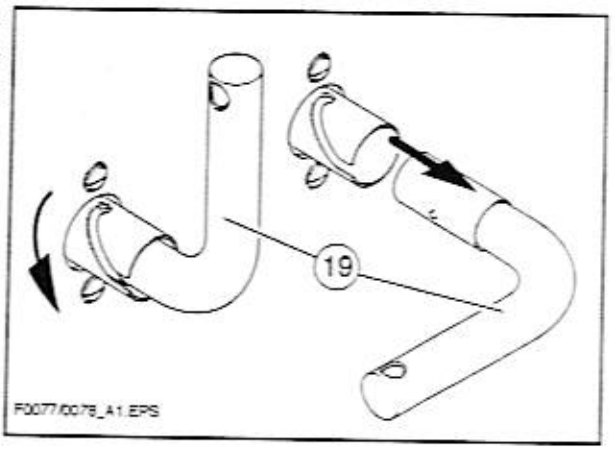


- Attach the tow bar to the coupling (18) located in the bumper.
- Carefully and slowly tow the paver finisher out of the construction site or the danger area (use the shortest possible distance).

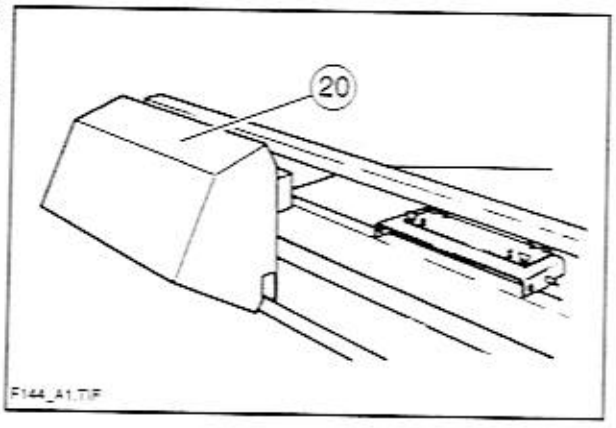


6 Safely parking the vehicle

When the paver finisher is parked at a location accessible to the public, it must be secured in such a way that unauthorized persons or playing children cannot damage the vehicle. Pull off the ignition key and the main switch (19) and take it with you – do not hide them somewhere on the machine.



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



D Operation

1 Safety regulations

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

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

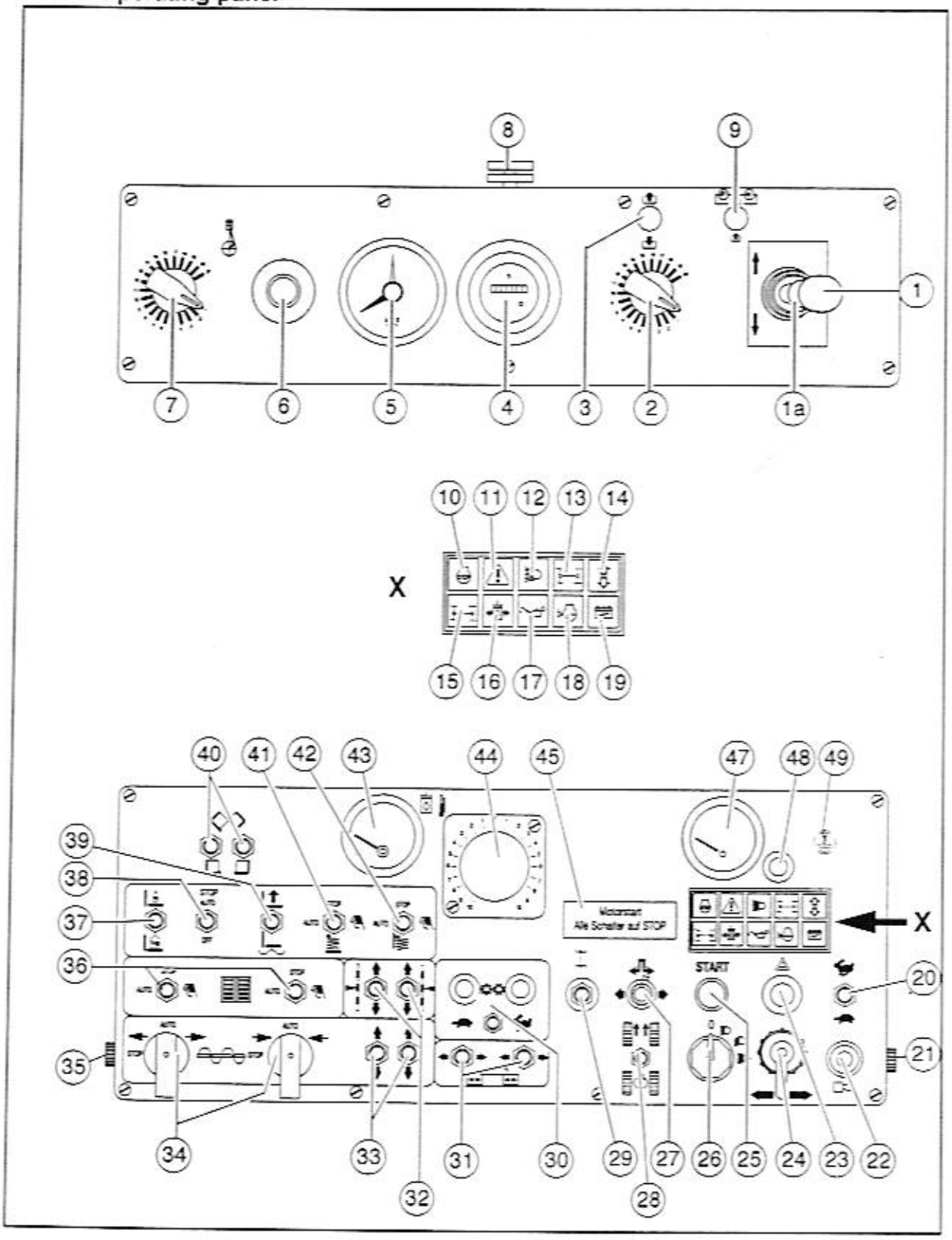
Never crawl into the auger tunnel or step into the hopper or onto the conveyor. Danger to life and limb!

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

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

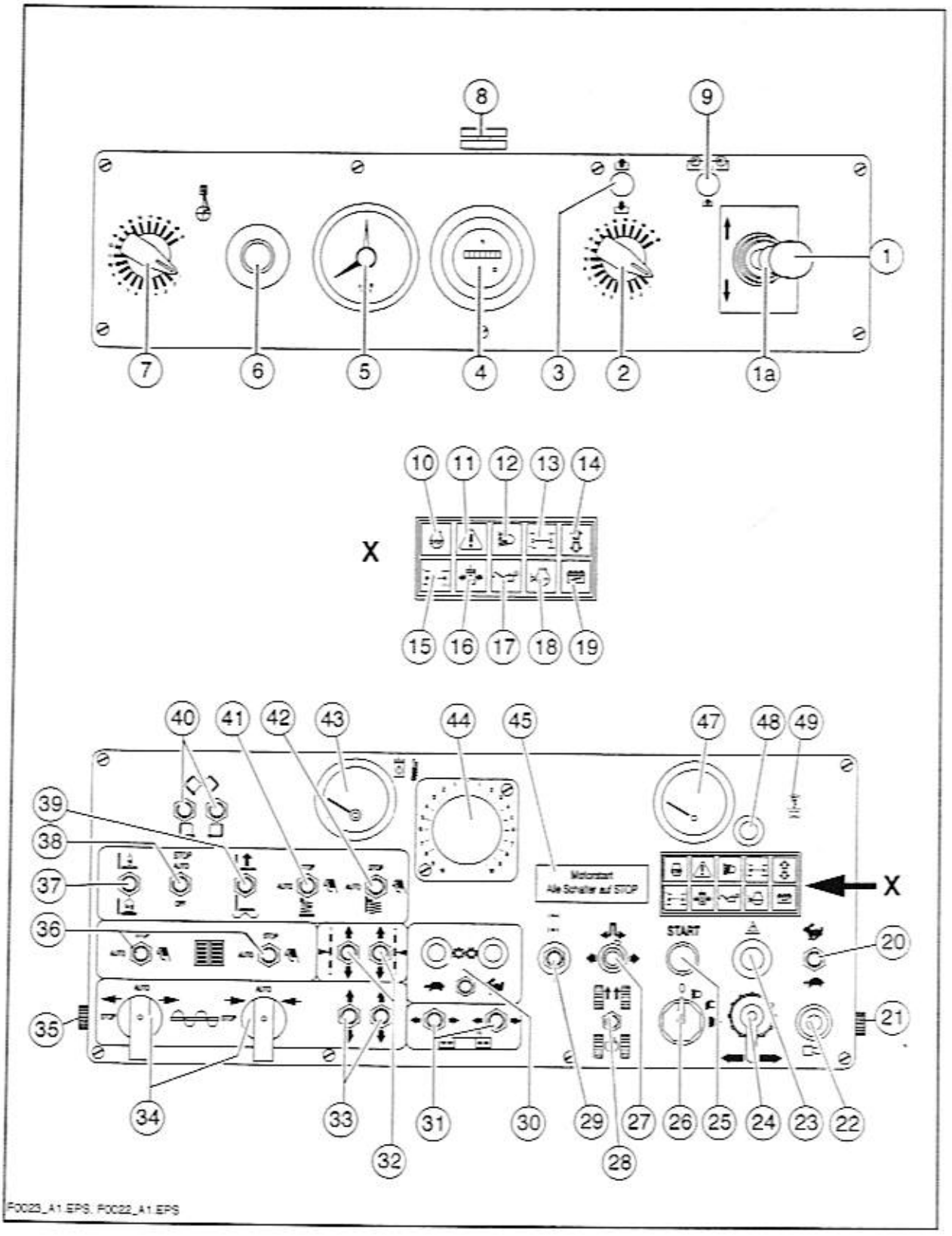
2 Controls

2.1 Operating panel

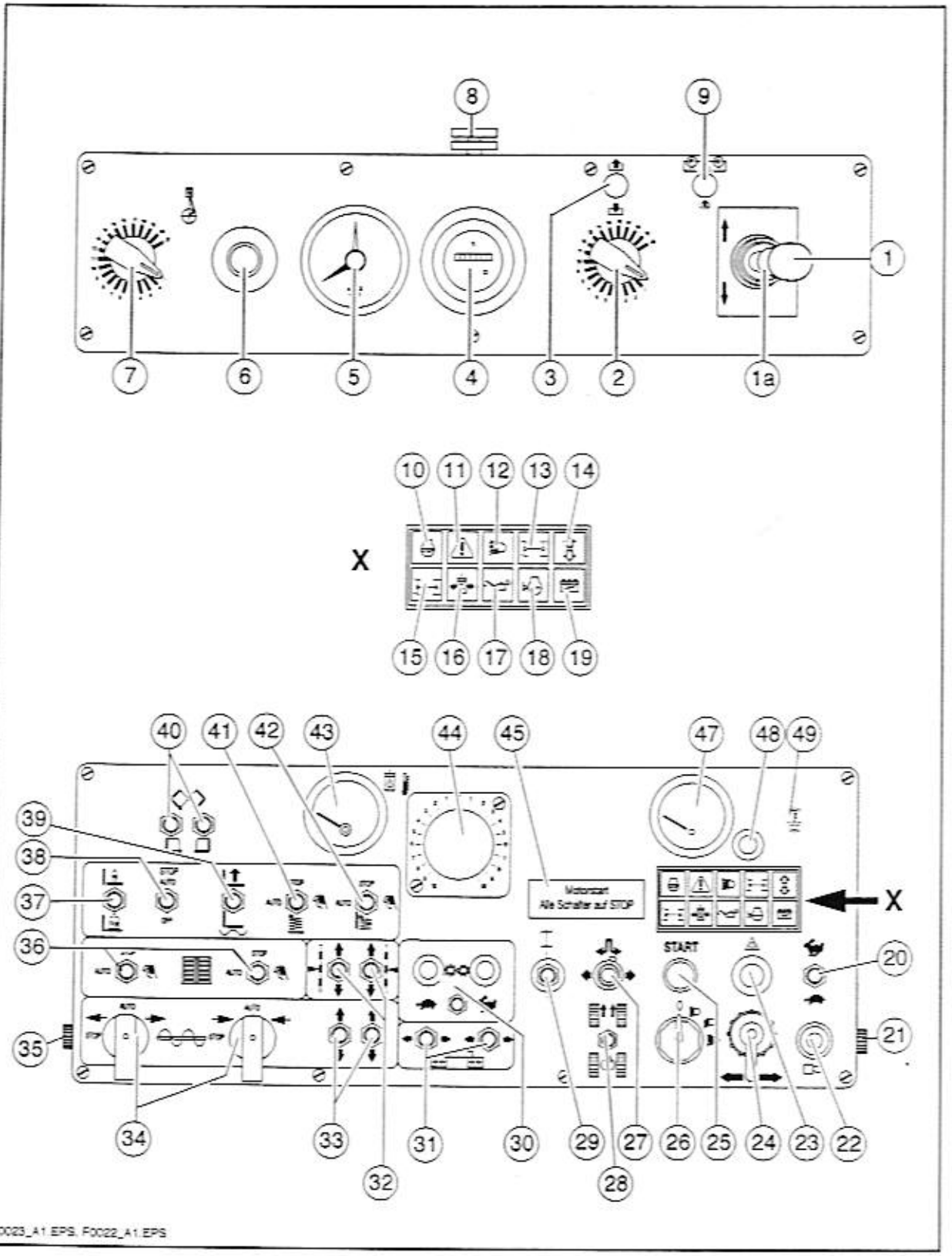


F0023_A1.EPS, F0022_A1.EPS

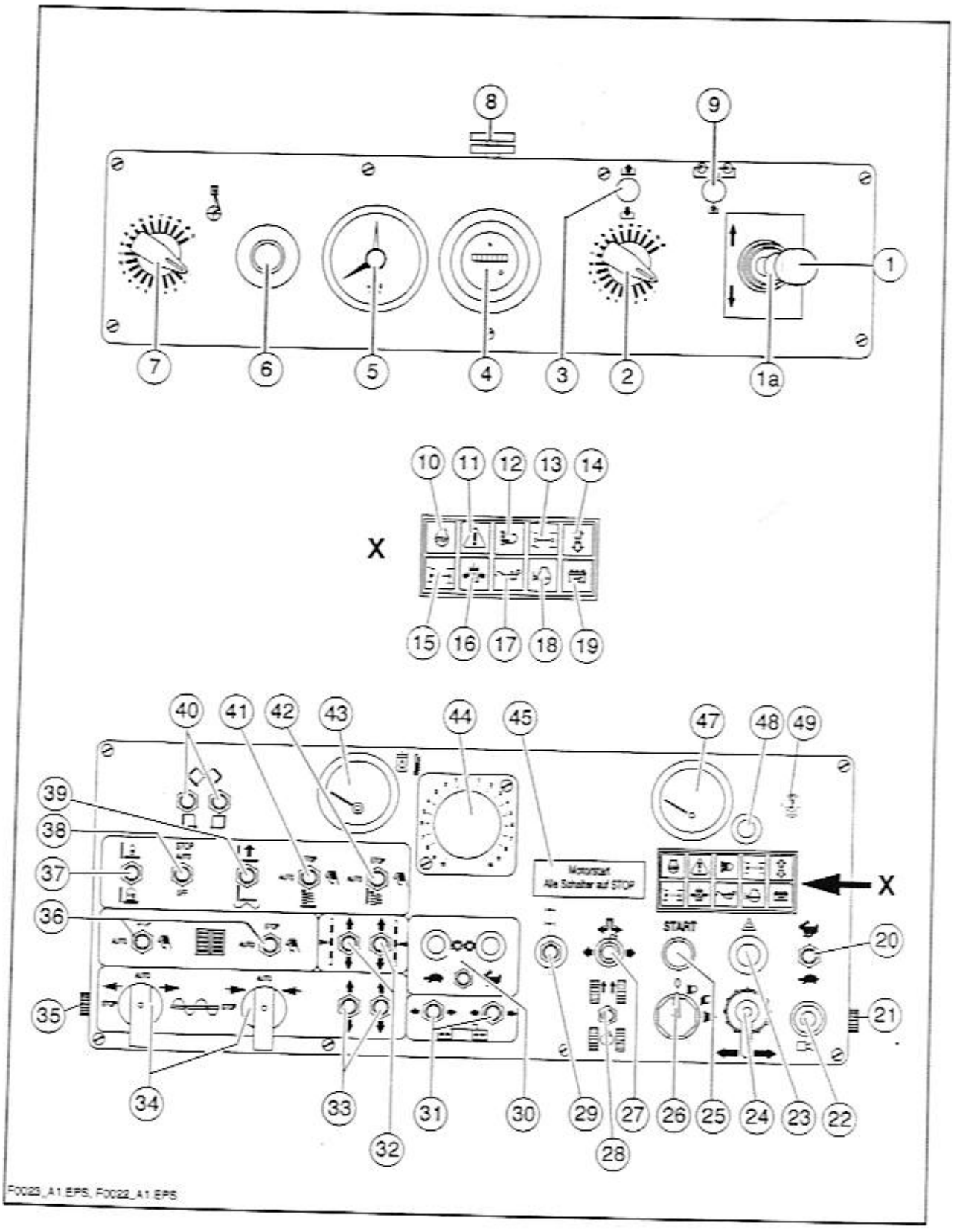
Item	Designation	Brief description
1	Drive lever (forward - reverse)	For switching on the paver finisher functions and for continuously regulating the traction speed – forward or reverse. Zero position: starting is possible; engine at idling speed; no traction; protection against inadvertent start. To move the lever, pull up the ring (1a). Depending on the position of the drive lever, the following functions can be activated: - 1st position: Engine to preselected speed (see engine speed adjuster (7)). - 2nd position: Conveyor and auger on. - 3rd position: Screed motion (tamper/vibration) on; traction drive on; increase speed until the stop is reached. Use the preselector (2) to set the maximum speed.
2	Preselector, traction drive	For setting the maximum speed that can be reached when the drive lever (1) is at its stop. ☞ The scale roughly matches the speed in m/min (during paving).
3	not used	
4	Operating hours counter	Operating hours are only recorded while the engine is running. Heed the maintenance intervals (see chapter F).
5	rpm meter ○	Indicates the engine speed in rpm. ☞ Use the engine speed adjuster (7) to change the engine speed.
6	Emergency stop button	Press in an emergency (danger to persons, possible collision etc.)! - Pressing the emergency stop button switches off the engine, the drives and the steering system. Making way, lifting the screed or other actions are then no longer possible! Danger! - The emergency stop button does not shut off the gas heater system. Close the main shut-off valve and the valves on the bottles by hand! - In the case of electrical malfunctions, the engine must be turned off manually at the leverage of the injection pump. To restart the engine, the button must be pulled out again.


8
9
1
7
6
5
4
3
2
1a
10
11
12
13
14
X
15
16
17
18
19
40
41
42
43
44
45
47
48
49
39
38
37
36
35
Motorstart
Alle Schalter auf STOP
X
START
20
21
34
33
31
30
29
27
26
25
24
23
22
32
28
F0023_A1.EPS, F0022_A1.EPS

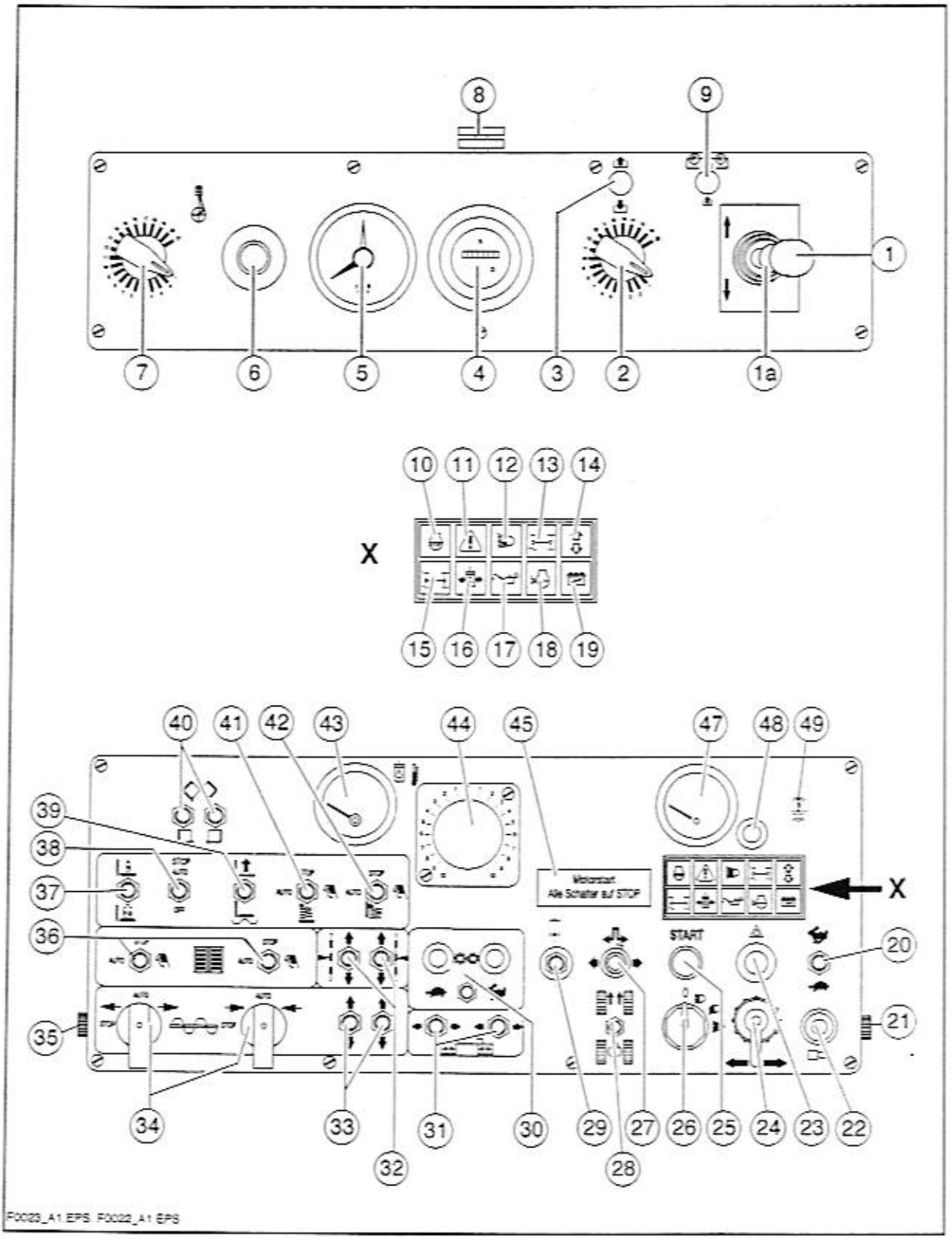
Item	Designation	Brief description
7	Engine speed adjuster ○	For continuous adjustment of the engine speed (when drive lever (1) is at the stop). Min. position: idling speed Max. position: rated speed ☞ For paving, select the rated speed; reduce the speed for transportation. ☞ The automatic speed control keeps the set speed constant even under a load.
8	Latch for operating panel	For securing the movable operating panel against inadvertent movement. - Turn the knurled screw at the desired location into the designated notch and secure with the knurled nut. STOP When not secured, the operating panel can move. Danger of accidents during transportation!
9	Front wheel drive On/Off ○	When in the upper position, the additional front wheel drive is switched on. ⚠ Use the front wheel drive only during paving, never during transportation. Increased wear! ☞ Refer to the valve (85) and the manometer (84) for setting the operating pressure.
10	Engine stop	Lights up when the engine cannot be started (e.g. because the emergency stop button (6) has been pressed). ☞ In this case, see the section "Malfunctions".
11	Error message ○	Is lit when an error has occurred in the electronics.
12	High beam indicator (blue)	Lights up when the high beam is switched on (on the ignition key (26)). STOP Avoid blinding the oncoming traffic!
13	Front-wheel drive ○	Is lit when the front wheel drive is activated.
14	Traction indicator (yellow)	Lights up when the drive lever (1) in the drive position. - The engine cannot be started.

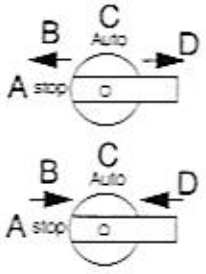

8
9
1
7
6
5
4
3
2
1a
10
11
12
13
14
X
15
16
17
18
19
40
41
42
43
44
45
47
48
49
39
38
37
36
35
Motorstart
Alle Schalter auf STOP
START
X
20
21
34
33
32
31
30
29
28
27
26
25
24
23
22
F0023_A1.EPS, F0022_A1.EPS

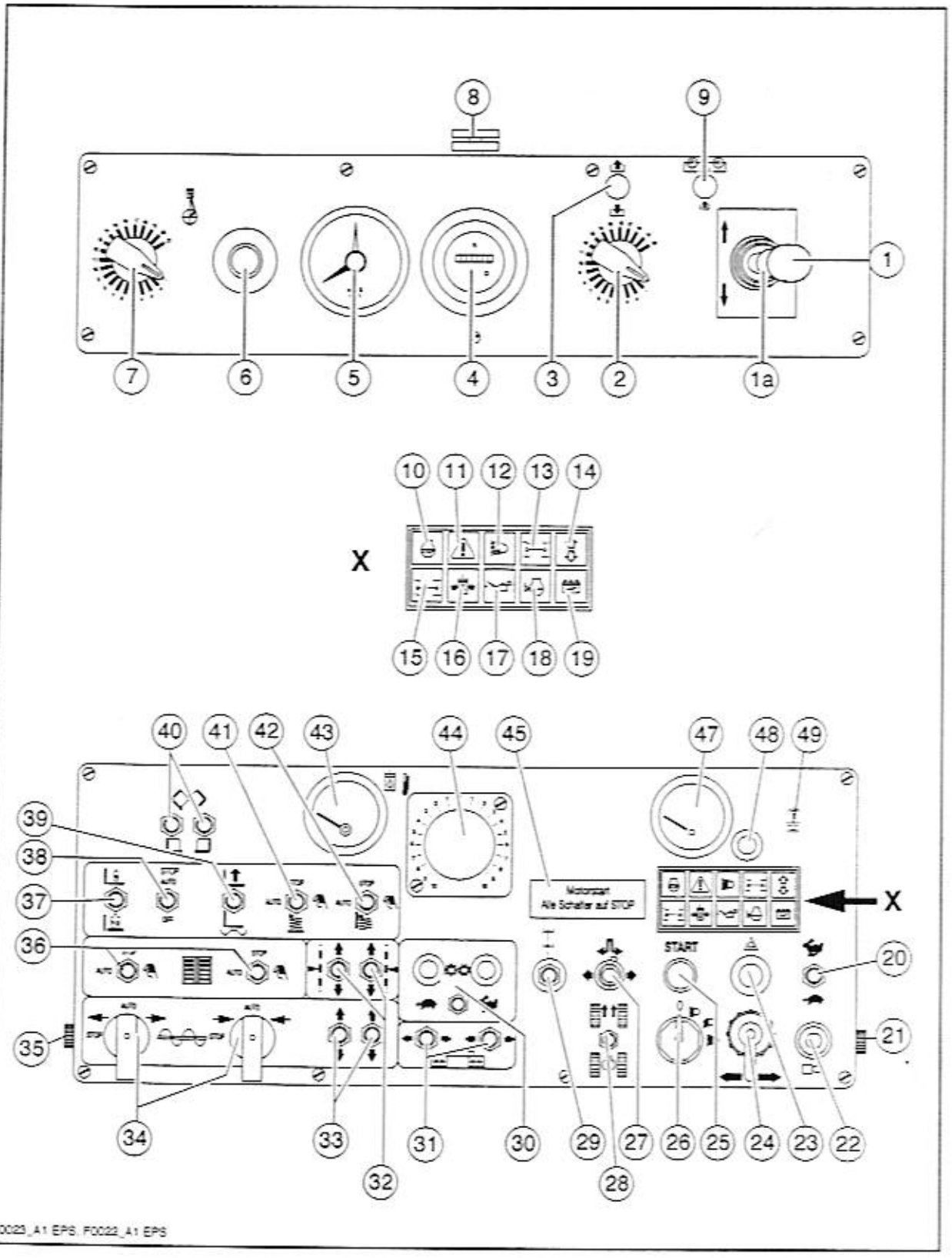
Item	Designation	Brief description
15	Indicator lamp differential lock	Lights up when the differential lock is switched on (using switch 29 or lever 95). ☞ Use the differential lock in the case of traction problems (loose ground). It can be switched on and off during driving. ⚠ Do not negotiate any curves with the differential lock switched on and the screed lifted out. The differential could be damaged. STOP Do not use the differential lock during transportation. Danger due to restricted maneuverability!
16	Oil pressure indicator for the hydraulic traction drive (red)	Must go out right after the engine has been started. Observe warm running. The hydraulic oil is possibly too cold and stiff. ⚠ Do not switch on the traction drive when the lamp does not go out (see the section "Malfunctions"). ☞ The lamp goes out when the pressure drops below 2.8 bar = 40 psi.
17	Oil pressure indicator lamp for the diesel engine (green)	Must go out right after the engine has been started. ⚠ Switch the engine off immediately if the lamp does not go out (see the section "Malfunctions") For further possible malfunctions, see the operating instructions for the engine.
18	Cooling water indicator (red)	Lights up when the cooling water level is too low. - Switch off the engine immediately (see the section 3).
19	Battery charge indicator (red)	Must go out after starting when the engine revs up. - Switch off the engine (see the section 3).
20	not used	
21	Socket for automatic leveling/ slope, right	For connection of the slope control (○) or the grade control system (○) when the right-hand side (leveling cylinder on the traction point) is to be controlled by the controller. ☞ For the left-hand side, see socket (35).
22	Horn	Press in the case of emergencies and to indicate when the machine starts to move!
23	Hazard flasher	Switch on as a protective measure on roads.


8
9
1
1a
7
6
5
4
3
2
10
11
12
13
14
X
15
16
17
18
19
40
41
42
43
44
45
47
48
49
39
38
37
36
35
34
33
32
31
30
29
28
27
26
25
24
23
22
20
21
Motorstart
Alle Schalter auf STOP
START
X
F0023_A1.EPS, F0022_A1.EPS

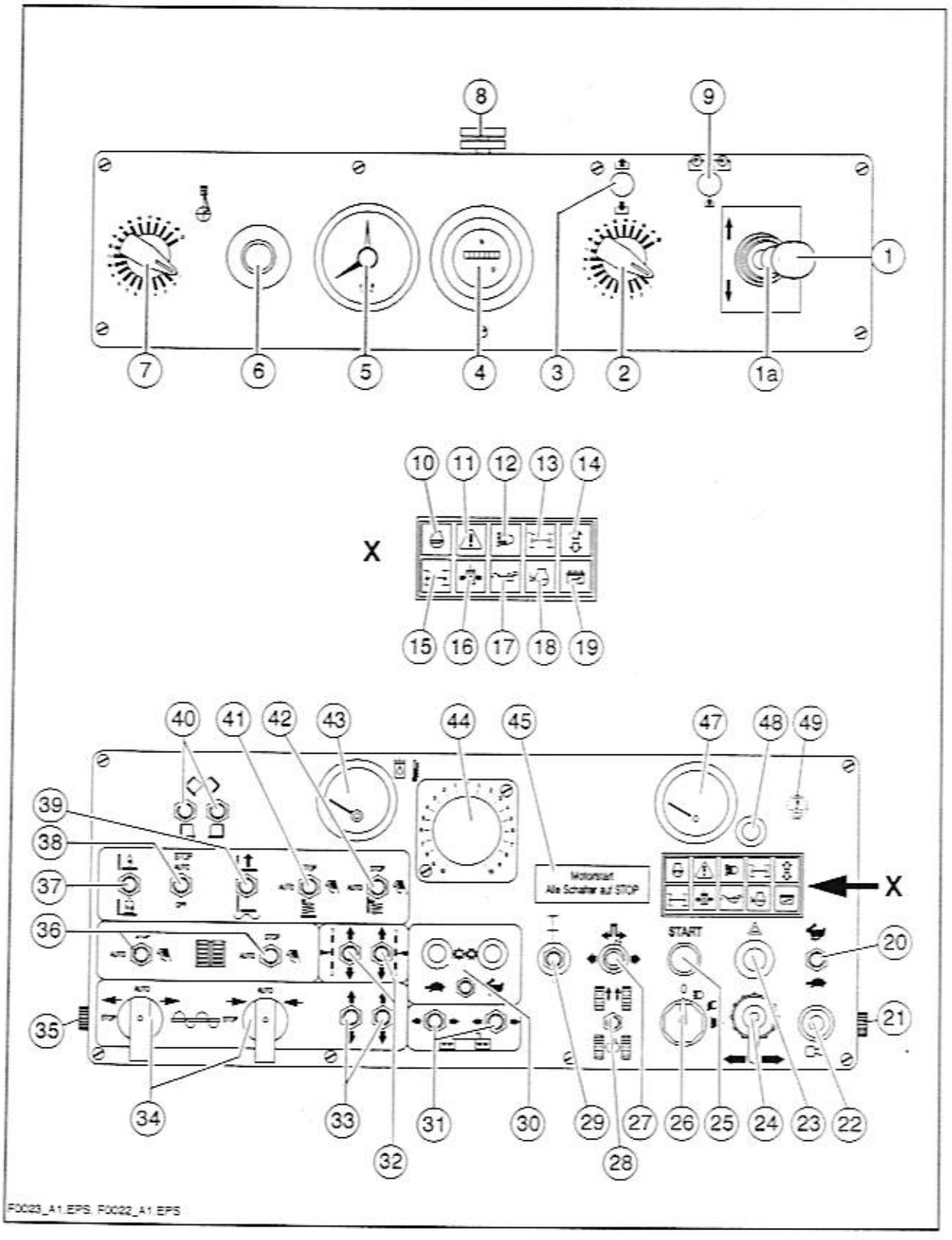
Item	Designation	Brief description
24	Drive direction indicator	Actuate when changing the drive direction on roads.
25	Starter	Starting is only possible when the driver lever (1) is in the neutral position. All emergency stop buttons (on the operating panel and the remote controls) must be pulled out.
26	Ignition lock and illumination switch	Key inserted: ignition on. Key removed: ignition and engine off. Key positions: 0 Lights off 1 Parking/rear lights, instrument panel illumination, working lights (if applicable) 2 Low beam 3 High beam ☞ To overcome the lock between positions 1 and 2, press in the key.
27	not used	
28	not used	
29	Electrical differential lock ○	For switching the differential lock on and off (also refer to lever 95). - Switching on: switch down; indicator lamp (15) lights up when the lock engages. - Switching off: switch up; drive until the indicator lamp goes out. **Important:** For application and possible dangers, refer to indicator lamp (15).
30	Electrical transmission shifting ○	This shifts the transmission.
31	Extend/retract screed parts ○	In the case of variable screeds, the extendable parts can be hydraulically extended/retracted with this switch. ☞ In EU countries, this is only allowed with switch (59) on the remote control.
32	Leveling cylinder left/right	For manually actuating the leveling cylinders when automatic leveling is switched off. Switch (60) (on the remote control) must be set to "manual.


8
9
1
7
6
5
4
3
2
1a
10
11
12
13
14
X
15
16
17
18
19
40
41
42
43
44
45
47
48
49
39
38
37
36
35
Motorstart
Alle Schalter auf STOP
X
START
20
21
34
33
32
31
30
29
28
27
26
25
24
23
22
F0023_A1.EPS F0022_A1.EPS

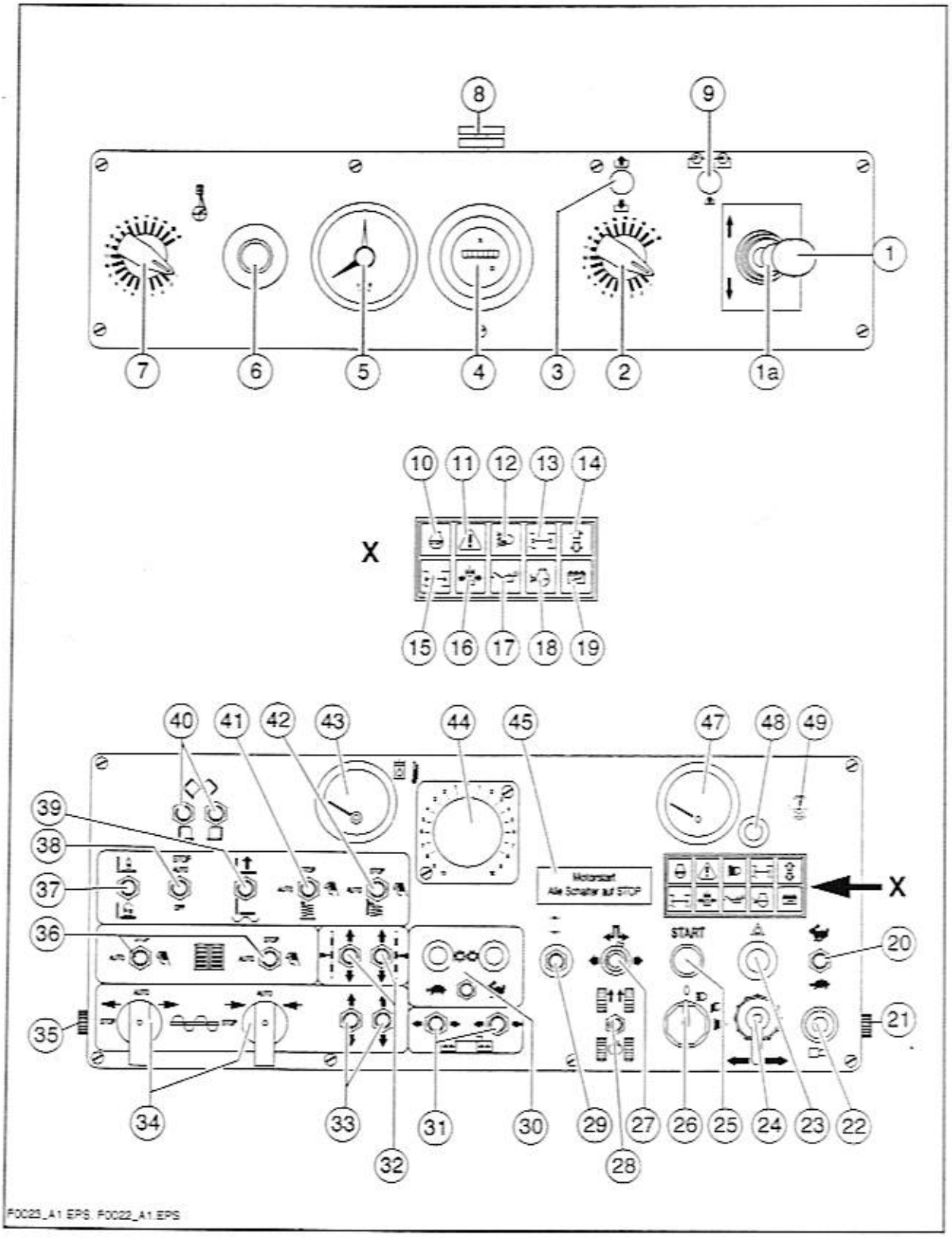
Item	Designation	Brief description
33	Adjustment of the auger beam left/right ○	For changing the height of the auger in the case of a hydraulically adjustable auger frame. - The height can be read on the scales to the left and the right of the auger frame support. Rule of thumb: paving thickness plus 5 cm (2 inches) equals the auger frame height. ⚠ Actuate both switches at the same time as otherwise the auger frame is jammed!
34	Auger left/right 	**A stop:** Off **B manual:** feeding outwards **C auto:** switched on with driver lever 1 and Material limit switch on the auger continuously controlled **D manual:** feeding inwards ☞ In positions (B) and (D), the auger half is running permanently (with full feed capacity, without automatic material control). To automatically operate the auger via the mechanical limit switch or the ultrasonic sensor (○), both switches must be set to "auto".
35	Socket for automatic leveling/ slope, left	For connection of the slope control (○) when the left-hand side (leveling cylinder on the traction point) is to be controlled by the controller. ☞ For the right-hand side, see socket (21).
36	Conveyor, left/right	**auto:** switched on with drive lever (1) and continuously controlled by the material limit switch **stop:** Off **manual:** permanently switched on (with full feed capacity, without material control) - To automatically operate the conveyor via the remote control (○), both switches must be set to "auto".


8
9
1
7
6
5
4
3
2
1a
10
11
12
13
14
X
15
16
17
18
19
40
41
42
43
44
45
47
48
49
39
38
37
36
35
Motorstart
Alle Schalter auf STOP
X
START
20
21
34
33
32
31
30
29
28
27
26
25
24
23
22
F0023_A1.EPS F0022_A1.EPS

Item	Designation	Brief description
37	Screed charging/ relieving device 	For charging/relieving the screed to influence traction and the compacting ratio. **A:** Relieving (screed 'lighter') **B:** No function **C:** Charging (screed 'heavier') - Pressure regulating valve (82) must be used to set the charging/relieving factor. - For "screed stop with pretensioning", position **A** must be selected (see switch (38) and pressure regulating valve (85)). ☞ Refer to section 3.7 for using the screed charging/ relieving device.
38	Screed stop 	"Screed stop" is used to lock the screed hydraulics to keep the screed from sinking into the material when the paver finisher is at a standstill (intermediate stop). **A:** Automatic when the drive lever (1) is in the center position - Position **C** is used for setting up the paver finisher, position **A** for paving. **B:** Permanently switched on **C:** Off STOP Position **B** is not sufficient for securing the screed during transportation or servicing! Insert the mechanical screed transport safeguard (90)! - Using the screed charging/relieving device (37) and the pressure regulating valve (85) (see there), a "screed stop with pretensioning" can be set. ☞ Refer to section 3.7 for using the screed stop.
39	Screed position 	**A:** Lift screed **B:** Hold screed (position for inserting the screed transport safeguard (90)) **C:** Lower screed and assume the "floating position" ⚠ During paving, the screed must always be in the floating position. This also applies to intermediate stops and truck changes when the automatic screed stop (38) is used.


8
9
1
7
6
5
4
3
2
1a
10
11
12
13
14
X
15
16
17
18
19
40
41
42
43
44
45
47
48
49
39
38
37
36
35
34
33
32
31
30
29
28
27
26
25
24
23
22
21
20
Motorstart
Alle Schalter auf STOP
START
X
F0023_A1.EPS F0022_A1.EPS

Item	Designation	Brief description
40	Open/close hopper	Top: Close hopper halves Center: No function Bottom: Open hopper halves Separate actuation (○): Is required when paving in spaces where there is only limited space at one side or when obstacles obstruct unloading of the truck.
41	Vibration (screed-specific)	Operation and application: see switch (42). Speed control (see the section 2.3 "Speed regulator, vibration").
42	Tamper (screed-specific)	**auto:** switched on with drive lever (1) switched off when at a standstill **stop:** completely switched off **manual:** permanently switched on As a rule, "auto" is used for paving. ⚠ When the switch is set to "manual" during paving, it must be set to "stop" when at a standstill. Otherwise, excessive compacting occurs! ☞ Speed control (see the section 2.3 "Speed regulator, tamper") .
43	Temperature indicator for hydraulic oil	Normal display up to 85 °C = 185 °F. ⚠ Stop the paver finisher when higher temperatures are encountered (drive lever (1) to the center position), let the engine cool down while idling. Determine the cause and correct it if necessary (see the section 3).
44	Steering wheel	The steering wheel movement is transferred hydraulically to the front wheels. STOP Heed the special steering ratio when transporting the machine through narrow curves (ca. 3 turns for a full steering deflection). Danger!
45	Label	All switches for the auger and the conveyor must be set to "Stop" (36 / 34). ☞ The diesel engine cannot be started up in the "Auto" position.

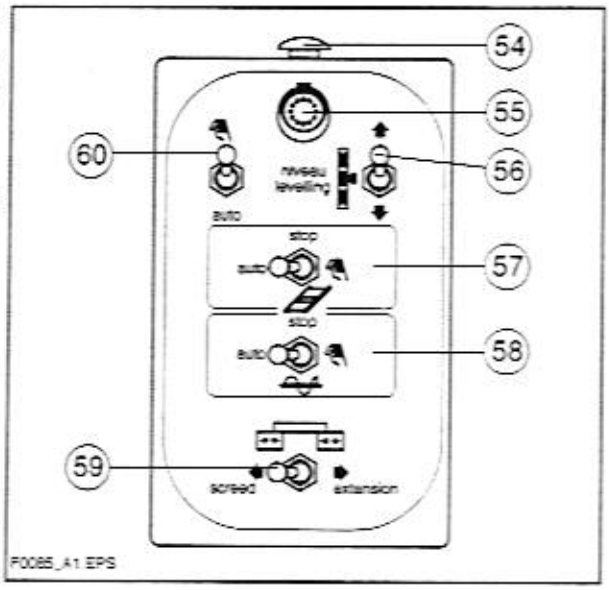

8
9
1
1a
2
3
4
5
6
7
10
11
12
13
14
15
16
17
18
19
X
40
41
42
43
44
45
47
48
49
39
38
37
36
35
34
33
32
31
30
29
27
28
26
25
24
23
22
20
21
Motorstart
Alle Schalter auf STOP
START
X
F0025_A1.EPS F0022_A1.EPS

Item	Designation	Brief description
47	Fuel gauge	Always heed the fuel gauge. ⚠ Do not completely empty the diesel tank! Otherwise, the entire fuel system must be ventilated.
48	Fuse, traction drive	Protects the traction controller of the traction drive. ☞ See the section "Malfunctions" if the traction drive does not react.
49	Engine temperature indicator (red)	Lights up when the engine temperature is to high. ⚠ The engine performance will be throttled down automatically (still possible to process the paver finisher). Stop the paver finisher (drive lever (1) to the center position), let the engine cool down while idling. Determine the cause and correct it if necessary (see the section "Malfunctions"). After cooling down to normal temperature, the engine will run with full performance again.

2.1 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.

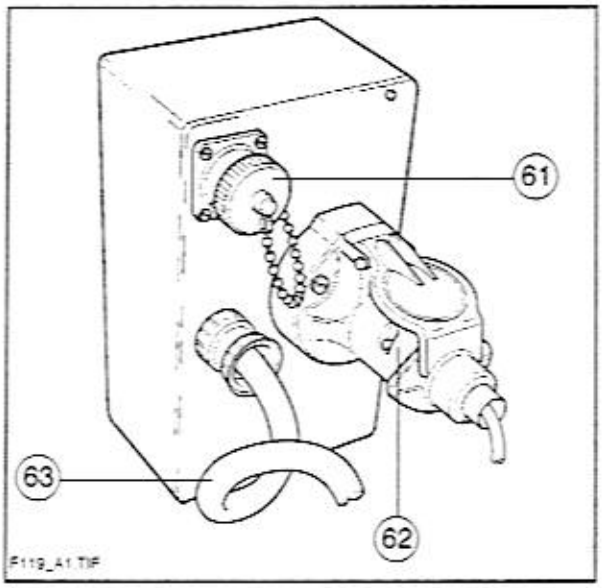
- The housing is fixed to the side panel of the screed.



Front

Item	Designation	Brief description
54	Emergency stop button ○	Function and application as with the emergency stop button (6) on the operating panel. Important for dangerous situations when the driver's "sight" is restricted.
55	Horn ○	Function as for push-button (22) on the operating panel.
56	Leveling cylinder	Function and application as for switch (32) on the operating panel. - Switch (60) must be set to "manual".
57	Conveyor ○	Function and application as for switch (36) on the operating panel. - The switches must be set to "auto".
58	Auger	Function and application as for switch (34) on the operating panel. - The switches must be set to "auto".
59	Extend/retract screed parts	Used to hydraulically extend or retract the extendable parts of the variable screed.
60	Automatic leveling system	manual: Height adjustment possible with switch (56) (or switch (32) on the operating panel) auto: Automatic height adjustment by means of the grade control unit

Rear

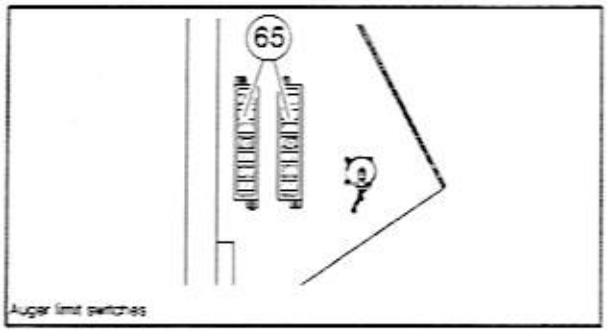


Item	Designation	Brief description
61	Socket for automatic leveling	Connect the cable for the grade control unit here.
62	Socket for auger limit switch	Connect the cable for the material limit switch here.
63	Cable for the remote control	Connect the plug to the screed (see operating instructions for the screed).

2.2 Operating elements on the paver finisher

Fuse box (65)

Two fuse strips containing blade-type fuses are located laterally on the operating panel.

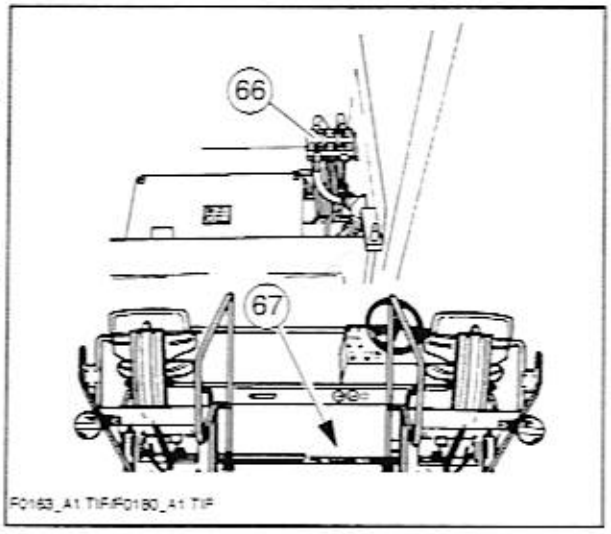


☞ For the fuse assignment, see chapter **F**.

Main fuses (66, 67)

Beneath the right-hand side flap, there is a fuse box (66) containing two high-current fuses.

There is a another fuse box (67) beneath the right-hand bottom flap of the driver's platform.

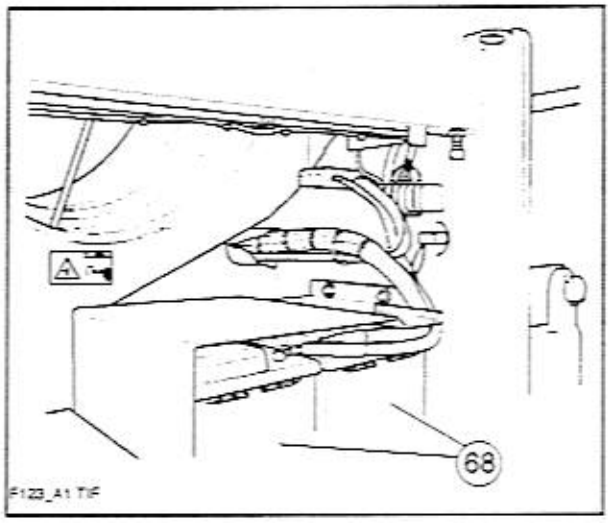


☞ For the assignment of the main fuses, see chapter **F**.

Batteries (68)

The batteries of the 24 V system are located beneath the right-hand side flap.

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

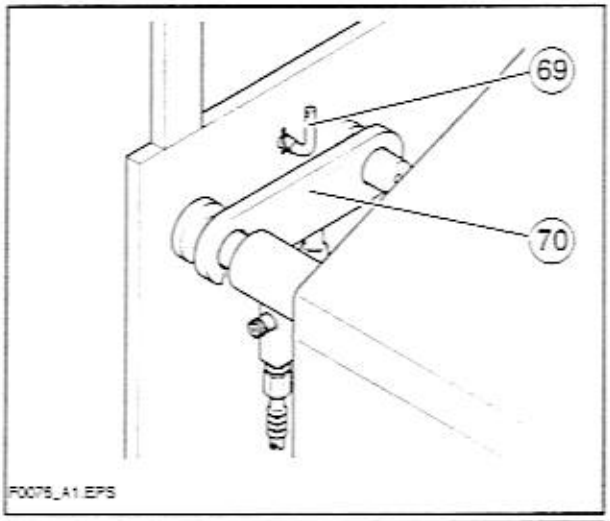


Battery main switch (69)

The main switch interrupting the circuit between the battery and the main fuse (66) is located on the right-hand side – between the front wall and the hopper.

- For switching off, turn the key pin (69) to the left and pull it out.

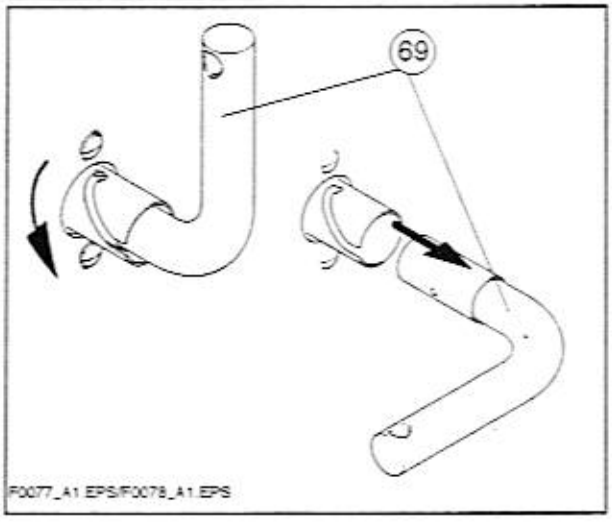
☞ Do not lose the key pin as in this case the paver finisher can no longer be moved!



Transport safeguards for the hopper (70)

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

STOP 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 adjuster for the conveyor limit switches (depending on the configuration) (73)

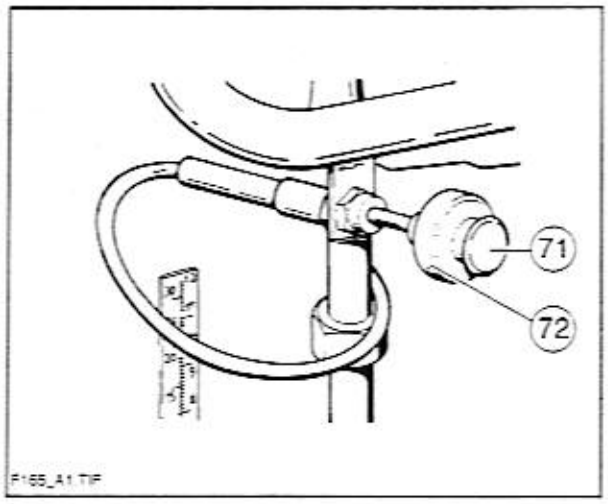
Used to define the switching point of the material limit switches (74) in the tunnel (see below), thus defining the conveyor performance. Coarse adjustment:

Coarse adjustment:

- Push in button (71) and pull out or push in the bowden cable.

Fine adjustment:

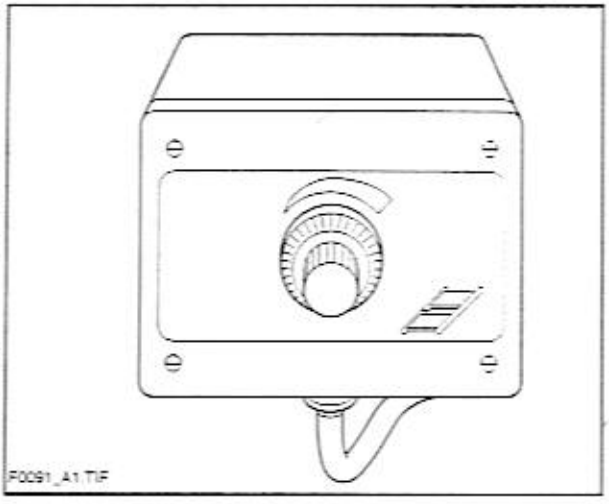
- Turn button (72).



Electrical adjustment of the conveyor performance (depending on the configuration)

Used to adjust the conveyor performance – either by mechanical limit switches (see below) or by ultrasonic scanning (option).

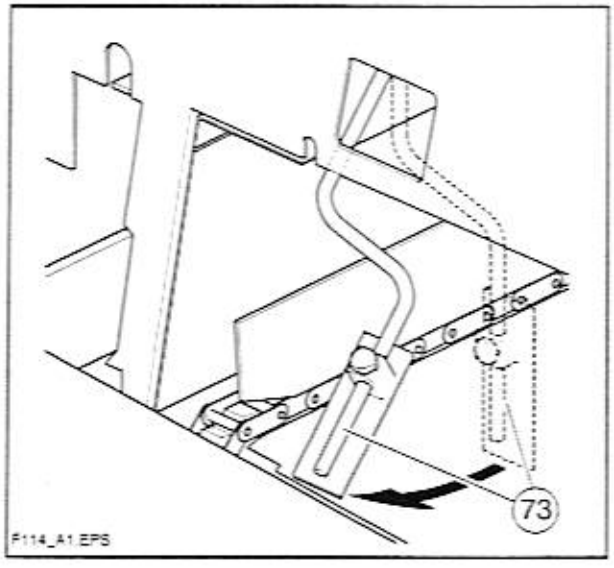
- Position "0" on the scale matches the lowest conveying rate that can be set.



Adjustment of the limit switches:

The conveyors should stop when the material has roughly reached the area below the auger tube.

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

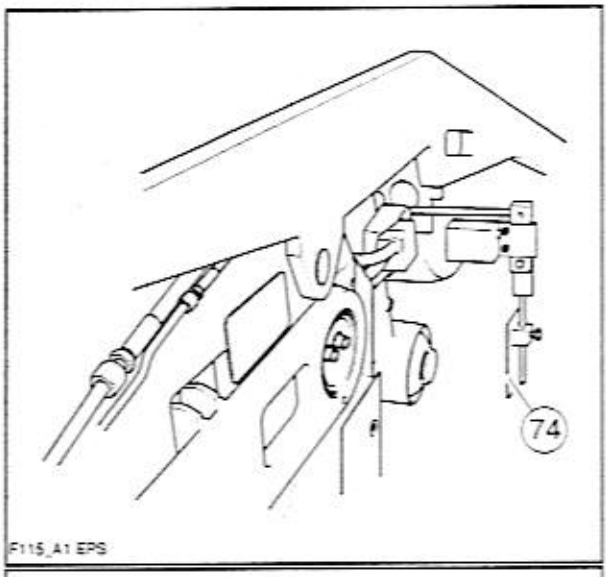


Auger limit switches (left and right)

☞ The limit switch controls the material flow at the respective auger half.

Electrical limit switch (74)

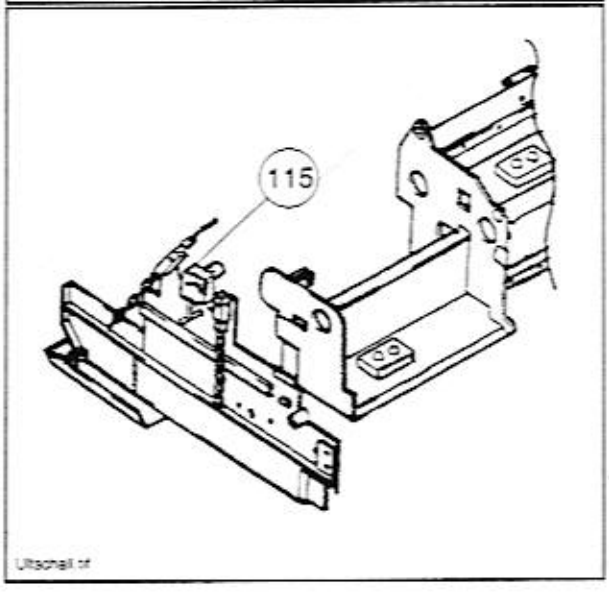
The electrical limit switch can be mounted to the auger support tube or to the side plate.
The cables must be connected to socket (78) or the remote control units located at the sides of the screed (socket (62)).



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

Ultrasonic limit switch (115)

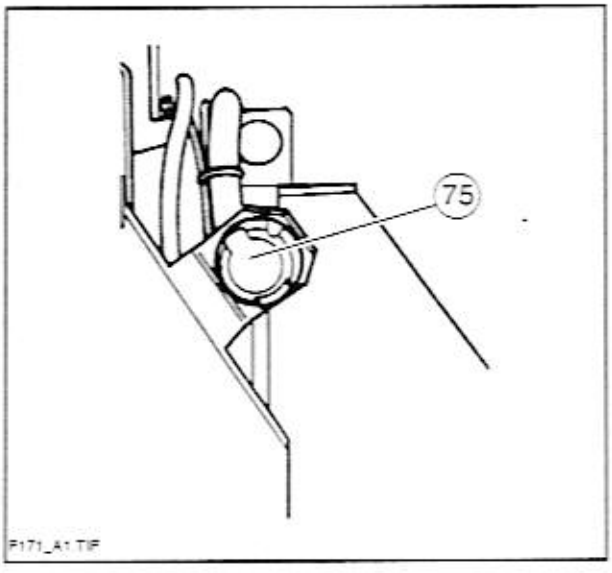
The ultrasonic sensor is mounted by means of an appropriate leverage to the side plate.
The cables must be connected to socket (78) or the remote control units located at the sides of the screed (socket (62)).



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

Sockets for the remote control (left and right) (75)

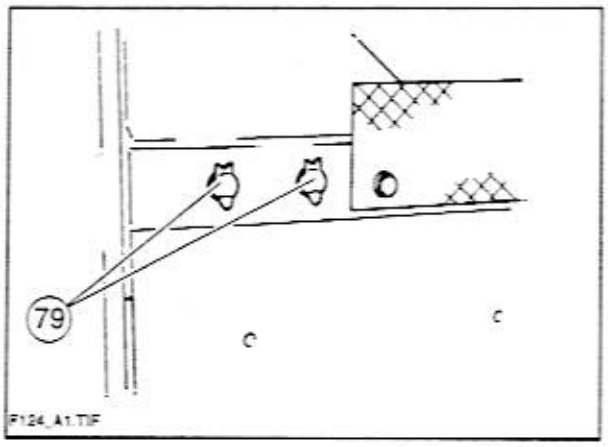
Connect the cable (63) of each large remote control unit to socket (75).



Sockets for working lights (left and right) (79)

Connect the working lights (24 V) here.

- Power is present when the main switch (69) is switched on.

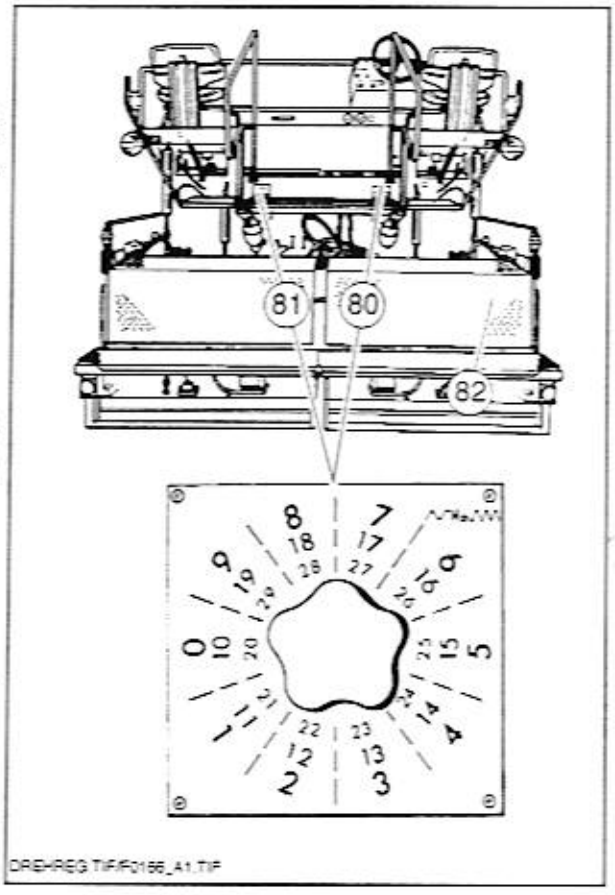


☞ As an option, one socket can be used to provide power for an electrically heated seat.

Speed regulator, tamper (screed specific) (80)

Used to set the desired speed (frequency) of the screed movement. Adjustment range:

Adjustment range:
3 turns = 30 scale divisions
= 0...max. frequency



☞ For the tamper frequency, see the section "Technical data" in the operating instructions for the screed.

Speed control, vibration (screed specific) (81)

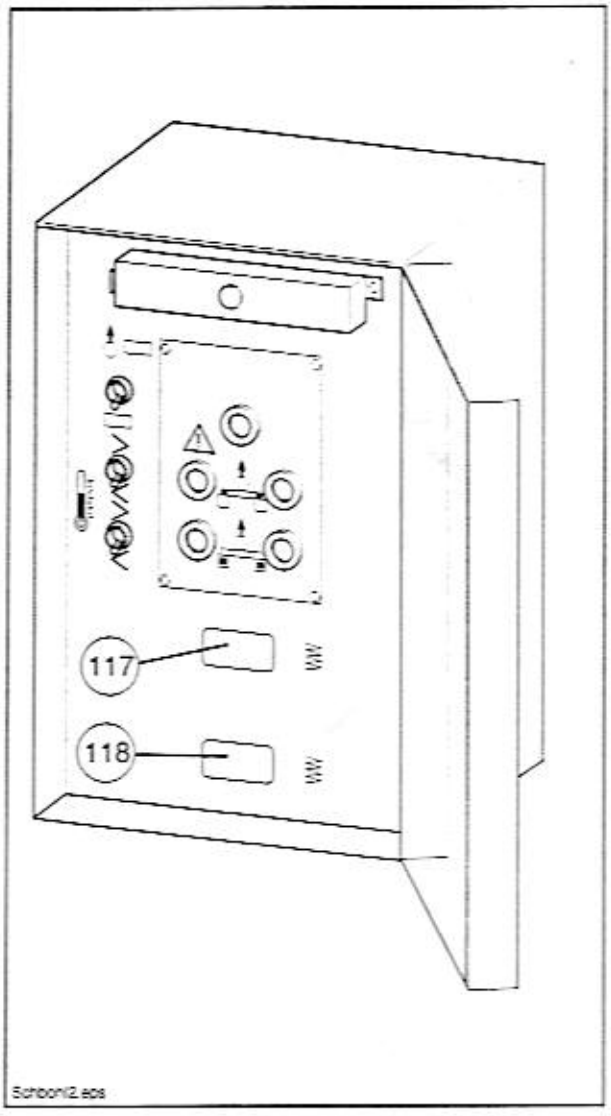
Operation as for the speed regulation for the tamper (80).

Adjustment range:
3 turns = 30 scale divisions
= 0...max. frequency

☞ For the vibration frequency, see the section "Technical data" in the operating instructions for the screed.

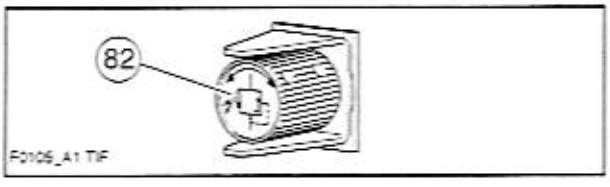
Speed / RPM display (116)

The speed / RPM display, which is available as an option, can be used to optimally adjust the tamper and vibration speeds to different paving situations.
When the heater is switched on, the current speed is automatically displayed (range 0 to maximum).
During paving, the speeds can be easily checked and, if necessary, readjusted.
The upper display (117) shows the current tamper speed.
The lower display (118) shows the current vibration speed.



Pressure control valve for screed charging/relieving (82)

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



- Activation: see "screed charging/relieving device" (37).
- Pressure display: see manometer (83).

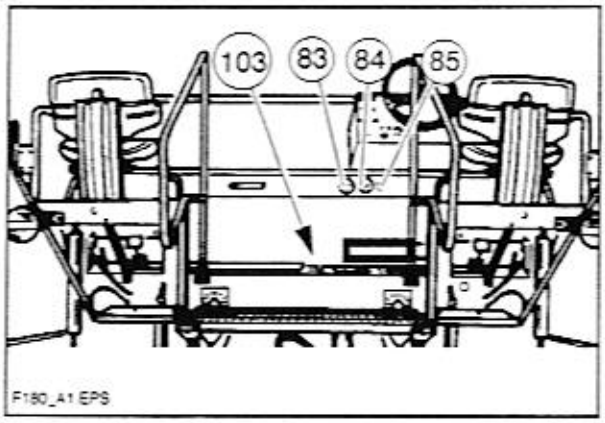
☞ Application: see the section 3.7

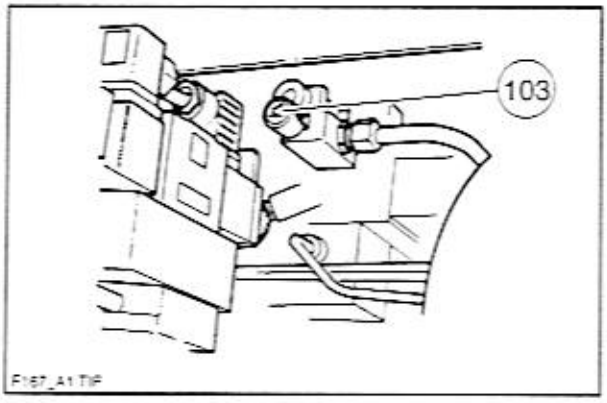
Pressure control valve for screed stop with pretensioning (103)

This valve is located beneath the right-hand bottom flap of the operator's platform.

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

- Activation: see "screed charging/ relieving device" (37).
- Pressure display: see manometer (83).

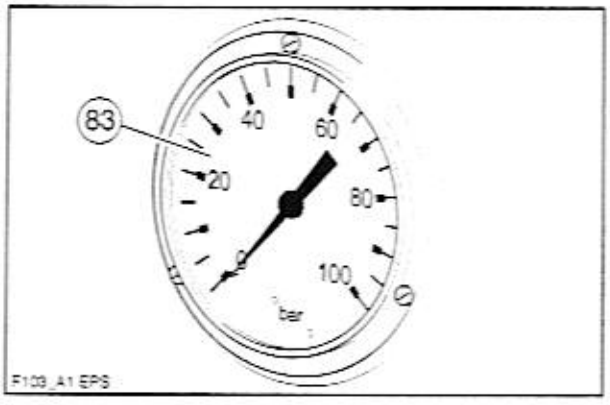




Manometer for screed charging/ relieving and screed stop with pretensioning (83)

Displays the pressure for

- screed stop with pretensioning when the drive lever (1) is set to the neutral position (pressure to be adjusted using valve (103).
- screed charging/relieving device when the drive lever (1) is in the third position. Pressure to be adjusted using valve (82).

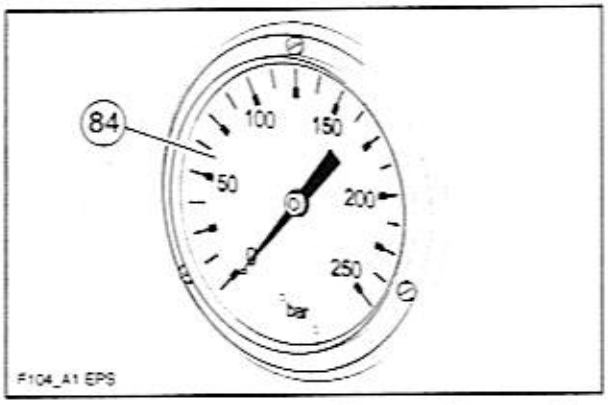


☞ Application: see the section 3.7

Manometer for front wheel drive (84) ○

Displays the operating pressure for the additional front wheel drive.

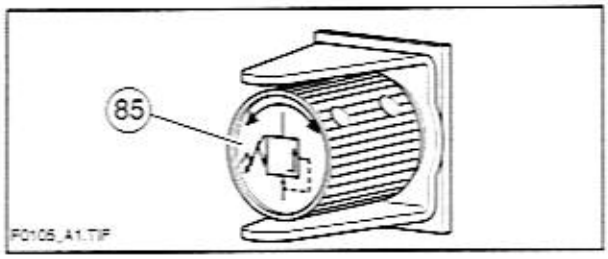
Pressure adjustment with valve (85)
Recommended: ca. 110 - 140 bar
Maximum value: ca. 200 bar



☞ When using the anti-skid controller (ASC – ○) the optimum value is automatically adjusted according to the varying traction conditions.
Therefore, the maximum value should be adjusted to ca. 200 bar.

Pressure regulating valve for front wheel drive (85) ○

Used to set the operating pressure for the additional front wheel drive.



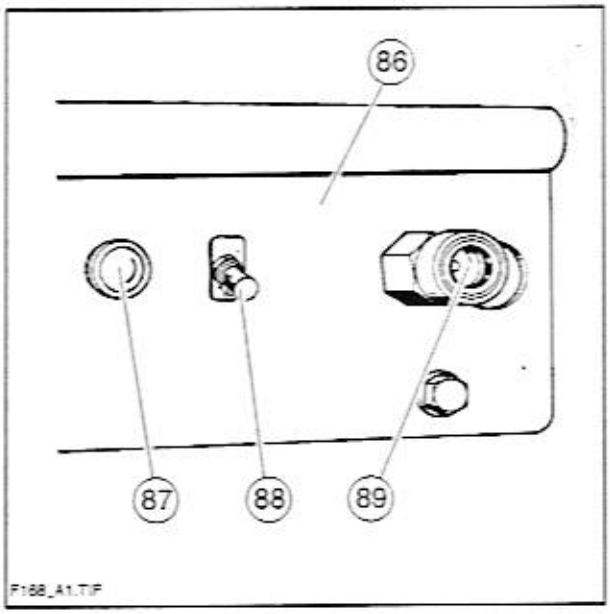
- Use switch (9) to switch on the front wheel drive.
- For the pressure indication, see manometer (84).

☞ Set the pressure while the paver finisher moves in such a way that the front wheels do not slip.

Separator fluid spraying system (86) ○

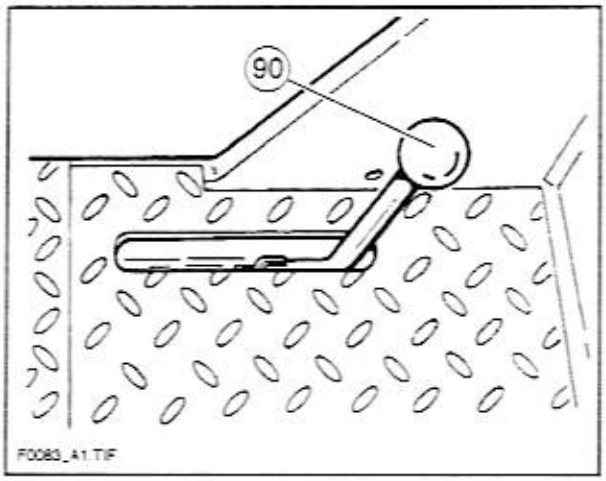
Used to spray the parts coming into contact with asphalt with a separator emulsion.

- The indicator lamp (87) lights up when the emulsion pump is running
- On/off switch (88) for the emulsion pump
- Quick-release coupling (89) for hose connection



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

Mechanical screed transport safeguard (to the left and the right beneath the driver's seat) (90)

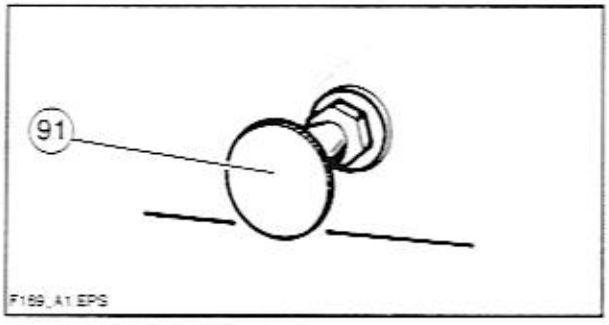


Used to protect the lifted screed from inadvertent lowering. The screed transport safeguard must be inserted before transportation and when work is finished.

STOP Transportation with an unsecured screed bears the danger of accidents!

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

Seat lock (behind the driver's seat) (91)



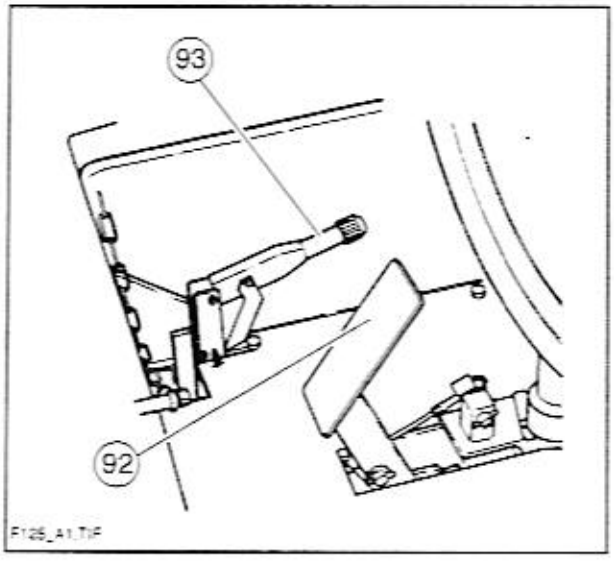
Telescoping seats (○) can be extended beyond the basic width of the paver finisher. They must be locked (also refer to "Latch for operating panel" (8)).

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

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

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

Service brake ("foot brake") (92)



There is a brake pedal in front of each of the driver's seats to the left and to the right.The service brake acts on two disc brakes on the main drive axle.

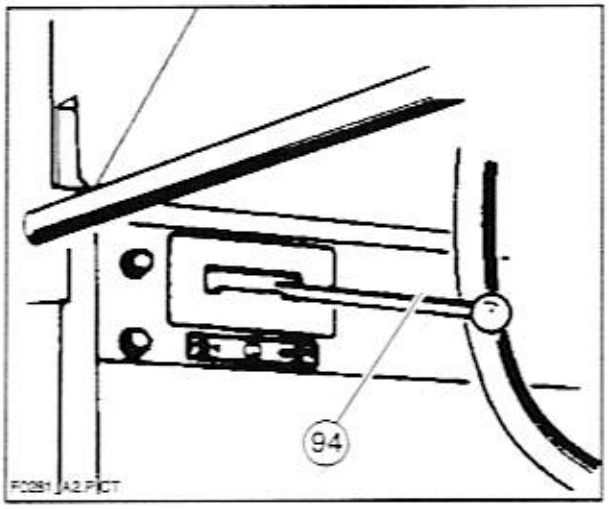
☞ When the brake is actuated, the speed of the traction drive is automatically reduced (regardless of the drive lever position (1)).

Parking brake ("hand brake") (93)

The brake lever is located to the left of the driver's seat (option: on both sides). The parking brake acts mechanically on one of the disc brakes on the main drive axle.

Always apply the brake whenever parking the paver finisher!

Switch lever for two-speed transmission (94)



The switch lever has three positions:

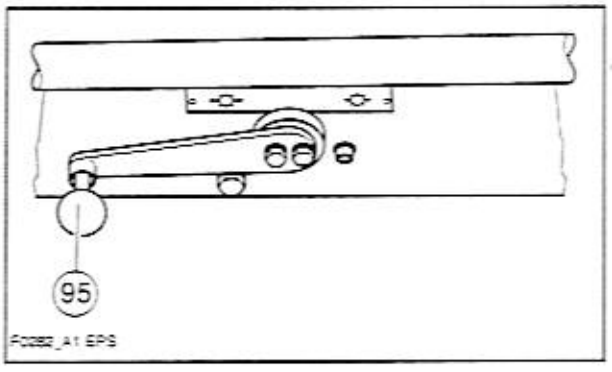
◂ = Paving
0 = Neutral
◂◂ = Transportation

Apply the parking brake (93) before changing the lever position. Only change the lever position when the paver finisher is at a standstill!

- Slightly move the drive lever (1) if the desired speed cannot be selected.

Set the lever to the neutral position when towing the paver finisher (e.g. when the diesel engine has failed). Otherwise, the transmission might be damaged.

Switch lever for the differential lock (95)



Used to switch the differential lock on and off (also see switch (29)).

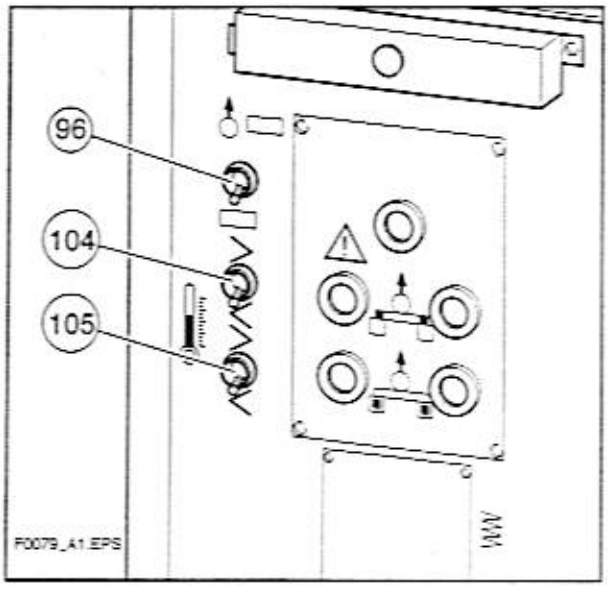
Switching on:
- Lever to the right; the indicator lamp (15) lights up when the lock has engaged.

Switching off:
- Lever to the left; drive until the indicator lamp (15) goes out.

Application and dangers: see indicator lamp (15).

2.3 Switch box for the gas heater system

Switch



On/Off switch (96)

Up: Heater switched off.

Down: Heater switched on.

Temperature level for the basic screed (104)

Position <: High temperature

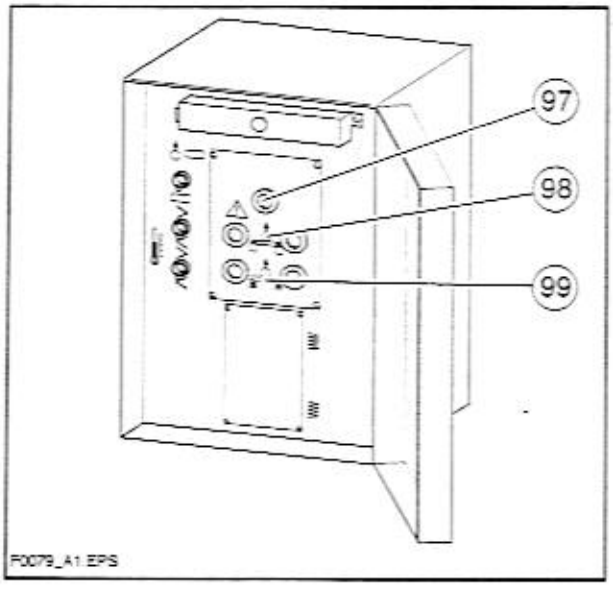
Position <: Low temperature

Temperature level for the extendable parts (105)

Position <: High temperature

Position <: Low temperature

Indicator lamps



Heater indicator (97)

Indicates whether or not the heater system is switched on.

Heating of the basic screed (98)

Indicates whether or not the heater of the basic screed is switched on.

Heating of the extendable parts (99)

Indicates whether or not the heater of the extendable parts is switched on.

☞ For the operation of the gas heater system, see the section 3.3.

D F12W.GB 30-62 0898

3 Operation

3.1 Preparing for operation

Required devices and aids

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

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

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

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

Checklist for the machine operator

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

3 Operation

3.1 Preparing for operation

Required devices and aids

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

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

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

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

Checklist for the machine operator

Check!	How?
Emergency stop button - on the operating panel - on both remote control units ○	Push in the button. The diesel engine and all running drives must stop immediately.
Steering	The paver finisher must immediately follow every steering wheel movement in a precise manner. Check straight running.
Horn - on the operating panel - on both remote control units ○	Briefly press the horn button. The horn must sound.
Lights	Switch on with the ignition key, walk around the paver finisher to check and switch off again.
Hazard warning lights of the screed (with vario screeds)	With the ignition switched on, press the switches for extending/retracting the screed parts. The rear lights must flash.
Gas heater system: - Bottle holders - Bottle valves - Pressure reducer - Hose break safety devices - Shut-off valves 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 lifted, it must be possible to push the locking rods sideways into the recesses in the crossbeams using the lever beneath the seat.
Hopper transport safeguard	When the hopper is closed, it must be possible to fold the catches over the lock studs on the two halves of the hopper.
Protective roof	Both locking bolts must be in the provided bore hole and secured by means of a split pin.
Miscellaneous: - Engine hood - Lateral flaps	Check that the hoods and flaps are securely seated.
Accessories: - Wedges - Warning triangle - First-aid kit	The accessories must be in the provided holders.

3.2 Starting the paver finisher

Before starting the paver finisher

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

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

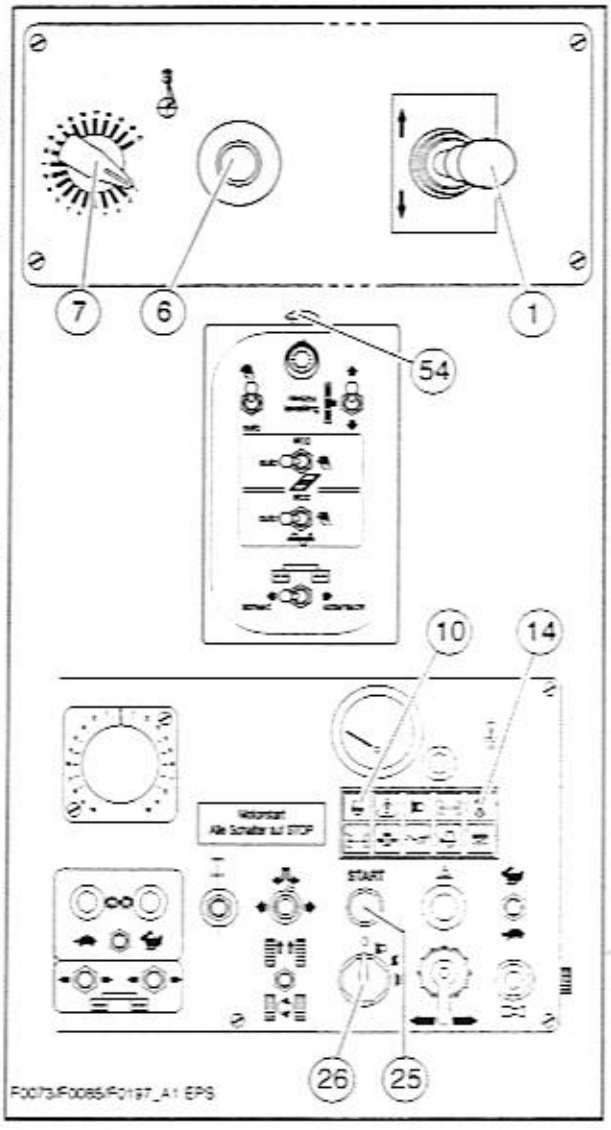
⚠ Check the operating hour counter to determine whether or not additional maintenance work (such as monthly or yearly maintenance) must be performed.

- Check the safety devices and protective devices.

"Normal" starting

Set the drive lever (1) to the center position and the speed adjuster (7) to minimum

- Insert the ignition key (26) in position "0". The lights should be switched off during starting to reduce the current drain on the battery.



☞ Starting is not possible when the traction indicator (14) lights up (drive lever not in the center position) or when the engine stop indicator (10) is active (emergency stop button (6) or (54) on the remote control unit (○) has been pressed, switch for the auger or conveyor is switched on).

- Press the starter button (25) to start the engine. Do not let the starter run permanently for more than 20 seconds; allow for a break of 1minute after every attempt!

External starting (starting aid)

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

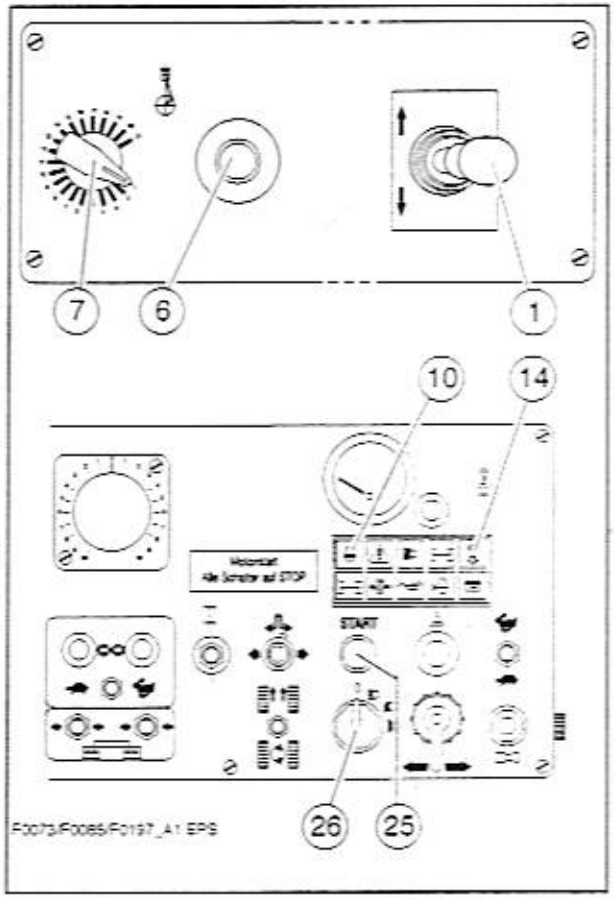
Suitable power sources are:

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

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

To externally start the engine:

- Set the drive lever (1) to the center position and the speed adjuster (7) to minimum.
- Insert the ignition key (26) in position "0" to switch on the ignition.
- Use appropriate cables to connect the external power source.



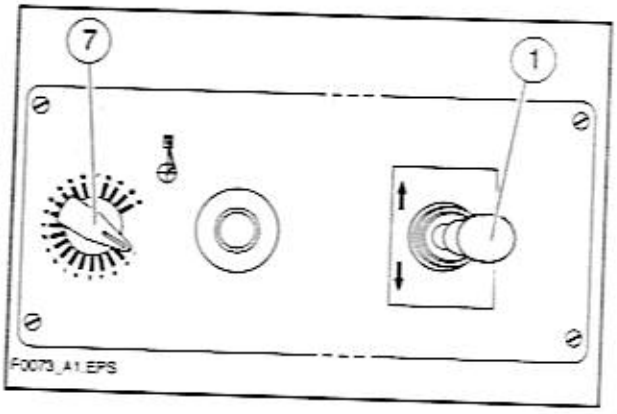
⚠ Observe the polarity! Always connect the negative cable last and disconnect it first!

- Press the starter button (25) to start the engine. Do not let the starter run permanently for more than 20 seconds; allow for a break of 1minute after every attempt!

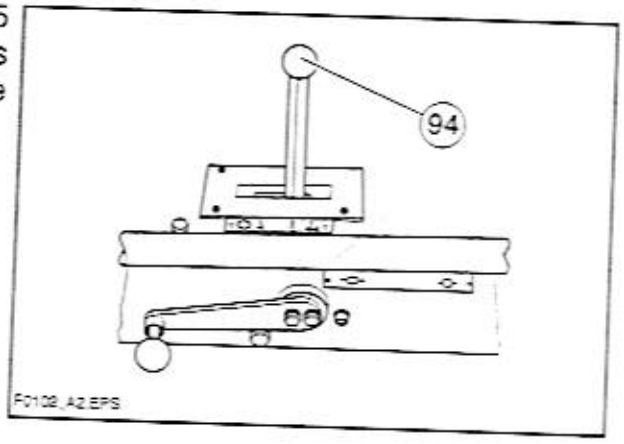
After starting

To increase the engine speed:

- Set up engine speed adjuster (7) to medium speed.
- Set the drive lever (1) to position 1 (slightly off the center position).



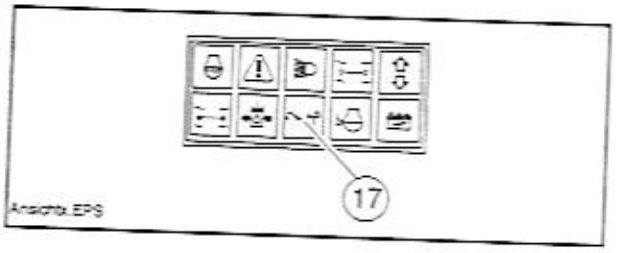
⚠ Let the paver finisher warm up for ca. 5 minutes if the engine is cold. For this purpose, set the switching lever of the two-speed transmission (94) to neutral.



Indicator lamps

The following indicator lamps must be observed under all circumstances:

Oil pressure indicator lamp for the diesel engine (17)

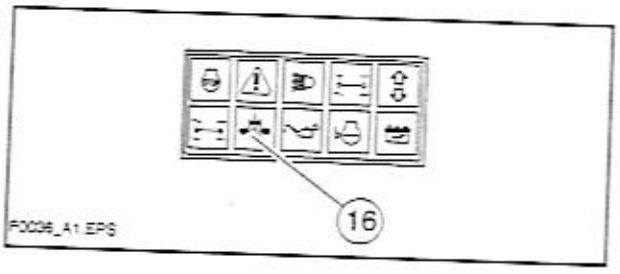


- Must go out right after the engine is started.

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

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

Oil pressure indicator lamp for the traction drive (16)

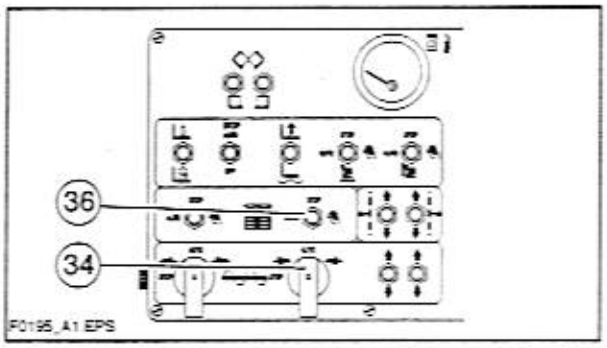


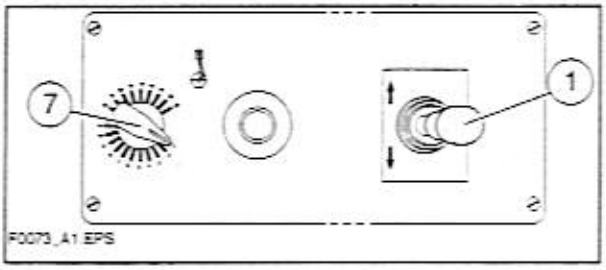
- Must go out after starting.

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

When the hydraulic oil is cold:

- Set the conveyor switch (36) to "manual" and the auger switch (34) to "manual" (arrow).
- Set the speed adjuster (7) to medium speed and tilt the drive lever (1) until conveyor and the auger start operating.
- Let the hydraulics warm up until the indicator lamp goes out.

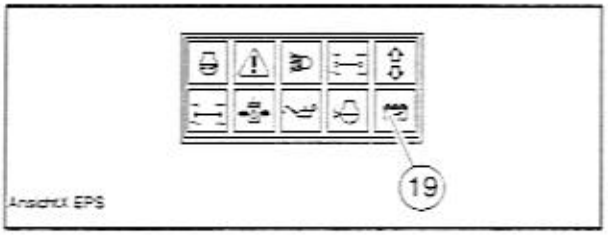




☞ The lamp goes out when the pressure drops below 2.8 bar = 40 psi.

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

Battery charge indicator (19)



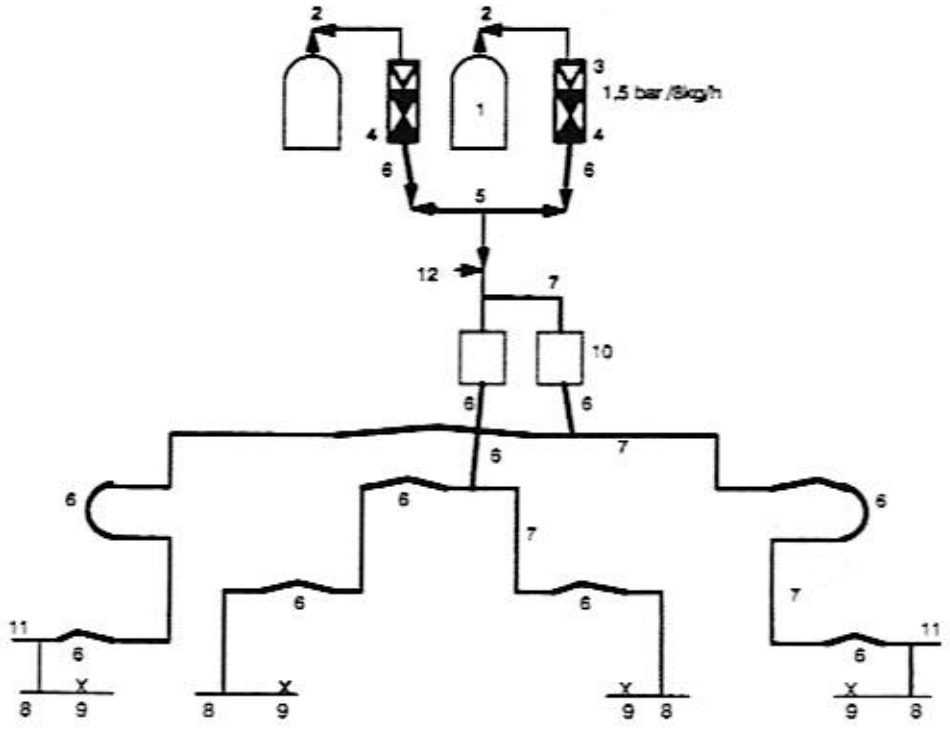
Must go out when the engine revs up after the start.

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

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

3.3 Gas heater system

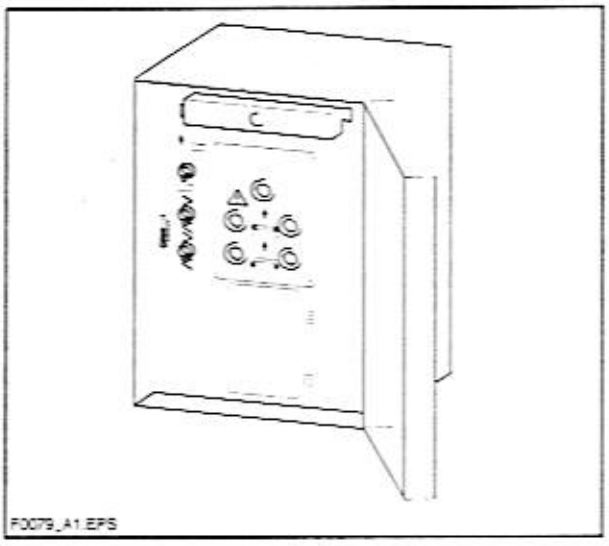
Schematic diagram of the gas supply system



Item	Designation
1	Gas bottles
2	Bottle valves
3	Pressure reducer
4	Hose break safety devices
5	Dual branch piping with shut-off valves
6	Hoses
7	Pipes
8	Burner
9	Ignition burner
10	Solenoid valves
11	Hose couplings
12	Main shut-off valve

D F12W GB 38-62 0898

General notes on the gas heater system

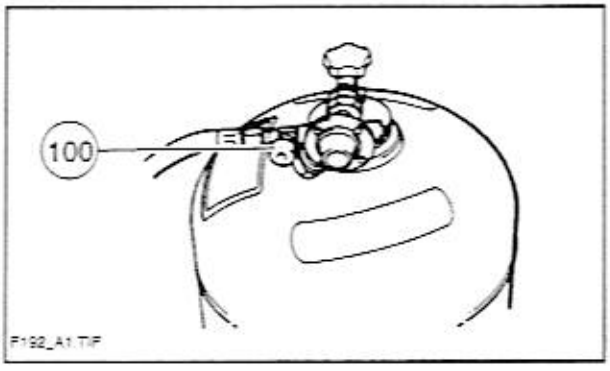


The heater of the screed burns propane gas (liquefied gas). The two gas bottles are located on the paver finisher.

The heater is equipped with an electronic ignition system and a temperature monitoring system. The switch box is on the finisher.

Heed the following points before commissioning the heater system:

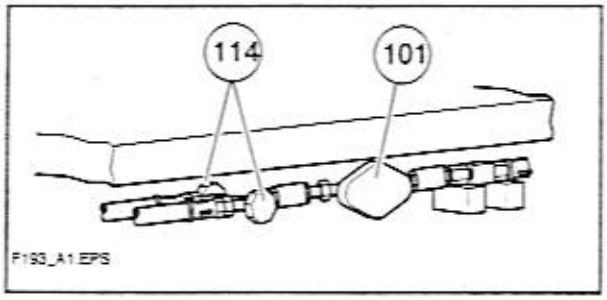
- The gas bottles must always be on the space provided for this purpose on the finisher. The bottles must be secured using the supplied strap retainers.
  The bottles must be fixed in position so that they cannot turn around their longitudinal axis even while the finisher is in operation.
- The liquefied gas system must not be operated without the hose break safety device (100). It is also absolutely necessary that the pressure reducing valve is installed before the system is put into operation.
- Check all gas hoses for external damage before using them. If any defect is found, immediately replace the hose in question by a new one.



There is a danger of fire and explosions when handling gas bottles and working on the gas heater.
Do not smoke! Do not use open fires!

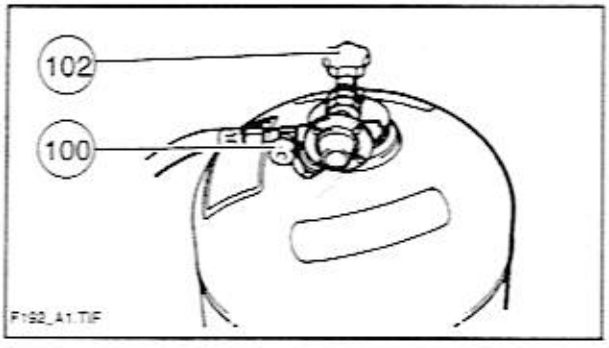
Connecting gas bottles and performing a leak test

☞ The gas pipe system of the main screed and the extendable parts is permanently installed. For the procedure required to connect any extendable parts to the gas supply, refer to the operating instructions for the screed.



To connect the gas bottles:

- Remove the protective cap from the bottle valves and keep it in a clean place.
- Check that the shut-off valves on the dual branch piping (114) and the main shut-off valve (101) are closed.
- Check that the bottle valves (102) are properly closed.
  Install the gas hoses with the pressure reducers and the hose break safety devices (100) to the bottles.



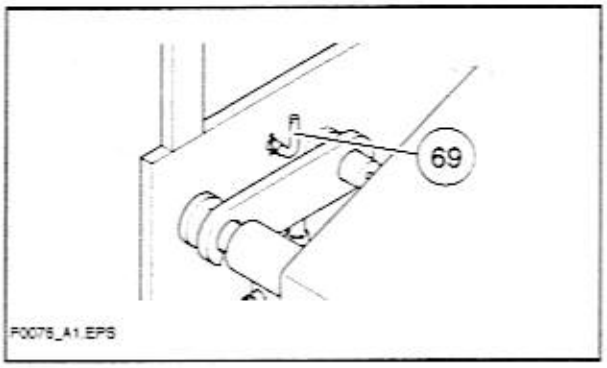
☞ The gas connections always have left-handed threads!

⚠ Make sure the gas pipe system has no leaks.

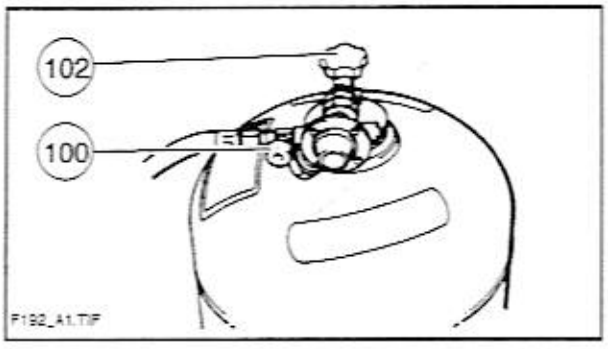
Putting the heater in operation and checking the heater

The gas heater is operated with one bottle.

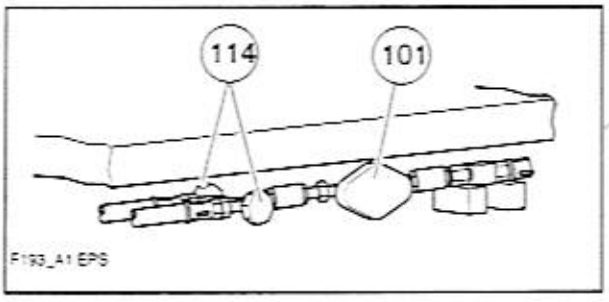
- Check that the battery's main switch (69) is switched on.



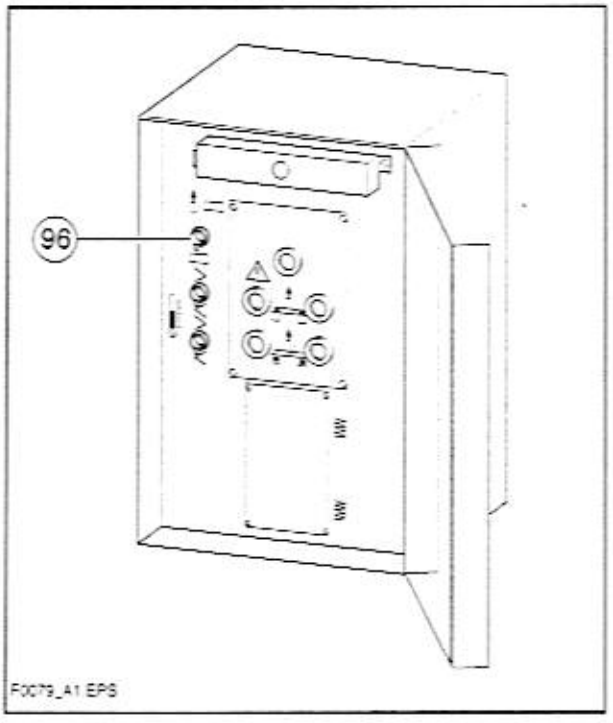
- Open the bottle valve (102). Unlock the safety valve by pressing the hose break safety device (100).



- Open the shut-off valves on the dual branch piping (114) (below the access to the operator´s platform).
  Open the main shut-off valve (101) (the illustration shows the main shut-off valve in the open position).

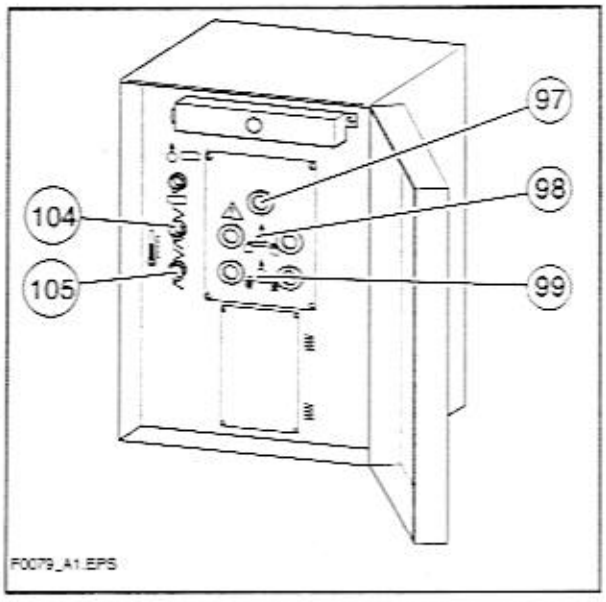


- Switch on the On/Off switch (96) in the switch box (top position).This
  - opens the electromagnetic non-return valves for the gas supply to the pipe burners;
  - activates the electronic ignition system, causing the gas to be automatically ignited by the spark plugs.



After the heater has been switched on, the following lamps must be lit on the switch box:

- Lamp (97) "Heater is on"
- During the preheating phase, the following lamps must also be lit:
- Lamp (98) "Ignition - main screed" (left-hand and right-hand side)
- Lamp (99) "Ignition - extendable parts/ extendable parts" (left-hand and right-hand side)



☞ The heater is automatically switched on and off by temperature sensors to ensure an optimum, constant temperature of the screed parts. When the temperature is reached, the pertaining control lamp goes out.

⚠ The control lamps are important for troublefree operation of the ignition system. Therefore, defective lamps should be immediately replaced!

Setting the temperature level:

- Switch (104) for the basic screed
- Switch (105) for the extendable parts/extension parts

Switch positions:

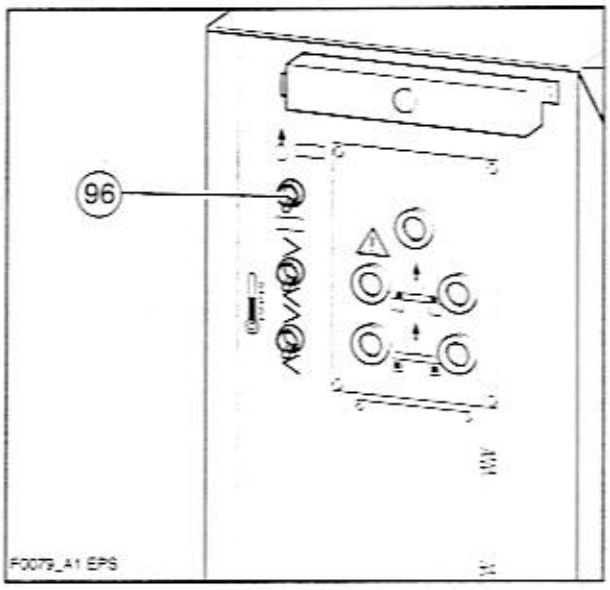
Position **>** high temperature
Position **<** low temperature

☞ Use the high temperature to preheat the screed and the extendable parts/extension parts before starting work; this prevents bitumen materials from sticking to the tamper knives and to the bottom plates on the first meters laid.
Usually, the heater can be switched to the lower temperature (saves gas) after a short time.

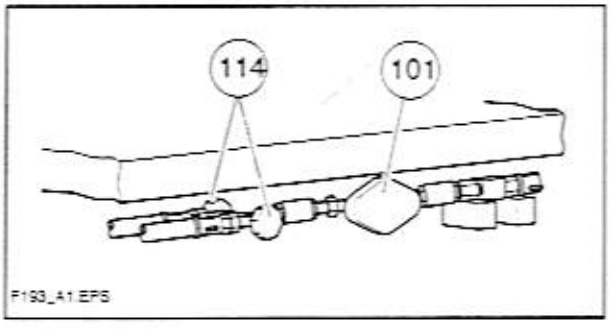
Switching off the heater

After work has been completed, or when the heater is no longer required:

- Switch off the On/Off switch (96) in the switch box
  (position 0 (center position)).



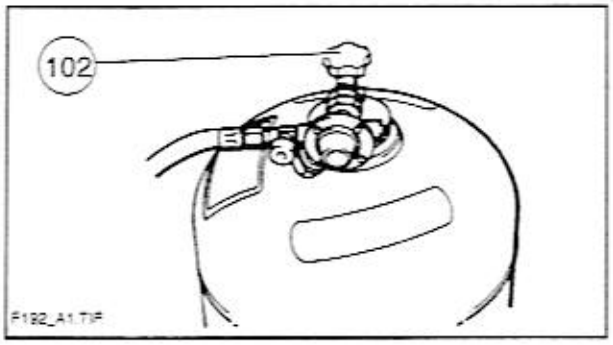
- Close the main shut-off valve (101), the two shut-off valves on the dual-branch piping (114) and the two bottle valves (102).



⚠ If these valves are not closed, there is a danger of fire and explosions as gas can escape!
Always close the valves during breaks and after work has been completed!

Exchanging the gas bottles

- Check that the main shut-off valve (101) is closed.
- Unscrew the gas hoses.
- Screw the protective caps for the bottle valves onto the gas bottles.



STOP Gas bottles that are full or not completely emptied are under pressure.
Therefore, make sure that the bottles are protected from heavy blows or shocks (particularly in the area of the valves or at the valves themselves) as long as the protective caps are not in place!

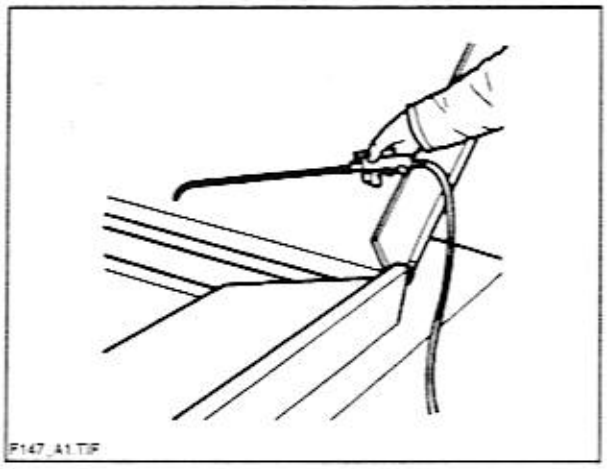
- Connect new gas bottles (see the section "Connecting gas bottles and performing a leak test").

3.4 Preparations for paving

Separating agent

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

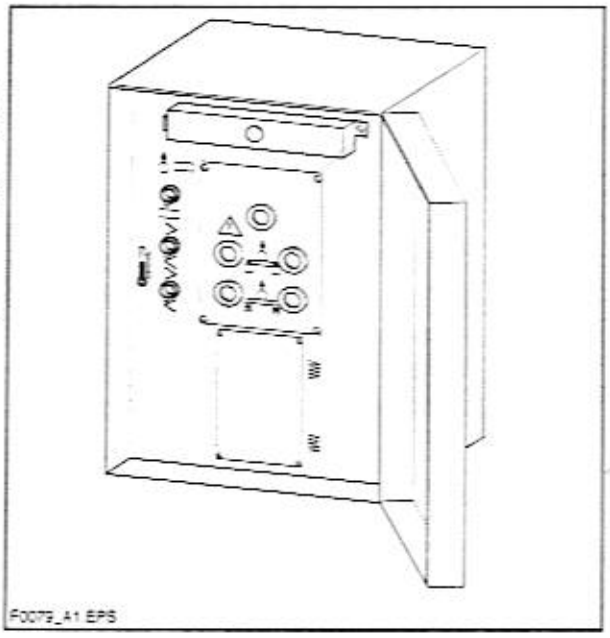
⚠ Do not use diesel fuel as it dissolves the bitumen (prohibited in Germany!).



Screed heater

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

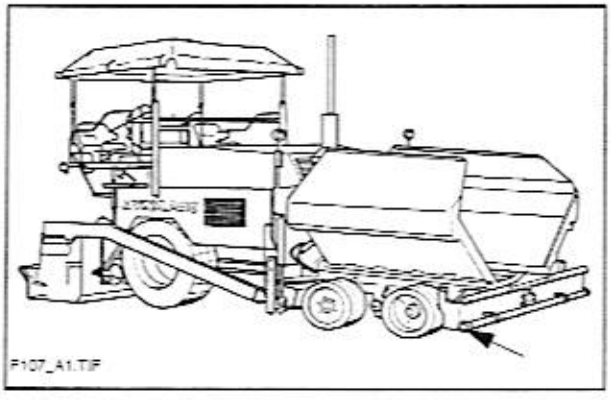
☞ See the section 3.3 on how to operate the heater.



Direction marks

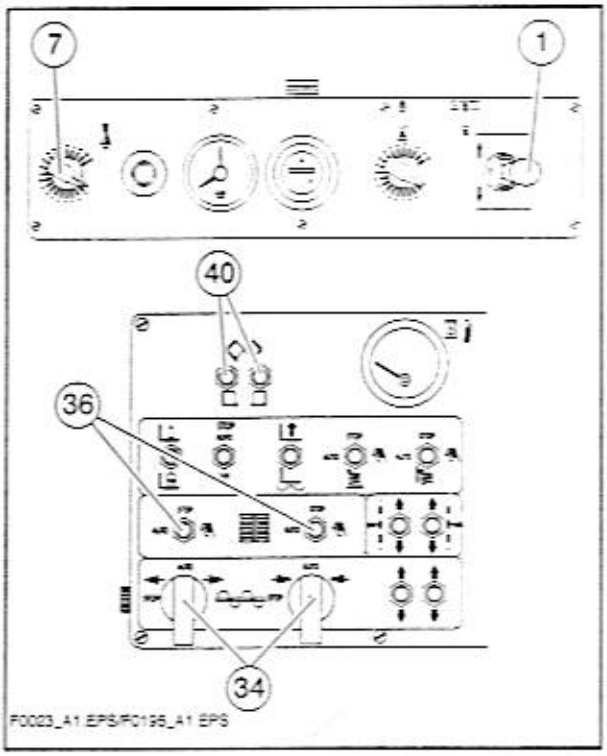
To ensure straight paving, a direction mark must be present or established (road edge, chalk lines or similar).

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

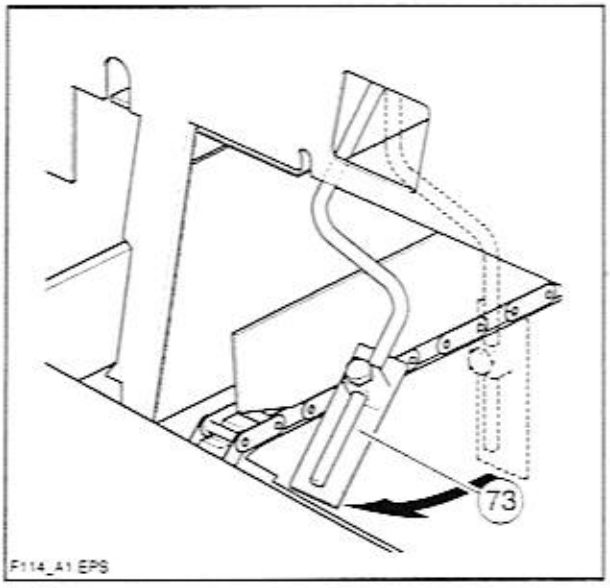


Loading/distributing material

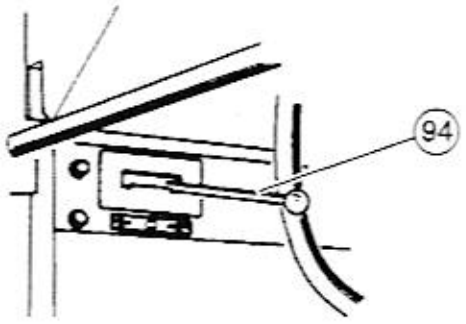
- Use switch (40) to open the hopper. Instruct the truck driver to dump the material.
- Set the switches for the auger (34) and the conveyor (36) to "auto".
- Set the switches for the auger and the conveyor on the remote controls (if applicable) to "auto".
- Set the engine speed controller (7) to marking "10". Push the drive lever (1) into the second position (ca. half the maximum engine speed).



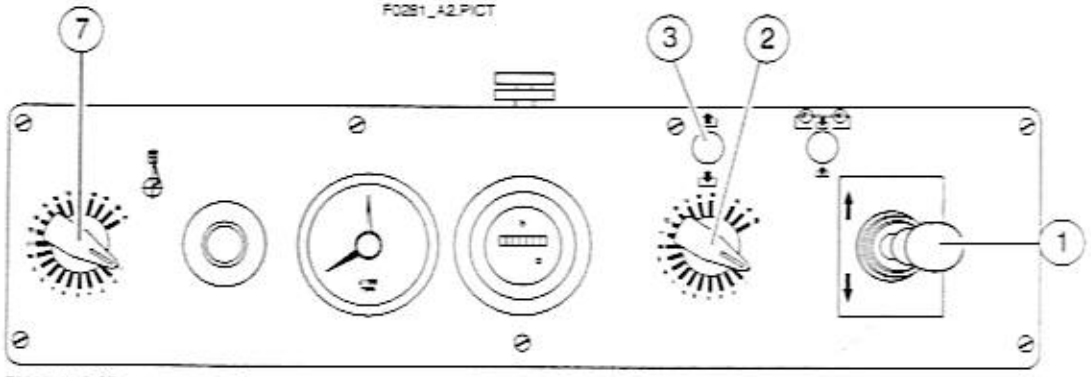
- Switch the conveyors on.
  The limit switches for the conveyors (73) must switch off when the material has reached the area beneath the auger crossbeam.
- Check that the material is conveyed properly.
  Manually switch on or off the conveyor if the material is not conveyed properly until a sufficient amount of material lies in front of the screed.



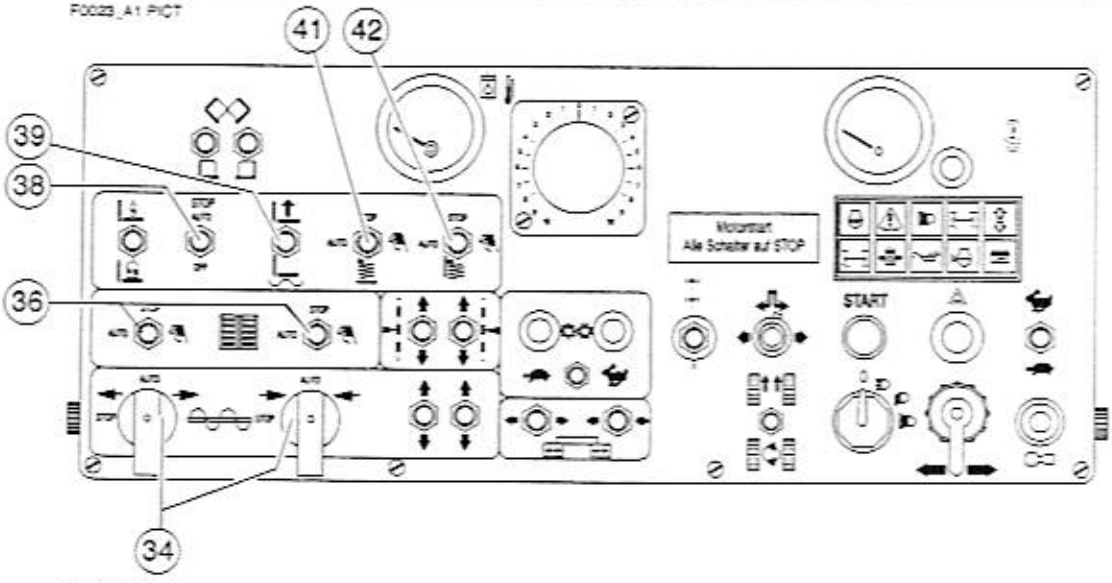
3.5 Starting for paving



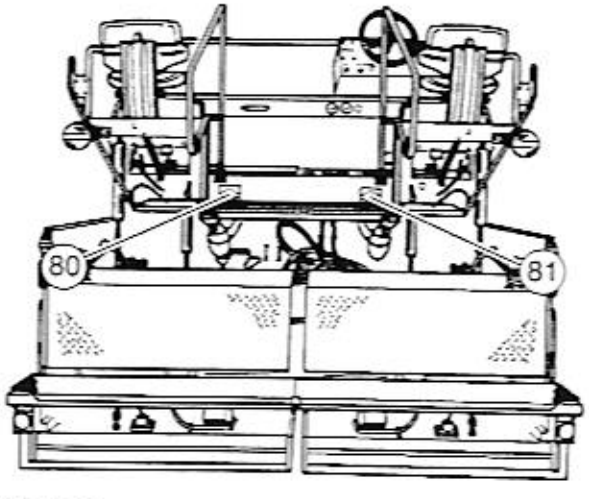
F0281_A2.PICT



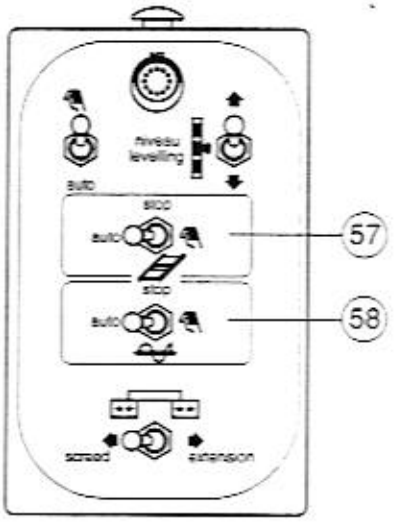
F0023_A1.PICT



F0022_A1.EPS



F0180_A1.TIF



F0085_A1.EPS

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

Item	Switch	Position
94	Transportation/working gear	Working gear (◂)
3	Preselector On/Off	On (down)
2	Traction drive preselector	Mark 6 - 7
7	Engine speed ○	Maximum
38	Screed stop	auto
39	Screed position	Floating position
41	Vibration	auto
42	Tamper	auto
34	Auger left/right	auto
36	Conveyor left/right	auto
80	Speed regulator, tamper	ca. mark 10
81	Speed control, vibration	ca. mark 10
57	Conveyor (○)	auto
58	Auger	auto

- Push the drive lever (1) all the way to the front and start driving.
- Observe the distribution of the material and adjust the limit switches if necessary.
- Set the compacting elements (tamper and/or vibration) according to the required compaction ratio.
- Let the paving master check the layer thickness after 5–6 meters and correct if necessary.

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

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

☞ The basic setting is for asphalt material.

3.6 Checks during paving

The following points must be constantly observed during paving:

Paver function

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

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

Quality of the layer

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

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

D F12WGB 48-62 0898

3.7 Paving with screed stop and screed charging/relieving

General

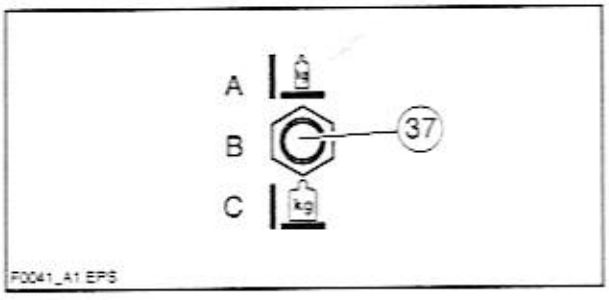
The screed hydraulics can be influenced in two ways to attain optimum paving results:

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

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

Screed charging/relieving

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



Switch (37) has the following positions:

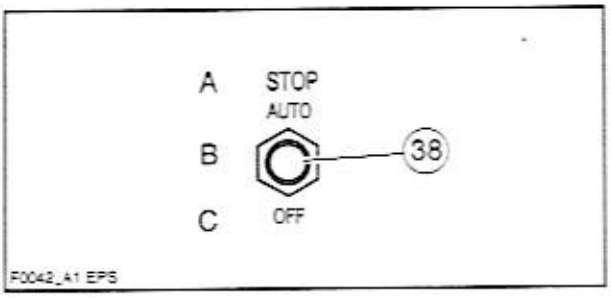
A: Relief (screed 'lighter')
B: No function
C: Charge (screed 'heavier')

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

Screed stop

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

Switch (38) has the following positions:



A: Automatic screed stop when the drive lever is in the center position
B: Screed stop always switched on
C: Switched off

☞ Use position (C) for setting up the paver finisher and position (A) for paving.

⚠ Position (B) is not sufficient as a safeguard during transport or maintenance work! In such a case, the screed transport safeguard must be inserted.

Screed stop with pretensioning

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

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

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

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

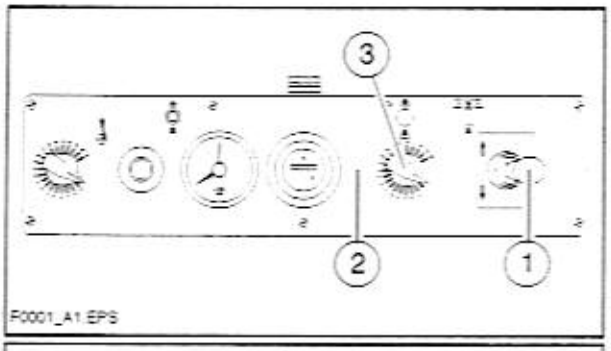
Especially in those cases where the "screed relieving" function is only briefly used as a start-up aid, there is a danger of uncontrolled floating when starting up again.

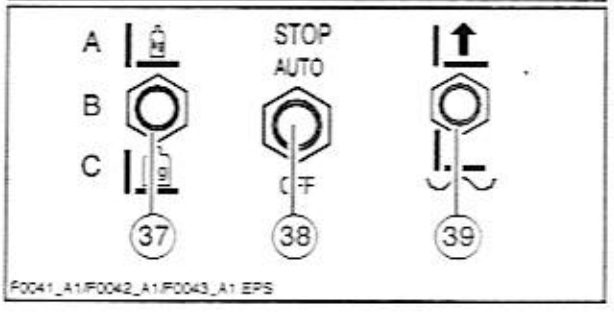
☞ Do not use the "screed stop with pretensioning" function while paving with the "screed stop" function.

Adjusting the pressure

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

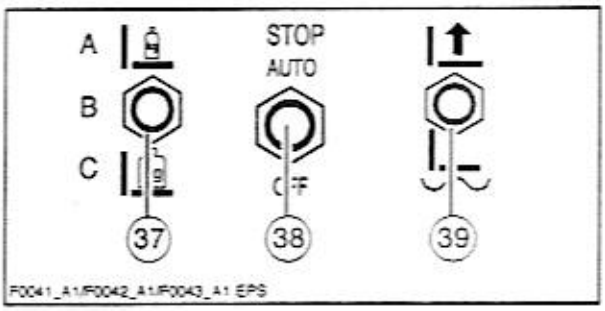
- Start the diesel engine and set the traction controller (3) to zero and turn on switch (2) if necessary (precaution against inadvertent advancing).
- Set switch (39) to "Floating position".



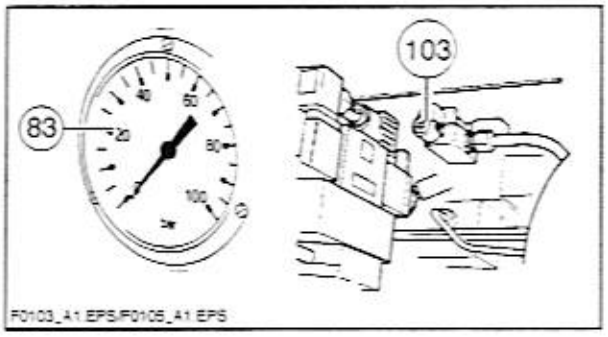


Adjusting the pressure for screed stop with pretensioning:

- Set the drive lever (1) to the center position.
- Set switch (38) to position **C** and switch (37) to position **A**.



- Adjust the pressure using control valve (103) (below the bottom plate of the operator´s platform); the current pressure can be read at the manometer (83).
  (Basic setting: 20 bar)

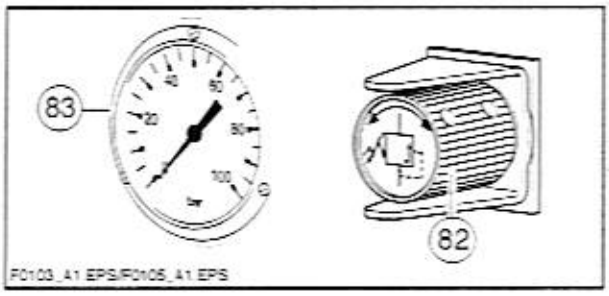


Adjusting the pressure for screed charging/relieving

- Set the drive lever to the third catch from the center position.
- Set switch (37) to position **A** (relieving) or **C** (charging).
- Use control valve (82) (on the rear panel of the paver finisher) to adjust the pressure and read it from the manometer (83).

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

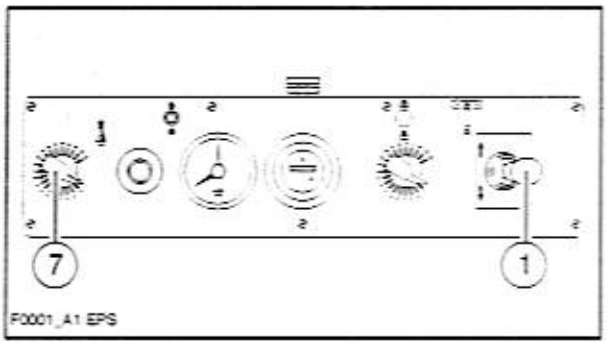
☞ The pressure can also be set or corrected during paving.
(Max. 50 bar)



3.8 Interrupting/terminating operation

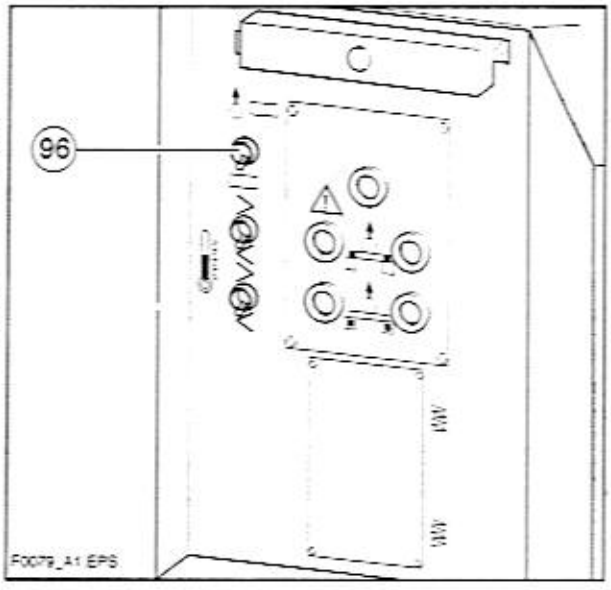
During breaks (e.g. delays caused by material trucks)

- Determine the approximate duration.
- When cooling down of the material below the minimum paving temperature must be expected, run the paver finisher empty and create an edge like the end of a layer.
- Set the drive lever (1) to the center position.

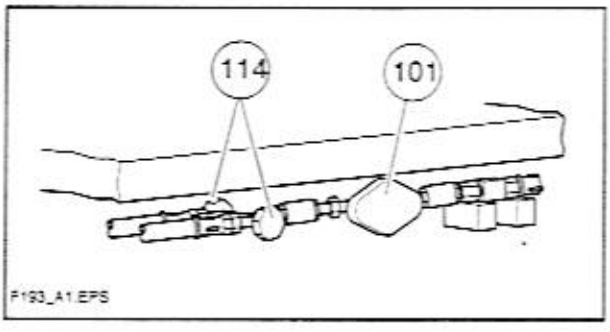


During longer breaks
(e.g. lunch break)

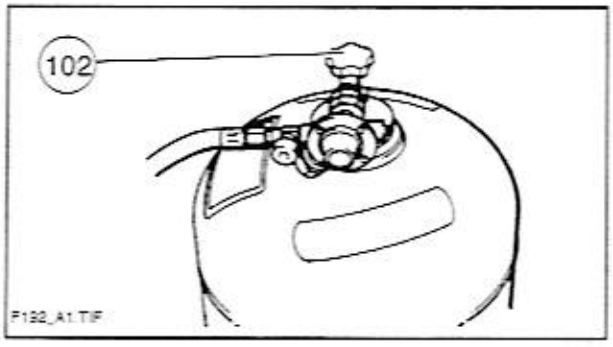
- Set the drive lever (1) to the center position and the speed adjuster (7) to minimum.
- Switch off the ignition.
- Switch the screed heater off with the ON/OFF switch (96) (position 0 (center position)).



- Close the main shut-off valve (101), the two shut-off valves on the dual-branch piping (114) and the two bottle valves (102).

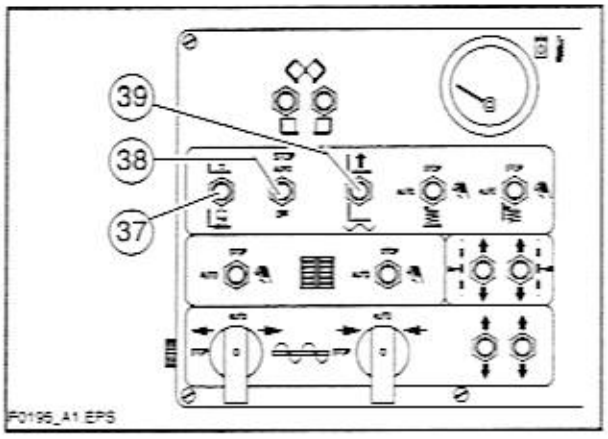


☞ The screed must be heated up to the correct paving temperature before paving my be restarted.

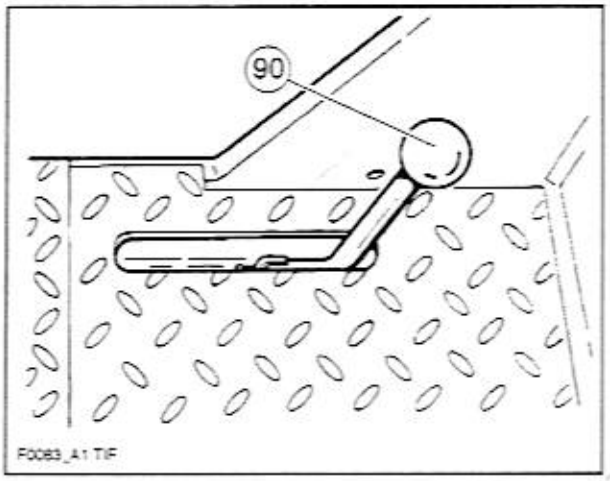


When work is finished

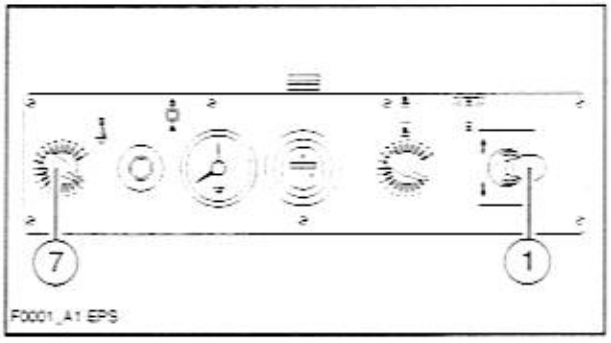
- Run the paver finisher empty and stop it.
- Lift the screed: set switch (37) to the center position, switch (38) to the top position and switch (39) to "lifting".
- Retract the screed parts to the basic screed width and lift the auger. Where applicable, completely extend the leveling cylinders.



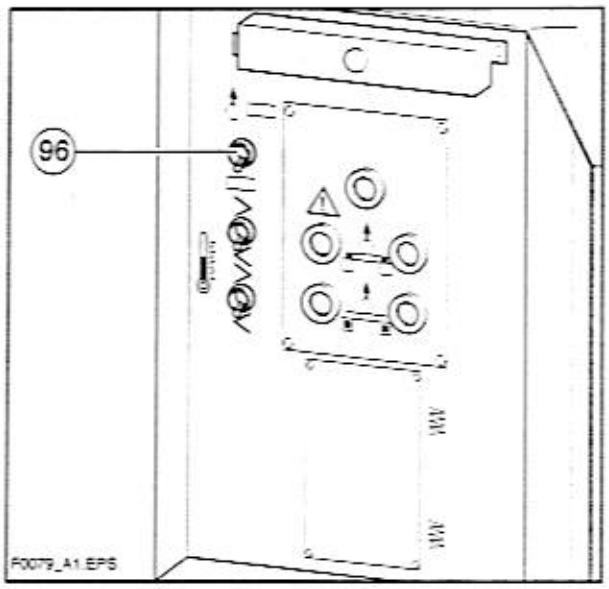
- Insert the mechanic screed transport safeguard (90).
  - While operating the tampers at a low speed, let any material residues drop out.



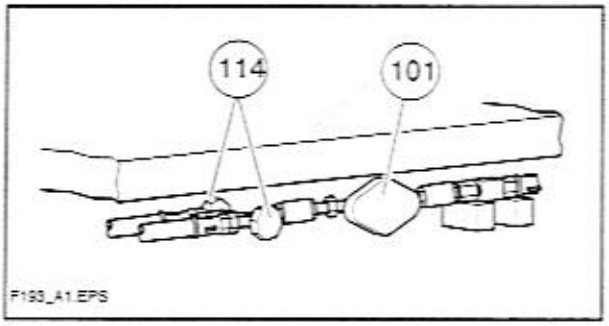
- Set the drive lever (1) to the center position and the speed adjuster (7) to minimum.
- Switch off the ignition.

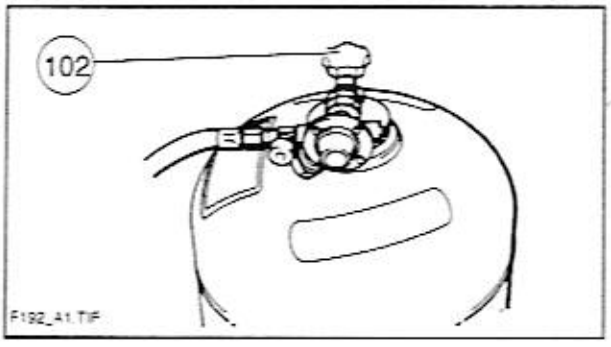


- Switch the screed heater off with the ON/OFF switch (96) (position 0 (center position)).

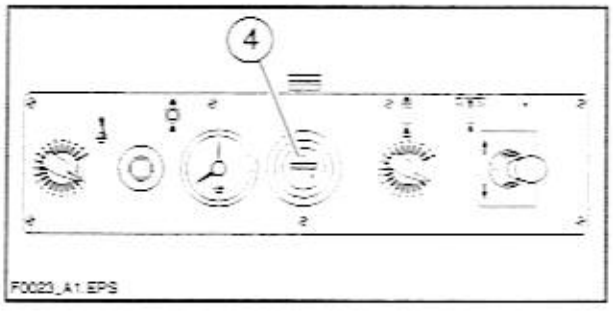


- Close the main shut-off valve (101), the two shut-off valves on the dual-branch piping (114) and the two bottle valves (102).
- Remove the levelling units and stow them away in the boxes; close all flaps.
- Remove all parts that extend beyond the paver finisher contour or secure them if the paver finisher is to be transported over public roads on a low-bed trailer.





- Read and check the operating hour meter ((4) 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.



4 Malfunctions

4.1 Problems during paving

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

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

4.2 Malfunctions on the paver finisher or screed

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

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

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

4.3 Malfunctions on the gas heater system

☞ Also refer to the section covering the electrical system for the gas heater system in the spare part catalog.

Malfunction	Cause	Remedy
Control lamps are not lit after the heater system has been switched on	Battery voltage is too low	Check the battery voltage
	Mains switch is switched off	Switch on the main switch
	25 A main fuse or 5 A fuses are defective	Check and, if necessary, replace the fuses
	Power supply interrupted	Check the plugged connection and the cable
No ignition spark at the spark plugs	2 A fuses are defective	Check and, if necessary, replace the fuses
	Ignition box(es) are blown	Check and, if necessary, replace the ignition boxes
	Power supply interrupted	Check the plugged connections and the cables
	Spark plug cable is broken	Check and, if necessary, replace the spark plug cables
	Bonding is interrupted at the spark plug holder	Check and, if necessary, replace the bonding
	Ignition coils are defective	Check and, if necessary, replace the ignition coils
	Spark plug is defective	Check and, if necessary, replace the spark plugs

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

4.3 Malfunctions on the gas heater system

☞ Also refer to the section covering the electrical system for the gas heater system in the spare part catalog.

Malfunction	Cause	Remedy
Control lamps are not lit after the heater system has been switched on	Battery voltage is too low	Check the battery voltage
	Mains switch is switched off	Switch on the main switch
	25 A main fuse or 5 A fuses are defective	Check and, if necessary, replace the fuses
	Power supply interrupted	Check the plugged connection and the cable
No ignition spark at the spark plugs	2 A fuses are defective	Check and, if necessary, replace the fuses
	Ignition box(es) are blown	Check and, if necessary, replace the ignition boxes
	Power supply interrupted	Check the plugged connections and the cables
	Spark plug cable is broken	Check and, if necessary, replace the spark plug cables
	Bonding is interrupted at the spark plug holder	Check and, if necessary, replace the bonding
	Ignition coils are defective	Check and, if necessary, replace the ignition coils
	Spark plug is defective	Check and, if necessary, replace the spark plugs

Malfunction	Cause	Remedy
Spark plugs provide ignition, but no heating flame at the burner pipes	No propane supply	Check the propane bottle valves
		Check and, if necessary, replace the safety valve /pressure reducer
		Open the closing valves or the main shut-off valve
		Check the relays of the solenoid valves and the solenoid valves; if necessary, replace
		Check and, if necessary, replace the temperature sensor
		Check and, if necessary, replace the hose connections
		Check and clean the filters and nozzles of the injectors; if necessary, replace them
		Check the gas/air mixture setting at the injectors; if necessary, readjust the setting

E Set-up and modification

1 Special notes on safety

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

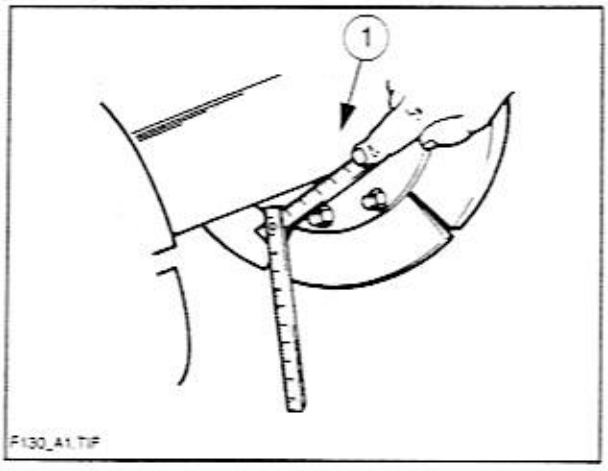
- To protect the paver finisher against inadvertent starting:
  Set the drive lever to the center position and set the preselector to zero; if applicable, remove the drive traction fuse from the operating panel; pull out the ignition key and the battery main switch.
- Secure lifted machine parts (e.g.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

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

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

2 Auger

2.1 Height adjustment



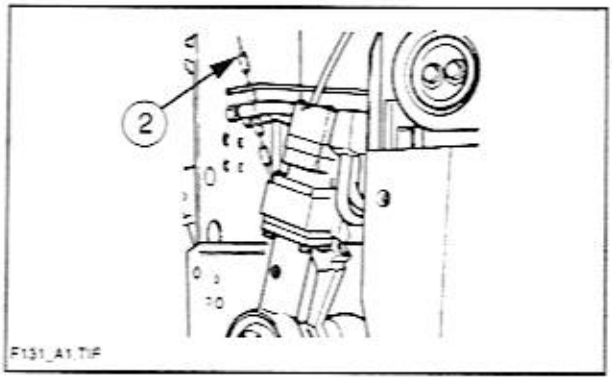
Depending on the material, the height of the auger (1) – measured from its lower edge – should be at least 50 mm (2 inches) above the height of the material layer.

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

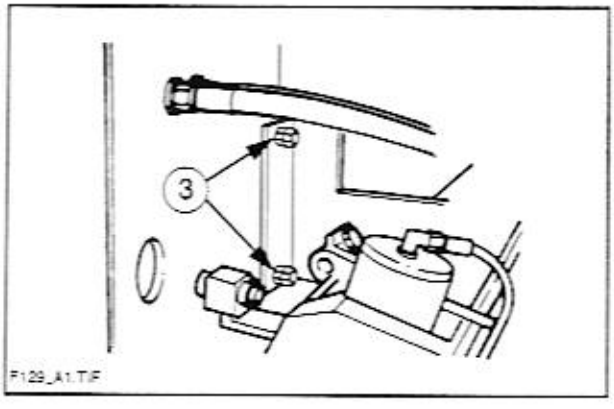
An incorrect height adjustment can result in the following problems:

- 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.

2.2 Auger crossbeam installed in a fixed position

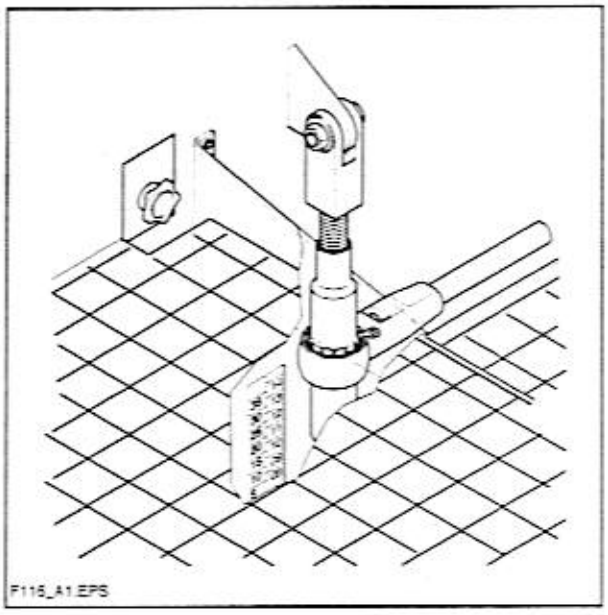


- Lower the screed onto a suitable support (e.g. squared timbers).
- Completely extend both leveling cylinders.
- Hook lifting chains (2) for lifting the auger crossbeam into the hooks of the crossbeams.
- Loosen the fixing screws (3) of the auger crossbeam.
- Retract the leveling cylinders until the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



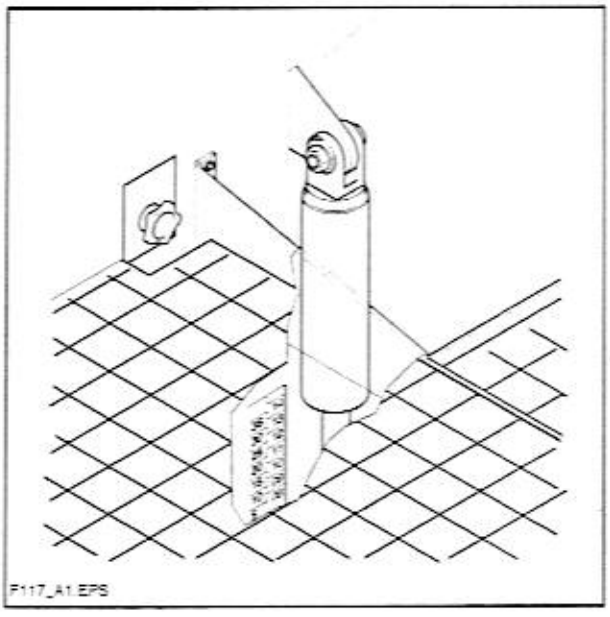
2.3 Mechanical adjustment with ratchet (option)

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



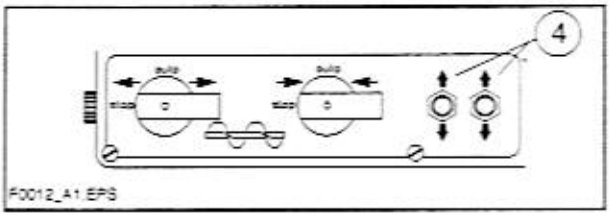
2.4 Hydraulic adjustment (option)

- Determine the currently set height of the auger crossbeam (left and right) by means of the scale.
- Push or pull the switches (4) on the operating panel to retract or extend the hydraulic cylinders.



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

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



2.5 Auger extension

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

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

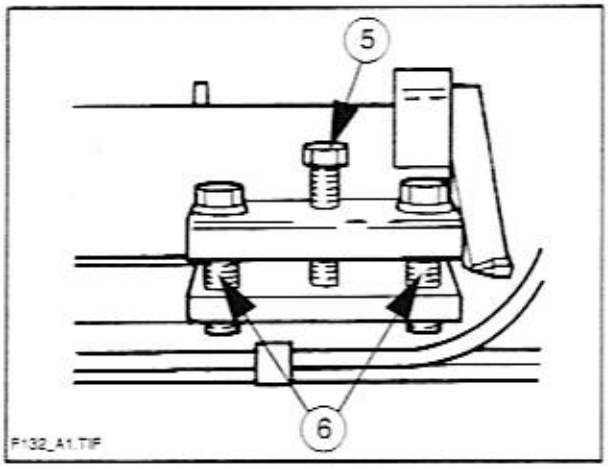
To attain the desired working width, the respective screed extensions, side plates, augers, tunnel plates or cut-off shoes must be mounted.

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

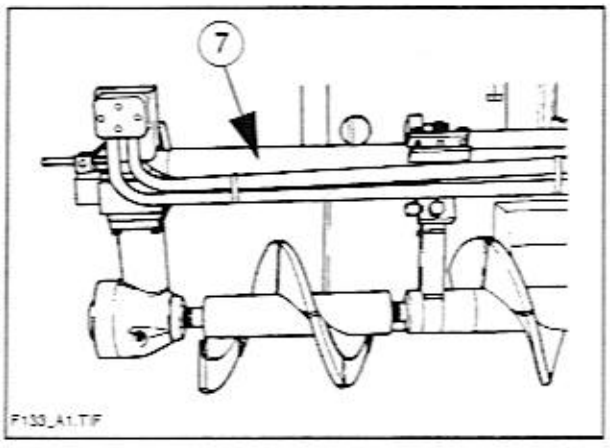
The diesel engine must be switched off whenever work is performed on the auger. Danger of injuries!

2.6 Mounting extension parts

- Loosen the clamping screws (6) on the support tube. Then turn in the center expanding screw (5) to expand the clamping joint.



- Pull the telescopic tube out of the support tube (7).
- Mount the required extension parts.



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

- Slide in the telescopic tube. When doing so, make sure that the drive of the auger gear is slid all the way over the shaft end of the auger extension part and that the threads of the augers match.
- Remove the expansion screw (5). Then tighten the clamping screws (6). Finally tighten the expansion screw by hand.

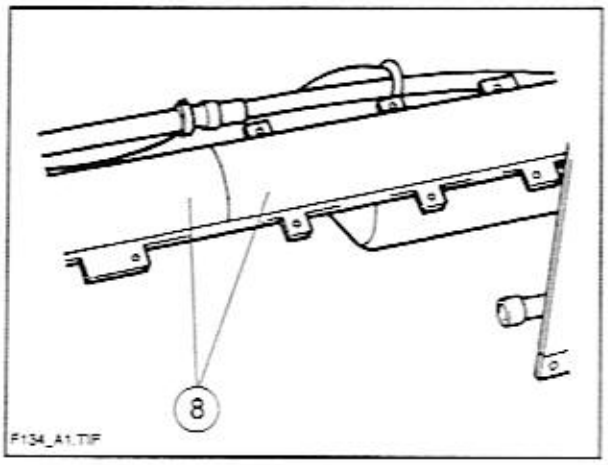
⚠ Before the clamping screws (6) can be tightened again, the expansion screw (5) must be sufficiently turned back!
Otherwise, the telescopic tube cannot be safely clamped and the splined shaft ends break.

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

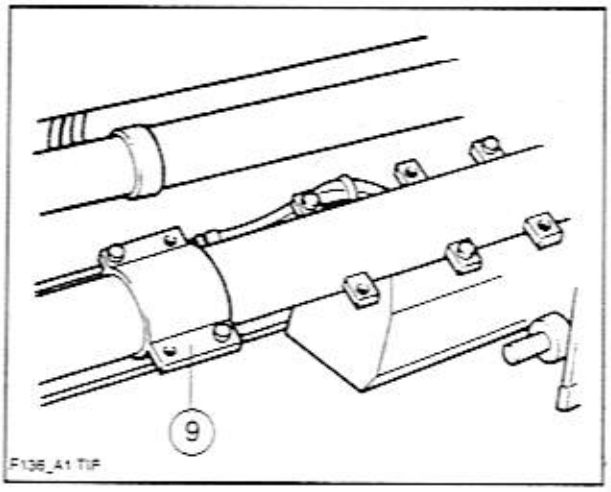
2.7 Mounting support tube extensions

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

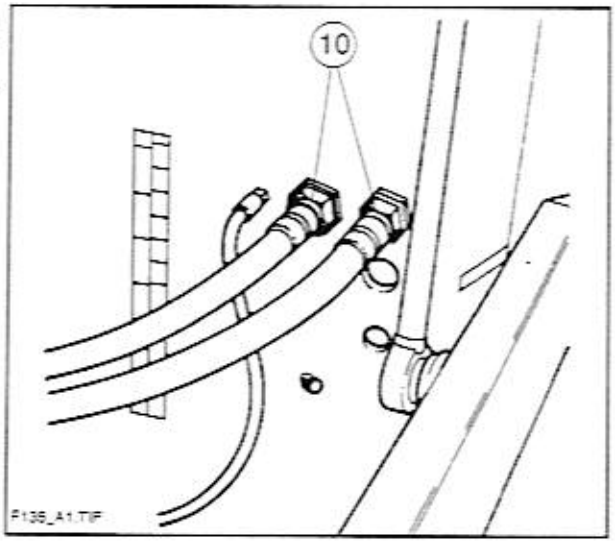
The support tube extension of the auger crossbeam consists of two halves (8) and is attached to the existing support tube by using a total of 5 screws. After the two halves have been screwed to the support tube, they also must be linked to each other by means of screwed connections.



Clamping of the telescopic tube occurs by tightening the screwed connections (9) linking the support tube extension.



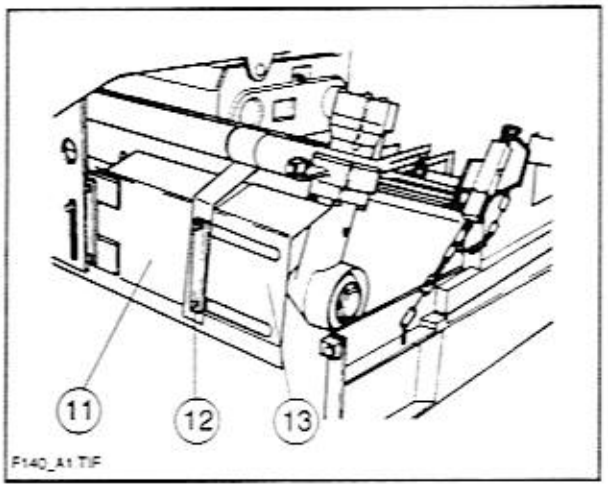
If the working width exceeds 7.50 m the hydraulic hoses (10) for the auger motors must be replaced with longer ones.
These long hoses are included in the scope of delivery for this working width.



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

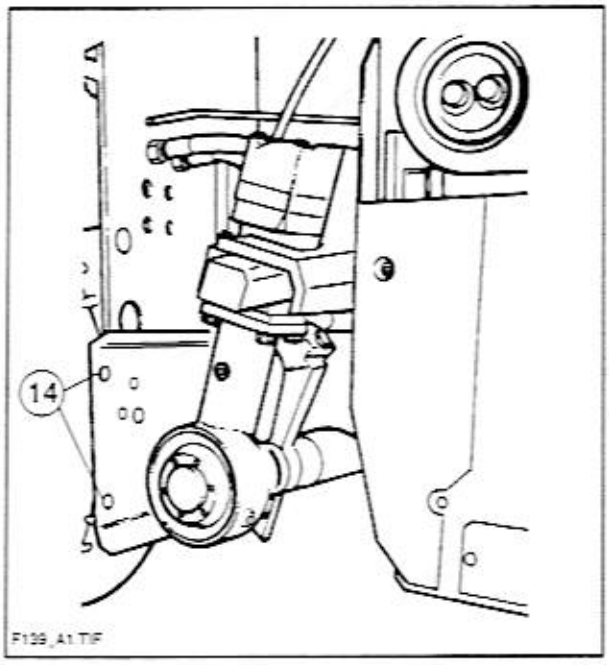
⚠ When installing the hoses, make sure that the area around the connections is clean.
Any dirt that enters the hydraulic system can cause malfunctions.

2.8 Installing tunnel plates



To ensure an optimum material flow – especially in the case of large paving widths – so-called tunnel plates (11) must be installed.
They are located directly in front of the auger distributor and – in conjunction with the auger – are an ideal system for conveying the material.

When operating with widths of more than 3.90 m, two or more combined tunnel plates (13) must be used. In this case, additional stabilizing supports (12) must be attached to the telescopic tube.



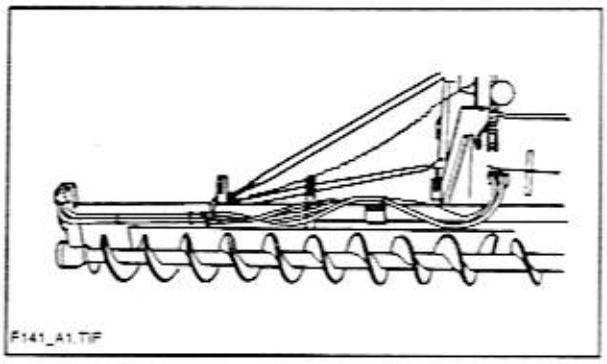
The tunnel plates must be directly screwed to the receptacles provided for this purpose (14); they are located on the auger frame sides and can thus be adjusted in height.

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

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

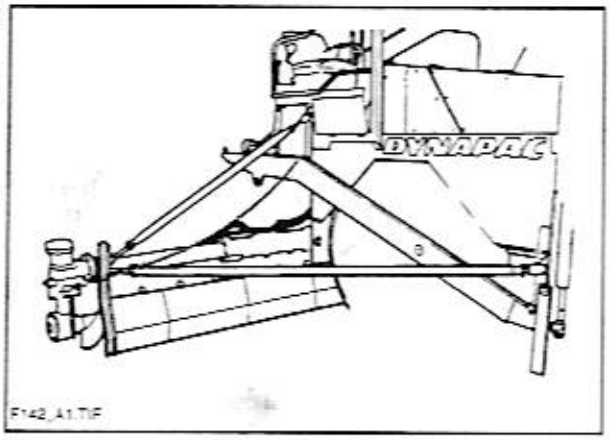
2.9 Installing additional braces

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



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

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



3 Screed

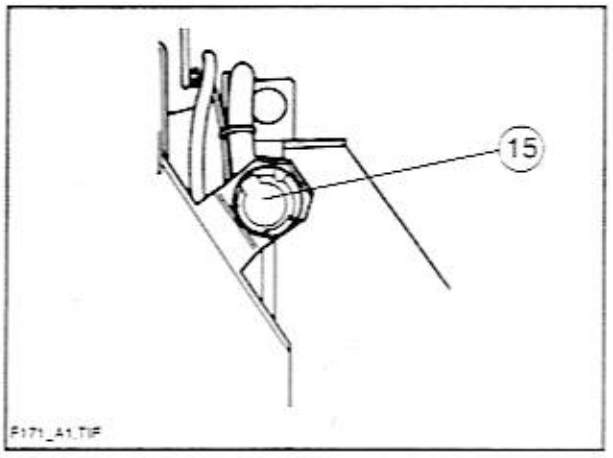
The operating instructions for the screed cover all work required for mounting, setting up and extending the screed.

4 Electrical connections

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

4.1 Remote controls

to socket (15) (on the screed).

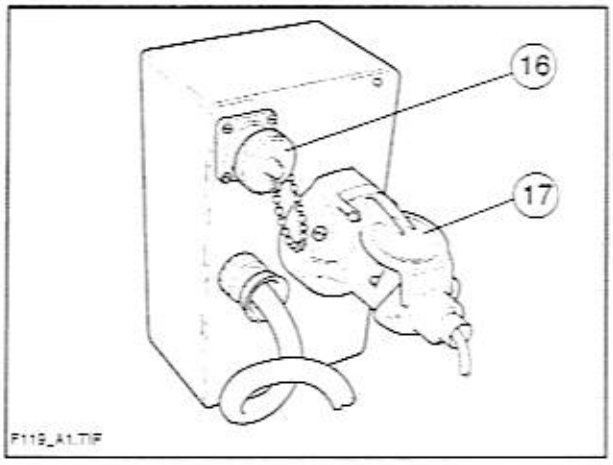


4.2 Grade control

to socket (16) (on the remote control unit)

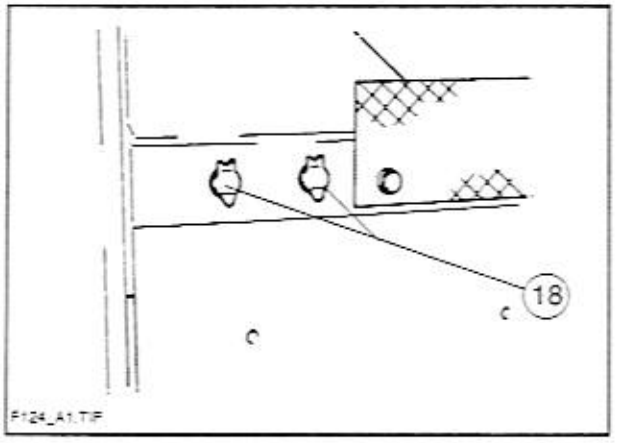
4.3 Auger limit switches

to socket (17) (on the remote control unit)



4.4 Working lights

to sockets (18) (on the paver finisher).



F Maintenance

1 Notes regarding safety

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

Secure the paver finisher and the attachments against inadvertent starting before beginning any maintenance work:
- Set the drive lever to the center position and the speed preselector to zero.
- Remove the traction drive fuse from the operating panel.
- Remove the ignition key and the battery main switch.

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

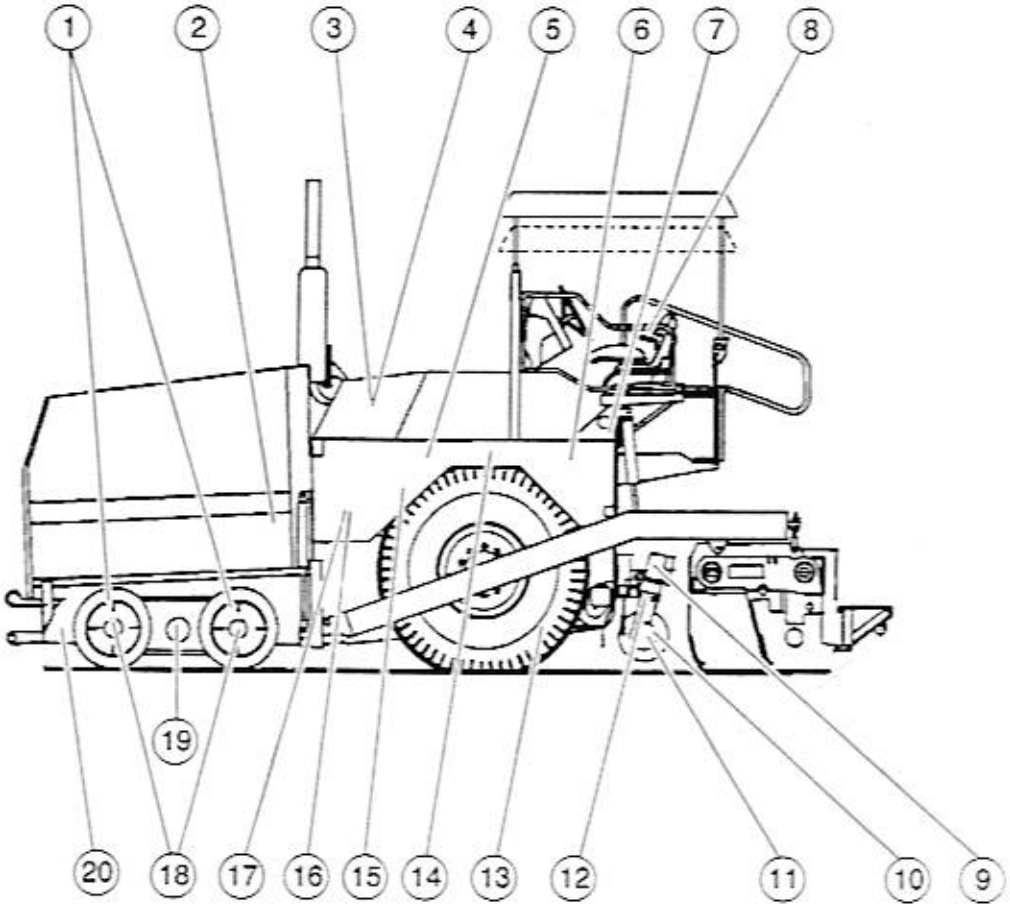
Spare parts: Use only approved parts and install them according to the specifications! If in doubt, contact the manufacturer!

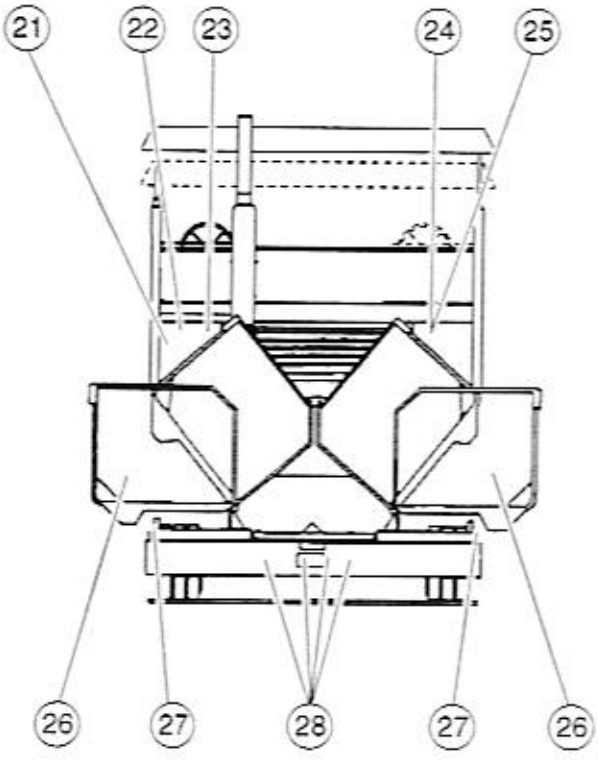
Re-commissioning: Mount all protective devices before re-commissioning the paver finisher.

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

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

2 Maintenance intervals

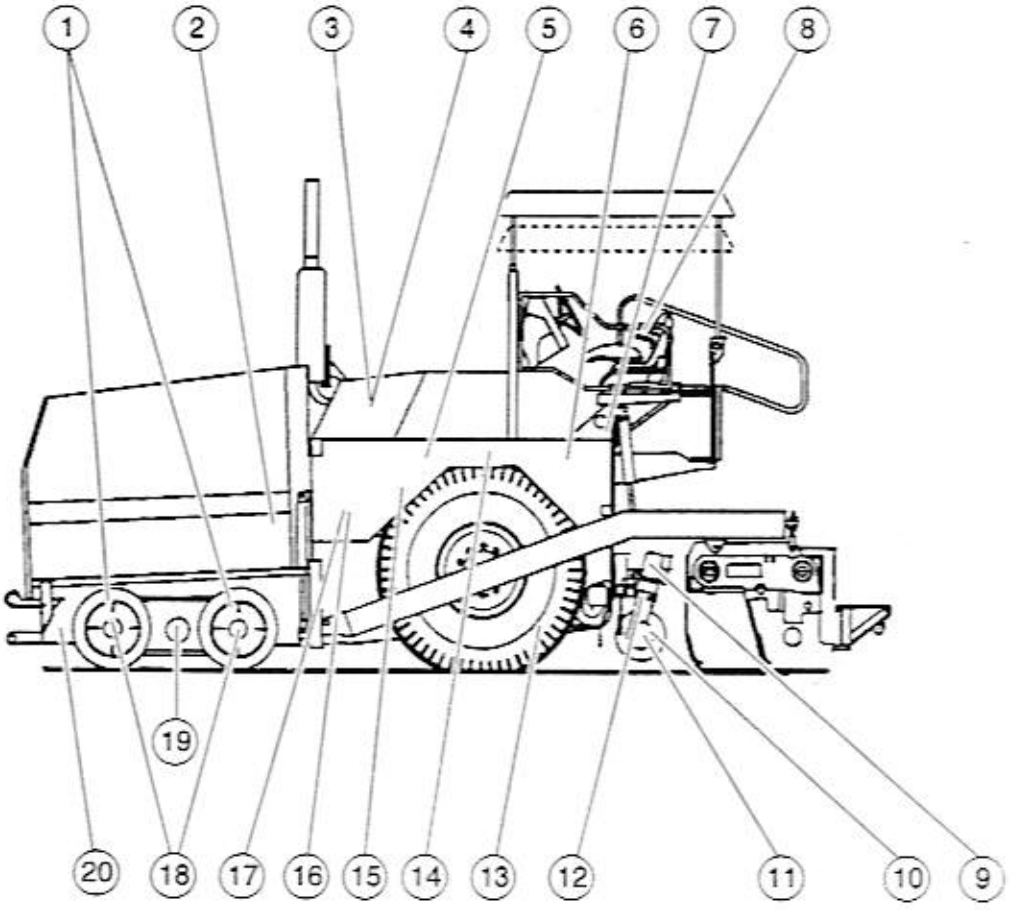


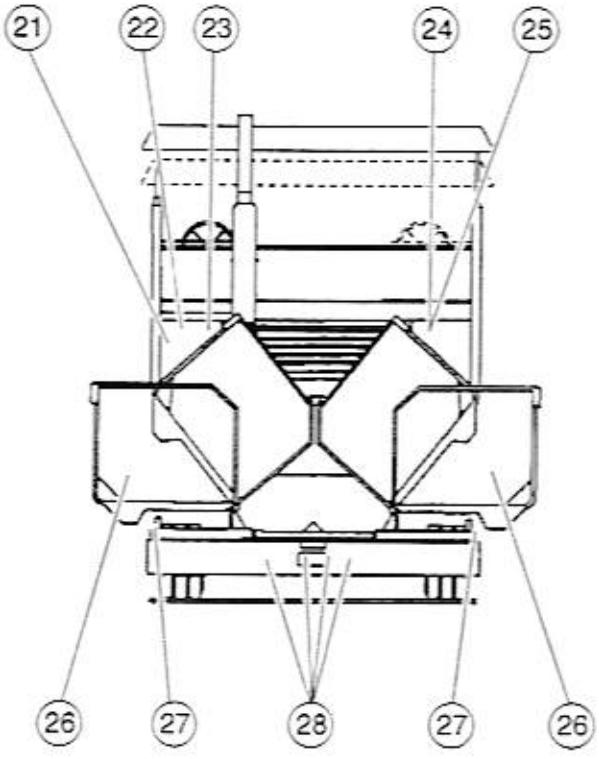


2.1 Daily (or every 10 operating hours)

Item	Maintenance point	Number	Lubrication	Check	Oil change	Filling volumes	Substance
3	V-belt tension	3		x			
5	Chain tension, drive	2		x		Grease	
6	High pressure hydraulic filter	5		x			
8	Conveyor - center bearing	1	x			Grease	10 strokes
9	Auger - outer bearing	2	x			Grease	5 strokes
10	Auger - center bearing	1	x			Grease	5 strokes
17	Diesel engine - oil level	1		x		Engine oil	
20	Conveyor deflection roller	2	x			Grease	5 strokes
23	Filling level, fuel tank	1		x		Diesel fuel	see "Filling volumes"
25	Hydraulic oil reservoir, filling level	1		x		Hydraulic oil	see "Filling volumes"
28	From these nipples, lubrication lines lead to the bearings. Chain tension, Conveyor gear (each side)	2		x			
	General security check: see chapter D, section 3.1.						
	Security check						

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



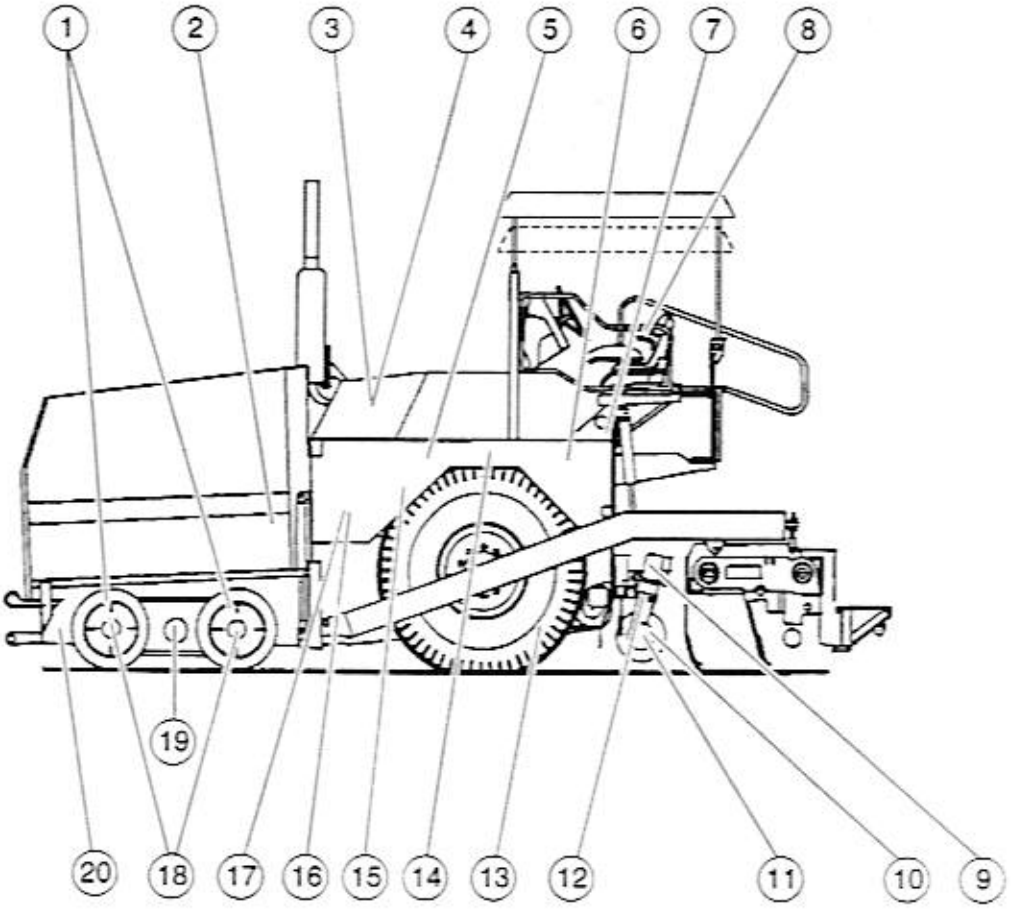


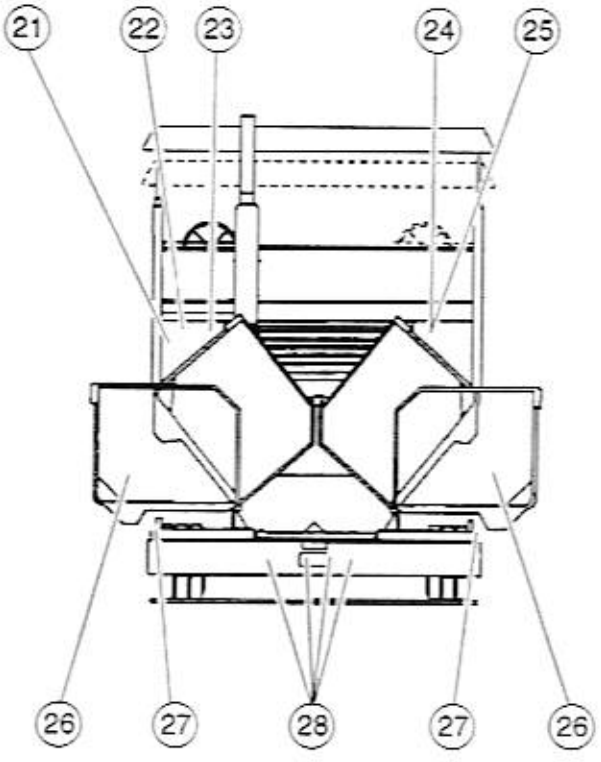
F F12W GB 4-28 0898

2.2 Weekly (or every 50 operating hours)

Item	Maintenance point	Number	Lubrication	Check	Oil change	Filling volumes	Substance
1	King pin	4	x			Grease	5 strokes
2	Steering	1	x			Grease	5 strokes
4	Air filter	1		x			
7	Conveyor gear	2		x		Gear oil 220	see "Filling volumes"
11	Auger bevel gear	2		x		Gear oil 90	see "Filling volumes"
12	Pump distribution gear	1		x		Gear oil 90	see "Filling volumes"
13	Drive wheels - air pressure *	2		x			
14	Drive axle	1		x		Gear oil 90	see "Filling volumes"
16	Water cooler – water level	1		x		Cooling fluid	
18	Wheel bearings F 12 W: F 12-4 W:	4 2	x x			Grease	5 strokes
19	Floating axle	2	x			Grease	5 strokes
21	Batteries: – Acid level – Terminals and cables	2		x		Dist. Distilled water Air filter	
26 ○	Steel hopper flaps	2	x			Grease	2 strokes
27	Push rollers	4	x			Grease	5 strokes

*) The tyre pressure required is stamped on the individual rims and marked with a colour code.





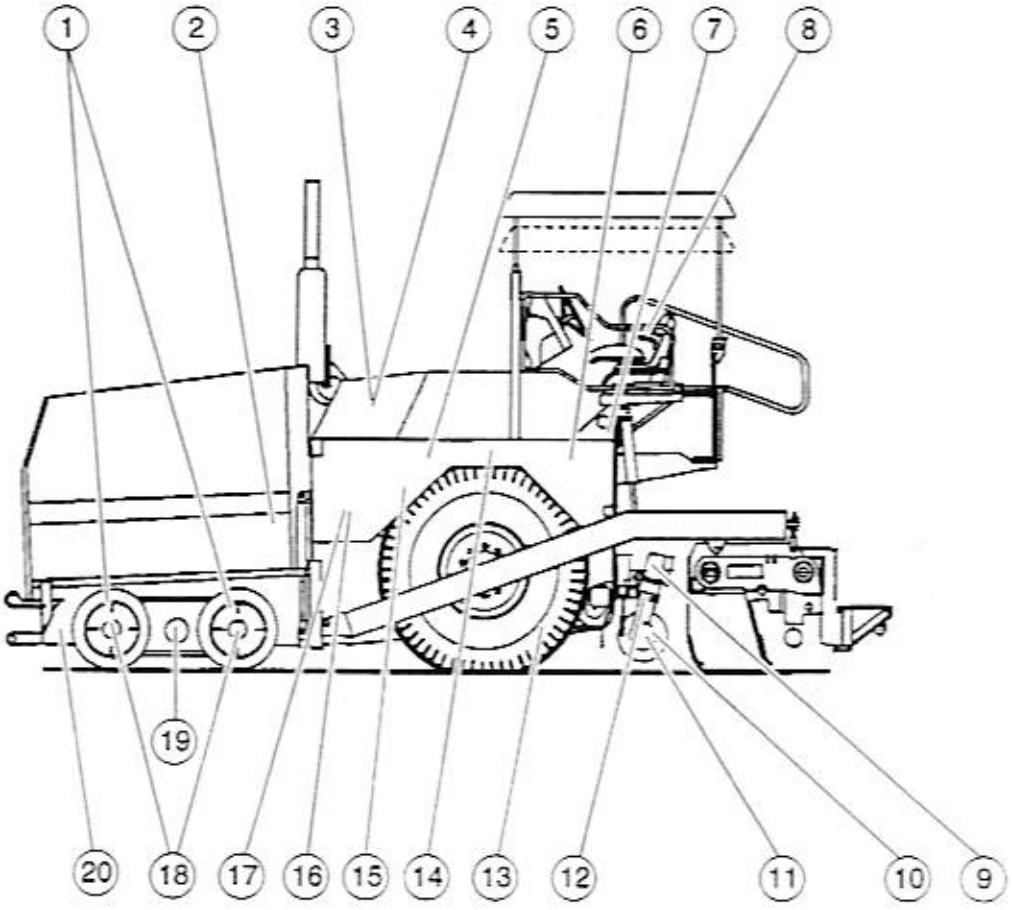
F F12W.GB 6-28 0898

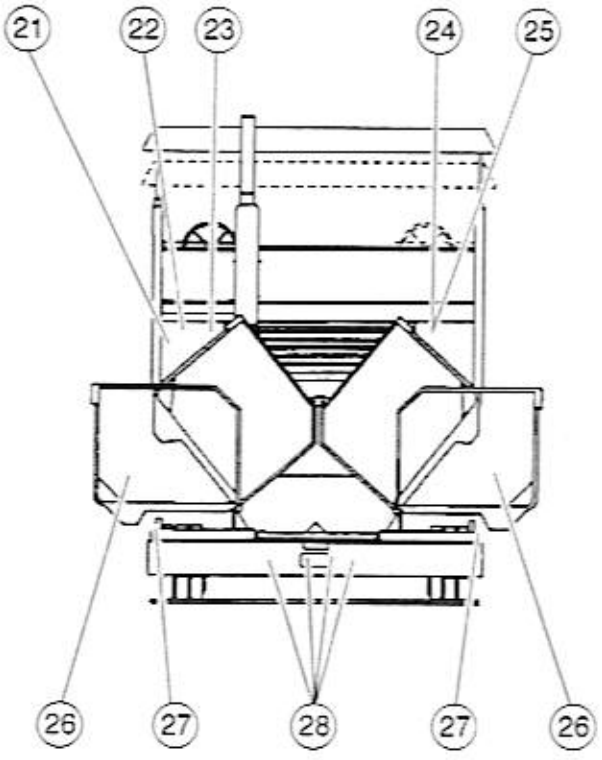
2.3 Every 250 operating hours

Item	Maintenance point	Number	Lubrication	Check	Oil change	Filling volumes	Substance
17	Diesel engine: – Oil change – Filter change	1		x	x	Engine oil	see "Filling volumes"
	Engine suspensions			x			

2.4 Yearly (or every 1000 operating hours)

Item	Maintenance point	Number	Lubrication	Check	Oil change	Filling volumes	Substance
7	Conveyor gear	2		x	x	Gear oil 220	see "Filling volumes"
11	Auger bevel gear	2		x	x	Gear oil 90	see "Filling volumes"
12	Pump distribution gear	1		x	x	Gear oil 90	see "Filling volumes"
14	Drive axle	1		x	x	Gear oil 90	see "Filling volumes"
16	Water cooler - anti-freeze agent	1		x		Cooling fluid	
22	Fuel prefilter	1		x			
	Diesel engine: – Valve clearance – Heater plugs			x x			
	Have a specialist check the screed and the gas heater system						





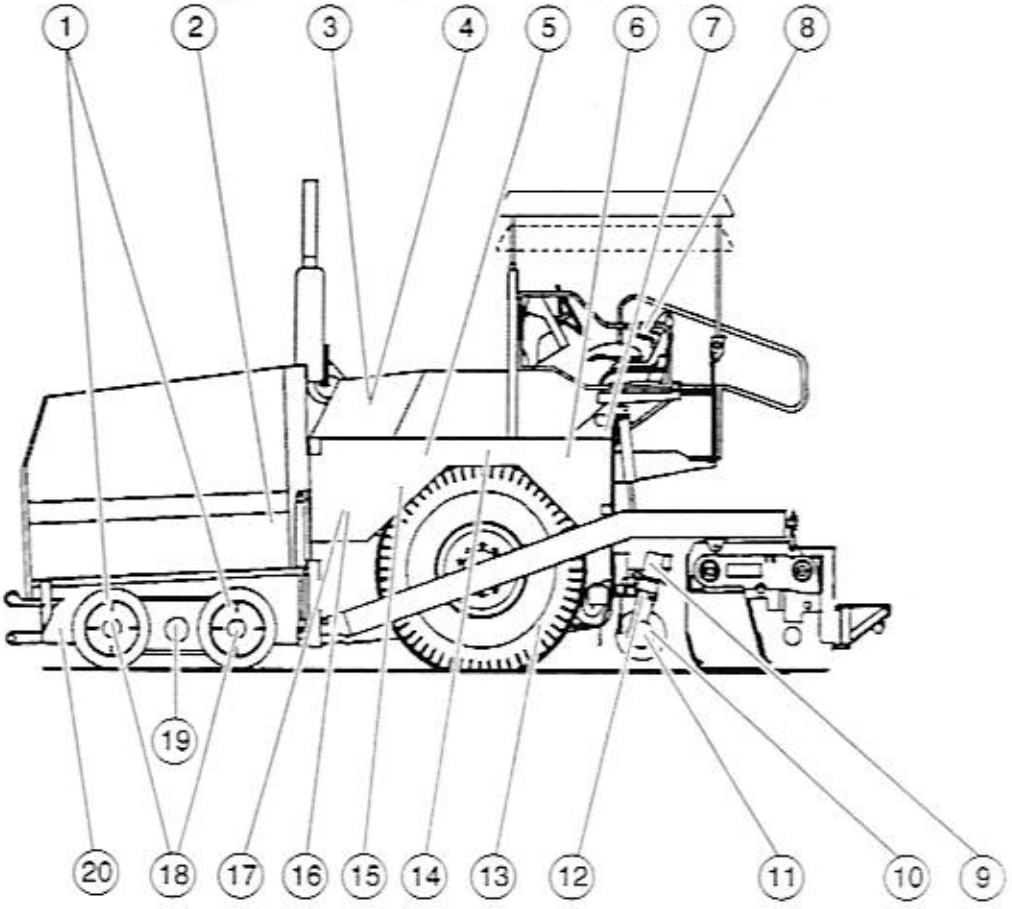
F F12W GB 8-28 0898

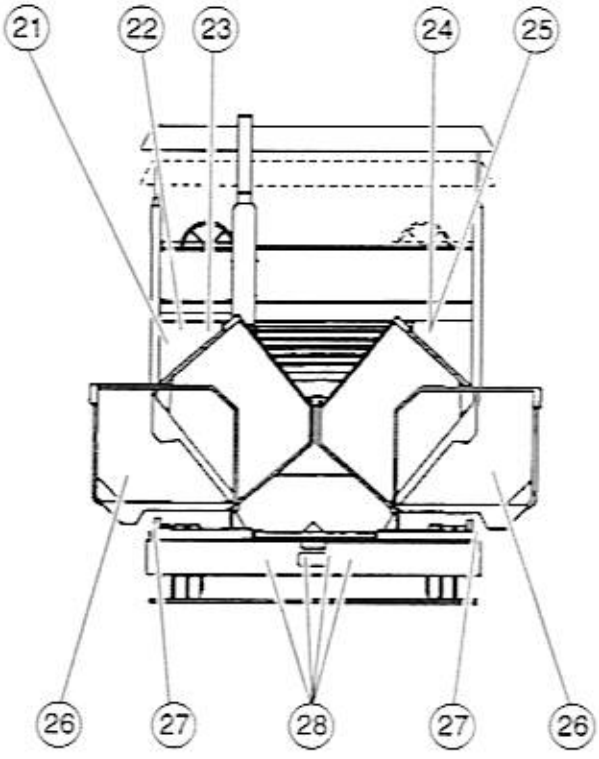
2.5 Every 2 years (or every 2000 operating hours)

Item	Maintenance point	Number	Replace	Clean	Oil change	Filling volumes	Substance
16	Water cooler and entire cooling system	1	x			Cooling fluid	see "Filling volumes"
23	Fuel tank and system	1		x			
24	Suction/return hydraulic filter *	2	x				
25	Hydraulic oil reservoir - entire filling	1			x	Hydraulic oil	see "Filling volumes"

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

3 Points for checking, lubricating and draining of oil



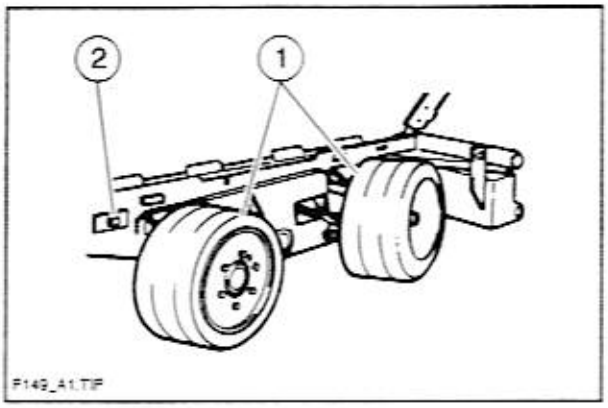


☞ The points for checking, lubricating and draining of oil are described in detail below. The item numbers given in the headers refer to the illustration above.

3.1 Lubrication points

King pins (1)

Each of the four king pins is equipped with one grease nipple.

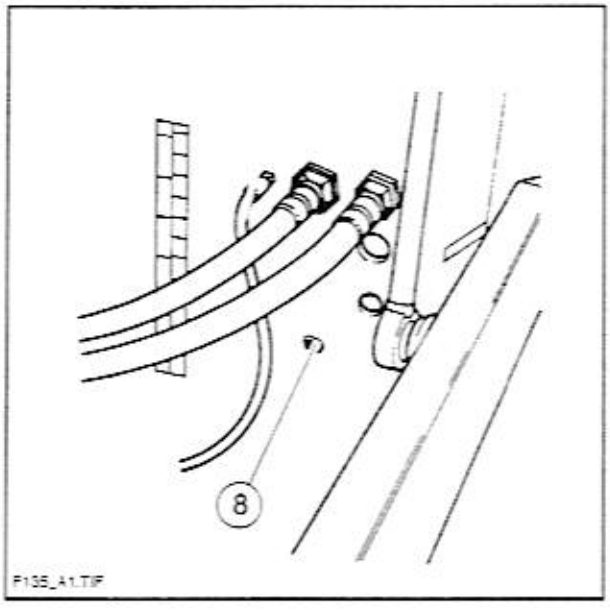


Steering (2)

The grease nipple is located on the right-hand side panel and supplies the entire steering leverage with grease via a lubrication line.

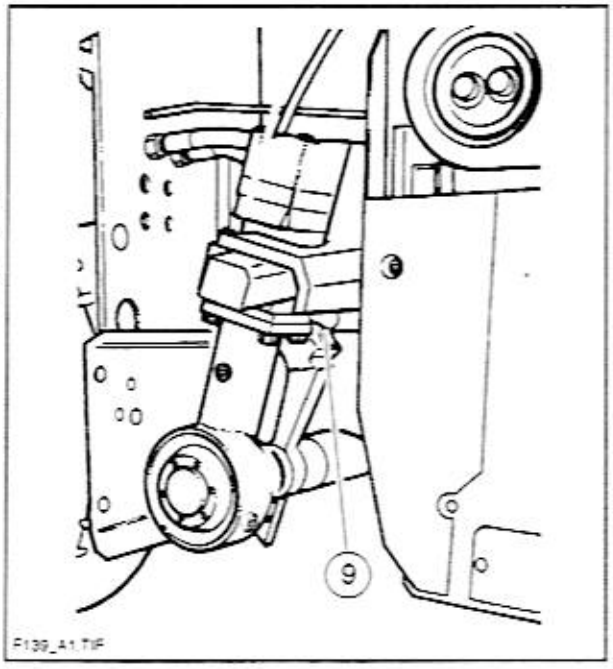
Center conveyor bearing (8)

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



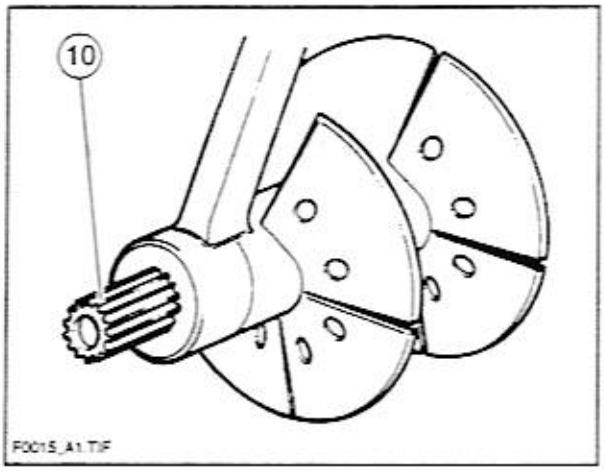
Outer auger bearing (9)

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



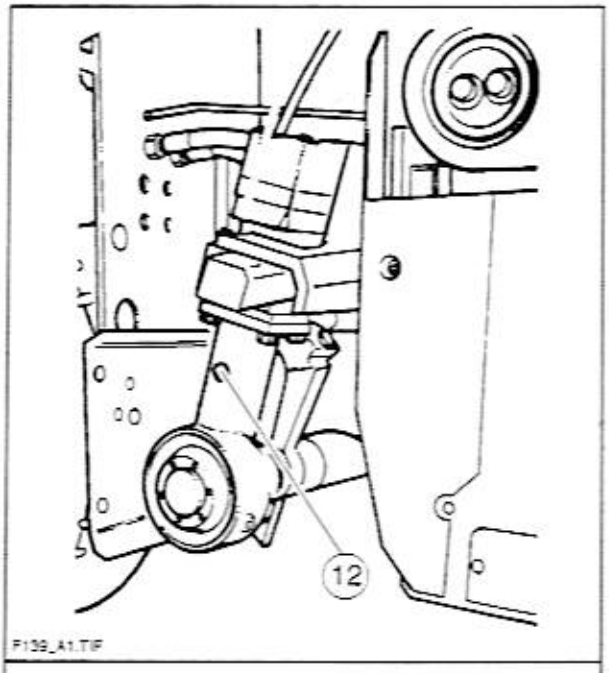
Center auger bearing (10)

The center bearing must be lubricated on the left-hand side of the auger. To do so, the bevel gear unit must be pulled off.
The center bearing must be lubricated when in a warm state to force out any bitumen residues.



Auger, gear neck bearing (12)

The socket head cap screw plug on the gear neck is for protection only. When the screw located underneath has been removed, a 10x1 grease nipple must be mounted. Using a grease gun, inject 10 strokes into it. Remove the grease nipple and screw both screws back in. The gear bearing is sealed at the underside and is exclusively lubricated with grease.

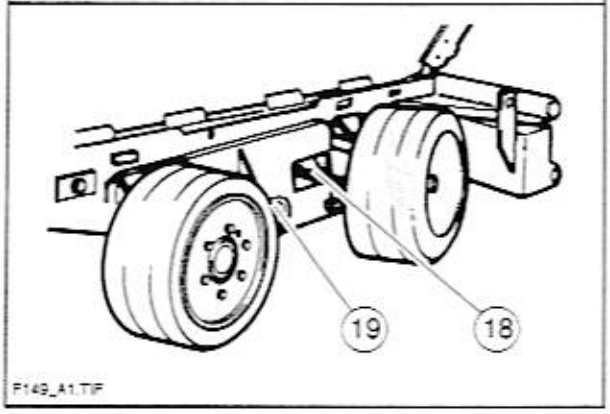


Wheel bearings (18)

Each of the wheels is equipped with a grease nipple on the wheel hub.
In the case of front-wheel driven paver finishers, the drive wheels have no grease nipples.

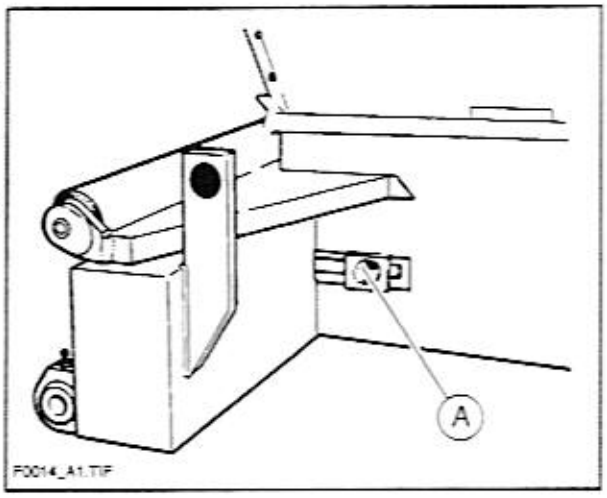
Floating axle (19)

The grease nipples are located to the left and to the right of the center bearing of the floating axle.



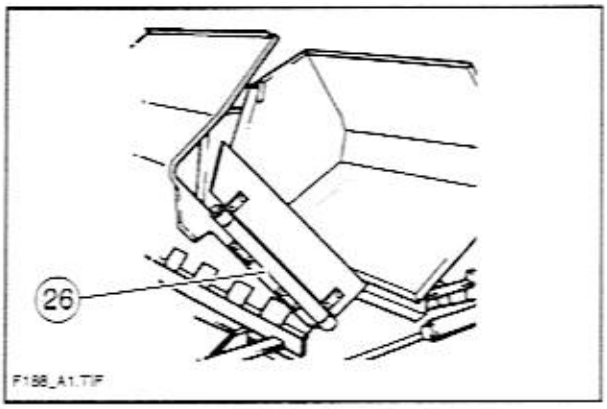
Conveyor deflection rollers (20)

The deflection rollers for the conveyor are lubricated with grease nipples **A** located behind the cross beam.
The center bearings are lubricated via the outer grease nipples.



Steel hopper flaps ○ (26)

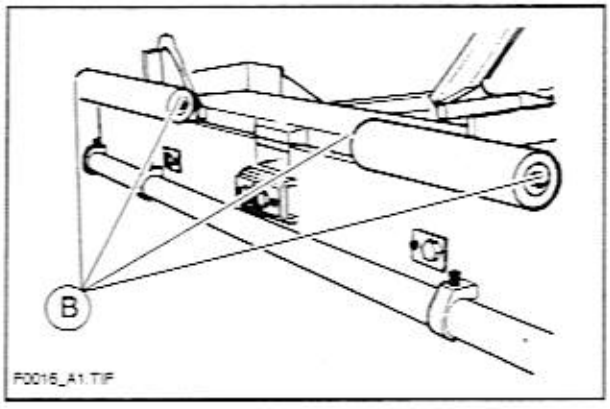
Each of the spring-loaded steel hopper flaps is equipped with a grease nipple in its center.



Push rollers (27)

Lubricate the push rollers on both sides **B**.

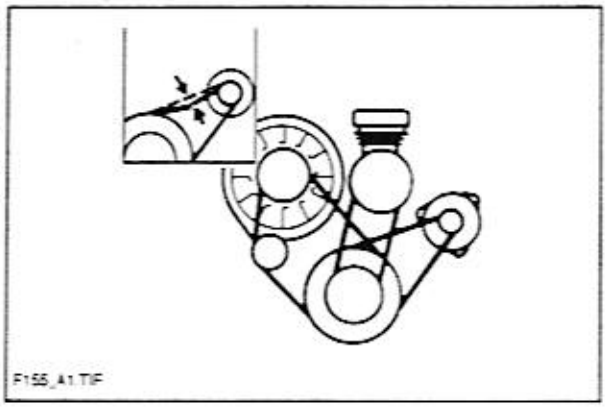
The crossbeam is pivoted at the center and needs not be lubricated.



3.2 Check points

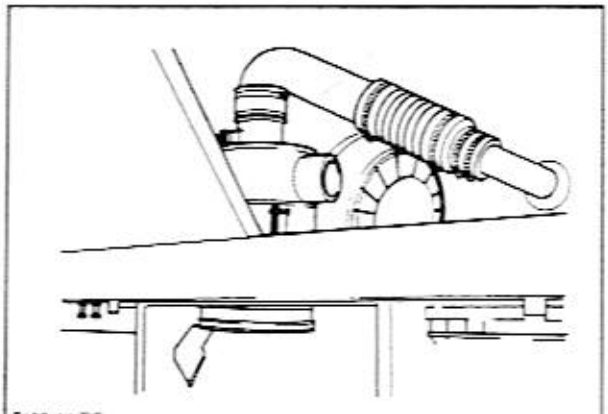
V-belts (3)

When checking the V-belts, it must be possible to push them inwards by max.1-1.5 cm. If this is not the case, tighten the V-belt (see the operating instructions for the engine). If one of the belts breaks, the engine is shut down by the speed adjuster or switched to idling speed.



Air filter (dry air filter) (4)

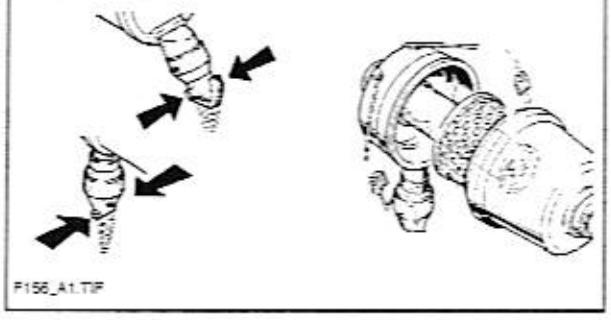
The maintenance for the air filter is described in the operating instructions for the engine.



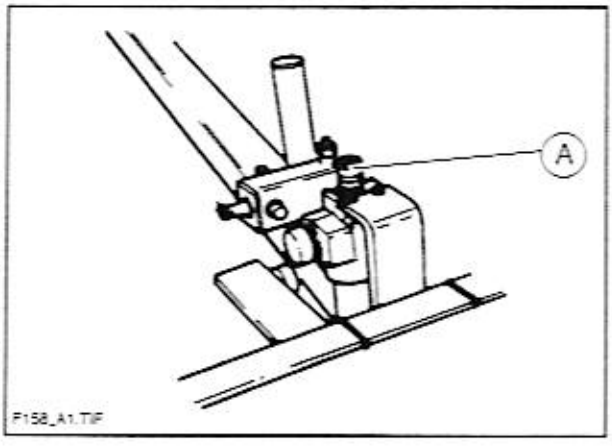
High pressure hydraulic filter (6)

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

Replace filter cartridges when maintenance indicator **A** turns red.

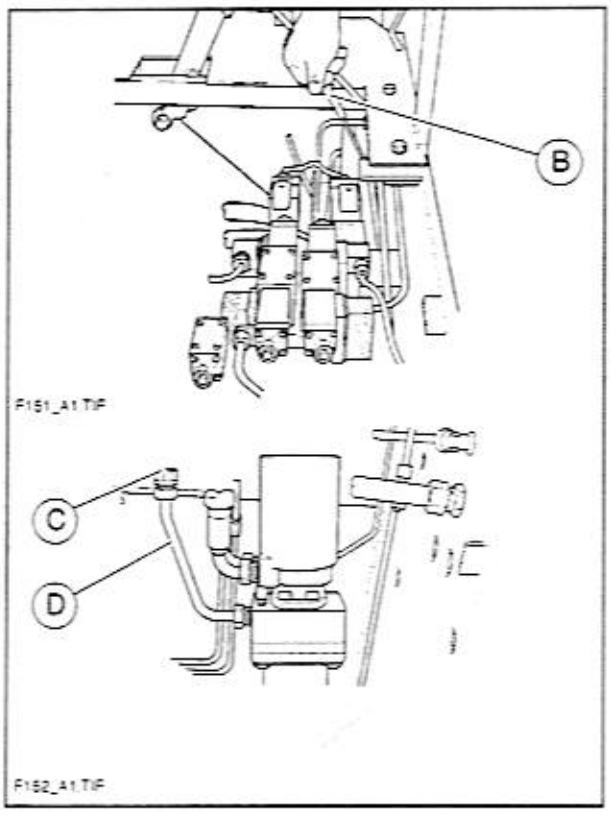


Drain the soiled oil that leaks out after unscrewing the filter cap into a used oil container. Take out the filter cartridge and have it disposed of by specialists (danger of environmental pollution!). Wash out the housing, replace the O-rings and apply a thin layer of oil to them. Mount the filter housing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



Conveyor gear (left/right((7)

The conveyor gears are beneath the footboard of the operator´s platform.
Always check the oil level before starting work. The oil level must reach the upper notch of the dipstick **B**. Top up the oil Remove the cap **C** and top up the oil through the oil filler neck **D**.

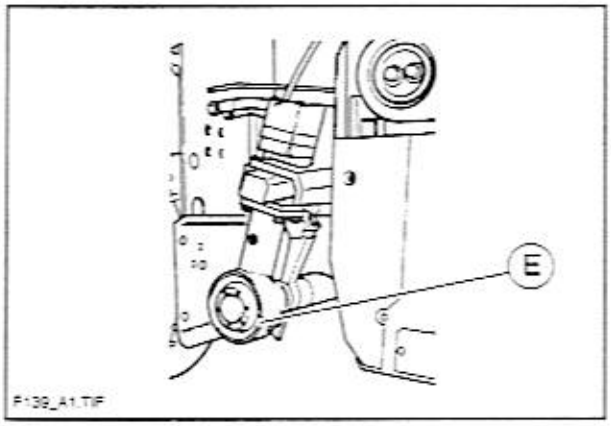


☞ 10 cm on the display equal about 0.25 l of oil The conveyor gears are filled with Optimol Optigear 220 at the factory. Due to the high quality of this oil, it is not necessary to replace the oil at regular intervals.
Checking the oil level in the gear at regular intervals is sufficient (see the section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

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

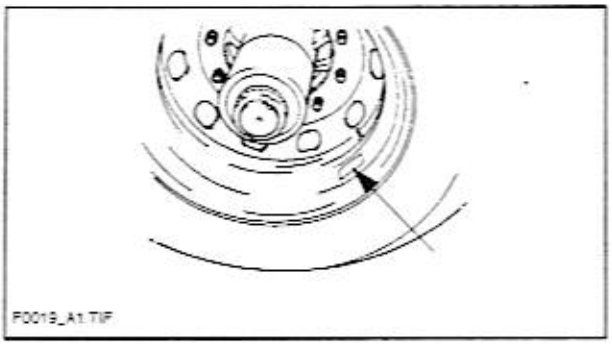
Auger, bevel gear (left/right) (11)

The gear unit has two filler plugs. The lateral screw plug **E** is used for checking the oil level and for topping up oil.
Clean the vicinity of the screw plug before unscrewing it. The oil level is correct when a small amount of oil leaks out of the lateral opening.



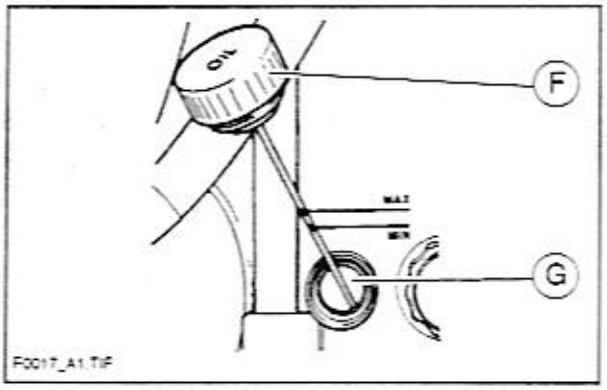
Drive wheel air pressure (13)

The required air pressure for the drive wheels is stamped on each rim and highlighted with paint.



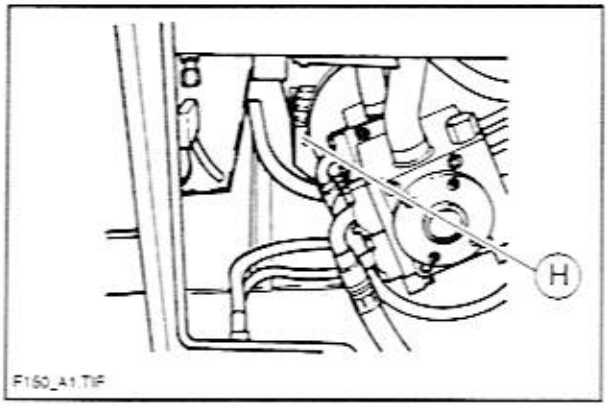
Drive axle (14)

The drive axle is equipped with a dipstick **F** . The oil level must reach the upper mark.
The dipstick opening **G** is also used for topping up oil.



Pump distribution gear (15)

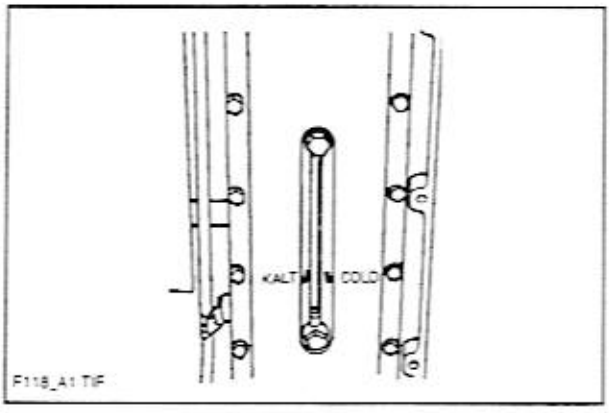
The screw plug **H** is used for topping up the oil and for checking the oil level.
After the plug has been screwed out, some oil must escape. If necessary, top up the oil.
Make sure that the area is clean!



Water cooler (16)

The cooling water level must be checked when the system is cold. The level should then be at the (COLD) mark. Make sure that the cooling water contains a sufficient amount of anti-freeze/ corrosion protection agents (-25° C).

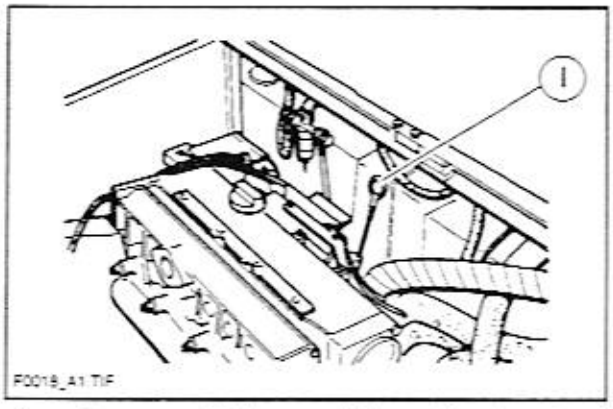
When hot, the system is under pressure. Danger of scalding when the system is opened!



Diesel engine (17)

Check the engine oil level with dipstick **I** every time before work is started.
Only check the oil level when the engine is in a horizontal position!

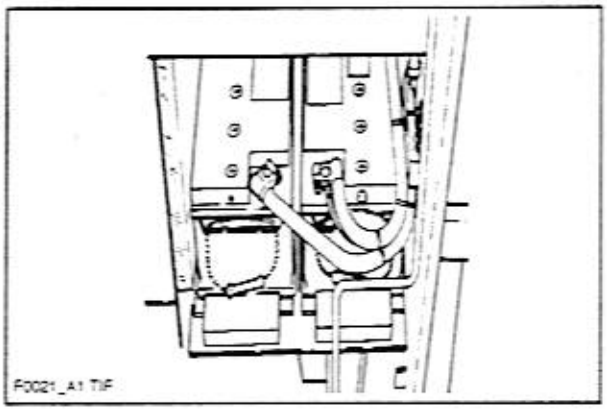
Too high an oil level destroys the seals in the engine while too low an oil level causes the engine to be overheated and destroyed.



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

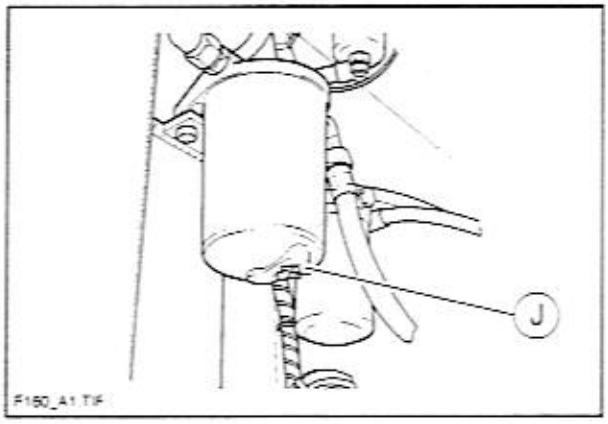
Batteries (21)

When supplied, the batteries are filled with the correct amount of acid. The acid level should reach the upper mark. If this is not the case, use only distilled water for topping up!
The poles must be free of oxide. Protect them with special pole grease.



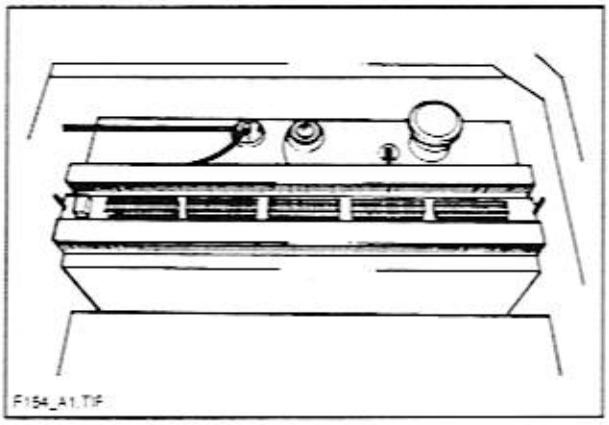
Fuel filter (22)

The filter is on the right-hand side and can be accessed after the cap to the left of the cooling air suction hole has been removed.
The system comprises a prefilter and a main filter. The drain plug **J** is used to drain the accumulated water.



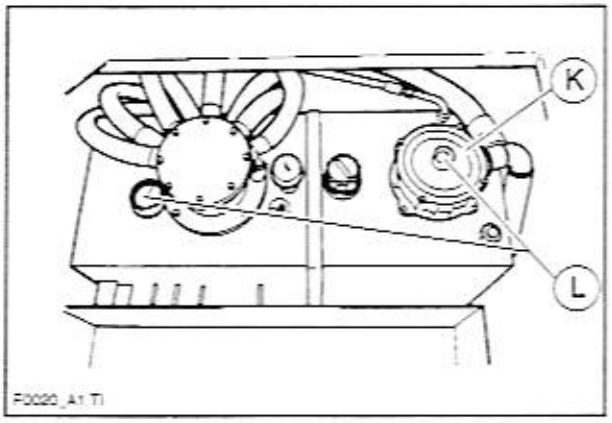
Fuel tank (23)

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.



Suction/return flow hydraulic filter (24)

The filters must be replaced when service indicators **K** or **L** turn red.
Always replace filters when exchanging the hydraulic oil.

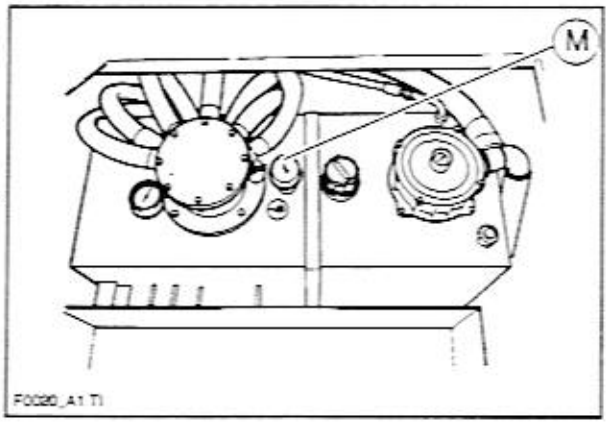


Unscrew the lid of the filter housing on the hydraulic oil reservoir and replace the filter cartridge.

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

Hydraulic oil reservoir (25)

Use dipstick **M** to check the oil level. With retracted cylinders, the oil level must reach the upper mark.
Regularly clean the oil reservoir ventilation and the oil cooler surfaces (see also the operation instructions for the engine).

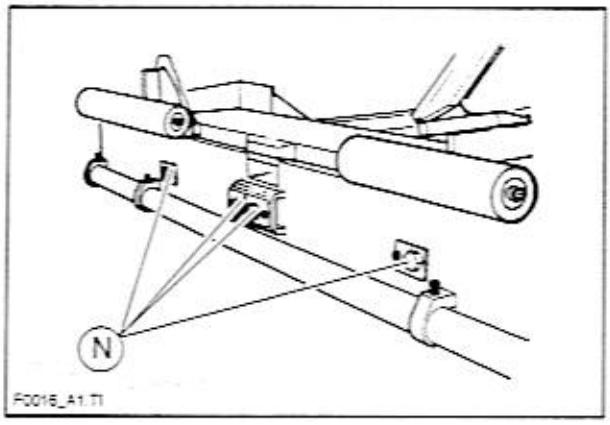


⚠ Use recommended hydraulic oils only, see the section "Recommended hydraulic oils" (page F23).

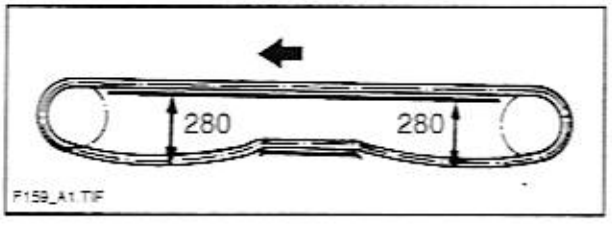
Chain tension, conveyor (28)

Adjusting screws **N** are located at the front of the crossbeam.

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



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



F F12W.GB 18-28 0898

General visual checks

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

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

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

Checks by a specialist

☞ The paver finisher, the screed and the gas heater system must be checked by a specialist for their safe state.

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

3.3 Oil drain points

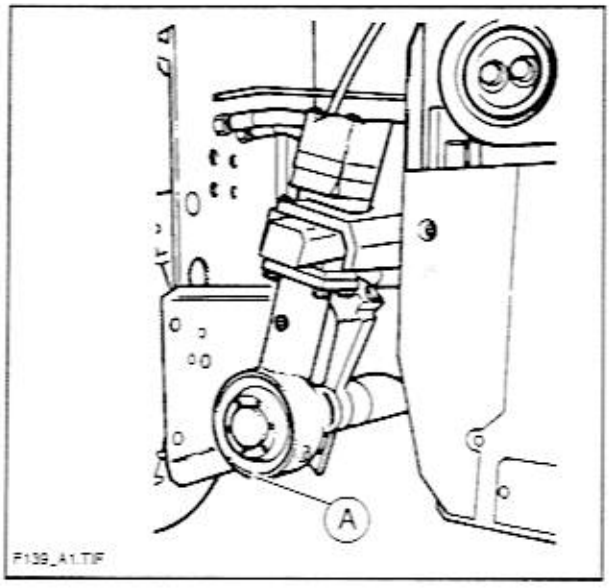
Collect all used oil and have it disposed of properly! Possible environmental hazard!

For the filling volumes, see "Filling volumes".

Auger - bevel gear (11)

To drain the oil, unscrew the lower screw **A**.
When returning the screw make sure to use a new seal.
Make sure that the area is clean!

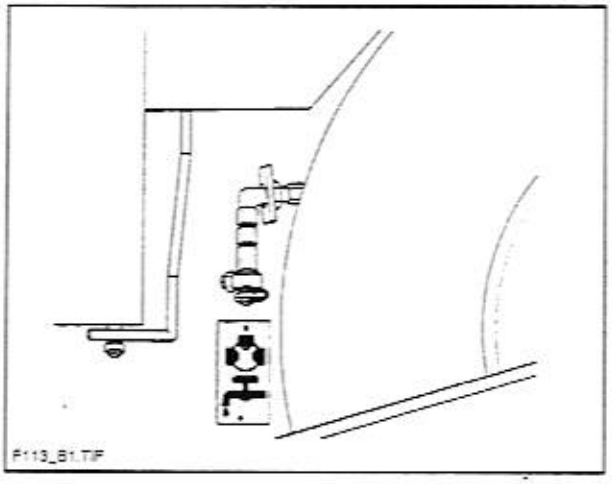
For filling in oil, refer to page F15.



Drive axle (14)

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

For filling in oil, refer to page F16.

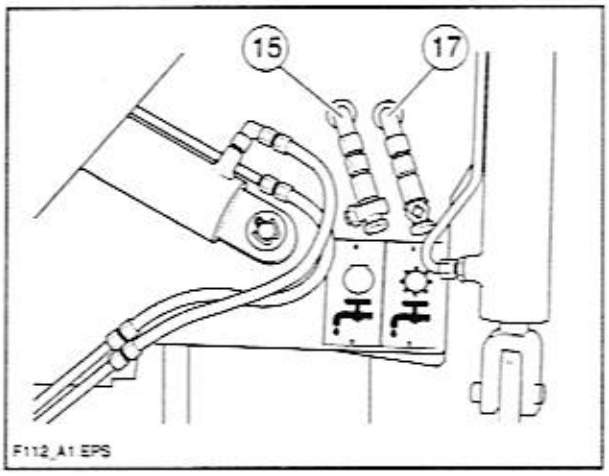


Pump distribution gear (15)

Draining the oil:

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

For filling in oil, refer to page F16.



Diesel engine (17)

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

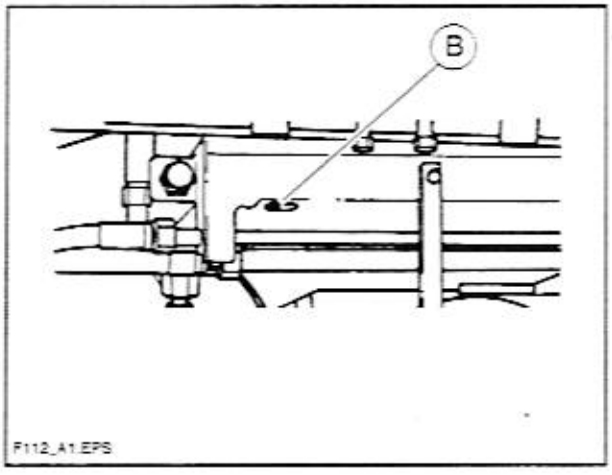
- Replacing the engine oil filter:
  The filter is on the right-hand side and can be accessed after the cap to the left of the cooling air suction hole has been removed.

For filling in oil, refer to page F16.

Hydraulic oil reservoir (25)

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

For filling in oil, refer to page F18.



4 Lubricating agents and operating substances

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

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

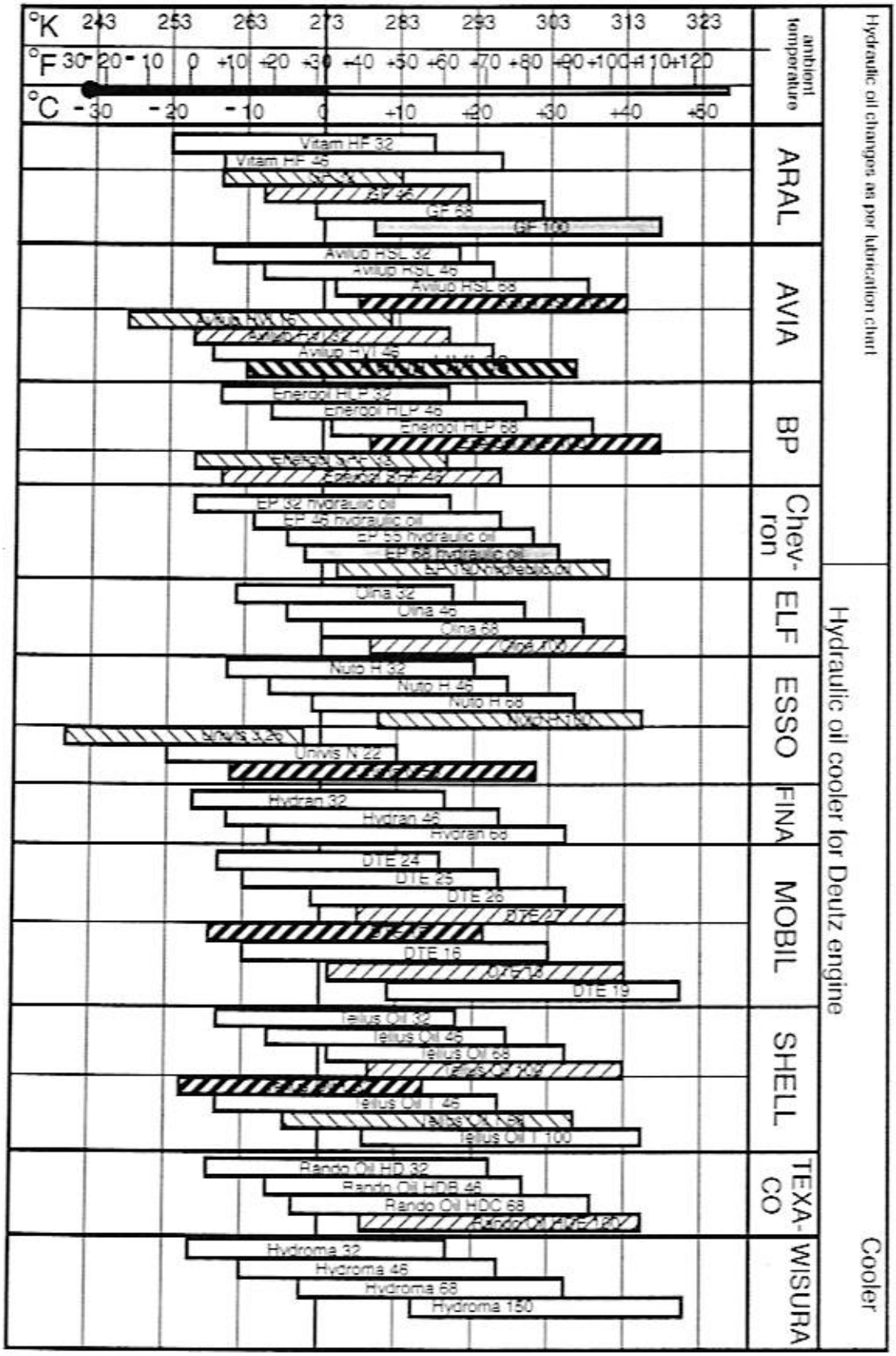
☞ Heed the filling volumes (see the section "Filling volumes").

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

	BP	Esso	Fina	Mobil	Renault	Shell	Wisura
Grease	BP Multi-purpose grease L2	ESSO Multi-purpose grease	FINA Marson L2	Mobilux 2 Mobiplex 47	Multi-purpose grease	SHELL Alvania Grease R 3	Retinax A
Engine oil	See the operating instructions for the engine. SAE 30 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	FINA Ponionic N SAE 90	MOBIL GX 90	Tranself EP 90	SHELL Spirax EP 90 Hypoit GL 4	
Gear oil 220	BP Energol GR-XP 220	ESSO Spartan EP 220	FINA Giran L 220	MOBIL Mobilgear 630 Mobil-gear SHC 220	Chevron NL Gear Compound 220	SHELL Omala 220	Optimol Optigear 220
	Optimol Optigear 220 has been filled in at the factory.						
Distilled water							
Diesel fuel							
Brake fluid	BP Blue original brake fluid	ATE Disc brake fluid	FINA Trelup HD 3	ELF			
Cooling liquid	Cooling liquid (anti-freeze and corrosion protection)						

F F12WGB 22-28 0898

4.1 Recommended hydraulic oils



Environmentally friendly HVI hydraulic oil on ester basis:

- WISURA Hydrofluid SE 46

⚠ When WISURA Hydrofluid SE 46 is used, the special notes under 4.2 must be heeded!

4.2 Special notes for using WISURA Hydrofluid SE 46

For environmental protection reasons, the hydraulic system must be emptied as far as possible when converting from mineral oils to WISURA Hydrofluid SE 46. To retain an optimum purity of the biologically degradable hydraulic oil, several rinsing cycles are recommended. Simply topping up with WISURA Hydrofluid SE 46 does not make the resulting mixture more environmentally friendly.

To ensure the operational safety, the oil filters in the hydraulic system must be cleaned after ca. 50 operating hours (metal screen filters) or replaced (paper filters) after conversion to WISURA Hydrofluid SE 46. This is necessary to safely remove the dirt particles caught in the filters which have been dissolved from the system owing to the high cleaning capabilities of WISURA Hydrofluid SE 46.

The oil change intervals for WISURA Hydrofluid SE 46 are the same as for hydraulic oils on mineral oil basis.

F F12W GB 24-28 0698

Gas heater system: Bottle holders Bottle valves Pressure reducer Hose break safety devices Closing valves of dual branch piping Main shut-off valve Connections Switch box control lamps	 Firm seating Cleanliness and tightness Operating pressure (1.5 bar) Proper functioning Proper functioning Proper functioning Tightness All lamps must be lit when the paver finisher is switched on.
Auger cover	For larger working widths, the width of the walkway plates must be increased and the auger tunnels must be covered. Hinged walkway plates must be folded down. Check that the side shields and plates and the covers are firmly seated.
Screed covers and walkway plates	When the screed is lifted (using the lever underneath the seat), it must be possible to push the locking rods sideways into the recesses in the crossbeam.
Hopper transport safeguards	When the hopper is closed, it must be possible to fold the catches over the lock studs on the two halves of the hopper.
Protective roof	Both locking bolts must be in the provided bore hole and secured by means of a split pin.
Miscellaneous	Check that the hoods and the flaps are firmly seated: motor hood lateral flaps
Accessories: wheel chocks warning triangle first-aid kit	The accessories must be in the provided holders.
* Option ** Paver finisher with wheels	

7 Functions of the controls and display instruments

☞ Heed all information given in the operating instructions on these items.

7.1 Starting up

STOP 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 and do not actuate any controls when this is expressly forbidden!
Unless otherwise specified in the operating instructions, 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 when the engine is running. Danger to life and limb!

7.2 Conduct during travelling

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! Immediately stop operation when the paver finisher is defective!
Do not let any persons ride on the paver finisher or on the screed!
Remove any obstacles from the road and the work area!
Always try to choose a driver position that is opposite to the flowing traffic! Lock the operating panel and the driver's seat.

While travelling,

- do not let your arms and legs hang out of the driver stand,
- do not lean beyond the outer edges of the paver finisher,
- do not climb from one vehicle onto another or onto permanent structures.

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.
Never use the paver finisher beyond its capacities to avoid losing control over the machine!

E Driving permission

1 Driver seat and driver platform

Paver finishers with a driver seat or driver platform may only be operated by persons who are at least 18 years of age, who have been trained in the operation of paver finishers, who have demonstrated to the user or his representative their capability of driving and handling the paver finisher, and who have expressly been charged by the user or his representative with the operation of the paver finisher. In addition, special knowledge about the paver finisher to be operated is required.

2 Rights, duties and conduct of the driver

The driver of a paver finisher must have been informed on his rights and duties. All necessary rights must be granted to him. He should wear protective clothing suited for the operating conditions. The driver must be familiar with the operating instructions, and a copy of the operating instructions must be available to him at any time. The user must ensure that the driver has understood all information related to safety.

3 Prohibition of unauthorized use

The driver is responsible for the paver finisher during working time. He must forbid unauthorized persons to operate the paver finisher. When leaving the paver finisher, he must protect it from unauthorized use. The driver may only transport persons if the paver finisher is specially equipped for this purpose. The maximum number of persons that may be transported must not be exceeded.

4 Persons in the danger area

Before starting up and during operation of the paver finisher, the driver must make sure that there is no-one in the danger area. He must give a warning signal whenever a situation presenting danger to persons might develop. He must immediately stop work if any person, although asked, does not leave the danger area.
All persons that are in the vicinity of the paver finisher must be informed on the dangers that can result from the operation of the paver finisher.

Do not climb or reach into moving parts.

5 Travelling on public roads

☞ Crawler-type paver finishers are not allowed to travel as self-propelled vehicles on public roads in Germany.
Paver finishers with wheels may only use public roads for short distances in Germany.
National regulations for using public roads with paver finishers must be observed.

6 Checks to be carried out before starting daily work

Before starting up the paver finisher, the driver must ensure that the machine can be safely operated. Before starting work:

Check!	How?
Emergency stop buttons on the operating panel and on the two remote controls*.	The diesel engine and all drives that are switched on must immediately stop.
Service brake** (pedal brake)	Step on the pedal while travelling at slow speed in the transport gear (with screed lifted). The paver finisher must stop immediately and must not pull to one side.
Parking brake** (hand brake)	Pull the lever as far as possible while travelling at slow speed in the transport gear (with screed lifted). The paver finisher must stop immediately.
Steering system	The paver finisher must immediately follow all steering movements in a precise manner.
Horn on the operating panel, on the two remote controls*	Briefly press the horn button. The horn must be sounded.
Lights	With the ignition switched on, check the following lights by switching them on: Parking/rear lights, low/high beam; stop lights; direction indicators, hazard warning lights
Hazard warning lights of the screed (with vario screeds)	With the ignition switched on, press the switches for extending/retracting the extendable parts of the screed. The rear lights must flash.
* Option ** Paver finisher with wheels	

7.3 Visibility

The driver must look in the direction of travel and must always have a clear view of the route ahead. Especially when driving in the reverse direction, he must ensure that his path and the working area are clear.

7.4 Braking

The driver must select a travelling speed that always provides a sufficient braking distance.

D Information on the paver finisher

1 Description of the paver finisher, the equipment and the extensions supplied

A description of the paver finisher and its extensions can be found in the pertaining operating instructions.

2 Safety devices and warning signs

The safety devices described in the operating instructions must be used in the proper manner. All warning signs and warning notes must be observed.

3 Airborne sound and vibration

The values given in the operating instructions for the sound level were determined according to the draft of prEN 500-6 dated March, 1997, and to the "ISO 4872".

However, the values given for the sound level of the paver finisher cannot be applied for determining the noise emission at the workplace according to directive 86/188/EEC (daily exposure to noise). If necessary, the actual values must be determined on site under actual conditions (additional sources of noise, special conditions of use, sound reflection).

Vibration acting on the entire body:

When the machine is used properly, the weighted effective acceleration values at the driver's seat of 0.5 m/s^2 stipulated in the draft of prEN 1032-1995 are not exceeded.

Vibrations acting on hands and arms:

When the machine is used properly, the weighted effective acceleration values of $a_{hw} = 2.5\ m/s^2$ stipulated in the draft of prEN 1033-1995 are not exceeded.

These values are characteristic values of the paver finisher under defined conditions. If necessary, the driver's exposure to vibration over a workday must be determined on site so that additional factors such as the distance traveled, the intensity, etc. can be taken into account.

4 Dimensions

The dimensions are given in absolute values to ensure safe maneouvering. Any national regulations must be observed.

C Correct application and areas of application

1 Correct application of the paver finisher

Paver finishers must only be used for laying mixed materials, roll-down concrete or lean-mixed concrete, track-laying ballast and unbound mineral aggregates for foundations for paving. If a paver finisher is to be used for other purposes, an approval from SVEDALA and, if necessary, from the appropriate authorities must be obtained beforehand to avoid any risks.

1.1 Damage, defects

Any damage or other defect on the paver finisher or on its extensions must be immediately reported to the supervisor. Paver finishers and extensions that cannot be safely operated must not be used until they have been properly repaired.

Safety installations and switches must not be removed or rendered ineffective. Permanently set values may only be changed after an approval has been obtained from SVEDALA.

1.2 Danger area

Apart from the operator on the operating stand, no other person must remain in the danger area of a paver finisher. The danger area is considered to be the area within which persons are endangered by the movements of the paver finisher and its operating devices.

1.3 Regulations for the use of roadways and for the area of application

Only the roadways specially allocated for work by the user or his representative must be used. There must be no obstacles on these roadways.

1.4 Dangerous spots

Dangerous spots must be indicated using the usual traffic signs and any additional warning signs that may be required.

1.5 Slopes and inclines

Negotiating slopes and inclines is only permitted if they do not exceed the values specified by SVEDALA.

2 Correct application of extensions

2.1 Using extensions

Extensions may only be applied as described in the pertaining operating instructions. The operator must have been trained in the operation of the attachments.

2.2 Allocation of extensions to the paver finisher

If the extensions have not been supplied by SVEDALA, the instructions provided by SVEDALA and by the manufacturer of the respective extension must be observed.

2.3 Mounting

The extension must be mounted according to the instructions provided by the manufacturer. Each time an extension is mounted, it must be checked for proper functioning before it may be used.

3 Operation

3.1 Emergency stop button

Pressing the emergency stop button (e.g. when someone enters the danger area, when the machine is no longer under control, etc.) causes the motor, the drives and the steering system to be switched off. The paver finisher is braked to a standstill. Before the finisher can be started up again, the cause of the malfunction must be determined and the malfunction eliminated. The finisher must then be started up again as described in the operating instructions.

3.2 System-specific devices

System-specific devices must be agreed upon by the user and by SVEDALA. Safety devices related to the paver finisher must be checked at regular intervals.

B Definitions

1 Correct application

Application for which the paver finisher is suited according to the specifications provided by SVEDELA or by the authorized importer.

2 Correct use

The manner in which the paver finisher is used.

3 User

A natural or legal person who either uses the paver finisher himself, or on whose behalf it is used. In special cases, such as leasing or renting, the user is considered the person who, in accordance with the contractual agreements between the owner and the user of the paver finisher, is charged with the observance of the operating duties.

4 Expert

An expert is a person of adequate experience who has been specially trained, has acquired sufficient know-how and is familiar with the applicable regulations and guidelines for safety at work and for the prevention of accidents as well as with the approved technical rules so that he can assess the condition of the machine in terms of safety.

Supervisor: A person charged by the user with instructing the operator on the correct use and application of the paver finisher and, if no other provisions have been made within the company or within the contract, with ordering any required or regular maintenance work as well as regular tests.

A Introduction (area of application, purpose)

☞ The present guidelines are part of the operating instructions enclosed with every paver finisher. They contain notes on the correct use and application of paver finishers as well as information on improper use and remaining risks, indicating also how these risks can be avoided.

Any unauthorized modification or supplement to the construction of the paver finisher can affect safety, thus causing the certificate of compliance stipulated by the EU to become invalid.

J Transportation, commissioning and storage

K Maintenance and repairs

L Additional notes regarding safety

M Tips regarding material laying

N Service card for delivery

O Service card for first after-sales service date

Table of contents

4.5 Fine adjustment

To check whether the transversal slope behind the screed matches the value shown at the control unit, place a percentage spirit level on the laid material. If the measured value differes from the value shown on the actual value display, enter the measured value using the control for the basic setting.

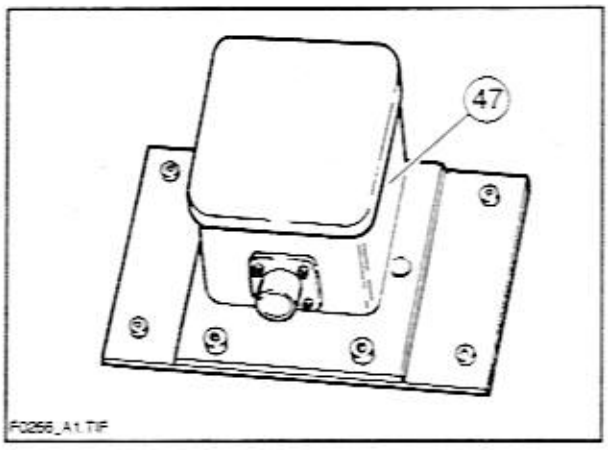
⚠ When switching the machine on, make sure that the set heights do not change; if necessary, readjust the slope control.

☞ The response time of the screed to any changes made to the transverse slope is approx. half a finisher length.

4.3 Installing the slope control

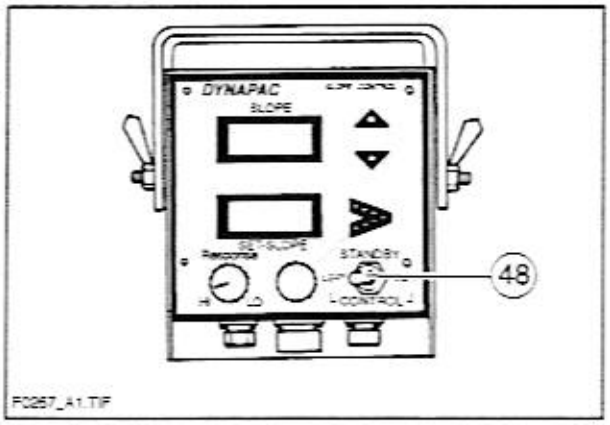
If the slope control (○) is to be used, the unit must be installed as follows:

- Bolt the sensor unit (47) to the transversal slope beam (49).

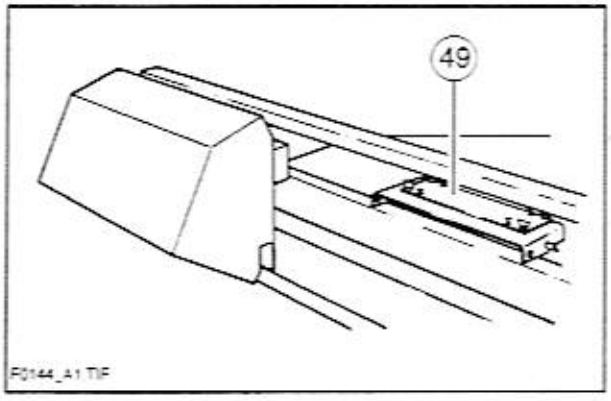


⚠ The socket must face rearwards.

- Attach the control unit to the finisher railing. Connect the power supply cable of the control unit. Set the control switch (48) to "Standby".

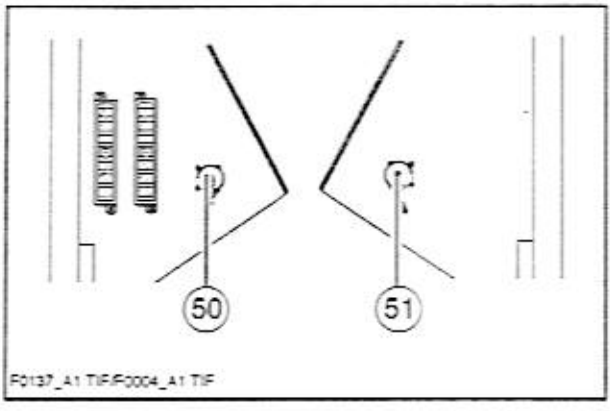


⚠ Check that the cables are not broken or crushed.
Switch on the ignition key and start up the diesel engine.



- Connect the power supply cable of the control unit to the socket on the operating panel, proceeding as follows:

If the slope control is to be used to control the **left-hand** side, connect the cable to the **left-hand** socket (50).



- In this case, set the "Slope" switch (48) to **LEFT**.

- If the slope control is to be used to control the **right-hand** side, connect the cable to the **right-hand** socket (51)

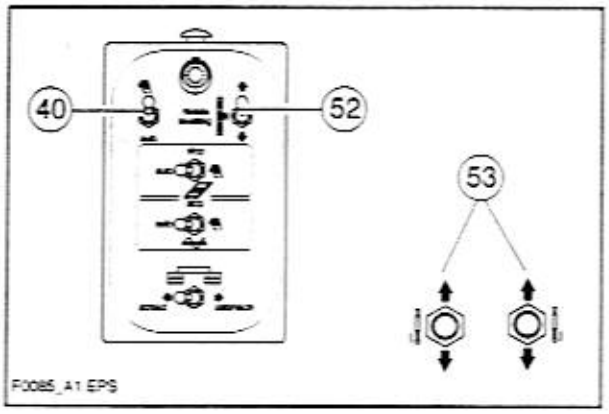
- In this case, set the "Slope" switch (48) to **RIGHT**.

4.4 Setting up the slope control

If the slope control (○) is to be used, the following settings must be made:

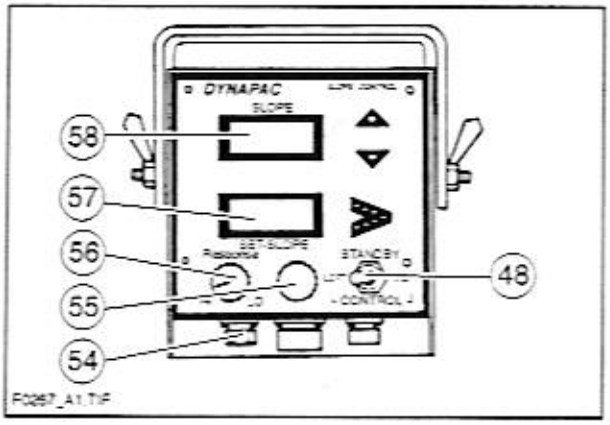
- Set switch (40) on the remote control to "manual".

- Using the levelling cylinders, align the transverse slope beam so that it is in a horizontal position.
  Use a spirit level to check the position of the transverse slope beam; if necessary, adjust the beam using switch (53) on the operating panel or switch (52) on the remote control.



- Set switch (40) on the remote control to "auto".

- Set the sensitivity control (56) to the required position:
  - Normal position: approx. center position.
  - For very precise scanning, turn the control towards "Hi" (higher).
  - For coarse scanning, turn the control towards "Lo" (lower).



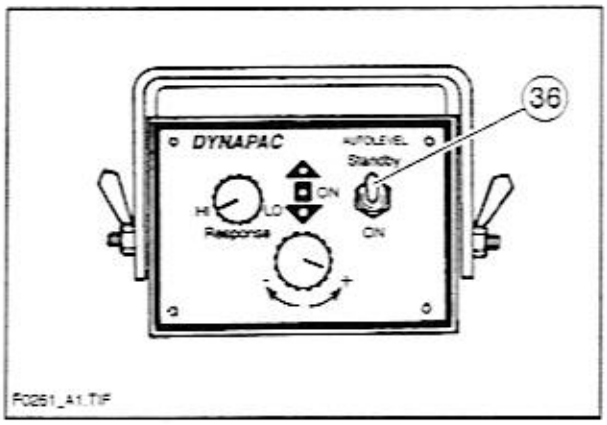
- The actual value display (58) should now indicate a transverse slope of 0.0 %. If a different value is shown, use the control for the basic setting (54) to readjust the setting.

- Use the set value control (55) to set the required percentage for the transverse slope. This percentage is shown in the set value display (57).
  The control should normally be in roughly the center position, i.e. turn the control in one direction until reaching the stop and then it back by 5 turns.

- After this setting has been made, the control switch (48) must be set to the side to be controlled.
  LEFT = left-hand side
  RIGHT = right-hand side

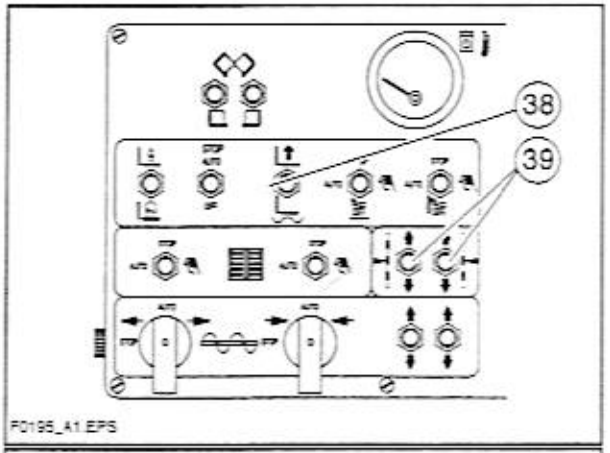
4.2 Setting up the grade control

- Start the engine. Move the finisher to the required position.



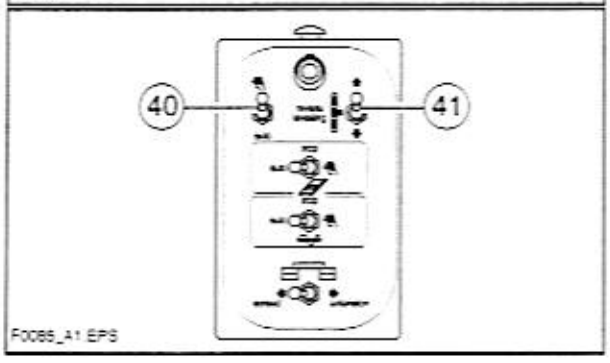
⚠ For all set-up work, the screed must be in the floating position (switch (38) in the bottom position)!

- Set the toggle switch (36) of the control unit to "Standby" and switch (40) of the remote control to "manual".



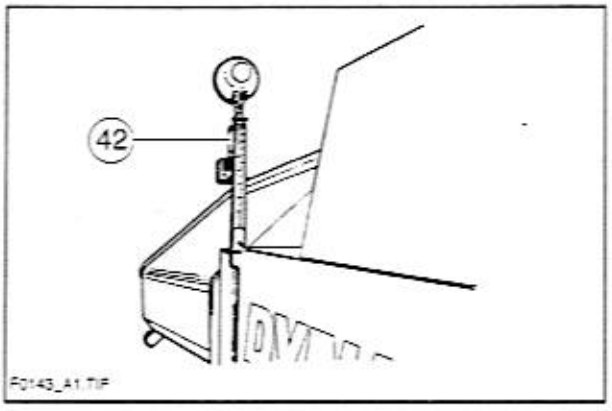
- Lower the screed onto two wooden blocks or a material carpet with a length of approx. 1 m.

  Height: material layer plus 20–25 % (for final compaction).

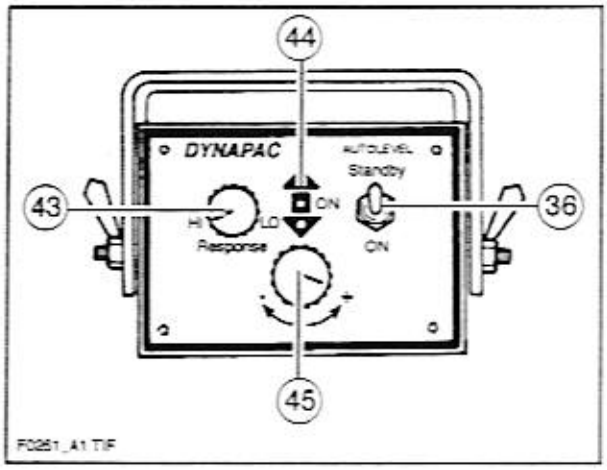


Using switch (39) (or (41) on the remote control), set this height at the scales (12) of the levelling cylinders.

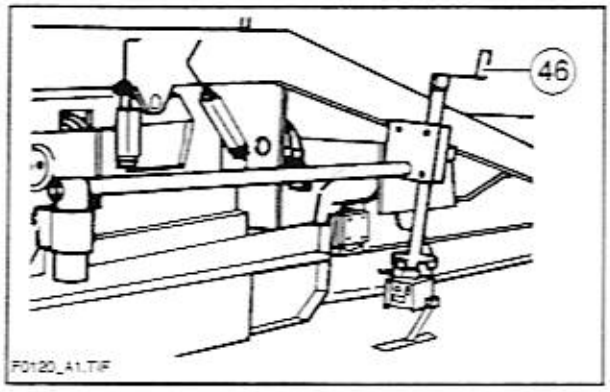
- Set switch (40) on the remote control to "auto".



- For normal adjustments:
  Turn the grade control (45) in one direction until reaching the stop. Then turn the control back by 5 turns (center position).
  Using the spindle (46), move the grade control upwards or downwards until the control lamps (44) on the control unit go out.
  The mechanic linkage of the sensor part now has been set to a position where the sensor arm is at an angle of 45° to the vertical. The scanning arm must be on the reference line.



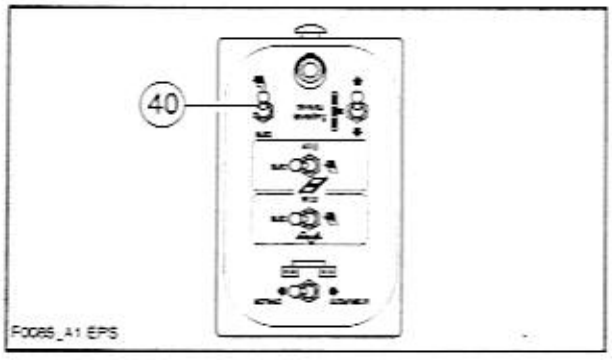
- Set the sensitivity control (43) to the required position:
  - Normal position: approx. center position.
  - For very precise scanning, turn the control towards "Hi" to increase the sensitivity.
  - For coarse scanning, turn the control towards "Lo" to reduce the sensitivity.



- If the layer thickness must be changed, use the grade control (45) to change the height.

Control lamps

Hi = point of traction further upwards
ON = height OK
LO = point of traction further downwards



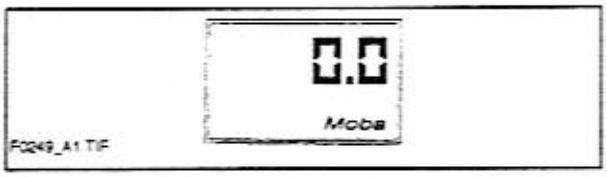
- Set the toggle switch (36) of the grade control to "On" and switch (40) on the remote control to "auto".

If automatic height scanning is to be carried out on both sides, the set-up procedure described above must be repeated for the other side.

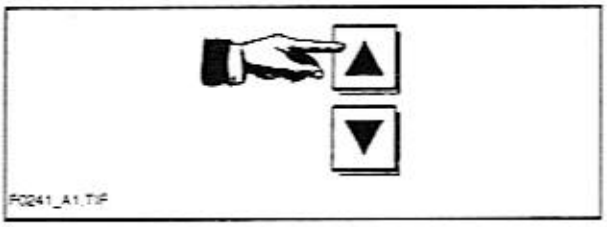
⚠ When switching the machine on, make sure that the set height does not change. If necessary, readjust using the grade control (45).

☞ The response time of the screed to any changes made to the height (layer thickness) is approx. 1 complete finisher length.

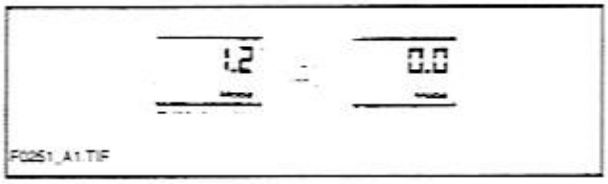
- The control unit keeps the screed at the set value.



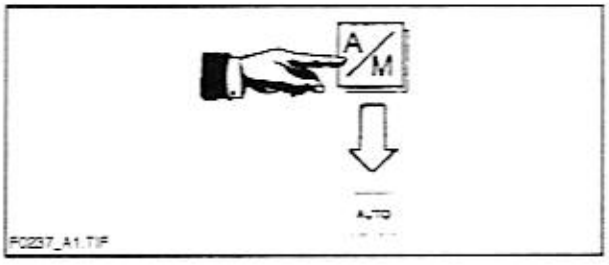
- To modify the set value, use the UP and DOWN keys.



- Each time one of these keys is pressed, the set value is increased or decreased by 2 mm. The control unit corrects the operating point of the "Sonic-Ski", matching it to the set value. After approx. 5 seconds, this value is adopted as the zero point on the display.



- Press the A/M key to toggle back to manual operation. Automatic valve control is deactivated.



☞ **Sensitivity**
If the system does not work smoothly or responds too slowly in the automatic mode, change the sensitivity setting accordingly. The procedure for changing the setting is described in the section "Sensitivity setting".

☞ **Control range**
The control range is active during "Sonic-Ski". For the procedure required to adjust the control range, see the section "Control range setting".

⚠ When switching the machine on, make sure that the set height does not change. If necessary, readjust the digital control unit.

☞ The response time of the screed to any changes made to the height (layer thickness) is approx. 1 complete finisher length.

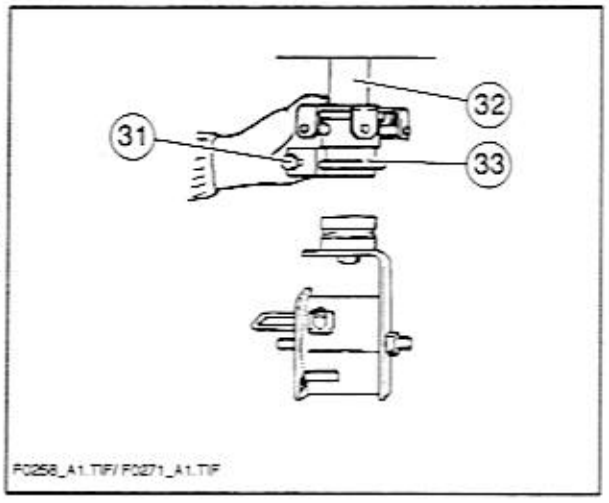
Maintenance

The construction of the MOBA-matic system provides a high degree of operational safety.
Check the supply cables for damage and dirt at regular intervals. Keep the plugged connections free from dirt, grease, asphalt and concrete to ensure proper contact. Only use suitable agents for cleaning.

4 Dynapac model

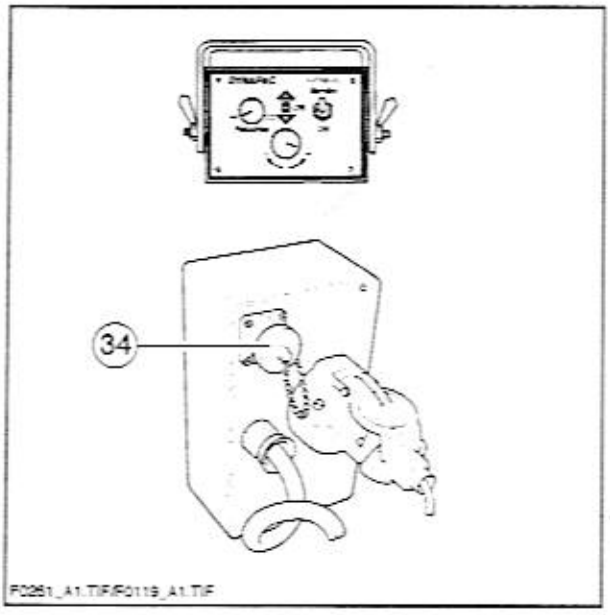
4.1 Installing the grade control

Height scanning can be carried out from the curb, from a wire or rope stretched tight between posts, from the top surface of an already laid layer of material, or from a long levelling shoe.



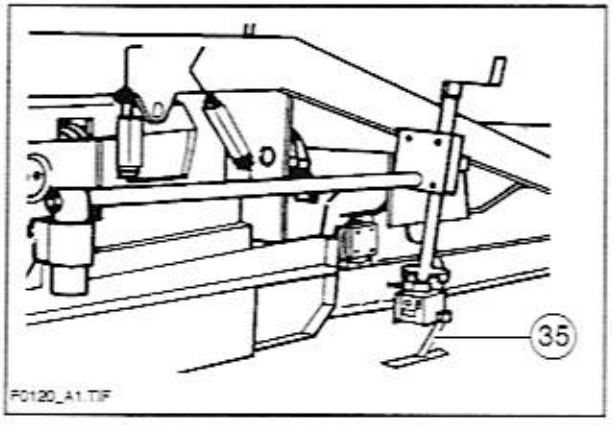
- Bolt the grade control bracket (32) to the frame provided on the side of the screed, hook the grade control unit into the clamping bracket (33) and secure it from being twisted by tightening the clamping screw (31).
  Ajust the telescopic tube so that scanning occurs at the level between the auger and the rear wall.
  Attach the control unit to the remote control bracket or to the finisher railing.

- Connect the power supply cable to the socket (34) on the remote control.
  Connect the remote control to the control unit and the control unit to the sensor.



⚠ Check that the cables are not broken or crushed.

- Next, the scanning arm (35) with the scanner tube (when using a wire or rope) or with the small scanner shoe (when using the curb or an already laid layer) must be fitted.

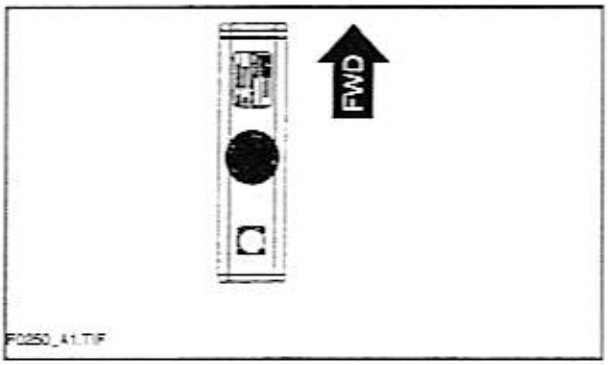


3.16 Ground scanning

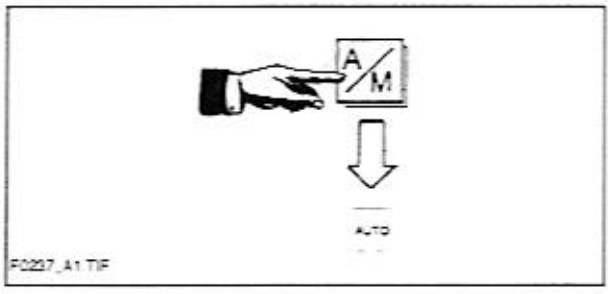
The "Sonic-Ski" unit has been installed and the cables have been connected. The direction of movement for ground scanning has been observed.

Procedure for ground scanning

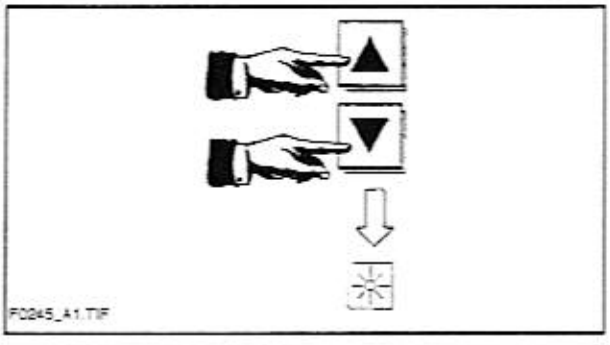
- For ground scanning, the "Sonic-Ski" must move in longitudinal direction.



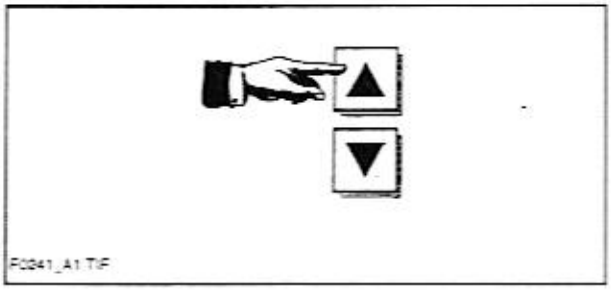
- Press the A/M key to toggle to manual operation. Function lamp "AUTO" goes out.



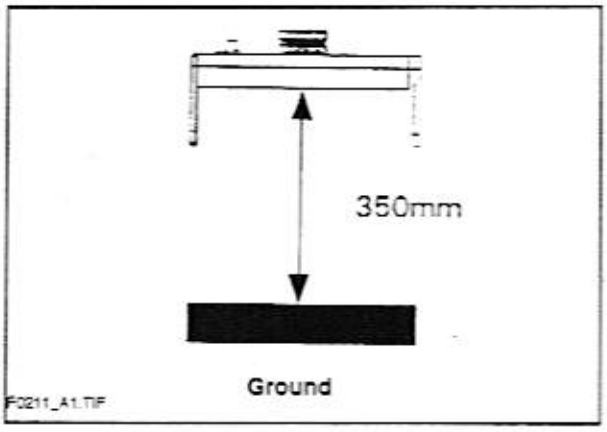
- Press the UP/DOWN keys simultaneously to activate the ground mode (generation of a mean value). The rope lamp is not lit.



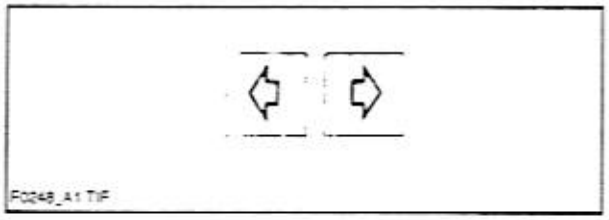
- Lift the screed to the working height. Use the UP/DOWN keys on the control unit or on the operating unit of the finisher to set the points of traction to the initial position.



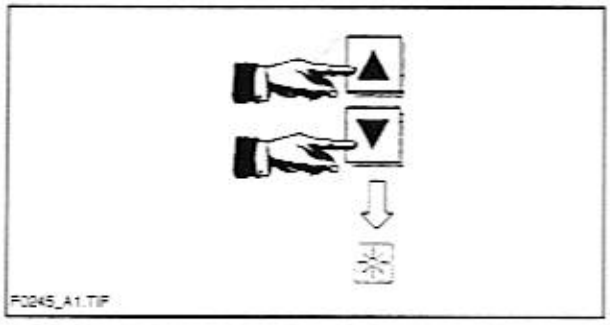
- Attach the "Sonic-Ski" at a distance of 350 mm above the ground (the actual value must be continuously shown).



- The two direction arrows are of no importance during ground scanning!

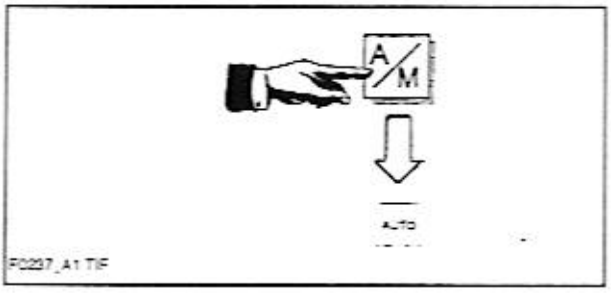


- Press the Enter key. "SEt" appears on the display.

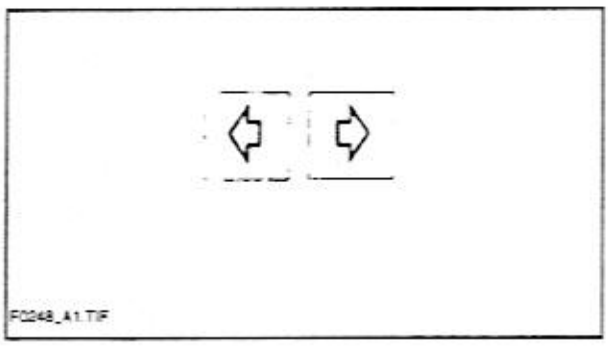


- The actual value and the set value are set to zero.

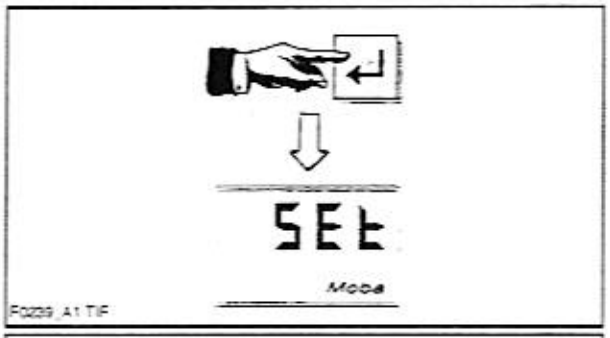
- Press the A/M key to toggle to automatic operation. Function lamp "AUTO" is lit.



- The "Sonic-Ski" should be aligned above the rope in such a manner that neither of the direction lamps is lit (center position above the rope).
  Lamp off: rope in center position
  Lamp flashes: rope on the outer edge
  If the rope is at the edge of the sensor range, the "Sonic-Ski" must be readjusted.

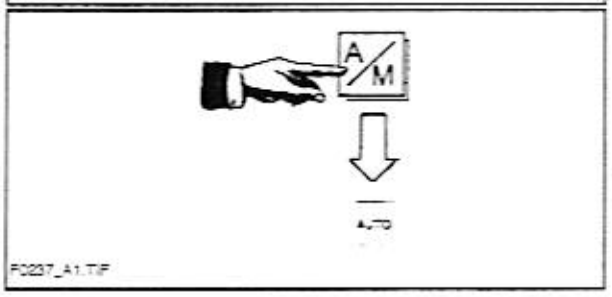


- Press the Enter key. "SEt" appears on the display.

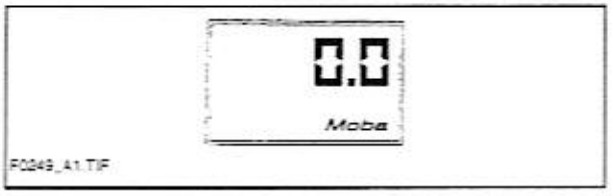


- The actual value and the set value are set to zero.

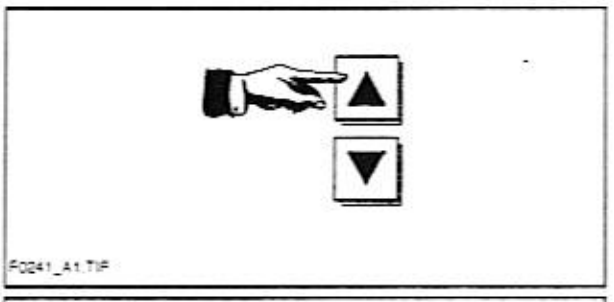
- Press the A/M key to toggle to automatic operation. Function lamp "AUTO" is lit.



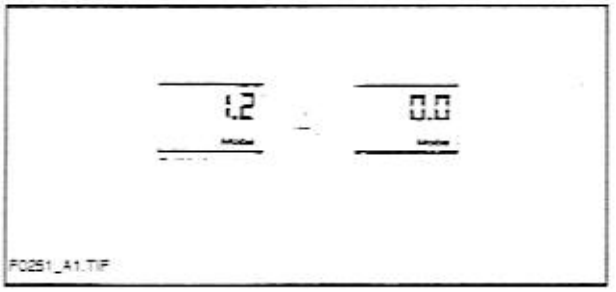
- The control unit keeps the screed at the set value.



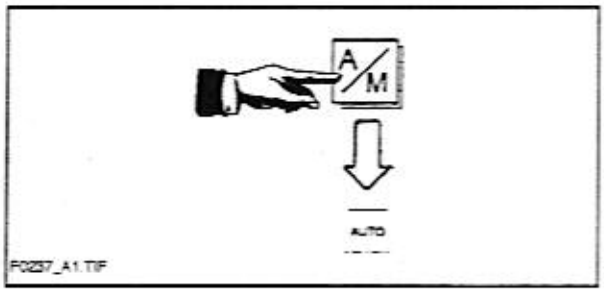
- To modify the set value, use the UP and DOWN keys.



- Each time one of these keys is pressed, the set value is increased or decreased by 2 mm. The control unit corrects the operating point of the "Sonic-Ski", matching it to the set value. After approx. 5 seconds, this value is adopted as the zero point on the display.



- Press the A/M key to toggle back to manual operation. Automatic valve control is deactivated.



☞ **Sensitivity**
If the system does not work smoothly or responds too slowly in the automatic mode, change the sensitivity setting accordingly. The procedure for changing the setting is described in the section "Sensitivity setting".

☞ **Control range**
The control range is active during "Sonic-Ski" operation. For the procedure required to adjust the control range, see the section "Control range setting".

⚠ When switching the machine on, make sure that the set height does not change. If necessary, readjust the digital control unit.

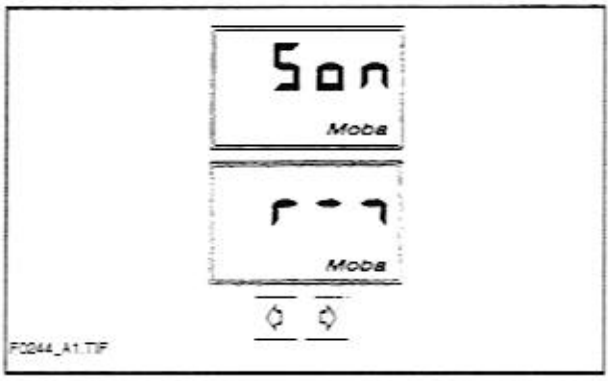
☞ The response time of the screed to any changes made to the height (layer thickness) is approx. 1 complete finisher length.

3.14 Operation of the "Sonic-Ski" unit

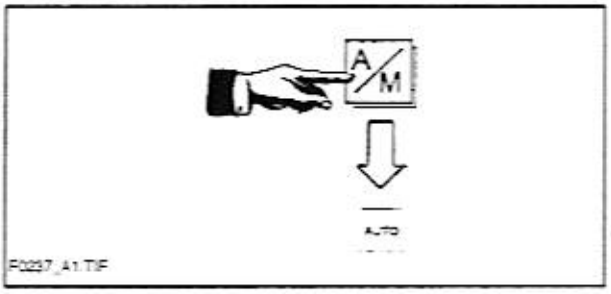
The "Sonic-Ski" unit and the digital control unit have been installed, the cables have been connected and the digital control unit is connected to the voltage supply. After the "Power On" message has been shown, the digital control unit displays the sensor identification. If the sensor is used for the first time or if the sensor has been changed, the sensor identification must be acknowledged using any key.

Procedure for acknowledging the sensor identification

- The digital control unit indicates the sensor identification. The two direction arrows flash.



- If the sensor has been connected for the first time or if the sensor has been changed, the identification must be acknowledged using any key.

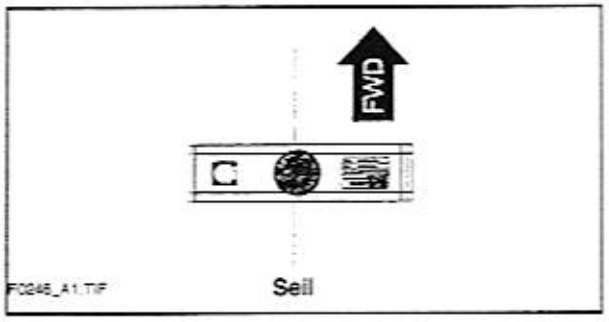


3.15 Rope scanning

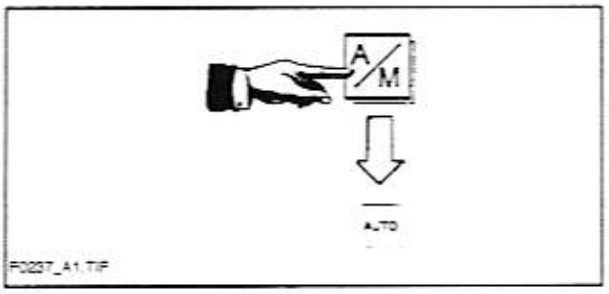
The "Sonic-Ski" unit has been installed and the cables have been connected. The direction of movement for rope scanning has been observed.

Procedure for rope scanning

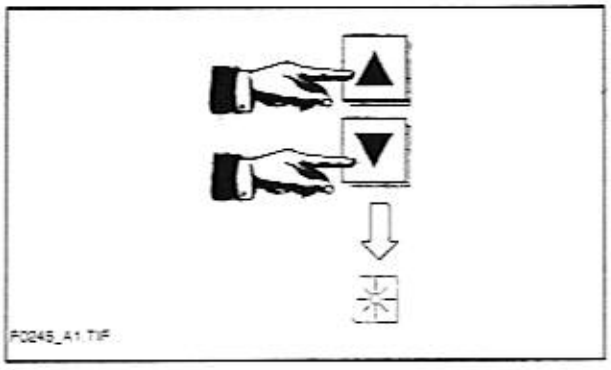
- For rope scanning, the "Sonic-Ski" must move in transverse direction.



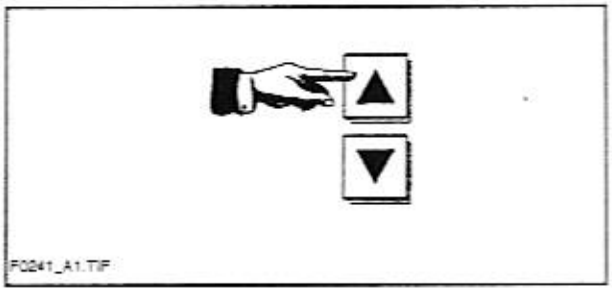
- Press the A/M key to toggle to manual operation. Function lamp "AUTO" goes out.



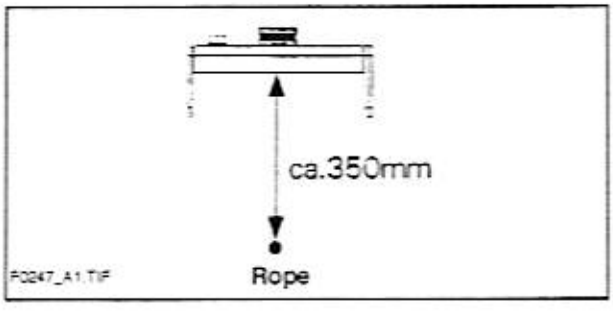
- Press the UP/DOWN keys simultaneously to activate the rope mode. The rope lamp is lit.



- Lift the screed to the working height. Use the UP/DOWN keys on the control unit or on the operating unit of the finisher to set the points of traction to the initial position.



- Attach the "Sonic-Ski" at a distance of 350 mm above the rope (the actual value must be continuously shown).

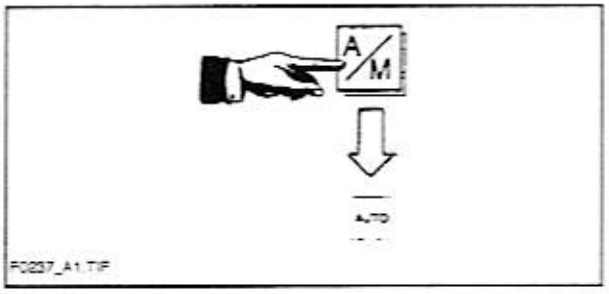


3.13 Working with the "Digi-Slope" sensor

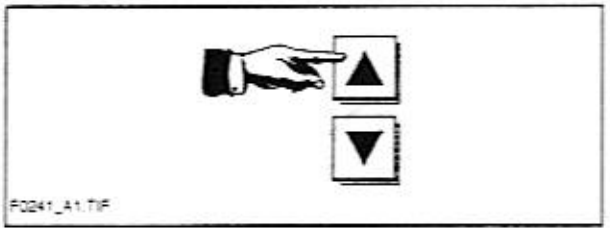
The "Digi-Slope" sensor has been installed, the actual value has been adjusted and the cables have been connected.

Procedure for working with the "Digi-Slope" sensor

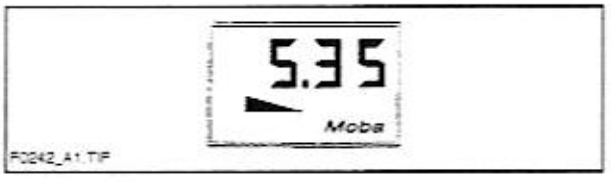
- Press the A/M key to toggle to manual operation. Function lamp "AUTO" goes out.



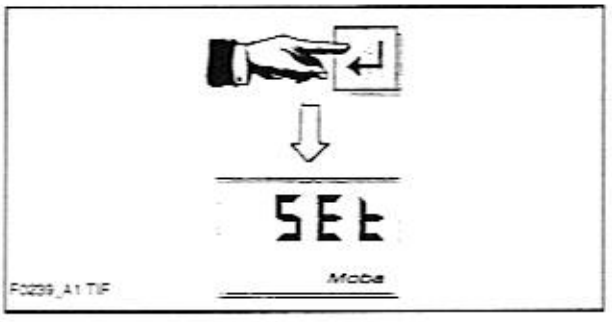
- Lift the screed to the working height. Use the UP/DOWN keys on the control unit or on the operating unit of the finisher to set the points of traction to the initial position.



(Example: slant to the right of 5.35 %).

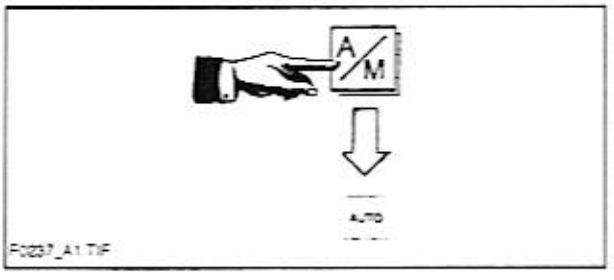


- Now press the Enter key. "SEt" appears on the display.



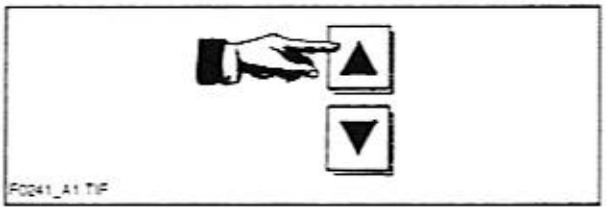
- The actual value reappears on the display. There is no "RAISE" or "LOWER" arrow on the display. The set value has been matched to the actual value.

- Press the A/M key to toggle to automatic operation. Function lamp "AUTO" is lit.



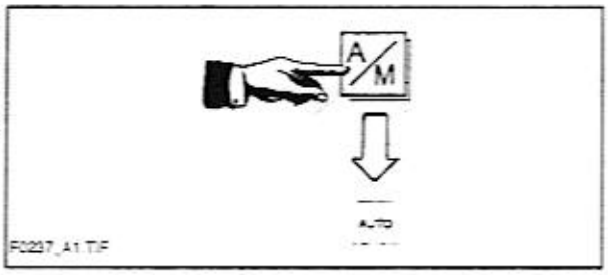
- The control unit now indicates 5.35 % as the set value. This value now forms the basis for regulation. Any deviation is indicated by the appropriate arrow ("RAISE" or "LOWER").

- To modify the set value, use the UP and DOWN keys. The control unit then uses the new value for regulation.



(Example: 6.00 %)

- Press the A/M key to toggle back to the actual value. In this way, the inclination angle of the screed can be checked. Automatic valve control is deactivated.



☞ If the system does not work smoothly or responds too slowly in the automatic mode, change the sensitivity setting accordingly. The procedure for changing the setting is described in the section "Sensitivity setting".

⚠ When switching the machine on, make sure that the set height does not change. If necessary, readjust the digital control unit.

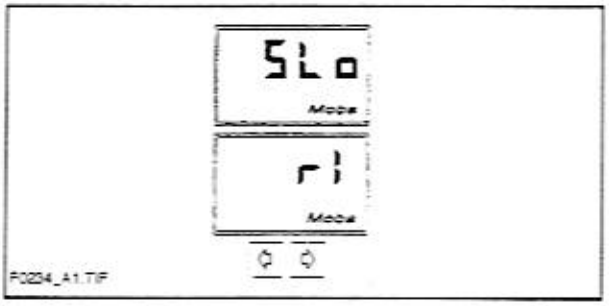
☞ The response time of the screed to any changes made to the height (layer thickness) is approx. 1 complete finisher length.

3.11 Operation of the "Digi-Slope" sensor

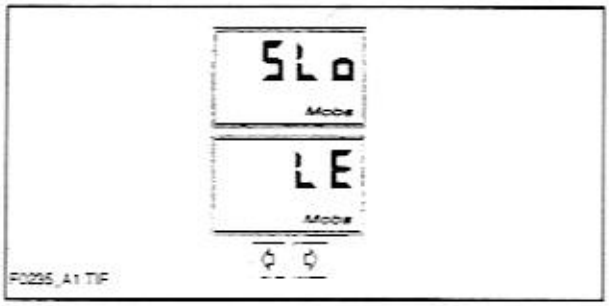
The "Digi-Slope" sensor and the digital control unit have been installed, the cables have been connected and the digital control unit is connected to the voltage supply. After the "Power On" message has been shown, the digital control unit displays the sensor identification. If the sensor is used for the first time or if the sensor has been changed, the sensor identification must be acknowledged using any key.

Procedure for acknowledging the sensor identification

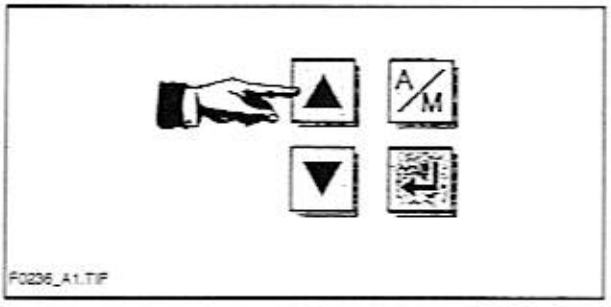
- The digital control unit indicates the sensor identification (right). The two direction arrows flash.



- The digital control unit indicates the sensor idenfication (left). The two direction arrows flash.



- If the sensor has been connected for the first time or if the sensor has been changed, the identification must be acknowledged using any key.

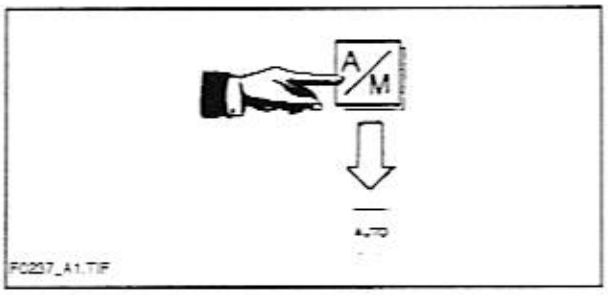


3.12 Adjusting the actual value

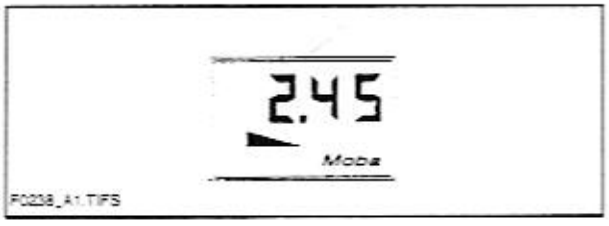
The actual value must only be adjusted once during commissioning. During this procedure, the inclination angle of the screed is matched with the actual value display of the digital control unit. The example below shows how to adjust the actual value of 2.45 % shown on the display to a value of 2.30 %.

Procedure for adjusting the actual value

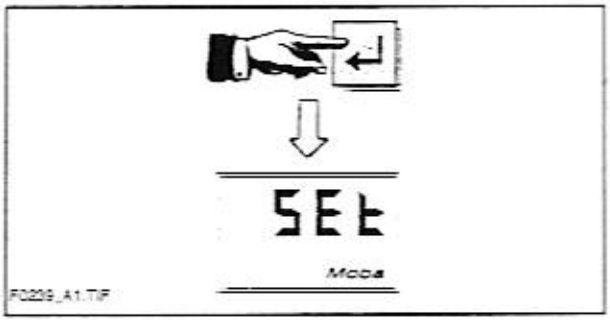
- Press the A/M key to toggle to manual operation. Function lamp "AUTO" goes out.



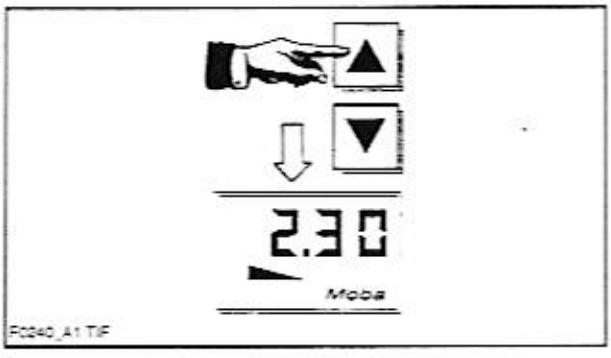
- The display indicates the actual value of the screed.



- Press the Enter key and keep it depressed. "SEt" appears on the display. The display then returns to the actual value.



- Keep the Return key pressed and use the UP/DOWN keys to correct the actual value so that it reads 2,30 %.



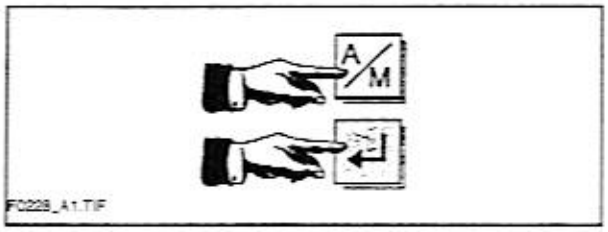
☞ If the installation position of the "Digi-Slope" sensor is changed, a new actual value adjustment must be carried out.

3.9 Sensitivity setting

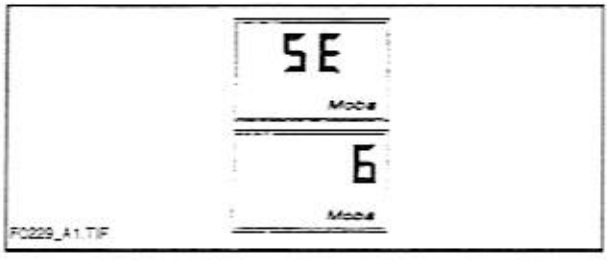
To operate the individual sensors in automatic mode, the sensitivity of the MOBA-matic system should be adjusted accordingly. The available settings range from 1 (low sensitivity) to 10 (high sensitivity). If the MOBA-matic system does not work smoothly in the automatic mode, reduce the sensitivity setting at the appropriate digital control unit. If the MOBA-matic system responds too slowly in the automatic mode, increase the sensitivity setting at the appropriate digital control unit.

Procedure for adjusting the sensitivity

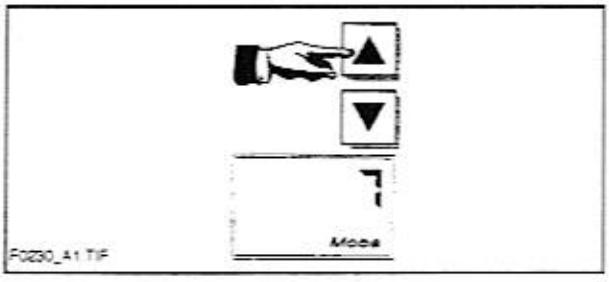
- Press the A/M key and the Enter key simultaneously.



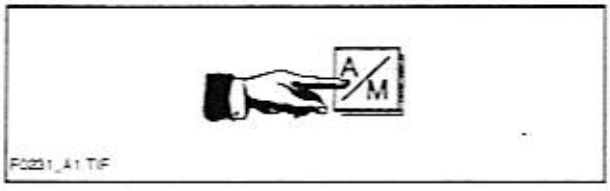
- The display toggles from "SE" to the standard value "6".



- Pressing the UP or DOWN key changes the value accordingly. (Example: setting the value 7)



- Pressing the A/M key switches the system back to the working mode. If no changes were made, the control unit automatically toggles back to the working mode.

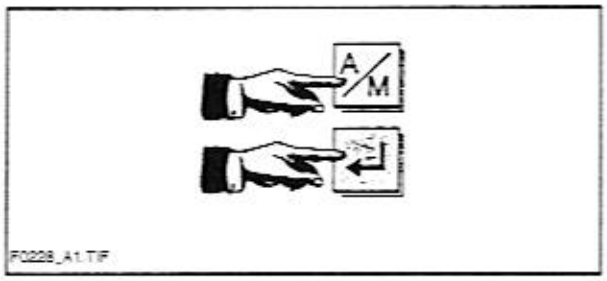


3.10 Control range setting

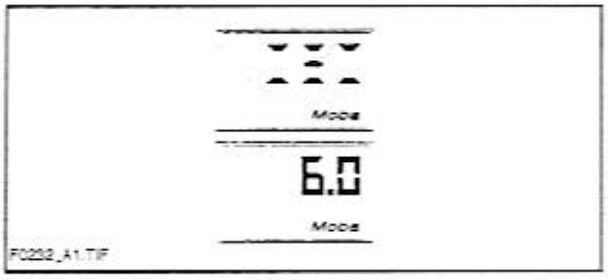
The control range only is of importance for "Sonic-Ski" operation. If the deviation exceeds the set range, an error is detected. The control range symbol appears on the display, the direction arrows flash and the hydraulic cylinders are not activated. The sensor must then be readjusted.

Procedure for adjusting the control range (entries in steps of 0.1 cm)

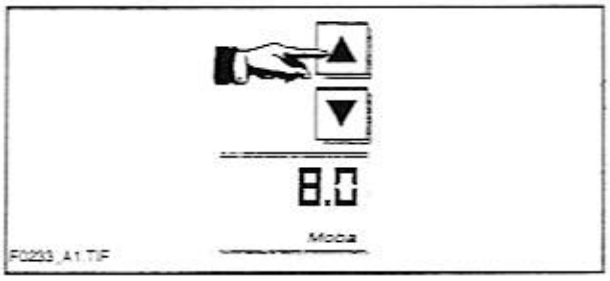
- Press the A/M key and the Enter key simultaneously **twice**.



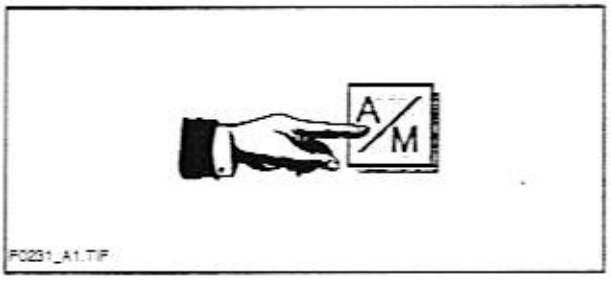
- The display toggles from the control range symbol to the standard value "6.0" (+/- 3.0 cm).



- Pressing the UP or DOWN key changes the value accordingly. (Example: setting the value 8.0 cm)

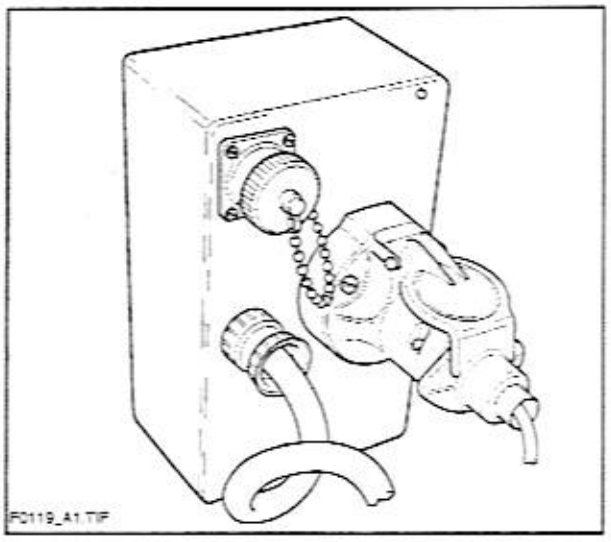


- Pressing the A/M key switches the system back to the working mode. If no changes were made, the control unit automatically toggles back to the working mode.



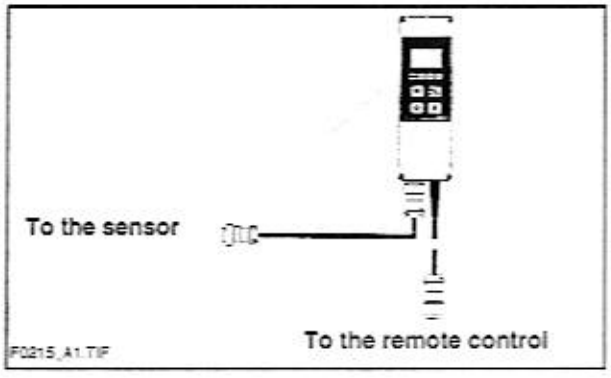
3.6 Connecting the connection cables

For each of the hydraulic cylinders, a separate digital control unit is required. Connect the connection cable with the 10-pin connector receptacle that is permanently attached to the digital control unit with the appliance plug on the machine (remote control).



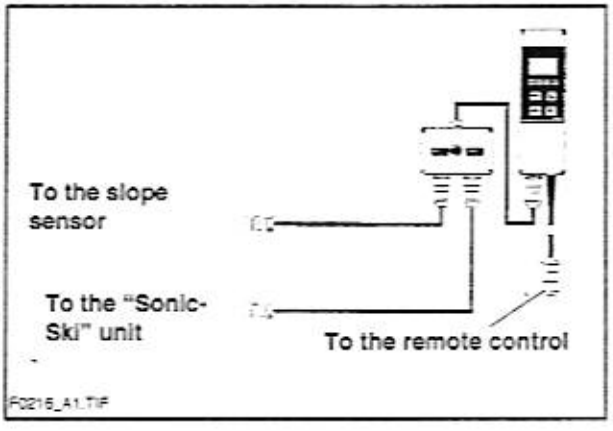
Without a switching unit

Connect the sensor connection cable to the digital control unit and to the appropriate sensor. If one of the digital control units is to be operated with another sensor, the connection cable must be connected to that sensor.



With a switching unit

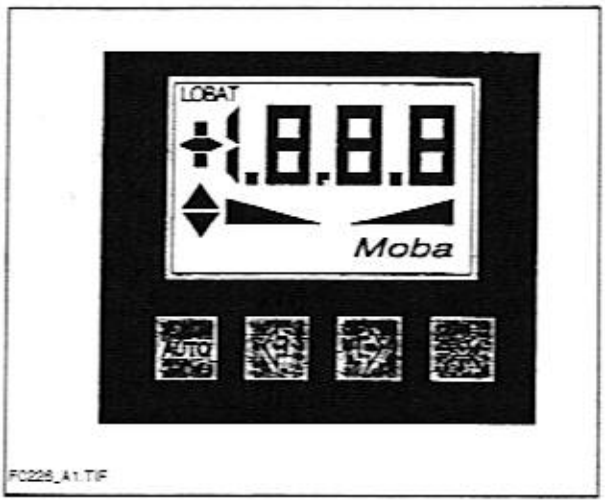
The switching unit allows two sensors to be connected to the digital control unit, usually one height sensor and one slope sensor. If the MOBA-matic model is used in conjunction with the switching unit and an additional control unit/sensor connection cable, the control unit/sensor cable need no longer be shifted. In this case, the required connection is established using the selector switch (SLOPE/GRADE).



☞ When connecting the slope sensor, make sure that the appropriate side is connected to the appropriate control unit.

3.7 "Power On" message

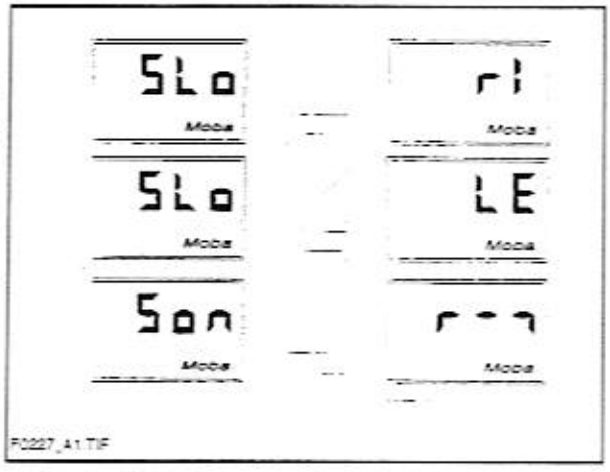
After the digital control unit has been switched on, a display test is carried out. During this test, all segments of the LC display and all function lamps are activated for approx. 2 seconds. If no characters appear on the display, inform the after-sales service.



F0226_A1.TIF

3.8 Sensor identification

After the "Power On" message has been displayed, the digital control unit twice indicates the connected sensor using an alternating display mode. In this mode, the two direction lamps also flash. The control unit then automatically switches to the working mode.



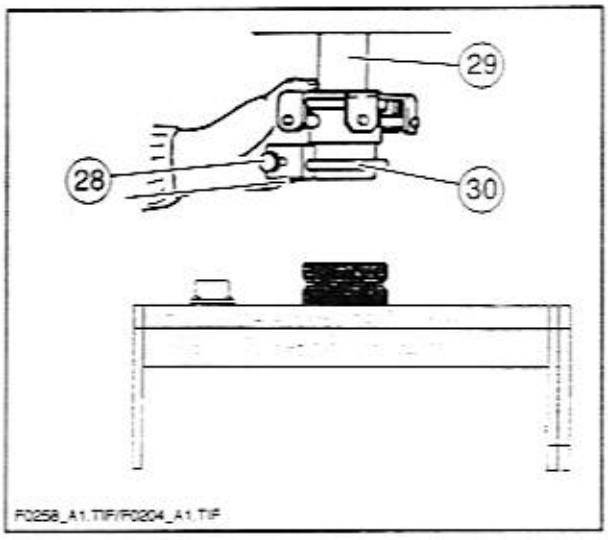
F0227_A1.TIF

⚠ If another sensor has been connected, the control unit remains in the alternating sensor identification mode until the identification has been acknowledged (any key). This is to remind the operator that the sensor has been changed and that the settings for the sensor must be checked accordingly.

Installing the "Sonic-Ski" unit

Height scanning can be carried out from the curb, from a wire or rope stretched tight between posts, from the top surface of an already laid layer of material, or from a long levelling shoe.

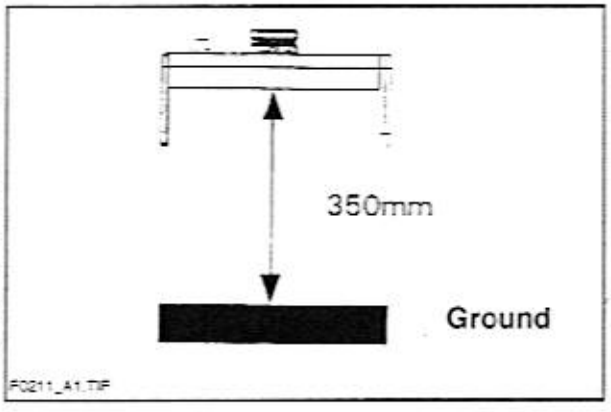
Bolt the grade control bracket (29) to the frame provided on the side of the screed, hook the grade control unit into the clamping bracket (30) and protect it from being twisted by tightening the clamping screw (28).

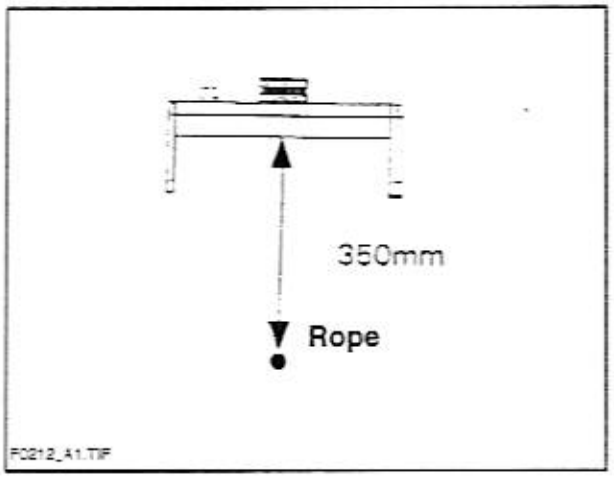


Adjust the telescopic tube so that scanning occurs at the level between the auger and the rear wall.

3.4 Working range

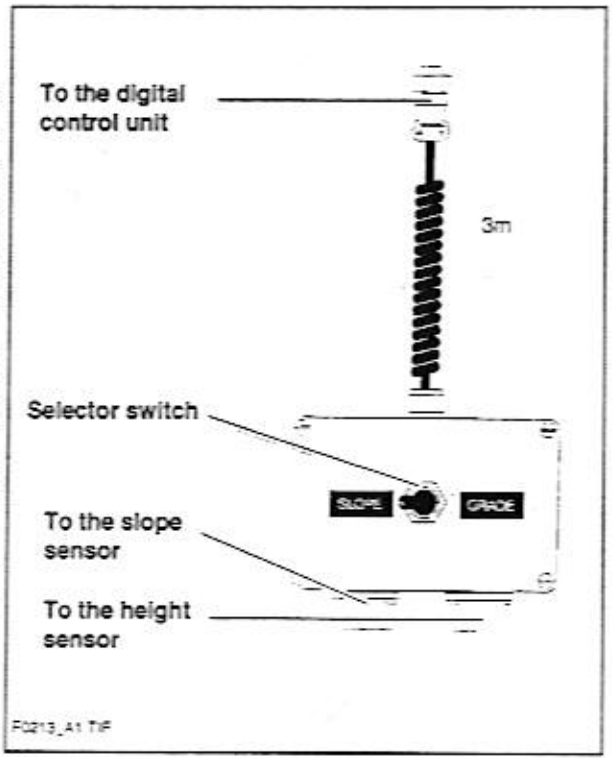
The working range for ground and rope scanning is between 30 cm and 40 cm. Within this range, the actual value shown on the digital display continuously rises; otherwise the display flashes (positioning aid). The "Sonic-Ski" unit should be aligned at a distance of approx. 35 cm to the means used as reference.





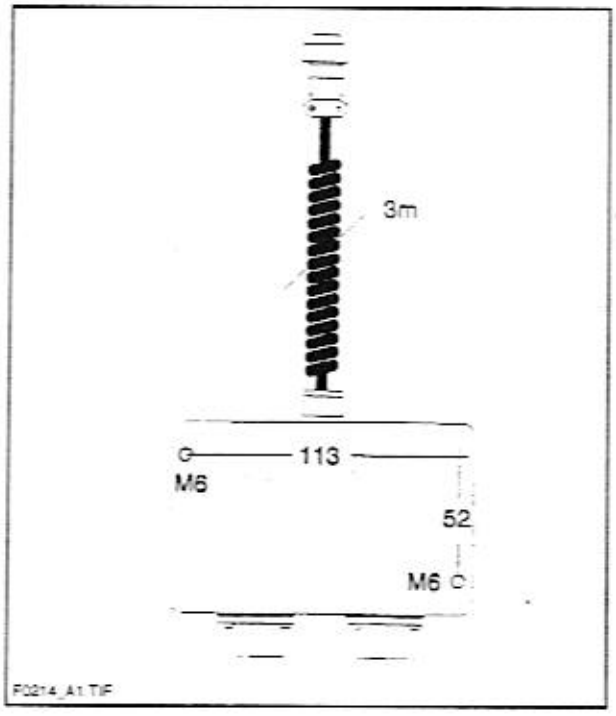
3.5 Switching unit (accessory)

The switching unit allows two sensors to be connected to the digital control unit, usually one height sensor and one slope sensor. If the MOBA-matic model is used in conjunction with the switching unit and an additional control unit/sensor connection cable, the control unit/sensor cable need no longer be shifted. In this case, the required connection is established using the selector switch (SLOPE/GRADE). The switching unit should be installed in a position where it is protected from splashes and dirt. There are two M6 bore holes on the rear of the housing for fastening the unit. For the dimensions, refer to the bottom drawing.

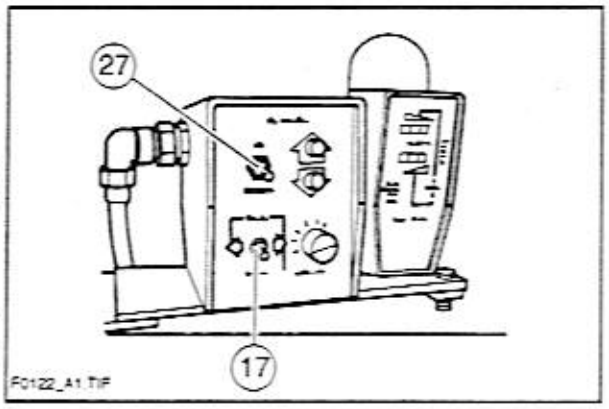


Make sure that the switching unit is installed near the digital control unit and that the switch can be easily reached. The unit must be installed in a vertical position (sensor cables facing downwards).

☞ When installing the switching unit, make sure that the connectors on the bottom side can be accessed. Provide sufficient space so that the plugs can be removed without having to remove the switching unit.



- Check that the "Slope" switch (17) is set to the correct side (left/right). Set switch (27) to "On".



⚠ When switching the machine on, make sure that the set heights do not change; if necessary, readjust the slope control.

☞ The response time of the screed to any changes made to the transverse slope is approx. half a finisher length.

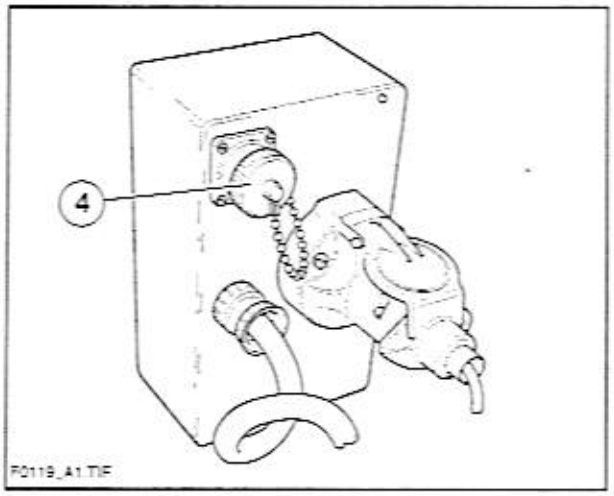
3 MOBA-matic model

3.1 Digital control unit

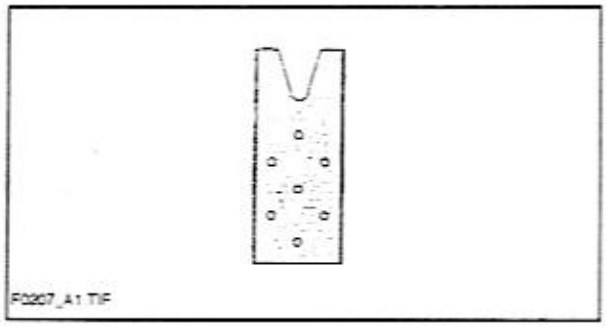
The digital control unit should be installed in a position where it is protected from splashes and dirt. When installing the unit, also make sure that the keys are easy to reach and that the digital display is easy to read. The unit must be installed in a vertical position (cables facing downwards).

Connect the power supply cable to the socket (4) at the remote control.

☞ When installing the digital control unit, make sure that the connectors on the bottom side can be accessed. Provide sufficient space so that the plugs can be removed without having to remove the digital control unit.

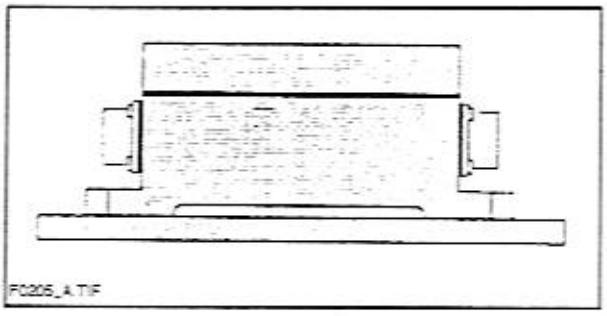


The digital control unit can be supplied with a bracket. This bracket should be installed in such a manner that the digital control unit fitted with a knob on the rear can be inserted in the holder from above.

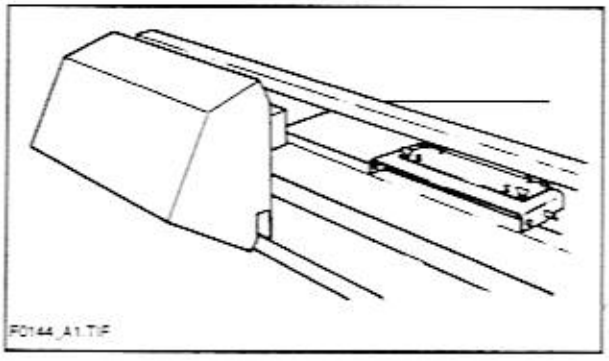


3.2 "Digi-Slope" sensor

The "Digi-Slope" sensor must be installed at the reference level (at the transverse slope beam of the paver finisher). There are four bore holes on the sensor for fastening it on the mounting plate.



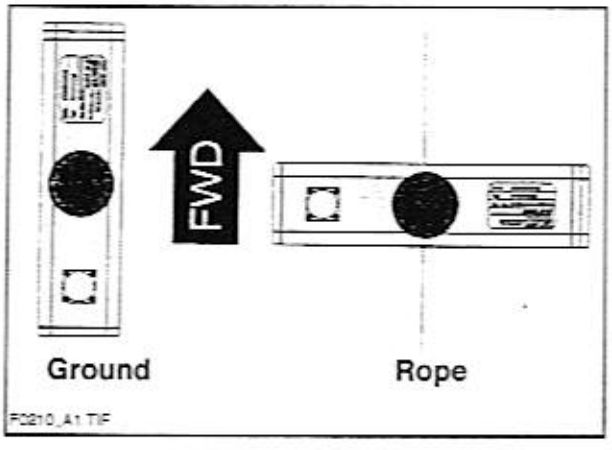
The connectors must be accessible so that the connection cable can be easily connected. Also heed the installation position (FWD arrow in the travelling direction).



3.3 Sonic-Ski

The direction of movement of the "Sonic-Ski" is defined as follows:

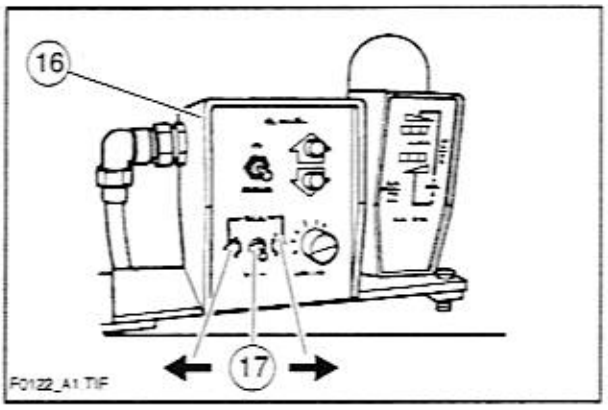
For ground scanning, the "Sonic-Ski" should move in longitudinal direction (generation of a mean value by the "Sonic-Ski"). For rope scanning, the "Sonic-Ski" should move in transverse direction so that the full operating width of 25 cm is available.



2.3 Installing the slope control

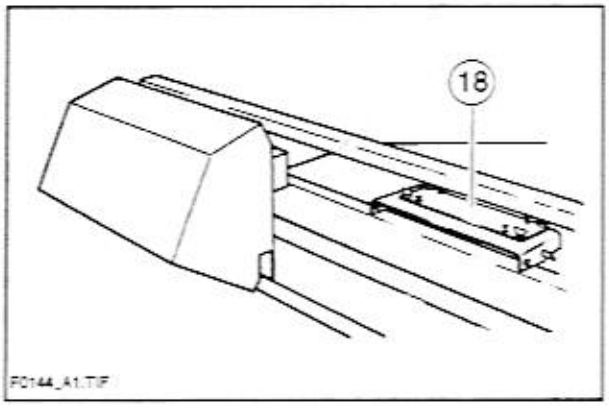
If the slope control (○) is to be used, the unit must be installed as follows:

- Bolt the slope control unit (16) to the transversal slope beam (18).



- Connect the connection cable of the unit to the appropriate socket on the operating panel:

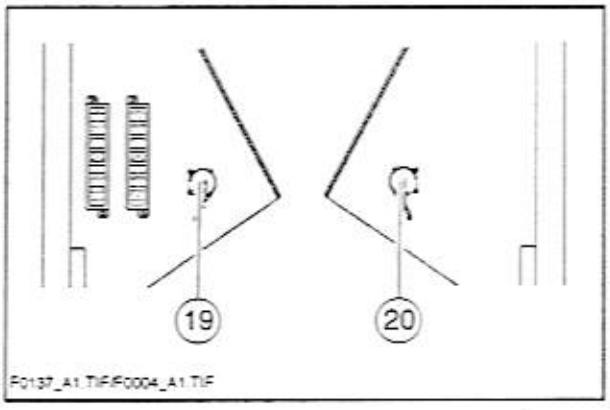
  - If the slope control is to be used to control the **left-hand** side, connect the cable to the **left-hand** socket (19).



  - In this case, set the "Slope" switch (17) to **left** (⬅).

  - If the slope control is to be used to control the **right-hand** side, connect the cable to the **right-hand** socket (20).

  - In this case, set the "Slope" switch (17) to **right** (➡).

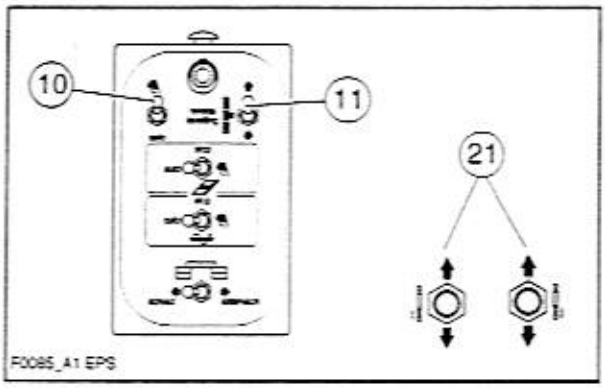


2.4 Setting up the slope control

If the slope control (○) is to be used, the following settings must be made:

- Set switch (10) on the remote control to "manual".

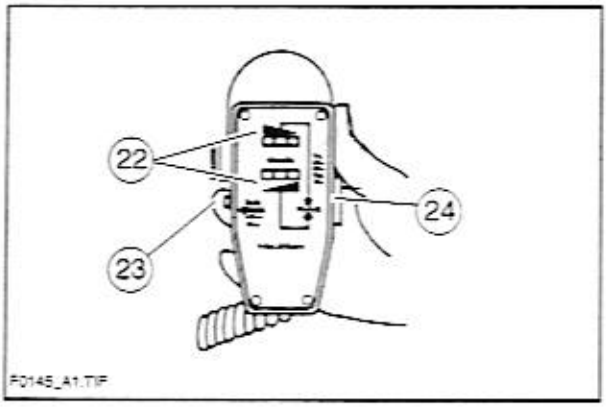
- Using the levelling cylinders, align the transverse slope beam so that it is in a horizontal position.
  Use a spirit level to check the position of the transverse slope beam; if necessary, adjust the beam using switch (21) on the operating panel or switch (11) on the remote control.



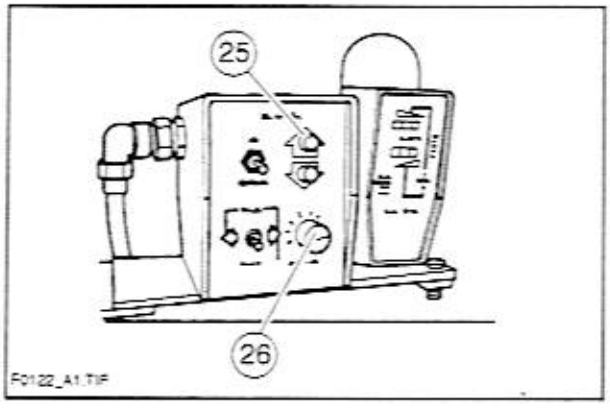
- Set switch (10) on the remote control to "auto".

- Turn the handwheel (24) on the hand control until the control lamps (25) on the slope control unit go out.

  The sensitivity adjuster (26) should be set to approx. "7" (empirical value).



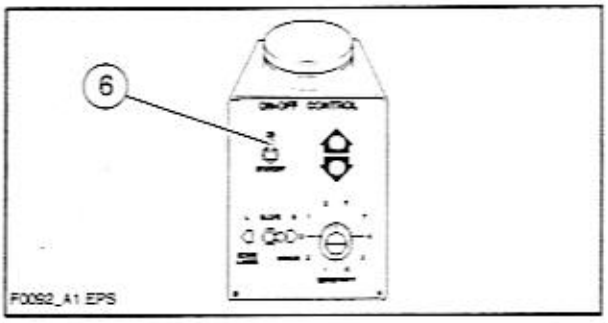
- To adjust the percentage scale at the hand control (without changing the basic setting), fully depress the button (23) on the left-hand side and turn the handwheel in the appropriate direction to set the scale (22) to 0%.
  Check whether one of the control lamps (25) is lit or flashes. In this case, repeat the set-up procedure.



- If the screed already has the required slope when deposited on the wooden blocks (determined using the spirit level), set the scale (22) on the hand control to the specified percentage and slope direction by pressing the left-hand button (23, brake).

2.2 Setting up the grade control

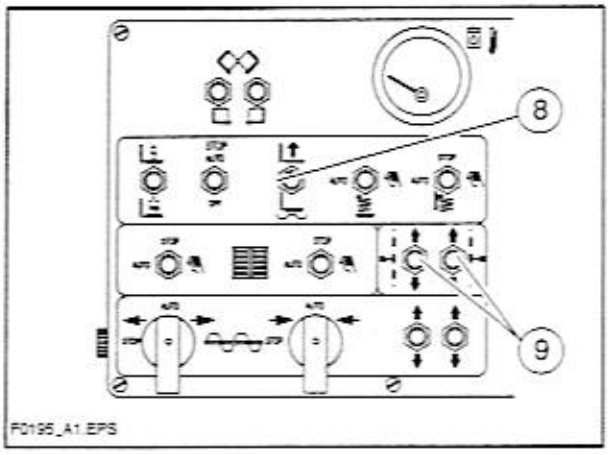
- Start the engine. Move the finisher to the required position.



⚠ For all set-up work, the screed must be in the floating position (switch (8) in the bottom position)!

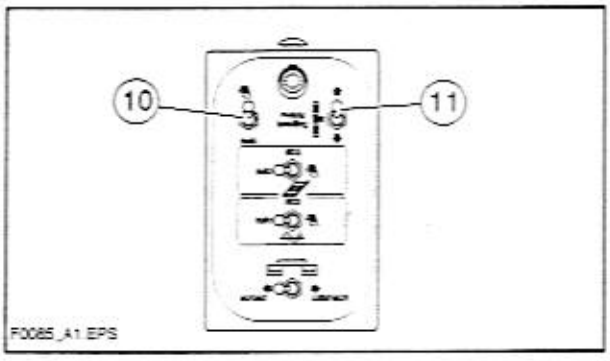
- Set the toggle switch (6) of the grade control to "Standby" and switch (10) of the remote control to "manual".

- Lower the screed onto two wooden blocks or a material carpet with a length of approx. 1 m.

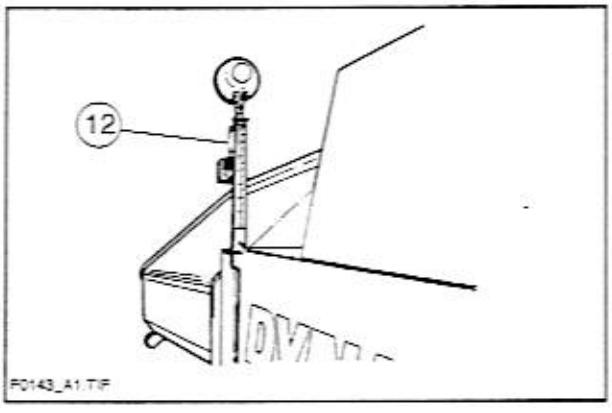


Height: material layer plus 20–25 % (for final compaction).

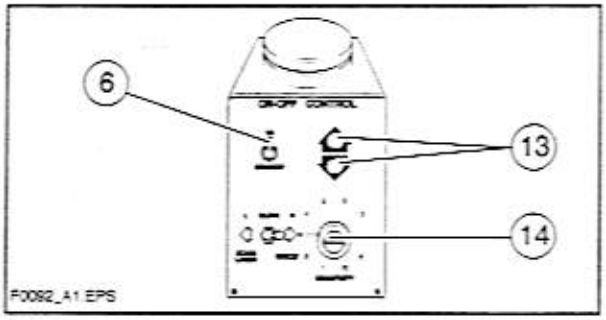
Using switch (9) (or (11) on the remote control), set this height at the scales (12) of the levelling cylinders.



- Set switch (10) on the remote control to "auto".

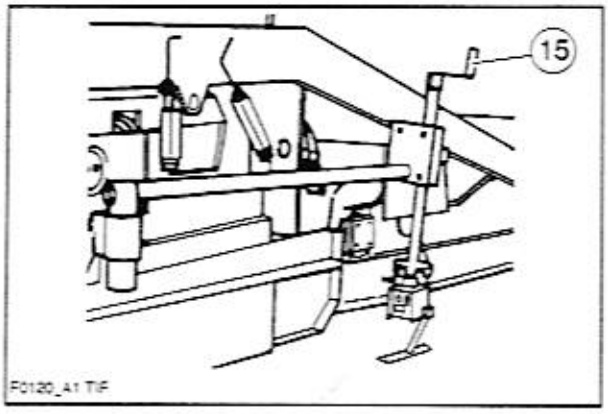


- Using the spindle (15), move the grade control upwards or downwards until the control lamps (13) on the grade control go out.

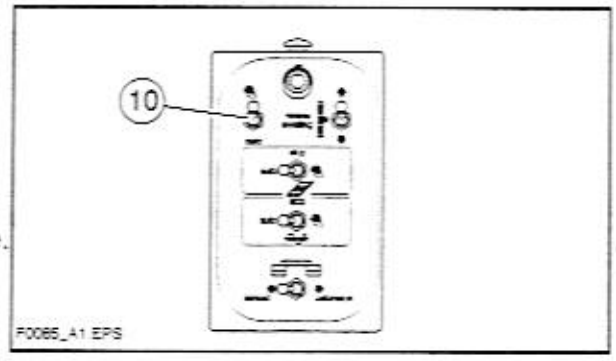


- Set the sensitivity adjuster (14) to the required position:
  - Normal position: approx. "5".
  - For very precise scanning, the setting must be > "5".
  - For coarse scanning, the setting must be > "5".

- Set the toggle switch (6) of the grade control to "On" and switch (10) on the remote control to "auto".



If automatic height scanning is to be carried out on both sides, the set-up procedure described above must be repeated for the other side.



⚠ When switching the machine on, make sure that the set height does not change. If necessary, readjust the grade control using the spindle (15).

☞ The response time of the screed to any changes made to the height (layer thickness) is approx. 1 complete finisher length.

D Set-up and modification

1 Special notes regarding safety

Inadvertent starting of the engine, the traction drive, the conveyor, the auger, the screed or the lifting devices can endanger persons.
Only carry out the required work with the finisher motor at a standstill unless the instructions state the opposite!

- Secure the paver finisher so that it cannot be switched on inadvertently:
  Set the drive lever to the center position and the preselector to zero; if necessary, remove the traction drive safeguard in the operating panel; pull out the ignition key and the battery main switch.
- Mecanically protect lifted machine parts (e.g. screed or hopper) from lowering.
- Always replace spare parts in a proper manner or have them replaced.

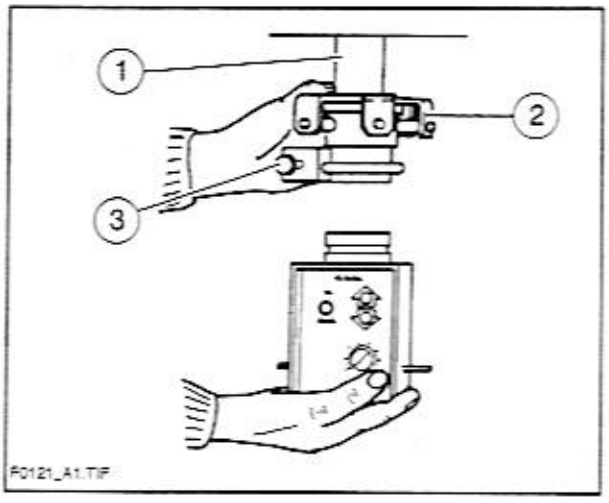
When connecting or disconnecting the hydraulic hoses or working on the hydraulic system, hot hydraulic oil can spurt out at high pressure. Switch off the motor and depressurise the hydraulic system! Protect the eyes!

- Before starting operation again, properly reattach all guards.
- For all working widths, the walkway plate must reach across the entire screed width.
  The hinged walkway plate (option for Vario screeds) may only be folded up under the following conditions:
- if the machine has to be backed up very closely to a wall or another obstacle,
- if the machine is transported on a low trailer.

2 MOBA Grade-Line model

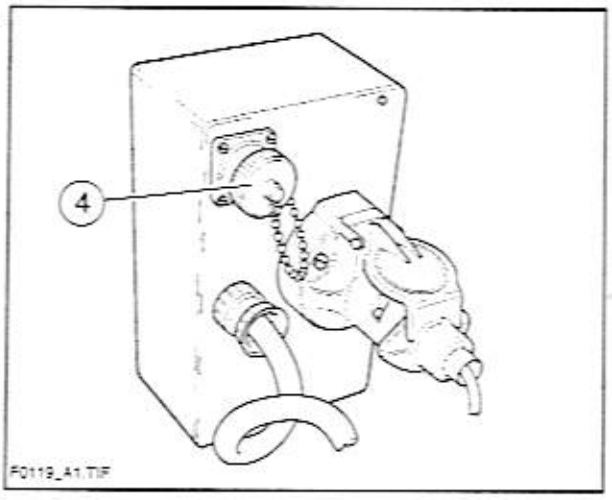
2.1 Installing the grade control

Height scanning can be carried out from the curb, from a wire or rope stretched tight between posts, from the top surface of an already laid layer of material, or from a long levelling shoe.



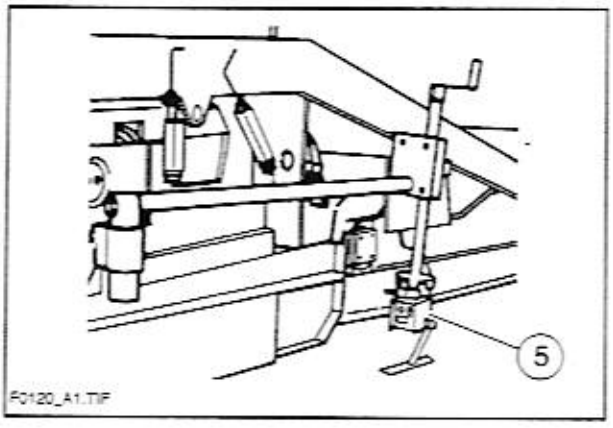
Bolt the grade control bracket (1) to the frame provided on the side of the screed, hook the grade control unit into the clamping bracket (2) and secure it from being twisted by tightening the clamping screw (3).
Adjust the telescopic tube so that scanning occurs at the level between the auger and the rear wall.

Connect the power supply cable to the socket (4) on the remote control.



Next, the scanning arm (5) with the scanner tube (when using a wire or rope) or with the small scanner shoe (when using the curb or an already laid layer) must be fitted.

Make sure that the hex screw of the scanning arm presses against the chamfer of the sensor shaft and that it is firmly tightened!

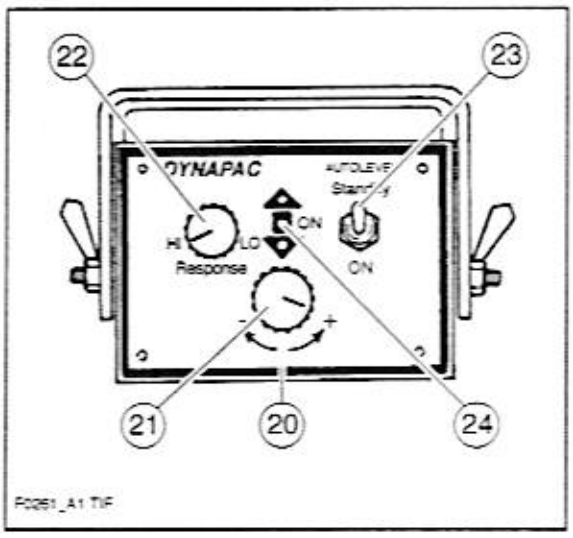


The counterweight on the scanning arm (only used in conjunction with the scanner tube) must be adjusted in such a manner that vibrations cannot cause the system to be lifted off the scanning level. When using a wire, the scanner tube must be relieved by the counterweight so that the rope is not pressed down.

The counterweight is not used in conjunction with the small scanner shoe!

3 Dynapac model

3.1 Grade control



- Control unit (20)
- Grade control for layer thickness (21)

Position	Function
Towards "+"	Increases the layer thickness
Towards "-"	Reduces the layer thickness

- Sensitivity control (22)

Position	Function
Center	Normal setting
Towards "HI"	Increases the sensitivity
Towards "LO"	Reduces the sensitivity

- Valve switch (23)

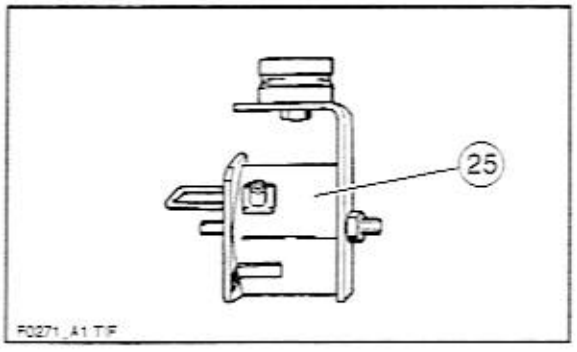
Position	Function
On	Switched on
Standby	Ready for operation (normal position)

- Control lamps (24)

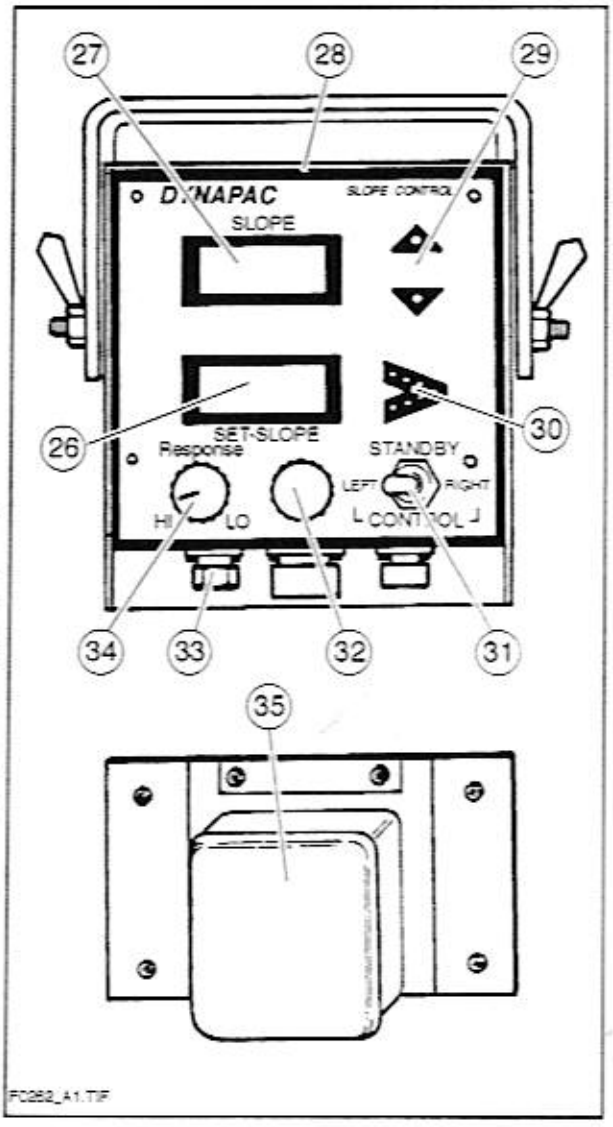
Lamp	Function
HI	Point of traction further upwards
ON	Height OK
LO	Point of traction further downwards

- Sensor unit (25)

The signals of the sensor unit are shown on the control unit.



3.2 Slope control



- Set value display (26)
  The transversal slope is indicated in percent.

- Actual value display (27)
  The transversal slope is indicated in percent.

- Control unit (28)

- Control lamps (29)

Lamp	Function
▲	Point of traction upwards
▼	Point of traction downwards

- Control lamps for the transversal slope (30)
  Indicate the current position of the screed.

- Control switch (31)

Position	Function
Center	"Standby" - ready for setting the transversal slope
LEFT	Controls the left-hand side of the screed. The control unit is connected to the left-hand side of the operating panel.
RIGHT	Controls the right-hand side of the screed. The control unit is connected to the right-hand side of the operating panel.

- Set value control for changing the transversal slope (32)

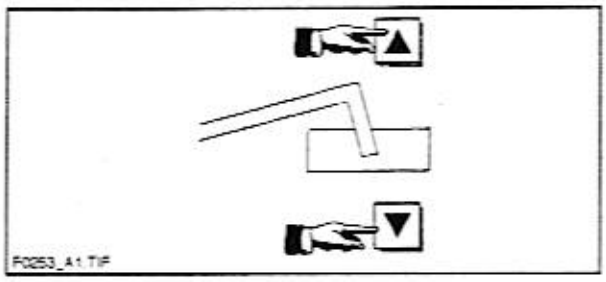
- Control for the basic setting (33)

- Sensitivity control (34)
  The normal position is the center position.

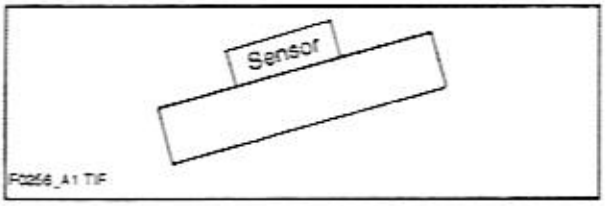
- Sensor unit (35)

☞ Installation and adjustment of the slope control is described in the chapter "Set-up and modification".

- Lift/lower the screed to its initial position.

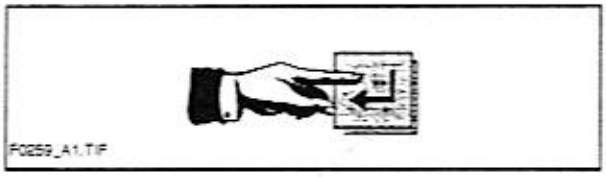


- The MOBA-matic control unit indicates the inclination angle of the screed in percent.
  If the indicated inclination angle is not correct, adjust the actual value (see chapter "Set-up and modification").

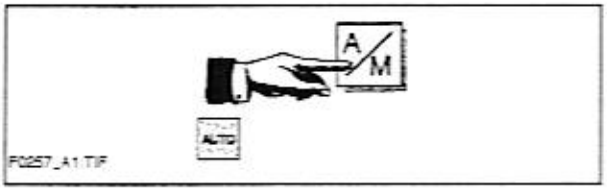


- Press the Enter key.

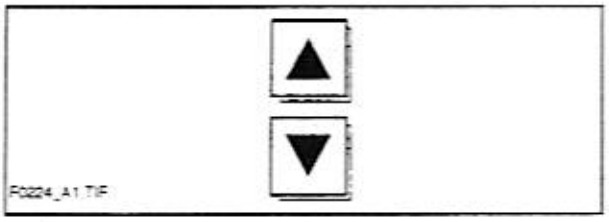
  The current position of the screed is adopted as the set value for the automatic levelling system.



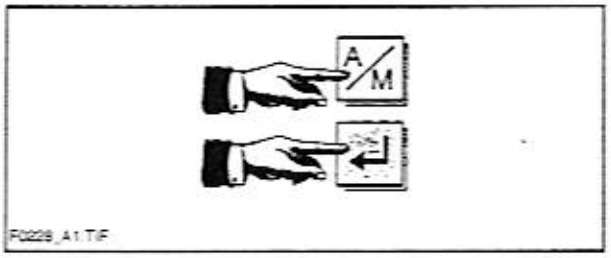
- The function lamp is lit.
- Use the A/M key to activate automatic operation. The MOBA-matic system now keeps the screed at the set inclination angle.



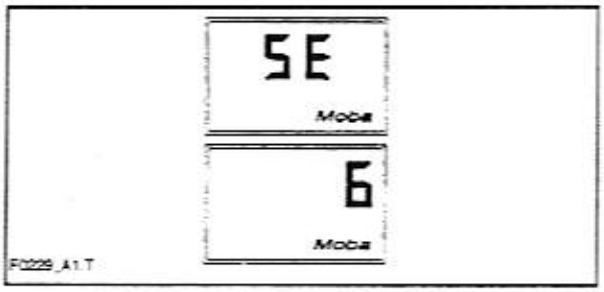
- The set value can be modified using the UP/DOWN keys.



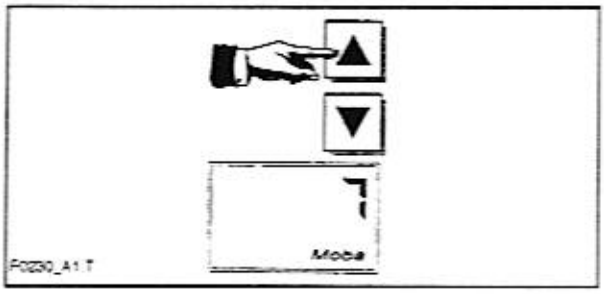
- Press the A/M key and the Enter key simultaneously.



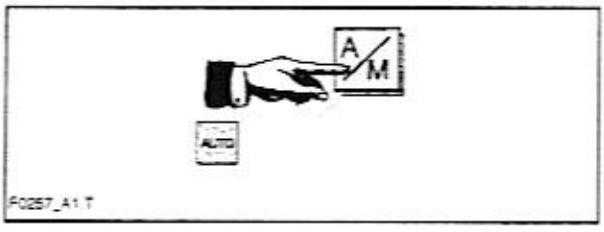
- The display toggles from "SE" to the standard value "6".



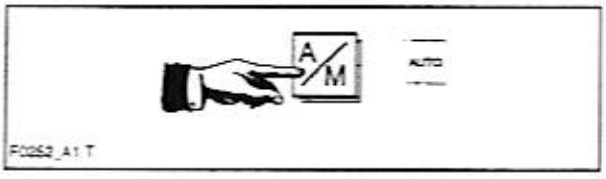
- Pressing the UP or DOWN key changes the value accordingly.
(Example: setting the value 7)



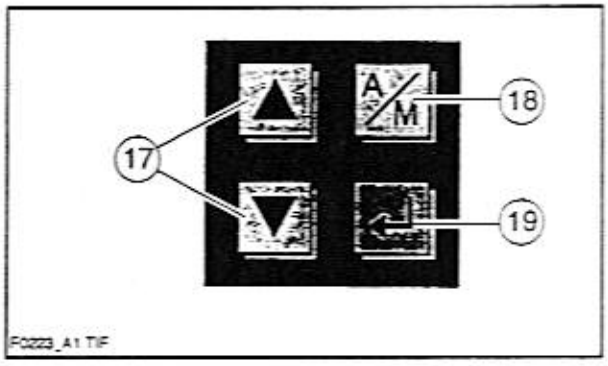
- Pressing the A/M key switches the system back to the working mode. If no changes were made, the controller automatically toggles back to the working mode.



☞ Automatic operation can be switched off using the A/M key.
The function lamp goes out.



2.4 Keyboard unit



Four keys are available for operating the MOBA-matic model. They are easy to use, being assigned with an additional function only for some settings.

- Up/Down keys (17)

  During automatic operation, these keys are used to modify the set value.
  During manual operation, they are used to activate the respective valve outputs.

- Automatic/Manual key (18)

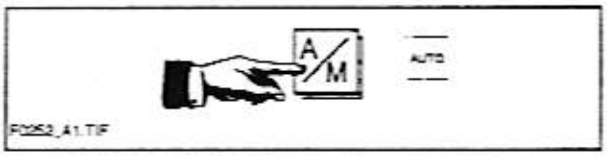
  This key is used to toggle between the automatic and the manual mode (manual operation).

- Enter key (19)

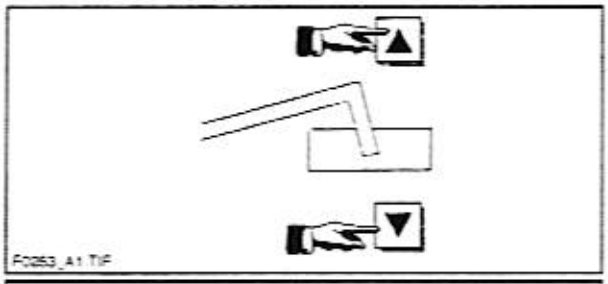
This key is used for zeroing and/or for adjusting the set value to the actual value.

2.5 Brief instructions

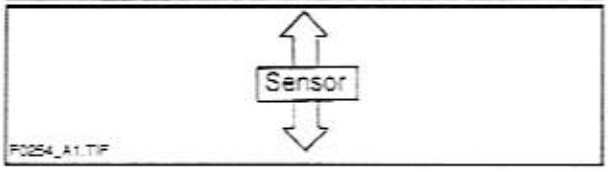
Always use the manual mode to make the basic settings!
The function lamp must be off.



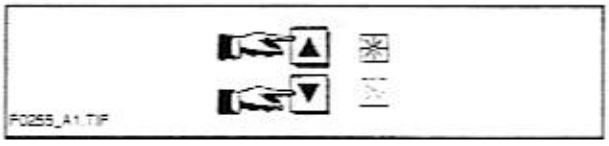
- Lift/lower the screed to its initial position.



- Align the sensor.



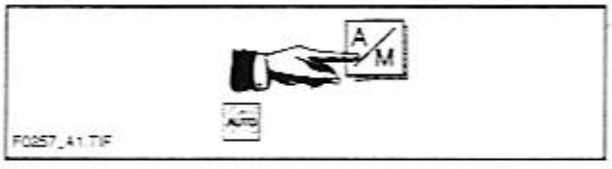
- In the case of the "Sonic-Ski" sensor, rope / ground scanning is set by pressing the UP/DOWN keys simultaneously.



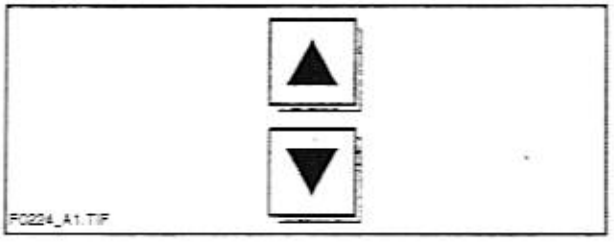
- Press the Enter key.

- The function lamp is lit.

Use the A/M key to activate automatic operation. The MOBA-matic system now keeps the screed at the set height.



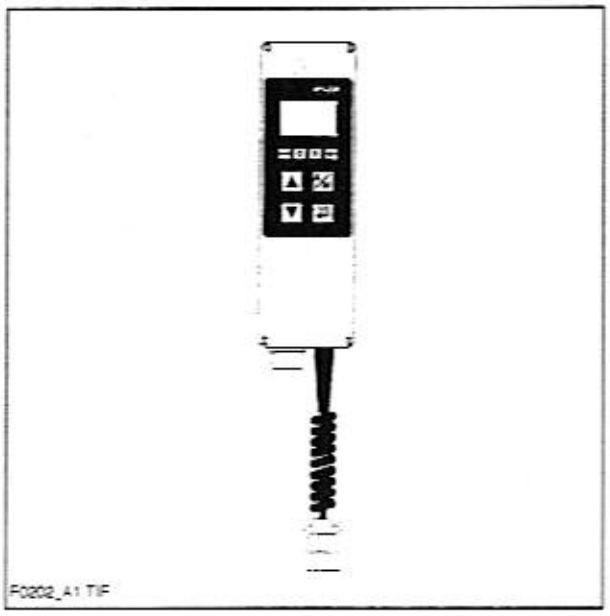
- The set value can be modified using the UP/DOWN keys.



2 MOBA-matic model

2.1 Basic operation of the digital control unit

The following part of the present operating instructions provides a general description of how the system is operated. The operating instructions for the individual sensors require that the operator is familiar with the basic operating procedures.

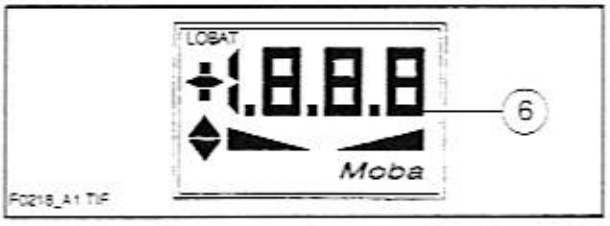


Description of the digital control unit

The digital control unit can be used for all types of machines. It is fitted with a digital display, four function lamps and four operating keys.

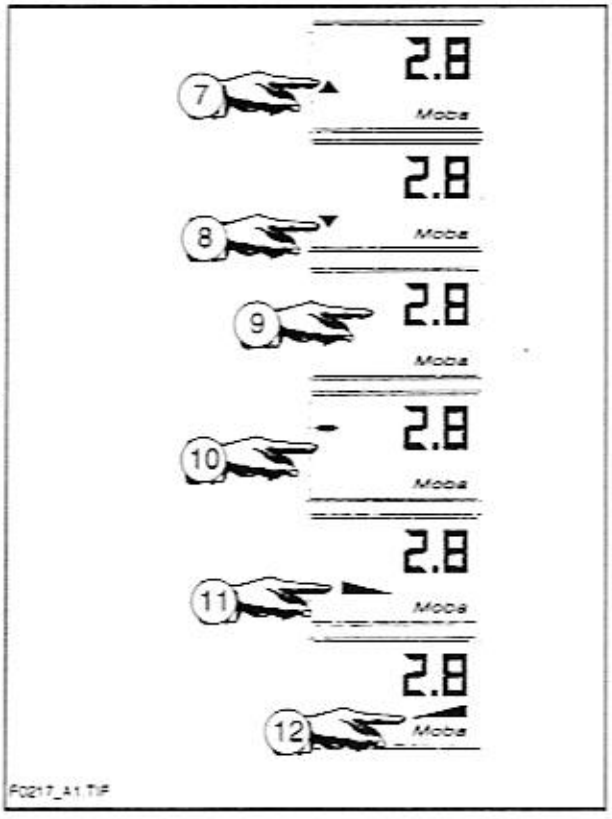
2.2 Liquid crystal display

Owing to the integrated illumination, the liquid crystal display (6) is easy to read even under unfavorable light conditions.

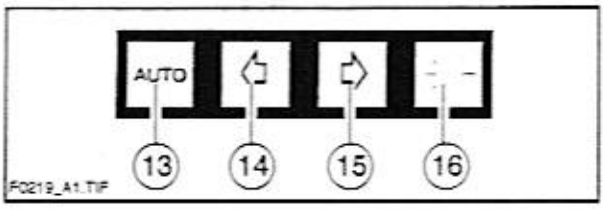


The displayed symbols have the following meaning:

Symbol	Meaning
Arrows RAISE (7) / LOWER (8)	Activated controller output
Value without sign (9)	Positive display value
Value with negative sign (10)	Negative display value
Bar tapering off to the right (11)	Slanted to the right
Bar tapering off to the left (12)	Slanted to the left



2.3 Function lamps



The function lamps have the following meaning:

- Lamp "AUTO" (13)

Lamp	Function
On	Automatic operation
Off	Manual operation

- Direction lamps (14, 15) - special function for "Sonic-Ski"

Lamp	Display	Function
LEFT	Off	Rope is outside the left-hand sensor range (set status)
	Flashing	Rope is within the left-hand sensor range
RIGHT	Off	Rope is outside the right-hand sensor range (set status)
	Flashing	Rope is within the right-hand sensor range

☞ If one of the lamp starts flashing, the "Sonic-Ski" must be readjusted (centered). If both lamps start flashing, they indicate an alarm.

- Rope lamp (16) - for "Sonic-Ski" operation only

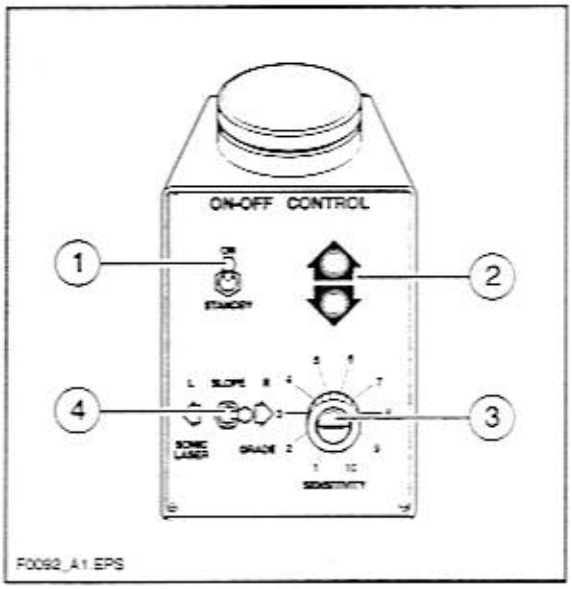
Lamp	Function
On	Rope mode active
Off	Ground mode active (generation of a mean value)

C Operation

1 MOBA Grade-Line model

1.1 Grade control

The grade control unit can be used for simple height adjustment or in combination with the slope control unit.



- Valve switch (1)

Position	Function
On	Switched on
Standby	Ready for operation (normal position)

- Control lamps (2)

Position	Function
Top	Point of traction further upwards
Bottom	Point of traction further downwards

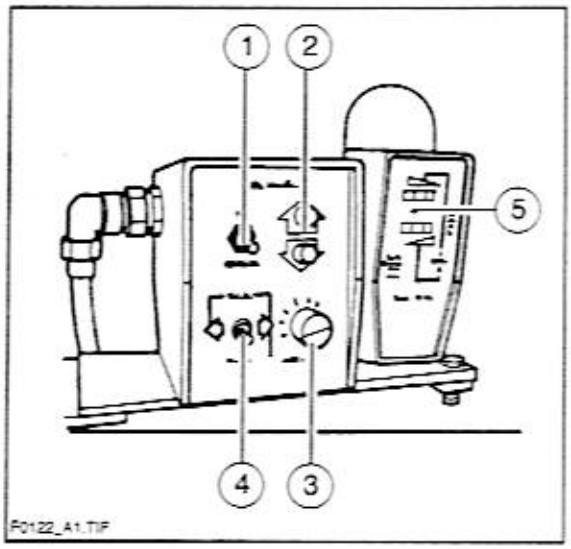
- Sensitivity adjuster (3)

Position	Function
< 5	Coarse scanning
> 5	Fine scanning

- Selector switch (4)

☞ The switch is blocked mechanically when the levelling system is used as a grade control.

1.2 Slope control (○)



☞ Operating elements 1, 2, 3 have the same function as for simple height control (see 1.1).

- Valve switch (1)

Position	Function
On	Switched on
Standby	Ready for operation (normal position)

- Control lamps (2)

Position	Function
Top	Point of traction further upwards
Bottom	Point of traction further downwards

- Sensitivity adjuster (3)

Position	Function
< 5	Coarse scanning
> 5	Fine scanning

- Selector switch (4)

Position	Function
Slope L	Control of the left-hand side
Slope R	Control for the right-hand side
	or, with sensors (option)
Sonic/Laser	Ultrasonic/laser scanning
Grade	Mechanical scanning

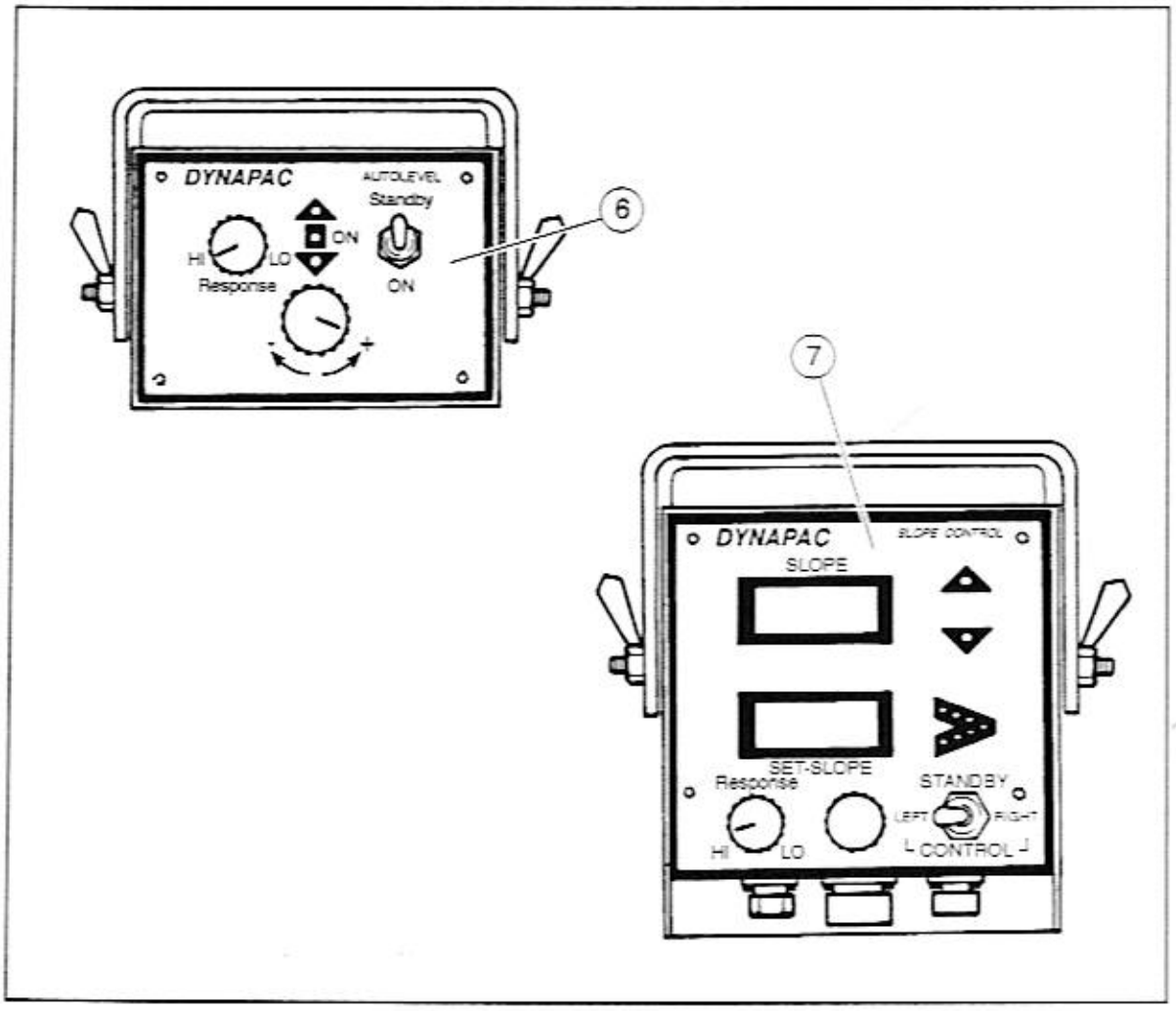
- Remote control unit (5) - can be removed:

Adjustment and display of the transversal slope

3.3 Dynapac

The grade control unit (6) can be used for simple height adjustment or in combination with the slope control unit (7).

Connect the distance or inclination sensors required to the respective devices.

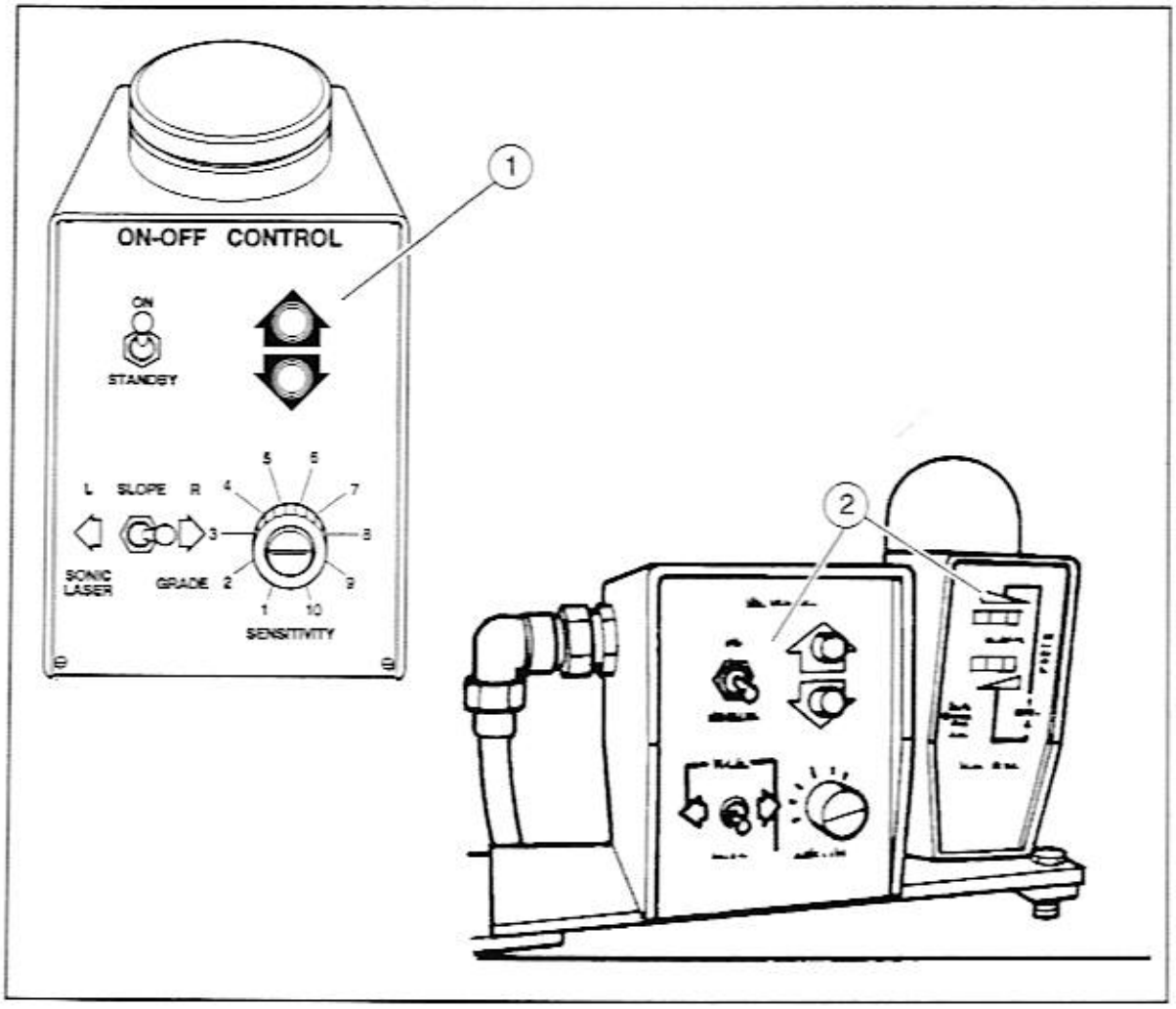


☞ Installation and adjustment of the automatic levelling system is described in the chapter "Set-up and modification".

3 Models

3.1 MOBA Grade-Line

The grade control unit (1) can be used for simple height adjustment or in combination with the slope control unit (2).

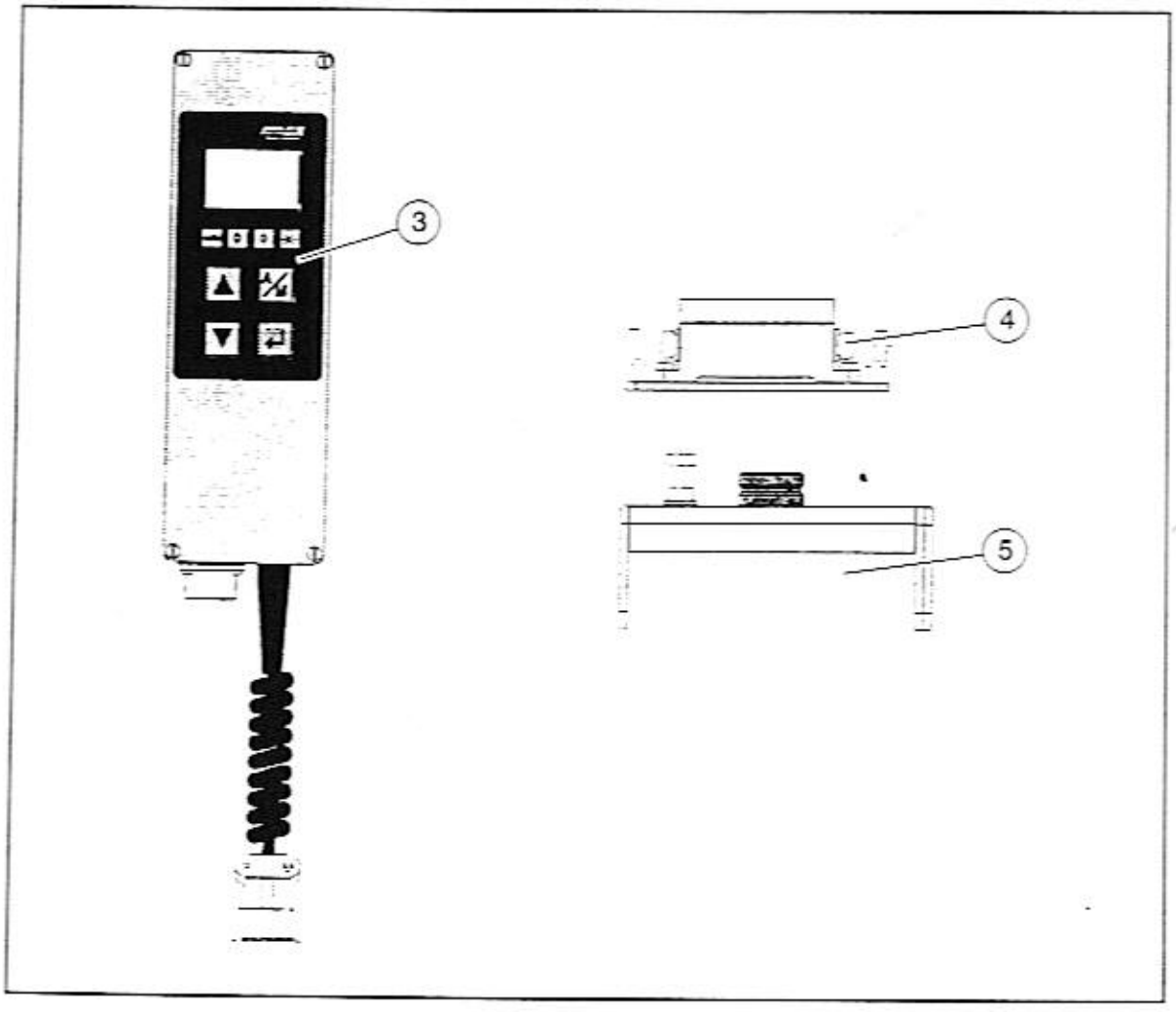


☞ Installation and adjustment of the automatic levelling system is described in the chapter "Set-up and modification".

3.2 MOBA-matic

The MOBA-matic model (3) is a control system for construction machines.
The digital controller is based on modern microprocessor technology and uses a digital interface, thus making it possible to connect different types of sensors (4 and 5) to the digital controller. The digital controller automatically recognizes the connected sensors when switched on. If a different sensor type is used, the change must be acknowledged by pressing any key after the machine has been switched on.

Available sensors:
- Digi-Slope inclination sensor (4)
- Sonic-Ski distance sensor (5)



☞ Installation and adjustment of the automatic levelling system is described in the chapter "Set-up and modification".

B Description of the levelling systems

1 Models

As an option, all SVEDALA-Dynapac paver finishers can be operated in conjunction with various automatic levelling systems. In some aspects, the systems that are currently available differ greatly in terms of construction. There are several models that are independent of each other.

1.1 Automatic height control in longitudinal direction by means of mechanical reference scanning

To use this method, a grade control unit with a mechanical scanning system is permanently connected to the laying system and guided by a suitable reference mechanism. Using hydraulic levelling cylinders, the grade control acts upon the laying system, keeping it parallel to the reference level. Any vertical movements carried out by the tractor are not transferred to the laying system.

1.2 Automatic height control in longitudinal direction by means of ultrasonic reference scanning

The scanning principle is similar to that of the mechanical reference mechanism described under 1.1. The major difference is that the sensor system is not based on a mechanical system, but on an ultrasonic signal that is emitted by the grade control unit, reflected by the reference level (wire, curbstone or similar) and received again by the grade control.

By applying this principle, the distance between the grade control unit and the reference level is kept constant, i.e. this method also causes the reference level to be transferred to the laying system, ensuring that the layers always are in parallel to the reference level.

1.3 Automatic slope control

The slope control unit is used to automatically adjust the laying system to the inclination angle defined for the road. This instrument is a kind of electronic level that continuously compares the actual slope to the set angle and, if necessary, corrects the value.

Slope controls can be operated in conjunction with grade controls, i.e. the grade control unit controls the left-hand or right-hand side of the laying system whereas the slope control unit adjusts the other side to keep the transversal slope constant when the layer thickness changes.

Continuous height control and automatic correction make it possible to achieve the best possible accuracy during laying when using an automatic levelling system. Any deviation detected by the grade control unit is automatically transferred to the control valve to correct the layer thickness. The slope control unit (pendulum) forms an artificial horizon that can be adjusted in position (transversal slope) and controls one side of the screed. The slope control unit is installed on a cross arm linked to the screed's crossbeams in the line of sight of the driver. When the levelling system is switched off, the height of the screed can be adjusted from the operating panel or from the remote control. The entire system consists of two controllers that operate independently. If a deviation occurs, both controllers act on electromagnetic valves that in turn adjust the levelling cylinders, thus correcting the layer thickness.

2 Application methods

There are two different application methods:

- The grade control unit scans one side using a defined reference line and transfers adjustments to the other side via the slope control unit (pendulum).
- The grade control unit scans both sides using defined reference lines. The slope control unit is not used.

A Correct use and application

☞ The "Guidelines for the Correct Use and Application of Paver Finishers" compiled by Svedala are included in the scope of delivery for levelling systems. The guidelines are part of the present operating instructions and must always be heeded. National regulations are fully applicable.

The levelling systems described in the present operating instructions are used in conjunction with paver finishers. They ensure uniform laying of mixed materials, roll-down concrete or lean-mixed concrete, track-laying ballast and unbound mineral aggregates for foundations for paving.
They 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 levelling systems 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 a levelling system 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 levelling systems 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.

Table of contents

NIVGB_IVZ 2-2 - 03.99

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.

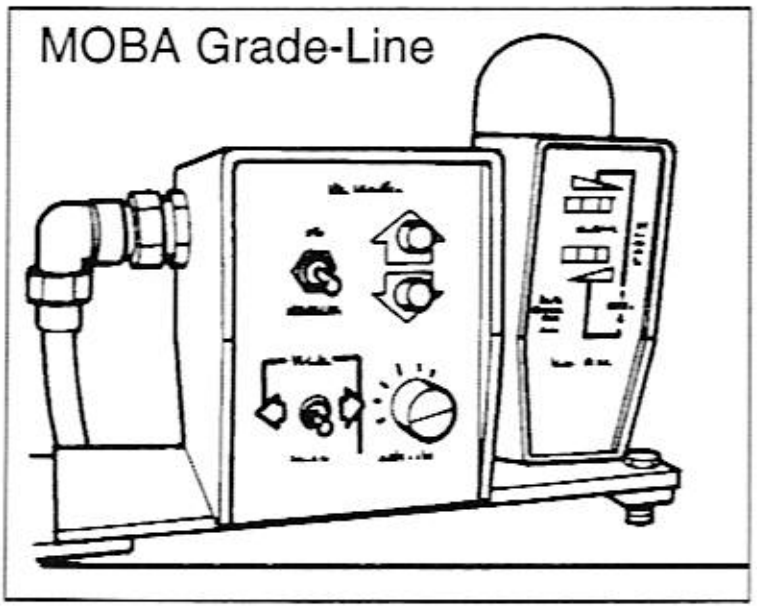
- ● Used to indicate standard equipment.
- ○ Used to indicate optional equipment.

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.

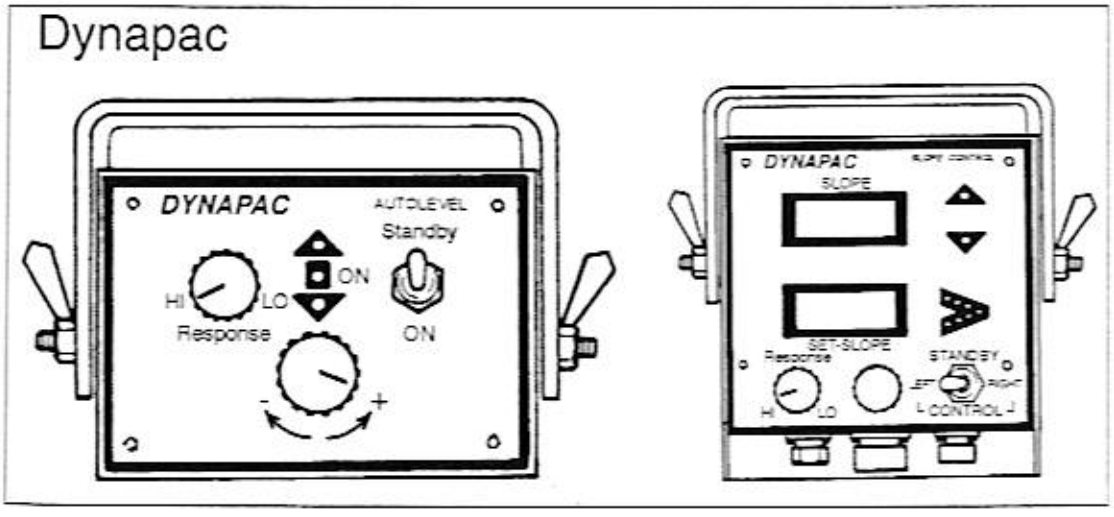
Svedala Strassenfertiger GmbH
Wardenburg

Ammerländer Strasse 93
D-26203 Wardenburg / Germany
Phone: +49 / (0)4407 / 972-0
Fax: +49 / (0)4407 / 972-228

SVEDALA



MOBA-matic



Operating Instructions (GB) 02

Levelling Systems

Typ MOBA Grade-Line / MOBA-matic / Dynapac

900 98 01 46

5.4 Fuses on the operating panel

	Fuse, traction drive	0.5 A fast-acting

No	Fuse strip II	A	No	Fuse strip I	A
1.	Hazard flasher (terminal 30)	5	1.	Horn; automatic drive controller; switch-on interlock; emergency stop button	5
2.	Hazard flasher (terminal 15)	3	2.	Control lamps; torn V-belt; indicators	3
3.	Brake light; screed hazard flasher	3	3.	Levelling system (slope control/grade control)	5
4.	High beam	7.5	4.	Conveyor Auger (right hand side)	7.5
5.	Low beam, right	3	5.	Conveyor Auger (left hand side)	7.5
6.	Low beam, left	3	6.	Tamper / vibration (in the case of front wheel drive)	3 (5)
7.	Parking light, right	3	7.	Hopper and screed hydraulics; hazard warning lights of the screed, leveling remote control, height adjustment for auger crossbeam (○)	7.5
8.	Parking light, left; instrument illumination	3	8.	Engine speed control	7.5

4.3 Filling volumes

	Filling volumes	Substance	
Volume	Diesel fuel	210 55,4 46,1	liters US gallons British gallons
Hydraulic oil reservoir	Hydraulic oil	185 48,8 40,6	liters US gallons British gallons
Diesel engine (with oil filter change)	Engine oil	14,0 3,7 3,1	liters US gallons British gallons
Cooling system	Cooling fluid	12,2 3,2 2,7	liters US gallons British gallons
Pump distribution gear	Gear oil 90	4,5 1,2 0,98	liters US gallons British gallons
Drive axle (differential)	Gear oil 90	18 4,8 4,0	liters US gallons British gallons
Conveyor gear (each side)	Gear oil 220	1,5 0,4 0,32	liters US gallons British gallons
Auger, bevel gear (each side)	Gear oil 90	0,6 0,15 0,13	liters US gallons British gallons
Central lubrication unit ○	Grease		
Brake fluid container	Brake fluid		
Batteries	Distilled water		

☞ For the different types of operating agents, see "Lubricating agents and operating substances", page F22.

5 Electric fuses

5.1 Main fuses

1.	Above the batteries: - Screed electicity - Screed heater system	 50 A 25 A
2.	below the stepping plate of the operator stand: - (free) - Screed heater	 -- 25 A

5.2 Fuses on the main terminal strip

(above the fuel tank)

1.	Emulsion spraying system (○)	3 A
2.	Diesel engine stop solenoid	7,5 A
3.	Anti-skid controller (○)	7,5 A
4.	(free)	-
5.	(spare)	(3 A)

5.3 Fuses in the gas heater switch box

1.	Power supply	5 A
2. – 5.	Ignition (4x)	2 A (4x)

F Installation, maintenance and charging of batteries

⚠ Always observe the national legal stipulations for the installation and operation of battery charging stations. Take special care to ensure that the batteries cannot be tipped over. Protect your hands and eyes. Avoid inhaling gases. If you have come into contact with battery acid, flush the affected parts with clean water and immediately consult a doctor. Observe the following safety rules for maintaining, charging and exchanging batteries:

1 Maintenance personnel

Only specially trained personnel may charge, maintain and exchange batteries. When doing so, they must follow the instructions provided by the manufacturers of the battery and the battery charger and by SVEDALA. The instructions for handling the battery and the operating instructions for the battery charger must also be observed.

2 Fire protection measures

Do not smoke or use naked flames when handling batteries. There must be no inflammable substances or spark-generating materials within a distance of 2 m of the battery to be charged and the battery charger. The location must be well ventilated and fire fighting equipment must be kept ready.

3 Rendering the paver finisher safe

If work is to be carried out on the battery, the paver finisher must be rendered safe as described in the operating instructions. The paver finisher may only be started up again after all hoods and connections have been reverted to the normal state required for operation.

4 Seating of the battery

The battery must be installed in the paver finisher according to the instructions provided by SVEDALA to avoid any hazards resulting from unexpected movements. Check and, if necessary, replace the battery seat every time the battery has been exchanged.

5 Damaged cables

When removing and installing batteries, make sure the battery cables are not damaged. Before starting the charging process, check the battery cable and the charger cable for damage and replace them if necessary.

6 Maintenance of the battery

The battery cell covers must be kept dry and clean. Spilled battery acid must be neutralized immediately. Terminals and cable shoes must be clean, lightly greased with terminal grease and securely tightened.

7 Charging the battery

During the charging process, the tops of the battery cells must be exposed and the screw caps must be removed to ensure adequate ventilation and thus prevent explosive gases from collecting. Do not place any metal objects on the battery.

G Refuelling paver finishers

1 Approved fuels

Only the fuels specified in the operating instructions may be used.

2 Refuelling

The national regulations for storing and handling liquid fuels must be observed.

Do not smoke or use naked flames when refuelling the paver finisher or checking the filling level of the tank. Make sure that no fuel is spilt and that no fuel drops onto hot parts.