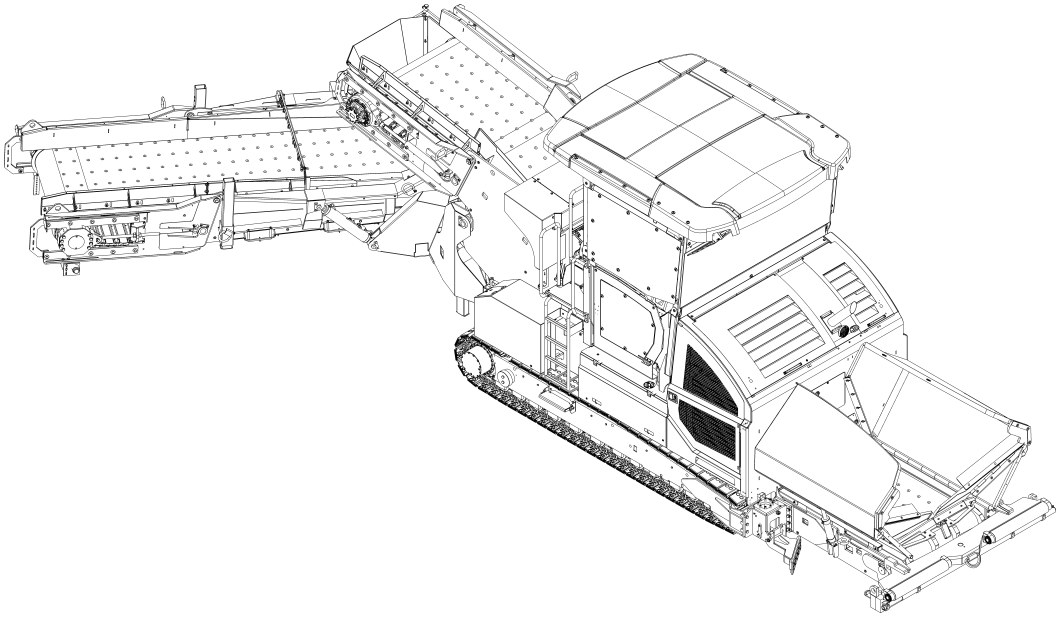
OPERATION & MAINTENANCE



Feeder
Dynapac
MF2500CS
Type 704

EN 01-0114 4812010805 (A5)
Keep for later use in document compartment

Valid for:
_____ to _____
_____ to _____

Sustainable Productivity

Atlas Copco


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V Preface

Original operating instructions

If the vehicle is to be operated safely, the information provided in these operating instructions will be required. 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 vehicle options. Make sure that during operation and maintenance work the description appropriate to the vehicle option is used.

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

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1 General safety instructions

1.1 Laws, guidelines, accident prevention regulations

☞ The locally applicable laws, guidelines and accident prevention regulations must always be observed, even if these are not expressly named here.
The user himself/herself is responsible for compliance with the resulting regulations and measures!

☞ The following warnings, prohibitive symbols and instructive symbols indicate dangers for persons, the vehicle and the environment due to residual risks when operating the vehicle.

☞ Failure to observe this information, prohibitions and instructions can result in life-threatening injuries!

☞ The "Guidelines for the correct and proper use of feeders" compiled by Dynapac must also be observed!

1.2 Safety signs, signal words

In the safety instructions, the signal words "Danger", "Warning", "Caution", "Note" are positioned in the coloured title block. They follow a certain hierarchy; in combination with the warning symbol, they indicate the severity of the danger or the type of note.

"Danger"!



Danger of personal injury.
Indication of an immediately threatening danger that result in fatal or severe injuries unless the corresponding actions are taken.

"Warning"!



Indication of a possible danger that can result in fatal or severe injuries unless the corresponding actions are taken.

"Caution"!



Indication of a possible danger that result in moderate or minor injuries unless the corresponding actions are taken.

"Note"!



Indication of a possible drawback unless the corresponding actions are taken, e.g. unwanted conditions or consequences can occur.

1.3 Other supplementary information

Other information and important explanations 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.

1.4 Warning symbols

Warning on a dangerous area or hazard!
Failure to observe the warnings can result in life-threatening injuries!



Warning on danger of being pulled in!

⚠ In this working area/on this element there is a danger of being pulled in by rotating or conveying elements!
Only carry out activities with elements switched off!



Warning on dangerous electrical voltage!

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



Warning on suspended loads!

⚠ Never stand under suspended loads!



Warning on danger of crushing!

⚠ There is a danger of crushing when certain components are operated, or certain functions or vehicle movements are carried out.
Always make sure that there are no persons within the endangered areas!



Warning on hand injuries!



Warning on hot surfaces or hot liquids!



Warning on danger of falling!



Warning on dangers posed by batteries!



Warning on hazardous or irritating substances!



Warning on substances which constitute a fire hazard!



Warning on gas bottles!



1.5 Prohibitive symbols

Opening/walking on/reaching in/carrying out/setting up are prohibited during operation or while the drive engine is running!



Do not start engine/drive!
Maintenance and repair work may only be carried out with the diesel engine shut down!



Spraying with water is prohibited!



Extinguishing with water is prohibited!



Unauthorised maintenance is prohibited!
Only qualified experts may conduct maintenance!

☞ Consult the Dynapac Service Department



Fire!, naked flames and smoking are prohibited!



Do not switch!



1.6 Protective equipment

☞ Locally applicable regulations may require the wearing of various safety equipment! Always observe these regulations!

Wear safety goggles to protect your eyes!



Wear suitable head protection!



Wear suitable hearing protection to protect your hearing!



Wear suitable safety gloves to protect your hands!



Wear safety shoes to protect your feet!



Always wear close-fitting work clothing!
Wear a warning vest to be seen in time to avoid accidents!



Wear respiratory equipment if breathing air is contaminated!



1.7 Environmental protection

☞ The locally applicable laws, guidelines and accident prevention regulations for the proper recycling and disposal of waste must always be observed, even if these are not expressly named here.
Water-endangering substances like:

- Lubricants (oil, grease)
- Hydraulic oil
- Diesel fuel
- Coolant
- Cleaning liquids

must not get into the soil or sewer system during cleaning, maintenance and repair work!

Substances must be caught, stored, transported and brought to professional disposal sites in suitable containers!



Environmentally hazardous substance!



1.8 Fire prevention

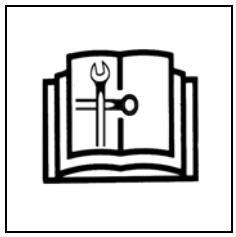
☞ Locally applicable regulations may require suitable extinguishing agents to be carried on the vehicle!
Always observe these regulations!

Fire extinguisher!
(optional equipment)



1.9 Additional information

⚠ Also observe the manufacturer's documentation and additional documentation!



☞ For example, the maintenance instructions of the engine manufacturer

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

2 CE identification and declaration of conformity

(only applies to vehicles sold in the EU/EEC)

This vehicle has CE identification. This identification says that the vehicle fulfils the basic health and safety requirements pursuant to the Machinery Directive 2006/42/EC together with all other valid regulations. The scope of supply of the vehicle includes a Declaration of Conformity as specified in the valid regulations and amendments together with harmonised standards and other valid provisions.

3 Guarantee conditions

☞ The guarantee conditions are included in the scope of supply of the vehicle.
This contains a complete specification of the valid conditions.

The guarantee becomes null and void if

- damage occurs through malfunctions caused by improper use and incorrect operation.
- repairs or manipulations are carried out by persons who are neither trained nor authorised accordingly.
- accessories or spare parts are used that cause damage and which are not approved by Dynapac.

4 Residual risks

These are risks that remain even if all possible measures and safety precautions have been taken to help minimise dangers (risks) or to reduce their probability and scope to zero.

Residual risks in the form of

- **Danger to life and limb of persons on the vehicle**
- **Danger to the environment posed by the vehicle**
- **Damage to property and restricted output and functionality of the vehicle**
- **Damage to property in the operating range of the vehicle**

caused by:

- wrong or improper use of the vehicle
- defective or missing safety devices
- use of the vehicle by untrained, uninstructed staff
- defective or damaged parts
- incorrect transport of the vehicle
- incorrect maintenance or repairs
- leaking operating substances
- emission of noise and vibrations
- impermissible operating substances

Existing residual risks can be avoided by complying and implementing the following:

- warnings on the vehicle
- warnings and instructions in the safety manual for feeders and in the operating instructions for the feeder
- operating instructions of the vehicle operator

5 Sensibly predictable incorrect usage

Every kind of sensibly predictable incorrect usage of the vehicle constitutes misuse. Incorrect usage renders the manufacturer's warranty null and void; the operator bears sole responsibility.

Sensibly predictable incorrect usage of the vehicle includes:

- presence in the danger zone of the vehicle
- transporting persons
- leaving the operator's platform while the vehicle is operating
- removing protection or safety devices
- starting and using the vehicle outside of the operator's platform
- failing to comply with the maintenance instructions
- omission or incorrect execution of maintenance or repair work
- spraying the vehicle with high pressure cleaners

A Correct use and application

☞ The Dynapac "Guideline for the correct and proper use of feeders" is included in the scope of delivery of this device. The guidelines are part of the present operating instructions and must always be heeded. National regulations are fully applicable.

The vehicle described in these operating instructions is a feeder which is used as a transportation and conveyor system for paving materials for paver finishers and which forwards material accepted from transport vehicles to paver finishers.
Roll-down or lean-mixed concrete, track-laying ballast and unbound mineral aggregates for paving foundations are suitable paving materials.
The feeder must be used, operated and maintained according to the specifications in these operating instructions. Any other use is regarded as improper and can cause injury to persons or damage to the feeder or other assets.

Any use going beyond the range of applications described above is regarded as improper use and is expressly forbidden! Especially in those cases where the feeder 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.

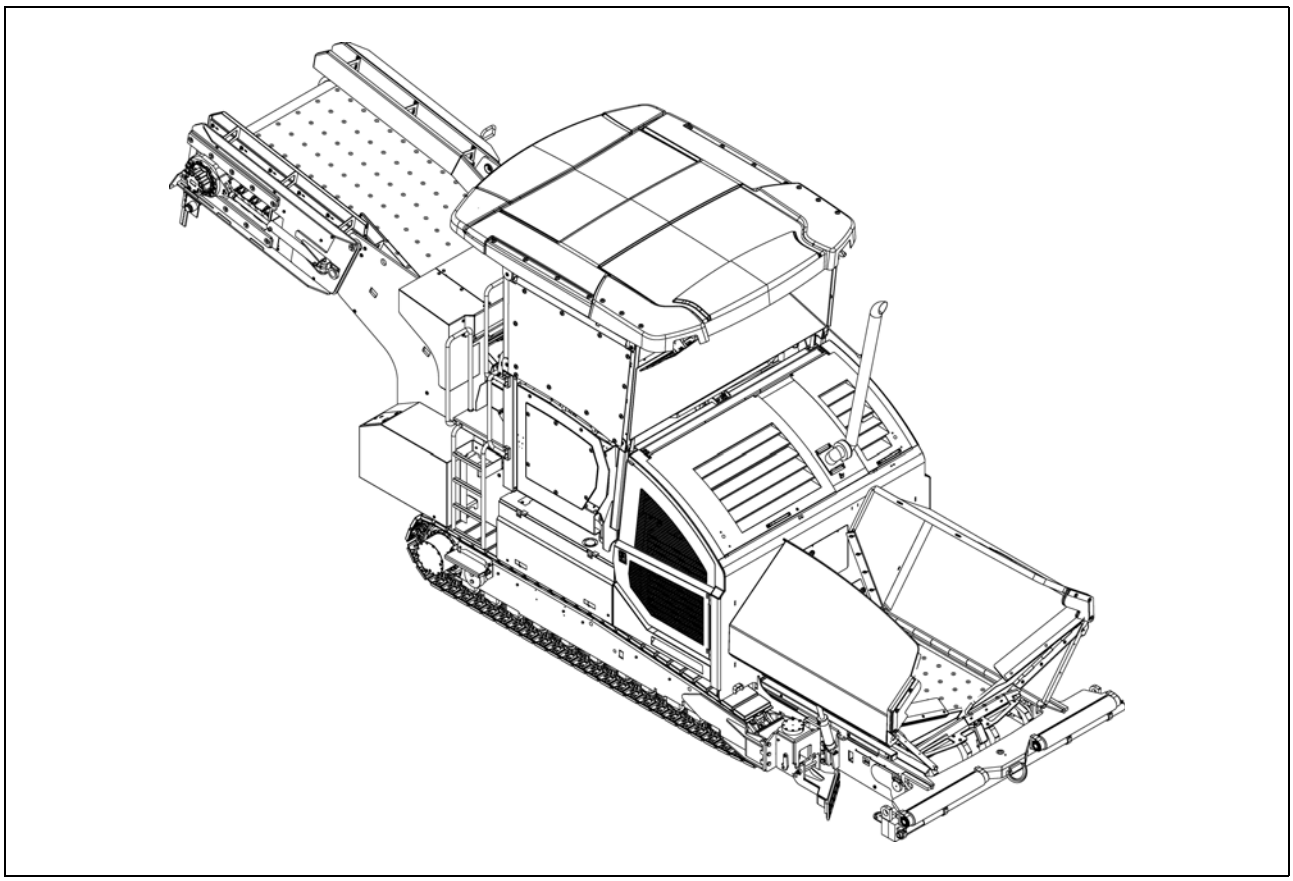
Duties of the operator: An operator within the meaning of these operating instructions is defined as any natural or legal person who either uses the feeder himself or on whose behalf it is used. In special cases (e.g. leasing or renting), the operator is considered to be the person who, in accordance with existing contractual agreements between the owner and the user of the feeder, is charged with the observance of the operating duties.
The operator must ensure that the feeder is only used in the proper manner and that all danger to the life and limb of the user 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 operator must also ensure that all persons operating the feeder have read and understood the present operating instructions.

Mounting of attachments: The feeder can only be operated with paver finishers and paving materials that have been approved by the manufacturer. Mounting or installation of additional facilities that interfere with or supplement the functions of the feeder are only permissible after written approval has been obtained from the manufacturer. If necessary, approval must be obtained from local authorities.
Any approval obtained from local authorities does not, however, make approval by the manufacturer unnecessary.

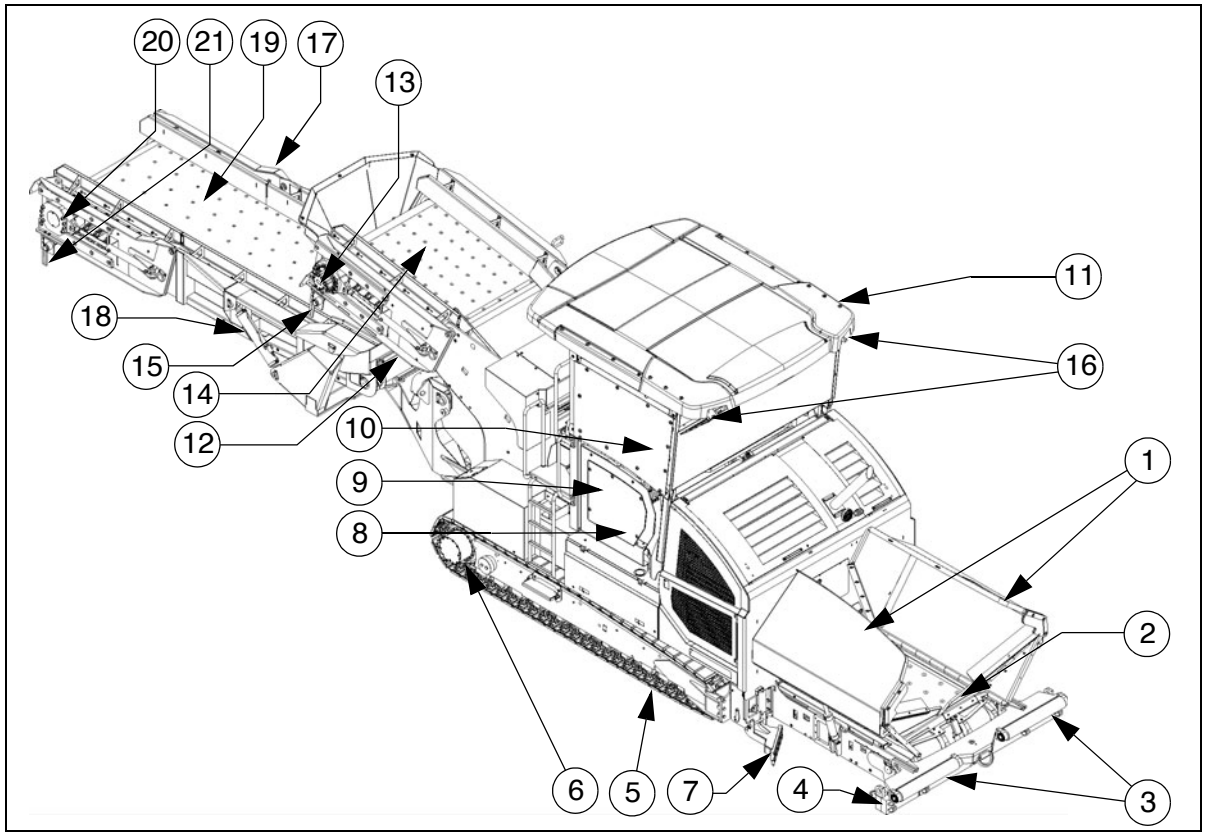
B Vehicle description

1 Application

Dynapac feeder MF2500CS is a transportation and conveyor system with caterpillar drives that is used as a link between paver finishers and transport vehicles for the provision of material.
A material compartment, whose lateral covers can be folded in to achieve better emptying and even material conveying, is used to accept material.
Material conveying is carried out using a rubber conveyor belt.
Material transfer is carried out into a material compartment adapted to the paver finisher; it is positioned in the paver finisher's hopper.



2 Description of assemblies and functions



Pos.		Designation
1	●	Material compartment (hopper)
2	●	Hydraulic front hopper flap
3	●	Push roller crossbar for truck docking
4	●	Tube for sensor rod (direction indicator) and holder for levelling shoe
5	●	Caterpillar drive
6	●	Travel drive of the caterpillar drive
7	●	Lane cleaner
8	●	Operator’s platform
8	○	Operator's platform, height-adjustable
9	●	Seat bracket, seat (swivelling)
10	●	Operating panel (laterally moveable, swivelling)
11	●	Protective roof
12	●	Conveyor belt
13	●	Conveyor belt drive
14	●	Conveyor belt, heat-resistant
15	●	Spring arm scraper
16	●	Working lights
17	○	Slewing conveyor belt
18	○	Swivel cylinder left / right
19	○	Conveyor belt, heat-resistant
20	○	Conveyor belt drive
21	○	Spring arm scraper

● = Standard equipment	○ = Optional equipment

2.1 Vehicle

Construction

The feeder has a welded steel frame on which the individual assemblies are mounted.

The caterpillar drives are able to compensate uneven areas on the ground.
The continuously adjustable hydrostatic travel drive allows the speed of the feeder to be matched to the relevant work conditions.

Operation of the feeder is made considerably easier by the clearly arranged operating elements and controls.

The following extra equipment (option) is available:

○ Swivelling conveyor belt

○ Automatic steering unit

○ Feeder-paver finisher distance control

○ Material requirement signal system

○ Additional headlights, warning lamps, work lighting

○ Camera system

○ Reverse buzzer

○ 12 volt system

○ Luxury seats

○ Fire extinguisher

○ Further equipment and upgrade options on request

Engine: The feeder is driven by a water cooled diesel engine. For further details see the technical data and the engine's instruction manual.

Various engine variants in different emission classes are available as options.

Stage IIIa / Tier 3 (○): There is no separate exhaust aftertreatment for this engine type when used in countries without specific regulations.

Stage IIIb / Tier 4i (○): A particulate filter cleans the exhaust gas from the incurred soot particles, reduces the generation of gaseous carbon monoxide and carbon dioxide pollutants and therefore acts as a catalytic converter to minimize environmental and health pollution. Particulate filter regeneration can be carried out automatically or manually.

Stage IV / Tier 4final (○): The engine complies with the latest emissions standards and helps to reduce diesel consumption and improve the working environment.
The exhaust gas aftertreatment system consists e.g. of a diesel oxidisation catalytic converter (DOC), an SCR catalytic converter (Selective Catalytic Reducer) and an AdBlue® / DEF injection system.
The emission of exhaust gases which are harmful to the environment and health is significantly reduced.

Drive unit: Both caterpillar drives are directly driven by separate drives. They operate directly, without any drive chains which require maintenance or servicing.
The tension of the caterpillar chains can be readjusted using tensioners.
For adaptation to the filling height of the material transporter or its tyre size and for driving onto the low-loader, a hydraulic cylinder connected to drive unit and vehicle chassis can be used to raise or lower the front section of the entire vehicle chassis.
A swivelling lane cleaner (○), which ensures an even passage during paving, is located in front of each of the drive units. Small obstacles lying in the lane are cleared away to the side.

Hydraulic system: The diesel engine drives the hydraulic pumps for all of the feeder's main drives via the flange-mounted distribution gear and its auxiliary drive shafts.

Travel drive: The continuously adjustable travel drive pumps are connected to the travel drive engines by means of high pressure hydraulic hoses.
These hydraulic motors drive the caterpillar chains via planetary gears that are mounted directly inside the drive units of the caterpillar chains.

Steering system/operator's platform: The independent hydrostatic travel drives allow the feeder to be turned on the spot.
Electronic synchronous control ensures precise straight-ahead travel.
The hydraulically height-adjustable control platform (○) provides the driver with an optimal view of all necessary working areas.
The driver's seats and the operating panel can be swivelled for operation beyond the outer edge of the vehicle.

Push roller crossbar: The push rollers for material trucks are fastened to a cross bar that is pivoted at its centre. The feeder deviates less from its course and material transfer in curves is made easier.
For adaptation to various truck design types, the push roller crossbar can be shifted to two positions.

Material compartment (hopper): The hopper inlet is equipped with a conveyor system for emptying and transporting the material onwards.
The hopper can hold approx. 12.0 t.
To facilitate emptying and achieve even material transfer, each of the lateral covers of the hopper can be hydraulically folded in.
The hydraulic front hopper flaps ensure that no material remains in the front area of the hoppers.

Conveyor belt: The feeder is equipped with a rubber conveyor belt for material transfer. The hydrostatic drive is continuously adjustable.
The transfer amount or speed is regulated fully automatically by scanning the filling height.
A spring arm scraper is located in the ejection area for cleaning and to reduce wear.
An automatic chain lubricating system keeps the drive chains constantly lubricated.
Height-adjustable conveyor belt (○): A height-adjustable conveyor belt is available tor adjusting to different types of material compartment.

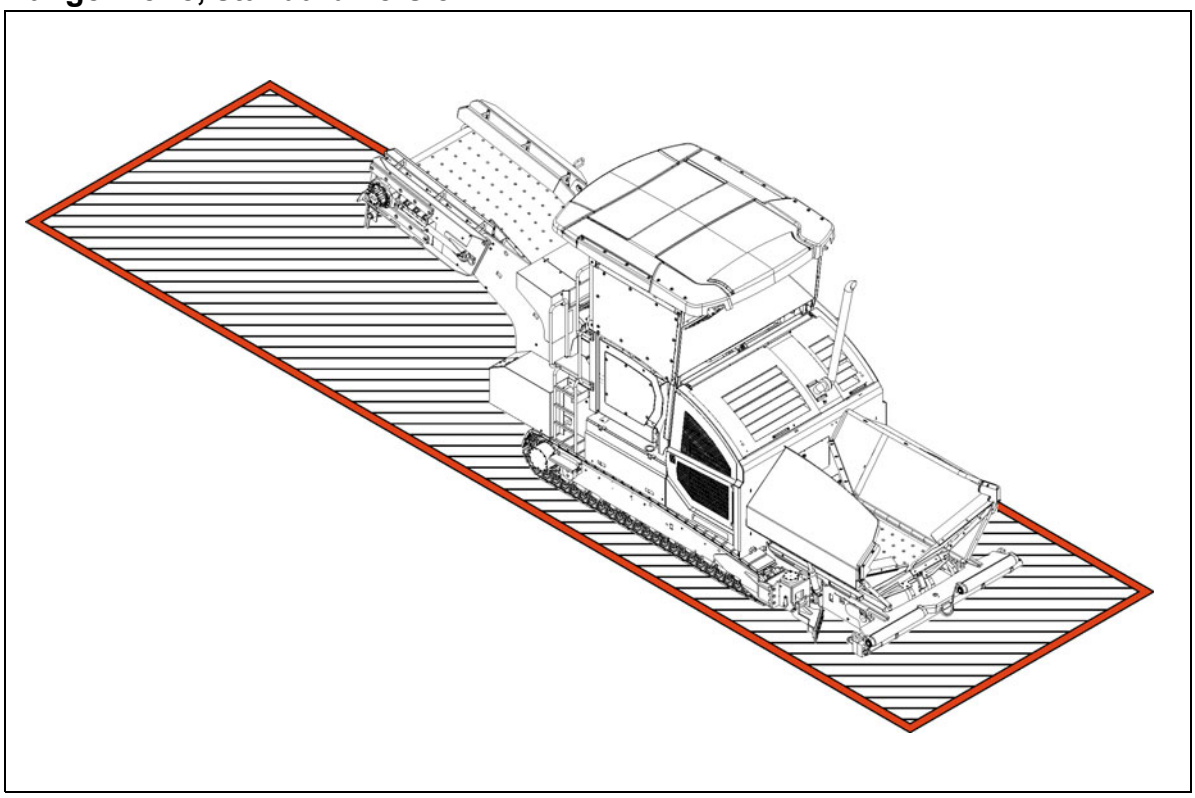
Slewing conveyor belt (○): A quickly mounted slewing conveyor belt can be fitted to the vehicle frame behind the short conveyor belt to offer additional possibilities for the feeder, such as filling two paver finishers or providing material for the construction of a cycle track at the side.
A spring arm scraper is located in the ejection area for cleaning and to reduce wear.
An automatic chain lubricating system keeps the drive chains constantly lubricated.

Distance sensor (○): A laser sensor on the rear of the vehicle is used to sense the distance between the feeder and the paver finisher.
As soon as the engaged sensor registers the approach of the paver finisher, the feeder's speed is adjusted to that of the paver finisher and the distance is automatically maintained.

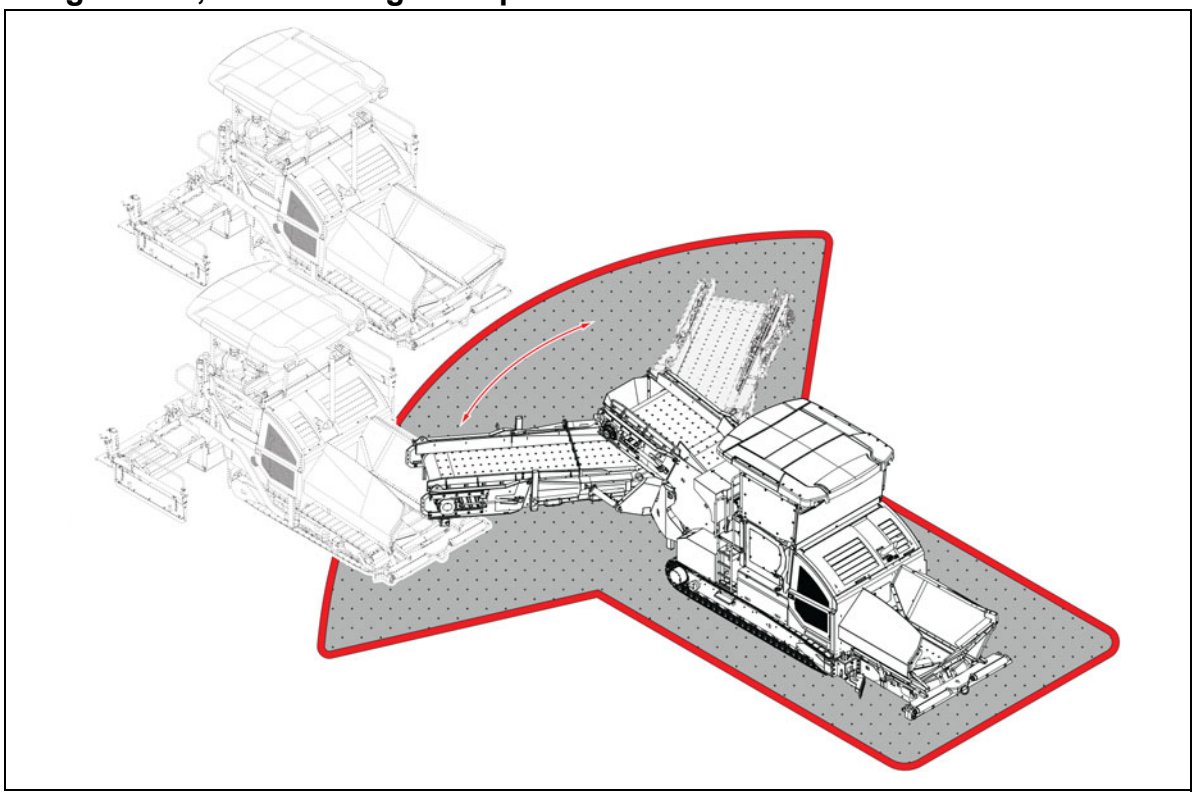
Central lubricating system (○): A central lubrication pump ensures that the conveyor belt chain links are lubricated with chain oil at adjustable intervals.

3 Danger zones

3.1 Danger zone, standard version



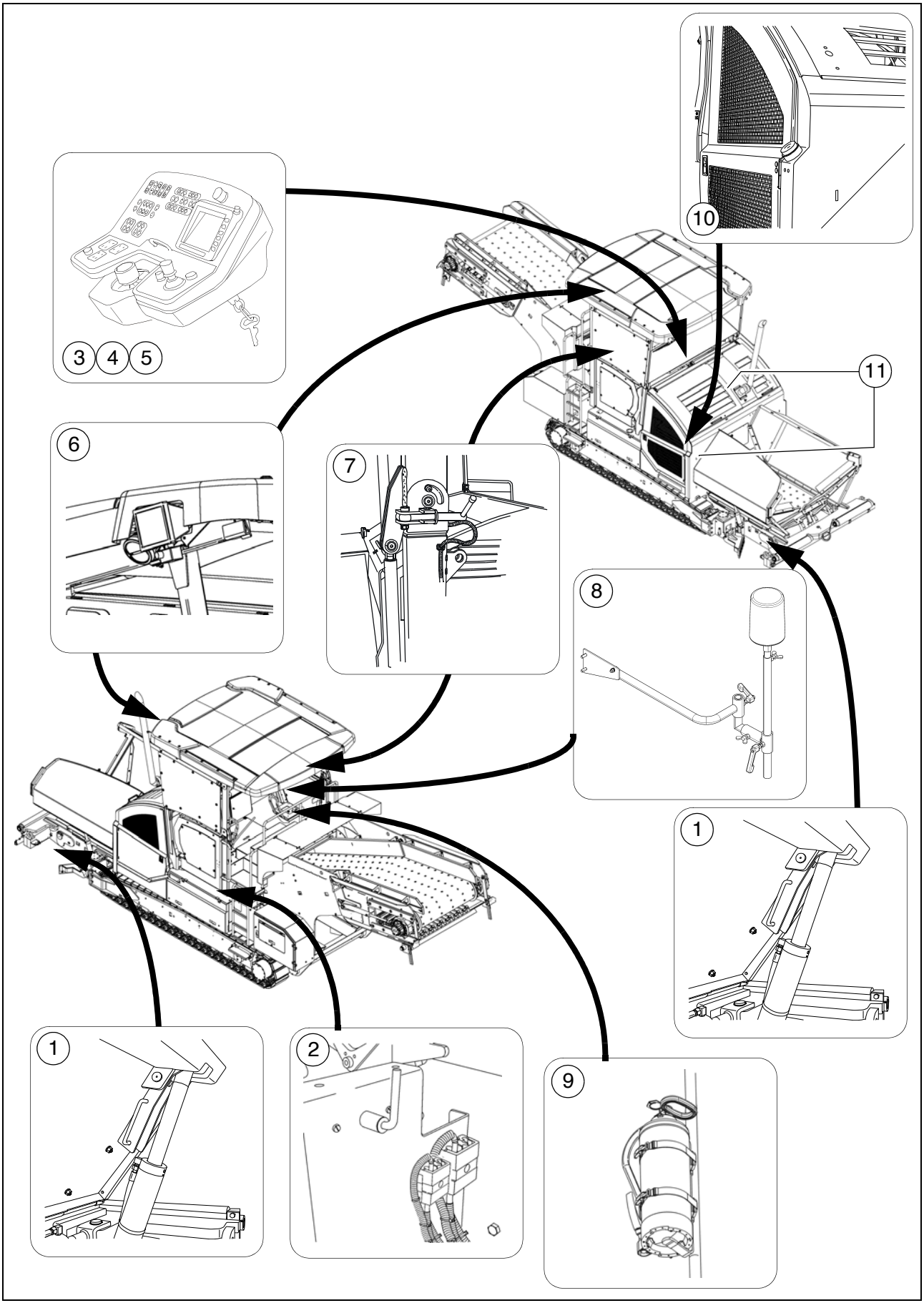
3.2 Danger zone, with slewing belt option



⚠ WARNING	**Danger for persons in the danger zone**
	Persons in the danger zone can suffer severe or fatal injuries from movements and functions of the vehicle! - Remaining in the vehicle's danger zone during operation is prohibited! - Only the vehicle operator may remain on the vehicle during operation. The vehicle operator must keep to the respective driver's seats. - Make sure that there is no-one in the danger zone before switching the vehicle on or starting it moving. - The vehicle operator must ensure that no-one is in the danger zone! - Sound the horn before driving away. - Comply with all further information in these instructions and in the safety manual.

⚠ WARNING	**Heed the danger zones of other vehicles and machinery being used in the construction site area!**
	Persons in the danger zone can suffer severe or fatal injuries from movements and functions of the vehicle! - Never stand in any of the danger zones of the entire paving system while in operation! - Make yourself familiar with the danger zones of downstream vehicles, such as paver finishers. - Comply with all further information in these instructions and in the safety manual.

4 Safety devices



Pos.	Designation	
1	Hopper transport safeguard	**
2	Main switch	
3	Emergency stop button	
4	Horn	
5	Ignition key	
6	Lights	**
7	Protective roof latch	**
8	Warning lights	
9	Fire extinguisher	
10	Hopper hazard warning flasher	**
11	Covers, lateral flaps, coverings	**

** Located on both sides of the vehicle

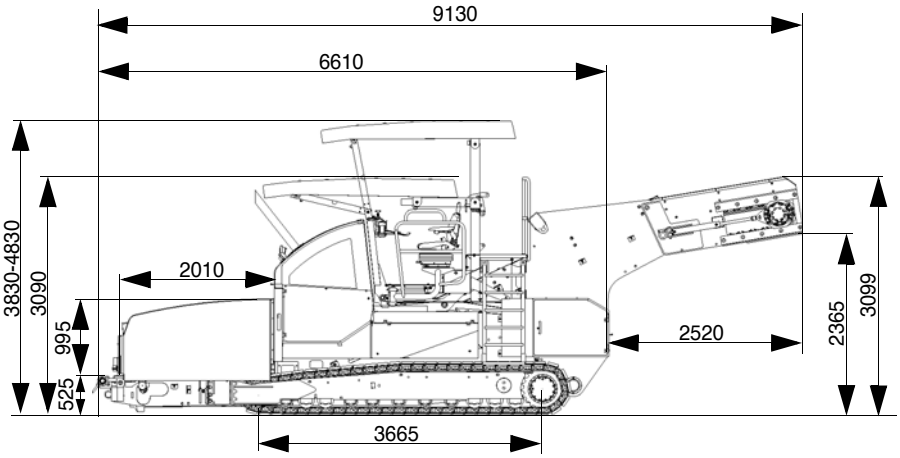
⚠ Safe operation is only possible when all operating and control elements are functioning correctly and when all safety devices are in position.

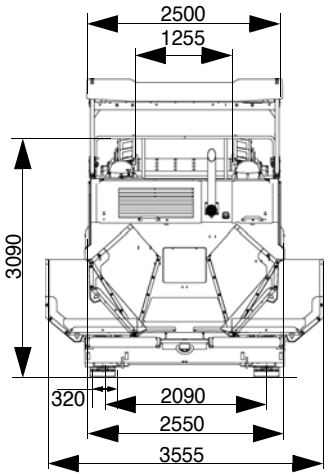
⚠ Check the function of these devices at regular intervals.

☞ Functional descriptions for the individual safety facilities can be found in the following chapters.

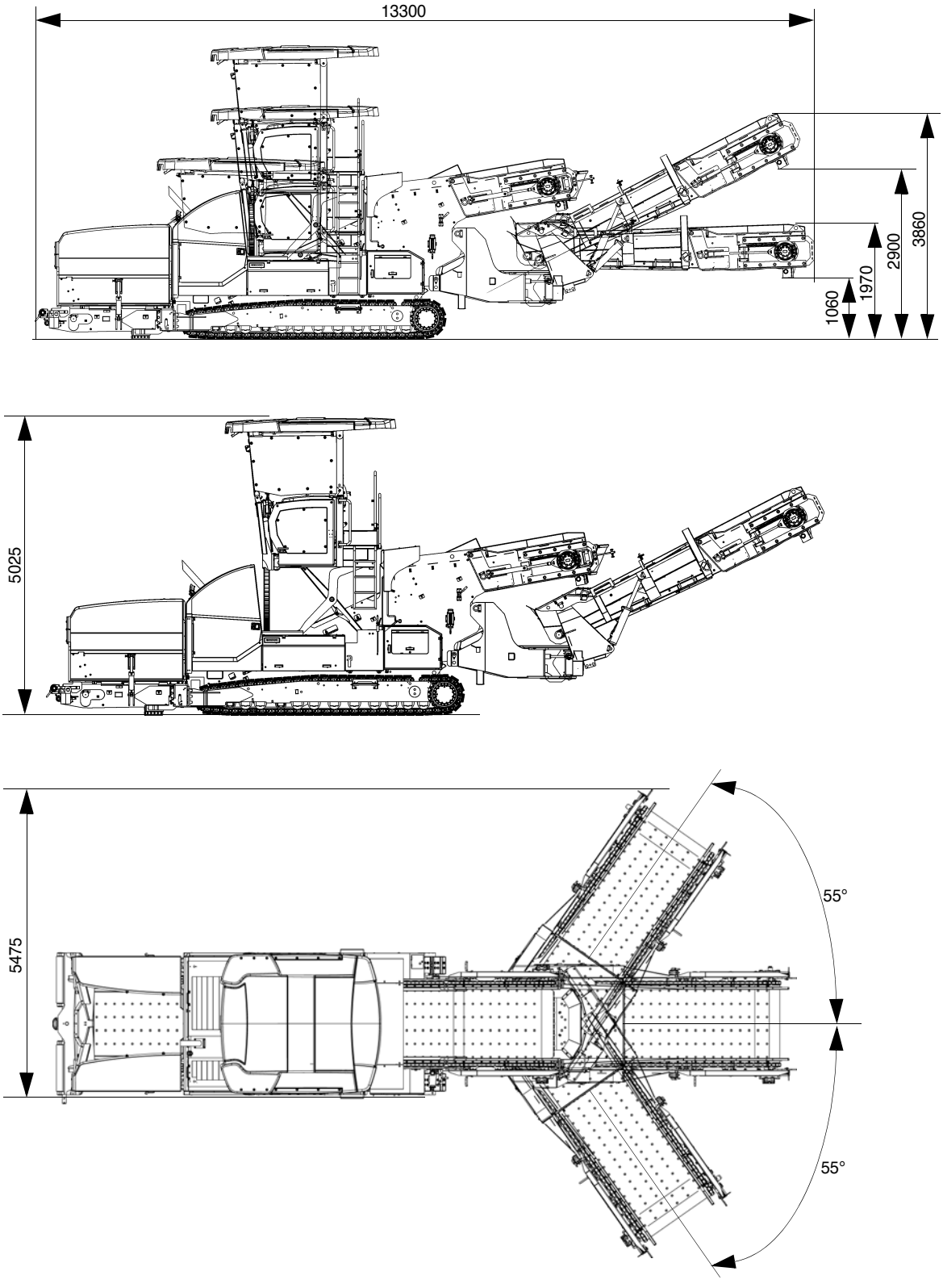
5 Technical data

5.1 Dimensions, standard version (all dimensions in mm)

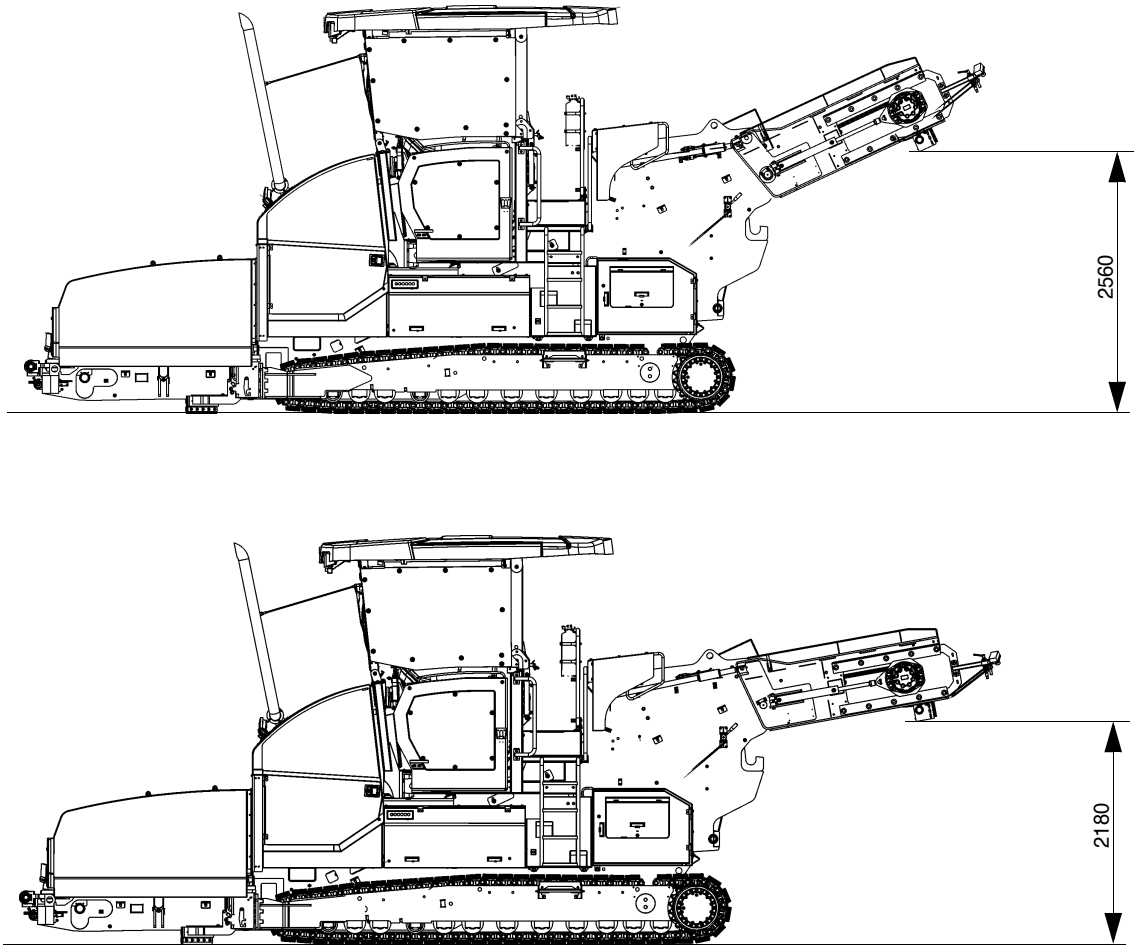




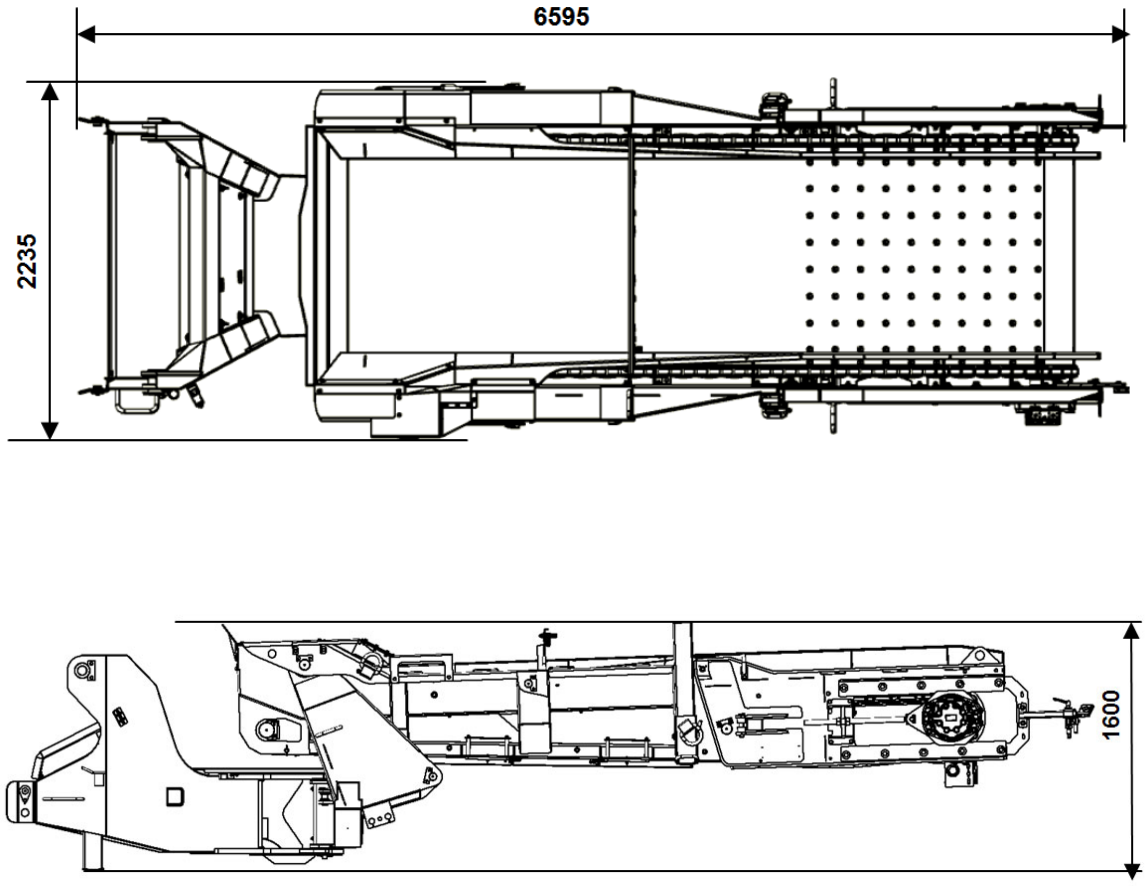
5.2 Dimensions, with slewing belt option (all dimensions in mm)



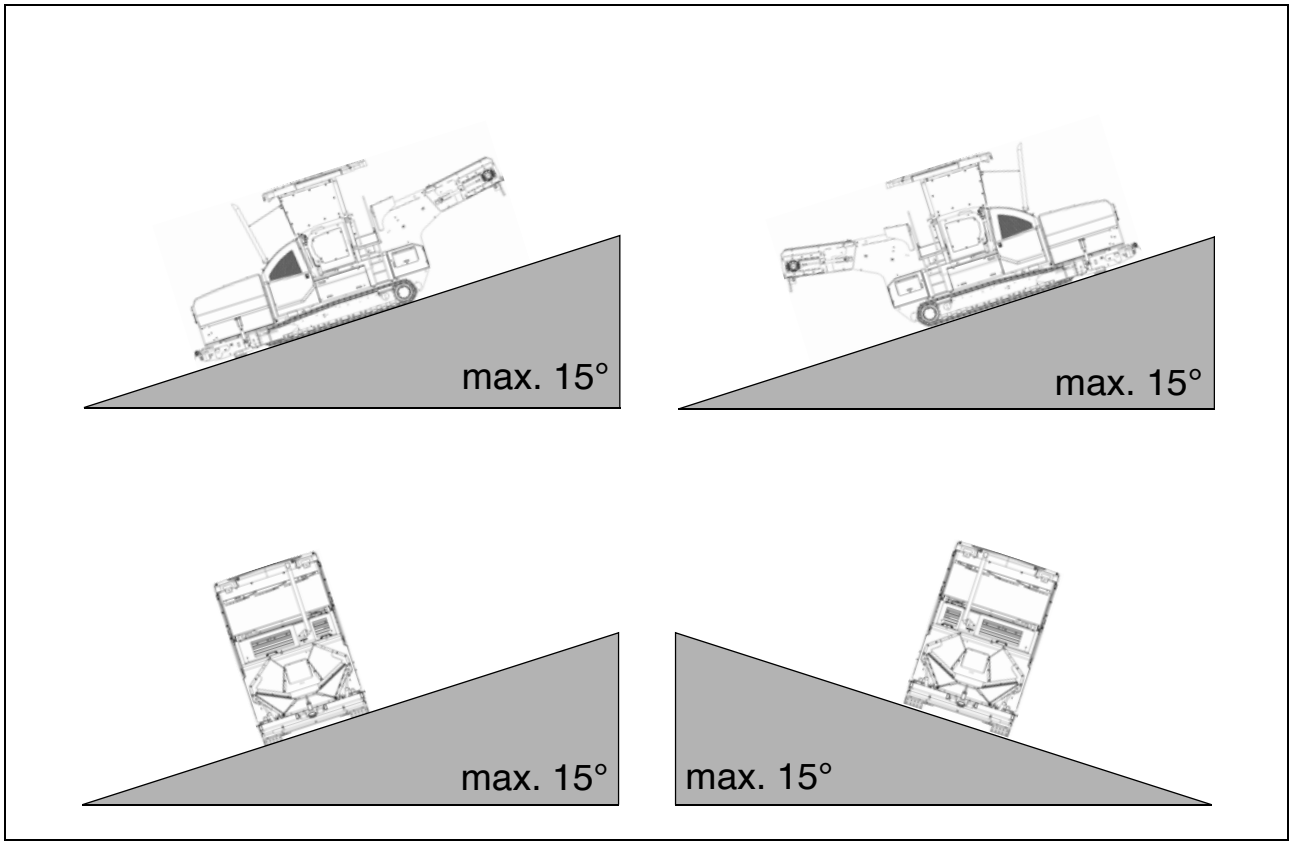
5.3 Dimensions, with "hydraulically adjustable end piece" option (all dimensions in mm)



5.4 Dimensions, slewing belt, solo (all dimensions in mm)

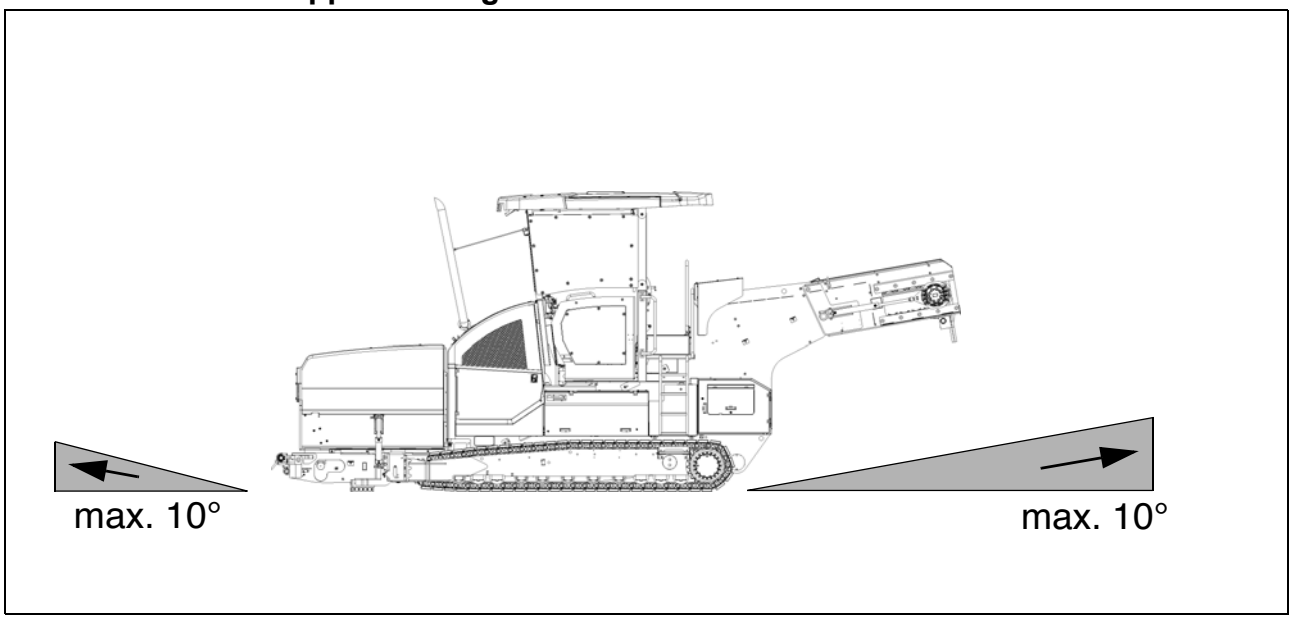


5.5 Allowed angle of rise and slope



☞ Before operating your vehicle in an inclined position (gradient, slope, lateral inclination) which is above the specified limit value, please consult the customer service department for your vehicle!

5.6 Permissible approach angle



5.7 Weights (all weights in t)

Feeder MF2500CS	approx. 20.0
Feeder MF2500CS, with slewing belt	approx. 24.5
With filled hopper Additionally max.	approx. 12.0
Slewing belt	approx. 4.5

5.8 Capacity data

Transport speed	0 - 4	km/h
Operating speed	0 - 25	m/min
Conveyor	4000	t/h
Slewing belt conveying rate (○)	2000	t/h

5.9 Travel drive/traction unit

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

5.10 Engine EU IIIa / Tier 3 (○)

Make/type	Cummins QSB 6.7-C260
Version	6-cylinder diesel engine (water cooled)
Performance	164 KW / 223 PS (at 2200 rpm)
Pollutant emissions in accordance with:	Stage IIIa / Tier 3
Fuel consumption, full load Fuel consumption, 2/3 load	44.8 l/h 29.9 l/h
Fuel tank capacity	(See chapter F)

5.11 Engine EU IIIa / Tier 3 (○) >/= s/n GG001804

Make/type	Cummins QSB 6.7-C220
Version	6-cylinder diesel engine (water-cooled)
Performance	164 KW / 223 PS (at 2200 rpm)
Pollutant emissions in accordance with:	Stage IIIa / Tier 3
Fuel consumption, full load Fuel consumption, 2/3 load	44.8 l/h 29.9 l/h
Fuel tank capacity	(See chapter F)

5.12 Engine EU IIIb / Tier 4i (○)

Make/type	Cummins QSB 6.7-C260
Version	6-cylinder diesel engine (water-cooled)
Performance	170 kW / 231 hp (at 2200 rpm)
Pollutant emissions in accordance with:	Stage IIIb / Tier 4i
Fuel consumption, full load Fuel consumption, 2/3 load	44.0 l/h 29.3 l/h
Fuel tank capacity	(See chapter F)

5.13 Engine EU IV / Tier 4final (○)

Make/type	Cummins QSB 6.7-C260
Version	6-cylinder diesel engine (water-cooled)
Performance	168 KW / 225 PS (at 2200 rpm)
Pollutant emissions in accordance with:	Stage IV / Tier 4final
Fuel consumption, full load Fuel consumption, 2/3 load	42.1 l/h 28.1 l/h
Fuel tank capacity	(See chapter F)

5.14 Hydraulic system

Pressure generation	Hydraulic pumps via distribution gear (directly flanged to the engine)
Pressure distribution	Hydraulic circuits for: - Travel drive - Conveyor belt - Operating functions - Fan
Hydraulic oil reservoir - volume	(See chapter F)

5.15 Material compartment (hopper)

Volume	Approx. 5.2 m^3 = approx. 12.0 t
Minimum inlet height, centre	525 mm
Hopper width, outside, open	3335

5.16 Material transfer

Type	Rubber conveyor belt
Width, main conveyor belt	1200 mm
Width, slewing conveyor belt	1380 mm
Drive	Hydrostatic, continuously controllable
Conveying volume controller	Fully automatic via configurable switching points

5.17 Electrical system

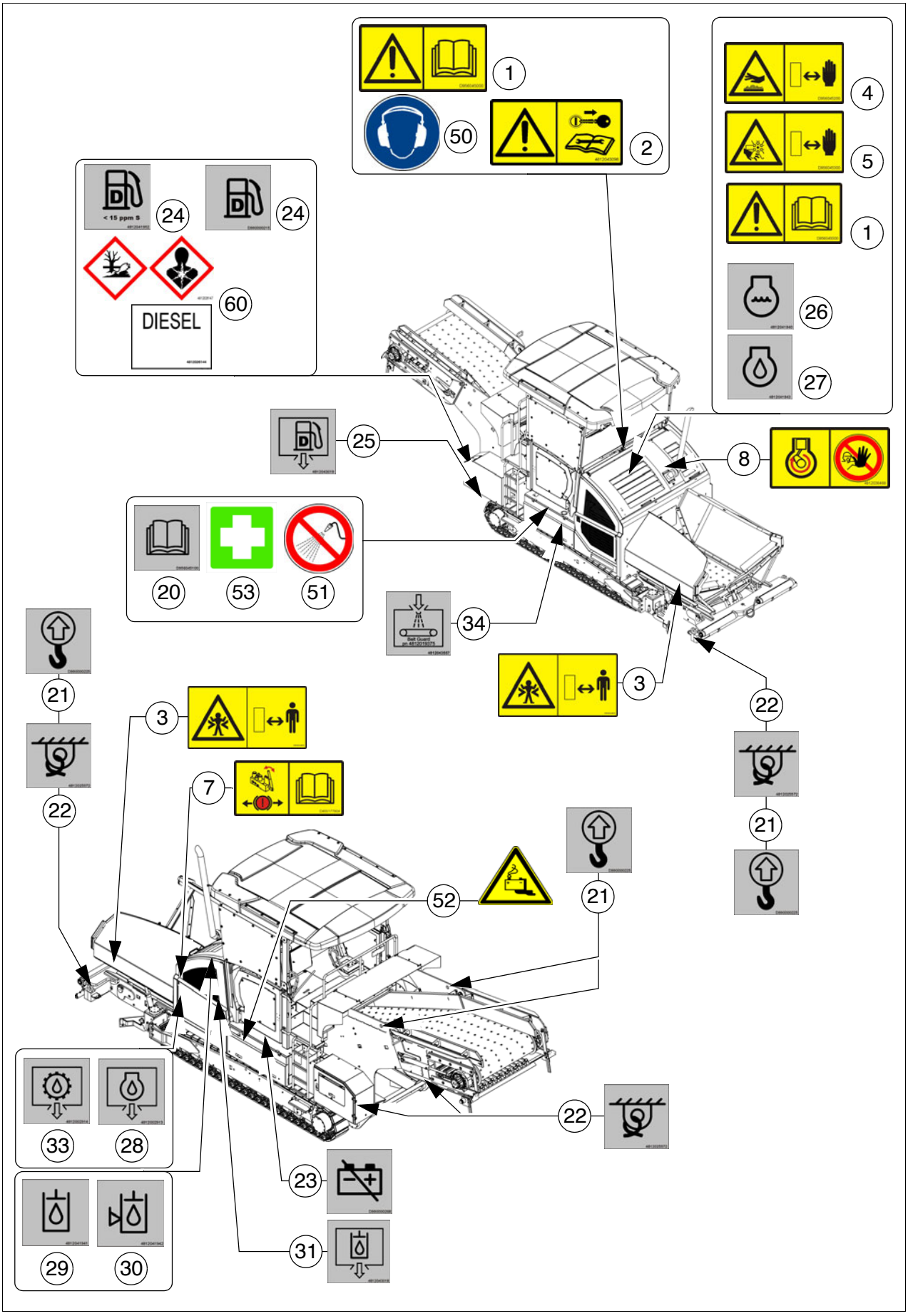
On-board voltage	24 V
Batteries	2 x 12 V, 100 Ah

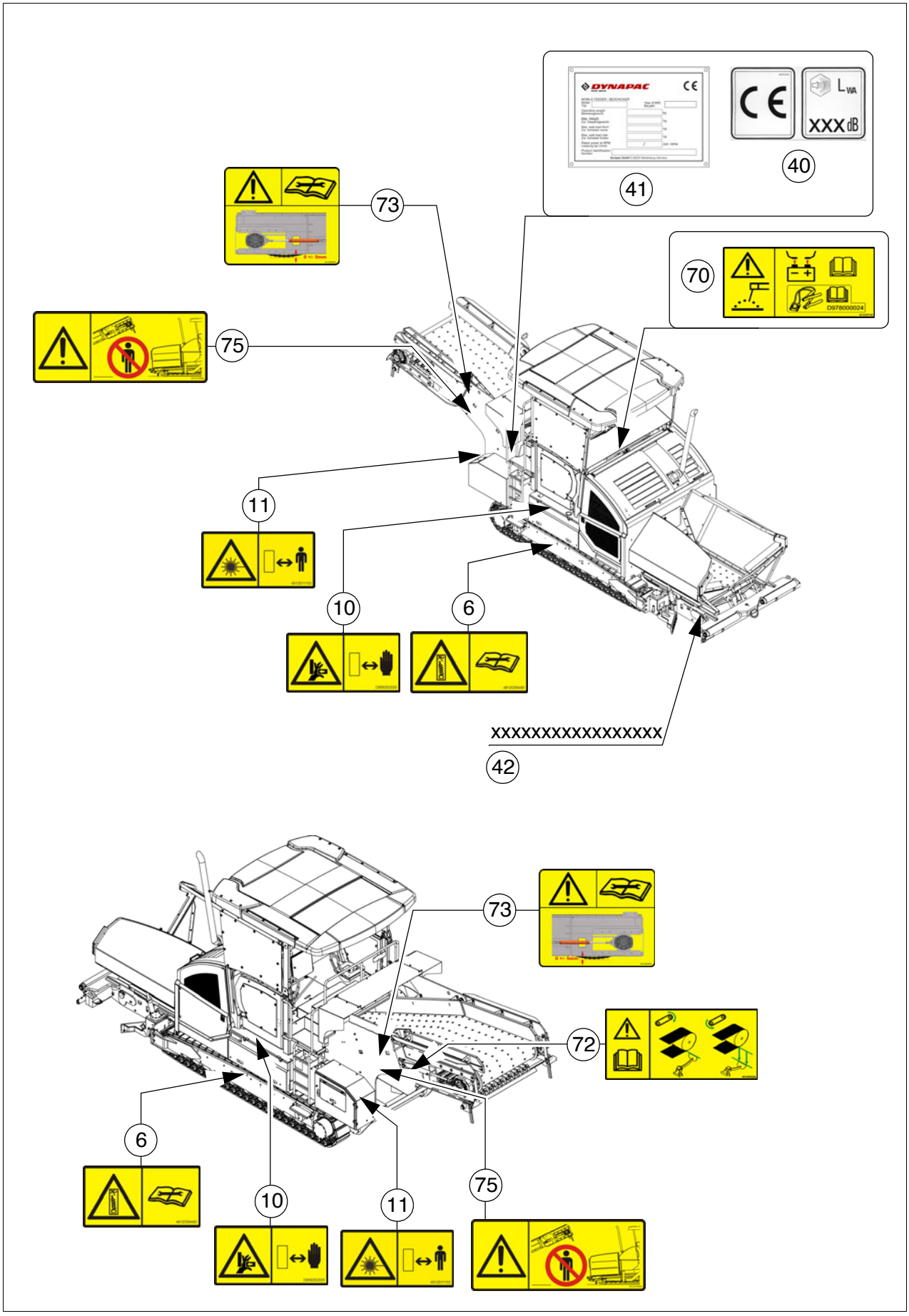
5.18 Permissible temperature ranges

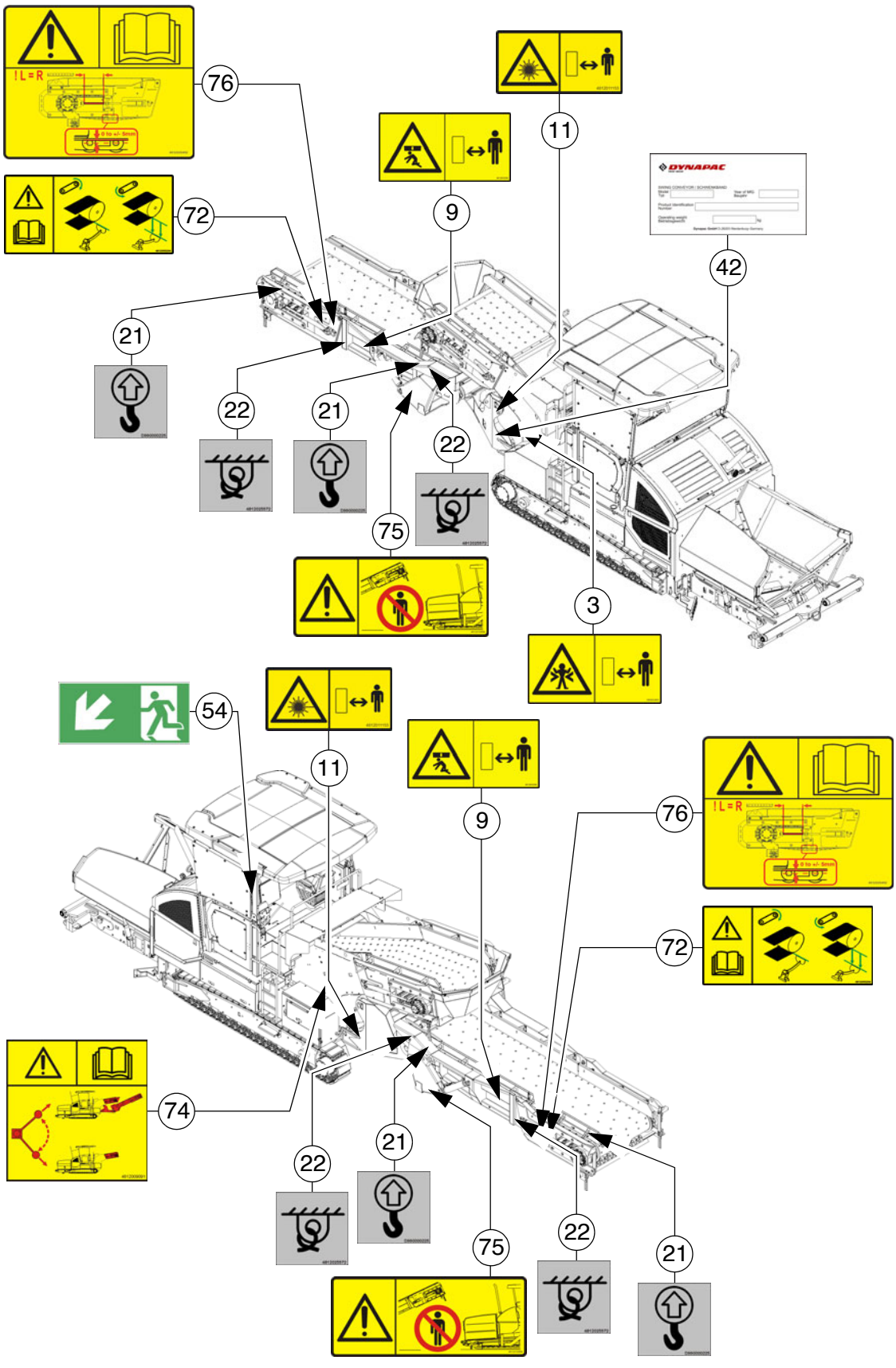
Operation	-5°C / +45°C
Storage	-5°C / +45°C

6 Location of instruction labels and type plates

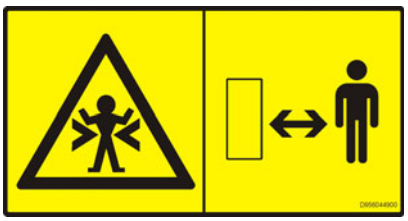
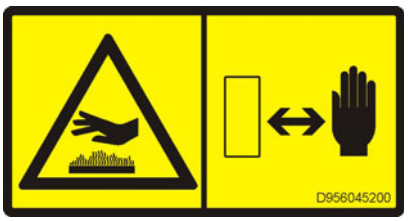
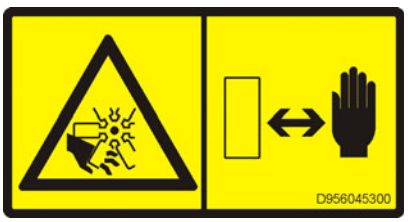
⚠ CAUTION	**Danger due to missing or misunderstood vehicle signs**
	Missing or misunderstood vehicle signs pose a danger of injuries! - Never remove any warnings or information signs from the vehicle. - Damaged or lost warning or information signs must be replaced immediately. - Make yourself familiar with the meaning and position of the warning and information signs. - Comply with all further information in these instructions and in the safety manual.

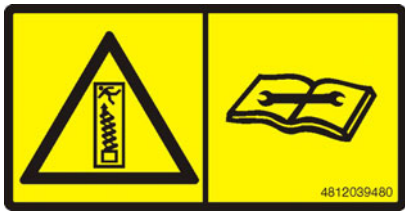
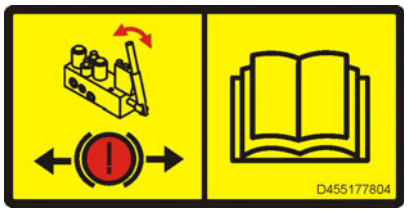
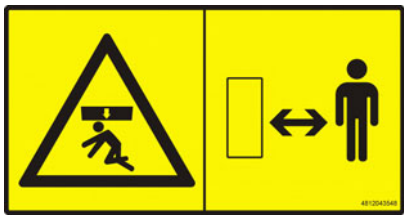
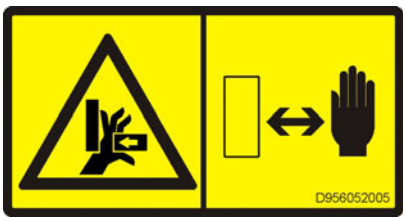
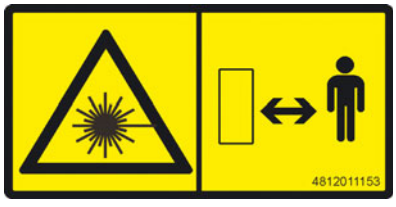

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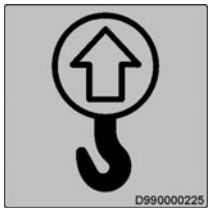
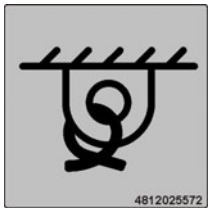
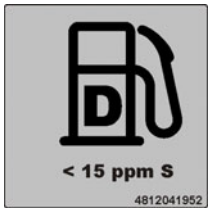
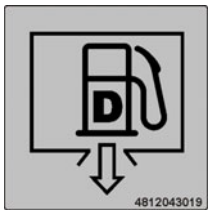

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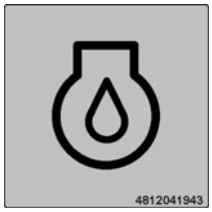
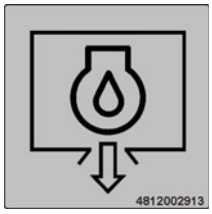
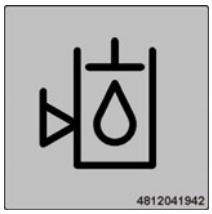
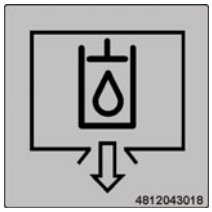
6.1 Warning signs

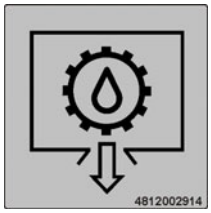
No.	Pictogram	Meaning
1		- **Warning - operating instructions!** Danger due to improper operation. The vehicle personnel must have read and understood the safety, operating and maintenance instructions for the vehicle before the vehicle is put into operation! Failure to comply with the operating and warning instructions can cause severe or fatal injuries. Always replace lost operating instructions immediately! It is your personal responsibility to take due care and attention!
2		- **Warning - switch off the engine and remove the ignition key before performing any maintenance and repair work!** If the drive engine is left running or functions are switched on, this can cause severe or fatal injuries! Switch the engine off and remove the ignition key.
3		- **Warning - danger of crushing!** Crushing points can cause severe or fatal injuries! Maintain a safe distance from the danger area!
4		- **Warning - hot surface - risk of burning!** Hot surfaces can cause severe injuries! Keep your hands a safe distance away from the danger area! Use protective clothing or protective equipment!
5		- **Warning - danger from fan!** Rotating fans can cause severe injuries from cutting or severing fingers and hands. Keep your hands a safe distance away from the danger area!

No.	Pictogram	Meaning
6		- **Warning - spring-loaded component!** Performing work incorrectly can cause severe to fatal injuries. Always observe the maintenance instructions!
7		- **Caution - danger due to incorrect towing!** Vehicle movements can cause severe or fatal injuries. The traction system brake must be released before towing. Always observe the operating instructions!
8		- **Warning - danger from running engine!** If the drive engine is left running, this can cause severe or fatal injuries. Never open the engine hood while the engine is running!
9		- **Warning - danger of crushing from above!** Crushing points can cause severe or fatal injuries! Maintain a safe distance from the danger area!
10		- **Warning - danger of crushing fingers and hands due to moving, accessible vehicle parts!** Crushing points can cause severe injuries with the loss of parts of the fingers or hand. Keep your hands a safe distance away from the danger area!
11		- **Warning - Danger due to laser light!** The laser beam can cause severe injuries! Do not look into the laser beam! Maintain a safe distance from the danger area!

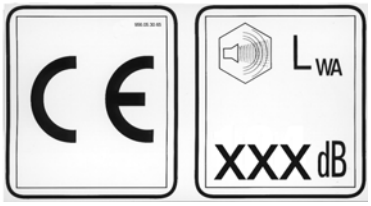
6.2 Information signs

No.	Pictogram	Meaning
20		- **Operating instructions** Position of the storage compartment.
21		- **Lifting point** Lifting the vehicle is only permitted at these lifting points!
22		- **Lashing point** Lashing the vehicle is only permitted at these points!
23		- **Main battery switch** Position of the main battery switch.
24		- **Diesel fuel** Position of the filling point.
24		- **Diesel fuel, sulphur level < 15 ppm** Position of the filling point, specification.
25		- **Fuel drainage point** Position of the drainage point.

No.	Pictogram	Meaning
26		- **Engine coolant** Position of the filling and control point.
27		- **Engine oil** Position of the filling and control point.
28		- **Engine oil drainage point** Position of the drainage point.
29		- **Hydraulic oil** Position of the filling point.
30		- **Hydraulic oil level** Position of the control point.
31		- **Engine oil drainage point** Position of the drainage point.
32		- **Gearbox oil** Position of the filling and control point.

No.	Pictogram	Meaning
33		- **Gear oil drainage point** Position of the drainage point.
34		- **Separator fluid spraying system - filling point** Position of the filling point. ⚠ Only fill in "Belt Guard" - 4812019375!

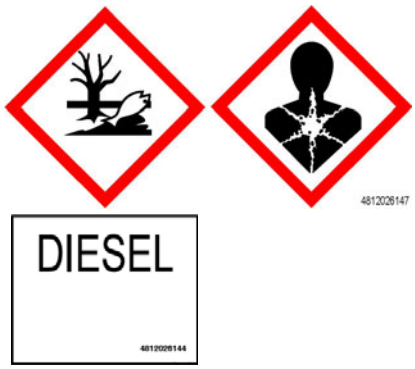
6.3 CE marking

No.	Pictogram	Meaning
40		- CE, sound output level

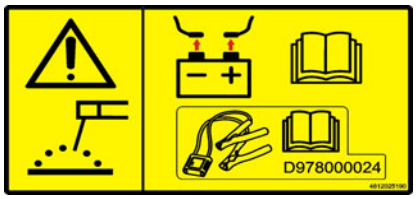
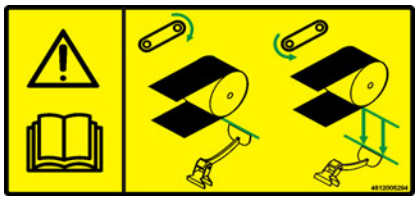
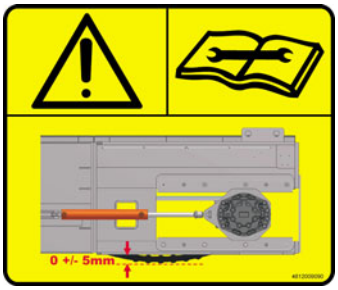
6.4 Instructive symbols, prohibitive symbols, warning symbols

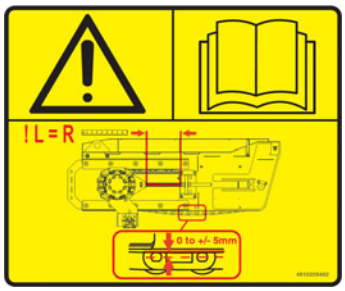
No.	Pictogram	Meaning
50		- Wear ear protectors
51		- Do not spray the area or component with water!
52		- Warning on dangers posed by batteries!
53		- First aid kit
54 (O)		- Escape route ☞ In the event of a vehicle malfunction, the raised control platform can be left via this route. (Emergency steps + ladder)

6.5 Danger symbols

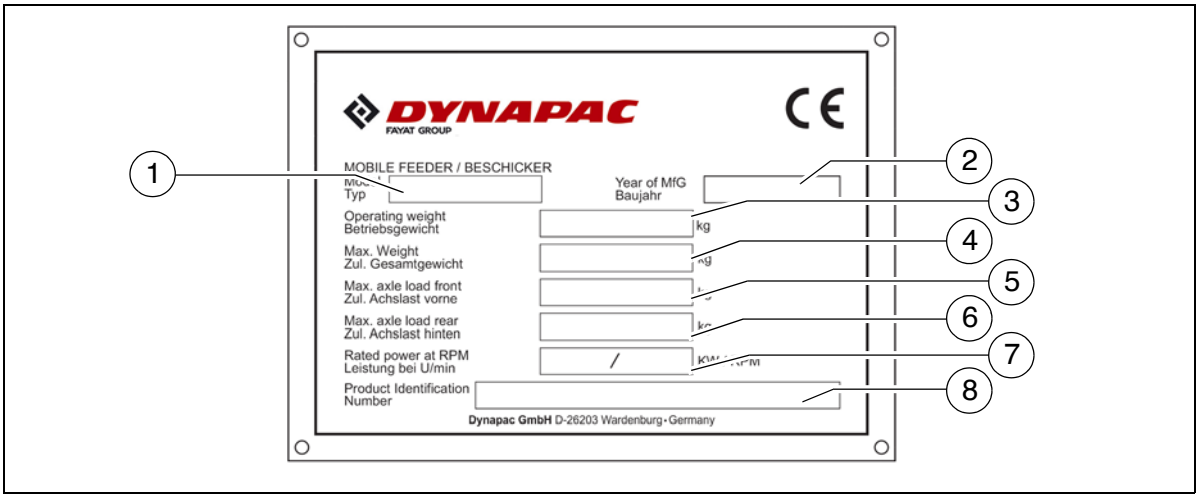
No.	Pictogram	Meaning	No.
60			- **XN: Danger to health!** This substance can damage your health when absorbed in the body! Substance irritating to skin, eyes and respiratory system; can cause inflammation. Avoid contact with the human body; also avoid inhaling the vapours and seek medical advice if feeling unwell. - **N: Environmentally hazardous substance!** May cause immediate or delayed danger to the eco-system when released into the environment. Do not release into the sewage system, ground or environment, depending on hazard potential. Comply with special disposal regulations! - Diesel fuel complies with EN590

6.6 Further warnings and operating instructions

No.	Pictogram	Meaning
70		- **Attention - danger of high voltage in vehicle electrical system!** Disconnect batteries and electronics during welding work or when charging the batteries, or use a service watchdog D978000024 in accordance with the corresponding instruction manual.
72		- **Attention - note conveyor belt scraper setting!** Swivel scraper down in conveyor belt reversing mode! Always observe the operating instructions!
73		- **Attention - check conveyor belt sag!** When the conveyor belt end piece is in the horizontal position, conveyor belt sag must be correctly set at the marked position! Always observe the maintenance instructions!

No.	Pictogram	Meaning
74		- **Attention - note rigid / slewing conveyor belt scraper hydraulic switching!** Set hydraulic valve according to vehicle equipment! Always observe the operating instructions!
75		- **Attention - danger zone!** Entering the danger zone between the feeder and the paver finisher can trigger undesired vehicle movements; these may lead to severe to fatal injuries! Never enter the danger zone!
76		- **Attention - check conveyor belt sag!** When the conveyor belt end piece is in the horizontal position, conveyor belt sag must be correctly set at the marked position! Always observe the maintenance instructions!

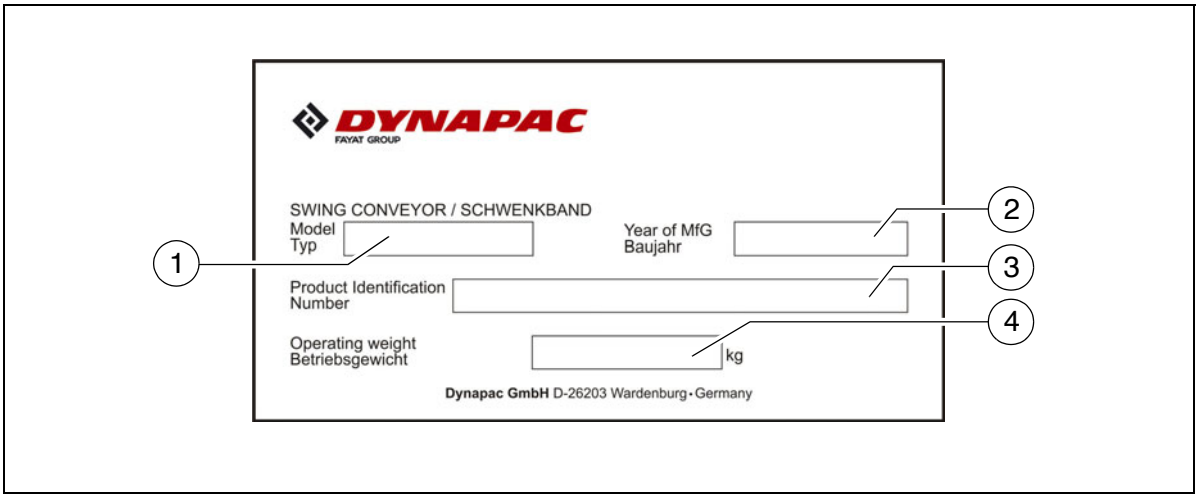
6.7 Identification label for the feeder (41)



Pos.	Designation
1	Feeder type
2	Year of construction
3	Operating weight, incl. all extension parts, in kg
4	Maximum permitted total weight in kg
5	Max. permissible load on the front axle, in kg
6	Max. permissible load on the rear axle, in kg
7	Rated performance in kW
8	Product identification number (PIN)

☞ The punched vehicle identification number (VIN) on the feeder must match the product identification number (8).

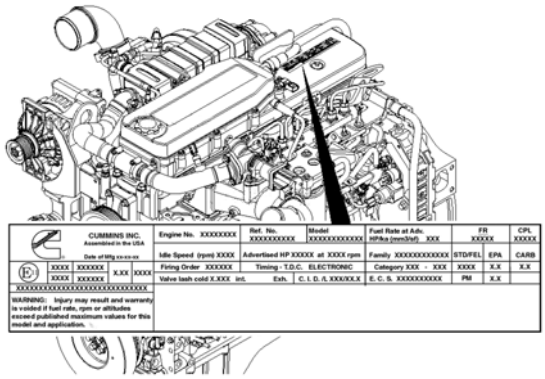
6.8 Type plate slewing belt (42) (○)



Pos.	Designation
1	Slewing belt type
2	Year of construction
3	Product identification number (PIN)
4	Operating weight, incl. all extension parts, in kg

☞ The punched product identification number (PIN) on the slewing belt must match the product identification number (3).

6.9 Engine type plate



CUMMINS INC. Assembled in the USA Date of Mfg xx-xx-xx				Engine No. XXXXXXXX	Ref. No. XXXXXXXXXX	Model XXXXXXXXXXX	Fuel Rate at Adv. HP/ka (mm3/sf) XXX	FR XXXXX		CPL XXXXX
				Idle Speed (rpm) XXXX	Advertised HP XXXXX at XXXX rpm		Family XXXXXXXXXXX	STD/FEL	EPA	CARB
E11	XXXX	XXXXXX	X.XX	XXXX	Firing Order XXXXXX	Timing - T.D.C. ELECTRONIC		Category XXX - XXX	XXXX	X.X	X.X
	XXXX	XXXXXX			Valve lash cold X.XXX int.	Exh.	C. I. D. /L XXX/XX.X	E. C. S. XXXXXXXXX	PM	X.X	
XXXXXXXXXXXXXXXXXXXXXXXXXXXXXX											
WARNING: Injury may result and warranty is voided if fuel rate, rpm or altitudes exceed published maximum values for this model and application.											

☞ The engine type plate (1) is affixed on top of the engine.
The type plate states the engine type, serial number and engine data.
Please state the engine number of the engine when ordering spare parts.
See also operating instructions for the engine.

7 EN standards

7.1 Continuous sound pressure MF2500CS, Cummins QSB 6.7-C260

⚠ Ear protectors must be worn when operating this vehicle. 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 protectors are used, hearing can be impaired.
The vehicle sound emission level measurements were performed under free-field conditions according to EN 500-6:2006 and ISO 4872.

Sound pressure level at the operator's position (at the height of the head): L_{AF} = 86.7 dB(A)

Sound capacity level: L_{WA} = 105.7 dB(A)

Sound pressure level at the vehicle

Measuring point	2	4	6	8	10	12
Sound pressure level L_{AFeq} (dB(A))	72.7	72.0	71.7	73.8	72.8	72.9

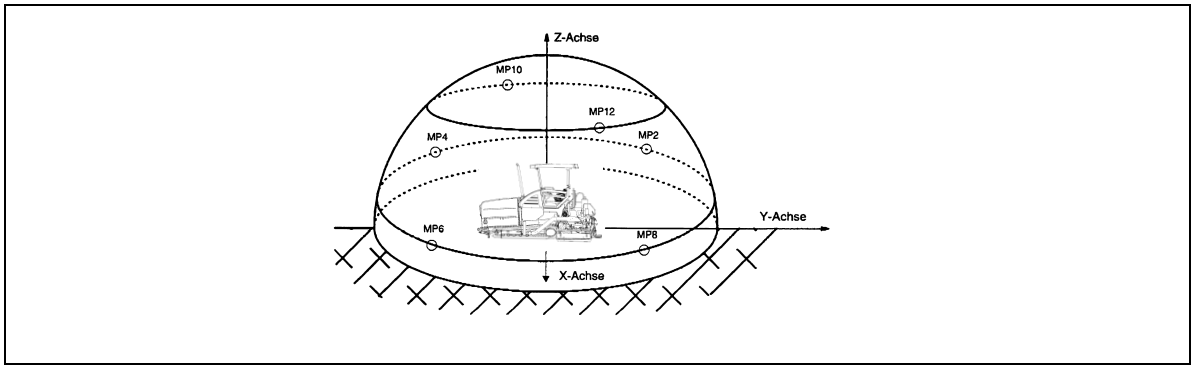
7.2 Operating conditions during measurement

The diesel engine was running at maximum speed. The conveyor belt was operated at a minimum of 20% of its maximum speed.

7.3 Measuring point configuration

Hemispherical measuring surface with a radius of 16 m. The vehicle was at the centre. The measuring points had been assigned the following coordinates:

	Measuring points 2, 4, 6, 8			**Measuring points 10, 12**		
Co-ordinates	X	Y	Z	X	Y	Z
	±11.2	±11.2	1.5	- 4.32 +4.32	+10.4 -10.4	11.36 11.36



7.4 Vibration acting on the entire body

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

7.5 Vibrations acting on hands and arms

When the vehicle is used properly, the weighted effective acceleration values at the driver's seat of $a_{hw} = 2.5\ m/s^2$ according to DIN EN ISO 20643 are not exceeded.

7.6 Electromagnetic compatibility (EMC)

The following limit values are observed according to the protection requirements of the EMC Directive 2004/108/EC:

- Interference emission according to DIN EN 13309:
  < 35 dB μV/m for frequencies of 30 MHz - 1GHz measured at a distance of 10 m
  < 45 db μV/m for frequencies of 30 MHz - 1 GHz measured at a distance of 10 m

- Interference immunity against electrostatic discharge (ESD) according to DIN EN 13309:
  The ± 4-KV contact and the ± 4-KV airborne discharge did not result in any influence on the vehicle which could be detected.
  Compliance is maintained with the modifications in accordance with assessment criterion "A", i.e. the vehicle continues to operate correctly during the test.

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

C 11 Transportation

1 Safety regulations for transportation on a low loader

⚠ WARNING	**Danger due to vehicle loading**
	Loading or unloading the vehicle onto or from another vehicle poses a potential risk of accident. Vehicles can tip over on driving onto the low loader and cause severe to fatal injuries! - The transportation vehicle must always meet the requirements for transportation and be designed for this. - Ensure that the transportation vehicle is secured correctly during loading and unloading. - Do not enter the danger zone. - Always work with a signalman during loading and unloading. - Only reliable persons may be used as signalmen who must have been received instructions about their task before taking up their activity. This refers in particular to the hand signals to be used. Standardised hand signals must be used. - Do not leave any load or loose parts on the vehicle. - Comply with all further information in these instructions and in the safety manual.

2 Transportation on low-bed trailers

⚠ Reduce the feeder to its basic width.
The maximum approach angle is indicated in the section entitled "Technical data"!

⚠ Check the fill level of the operating substances so that these do not escape when driving on an incline.

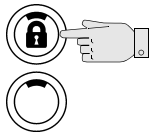
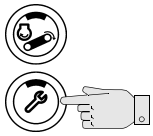
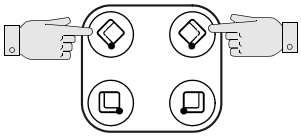
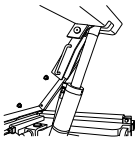
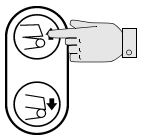
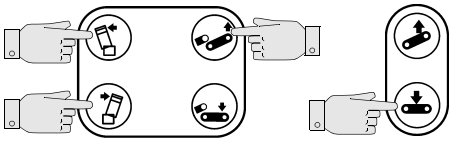
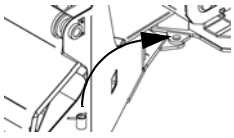
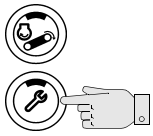
⚠ Attachment and loading equipment must meet the conditions of the applicable accident prevention regulations!

⚠ Remove all protruding or loose parts from the feeder. Stow all parts securely.

⚠ The vehicle must be cleaned, all material deposits removed and all maintenance flaps closed correctly.

⚠ Swivel in the operating panel guide and seat consoles; insert the relevant locking bolts appropriately.

Preparations

Operation	Buttons
- Deactivating the function lock	
- Activate set-up mode.	
- Lower control platform.(○)	
- Close the hopper lids.	
- Engage both hopper transport safeguards.	
- Fully extend drive unit frame cylinders.	
- Raise slewing belt.(○) - Bring slewing belt into the centre position.(○) - Lower main conveyor belt (○).	
- Insert the retaining pin at the swivel arm.(○)	
- Deactivate set-up mode.	



3 Securing the load

☞ The following instructions for securing the load on the low-bed trailer consist merely in examples of how to secure the load correctly.

☞ Always comply with the local regulations for securing the load and for correct use of load securing equipment.

☞ Normal driving mode also includes emergency braking, evasive manoeuvres and poor road surfaces.

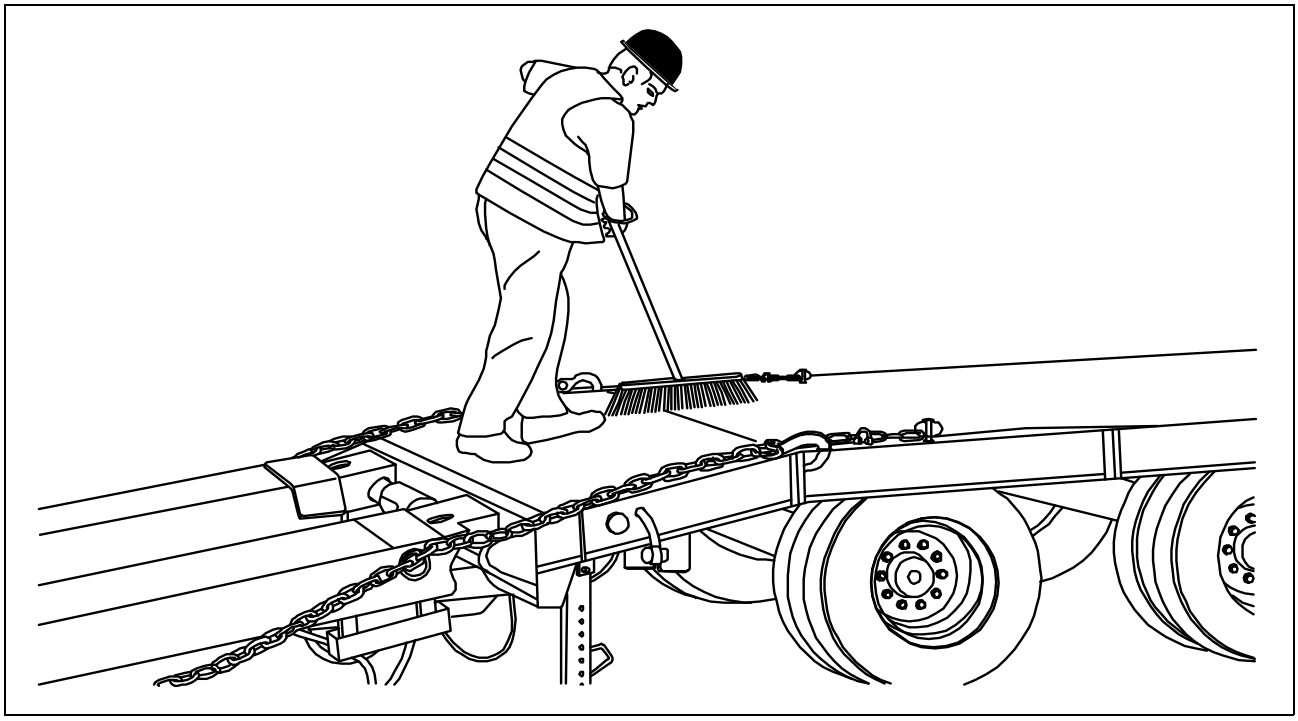
☞ Use should be made of the different methods available for securing loads (positive fit, force connection, diagonal lashing, etc.) in accordance with the specific transport vehicle.

⚠ The low loader must have the necessary number of lashing points with a lashing strength of LC 6,000 daN.

⚠ The total height and total width must not exceed the maximum permissible dimensions.

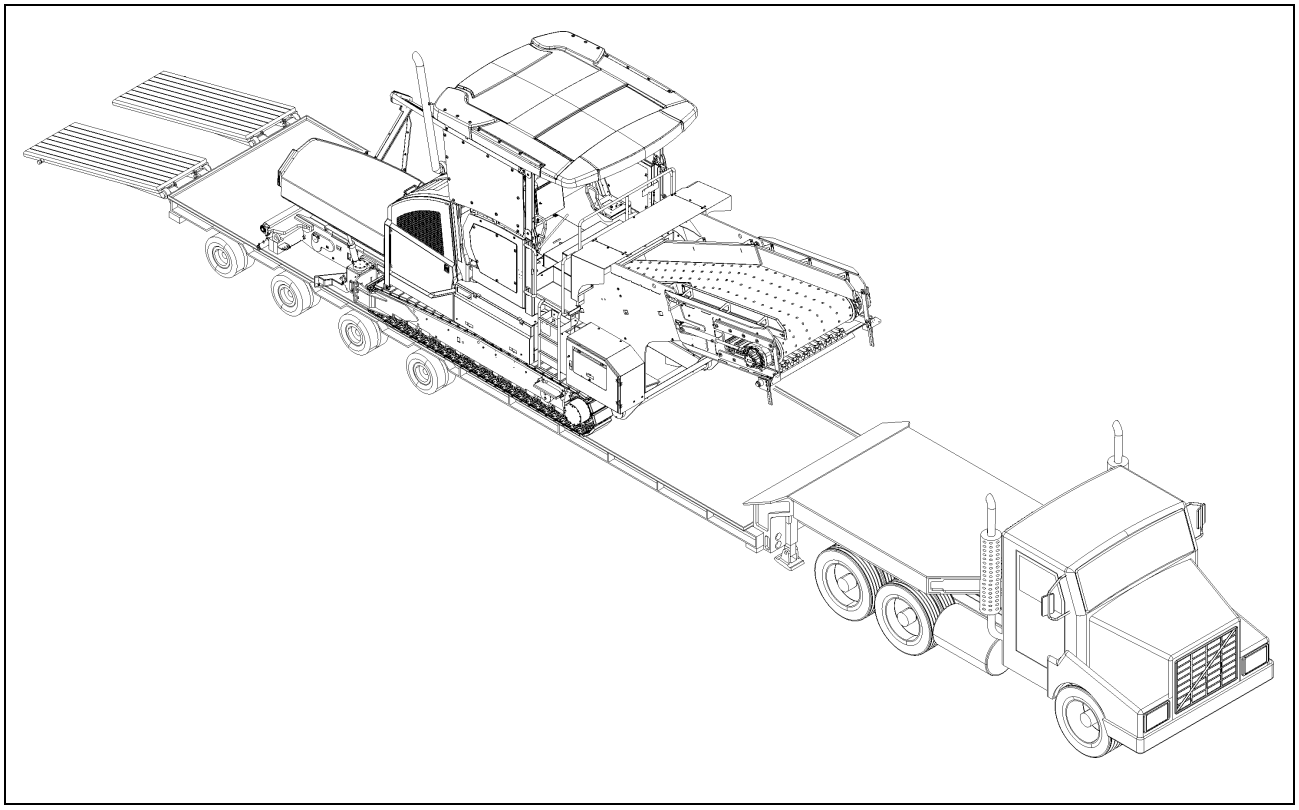
⚠ The ends of lashing chains and straps must be secured to prevent them working loose and falling down unintentionally!

3.1 Prepare the low loader



⚠ The floor of the loading space must always be undamaged, free of oil and mud, dry (residual moisture is permitted without accumulations of water) and swept clean!

3.2 Driving onto the low-bed trailer



⚠ WARNING	**Danger due to vehicle loading**
	Loading or unloading the vehicle onto or from another vehicle poses a potential risk of accident. Vehicles can tip over on driving onto the low loader and cause severe to fatal injuries! - The transportation vehicle must always meet the requirements for transportation and be designed for this. - Ensure that the transportation vehicle is secured correctly during loading and unloading. - Do not enter the danger zone. - Always work with a signalman during loading and unloading. - Only reliable persons may be used as signalmen who must have been received instructions about their task before taking up their activity. This refers in particular to the hand signals to be used. Standardised hand signals must be used. - Do not leave any load or loose parts on the vehicle. - Comply with all further information in these instructions and in the safety manual.

⚠ To avoid damage, the transportation vehicle's loading ramps must not exceed a vertical angle of 10°.

- Use the work gear and low engine speeds to drive onto the low-bed trailer.

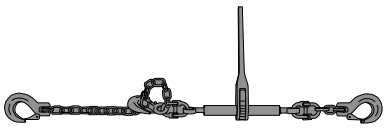
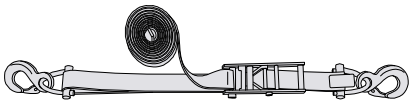
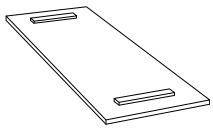
NOTE	**Caution! Possible collision of parts**
	- When driving up inclines, lock the lane clearer in the upper position.

3.3 Lashing equipment - MF2500CS / CM

Use the load securing equipment, lashing straps and chains belonging to the vehicle. Additional shackles, eyebolts, edge guards and non-slip mats may be needed depending on the type of load securing equipment.

⚠ Always comply with the stated values for permitted lashing force and load rating!

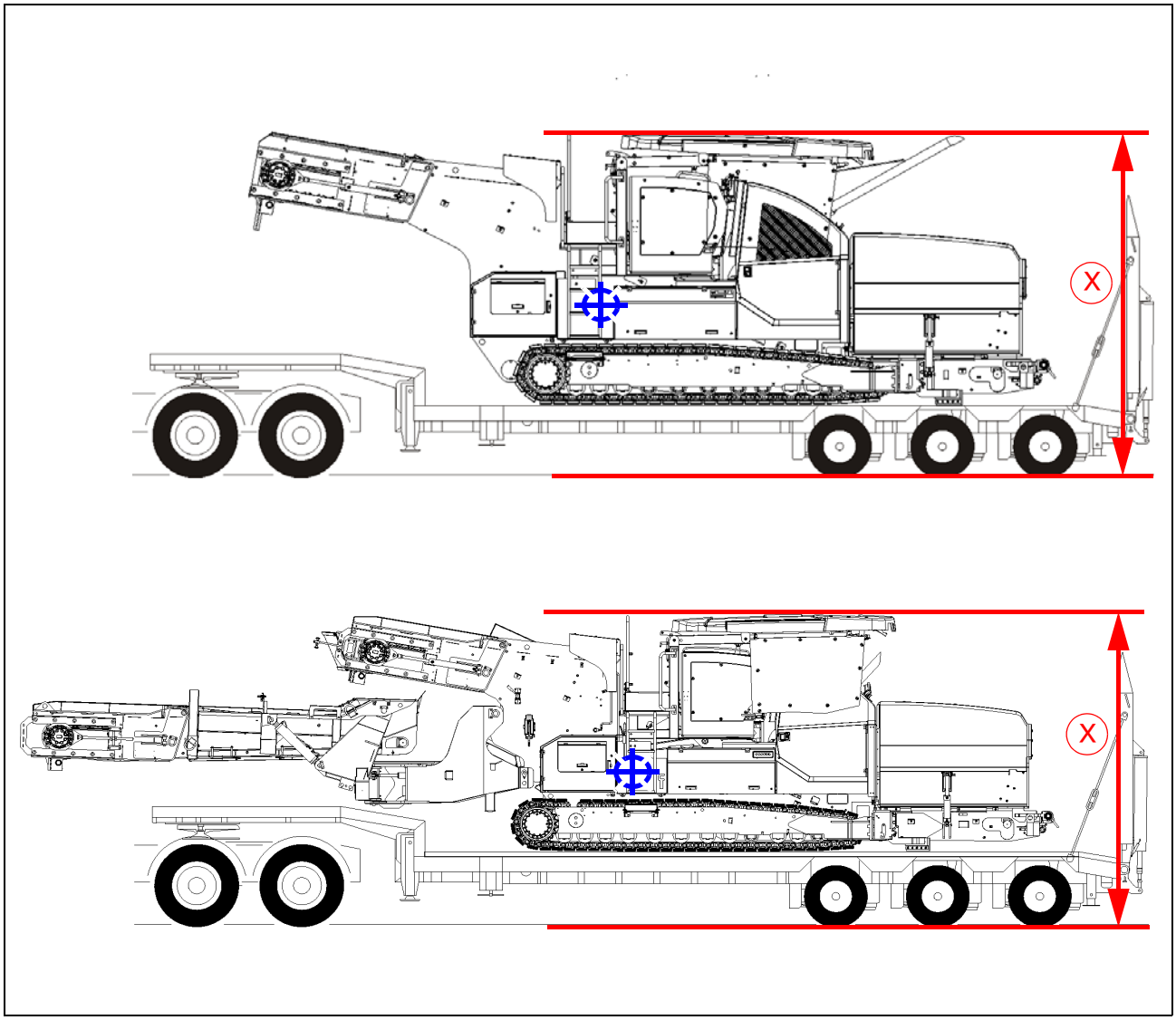
⚠ Always tighten the lashing chains and straps hand-tight (100-150 daN).

- Lashing chain permissible lashing force LC 6,000 daN or - Heavy load strap permissible lashing force LC 6,000 daN	 
- Edge guards for lashing straps	
- Lashing straps permissible lashing force LC 2,500 daN	

⚠ Lashing equipment must be checked by the user for any signs of damage before use. On detecting any signs of damage that affect safety, the lashing equipment must be withdrawn from further use.

* when fitted with slewing belt (○)

3.4 Loading

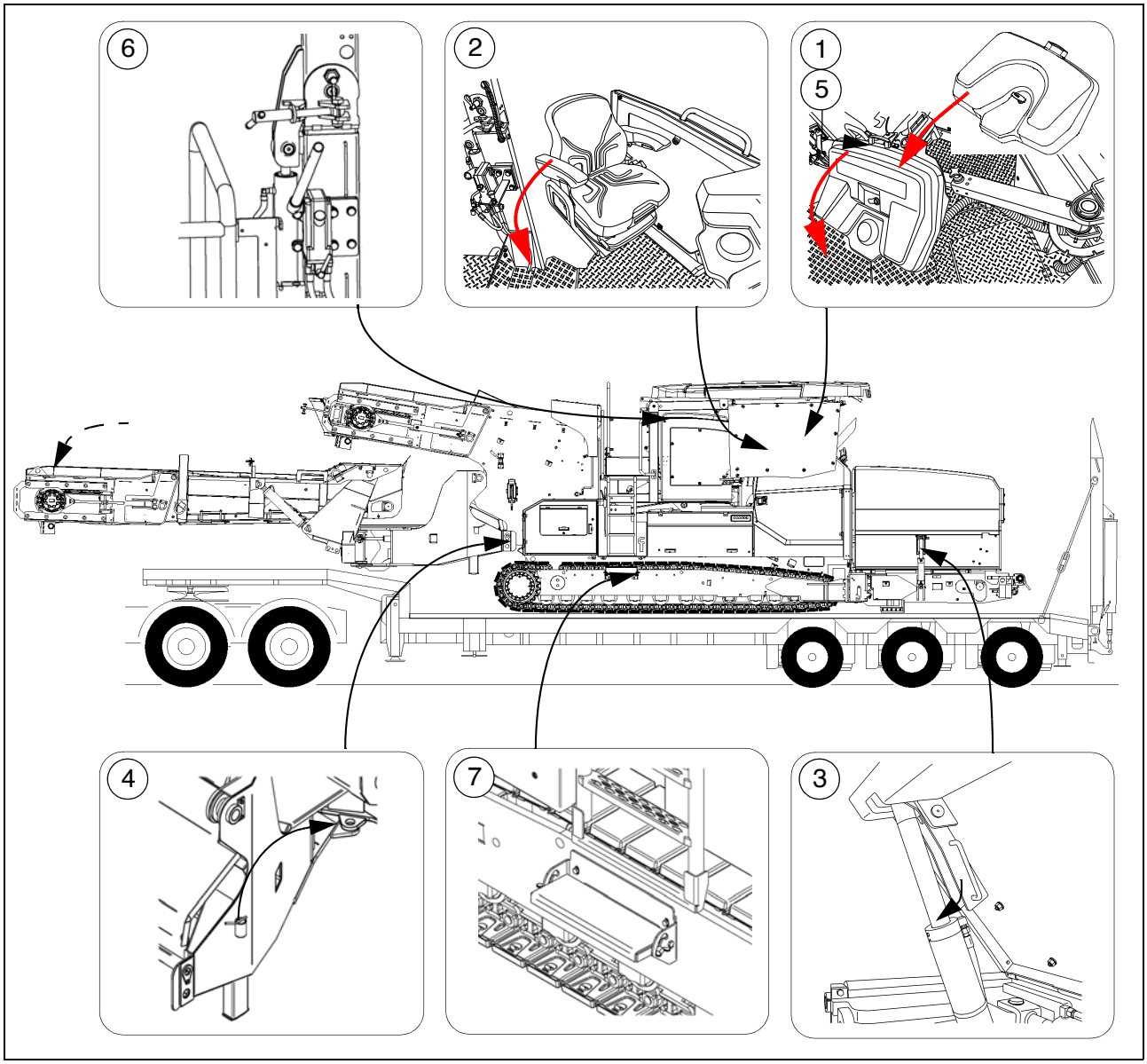


Pay attention to load distribution during loading!
On some vehicles, the kingpin load is too low so that the load has to be positioned further to the back of the vehicle.
Always observe the specifications regarding load distribution for the vehicle and the centre of gravity of the vehicle.

The overall height (X) of 4 m must not be exceeded!

The overall width (X) of 2.55m must not be exceeded!

3.5 Preparing the vehicle

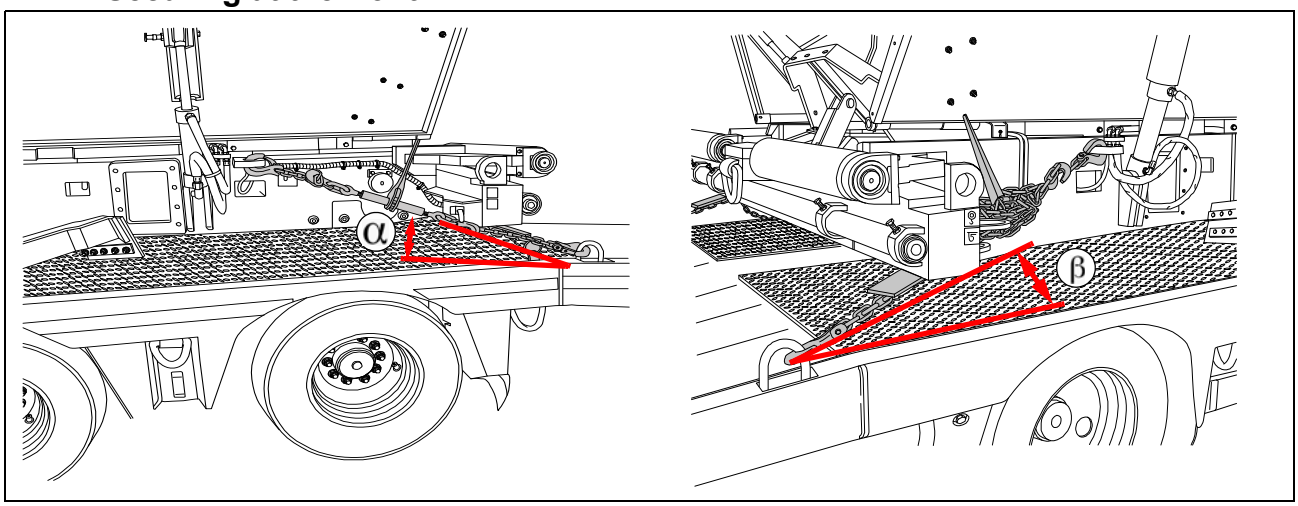


After the vehicle has been positioned on the low-loader, the following preparations must be carried out:

- Move the operating panel (1) to the transportation position and lock properly in position.
- Move the seat console (2) to the transportation position and lock properly in position.
- Close the hopper and set the hopper transport safeguards (3) on both sides.
- Lower slewing belt (○) to lowest position.
- Lower height-adjustable (○) conveyor belt to lowest position.
- Lower control platform to lowest position (○).
- Switch the machine off.
- Insert the retaining pin (4) at the swivel arm (○).
- Attach and secure the protective hood (5) to the operating panel.
- Lower the roof and set the latches (6) properly on both sides (see Section entitled "Protective roof").
- Fold up the folding step (7) on both sides.

4 Securing the load

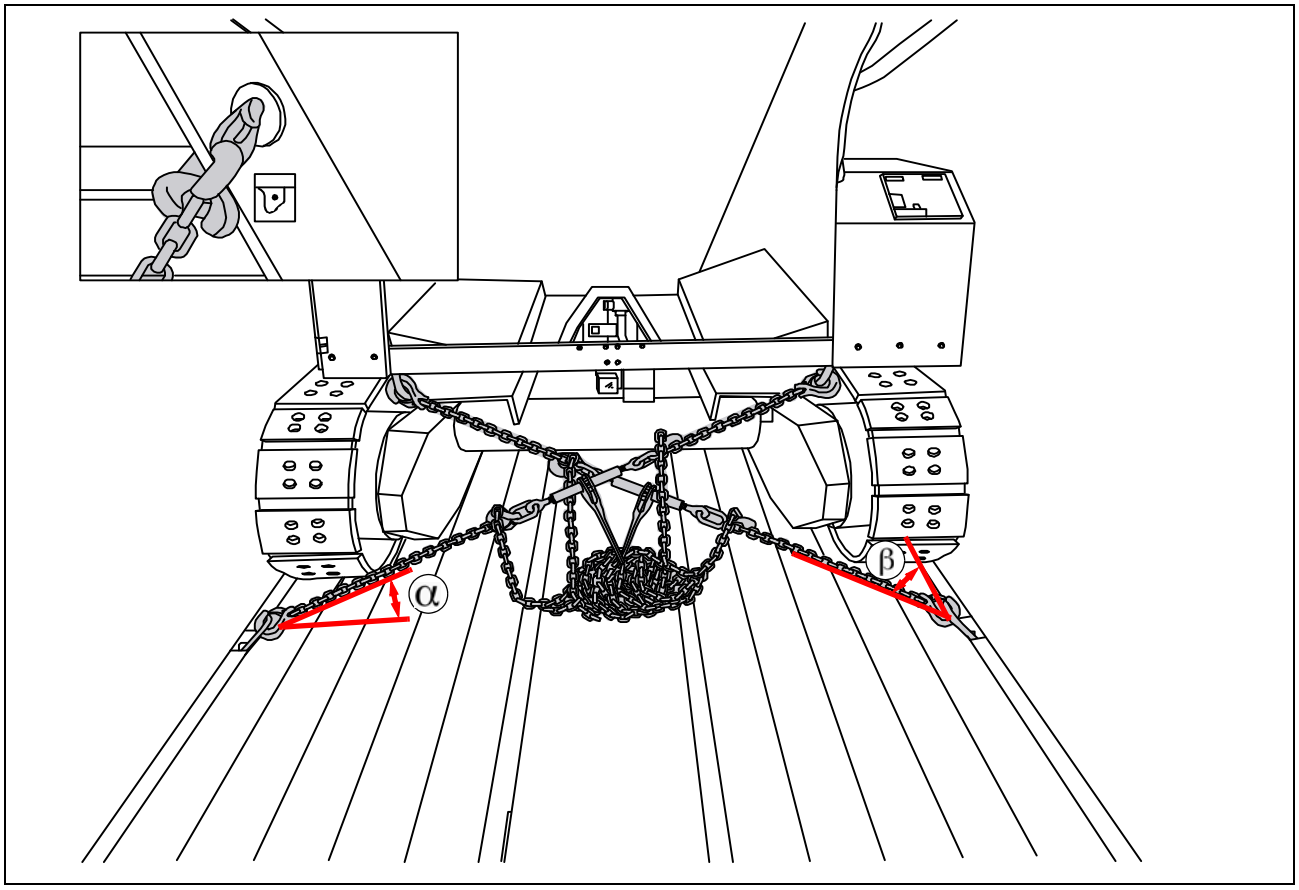
4.1 Securing at the front



⚠ Diagonal lashing must be performed to secure the vehicle in the direction of travel. The lashing points on the vehicle and on the low-loader must be used. The lashing equipment must be installed as shown.

⚠ The vertical angle "a" must not be less or more than the 19° - 36° ranges!
The horizontal angle "ß" must not be less or more than the 6° - 39° ranges!

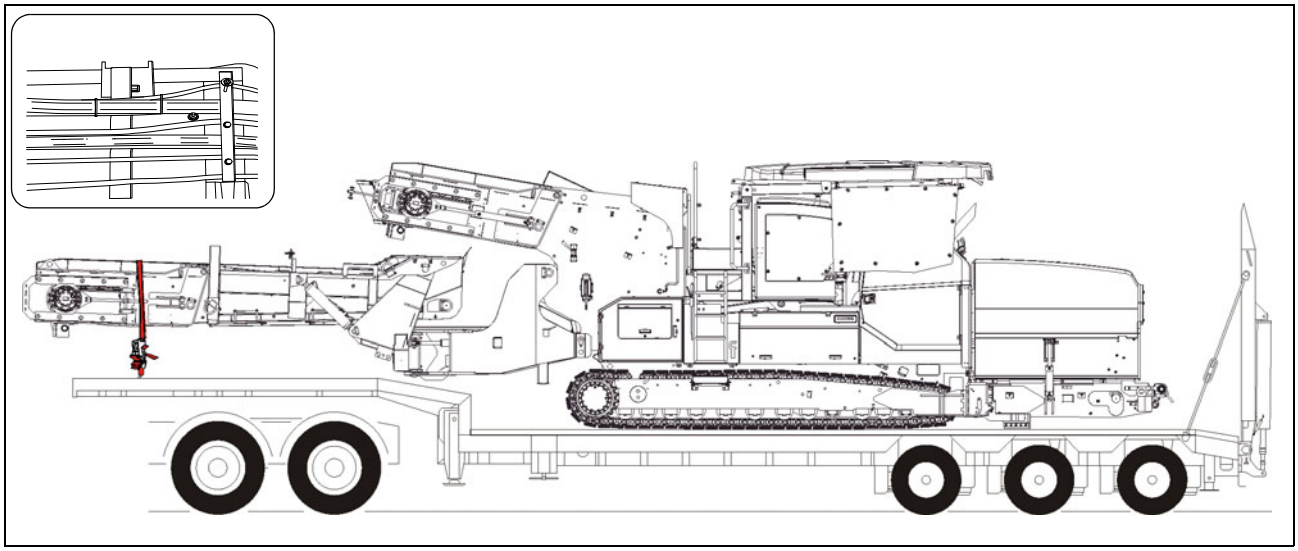
4.2 Securing at the rear



⚠ Diagonal lashing must be performed to secure the vehicle counter to the direction of travel. The lashing points on the vehicle and on the low-loader must be used. Fasten the lashing straps as shown.

⚠ The lashing angles should be: "ß" between 6°-55° and "a" between 20°-65°!

4.3 Securing the conveyor belt



⚠ In addition to the above described securing measures, the conveyor belt must be secured by lashing down with lashing equipment and edge guards.
The lashing points on the low-load trailer must be observed.

☞ The edge guards and the lashing straps must run beneath the supply lines!

⚠ The lasting straps must reveal an LC value of at least 2,500 daN!

4.4 After transportation

- Remove the attachment devices.
- Raise protective roof:

☞ See section entitled "Protective roof"

⚠ Risk of collision!
Raise the front area of the vehicle chassis by completely extending the drive unit cylinders.

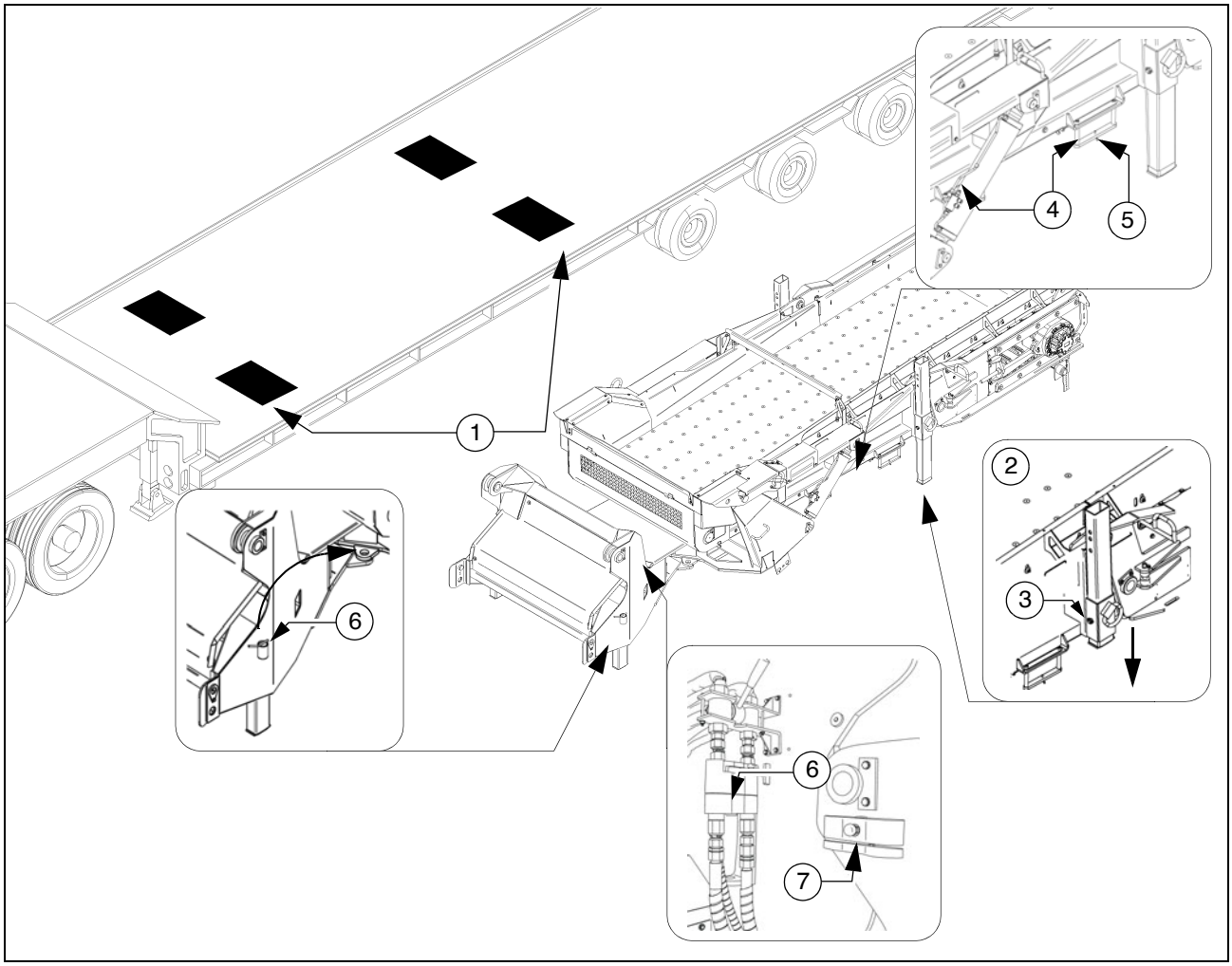
- Start the engine and drive from the trailer at a low engine/traction speed.
- Park the vehicle in a secure spot and switch off the engine.
- Remove the key and/or cover the operating panel with the protective hood and secure it.

5 Low-bed trailer transportation, slewing belt(solo)

Low-bed trailer requirements

⚠ The low-loader must have the necessary number of lashing points with a lashing strength of LC 2,000 daN.

5.1 Prepare low loader and conveyor belt



⚠ Before loading begins, non-slip mats (1) fitted to the contact points where the conveyor belt frame stands on the low loader.

☞ The conveyor belt can be raised with suitable lifting gear or a forklift truck.

The conveyor belt must be prepared for loading as follows:

- The conveyor belt must be cleaned, all material deposits removed and all maintenance flaps closed correctly.
- The conveyor belt must stand on all standing legs (2). The standing legs must be secured in lowered position with the corresponding retaining pins (3).
- Open the openings (4) for the forklift truck fork (lock nut (5)).
- Insert the retaining pin (6) at the swivel arm.
- The hose package (7) must be fastened to the parking coupling (8)!

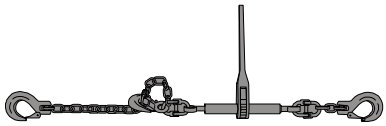
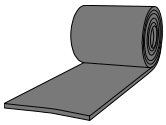
⚠ Always work with a signalman when approaching with the forklift truck and inserting the forklift tines in the openings.

5.2 Lashing equipment

Use the load securing equipment, lashing straps and chains belonging to the vehicle. Additional shackles, eyebolts, edge guards and non-slip mats may be needed depending on the type of load securing equipment.

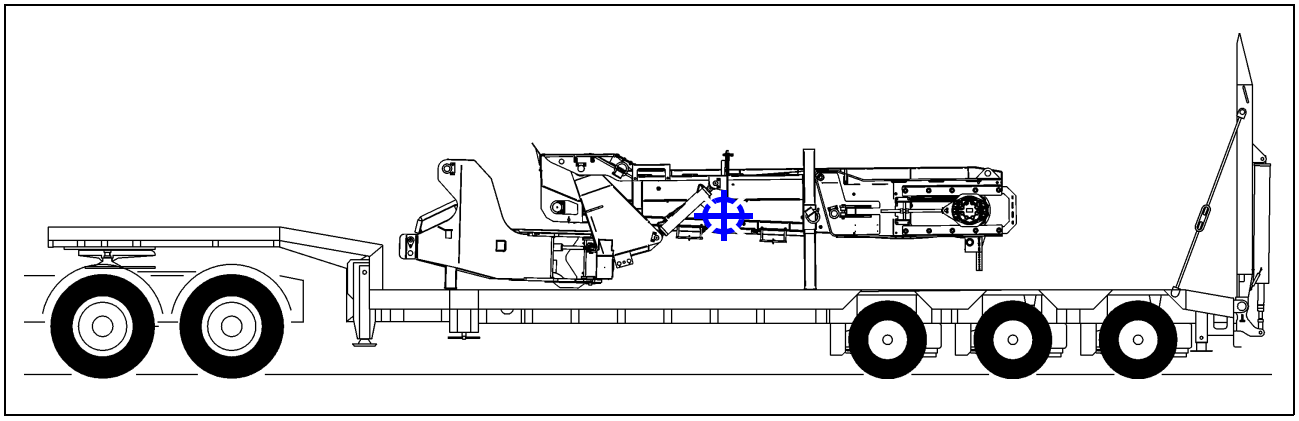
⚠ Always comply with the stated values for permitted lashing force and load rating!

⚠ Always tighten the lashing chains and straps hand-tight (100-150 daN).

- Lashing chain permissible lashing force min. LC 2,200 daN	
- Lashing straps permissible lashing force min. LC 2,500 daN	
- Non-slip mats 8mm compressive stress min. 2.7 N/mm^2	

⚠ Lashing equipment must be checked by the user for any signs of damage before use. On detecting any signs of damage that affect safety, the lashing equipment must be withdrawn from further use.

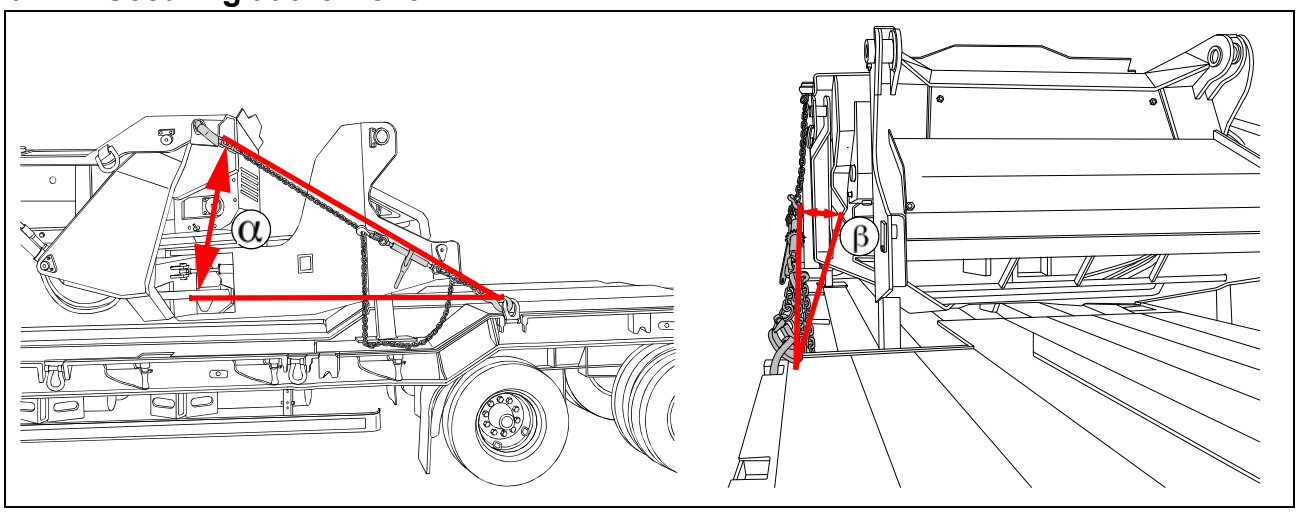
5.3 Loading



⚠ Pay attention to load distribution during loading!
On some vehicles, the kingpin load is too low so that the load has to be positioned further to the back of the vehicle.
Always observe the specifications regarding load distribution for the vehicle and the centre of gravity of the vehicle.

6 Securing the load

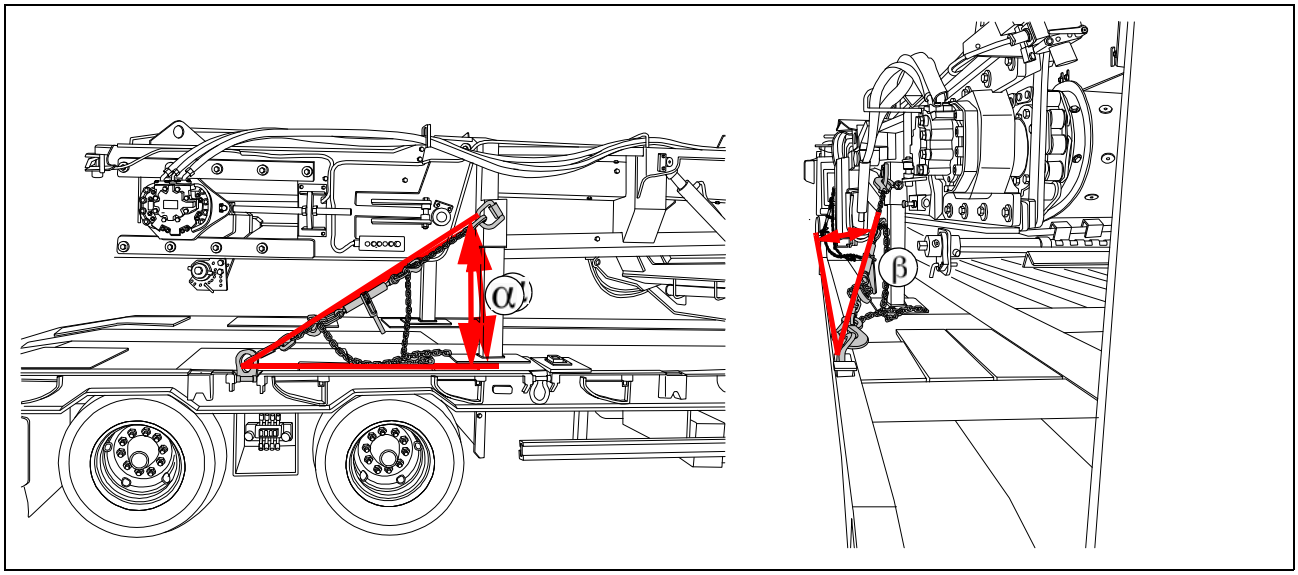
6.1 Securing at the front



⚠ Diagonal lashing must be performed to secure the load counter to the direction of travel. The lashing points on the vehicle and on the low-loader must be used. The lashing equipment must be installed as shown.

⚠ The vertical angle "a" must not be less or more than the 20° - 65° ranges!
The horizontal angle "ß" must not be less or more than the 6° - 55° ranges!

6.2 Securing at the rear



⚠ Diagonal lashing must be performed to secure the load counter to the direction of travel. The lashing points on the vehicle and on the low-loader must be used. Fasten the lashing straps as shown.

⚠ The lashing angles should be: "ß" between 6°-55° and "a" between 20°-65°!

6.3 After transportation

- Remove the attachment devices.
- Raise protective roof:

☞ See section entitled "Protective roof"

⚠ Risk of collision!
Raise the front area of the vehicle chassis by completely extending the drive unit cylinders.

- Start the engine and drive from the trailer at a low engine/traction speed.
- Park the vehicle in a secure spot and switch off the engine.
- Remove the key and/or cover the operating panel with the protective hood and secure it.

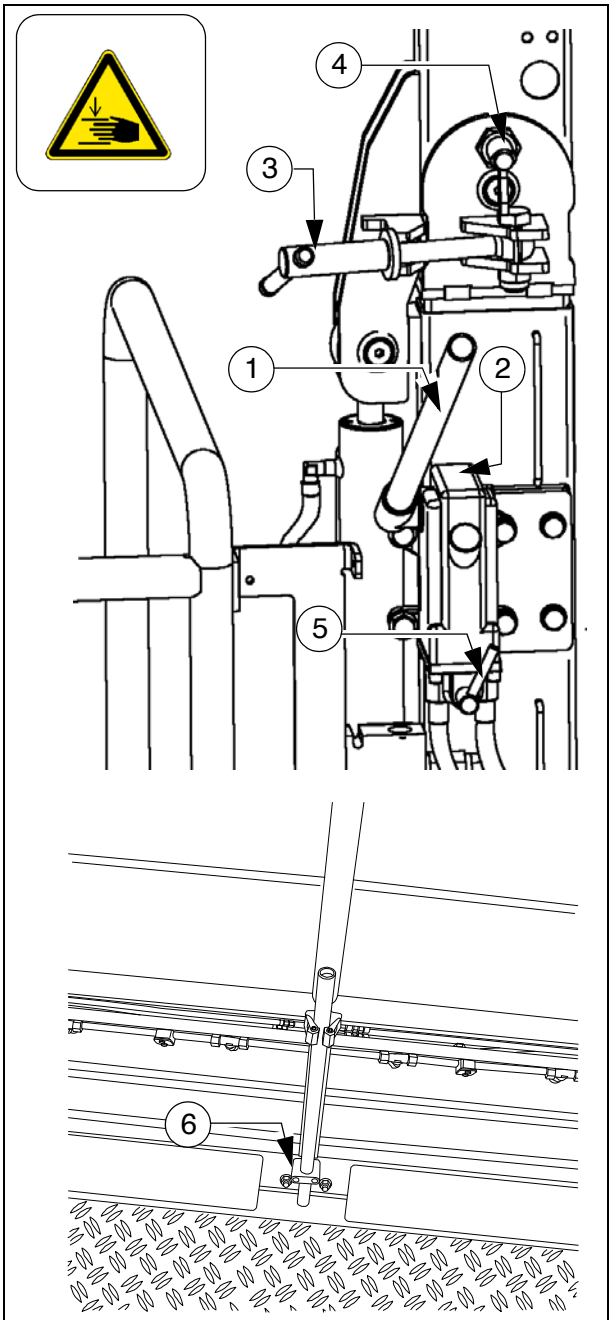
Protective roof (○)

The protective roof can be raised and lowered with a manual hydraulic pump.

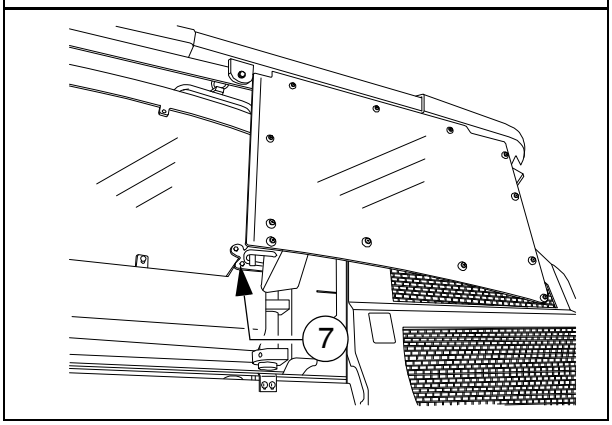
☞ The exhaust pipe is lowered or raised together with the roof.

- Connect the pump lever (1) to the pump (2).
  - Lower the roof: The locks (3) on both sides of the roof must be released.
  - Raise the roof: the locks (4) on both sides of the roof must be released.
- Set the adjustment lever (5) to the "Raise" or "Lower" position.
  - Raise the roof: The lever points forwards.
  - Lower the roof: The lever points backwards.
- Operate the pump lever (1) until the roof has reached the upper or lower limit position.
  - Roof in uppermost position: Set the locks (3) on both sides of the roof.
  - Roof lowered: set the lock (4) on both sides of the roof.

☞ Place the pump lever in the bracket (6).



⚠ After lowering, check whether the pin (7) of the side windows is located in the relevant mounting.



NOTE	**Caution! Possible collision of parts**
	The following adjustments must be made before lowering the roof: - Seat consoles swivelled in and locked - Operating panel locked in a central position in front of one of the driver's seats. - Side windows closed. - Engine hood and lateral flaps closed. - Rotary beacon swivelled inwards and in lowest setting

7 Transportation

⚠ CAUTION	**Danger due to restricted vision**
	Restricted vision poses a risk of injury! - Before starting work, arrange the intended driver's seat to ensure adequate vision. - Signalmen must be used when vision is restricted, also to the sides and when reversing. - Only reliable persons may be used as signalmen who must have been received instructions about their task before taking up their activity. This refers in particular to the hand signals to be used. Standardised hand signals must be used. - Adequate lighting must be provided when working at night. - Comply with all further information in these instructions and in the safety manual.

⚠ Reduce the feeder to its basic width. Remove all protruding or loose parts from the feeder. Stow all parts securely.

⚠ The vehicle must be cleaned, all material deposits removed and all maintenance flaps closed correctly.

⚠ Only accessories and extension parts may be transported in the hopper, no material!

⚠ Lock the lane cleaner in the upper position.

⚠ Swivel in the operating panel guide and seat consoles; insert the relevant locking bolts appropriately.
The operating panel must be moved to the side of the oncoming traffic and secured in this position.

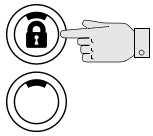
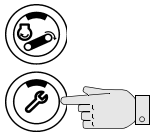
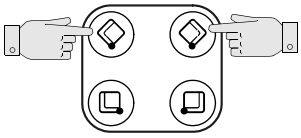
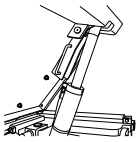
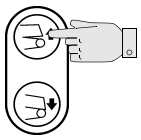
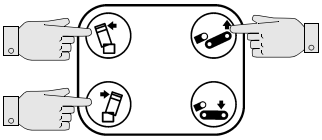
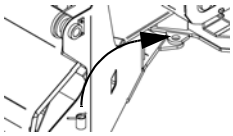
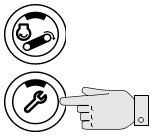
⚠ The headlights and warning lamps must be switched on and properly adjusted.

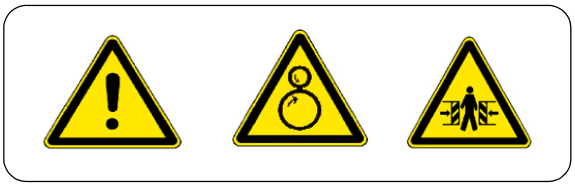
Additional stipulations for transportation on public roads:

⚠ In Germany, feeders **must never be driven as self-propelling vehicles** on public roads.
Note that in other countries different regulations may apply.

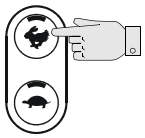
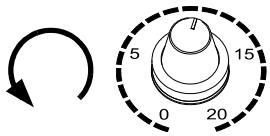
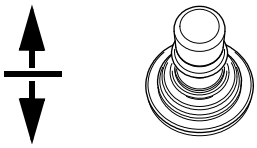
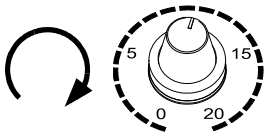
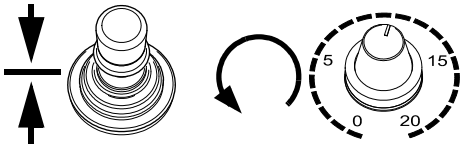
The operator must be in the possession of a valid permit for vehicles of this type.

Preparations

Operation	Buttons
- Deactivating the function lock	
- Activate set-up mode.	
- Lower control platform (○).	
- Close the hopper lids.	
- Engage both hopper transport safeguards.	
- Fully extend drive unit frame cylinders.	
- Raise slewing belt.(○) - Bring slewing belt into the centre position.(○)	
- Insert the retaining pin at the - swivel arm.(○)	
- Deactivate set-up mode.	



7.1 Driving mode

Operation	Buttons
- Set the fast/slow switch to "Hare" if necessary.	
- Turn the preselector to "zero".	
- Swivel the drive lever to maximum. STOP The vehicle already advances slightly on deflecting the drive lever!	
- Adjust required vehicle speed with the preselector.	
- To stop the vehicle, swivel the drive lever to the middle setting and set the preselector to "zero".	

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

8 Loading by crane

WARNING	Danger from suspended loads
	Crane and/or lifted vehicle can tip when lifted and cause injuries! - The vehicle may only be raised at the marked lifting points. - Heed the operating weight of the vehicle. - Do not enter the danger zone. - Use only lifting gear that can bear the load. - Do not leave any load or loose parts on the vehicle. - Comply with all further information in these instructions and in the safety manual.

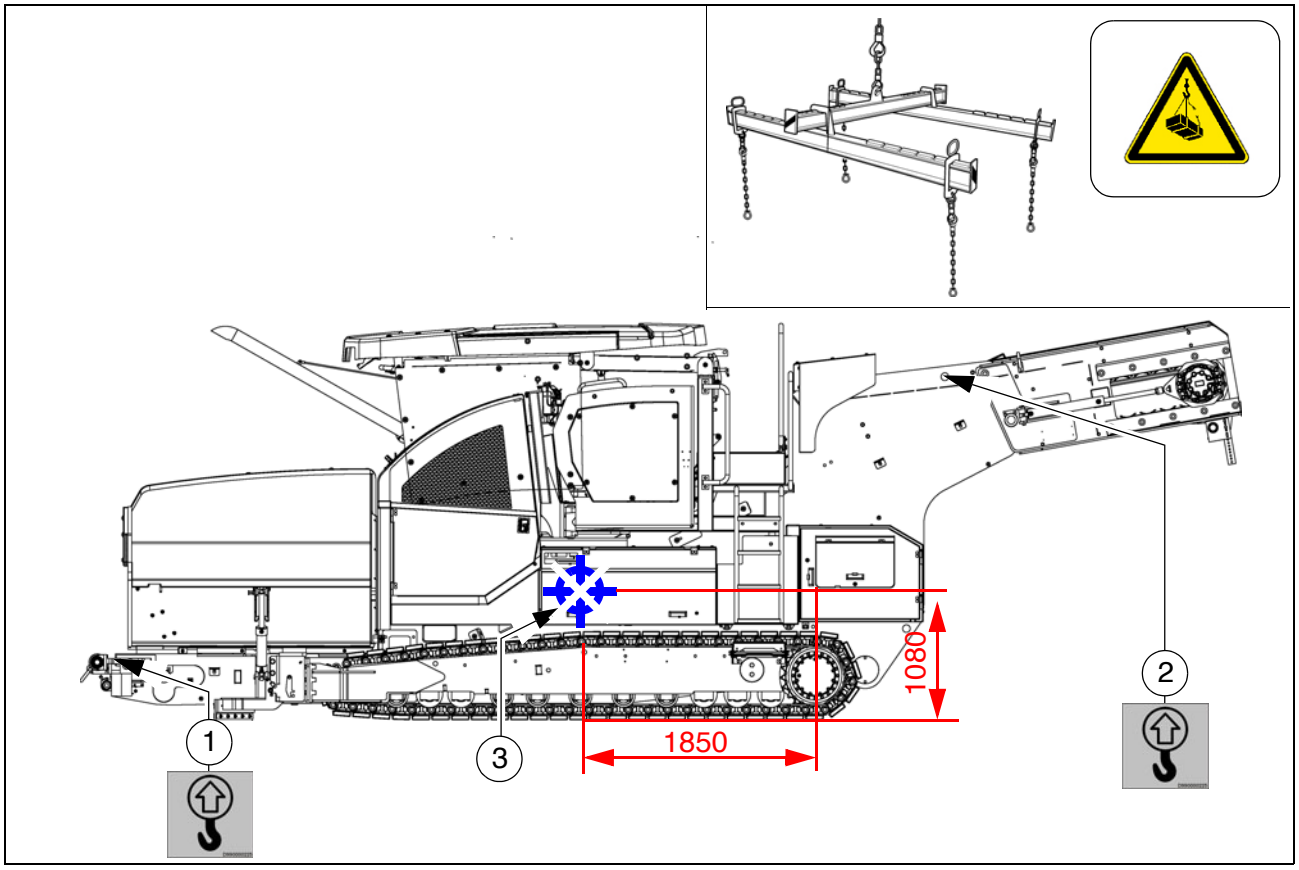
⚠ Use only lifting gear that can bear the load.
(See chapter B for weights and dimensions).

⚠ Attachment and loading equipment must meet the conditions of the applicable accident prevention regulations!

⚠ The vehicle's centre of gravity is dependent on the conveyor belt version.

⚠ Disconnect the slewing conveyor belt (○) from the vehicle before loading by crane!
The vehicle and conveyor belt must be loaded separately!

Loading the vehicle



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

- Reduce the vehicle to its basic width.
- Lower the front area of the vehicle chassis by completely retracting the drive unit cylinders.
- Swivel in the operating panel guide and seat consoles; insert the relevant locking bolts appropriately.
- Close the hopper and set the hopper transport safeguards on both sides.
- Switch the vehicle off.
- Attach and secure the protective hood to protect the operating panel.
- Remove protruding or loose parts (see chapters E and D).
- Then lower and set the latches properly on both sides:

See section entitled "Protective roof"

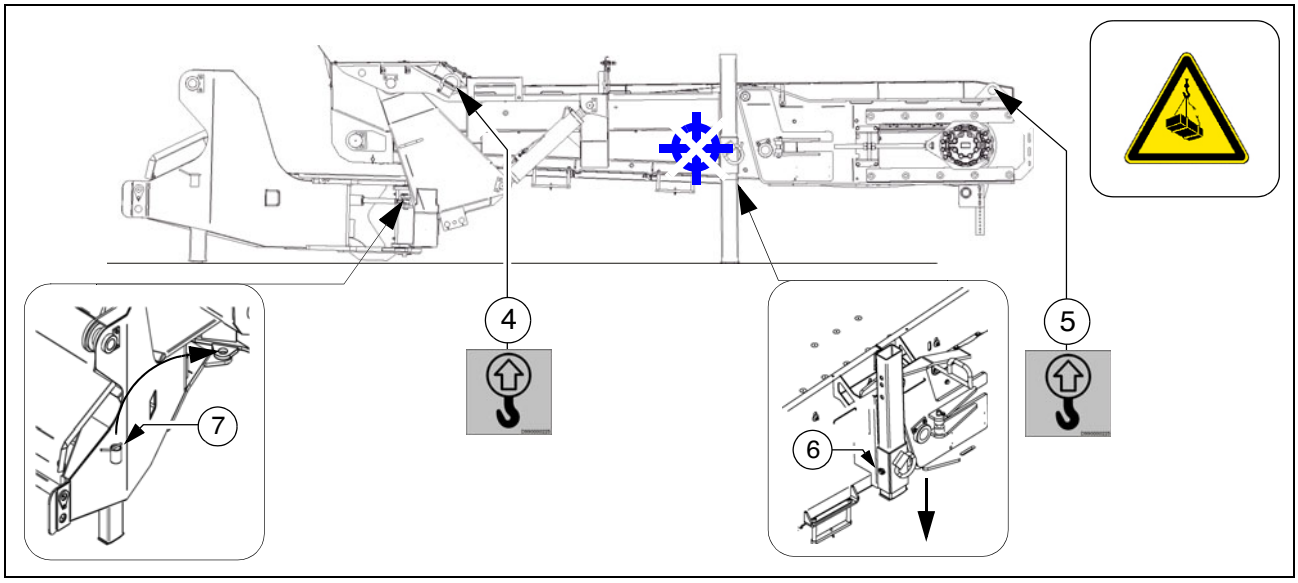
- Attach lifting gear to the four attachment points (1, 2).

The max. permissible attachment point load at the attachment points is: 73.5 kN.

The permissible load applies in the vertical direction!

Make sure that the feeder remains in a horizontal position during transportation!

Loading the slewing conveyor belt (○)



☞ Four lifting eyes (4,5) are provided for loading the conveyor belt with a crane.

- The conveyor belt must be cleaned, all material deposits removed and all maintenance flaps closed correctly.
- The conveyor belt must stand on all standing legs. The standing legs must be secured in lowered position with the corresponding retaining pins (6).
- The retaining pin (7) must be inserted at the swivel arm.

- Attach lifting gear to the four attachment points (4, 5).

⚠ The max. permissible attachment point load at the attachment points is xx.x kN.

⚠ The permissible load applies in the vertical direction!

⚠ Make sure that the conveyor belt remains in a horizontal position during transportation!

9 Towing

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

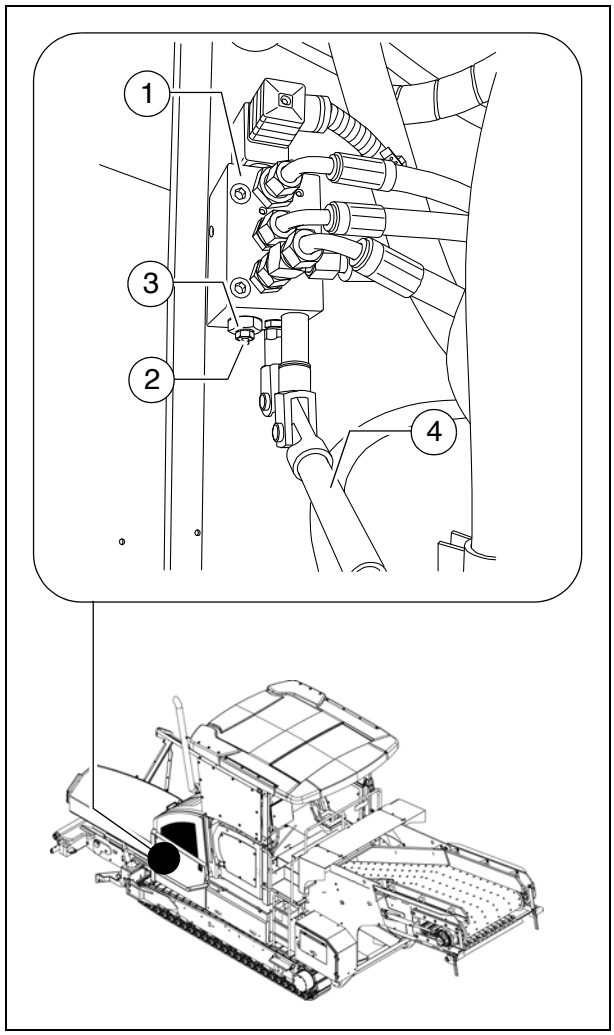
The towing vehicle must be capable of securing the feeder even on slopes.

Use only approved tow bars!

If necessary, reduce the feeder to its basic width.

A hand pump (1) is located in the engine compartment (left side); it must be actuated to be able to tow the machine.
Pressure for releasing the traction system brakes is built up with the hand pump.

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



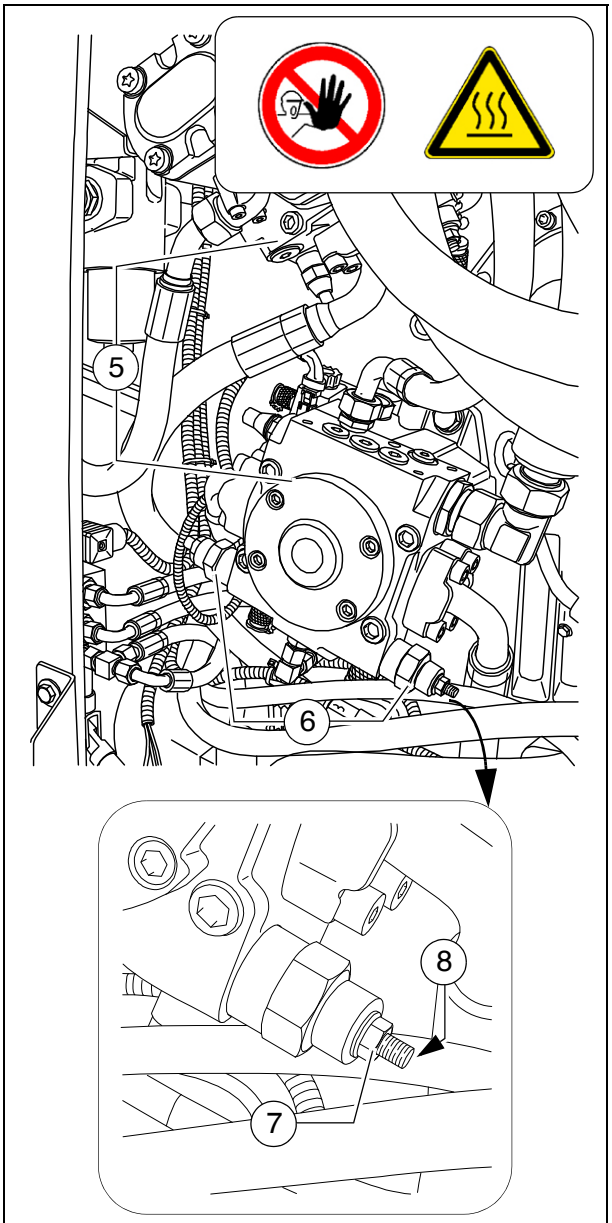
On completion of the towing process, restore the initial status.

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

Two high-pressure cartridges (6) are located on both of the travel drive pumps (5). The following activities must be carried out to activate the towing function:

- Loosen lock nut (7) half a turn.
- Screw in the bolt (8) until increased resistance occurs. Then screw the bolt a further half turn into the high-pressure cartridge.
- Tighten the lock nut (7) to a torque of 22 Nm.

⚠ On completion of the towing process, restore the initial status.



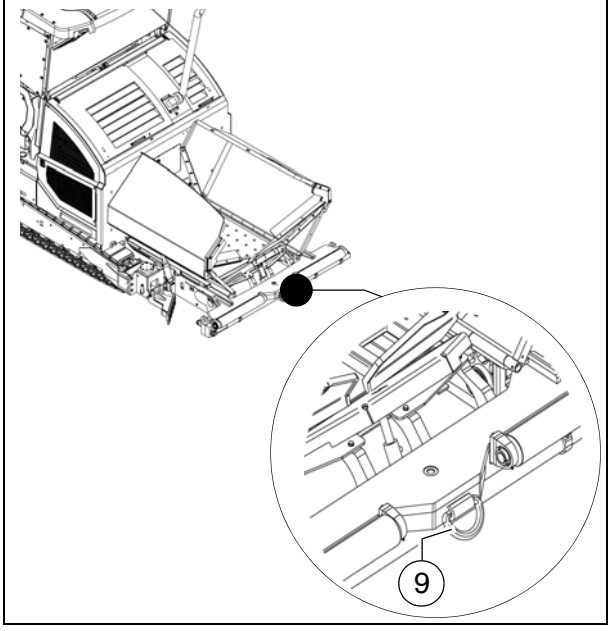
- Attach the tow bar to the coupling (9) located in the bumper.

The machine can now be carefully and slowly towed out of the construction site area.

⚠ Only ever tow the shortest distance to the means of transport or the next parking possibility.

⚠ The max. permissible towing speed is 10 m/min!
In hazardous situations, a towing speed of 15 m/min is only permitted temporarily.

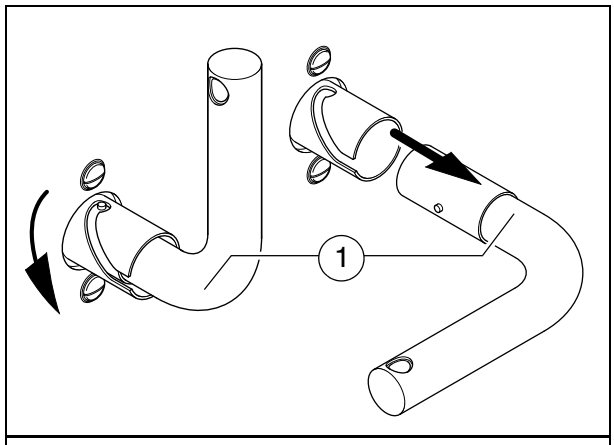
⚠ The max. permissible towing eye (9) load is: 200 kN



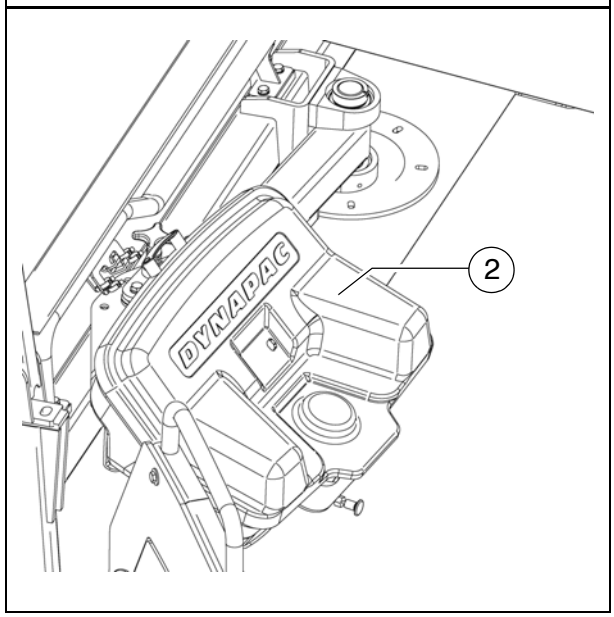
10 Safely parking the vehicle

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

- Remove ignition key and main switch (1) and take them with you – do not leave them "hidden" on the machine.



- Protect the operating panel with the dust cover (2) and lock it.
- Store loose parts and accessories in a safe place.
- Then lower and set the latches properly on both sides.



D 11 Operation

1 Safety regulations



Injury or death can result through starting the engine, travel drive, conveyor belt or lifting units.
Before starting, ensure that nobody is working on or underneath the vehicle or standing in the vehicle's 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 enter the hopper or conveyor belt whilst the engine is running. Danger to life!

- Always make sure during work that no-one is endangered by the vehicle!
- Ensure that all protective covers and hoods are fitted and secured accordingly!
- Immediately rectify damage which as been ascertained! Operation must not be continued when the vehicle is defective!
- Do not allow anyone to ride along on the vehicle!
- Remove obstacles from the road and the work area!
- Always try to choose a driver’s position that is opposite to the flowing traffic! Lock the operating panel and the driver’s seat.
- Maintain sufficient safety clearance from overhanging objects, other vehicles and points of danger!
- Be careful when travelling on rough terrain to keep the feeder from slipping, tipping or turning over.



Always maintain control of the vehicle; never try to use it beyond its capacities!

DANGER	**Danger due to improper operation**
	Improper operation of the vehicles can cause severe to fatal injuries! - The vehicle may only be used in the proper manner for its intended purpose. - The vehicle may only be operated by trained staff. - The vehicle operators must have made themselves familiar with the contents of the operating instructions. - Avoid jerky movements of the vehicle. - Do not exceed the permissible angle of rise and slope. - Keep hoods and covering parts closed during operation. - Comply with all further information in these instructions and in the safety manual.

WARNING	**Danger of being pulled in by rotating or conveying vehicle parts**
	Rotating or conveying vehicle parts can cause severe or fatal injuries! - Do not enter the danger zone. - Do not reach into rotating or conveying parts. - Only wear close-fitting clothing. - Comply with the warning and information signs on the vehicle. - Stop the engine and remove the ignition key for any maintenance work. - Comply with all further information in these instructions and in the safety manual.

WARNING	**Danger of crushing due to moving vehicle parts**
	Vehicle parts performing movements can cause severe or fatal injuries! - Remaining in the vehicle's danger zone during operation is prohibited! - Do not reach into the danger zone. - Comply with the warning and information signs on the vehicle. - Comply with all further information in these instructions and in the safety manual.

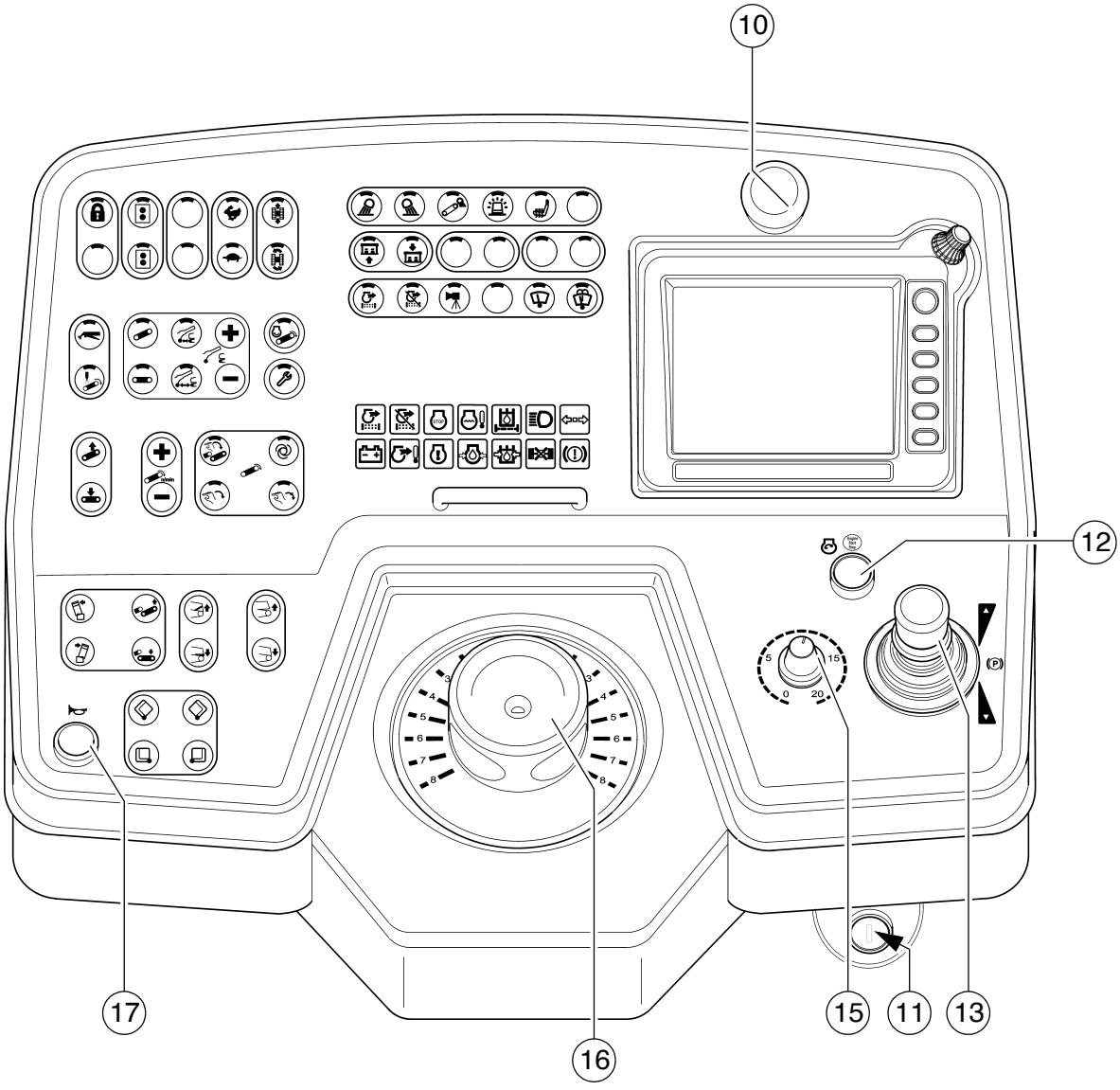
2 Controls

2.1 Operating panel

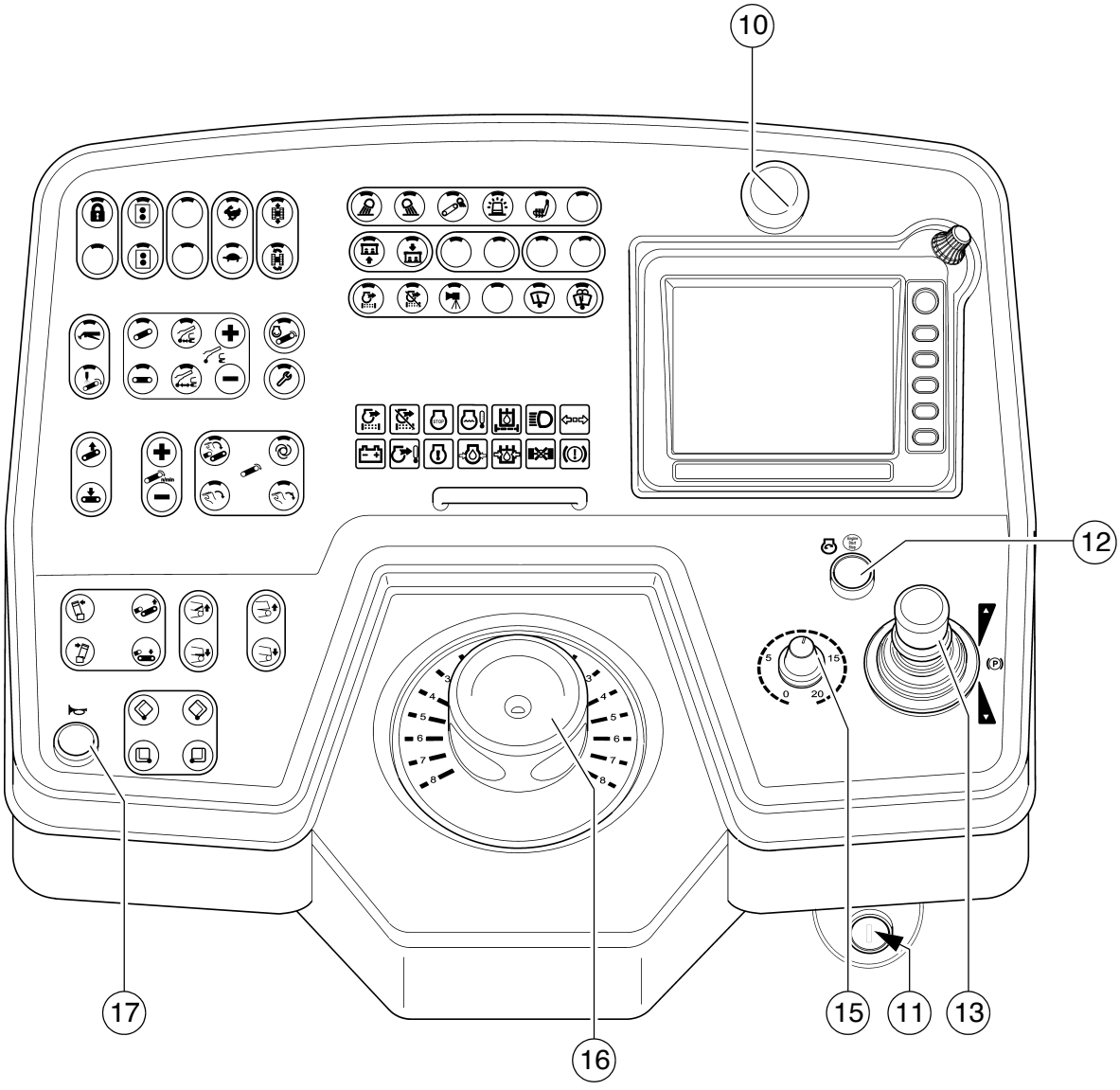
All detent switch functions which may pose a risk on starting the diesel engine are set to the STOP function in the event of an EMERGENCY STOP or on restarting the control system. If settings are changed when the diesel engine is stopped ("AUTO" or "MANUAL"), these are reset to "STOP" on starting the diesel engine.
The "Turning on the spot" function is reset to "Straight-ahead travel".

Only adjust the operating panel position whilst the vehicle is stationary!

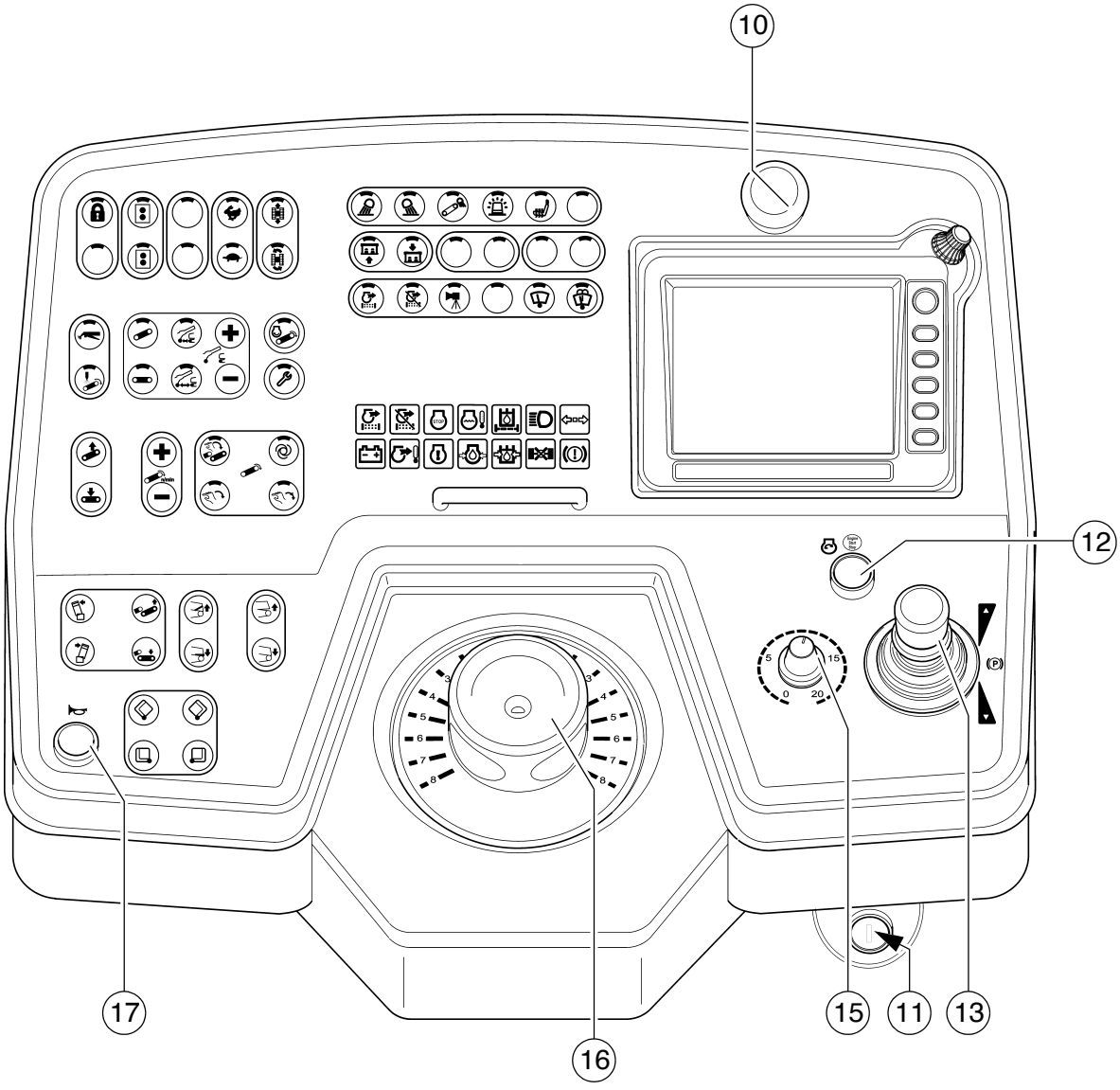
Make sure it is latched properly!


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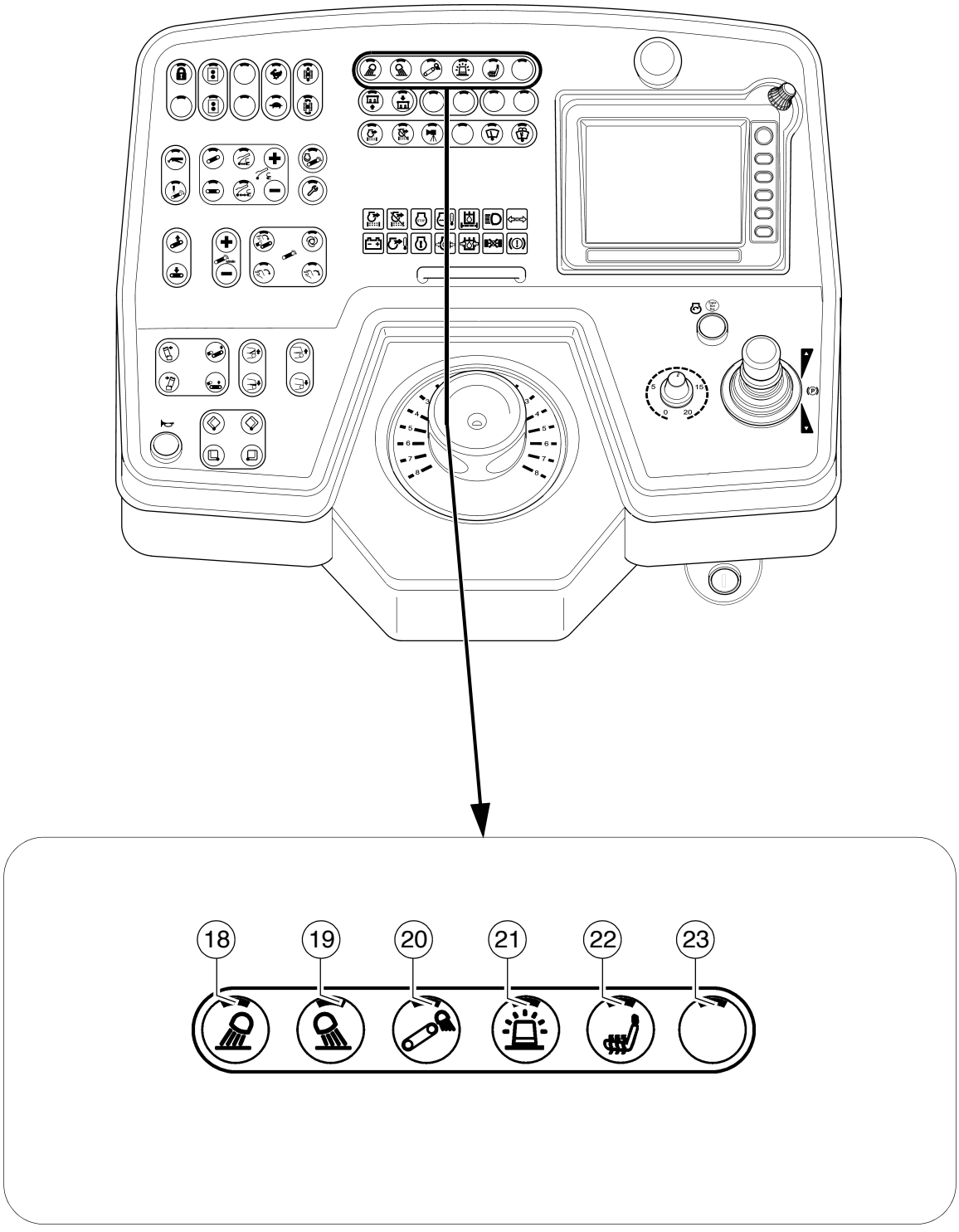
Pos.	Designation	Brief description
10	Emergency stop button	Press in an emergency (danger to persons, impending collision, etc.)! - Pressing the emergency stop button switches off the engine, the drives and the steering system. Making way, moving the conveyor belt, etc. is then no longer possible! Danger of accidents! - To restart the engine, the button must be pulled out again.
11	Ignition lock	To activate the ignition voltage by turning the key. - Switch off by turning the key back to its starting position. ☞ After activating the ignition voltage, the input and display terminal requires a few seconds for the booting process. ☞ On shutting off the vehicle, first switch off the ignition, then deactivate the main switch. ☞ Before the main battery switch is deactivated, a period of at least 10 seconds must elapse after switching off the vehicle.
12	Starter / drive engine OFF	For starting and shutting off the drive engine. - On actuation, the starter is in operation - Switch the running engine OFF by pressing the button again ⚠ Run the starter continuously for a maximum of 20 seconds, then take a break for 1 minute! ☞ The emergency stop button must be pulled up during the starting process.


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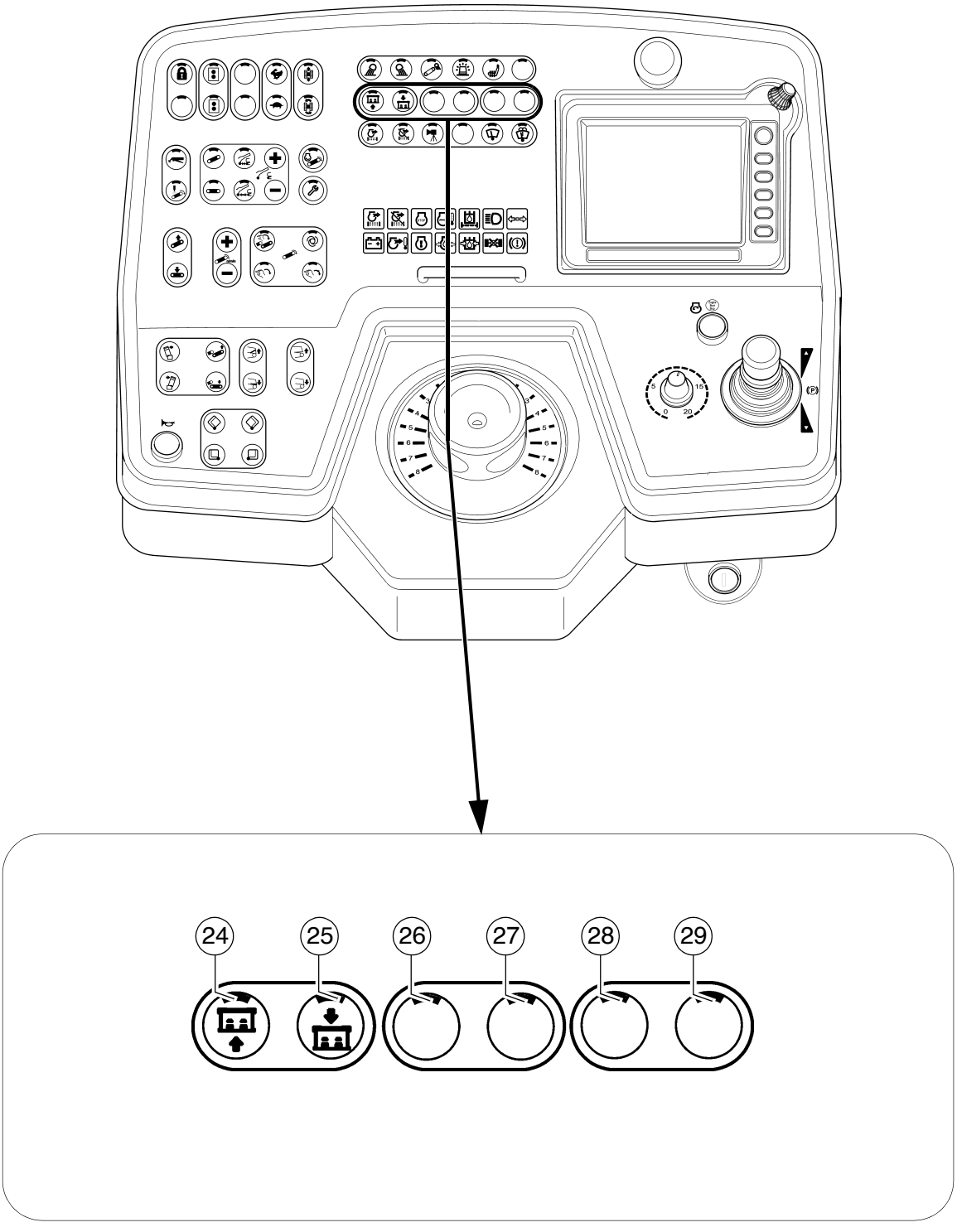
Pos.	Designation	Brief description
13	Drive lever (traction)	For engaging the feeder functions and continuously regulating the vehicle speed – forward or reverse. Centre position: Engine in neutral; no travel drive; - To swivel the drive lever out, release by pulling the handle up. - Engagement of the conveying functions set to "AUTO"! ☞ Use the preselector to set the maximum speed. STOP The vehicle speed cannot be reduced to "0" with the preselector. The vehicle advances slightly with deflected drive lever, even if the travel drive preselector is set to zero! ☞ If the engine is started with the drive lever swivelled, the travel drive is blocked. To be able to start the travel drive, the drive lever must first be returned to the centre position. ☞ When changing over between forwards and reverse travel, the drive lever must remain briefly in neutral.


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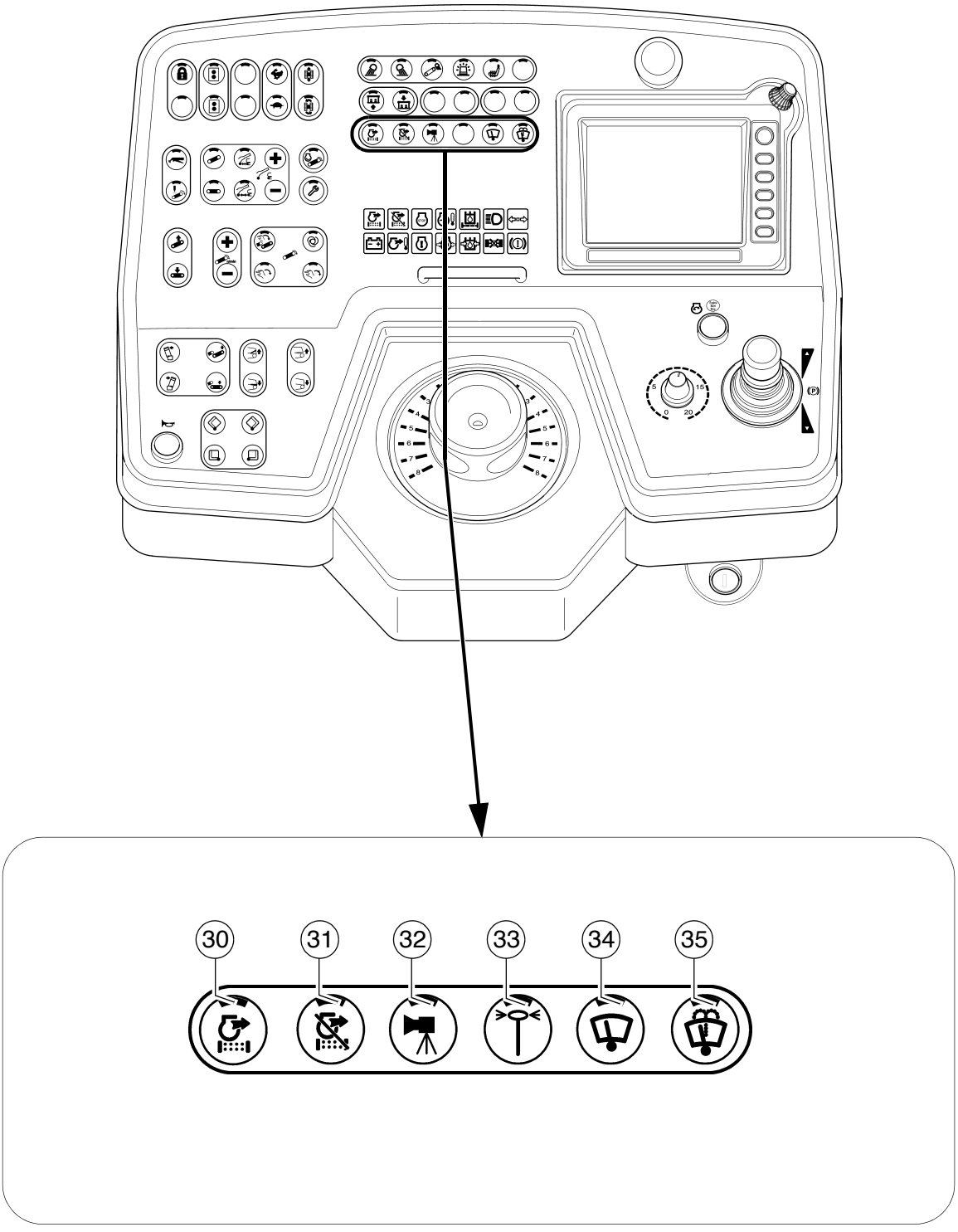
Pos.	Designation	Brief description
15	Travel drive preselector	For setting the maximum speed that can be reached when the drive lever is at its stop. ☞ The scale roughly matches the speed in m/min (during paving). STOP The vehicle speed cannot be reduced to "0" with the preselector. The vehicle advances slightly with deflected drive lever, even if the travel drive preselector is set to zero!
16	Steering potentiometer	The steering wheel movement is transferred electrohydraulically. ☞ For precise adjustments (position "0" = straight-ahead), see the straight-ahead travel synchronisation. For turning on the spot, see switch (Turning on the spot).
17	Horn	Press in the case of emergencies and to indicate when the vehicle starts to move! ☞ The horn can also be used to communicate acoustically with the truck driver for material loading!


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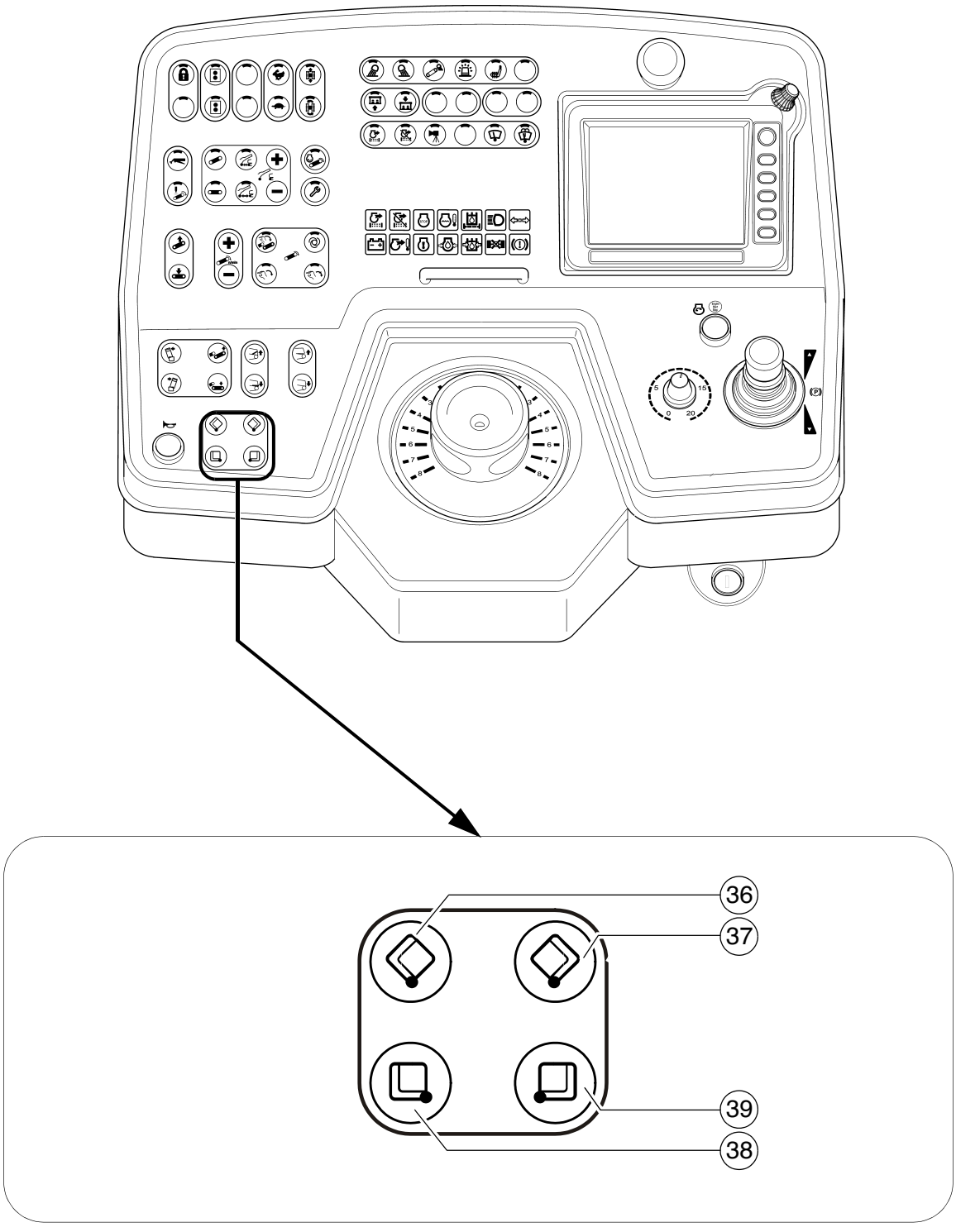
Pos.	Designation	Brief description
18	Front working lights ON / OFF (○)	Button with detent switch function and LED feedback: - For switching on the front working lights - Switch OFF by pressing the button again STOP Avoid dazzling other road users!
19	Rear working lights ON / OFF (○)	Button with detent switch function and LED feedback: - For switching on the rear working lights - Switch OFF by pressing the button again STOP Avoid dazzling other road users!
20	Conveyor belt working lights ON / OFF (○)	Button with detent switch function and LED feedback: - For engaging the working lights on the conveyor belt - Switch OFF by pressing the button again STOP Avoid dazzling other road users!
21	Rotary beacon ON / OFF (○)	Button with detent switch function and LED feedback: - For switching on the rotary beacon - Switch OFF by pressing the button again ☞ Switch on for safety on roads and in the construction site area
22	Seat heating ON / OFF (○)	Button with detent switch function and LED feedback: - For switching on the seat heating - Switch OFF by pressing the button again
23	not used	


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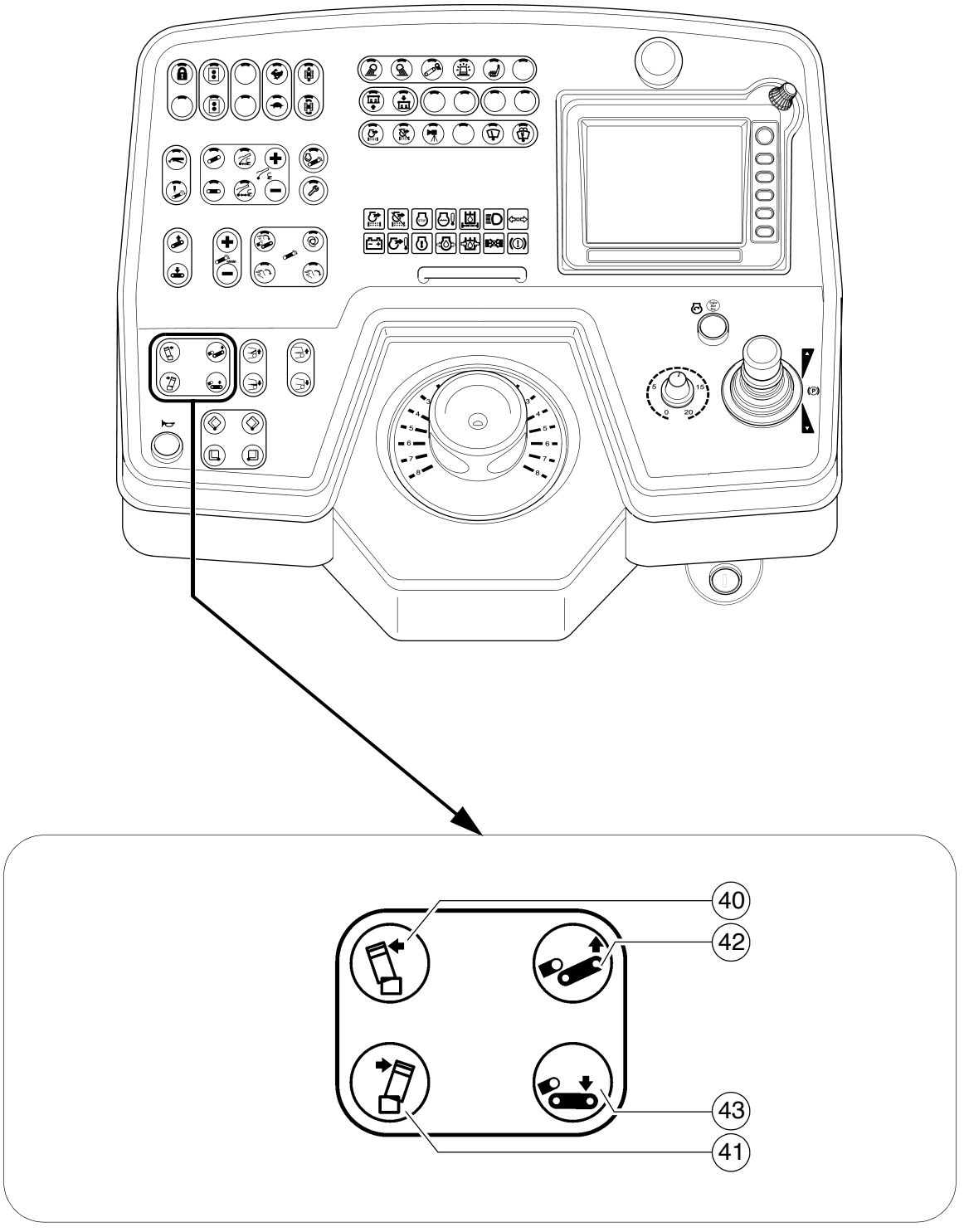
Pos.	Designation	Brief description
24	Raise control platform (○)	Pushbutton function with LED feedback: - To raise the control platform. ⚠ The platform lock must be released before moving the control platform! STOP On actuation, heed danger zones of moving parts of the vehicle! STOP When negotiating bridges, tunnels, overhead wires, underpasses, etc., you must ensure that a sufficient distance is maintained.
25	Lower control platform (○)	Pushbutton function with LED feedback: - To lower the control platform. STOP On actuation, heed danger zones of moving parts of the vehicle!
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27	Not used	
28	Not used	
29	Not used	


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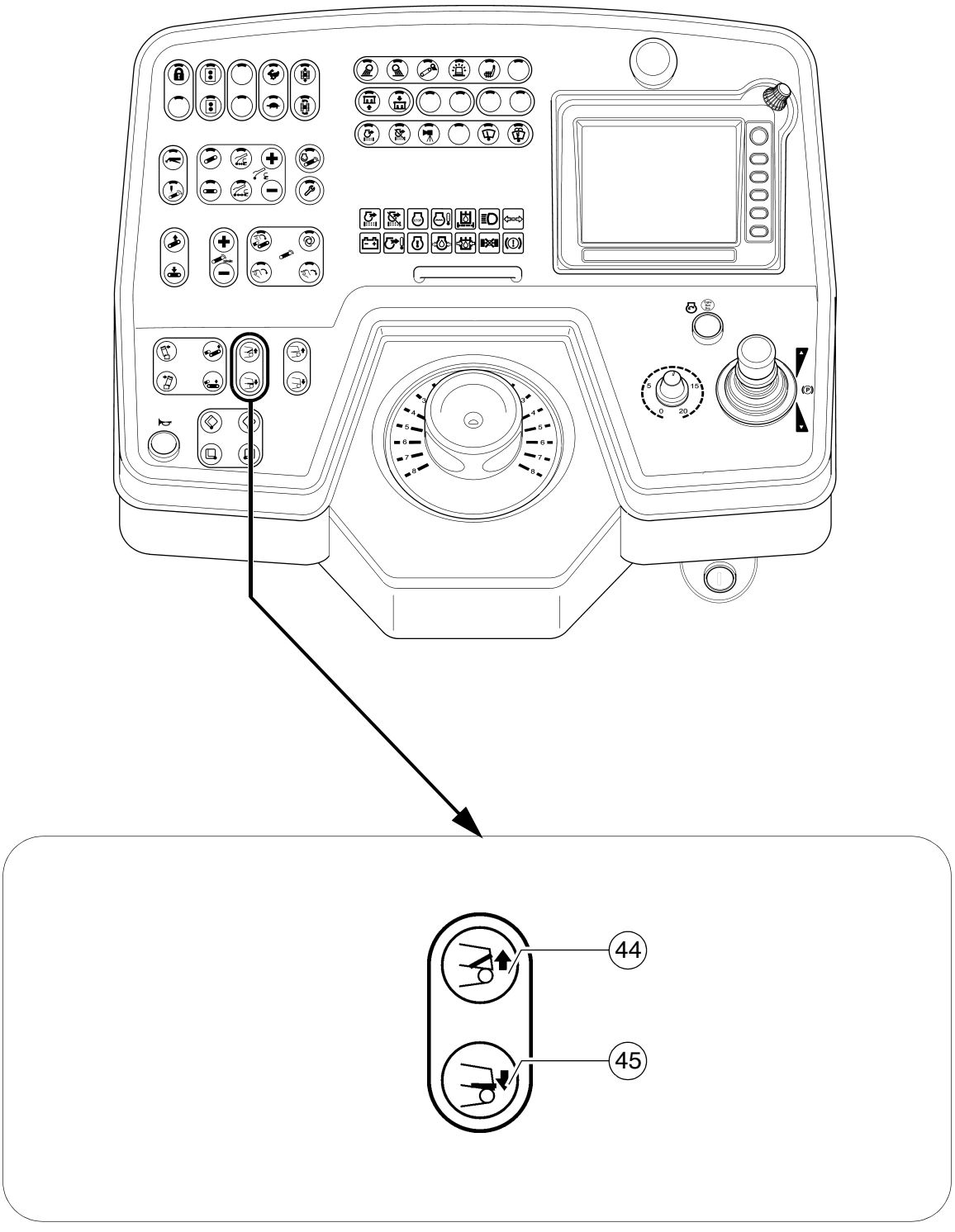
Pos.	Designation	Brief description
30	Particulate filter regeneration, manual (○)	Detent switch function with LED feedback: - For activating / manually triggering particulate filter regeneration. ☞ Particulate filter regeneration does not start when the soot level in the particulate filter is too low. ☞ Particulate filter regeneration takes about 45 minutes.
31	Particulate filter r egeneration, automatic - deactivate (○)	Detent switch function with LED feedback: - For deactivating automatic triggering of particulate filter regeneration. ☞ Depending on the saturation level of the particulate filter, automatic particular filter regeneration can take place immediately after deactivation has been disabled.
32	Camera system ON / OFF (○)	Button with detent switch function and LED feedback: - For engaging cameras / display - Switch OFF by pressing the button again
33	Illuminated balloon ON / OFF (○)	Button with detent switch function and LED feedback: - For engaging the illuminated balloon - Switch OFF by pressing the button again
34	Windscreen wipers ON / OFF (○)	Detent switch function with LED feedback: - For switching on the windscreen wipers - Switch OFF by pressing the button again
35	Windscreen washer system + windscreen wiper ON / OFF (○)	Detent switch function with LED feedback: - For engaging the windscreen washer system + windscreen wipers - Switched OFF with time control


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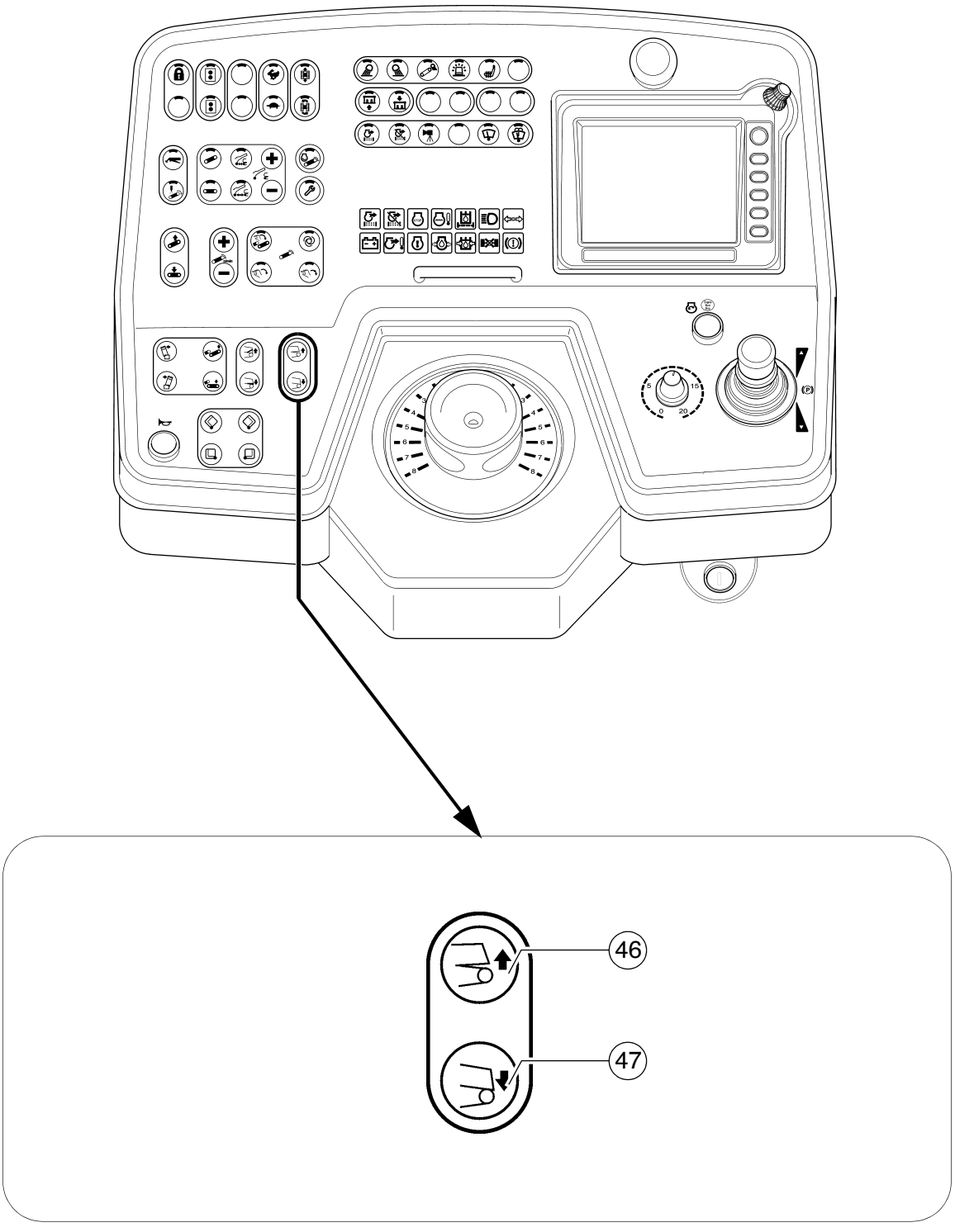
Pos.	Designation	Brief description
36	Close hopper left	Pushbutton function: - To close the left hopper lid + front hopper.  On actuation, heed danger zones of moving parts of the vehicle!  If the "Joint hopper actuation" function is activated, both hopper lids are moved.
37	Close hopper right	Pushbutton function: - To close the right hopper lid + front hopper.  On actuation, heed danger zones of moving parts of the vehicle!  If the "Joint hopper actuation" function is activated, both hopper lids are moved.
38	Open hopper left	Pushbutton function: - To open the left hopper lid + front hopper.  On actuation, heed danger zones of moving parts of the vehicle!  If the "Joint hopper actuation" function is activated, both hopper lids are moved.
39	Open hopper right	Pushbutton function: - To open the right hopper lid + front hopper.  On actuation, heed danger zones of moving parts of the vehicle!  If the "Joint hopper actuation" function is activated, both hopper lids are moved.


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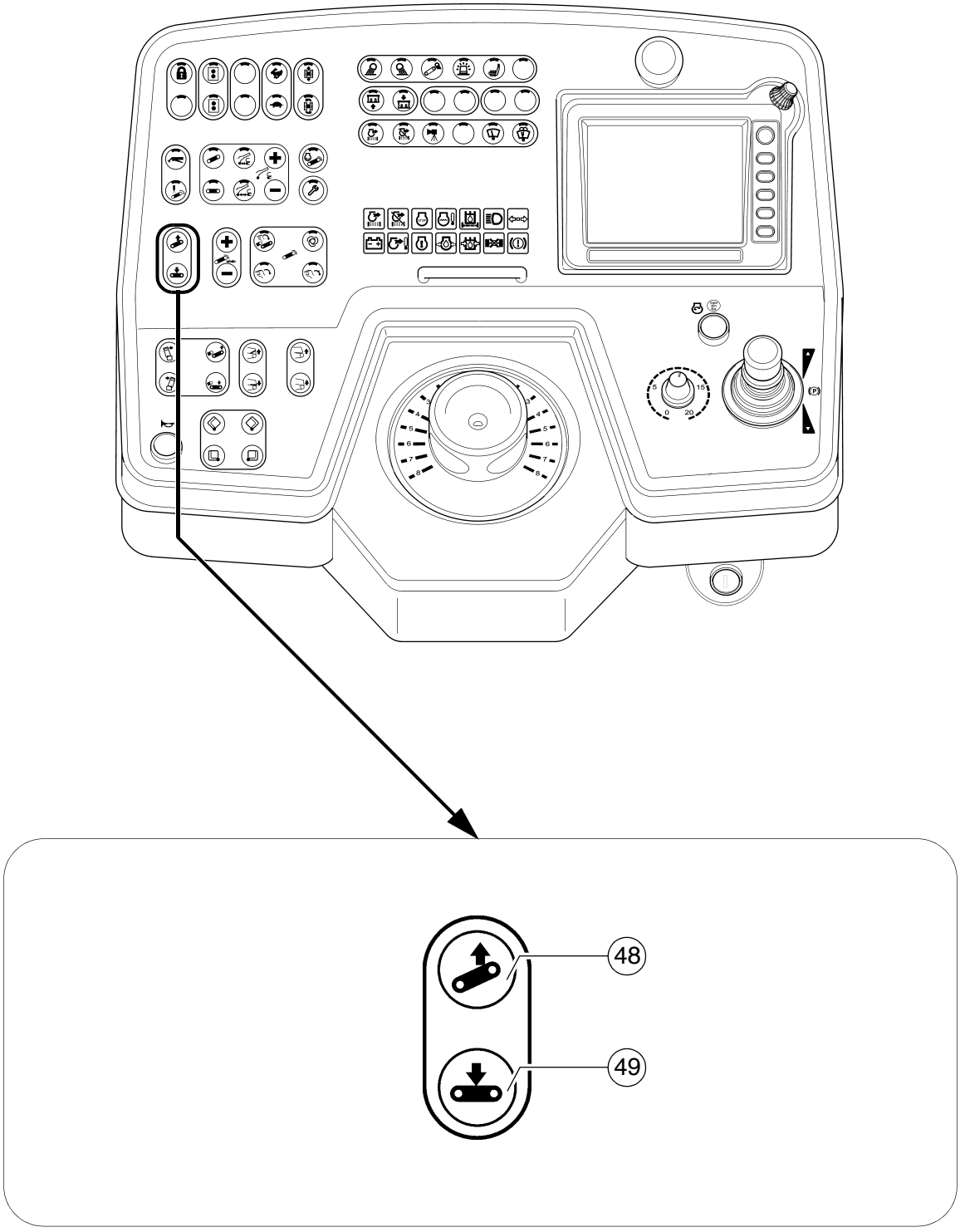
Pos.	Designation	Brief description
40	Slew slewing belt to the left (○)	Pushbutton function: - For slewing the conveyor belt to the left. ☞ This function is not used in vehicle configurations without a slewing belt. STOP On actuation, heed danger zones of moving parts of the vehicle!
41	Slew slewing belt to the right (○)	Pushbutton function: - For slewing the conveyor belt to the right. ☞ This function is not used in vehicle configurations without a slewing belt. STOP On actuation, heed danger zones of moving parts of the vehicle!
42	Raise slewing belt (○)	Pushbutton function: - To raise the slewing belt. ☞ This function is not used in vehicle configurations without a slewing belt. STOP On actuation, heed danger zones of moving parts of the vehicle!
43	Lower slewing belt (○)	Pushbutton function: - To lower the slewing belt. ☞ This function is not used in vehicle configurations without a slewing belt. STOP On actuation, heed danger zones of moving parts of the vehicle!


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Pos.	Designation	Brief description
44	Close front hopper	Pushbutton function: - To close the front hopper flap.  On actuation, heed danger zones of moving parts of the vehicle!
45	Open front hopper	Pushbutton function: - To lower the front hopper flap.  On actuation, heed danger zones of moving parts of the vehicle!

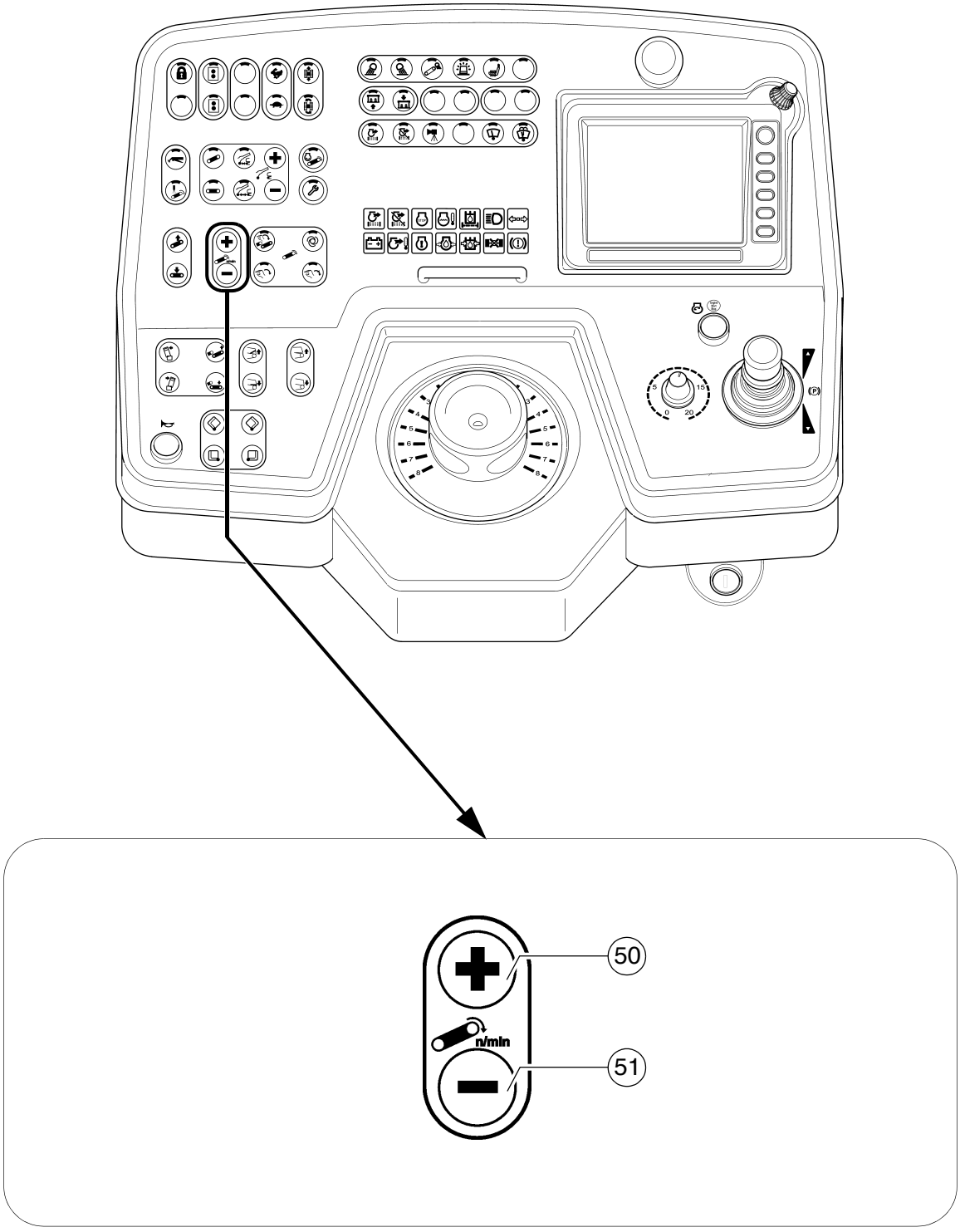

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Pos.	Designation	Brief description
46	Raise drive unit frame	Pushbutton function: - To raise the drive unit frame.  On actuation, heed danger zones of moving parts of the vehicle!
47	Lower drive unit frame	Pushbutton function: - To lower the drive unit frame.  On actuation, heed danger zones of moving parts of the vehicle!

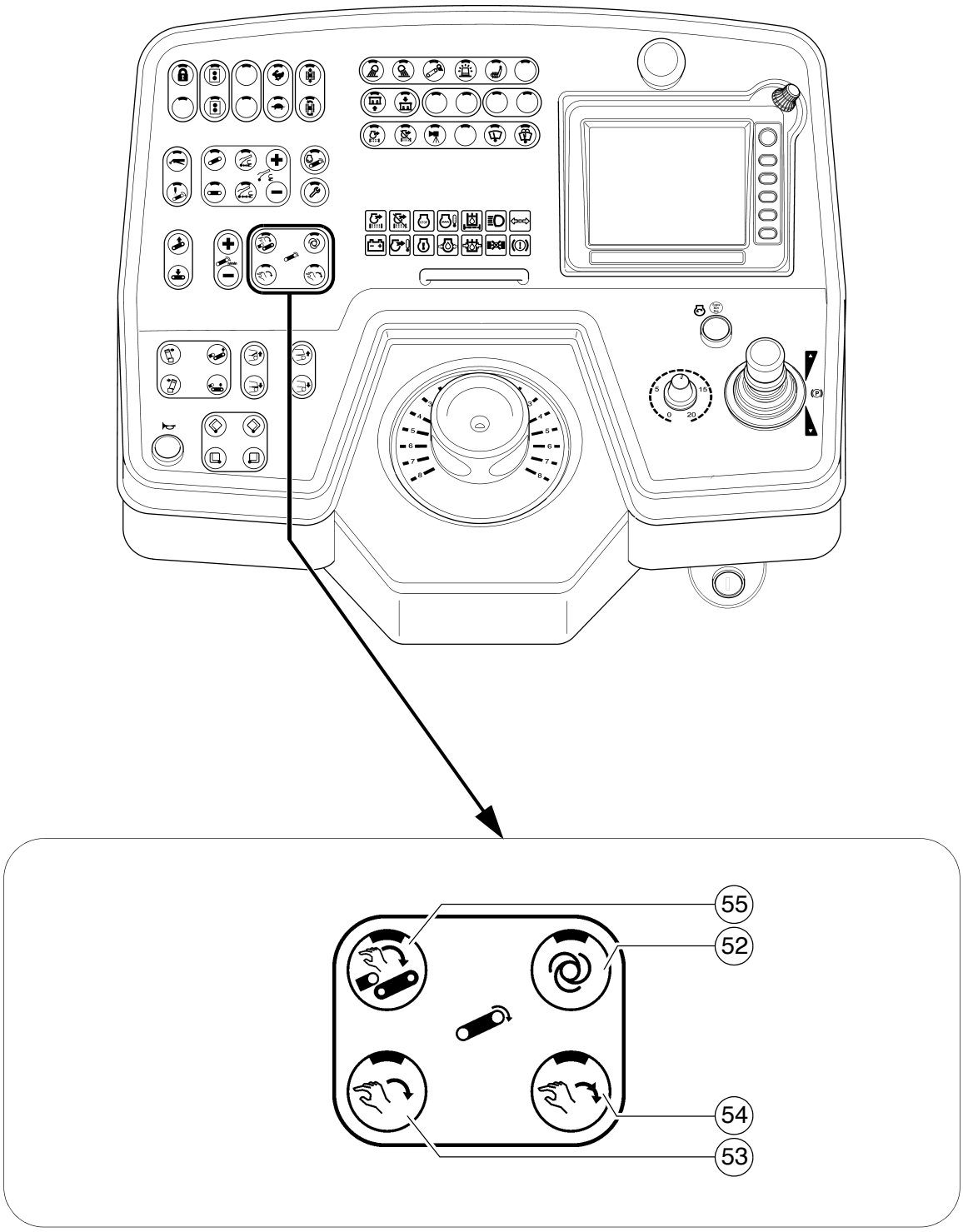

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Pos.	Designation	Brief description
48	Raise main conveyor belt (○)	Pushbutton function: - To raise the main conveyor belt.  On actuation, heed danger zones of moving parts of the vehicle!
49	Lower main conveyor belt (○)	Pushbutton function: - To lower the main conveyor belt.  On actuation, heed danger zones of moving parts of the vehicle!

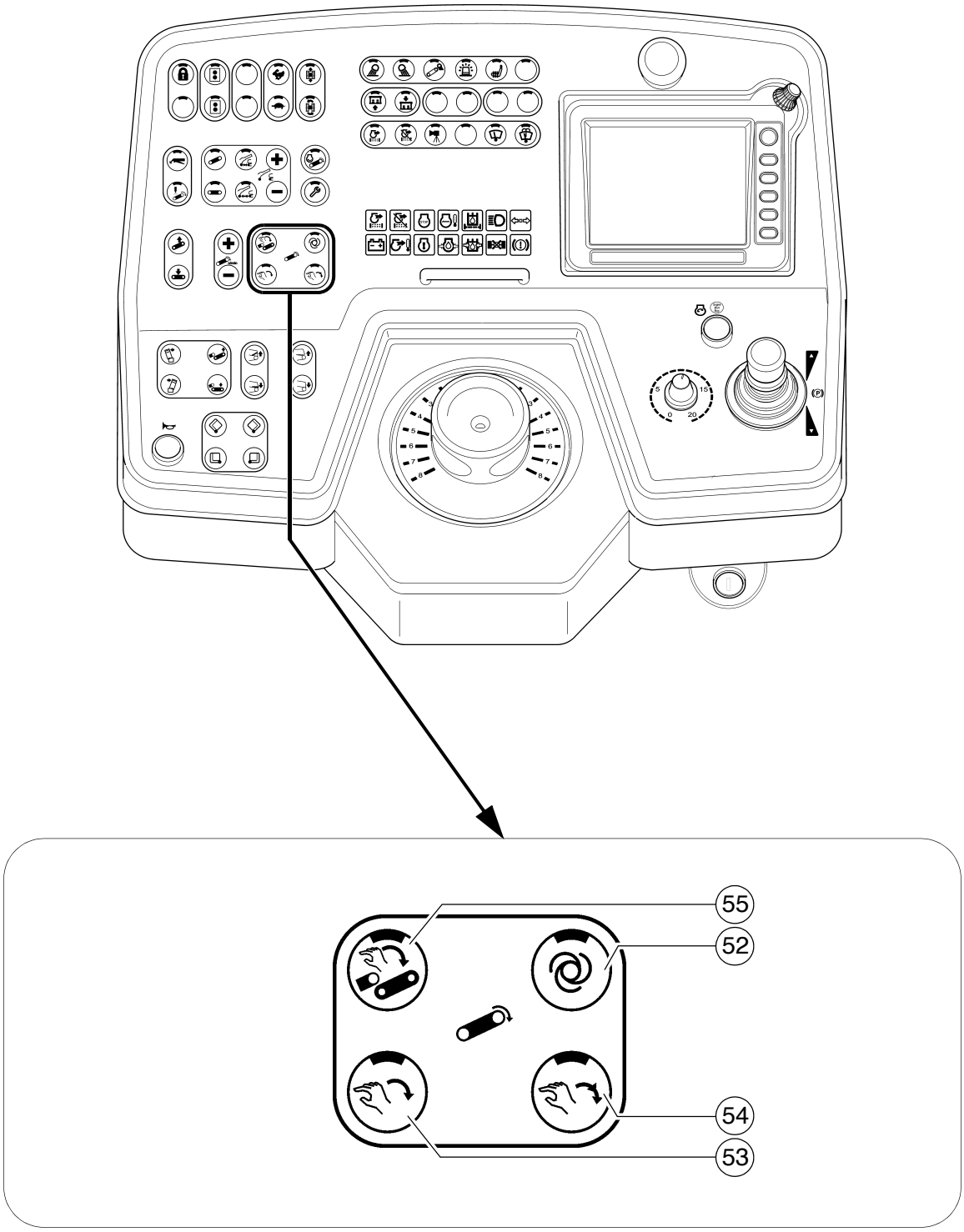
⚠ **MF2500CS**: For joint use of slewing conveyor belt (○) and height-adjustable main conveyor belt (○), the main conveyor belt must be set up to its lowest position during operation!


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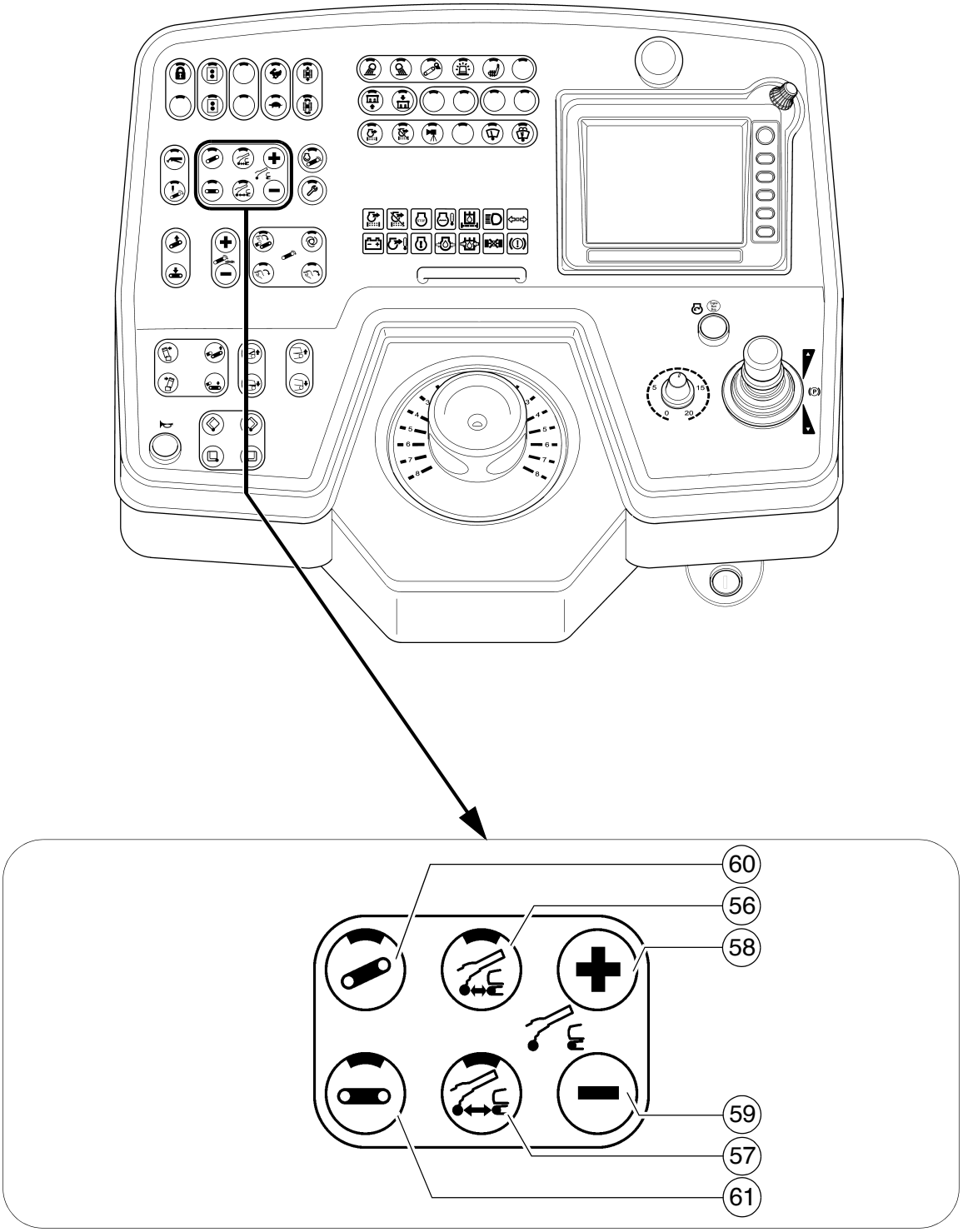
Pos.	Designation	Brief description
50	Main conveyor belt + slewing conveyor belt (○) - Increase conveying rate (+)	Pushbutton function: - To adjust the conveying rate to max. output. Adjustment is carried out in 5% steps.
51	Main conveyor belt + slewing conveyor belt (○) - Reduce conveying rate (-)	Pushbutton function: - To adjust the conveying rate to min. output. Adjustment is carried out in 5% steps.


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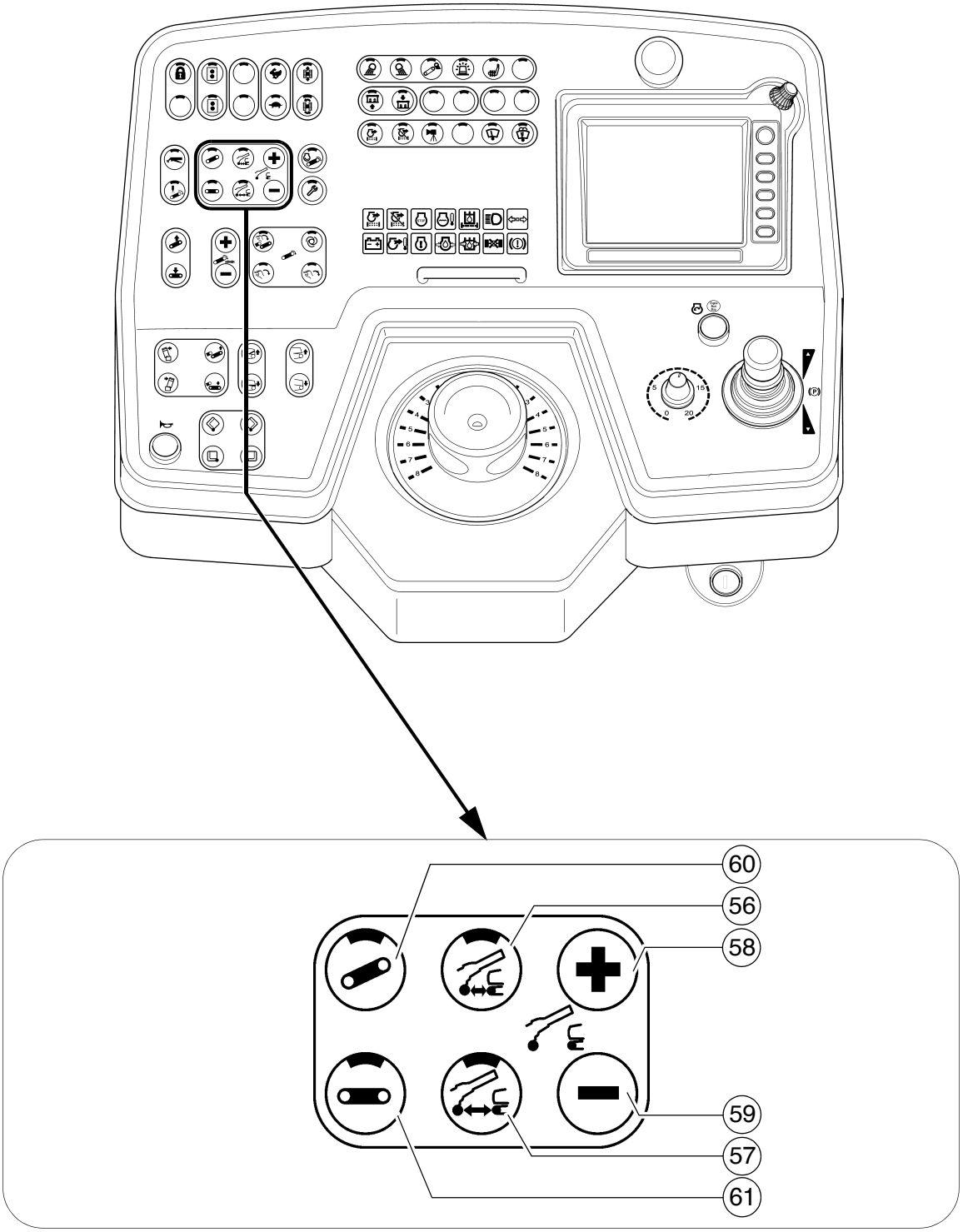
Pos.	Designation	Brief description
52	Main conveyor belt + slewing conveyor belt (○) - "AUTO"	Button with detent switch function and LED feedback: - The conveying function is switched on when the drive lever is swivelled out and is continuously controlled via the material limit switches. - Switch OFF by pressing the button again ☞ The function is shut off by pressing the EMERGENCY STOP button or restarting the vehicle. ☞ The main function switch locks the conveying function. STOP On actuation, heed danger zones of moving parts of the vehicle!
53	Main conveyor belt + slewing conveyor belt (○) - "MANUAL" Slow speed	Button with detent switch function and LED feedback: - The conveying function is switched on continuously at half of the delivery rate, without material control via the limit switches. - Switch OFF by pressing the button again ☞ The function is shut off by pressing the EMERGENCY STOP button or restarting the vehicle. ☞ The main function switch locks the conveying function. STOP On actuation, heed danger zones of moving parts of the vehicle!


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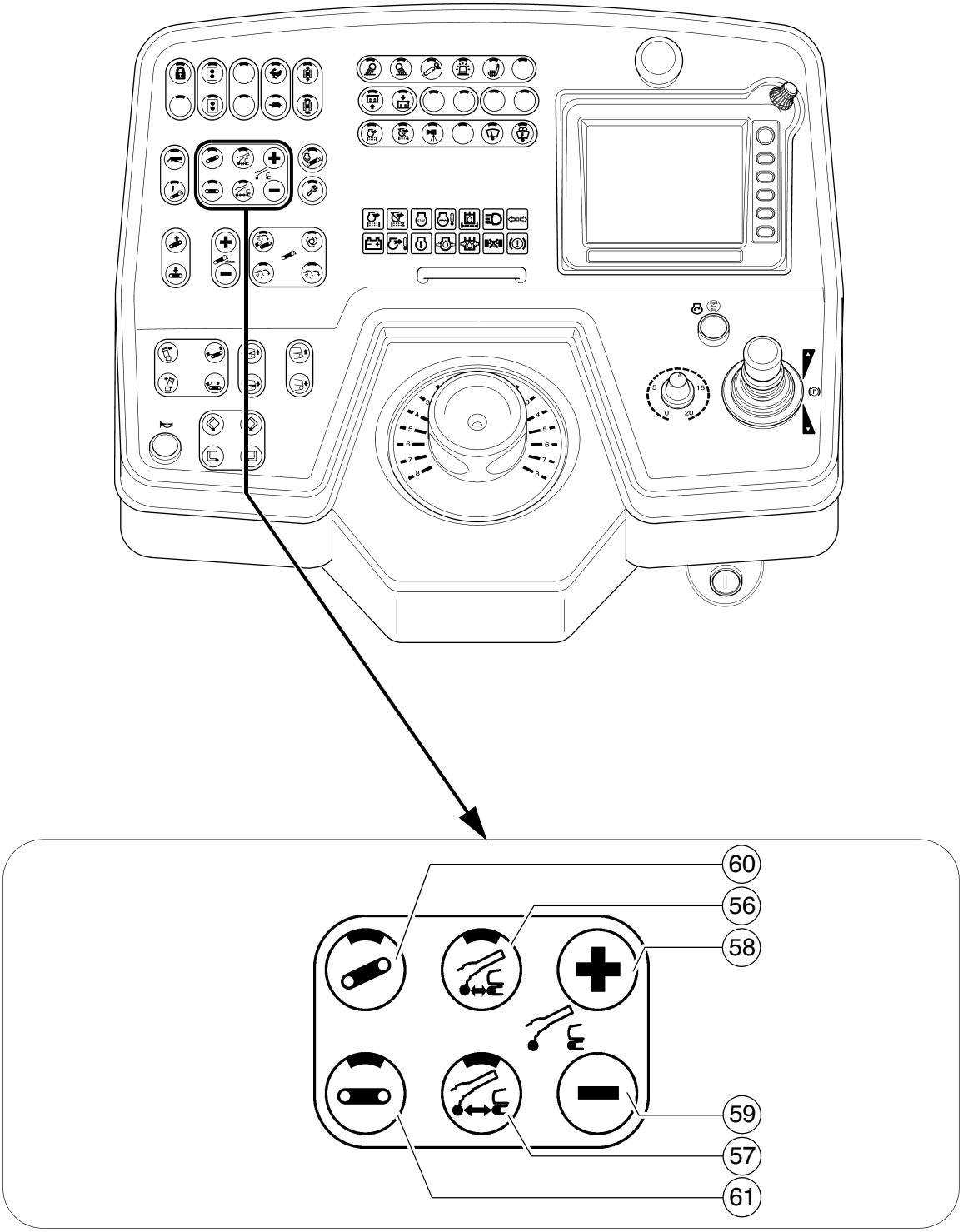
Pos.	Designation	Brief description
54	Main conveyor belt + slewing conveyor belt (○) - "MANUAL" Fast speed	Button with detent switch function and LED feedback: - The conveying function is switched on continuously at high delivery rate, without material control via the limit switches. - Switch OFF by pressing the button again ☞ The function is shut off by pressing the EMERGENCY STOP button or restarting the vehicle. ☞ The main function switch locks the conveying function. STOP On actuation, heed danger zones of moving parts of the vehicle!
55	Slewing conveyor belt (○) - "MANUAL" Slow speed	Button with detent switch function and LED feedback: - The conveying function is switched on constantly, without material control via the limit switches. - Switch OFF by pressing the button again ☞ The function is shut off by pressing the EMERGENCY STOP button or restarting the vehicle. ☞ The main function switch locks the conveying function. STOP On actuation, heed danger zones of moving parts of the vehicle!


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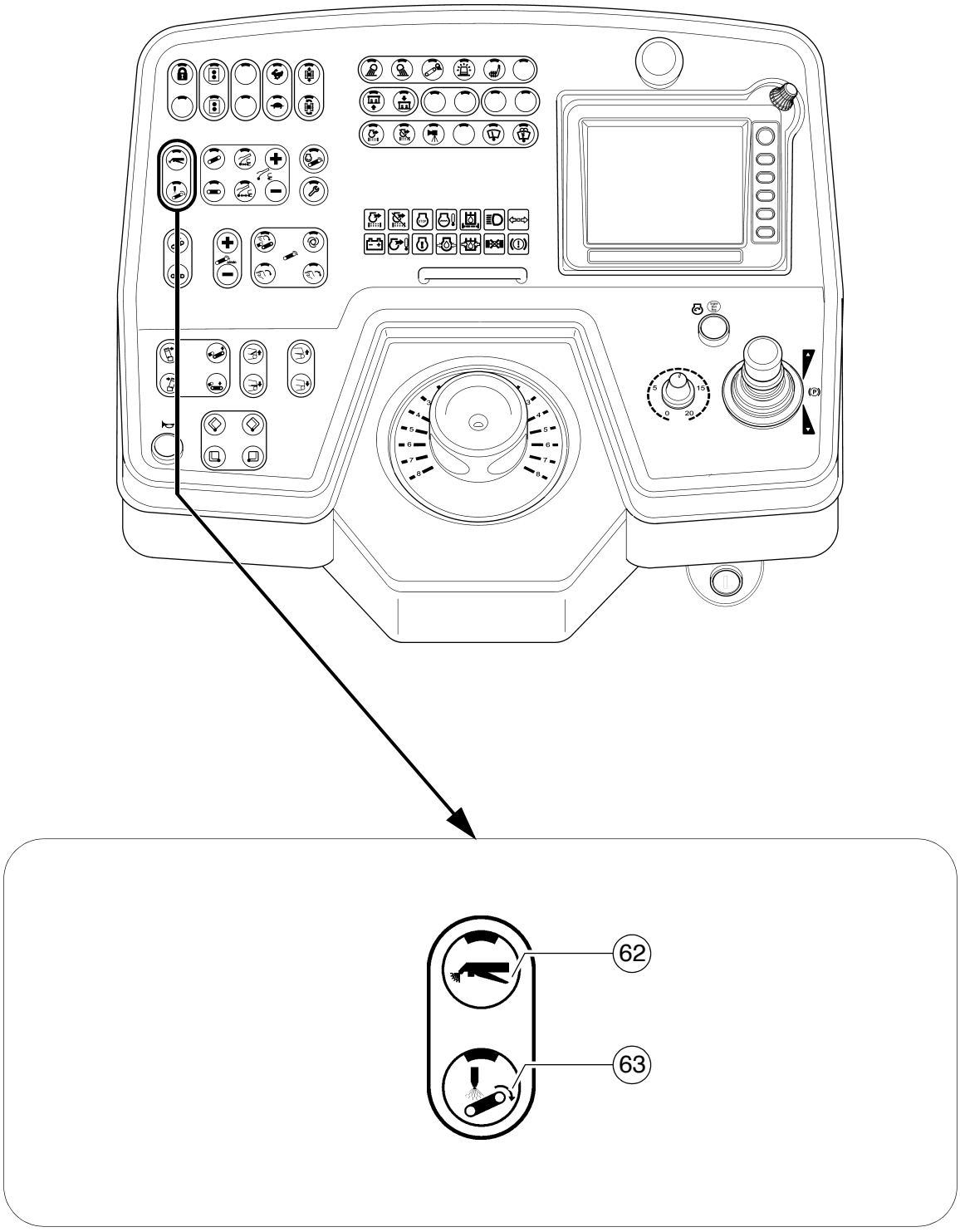
Pos.	Designation	Brief description
56	Distance control ON / OFF Stage I, save distance value (○)	Button with detent switch function and LED feedback: ☞ Distance control can only be activated whilst the vehicle is moving in working gear when the conveying function is engaged. The vehicle speed is automatically adapted to the speed of the paver finisher. When the paver finisher comes to a stop, the feeder is halted and all "Auto" functions are paused. - Activate distance control when the feeder has reached the desired position and the distance is to be maintained. - Switch OFF by pressing the button again. ☞ Distance values in the memory: If the current position is maintained, the LEDs on both distance control buttons light up. To end distance control, move the drive lever into its centre position. - Press the button again to use the stored distance value. ☞ If the distance value from the memory is used, only the relevant button's LED lights up. - Switch OFF by pressing the button again. - To save the current distance value (memory location 1), press the button for approx. 2 sec. ☞ For further information on the stored distance values, refer to the section entitled "Input and display terminal" ☞ Distance control can be activated in a distance range between 0.2 and 9.9 m. ☞ If necessary, adjust the distance using buttons (58)/(59).


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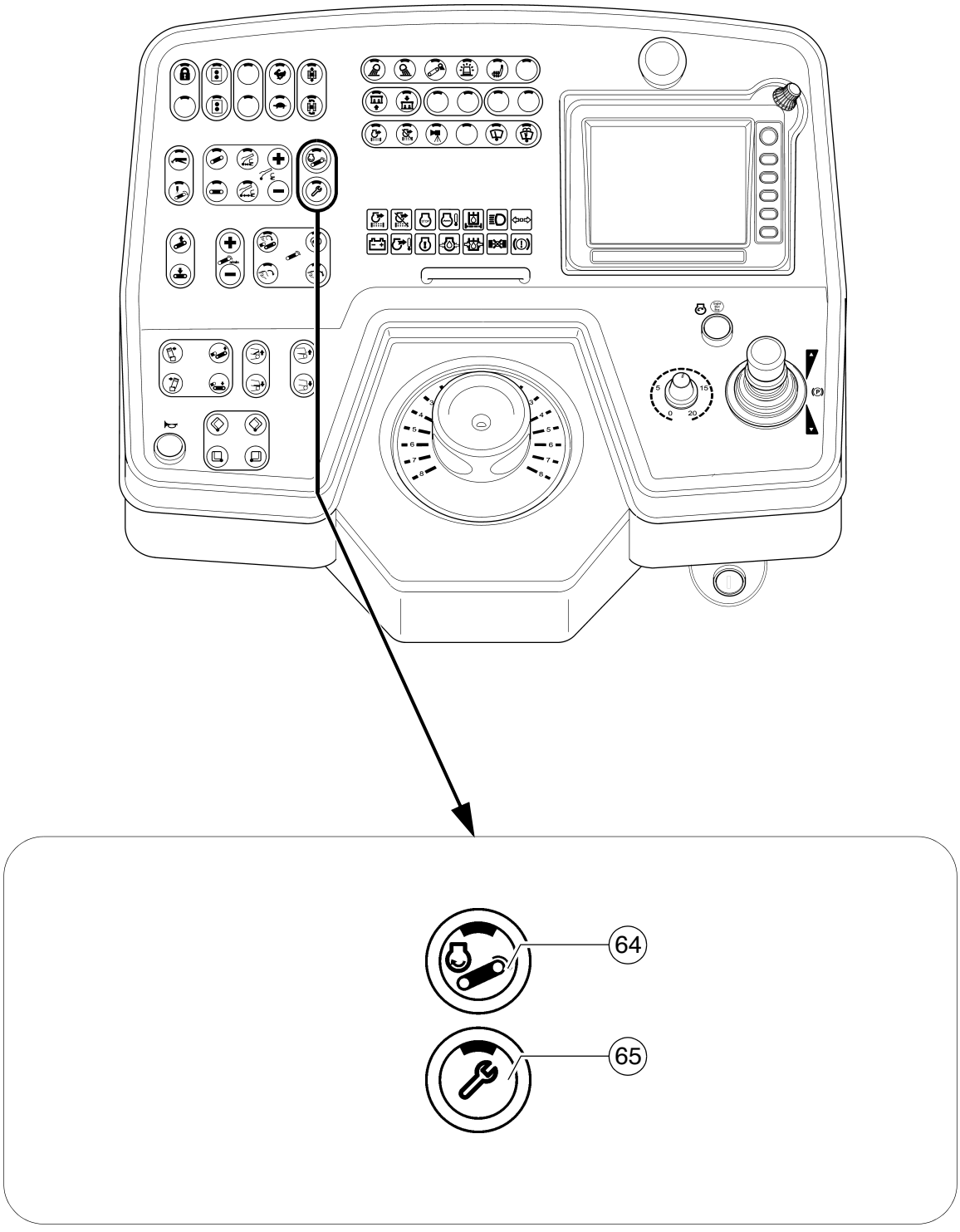
Pos.	Designation	Brief description
57	Distance control ON / OFF Stage II Save distance value (○)	Button with detent switch function and LED feedback: ☞ Distance control can only be activated whilst the vehicle is moving in working gear when the conveying function is engaged. The vehicle speed is automatically adapted to the speed of the paver finisher. When the paver finisher comes to a stop, the feeder is halted and all "Auto" functions are paused. - Activate distance control when the feeder has reached the desired position and the distance is to be maintained. - Switch OFF by pressing the button again. ☞ Distance values in the memory: If the current position is maintained, the LEDs on both distance control buttons light up. To end distance control, move the drive lever into its centre position. - Press the button again to use the stored distance value. ☞ If the distance value from the memory is used, only the relevant button's LED lights up. - Switch OFF by pressing the button again. - To save the current distance value (memory location 2), press the button for approx. 2 sec. ☞ For further information on the stored distance values, refer to the section entitled "Input and display terminal" ☞ Distance control can be activated in a distance range between 0.2 and 9.9 m. ☞ If necessary, adjust the distance using buttons (58)/(59).


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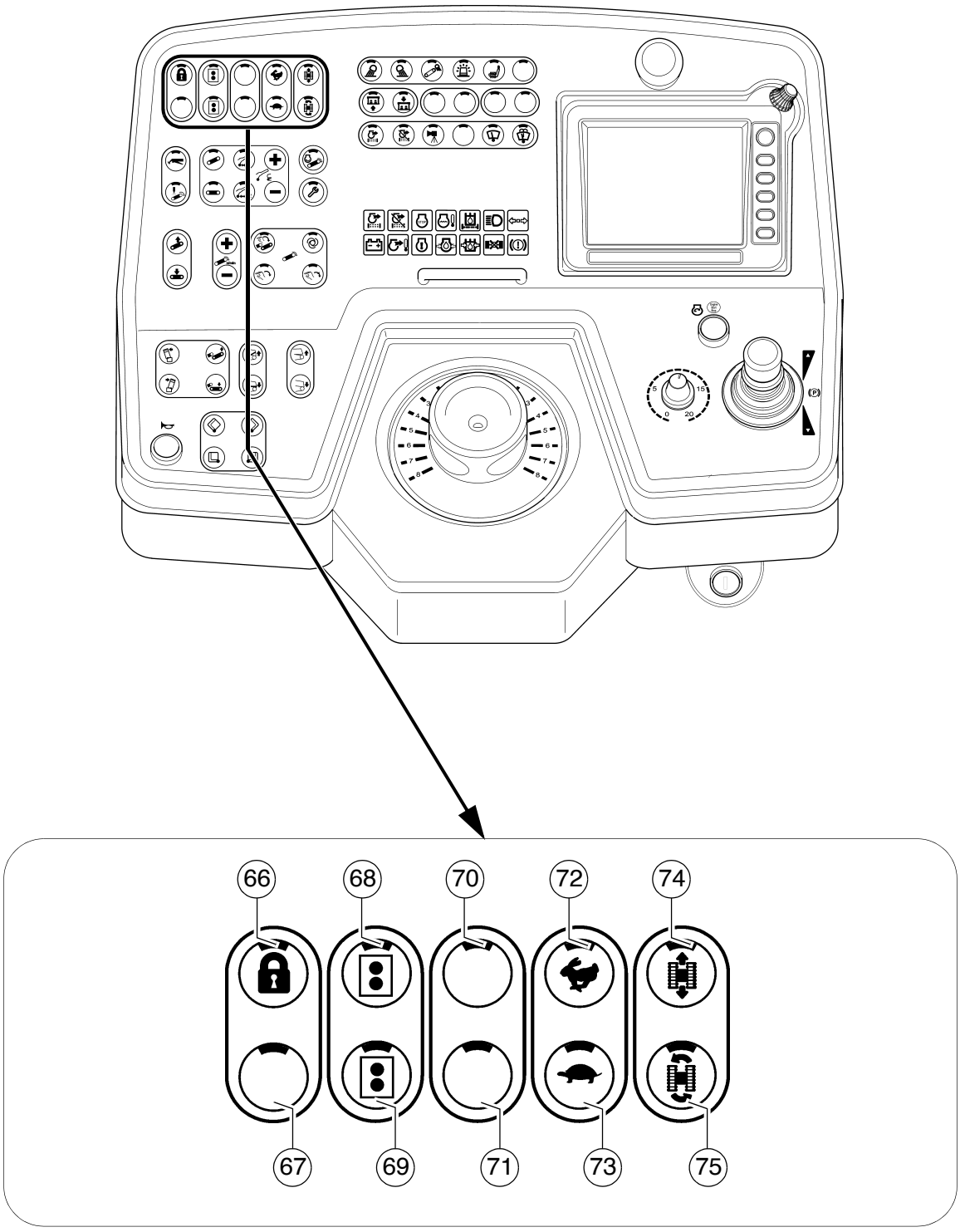
Pos.	Designation	Brief description
58	Distance control - Increase distance (+)	Pushbutton function: - To adjust the distance to max. Adjustment is carried out in 10cm steps. ☞ Adjustment range max. + 1 m.
59	Distance control - Reduce distance (-)	Pushbutton function: - To adjust the distance to min. Adjustment is carried out in 10cm steps. ☞ Adjustment range max. -1 m.
60	Preselection Belt position "top", save position (○)	Button with detent switch function and LED feedback: - On actuation, the conveyor belt moves to a defined upper position. - To save the belt position (memory location 1), press the button for approx. 2 sec. ☞ If the conveyor moves to the stored belt position by pressing the button, the LED goes out on reaching the position. ☞ Refer to the section entitled "Input and display terminal" for use of the stored belt position. STOP On actuation, heed danger zones of moving parts of the vehicle!
61	Preselection Belt position "bottom", save position (○)	Button with detent switch function and LED feedback: - On actuation, the conveyor belt moves to a defined lower position. - To save the belt position (memory location 2), press the button for approx. 2 sec. ☞ If the conveyor moves to the stored belt position by pressing the button, the LED goes out on reaching the position. ☞ Refer to the section entitled "Input and display terminal" for use of the stored belt position. STOP On actuation, heed danger zones of moving parts of the vehicle!


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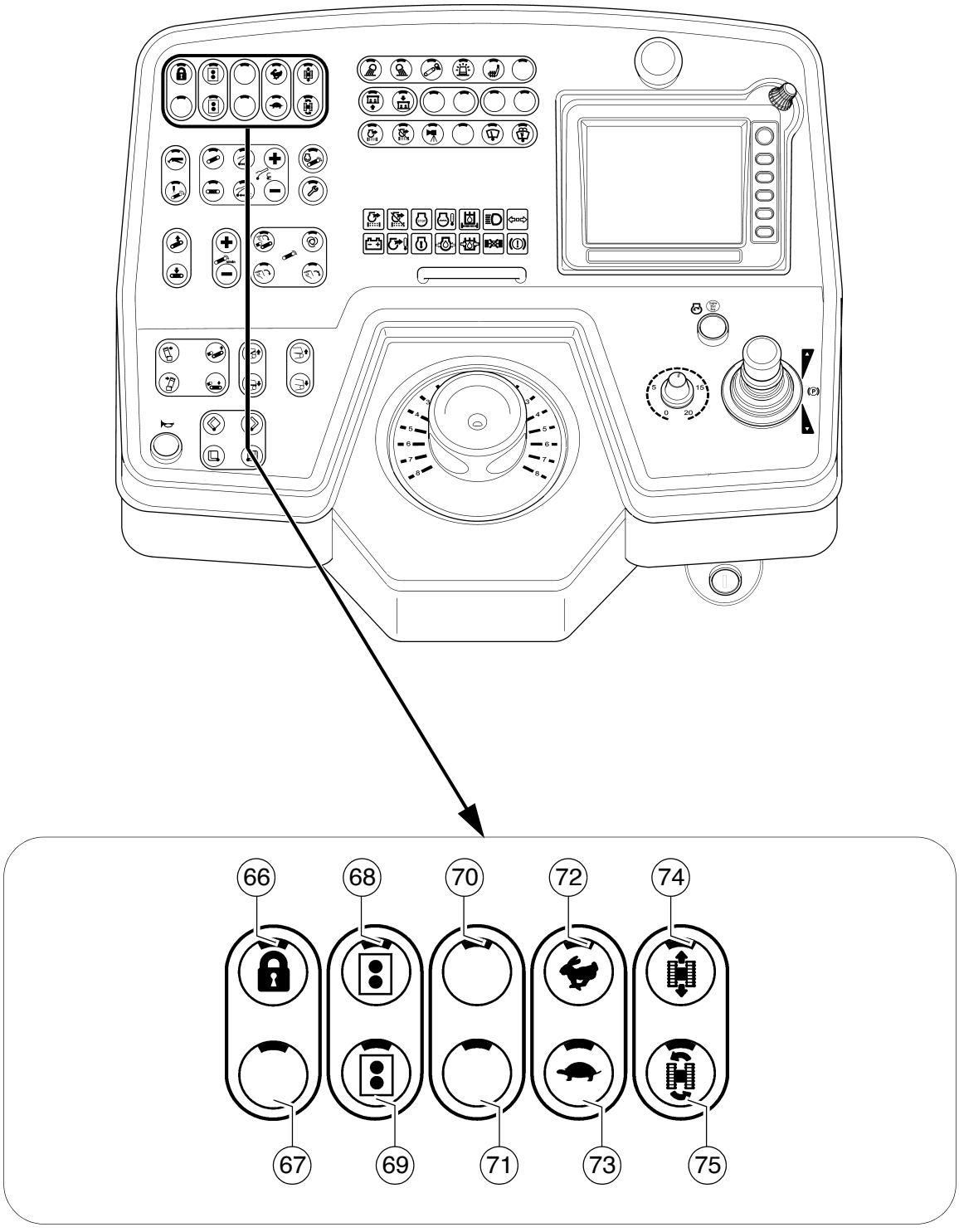
Pos.	Designation	Brief description
62	Separator fluid spray system ON / OFF	Button with detent switch function and LED feedback: - On engagement, work can be undertaken with the manual emulsion spray. - Switch OFF by pressing the button again. Do not spray into open flame or on hot surface! Danger of explosion! If the tank is empty, the pump shuts off automatically.
63	Conveyor belt spraying system "AUTO"	Button with detent switch function and LED feedback: - The conveyor belt spraying system is switched on on engaging the conveying function. - Switch OFF by pressing the button again. Automatic shut-off takes place after one complete conveyor belt revolution.


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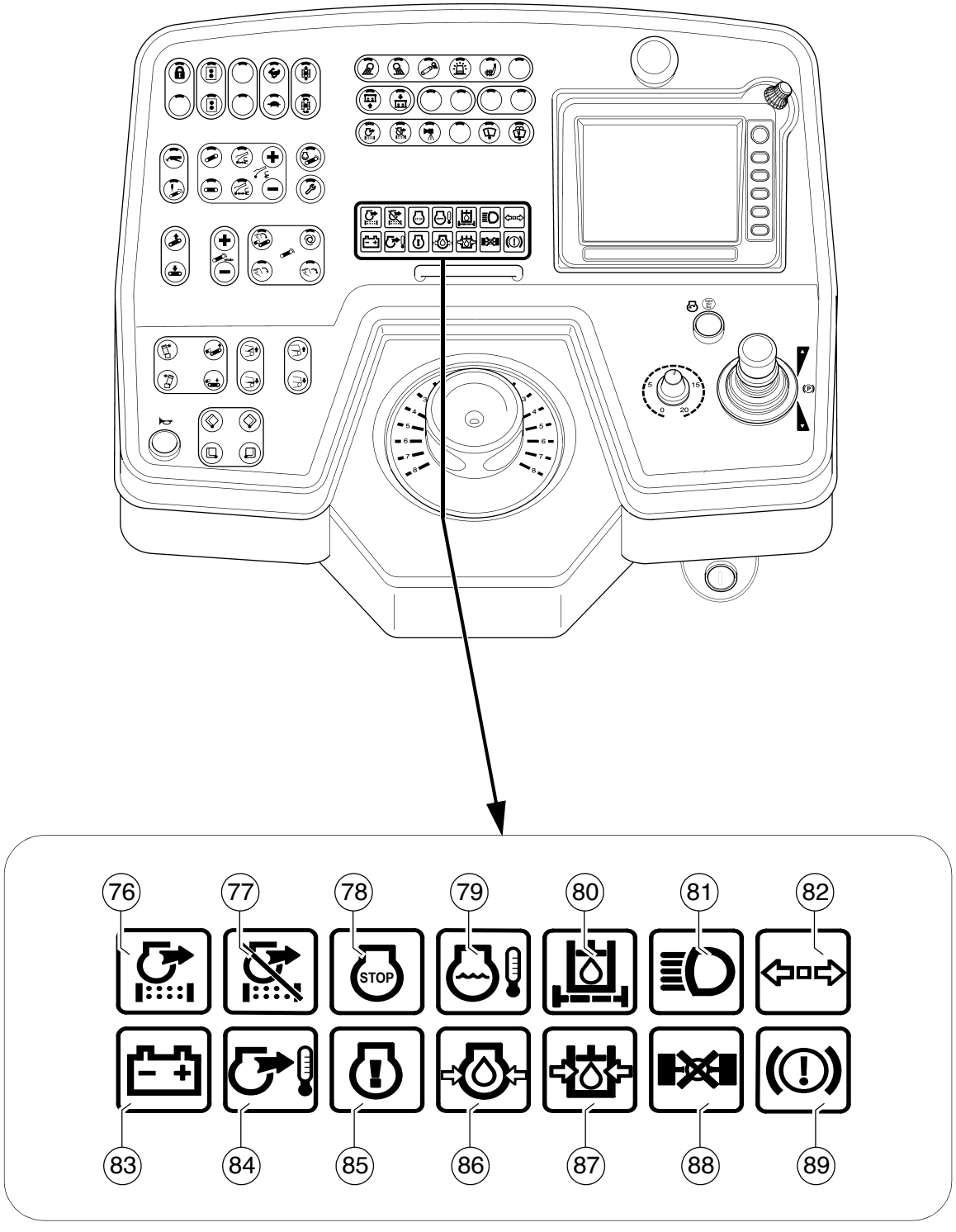
Pos.	Designation	Brief description
64	Fill vehicle for conveying process	Detent switch function with LED feedback: - Filling function for the conveying process. The diesel engine's speed is increased to the preselected nominal speed and all functions set to "Automatic" are engaged. ☞ The main function switch must be set to the OFF position. - Switch OFF by pressing the button again or by swivelling the drive lever out to the paving position. - On reaching the adjusted material height (material sensor), the filling function is automatically switched off. STOP On actuation, heed danger zones of moving parts of the vehicle!
65	Set-up mode	Detent switch function with LED feedback: - When the vehicle is stationary, this function enables all operating functions, which are only activated when the drive lever is swivelled out (vehicle driving), to be started up. ☞ The main function switch must be set to the OFF position. ☞ The engine speed is increased to the preselected nominal value.


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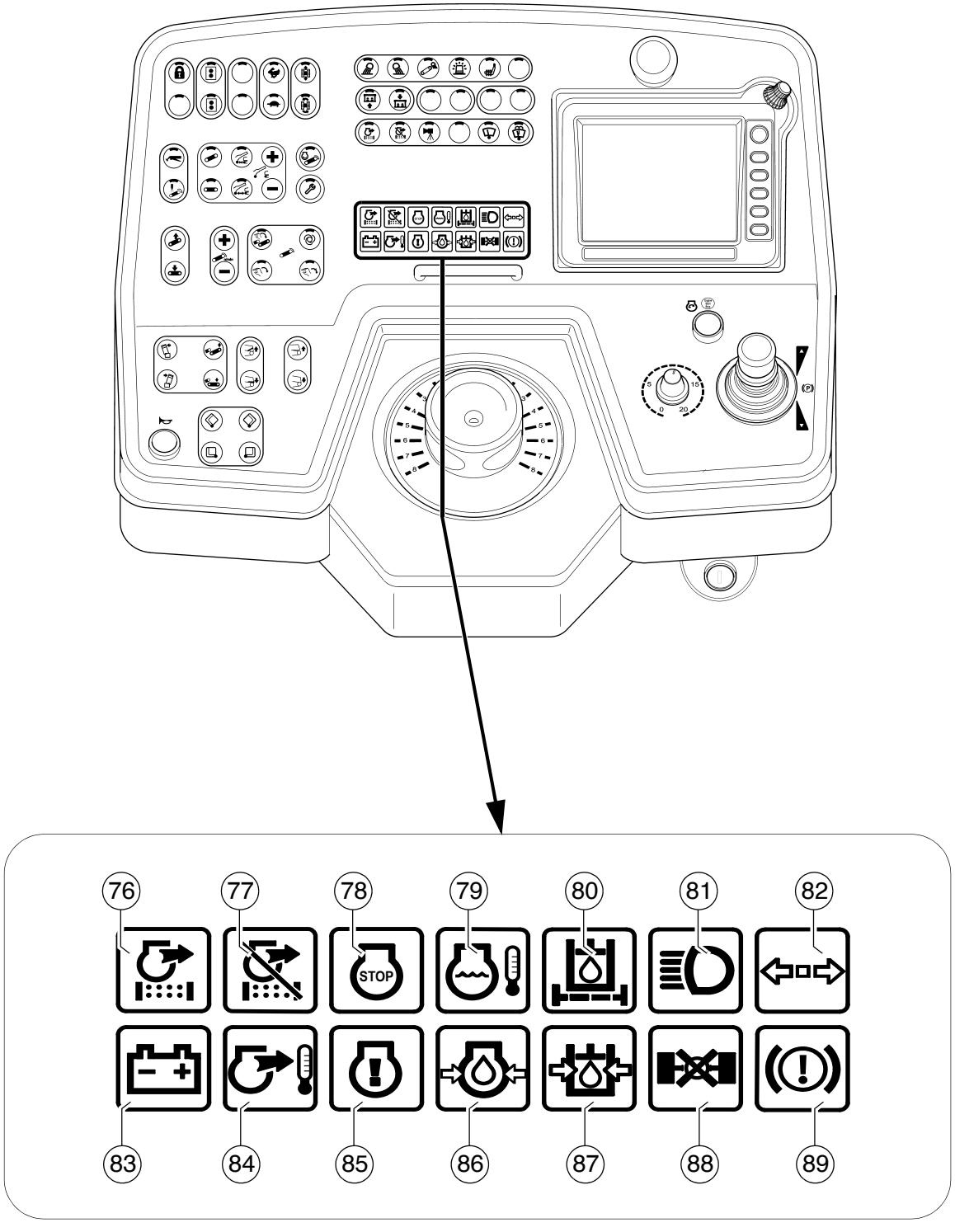
Pos.	Designation	Brief description
66	Main function switch	Detent switch function with LED feedback: - To lock all "Auto" functions. Despite "Auto" settings in the individual functions, these are not activated when the drive lever is swivelled out. - Switch OFF by pressing the button again. ☞ The preset vehicle can be relocated and released at the new paving location. The conveying process is continued on swivelling the drive lever out. ☞ On restarting, the function is set to "ON".
67	Not used	
68	Signal system - red ON / OFF (○)	Button with detent switch function and LED feedback: - Engage signal system "RED" to request the corresponding material or indicate its conveying. - Alternate switching with "Signal system - green", press the button again to switch off.
69	Signal system - green ON / OFF (○)	Button with detent switch function and LED feedback: - Engage signal system "GREEN" to request the corresponding material or indicate its conveying. - Alternate switching with "Signal system - red", press the button again to switch off.
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71	Not used	


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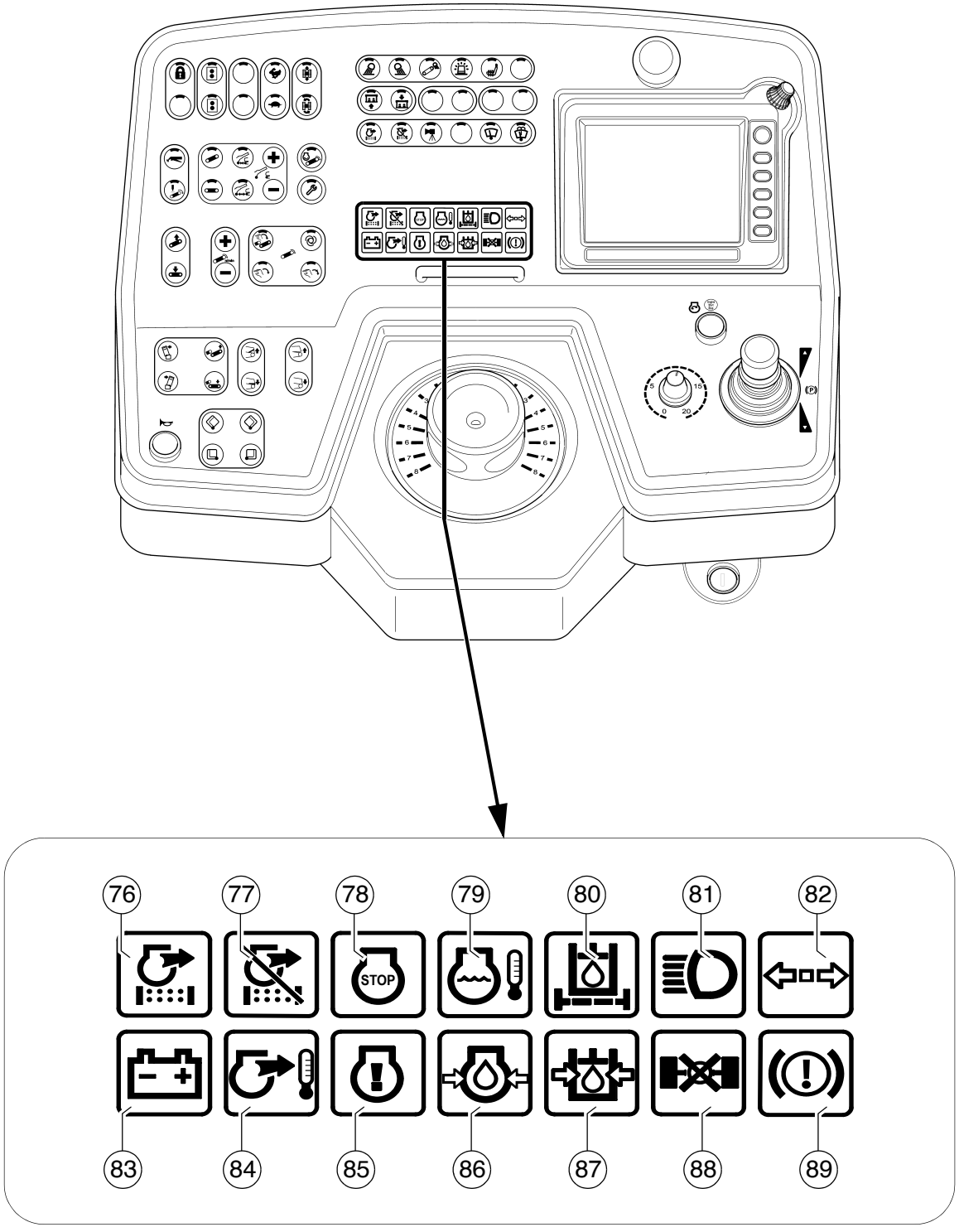
Pos.	Designation	Brief description
72	Traction drive speed fast (hare) - transport speed	Buttons with detent switch function and LED feedback: - To preselect the speed level -transport speed ☞ On restarting, the speed is set to operating speed (tortoise).
73	Traction drive speed slow (tortoise) working gear	Buttons with detent switch function and LED feedback: - To preselect the speed level -operating speed. ☞ On restarting, the buttons are set to operating speed (tortoise).
74	Straight-ahead travel	Button with detent switch function and LED feedback: - Normal position for straight-ahead travel. ☞ On restarting, the "Straight-ahead travel" button is set. ☞ If the "Turning on the spot" function has been inadvertently activated (and the steering is set to straight-ahead travel), the vehicle does not move. This is often interpreted as a "malfunction".
75	Turning on the spot	Button with detent switch function and LED feedback: - The vehicle turns on the spot (the caterpillar chain-sare) - transport sperun in opposite directions) when the steering is set to "10". - Steering turned to the left = vehicle turns to the left - Steering turned to the right = vehicle turns to the right ☞ The function can only be activated in the working gear ("travel drive slow") speed. ☞ If the "Turning on the spot" function has been inadvertently activated (and the steering is set to straight-ahead travel), the vehicle does not move. This is often interpreted as a "malfunction". STOP When the vehicle turns, persons and objects next to the vehicle are in extreme danger. Monitor the area where the vehicle turns!


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Pos.	Designation	Brief description
76	Indicator lamp particulate filter maintenance (○)	Lights up when particulate filter regeneration is necessary. - Indicator lamp on permanently: Urgent maintenance, level I. Particulate filter regeneration must be carried out as soon as the operating status of the vehicle permits. - Indicator lamp flashes: Urgent maintenance, level II. Particular filter regeneration must be carried out as soon as possible. - Indicator lamp flashes + indicator lamp "Engine malfunction" (85) is on permanently. Urgent maintenance, level III. Particulate filter regeneration is vitally necessary to avoid subsequent damage and repairs. - Indicator lamp goes off + indicator lamp "Engine malfunction" (78) is on permanently. Particulate filter regeneration is no longer possible. ⚠ Operation must be stopped immediately. ☞ Consult the Dynapac service department.
77	Indicator lamp particulate filter Particulate filter regeneration, automatic - deactivated (○)	Lights up when particulate filter regeneration is deactivated. ☞ Automatic regeneration should only be deactivated if the operating status of the vehicle does not permit any automatic function.
78	Error message "Serious error" (red)	Lights up when a serious error has occurred on the engine. ⚠ Switch off the drive engine immediately! ☞ The error code can be retrieved using the "Call up error/malfunction" switch. ☞ Lights up for a few seconds once the ignition has been switched on for checking purposes.

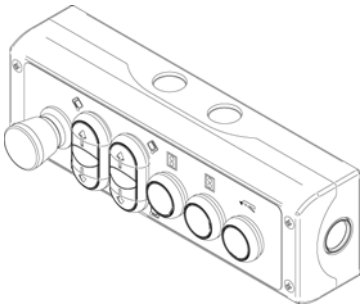

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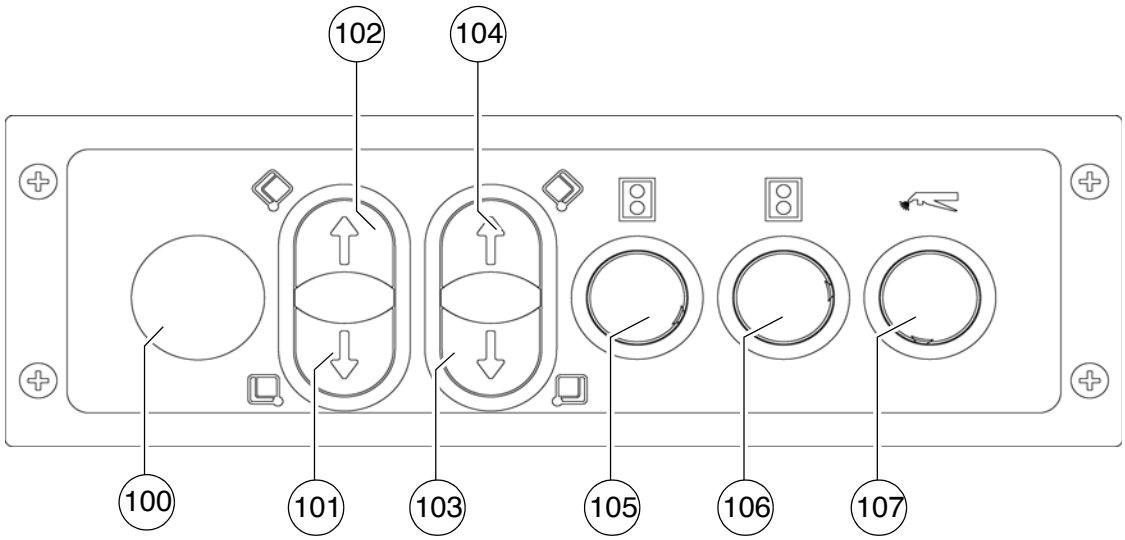
Pos.	Designation	Brief description
79	Indicator lamp Engine coolant temperature	Lights up when the engine temperature is too high. ⚠ The engine performance will be throttled down automatically. (Driving mode remains possible). Stop the vehicle (drive lever in centre position), let the engine cool down while idling. Determine the cause and rectify if necessary (refer to "Malfunctions" section). After cooling down to normal temperature, the engine will run with full performance again. ☞ Indicates the fault together with the "Error message" lamp.
80	Indicator lamp hydraulic filter	Lights up when the hydraulic filter needs replacing. ☞ Replace filter element acc. to Maintenance Instructions!
81	Not used	
82	Not used	
83	Battery charge indicator (red)	Must go out after starting when the engine revs up. - If the light does not go out, switch off the engine
84	"HEST" warning message (○)	The HEST lamp lights up when the exhaust gas temperature is increased due to particulate filter regeneration. This is a normal process and does not indicate a fault. ⚠ When this lamp lights up, make sure that the exhaust pipe is not pointing at flammable materials or surfaces!
85	Error message (yellow)	Indicates that there is a drive engine fault. Depending on the type of fault, the vehicle can temporarily continue to be operated or, in the case of serious faults, should be shut down immediately to prevent further damage from occurring. Each fault should be rectified as soon as possible! ☞ The error code can be retrieved using the "Call up error/malfunction" switch. ☞ Lights up for a few seconds once the ignition has been switched on for checking purposes.


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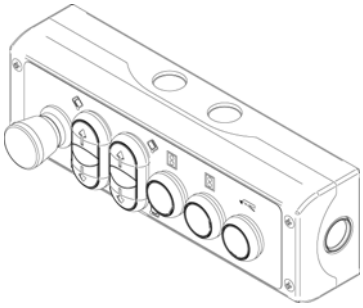
Pos.	Designation	Brief description
86	Oil pressure indicator lamp for the diesel engine (red)	⚠ Lights up when the oil pressure is too low. Switch off the engine immediately! For further possible faults, see Engine's operating instructions. ☞ Indicates the fault together with the "Error message" lamp.
87	Oil pressure indicator for the hydraulic travel 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 travel 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.
88	Not used	
89	Not used	

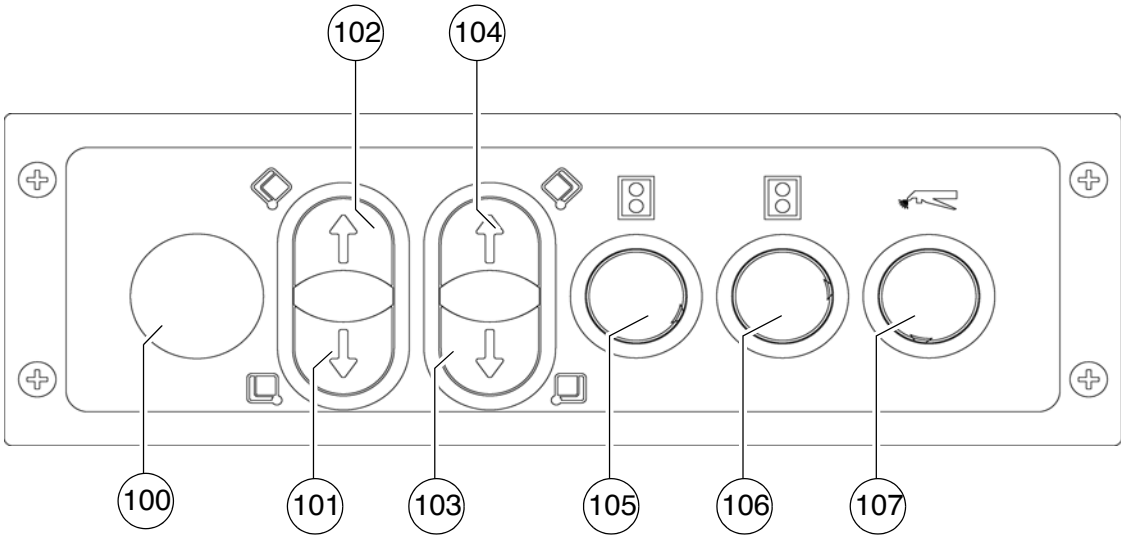
Side operating unit - front





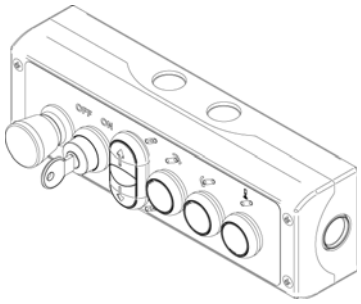
Pos.	Designation	Brief description
100	Emergency stop button	Press in an emergency (danger to persons, impending collision, etc.)! - Pressing the emergency stop button switches off the engine, the drives and the steering system. Making way, moving the conveyor belt, etc. is then no longer possible! Danger of accidents! - To restart the engine, the button must be pulled out again.
101	Open hopper left	Pushbutton function: - To open the left hopper lid + front hopper.  On actuation, heed danger zones of moving parts of the vehicle!
102	Close hopper left	Pushbutton function: - To close the left hopper lid + front hopper.  On actuation, heed danger zones of moving parts of the vehicle!
103	Open hopper right	Pushbutton function: - To open the right hopper lid + front hopper.  On actuation, heed danger zones of moving parts of the vehicle!
104	Close hopper right	Pushbutton function: - To close the right hopper lid + front hopper.  On actuation, heed danger zones of moving parts of the vehicle!

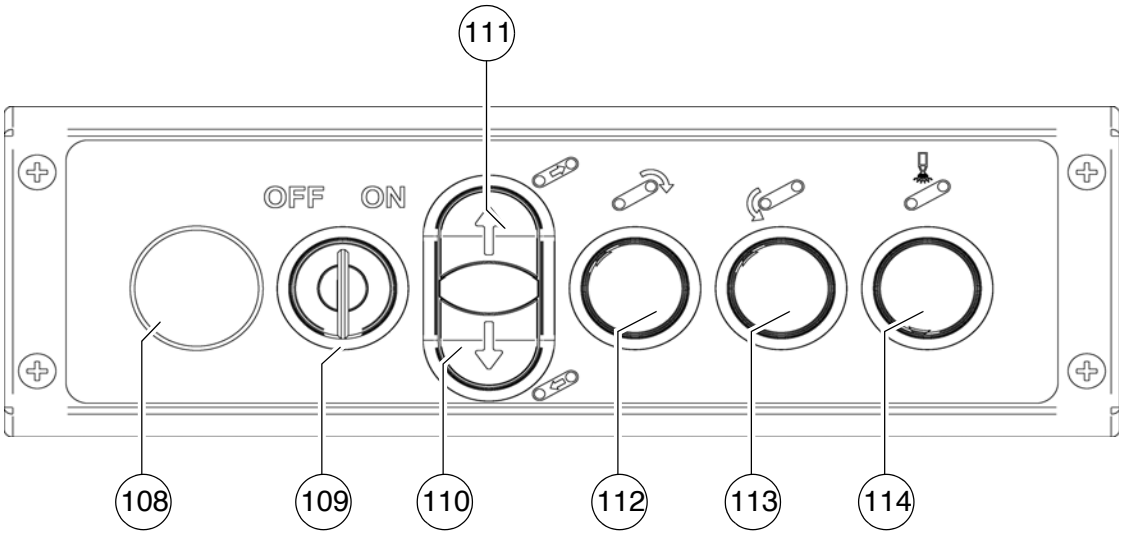



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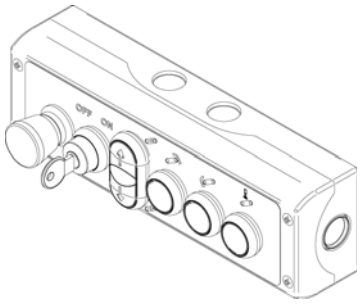
Pos.	Designation	Brief description
105	Signal system - green ON / OFF (○)	Button with detent switch function: E.g. for communication with material transporter and material recipient during compact asphalt paving. - Engage signal system "GREEN" to request the corresponding material or indicate its conveying. - Alternate switching with "Signal system - green", press the button again to switch off.
106	Signal system - red ON / OFF (○)	Button with detent switch function: E.g. for communication with material transporter and material recipient during compact asphalt paving. - Engage signal system "RED" to request the corresponding material or indicate its conveying. - Alternate switching with "Signal system - green", press the button again to switch off.
107	Emulsion spraying system ON / OFF	Button with detent switch function: - On engagement, work can be undertaken with the manual emulsion spray. - Switch OFF by pressing the button again.  Do not spray into open flame or on hot surface! Danger of explosion!  If the tank is empty, the pump shuts off automatically.

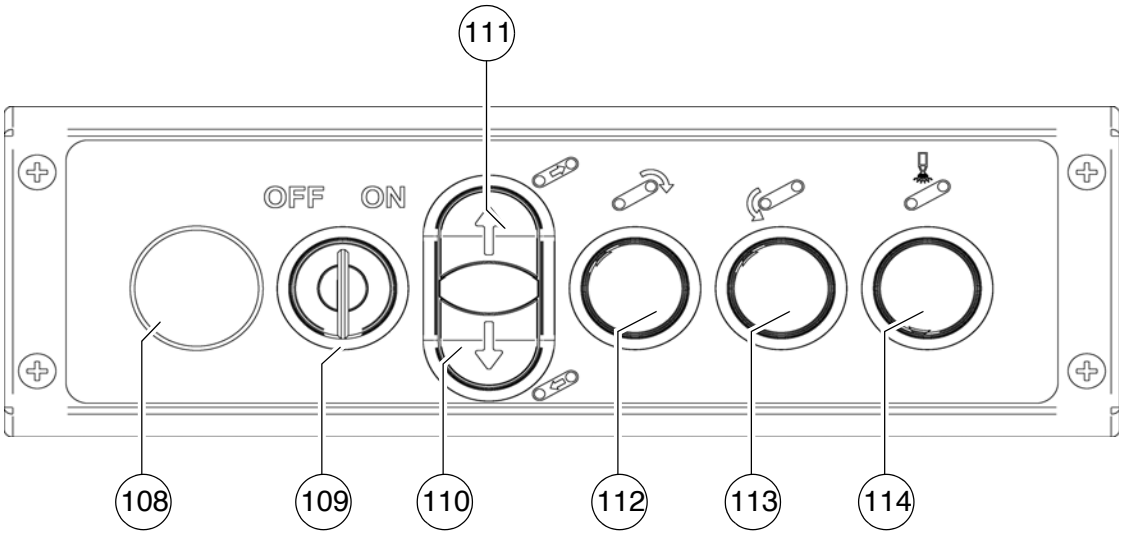
Side operating unit - rear





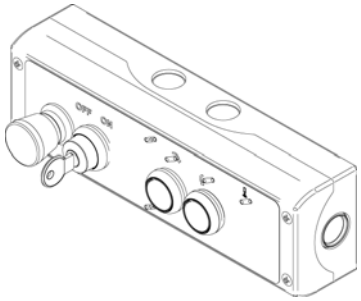
Pos.	Designation	Brief description
108	Emergency stop button	Press in an emergency (danger to persons, impending collision, etc.)! - Pressing the emergency stop button switches off the engine, the drives and the steering system. Making way, moving the conveyor belt, etc. is then no longer possible! Danger of accidents! - To restart the engine, the button must be pulled out again.
109	Key switch conveyor belt maintenance	Key switch with detent switch function: - For releasing and blocking the conveyor belt maintenance functions. - Switch setting I: functions released - Switch setting 0: functions blocked, remove key. ☞ Observe maintenance intervals for conveyor belt tension! ⚠ If the function is not required, remove the key from the switch. ☞ When conveyor belt maintenance is engaged, all conveyor belt functions on the operating panel are blocked.
110	Increase conveyor belt tension	Button with pushbutton function: - To increase the conveyor belt tension. ☞ Observe maintenance intervals for and regulations regarding conveyor belt tension!
111	Decrease conveyor belt tension	Button with pushbutton function: - To reduce the conveyor belt tension. ☞ Observe maintenance intervals for and regulations regarding conveyor belt tension!

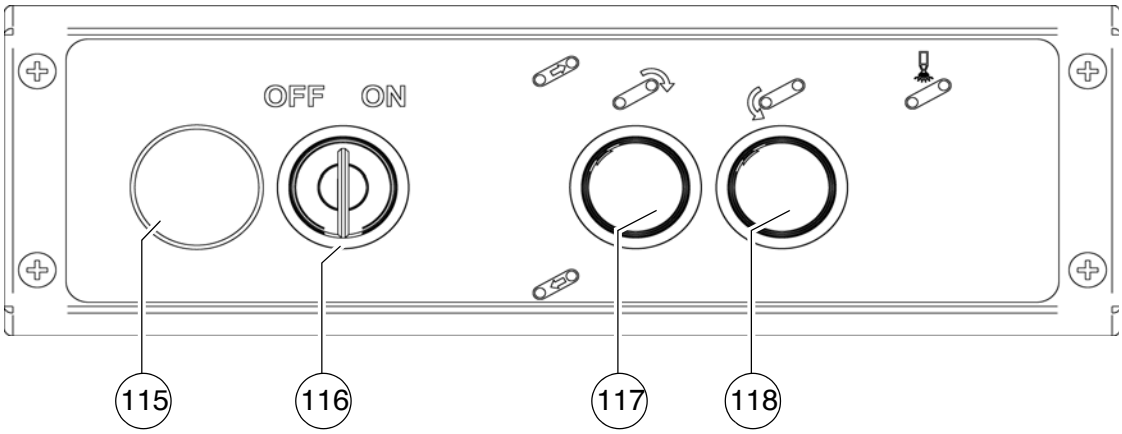



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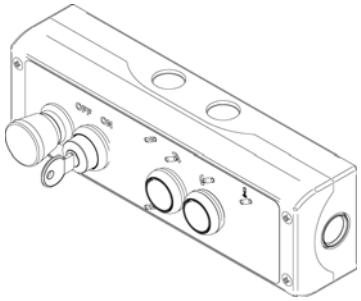
Pos.	Designation	Brief description
112	Conveyor belt drive "manual"	Button with pushbutton function: - For temporarily driving the conveyor belt during maintenance work. ☞ The conveyor belt is driven at low speed! STOP On actuation, heed danger zones of moving parts of the vehicle!
113	Reverse conveyor belt drive "manual"	Button with pushbutton function: - For temporarily driving the conveyor belt during maintenance work. ☞ The conveyor belt is driven at low speed for a defined time! STOP On actuation, heed danger zones of moving parts of the vehicle! ⚠ Risk of damage to equipment! Only allow the conveyor belt to run in reversing mode if the conveyor belt scraper has been disengaged!
114	Not used	

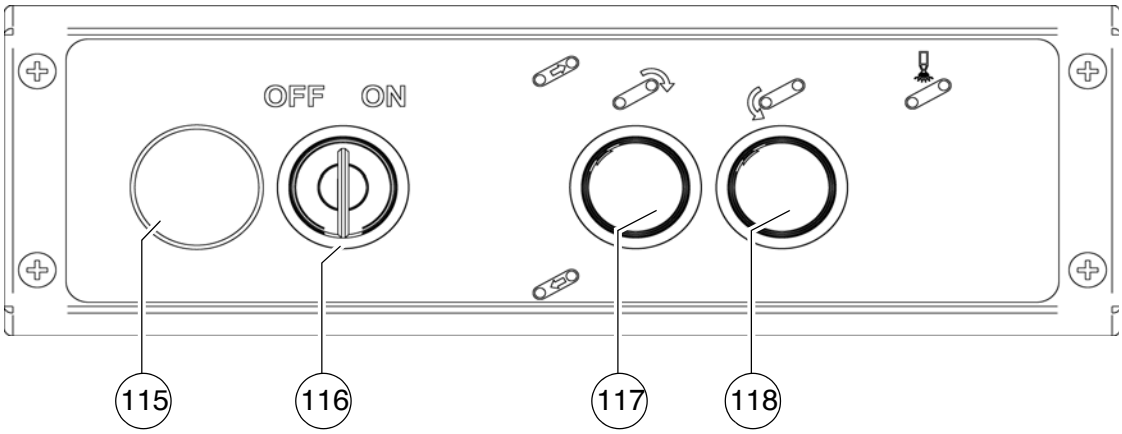
Side operating unit - slewing conveyor belt (○)





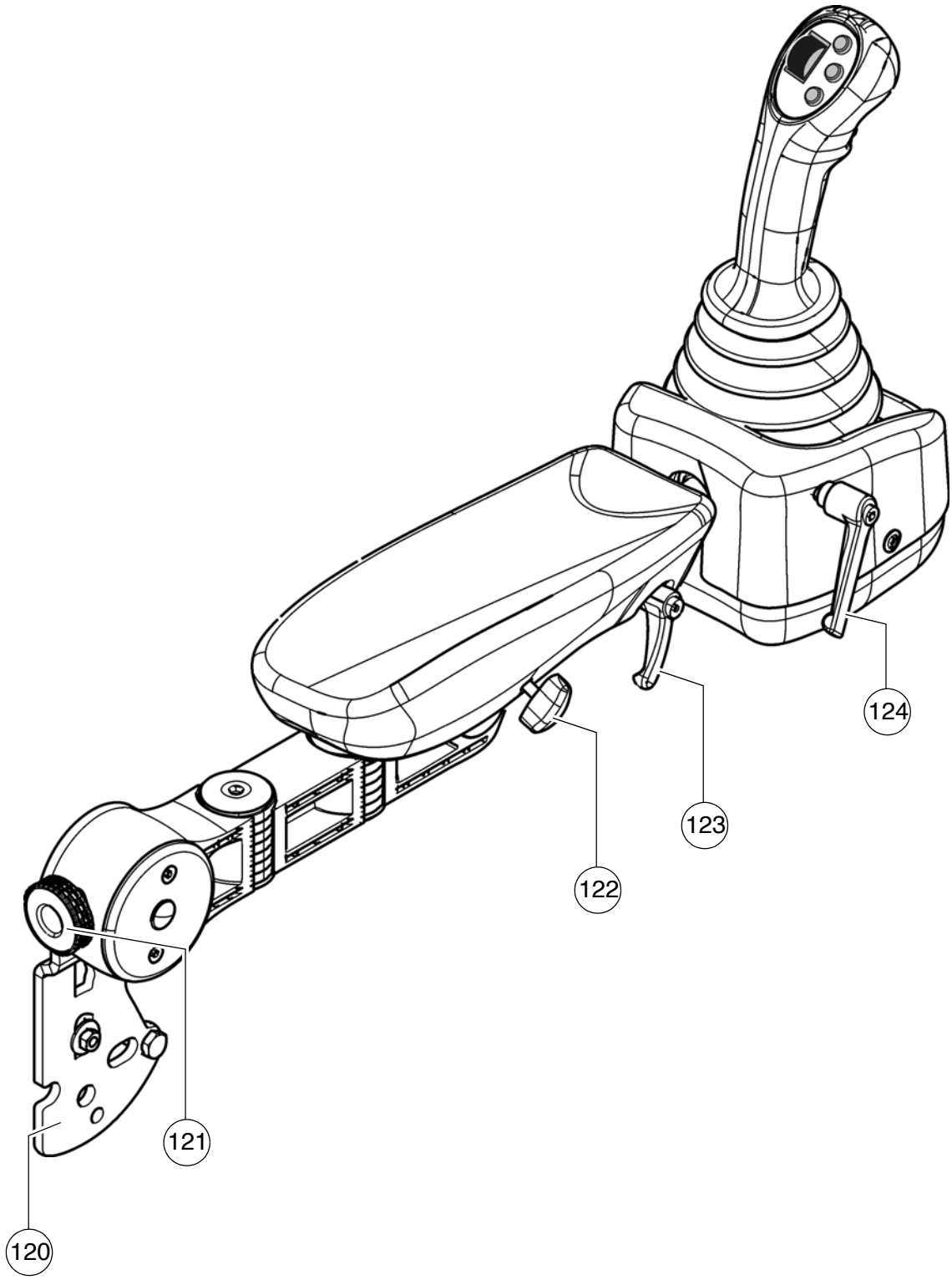
Pos.	Designation	Brief description
115	Emergency stop button	Press in an emergency (danger to persons, impending collision, etc.)! - Pressing the emergency stop button switches off the engine, the drives and the steering system. Making way, moving the conveyor belt, etc. is then no longer possible! Danger of accidents! - To restart the engine, the button must be pulled out again.
116	Key switch conveyor belt maintenance	Key switch with detent switch function: - For releasing and blocking the conveyor belt maintenance functions. - Switch setting I: functions released - Switch setting 0: functions blocked, remove key. ☞ Observe maintenance intervals for conveyor belt tension! ⚠ If the function is not required, remove the key from the switch. ☞ When conveyor belt maintenance is engaged, all conveyor belt functions on the operating panel are blocked.




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Pos.	Designation	Brief description
117	Conveyor belt drive "manual"	Button with pushbutton function: - For temporarily driving the conveyor belt during maintenance work. ☞ The conveyor belt is driven at low speed! STOP On actuation, heed danger zones of moving parts of the vehicle!
118	Reverse conveyor belt drive "manual"	Button with pushbutton function: - For temporarily driving the conveyor belt during maintenance work. ☞ The conveyor belt is driven at low speed for a defined time! STOP On actuation, heed danger zones of moving parts of the vehicle! ⚠ Risk of damage to equipment! Only allow the conveyor belt to run in reversing mode if the conveyor belt scraper has been disengaged!

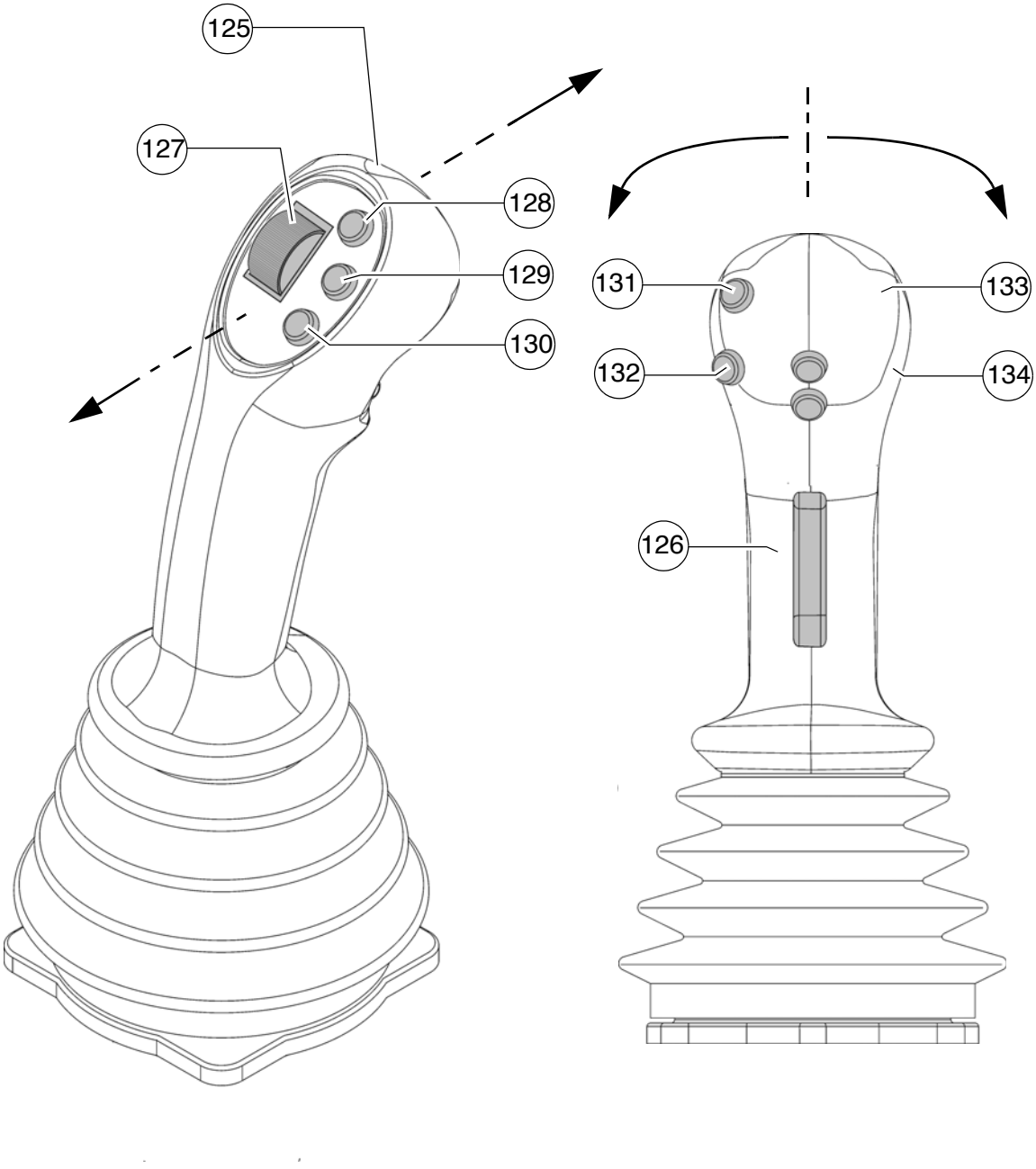
Joystick - travel drive / slewing belt (○)



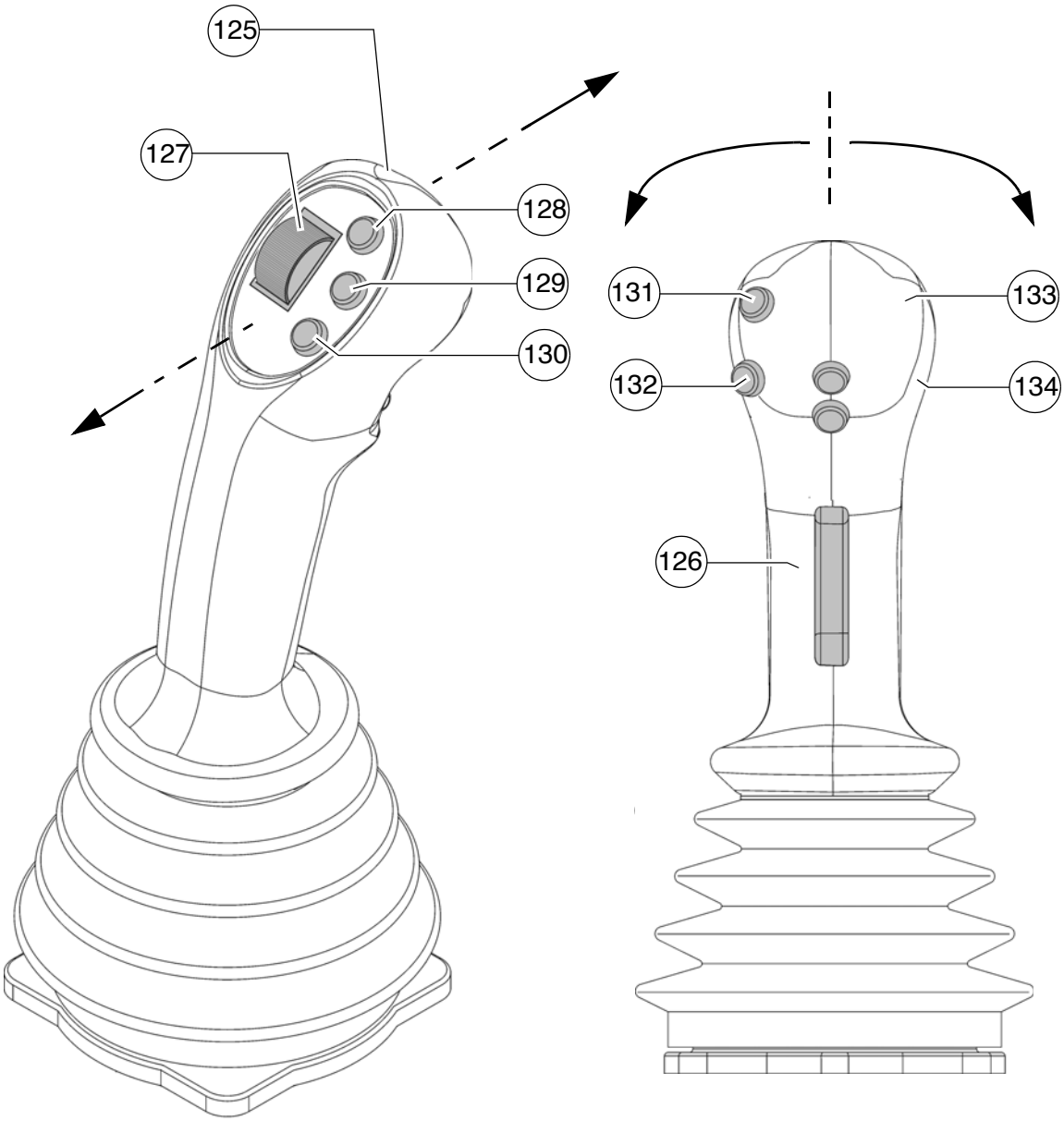
☞ The joystick holder can be fitted to both driver's seats.
To fit the joystick holder to the driver's seat, the right armrest of the seat has to be dismantled.

☞ There are various possible settings for adjusting the joystick holder to the needs of the driver.

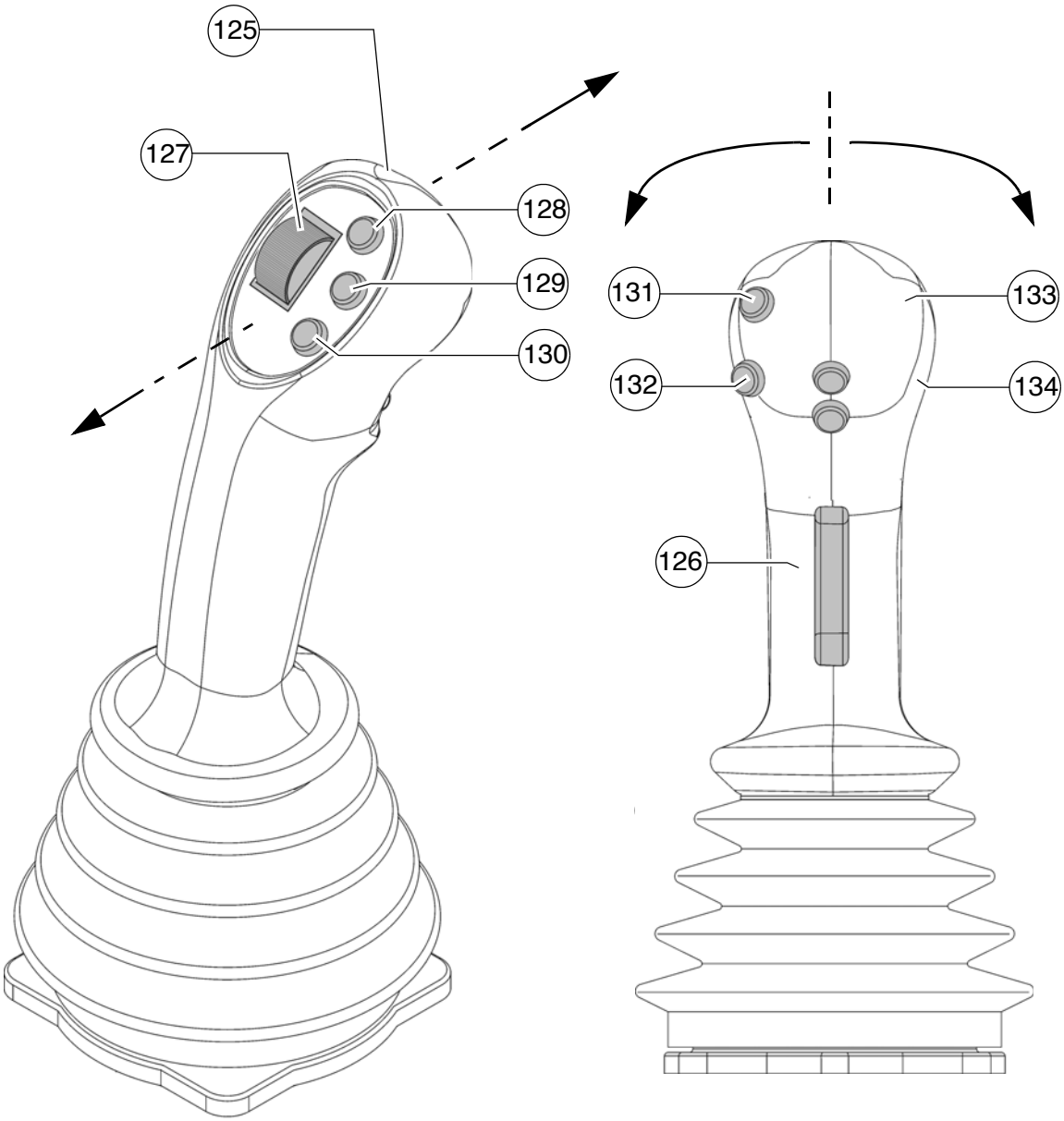
Pos.	Designation	Brief description
120	Mounting plate	For mounting the joystick holder to the driver's seat.
121	Knob - for adjusting the height	Press the knob to adjust the armrest up or down.
122	Latch - for horizontal adjustment	For fixing armrest and control unit (horizontal adjustment).
123	Latch - pivot joint 1	For fixing the pivot joint in the armrest
124	Latch - pivot joint 2	For fixing the pivot joint in the control unit (joystick box)


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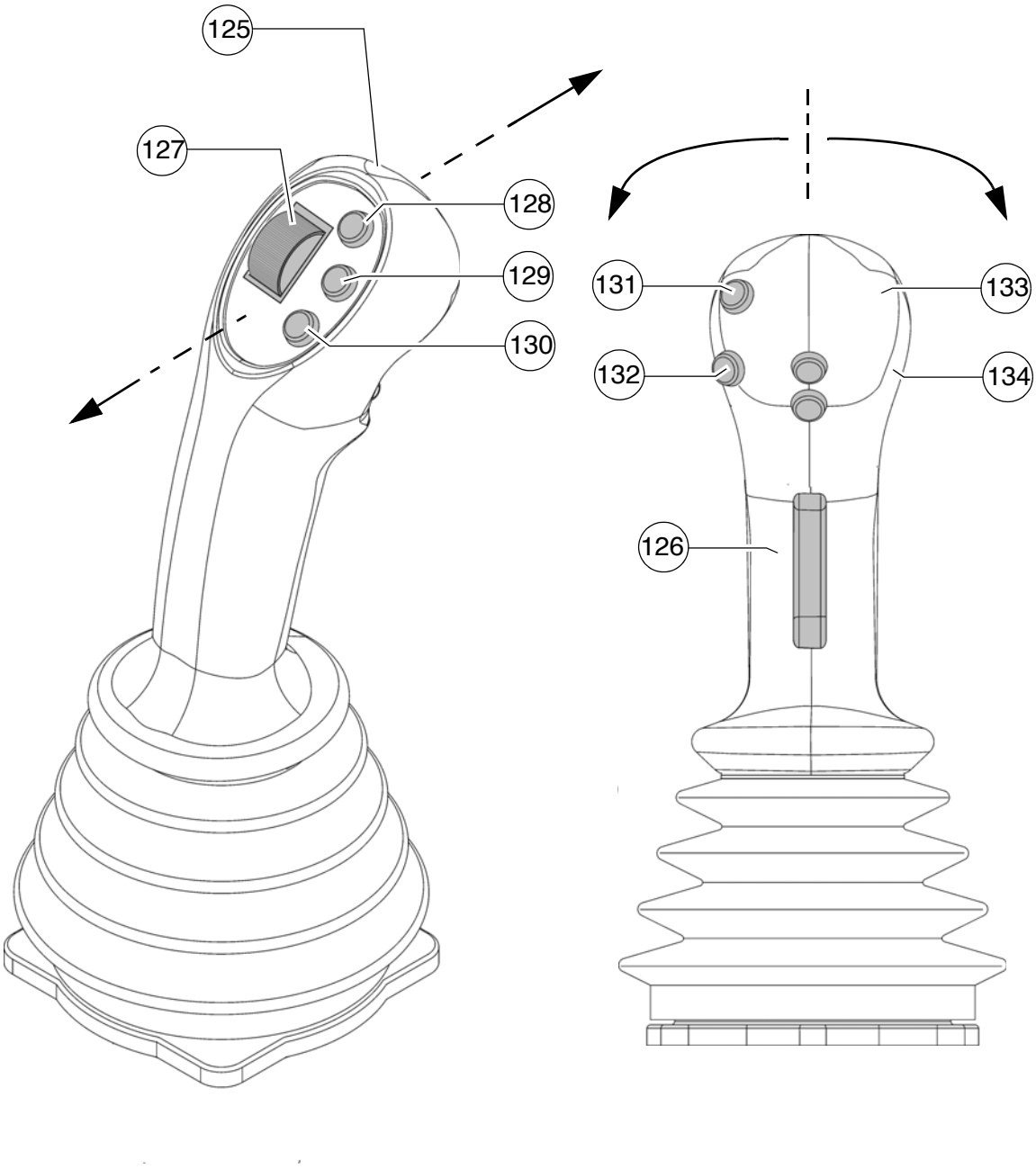
Pos.	Designation	Brief description
125	Drive and function lever (joystick)	For engaging the feeder functions and continuously regulating the vehicle speed – forward or reverse. Centre position: Engine in neutral; no travel drive; - Press release button (121) to swivel out. - Engagement of the conveying functions set to "AUTO"! ☞ Use the preselector on the operating panel to set the maximum speed. STOP The vehicle speed cannot be reduced to "0" with the preselector. The vehicle advances slightly with deflected drive lever, even if the travel drive preselector is set to zero! ☞ If the engine is started with the drive lever swivelled, the travel drive is blocked. To be able to start the travel drive, the drive lever must first be returned to the centre position. ☞ When changing over between forwards and reverse travel, the drive lever must remain briefly in neutral.
126	Release button	- Must be pressed to release the travel drive with deflected drive lever.
127	Main conveyor belt + slewing conveyor belt (o) - conveying rate + / -	Rotary switch: - for adjusting the conveying rate from max. to min. rate. - turning "upwards": increase conveying rate. - turning "downwards": reduce conveying rate.
128	Horn	Press in the case of emergencies and to indicate when the vehicle starts to move! ☞ The horn can also be used to communicate acoustically with the truck driver for material loading!


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Pos.	Designation	Brief description
129	Main conveyor belt + slewing conveyor belt - "MANUAL" / "AUTO"	For switching the "MANUAL" and "AUTO" modes of the conveying function ON and OFF: - Engaging the "MANUAL" mode: Press button (124) briefly (< 1 second). ☞ The conveying function is switched on continuously at half of the delivery rate, without material control via the limit switches. - Switch OFF by pressing the button again (briefly). - Engaging the "AUTO" mode: Press button (124) min. 1 second. ☞ The conveying function is switched on when the drive lever is swivelled out and is continuously controlled via the material limit switches. - Switch OFF by pressing the button again (min 1 second). ☞ The function is shut off by pressing the EMERGENCY STOP button or restarting the vehicle. ☞ The main function switch (operating panel) locks the conveying function. STOP On actuation, heed danger zones of moving parts of the vehicle!


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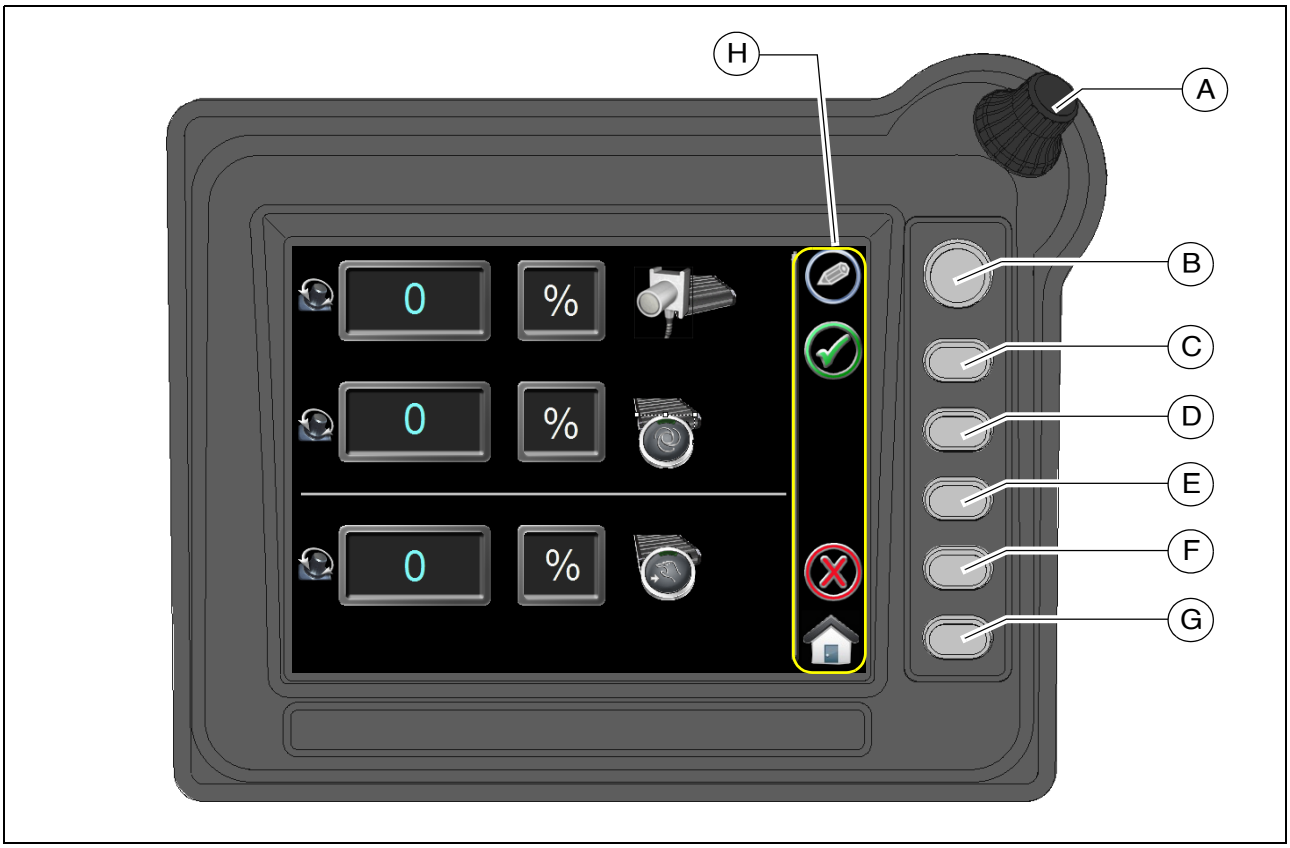
Pos.	Designation	Brief description
130	Distance control ON / OFF	Button with detent switch function: ☞ Distance control can only be activated whilst the vehicle is moving in working gear when the conveying function is engaged. The vehicle speed is automatically adapted to the speed of the paver finisher. When the paver finisher comes to a stop, the feeder is halted and all "Auto" functions are paused. - Activate distance control when the feeder has reached the desired position and the distance is to be maintained. - Switch OFF by pressing the button again. ☞ Distance control can be activated in a distance range between 0.2 and 9.9 m.


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Pos.	Designation	Brief description
131	Raise slewing belt	Pushbutton: - To raise the slewing belt. On actuation, heed danger zones of moving parts of the vehicle!
132	Lower slewing belt	Pushbutton: - To lower the slewing belt. On actuation, heed danger zones of moving parts of the vehicle!
133	Swivel slewing belt to the left	Pushbutton function: - For slewing the conveyor belt to the left. On actuation, heed danger zones of moving parts of the vehicle!
134	Swivel slewing belt to the right	Pushbutton function: - For slewing the conveyor belt to the right. On actuation, heed danger zones of moving parts of the vehicle!

D 21 Operation

1 Operation of the input and display terminal



Button layout on the display

- (A) Encoder (rotary actuation):
  - To scroll in the menu
  - To select various parameters within a menu
  - To change parameters

- (B) - (G) Function buttons:
  - To trigger the commands assigned in the display area (H)
  - To select the menus assigned in the display area (H)

Command symbols

Command	Symbol in the display
- Edit selected parameters.	
- Adopt edited parameters. - For error messages: confirms message and goes straight to the error list.	
- Exit menu. Return to the previous menu. Edited parameters are not adopted.	
- Cancel. Edited parameters are not adopted.	
- Return to start menu. Edited parameters are not adopted.	
- Save parameters.	
- Load parameter from memory.	
- Parameter successfully saved / loaded	

1.1 Menu operation



Example: Conveyor belt parameter menu

- Turn the encoder (A) until the desired menu appears in the display area (H).
- Press button (C) to call up the "Conveyor belt parameter" menu.
- Turn the encoder (A) again until the selection field (red frame) is positioned over the desired parameter to be adjusted.
- Press button (B) to activate the selected parameter to be adjusted.
- Set the desired parameter by turning the encoder (A).
- Press button (F) to exit parameter adjustment without saving.
- Press button (C) to confirm the adjusted parameter.
- Press button (G) to go to the start menu.

Main menu

Display and function menu



Displays:

- (1) Speed:
  - paving operation (m/min)
  - driving mode (km/h)
- (2) Fuel gauge
- (3) Conveyor belt speed
- (4) Emulsion tank filling level
- (5) Distance feeder / paver finisher (○) - memory location, current distance (m)
- (6) Time of day (hh/mm)
- (7) Error warning (retrievable in the error memory)
- (8) Paver finisher hopper filling level
- (9) Conveyor belt "STOP" - conveyor belt maintenance active
- (10) Conveyor belt angle (○) - memory location, current angle (°)
- (11) Level AdBlue® / DEF tank (○)

⚠ If the level is too low, a warning appears at this point.
Level 10% - display flashes
Level 5% - display stays on permanently
Level 0% - drive engine is throttled to emergency mode



- (12) Operating status - different symbols are shown depending on the operating status:

Hare: Transportation gear active



Tortoise: Working gear active



STOP: Vehicle stop



Snow flake: hydraulic oil temperature too low! Bring vehicle up to temperature with stationary acceleration!



☞ The engine speed cannot be increased when the hydraulic oil temperature is too low!

Red cross: Emergency mode active.



Functions:

Pressing encoder (A) calls up the available menus or functions in the start screen.

☞ The menus are called up by pressing the adjacent function button.

☞ Pressing the adjacent function button activates or deactivates the functions. If the relevant symbol is covered with a red cross, the function is deactivated.



- (20) "Engine speed" menu.
- (21) "Conveyor belt parameters" menu.
- (22) "Automatic steering unit" menu.
- (23) Not used
- (24): "Conveyor belt angle / distance control" menu (○).
- (25): "Set-up" menu
- (26) "Eco mode" function
  - The engine speed is constantly regulated to 1600 rpm.
- (27) "Automatic steering unit" function
  - The vehicle is steered automatically via corresponding sensing along a reference (e.g. cable).

⚠ When the automatic steering unit is activated, the steering potentiometer is deactivated.

☞ If the driver carries out a steering movement, this overrides the automatic steering unit due to safety reasons.

- (28): "Joint hopper actuation" function
  - Both hopper lids are actuated together with one of the hopper function switches (open hopper / close hopper).

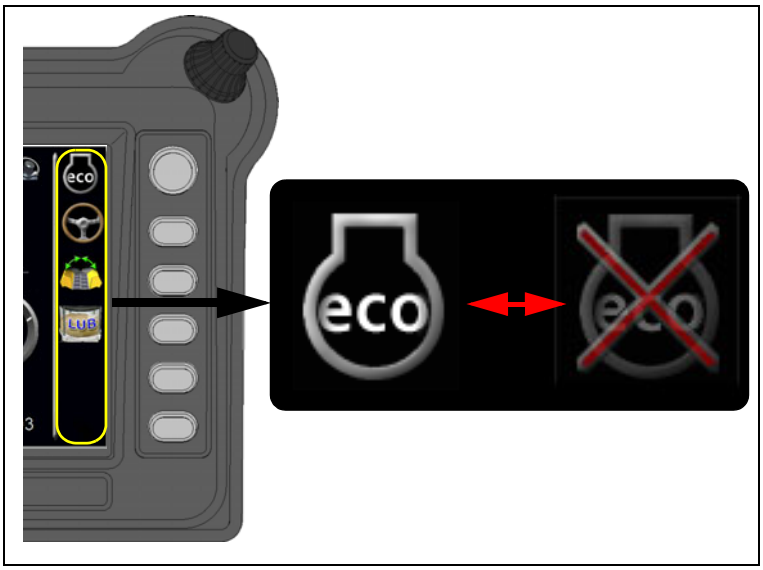
- (29): "Central lubrication system" function
  - The central lubrication system is engaged for a defined period of time.

- (30): Camera display function / menu (○).
  - The vehicle positions monitored by camera are shown in the display.

- (31) "Error memory" menu.

Active / inactive display function

Pressing the adjacent function button activates or deactivates the functions.
If the relevant symbol is covered with a red cross, the function is deactivated.



"Engine speed" menu

Menu for showing and adjusting the engine speed.

☞ Press the adjacent function button (B) to call up the menus.



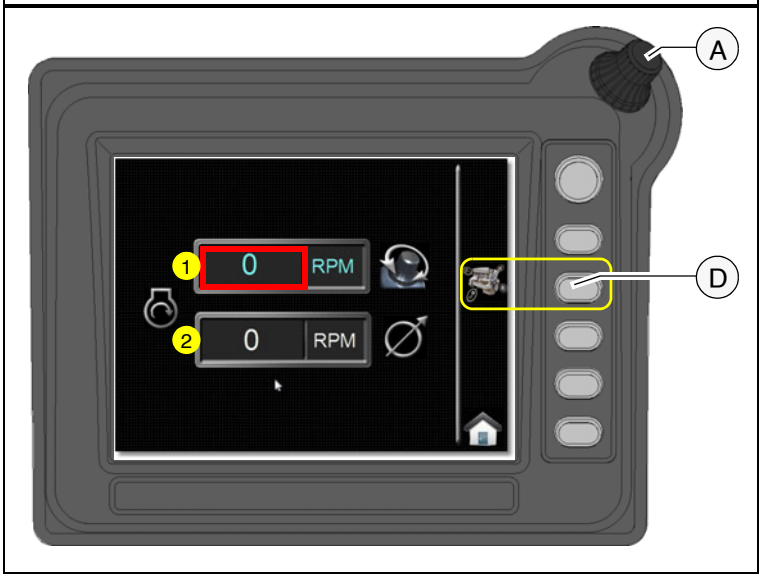
Set-up menu
Engine speed

- (1) Nominal speed display and adjustment parameters
- (2) Actual speed display

☞ Press encoder (A) to start the editing menu.

☞ Adjustment is carried out in steps of 50; the engine speed is adapted directly.

☞ Press the adjacent function button (D) to call up the "Drive engine measured value" display.



Measured value display Drive engine

Menu for retrieving various drive engine measured values.

- (1) On-board voltage (V)
- (2) Engine coolant temperature (°C)
- (3) Engine oil pressure (bar)
- (4) Operating hours (h)
- (5) Fuel consumption (l/h)



"Conveyor belt parameter" menu

Menu for showing and setting the conveyor belt parameters.

☞ Press the adjacent function button (B) to call up the menu.

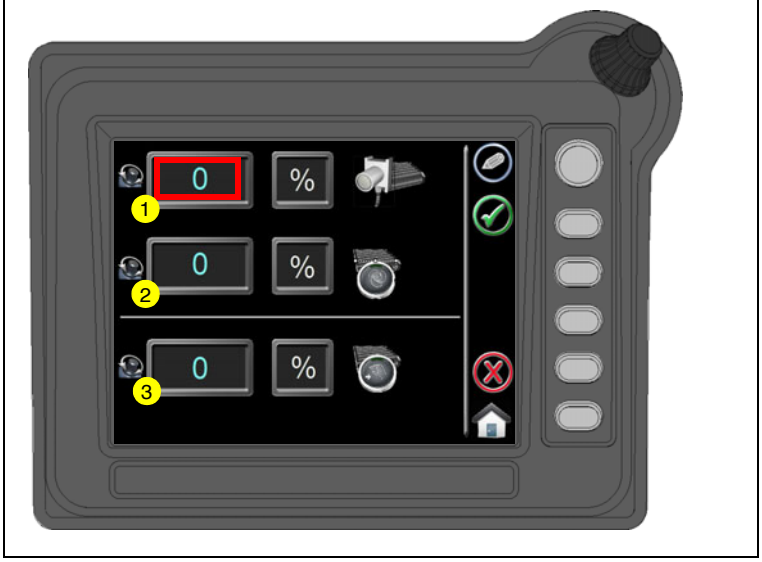


Set-up menu
Conveyor belt parameters

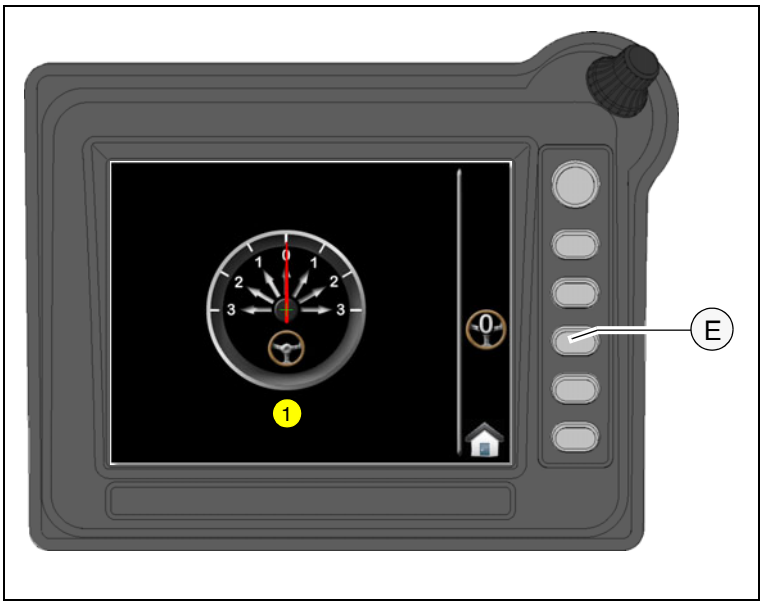
- (1) Max. material filling level display and setting parameters (paver finisher hopper) (%).

☞ The conveying function is shut off when the max. filling level is reached.

- (2) Conveyor belt rpm display and setting parameters (%)
  "AUTO" operating mode.
- (3) Conveyor belt rpm display and setting parameters (%)
  "MANUAL - slow" operating mode.



Automatic steering unit menu



Menu for displaying steering monitoring and resetting the steering monitoring reference.

- (1) Steering monitoring is used for distance control scanning --> reference.
  - Set reference value to zero: button (E).

☞ Ideal distance scanning --> reference is the value "0" in display (1). Excursions indicate increased or reduced distances.

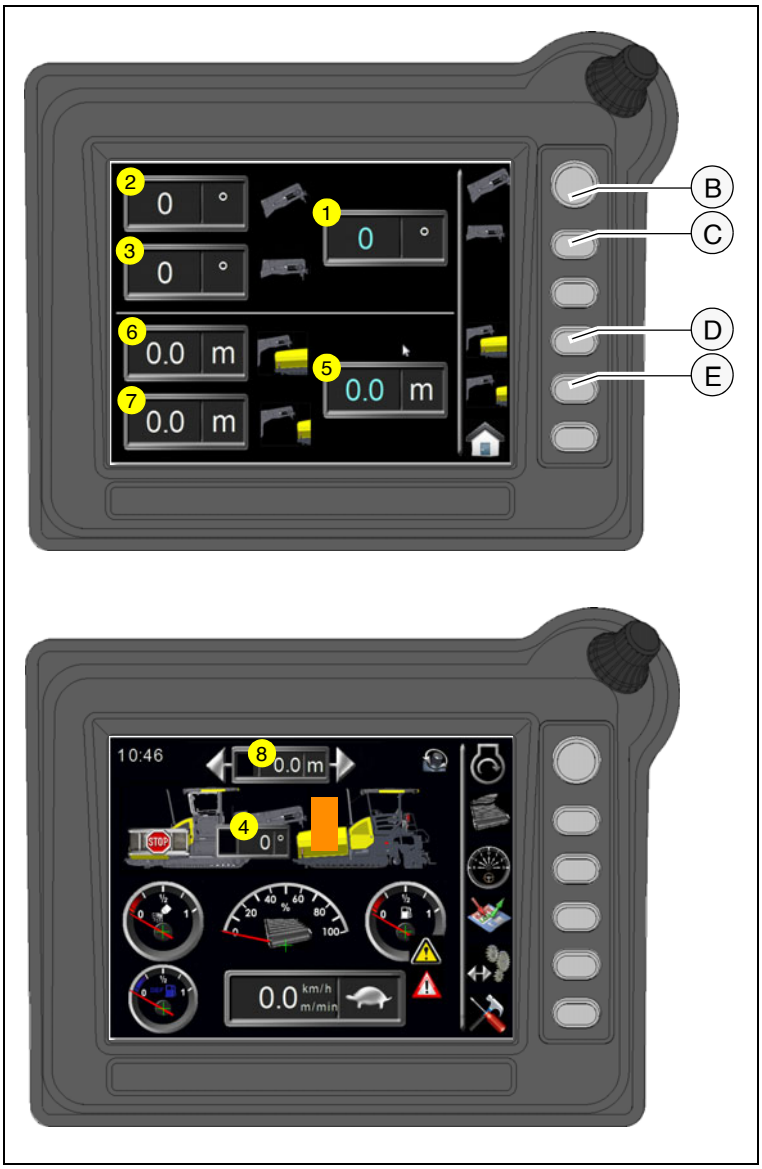
☞ If necessary, carry out correction via slight steering movement!

☞ If the driver carries out a steering movement, this overrides the automatic steering unit due to safety reasons.

"Conveyor belt angle / distance control" menu (○)

Menu for displaying and saving conveyor belt positions and distance values.

- (1) Conveyor belt angle display and selection parameters.
  - (2) Memory location - conveyor belt "up", display of the stored angle.
  - (3) Memory location - conveyor belt "down", display of the stored angle.



☞ The current value is saved by pressing the relevant function buttons (B) / (C).

☞ In the main menu, the memory location and the relevant conveyor belt angle are shown in display (4).

- (5) Distance control display and selection parameters.
  - (6) Memory location - "short distance", display of the stored distance.
  - (7) Memory location - "long distance", display of the stored distance.

☞ The current value is saved by pressing the relevant function buttons (D) / (E).

☞ In the main menu, the memory location and the relevant distance value are shown in display (8).

☞ All stored values are reset to "zero" on re-starting.

Menu
"System information & basic settings"



Display of the following information:

- (1) Time (hh/mm/ss)
- (2) Date (dd/mm/yyyy)
- (3) Software version, travel drive computer
- (4) Software version, terminal
- (5) Operating hours (h)

☞ If consultation with Technical Support is required for your vehicle, always specify the software version!

The following set-up menus can be called up directly:

- (6) "Service" menu.
- (7) "Terminal" set-up menu

Menu
"Service"

Password-protected menu for various service settings.



Set-up menu
"Terminal settings"

- (1) Button day time brightness (%) display and adjustment parameters
- (2) Button night time brightness (%) display and adjustment parameters



☞ Setting range 0-100%

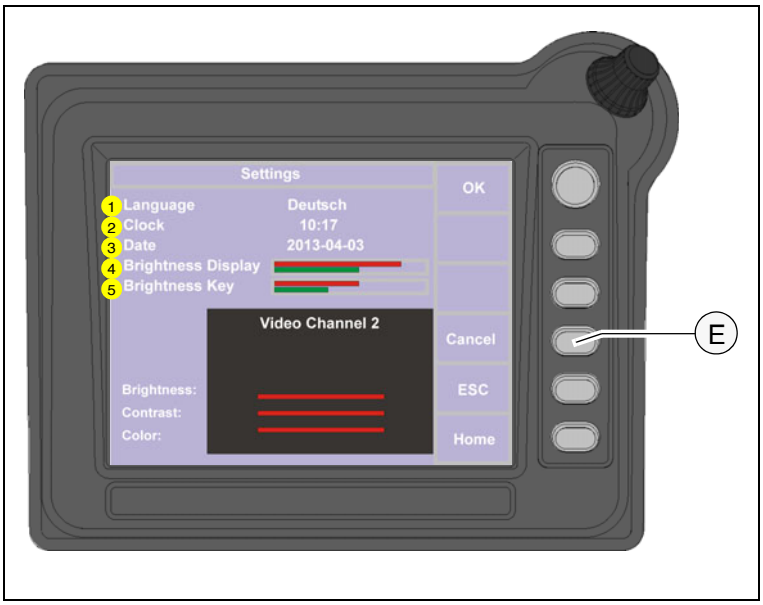
☞ When the working lights are switched on, the system automatically switches to the night time operation settings.

- (3) "Beep" display and adjustment parameters - warning signal for error messages until the error has been acknowledged.
  - "beep" ON: parameter 1
  - "beep" OFF: parameter 0

☞ Press button (D) to call up the system menu.

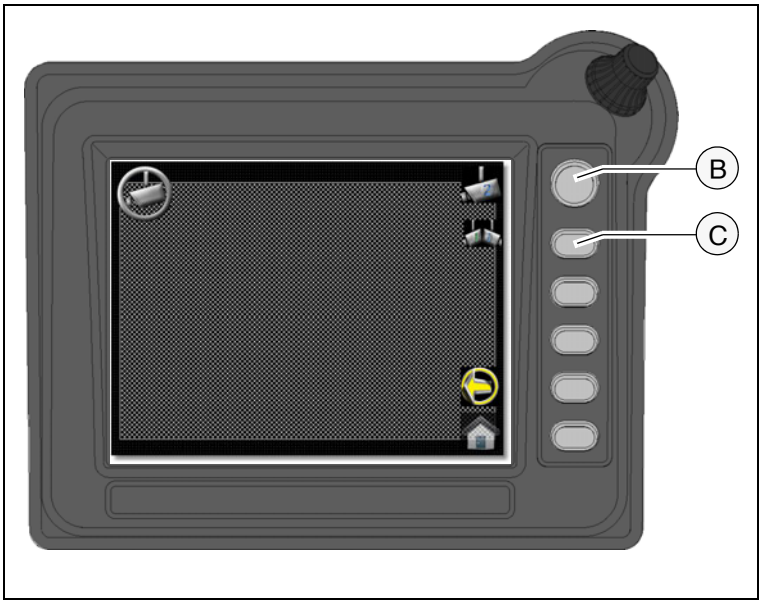
System menu -
"Display basic settings"

- (1) Language display and adjustment parameters
- (2) Time display and adjustment parameters (hh-mm)
- (3) Date display and adjustment parameters (DD-MM-YYYY)
- (4) Monitor brightness display and adjustment parameters
- (5) Button brightness display and adjustment parameters



☞ The display brightness is adjusted directly, the buttons light up briefly to check.

Menu
"Camera display"



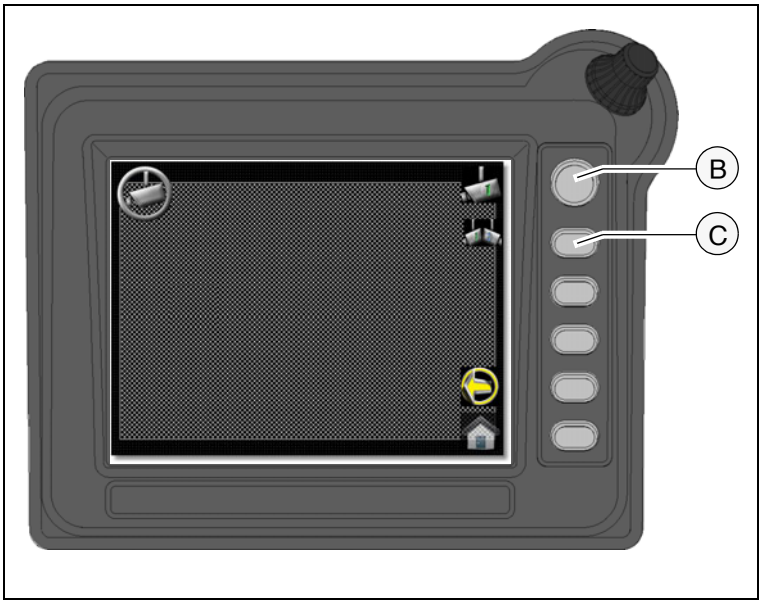
Machine parts partly concealed from view can be displayed by the camera system.

When this function is called up, display camera 1 appears.

- Show camera 2 display: button (B).
- Show camera 1+2 display: button (C).

☞ When the camera function is active, the rear camera is automatically displayed on reverse travel.

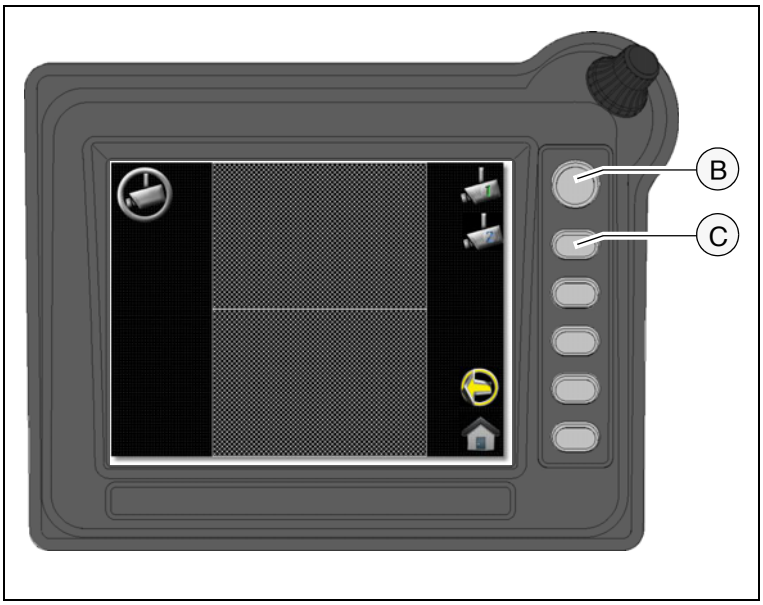
"Camera 2" display



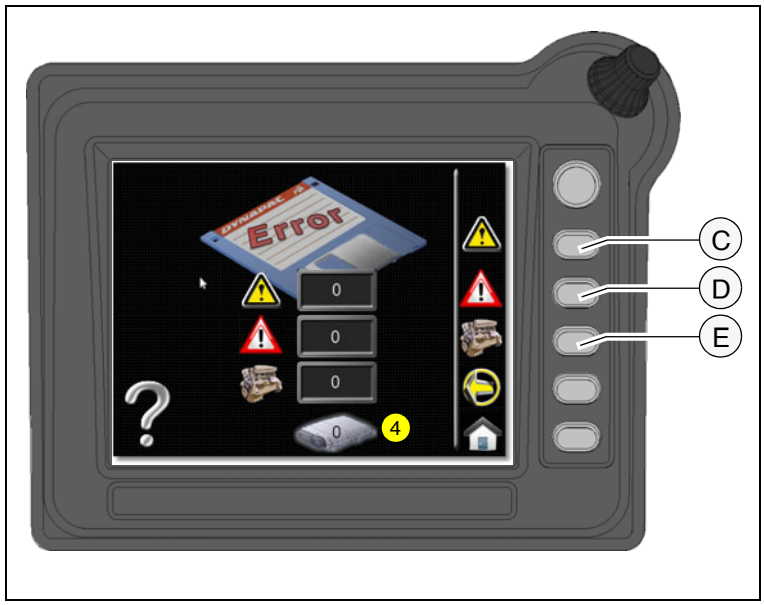
- "Show camera 1" display: button (B).
- Show camera 1+2 display: button (C).

"Camera 1+2" display

- Show camera 1 display: button (B).
- Show camera 2 display: button (C).



Menu -
"Error memory"

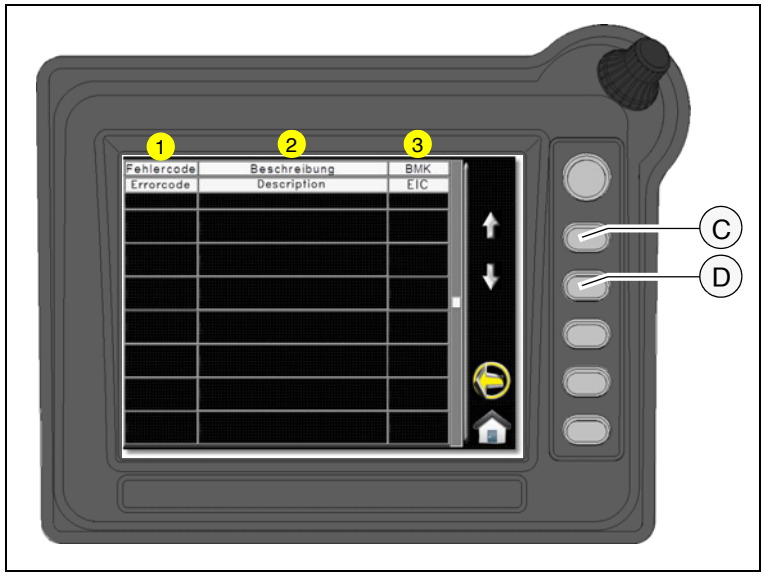


Menu for retrieving existing error messages.

- (1) Number of warning messages.
  - Warning messages retrieval: button (C).
- (2) Number of error messages with engine stop.
  - Error messages retrieval: button (D).
- (3) Number of error messages drive engine.
  - Error messages retrieval: button (E).
- (4) System error display.

☞ Notify the customer service department for your vehicle of the system error number which is displayed; the customer service department will then discuss the further procedure with you.

Vehicle error messages display



Display of existing error messages in a table.

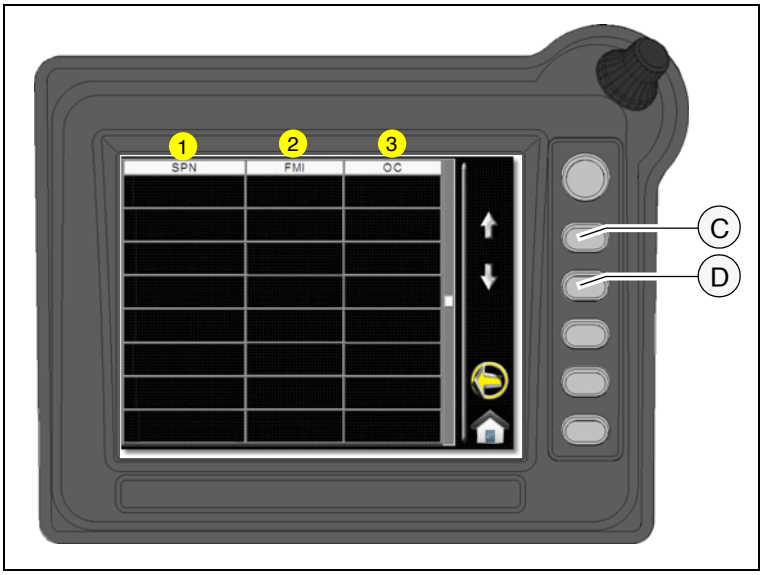
☞ This is shown separately from warning messages and error messages with engine stop.

- (1) Error code.
- (2) Error description.
- (3) Designation of the faulty part as per BMK/EIC list.

☞ Press (C) / (D) to scroll through the list.

Engine error messages display

Display of existing error messages in a table.



☞ This is shown separately from warning messages and error messages with engine stop.

- (1) SPN code.
- (2) FMI code.
- (3) OC error frequency.

☞ All error messages can be identified in the section "Error codes drive engine".

☞ Press (C) / (D) to scroll through the list.

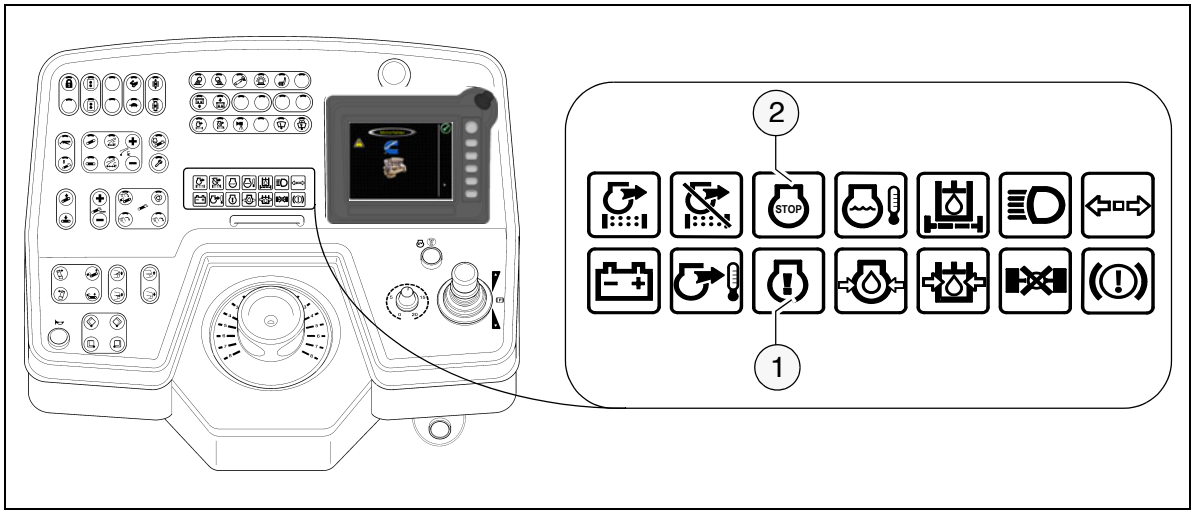
2 Terminal error messages

☞ The following error messages appear directly in the display when corresponding errors occur.

☞ Press (B) to confirm and call up the corresponding error list.

Error No. / meaning	Display
Error message "Stop" - Display for all error messages with machine stop.	
Error message "Engine malfunction" - Display for all engine stop error messages.	
Error message "800F" - Emergency stop button actuated or communication master display interrupted.	

2.1 Drive engine error codes



If a fault has been detected on the drive engine, this is indicated by the corresponding warning lamp (1) / (2) and appears at the same time as a warning message in the display.

The error message that can be called up in the display contains several numerical codes, which uniquely define the fault after decoding.

- Display "Engine fault" (3) indicates that there is a fault on the drive engine.

⚠ It may be possible to continue operating the vehicle, depending on the severity of the error. The error should however be remedied quickly to prevent further damage.

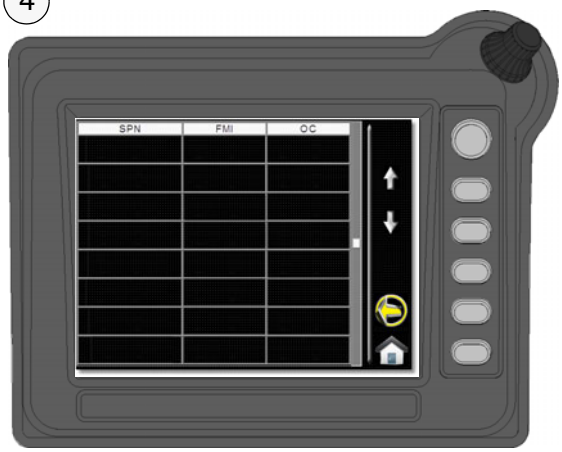
☞ Severe errors in the drive engine result in the engine stopping automatically to prevent further damage.

- After confirming the display, the numerical codes appear in the corresponding error list (4).

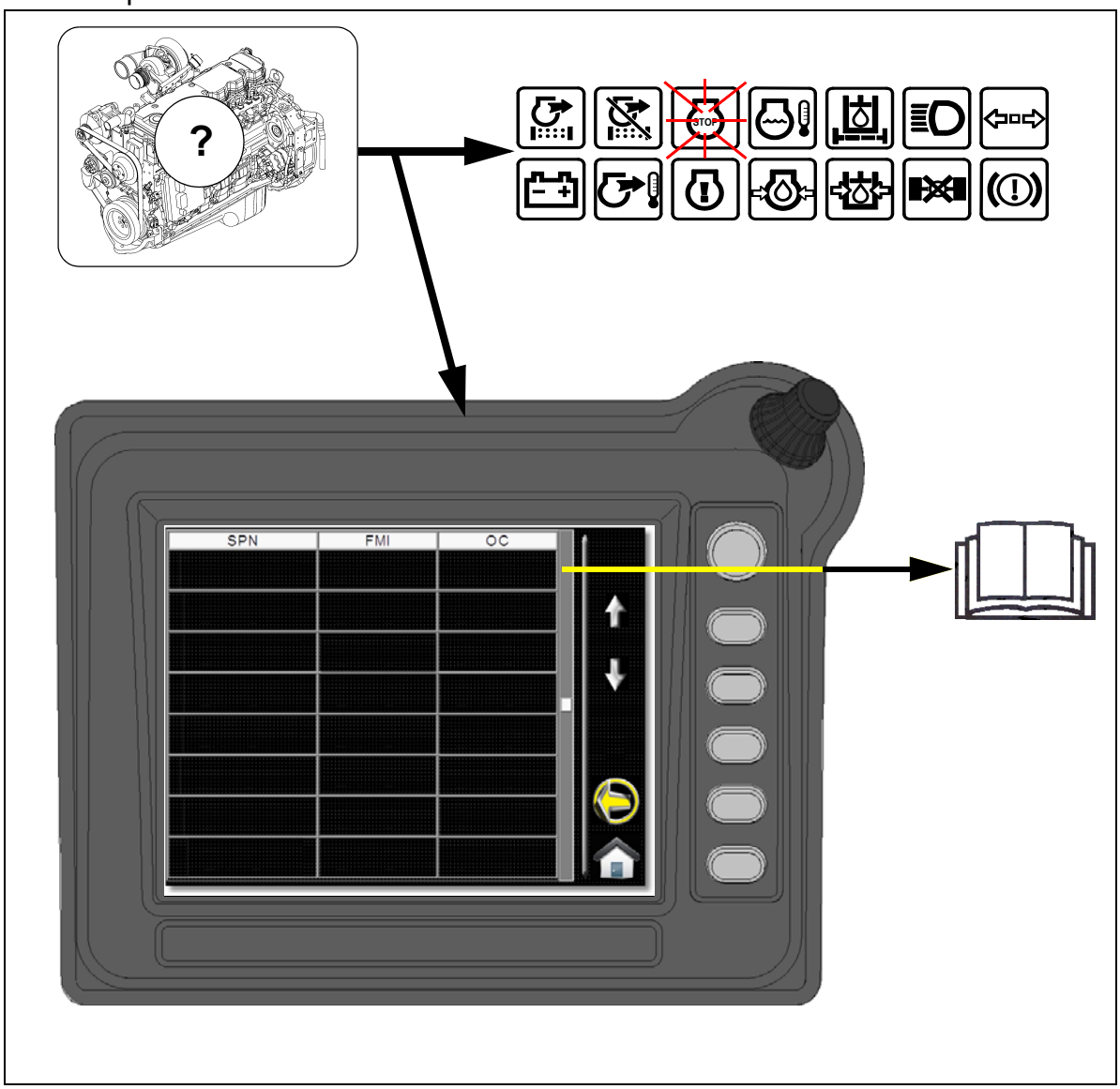
3



4



Example:



Explanation:
Warning light and display signal a serious fault on the drive engine with automatic or necessary engine shut-down.
Display:
SPN: 157
FMI: 3
OC: 1

Cause: Cable break on sensor for rail pressure.
Effect: Engine shut-down.
Frequency: Fault occurs for the 1st time.

⚠ Notify the customer service department for your vehicle of the error number which is displayed; the customer service department will then discuss the further procedure with you.

2.2 Fault codes

Diesel Engine fault codes chart					
Fault Code	**SPN**	**FMI**	**Lamp**	**SPN description**	**Cumins Description**
111	629	12	Red	Controller #1	Engine Control Module Critical Internal Failure - Bad intelligent device or component
115	612	2	Red	System Diagnostic Code #2	Engine Magnetic Speed/Position Lost Both of Two Signals - Data erratic, intermittent or incorrect
122	102	3	Amber	Engine Intake Manifold #1 Pressure	Intake Manifold 1 Pressure Sensor Circuit - Voltage above normal, or shorted to high source
123	102	4	Amber	Engine Intake Manifold #1 Pressure	Intake Manifold 1 Pressure Sensor Circuit - Voltage below normal, or shorted to low source
124	102	16	Amber	Engine Intake Manifold #1 Pressure	Intake Manifold 1 Pressure - Data Valid But Above Normal Operating Range - Moderately Severe Level
125	102	18	Amber	Engine Intake Manifold #1 Pressure	Intake Manifold 1 Pressure - Data Valid But Below Normal Operating Range - Moderately Severe Level
131	91	3	Red	Accelerator Pedal Position 1	Accelerator Pedal or Lever Position Sensor 1 Circuit - Voltage above normal, or shorted to high source
132	91	4	Red	Accelerator Pedal Position 1	Accelerator Pedal or Lever Position Sensor 1 Circuit - Voltage below normal, or shorted to low source
133	974	3	Red	Remote Accelerator Pedal Position	Remote Accelerator Pedal or Lever Position Sensor 1 Circuit - Voltage above normal, or shorted to high source
134	974	4	Red	Remote Accelerator Pedal Position	Remote Accelerator Pedal or Lever Position Sensor 1 Circuit - Voltage below normal, or shorted to low source
135	100	3	Amber	Engine Oil Pressure	Engine Oil Rifle Pressure 1 Sensor Circuit - Voltage above normal, or shorted to high source
141	100	4	Amber	Engine Oil Pressure	Engine Oil Rifle Pressure 1 Sensor Circuit - Voltage below normal, or shorted to low source
143	100	18	Amber	Engine Oil Pressure	Engine Oil Rifle Pressure - Data Valid But Below Normal Operating Range - Moderately Severe Level
144	110	3	Amber	Engine Coolant Temperature	Engine Coolant Temperature 1 Sensor Circuit - Voltage above normal, or shorted to high source
145	110	4	Amber	Engine Coolant Temperature	Engine Coolant Temperature 1 Sensor Circuit - Voltage below normal, or shorted to low source
146	110	16	Amber	Engine Coolant Temperature	Engine Coolant Temperature - Data Valid But Above Normal Operating Range - Moderately Severe Level
147	91	1	Red	Accelerator Pedal Position 1	Accelerator Pedal or Lever Position 1 Sensor Circuit Frequency - Data valid but below normal operating Range

Diesel Engine fault codes chart					
Fault Code	**SPN**	**FMI**	**Lamp**	**SPN description**	**Cumins Description**
148	91	0	Red	Accelerator Pedal Position 1	Accelerator Pedal or Lever Position Sensor 1 - Data valid but above normal operational range - Most Severe Level
151	110	0	Red	Engine Coolant Temperature	Engine Coolant Temperature - Data valid but above normal operational range - Most Severe Level
153	105	3	Amber	Engine Intake Manifold 1 Temperature	Intake Manifold 1 Temperature Sensor Circuit - Voltage above normal, or shorted to high source
154	105	4	Amber	Engine Intake Manifold 1 Temperature	Intake Manifold 1 Temperature Sensor Circuit - Voltage below normal, or shorted to low source
155	105	0	Red	Engine Intake Manifold 1 Temperature	Intake Manifold 1 Temperature - Data valid but above normal operational range - Most Severe Level
187	3510	4	Amber	Sensor supply voltage 2	Sensor Supply 2 Circuit - Voltage below normal, or shorted to low source
193	520199	3	Amber	Cruise Control	Cruise Control (Resistive) Signal Circuit - Voltage above normal, or shorted to high source
194	520199	4	Amber	Cruise Control	Cruise Control (Resistive) Signal Circuit - Voltage below normal, or shorted to low source
195	111	3	Amber	Engine Coolant Level	Coolant Level Sensor 1 Circuit - Voltage above normal, or shorted to high source
196	111	4	Amber	Engine Coolant Level	Coolant Level Sensor 1 Circuit - Voltage below normal, or shorted to low source
197	111	18	Amber	Engine Coolant Level	Coolant Level - Data Valid But Below Normal Operating Range - Moderately Severe Level
212	175	3	Amber	Engine Oil Temperature 1	Engine Oil Temperature Sensor 1 Circuit - Voltage above normal, or shorted to high source
213	175	4	Amber	Engine Oil Temperature 1	Engine Oil Temperature Sensor 1 Circuit - Voltage below normal, or shorted to low source
214	175	0	Red	Engine Oil Temperature 1	Engine Oil Temperature - Data valid but above normal operational range - Most Severe Level
221	108	3	Amber	Barometric Pressure	Barometric Pressure Sensor Circuit - Voltage above normal, or shorted to high source
222	108	4	Amber	Barometric Pressure	Barometric Pressure Sensor Circuit - Voltage above normal, or shorted to high source
227	3510	3	Amber	Sensor supply voltage 2	Sensor Supply 2 Circuit - Voltage above normal, or shorted to high source
231	109	3	Amber	Engine Coolant Pressure	Coolant Pressure Sensor Circuit - Voltage above normal, or shorted to high source

Diesel Engine fault codes chart

Fault Code	SPN	FMI	Lamp	SPN description	Cumins Description
232	109	4	Amber	Engine Coolant Pressure	Coolant Pressure Sensor Circuit - Voltage below normal, or shorted to low source
233	109	18	Amber	Engine Coolant Pressure	Coolant Pressure - Data Valid But Below Normal Operating Range - Moderately Severe Level
234	190	0	Red	Engine Speed	Engine Crankshaft Speed/Position - Data valid but above normal operational range - Most Severe Level
235	111	1	Red	Engine Coolant Level	Coolant Level - Data valid but below normal operational range - Most Severe Level
237	644	2	Amber	Engine External Speed Command Input	External Speed Command Input (Multiple Unit Synchronization) - Data erratic, intermittent or incorrect
238	3511	4	Amber	Sensor supply voltage 3	Sensor Supply 3 Circuit - Voltage below normal, or shorted to low source
239	3511	3	Amber	Sensor supply voltage 3	Sensor Supply 3 Circuit - Voltage above normal, or shorted to high source
241	84	2	Amber	Wheel-Based Vehicle Speed	Wheel-Based Vehicle Speed - Data erratic, intermittent or incorrect
242	84	10	Amber	Wheel-Based Vehicle Speed	Wheel-Based Vehicle Speed Sensor Circuit tampering has been detected - Abnormal rate of change
245	647	4	Amber	Engine Fan Clutch 1 Output Device Driver	Fan Control Circuit - Voltage below normal, or shorted to low source
249	171	3	Amber	Ambient Air Temperature	Ambient Air Temperature Sensor 1 Circuit - Voltage above normal, or shorted to high source
253	98	1	Red	Engine Oil Level	Engine Oil Level - Data valid but below normal operational range - Most Severe Level
256	171	4	Amber	Ambient Air Temperature	Ambient Air Temperature Sensor 1 Circuit - Voltage below normal, or shorted to low source
261	174	16	Amber	Engine Fuel Temperature 1	Engine Fuel Temperature - Data Valid But Above Normal Operating Range - Moderately Severe Level
263	174	3	Amber	Engine Fuel Temperature 1	Engine Fuel Temperature Sensor 1 Circuit - Voltage above normal, or shorted to high source
265	174	4	Amber	Engine Fuel Temperature 1	Engine Fuel Temperature Sensor 1 Circuit - Voltage below normal, or shorted to low source
266	174	0	Red	Engine Fuel Temperature 1	Engine Fuel Temperature - Data valid but above normal operational range - Most Severe Level
269	1195	2	Red	Anti-theft Password Valid Indicator	Antitheft Password Valid Indicator - Data erratic, intermittent or incorrect
271	1347	4	Amber	Engine Fuel Pump Pressurizing Assembly #1	Engine Fuel Pump Pressurizing Assembly 1 Circuit - Voltage below normal, or shorted to low source

Diesel Engine fault codes chart					
Fault Code	**SPN**	**FMI**	**Lamp**	**SPN description**	**Cumins Description**
272	1347	3	Amber	Engine Fuel Pump Pressurizing Assembly #2	Engine Fuel Pump Pressurizing Assembly 1 Circuit - Voltage above normal, or shorted to high source
281	1347	7	Amber	Engine Fuel Pump Pressurizing Assembly #3	Engine Fuel Pump Pressurizing Assembly 1 - Mechanical system not responding or out of adjustment
285	639	9	Amber	J1939 Network #1, Primary Vehicle Network (previously SAE J1939 Data Link)	SAE J1939 Multiplexing PGN Timeout Error - Abnormal update rate
286	639	13	Amber	J1939 Network #1, Primary Vehicle Network (previously SAE J1939 Data Link)	SAE J1939 Multiplexing Configuration Error - Out of Calibration
288	974	19	Red	Remote Accelerator Pedal Position	SAE J1939 Multiplexing Remote Accelerator Pedal or Lever Position Sensor System - Received Network D
291	625	9	Red		Proprietary Datalink Error (OEM/Vehicle Datalink) - Abnormal update rate
292	441	14	Red	Auxiliary Temperature 1	Auxiliary Temperature Sensor Input 1 - Special Instructions
293	441	3	Amber	Auxiliary Temperature 1	Auxiliary Temperature Sensor Input 1 Circuit - Voltage above normal, or shorted to high source
294	441	4	Amber	Auxiliary Temperature 1	Auxiliary Temperature Sensor Input 1 Circuit - Voltage below normal, or shorted to low source
295	108	2	Amber	Barometric Pressure	Barometric Pressure - Data erratic, intermittent or incorrect
296	1388	14	Red	Auxiliary Pressure #2	Auxiliary Pressure Sensor Input 2 - Special Instructions
297	1388	3	Amber	Auxiliary Pressure #2	Auxiliary Pressure Sensor Input 2 Circuit - Voltage above normal, or shorted to high source
298	1388	4	Amber	Auxiliary Pressure #2	Auxiliary Pressure Sensor Input 2 Circuit - Voltage below normal, or shorted to low source
319	251	2	Amber (Blink-ing)	Time	Real Time Clock - Data erratic, intermittent or incorrect
322	651	5	Amber	Engine Injector Cylinder #01	Injector Solenoid Driver Cylinder 1 Circuit - Current below normal or open circuit
323	655	5	Amber	Engine Injector Cylinder #05	Injector Solenoid Driver Cylinder 5 Circuit - Current below normal or open circuit
324	653	5	Amber	Engine Injector Cylinder #03	Injector Solenoid Driver Cylinder 3 Circuit - Current below normal or open circuit
325	656	5	Amber	Engine Injector Cylinder #06	Injector Solenoid Driver Cylinder 6 Circuit - Current below normal or open circuit

Diesel Engine fault codes chart

Fault Code	SPN	FMI	Lamp	SPN description	Cumins Description
331	652	5	Amber	Engine Injector Cylinder #02	Injector Solenoid Driver Cylinder 2 Circuit - Current below normal or open circuit
332	654	5	Amber	Engine Injector Cylinder #04	Injector Solenoid Driver Cylinder 4 Circuit - Current below normal or open circuit
334	110	2	Amber	Engine Coolant Temperature	Engine Coolant Temperature - Data erratic, intermittent or incorrect
338	1267	3	Amber	Idle Shutdown Vehicle Accesso-ries Relay Driver Circuit	Idle Shutdown Vehicle Accessories Relay Driver Circuit - Voltage above normal, or shorted to high source
339	1267	4	Amber	Idle Shutdown Vehicle Accessories Relay Driver Circuit	Idle Shutdown Vehicle Accessories Relay Driver Circuit - Voltage below normal, or shorted to low source
343	629	12	Amber	Controller #1	Engine Control Module Warning Internal Hardware Failure - Bad intelligent device or component
346	630	12	Amber	Calibration Memory	Engine Control Module Calibration Memory Software - Bad intelligent device or component
349	191	16	Amber	Transmission Output Shaft Speed	Transmission Output Shaft Speed - Data Valid But Above Normal Operating Range - Moderately Severe Level
351	3597	12	Amber	ECU Power Output Supply Voltage #1	Injector Power Supply - Bad intelligent device or component
352	3509	4	Amber	Sensor supply volt-age 1	Sensor Supply 1 Circuit - Voltage below normal, or shorted to low source
386	3509	3	Amber	Sensor supply volt-age 1	Sensor Supply 1 Circuit - Voltage above normal, or shorted to high source
415	100	1	Red	Engine Oil Pressure	Engine Oil Rifle Pressure - Data valid but below normal operational range - Most Severe Level
418	97	15	Amber (Blink-ing)	Water In Fuel Indicator	Water in Fuel Indicator - Data Valid But Above Normal Operating Range - Least Severe Level
421	175	16	Amber	Engine Oil Temperature 1	Engine Oil Temperature - Data Valid But Above Normal Operating Range - Moderately Severe Level
422	111	2	Amber	Engine Coolant Level	Coolant Level - Data erratic, intermittent or incorrect
425	175	2	Amber	Engine Oil Temperature 1	Engine Oil Temperature - Data erratic, intermittent or incorrect
426	639	2	None	J1939 Network #1, Primary Vehicle Network (previously SAE J1939 Data Link)	J1939 Network #1 - Data erratic, intermittent or incorrect

Diesel Engine fault codes chart					
Fault Code	**SPN**	**FMI**	**Lamp**	**SPN description**	**Cumins Description**
427	639	9	None	J1939 Network #1, Primary Vehicle Network (previously SAE J1939 Data Link)	SAE J1939 Datalink - Abnormal update rate
428	97	3	Amber	Water In Fuel Indicator	Water in Fuel Indicator Sensor Circuit - Voltage above normal, or shorted to high source
429	97	4	Amber	Water In Fuel Indicator	Water in Fuel Indicator Sensor Circuit - Voltage below normal, or shorted to low source
431	558	2	Amber	Accelerator Pedal 1 Low Idle Switch	Accelerator Pedal or Lever Idle Validation Switch - Data erratic, intermittent or incorrect
432	558	13	Red	Accelerator Pedal 1 Low Idle Switch	Accelerator Pedal or Lever Idle Validation Switch Circuit - Out of Calibration
435	100	2	Amber	Engine Oil Pressure	Engine Oil Rifle Pressure - Data erratic, intermittent or incorrect
436	105	2	Amber	Engine Intake Manifold 1 Temperature	Intake Manifold 1 Temperature - Data erratic, intermittent or incorrect
441	168	18	Amber	Battery Potential / Power Input 1	Battery 1 Voltage - Data Valid But Below Normal Operating Range - Moderately Severe Level
442	168	16	Amber	Battery Potential / Power Input 1	Battery 1 Voltage - Data Valid But Above Normal Operating Range - Moderately Severe Level
449	157	0	Red	Engine Injector Metering Rail 1 Pressure	Injector Metering Rail 1 Pressure - Data valid but above normal operational range - Most Severe Level
451	157	3	Amber	Engine Injector Metering Rail 1 Pressure	Injector Metering Rail 1 Pressure Sensor Circuit - Voltage above normal, or shorted to high source
452	157	4	Amber	Engine Injector Metering Rail 1 Pressure	Injector Metering Rail 1 Pressure Sensor Circuit - Voltage below normal, or shorted to low source
471	98	17	Amber (Blinking)	Engine Oil Level	Engine Oil Level - Data Valid But Below Normal Operating Range - Least Severe Level
483	1349	3	Amber	Engine Injector Metering Rail 2 Pressure	Injector Metering Rail 2 Pressure Sensor Circuit - Voltage above normal, or shorted to high source
484	1349	4	Amber	Engine Injector Metering Rail 2 Pressure	Injector Metering Rail 2 Pressure Sensor Circuit - Voltage below normal, or shorted to low source
487	626	18	Amber	Engine Start Enable Device 1	Start Enable Device 1 Canister Empty (Ether Injection) - Data Valid But Below Normal Operating Range
489	191	18	Amber	Transmission Output Shaft Speed	Transmission Output Shaft Speed - Data Valid But Below Normal Operating Range - Moderately Severe Level

Diesel Engine fault codes chart					
Fault Code	**SPN**	**FMI**	**Lamp**	**SPN description**	**Cumins Description**
497	1377	2	Amber	Engine Synchronization Switch	Multiple Unit Synchronization Switch - Data erratic, intermittent or incorrect
515	3514	3	Amber	Sensor supply voltage 6	Sensor Supply 6 Circuit - Voltage above normal, or shorted to high source
516	3514	4	Amber	Sensor supply voltage 6	Sensor Supply 6 Circuit - Voltage below normal, or shorted to low source
523	611	2	Amber	System Diagnostic Code #1	Auxiliary Intermediate (PTO) Speed Switch Validation - Data erratic, intermittent or incorrect
527	702	3	Amber	Auxiliary I/O #02	Auxiliary Input/Output 2 Circuit - Voltage above normal, or shorted to high source
528	93	2	Amber	Engine Net Brake Torque	Auxiliary Alternate Torque Validation Switch - Data erratic, intermittent or incorrect
529	703	3	Amber	Auxiliary I/O #03	Auxiliary Input/Output 3 Circuit - Voltage above normal, or shorted to high source
535	174	2	Amber	Engine Fuel Temperature 1	Engine Fuel Temperature - Data erratic, intermittent or incorrect
546	94	3	Amber	Engine Fuel Delivery Pressure	Fuel Delivery Pressure Sensor Circuit - Voltage above normal, or shorted to high source
547	94	4	Amber	Engine Fuel Delivery Pressure	Fuel Delivery Pressure Sensor Circuit - Voltage below normal, or shorted to low source
553	157	16	Amber	Engine Injector Metering Rail 1 Pressure	Injector Metering Rail 1 Pressure - Data Valid But Above Normal Operating Range - Moderately Severe Level
554	157	2	Amber	Engine Injector Metering Rail 1 Pressure	Injector Metering Rail 1 Pressure - Data erratic, intermittent or incorrect
555	101	16	Amber	Engine Crankcase Pressure	Crankcase Pressure - Data Valid But Above Normal Operating Range - Moderately Severe Level
556	101	0	Red	Engine Crankcase Pressure	Crankcase Pressure - Data valid but above normal operational range - Most Severe Level
559	157	18	Amber	Engine Injector Metering Rail 1 Pressure	Injector Metering Rail 1 Pressure - Data Valid But Below Normal Operating Range - Moderately Severe Level
584	677	3	Amber	Engine Starter Motor Relay	Starter Relay Driver Circuit - Voltage above normal, or shorted to high source
585	677	4	Amber	Engine Starter Motor Relay	Starter Relay Driver Circuit - Voltage below normal, or shorted to low source
595	103	16	Amber	Engine Turbocharger 1 Speed	Turbocharger 1 Speed - Data Valid But Above Normal Operating Range - Moderately Severe Level

Diesel Engine fault codes chart					
Fault Code	**SPN**	**FMI**	**Lamp**	**SPN description**	**Cumins Description**
599	640	14	Red	Engine External Protection Input	Auxiliary Commanded Dual Output Shutdown - Special Instructions
611	1383	31	None	Engine was Shut Down Hot	Engine Shut Down Hot - Condition Exists
629	1176	18	Amber	Engine Turbocharger 1 Compressor Intake Pressure	Turbocharger 1 Compressor Intake Pressure - Data Valid But Below Normal Operating Range - Moderately
649	1378	31	Amber (Blinking)	Engine Oil Change Interval	Engine Oil Change Interval - Condition Exists
686	103	2	Amber	Engine Turbocharger 1 Speed	Turbocharger 1 Speed - Data erratic, intermittent or incorrect
687	103	18	Amber	Engine Turbocharger 1 Speed	Turbocharger 1 Speed - Data Valid But Below Normal Operating Range - Moderately Severe Level
688	98	0	Red	Engine Oil Level	Engine Oil Level - Data valid but above normal operational range - Most Severe Level
689	190	2	Amber	Engine Speed	Engine Crankshaft Speed/Position - Data erratic, intermittent or incorrect
691	1172	3	Amber	Engine Turbocharger 1 Compressor Intake Temperature	Turbocharger 1 Compressor Intake Temperature Circuit - Voltage above normal, or shorted to high source
692	1172	4	Amber	Engine Turbocharger 1 Compressor Intake Temperature	Turbocharger 1 Compressor Intake Temperature Circuit - Voltage below normal, or shorted to low source
693	1172	2	Amber	Engine Turbocharger 1 Compressor Intake Temperature	Turbocharger 1 Compressor Intake Temperature - Data erratic, intermittent or incorrect
697	1136	3	Amber	Engine ECU Temperature	Engine ECU Temperature Sensor Circuit - Voltage above normal, or shorted to high source
698	1136	4	Amber	Engine ECU Temperature	Engine ECU Temperature Sensor Circuit - Voltage below normal, or shorted to low source
699	1136	2	Amber	Engine ECU Temperature	Engine ECU Temperature - Data erratic, intermittent or incorrect
731	723	7	Amber	Engine Speed 2	Engine Speed / Position Camshaft and Crankshaft Misalignment - Mechanical system not responding or out of adjustment
741	1176	3	Amber	Engine Turbocharger 1 Compressor Intake Pressure	Turbocharger 1 Compressor Intake Pressure Circuit - Voltage above normal, or shorted to high source

Diesel Engine fault codes chart

Fault Code	SPN	FMI	Lamp	SPN description	Cumins Description
742	1176	4	Amber	Engine Turbocharger 1 Compressor Intake Pressure	Turbocharger 1 Compressor Intake Pressure Circuit - Voltage below normal, or shorted to low source
743	1176	2	Amber	Engine Turbocharger 1 Compressor Intake Pressure	Turbocharger 1 Compressor Intake Pressure - Data erratic, intermittent or incorrect
755	157	7	Amber	Engine Injector Metering Rail 1 Pressure	Injector Metering Rail 1 Pressure - Mechanical system not responding or out of adjustment
769	597	3	Amber	Brake Switch	Brake Switch Circuit - Voltage above normal, or shorted to high source
771	597	4	Amber	Brake Switch	Brake Switch Circuit - Voltage below normal, or shorted to low source
778	723	2	Amber	Engine Speed 2	Engine Camshaft Speed / Position Sensor - Data erratic, intermittent or incorrect
784	1590	2	None	Adaptive Cruise Control Mode	Adaptive Cruise Control Mode - Data erratic, intermittent or incorrect
1117	3597	2	None	ECU Power Output Supply Voltage #1	Power Supply Lost With Ignition On - Data erratic, intermittent or incorrect
1139	651	7	Amber	Engine Injector Cylinder #01	Injector Solenoid Driver Cylinder 1 - Mechanical system not responding or out of adjustment
1141	652	7	Amber	Engine Injector Cylinder #02	Injector Solenoid Driver Cylinder 2 - Mechanical system not responding or out of adjustment
1142	653	7	Amber	Engine Injector Cylinder #03	Injector Solenoid Driver Cylinder 3 - Mechanical system not responding or out of adjustment
1143	654	7	Amber	Engine Injector Cylinder #04	Injector Solenoid Driver Cylinder 4 - Mechanical system not responding or out of adjustment
1144	655	7	Amber	Engine Injector Cylinder #05	Injector Solenoid Driver Cylinder 5 - Mechanical system not responding or out of adjustment
1145	656	7	Amber	Engine Injector Cylinder #06	Injector Solenoid Driver Cylinder 6 - Mechanical system not responding or out of adjustment
1228	27	2	Amber	Engine Exhaust Gas Recirculation 1 Valve Position	EGR Valve Position - Data erratic, intermittent or incorrect
1239	2623	3	Amber	Accelerator Pedal #1 Channel 2	Accelerator Pedal or Lever Position Sensor 2 Circuit - Voltage above normal, or shorted to high source
1241	2623	4	Amber	Accelerator Pedal #1 Channel 2	Accelerator Pedal or Lever Position Sensor 2 Circuit - Voltage below normal, or shorted to low source
1242	91	2	Red	Accelerator Pedal Position 1	Accelerator Pedal or Lever Position Sensor 1 - Data erratic, intermittent or incorrect
1256	1563	2	Amber	Incompatible Monitor/Controller	Control Module Identification Input State Error - Data erratic, intermittent or incorrect

Diesel Engine fault codes chart					
Fault Code	**SPN**	**FMI**	**Lamp**	**SPN description**	**Cumins Description**
1257	1563	2	Red	Incompatible Monitor/Controller	Control Module Identification Input State Error - Data erratic, intermittent or incorrect
1411	4182	3	Amber		Generator Output Frequency Adjust Potentiometer Circuit - Voltage above normal, or shorted to high source
1412	4183	3	Amber		Droop Adjust Potentiometer Circuit - Voltage above normal, or shorted to high source
1418	4184	3	Amber		Gain Adjust Potentiometer Circuit - Voltage above normal, or shorted to high source
1427	4185	31	Amber	Overspeed Shutdown Relay Driver	Overspeed Shutdown Relay Driver Diagnostic has detected an error - Condition Exists
1428	4186	31	Amber	Low Oil Pressure Shutdown Relay Driver	Low Oil Pressure (LOP) Shutdown Relay Driver Diagnostic has detected an error - Condition Exists
1429	4187	31	Amber	High Engine Temperature Shut-down Relay Driver	High Engine Temperature (HET) Shutdown Relay Driver Diagnostic has detected an error - Condition Exists
1431	4188	31	Amber	Pre-Low Oil Pressure Indicator Relay Driver	Pre-Low Oil Pressure Warning Relay Driver Diagnostic has detected an error - Condition Exists
1432	4223	31	Amber	Pre-High Engine Temperature Warn-ing Relay Driver	Pre-High Engine Temperature Warning Relay Driver Diagnostic has detected an error - Condition Exists
1515	91	19	Red	Accelerator Pedal Position 1	SAE J1939 Multiplexed Accelerator Pedal or Lever Sensor System - Received Network Data In Error
1539	1387	3	Amber	Auxiliary Pressure #1	Auxiliary Pressure Sensor Input 1 Circuit - Voltage above normal, or shorted to high source
1548	657	5	Amber	Engine Injector Cylinder #7	Injector Solenoid Driver Cylinder 7 Circuit - Current below normal or open circuit
1549	658	5	Amber	Engine Injector Cylinder #8	Injector Solenoid Driver Cylinder 8 Circuit - Current below normal or open circuit
1551	660	5	Amber	Engine Injector Cylinder #10	Injector Solenoid Driver Cylinder 10 Circuit - Current below normal or open circuit
1552	661	5	Amber	Engine Injector Cylinder #11	Injector Solenoid Driver Cylinder 11 Circuit - Current below normal or open circuit
1553	662	5	Amber	Engine Injector Cylinder #12	Injector Solenoid Driver Cylinder 12 Circuit - Current below normal or open circuit
1554	663	5	Amber	Engine Injector Cylinder #13	Injector Solenoid Driver Cylinder 13 Circuit - Current below normal or open circuit
1555	664	5	Amber	Engine Injector Cylinder #14	Injector Solenoid Driver Cylinder 14 Circuit - Current below normal or open circuit

Diesel Engine fault codes chart

Fault Code	SPN	FMI	Lamp	SPN description	Cumins Description
1556	665	5	Amber	Engine Injector Cylinder #15	Injector Solenoid Driver Cylinder 15 Circuit - Current below normal or open circuit
1557	666	5	Amber	Engine Injector Cylinder #16	Injector Solenoid Driver Cylinder 16 Circuit - Current below normal or open circuit
1621	1387	4	Amber	Auxiliary Pressure #1	Auxiliary Pressure Sensor Input 1 Circuit - Voltage below normal, or shorted to low source
1622	659	5	Amber	Engine Injector Cylinder #9	Injector Solenoid Driver Cylinder 9 Circuit - Current below normal or open circuit
1654	1323	31	Amber	Engine Misfire Cylinder #1	Engine Misfire Cylinder 1 - Condition Exists
1655	1324	31	Amber	Engine Misfire Cylinder #2	Engine Misfire Cylinder 2 - Condition Exists
1656	1325	31	Amber	Engine Misfire Cylinder #3	Engine Misfire Cylinder 3 - Condition Exists
1657	1326	31	Amber	Engine Misfire Cylinder #4	Engine Misfire Cylinder 4 - Condition Exists
1658	1327	31	Amber	Engine Misfire Cylinder #5	Engine Misfire Cylinder 5 - Condition Exists
1659	1328	31	Amber	Engine Misfire Cylinder #6	Engine Misfire Cylinder 6 - Condition Exists
1664	4796	31	Amber	Aftertreatment 1 Diesel Oxidation Catalyst Missing	Aftertreatment 1 Diesel Oxidation Catalyst Missing - Condition Exists
1668	1761	4	Amber	Aftertreatment 1 Diesel Exhaust Fluid Tank Level	Aftertreatment 1 Diesel Exhaust Fluid Tank Level Sensor Circuit - Voltage below normal, or shorted to low source
1669	1761	3	Amber	Aftertreatment 1 Diesel Exhaust Fluid Tank Level	Aftertreatment 1 Diesel Exhaust Fluid Tank Level Sensor Circuit - Voltage above normal, or shorted to high source
1673	1761	1	Amber	Aftertreatment 1 Diesel Exhaust Fluid Tank Level	Aftertreatment 1 Diesel Exhaust Fluid Tank Level - Data valid but below normal operational range -Most Severe Level
1677	3031	4	Amber	Aftertreatment 1 Diesel Exhaust Fluid Tank Temperature	Aftertreatment 1 Diesel Exhaust Fluid Tank Temperature Sensor - Voltage below normal, or shorted to low source
1678	3031	3	Amber	Aftertreatment 1 Diesel Exhaust Fluid Tank Temperature	Aftertreatment 1 Diesel Exhaust Fluid Tank Temperature Sensor - Voltage above normal, or shorted to high source
1679	3031	2	Amber	Aftertreatment 1 Diesel Exhaust Fluid Tank Temperature	Aftertreatment 1 Diesel Exhaust Fluid Tank Temperature - Data erratic, intermittent or incorrect
1682	3362	31	Amber	Aftertreatment 1 Diesel Exhaust Fluid Dosing Unit Input Lines	Aftertreatment 1 Diesel Exhaust Fluid Dosing Unit Input Lines - Condition Exists

Diesel Engine fault codes chart					
Fault Code	**SPN**	**FMI**	**Lamp**	**SPN description**	**Cumins Description**
1683	3363	3	Amber	Aftertreatment 1 Diesel Exhaust Fluid Tank 1 Heater	Aftertreatment 1 Diesel Exhaust Fluid Tank Heater - Voltage above normal, or shorted to high source
1684	3363	4	Amber	Aftertreatment 1 Diesel Exhaust Fluid Tank 1 Heater	Aftertreatment 1 Diesel Exhaust Fluid Tank Heater - Voltage below normal, or shorted to low source
1685	3364	4	Amber	Aftertreatment 1 Diesel Exhaust Fluid Tank 1 Quality	Aftertreatment Diesel Exhaust Fluid Quality Sensor Circuit - Voltage below normal, or shorted to low source
1686	3364	3	Amber	Aftertreatment 1 Diesel Exhaust Fluid Tank 1 Quality	Aftertreatment Diesel Exhaust Fluid Quality Sensor Circuit - Voltage above normal, or shorted to high source
1691	5298	18	Amber	Aftertreatment 1 Diesel Oxidation Catalyst Conversion Efficiency	Aftertreatment 1 Diesel Oxidation Catalyst Conversion Efficiency - Data Valid But Below Normal Operating Range - Moderately Severe Level
1694	3226	2	Amber	Aftertreatment 1 Outlet NOx	Aftertreatment 1 Outlet NOx Sensor - Data erratic, intermittent or incorrect
1695	3513	3	Amber	Sensor supply voltage 5	Sensor Supply 5 - Voltage above normal, or shorted to high source
1696	3513	4	Amber	Sensor supply voltage 5	Sensor Supply 5 - Voltage below normal, or shorted to low source
1699	1761	2	Amber	Aftertreatment 1 Diesel Exhaust Fluid Tank Level	Aftertreatment 1 Diesel Exhaust Fluid Tank Level Sensor - Data erratic, intermittent or incorrect
1712	3363	18	Amber	Aftertreatment 1 Diesel Exhaust Fluid Tank 1 Heater	Aftertreatment 1 Diesel Exhaust Fluid Tank Heater - Data Valid But Below Normal Operating Range - Moderately Severe Level
1713	3363	16	Amber	Aftertreatment 1 Diesel Exhaust Fluid Tank 1 Heater	Aftertreatment 1 Diesel Exhaust Fluid Tank Heater - Data Valid But Above Normal Operating Range - Moderately Severe Level
1714	3364	13	Amber	Aftertreatment 1 Diesel Exhaust Fluid Tank 1 Quality	Aftertreatment Diesel Exhaust Fluid Quality - Out of Calibration
1715	3364	11	Amber	Aftertreatment 1 Diesel Exhaust Fluid Tank 1 Quality	Aftertreatment Diesel Exhaust Fluid Quality - Root Cause Not Known
1718	1322	31	Amber	Engine Misfire for Multiple Cylinders	Engine Misfire for Multiple Cylinders - Condition Exists
1776	2634	3	Amber	Power Relay	Power Relay Driver Circuit - Voltage above normal, or shorted to high source
1777	2634	4	Amber	Power Relay	Power Relay Driver Circuit - Voltage below normal, or shorted to low source

Diesel Engine fault codes chart

Fault Code	SPN	FMI	Lamp	SPN description	Cumins Description
1843	101	3	Amber	Engine Crankcase Pressure	Crankcase Pressure Circuit - Voltage above normal, or shorted to high source
1844	101	4	Amber	Engine Crankcase Pressure	Crankcase Pressure Circuit - Voltage below normal, or shorted to low source
1847	110	14	Red	Engine Coolant Temperature	Engine Coolant Temperature - Special Instructions
1852	97	16	Amber	Water In Fuel Indicator	Water in Fuel Indicator - Data Valid But Above Normal Operating Range - Moderately Severe Level
1861	3217	2	Amber	Aftertreatment 1 Intake O2	Aftertreatment Intake Oxygen Sensor - Data erratic, intermittent or incorrect
1866	411	2	Amber	Engine Exhaust Gas Recirculation 1 Differential Pressure	Exhaust Gas Recirculation Differential Pressure - Data erratic, intermittent or incorrect
1867	412	2	Amber	Engine Exhaust Gas Recirculation 1 Temperature	Exhaust Gas Recirculation Temperature - Data erratic, intermittent or incorrect
1879	3251	3	Amber	Aftertreatment 1 Diesel Particulate Filter Differential Pressure	Aftertreatment Diesel Particulate Filter Differential Pressure Sensor Circuit - Voltage above normal
1881	3251	4	Amber	Aftertreatment 1 Diesel Particulate Filter Differential Pressure	Aftertreatment Diesel Particulate Filter Differential Pressure Sensor Circuit - Voltage below normal
1883	3251	2	Amber	Aftertreatment 1 Diesel Particulate Filter Differential Pressure	Aftertreatment Diesel Particulate Filter Differential Pressure Sensor - Data erratic, intermittent or incorrect
1885	3216	4	Amber	Aftertreatment 1 Intake Nox	Aftertreatment 1 Intake NOx Sensor Circuit - Voltage below normal, or shorted to low source
1887	3226	4	Amber	Aftertreatment 1 Outlet NOx	Aftertreatment 1 Outlet NOx Sensor Circuit - Voltage below normal, or shorted to low source
1893	2791	9	Amber	Engine Exhaust Gas Recirculation 1 (EGR1) Valve Control	EGR Valve Control Circuit - Abnormal update rate
1896	2791	13	Amber	Engine Exhaust Gas Recirculation 1 (EGR1) Valve Control	EGR Valve Controller - Out of Calibration
1898	641	13	Amber	Engine Variable Geometry Turbo-charger Actuator #1	VGT Actuator Controller - Out of Calibration
1921	3251	16	Amber	Aftertreatment 1 Diesel Particulate Filter Differential Pressure	Aftertreatment Diesel Particulate Filter Differential Pressure - Data Valid But Above Normal Operating Range

Diesel Engine fault codes chart					
Fault Code	**SPN**	**FMI**	**Lamp**	**SPN description**	**Cumins Description**
1922	3251	0	Red	Aftertreatment 1 Diesel Particulate Filter Differential Pressure	Aftertreatment Diesel Particulate Filter Differential Pressure - Data valid but above normal Operating Range
1923	3482	3	Amber	Aftertreatment 1 Fuel Enable Actuator	Aftertreatment Fuel Shutoff Valve Circuit - Voltage above normal, or shorted to high source
1924	3482	4	Amber	Aftertreatment 1 Fuel Enable Actuator	Aftertreatment Fuel Shutoff Valve Circuit - Voltage below normal, or shorted to low source
1925	3482	2	Amber	Aftertreatment 1 Fuel Enable Actuator	Aftertreatment Fuel Shutoff Valve - Data erratic, intermittent or incorrect
1926	3480	2	Amber	Aftertreatment Fuel Pressure	Aftertreatment Fuel Pressure Sensor - Data erratic, intermittent or incorrect
1927	3480	3	Amber	Aftertreatment Fuel Pressure	Aftertreatment Fuel Pressure Sensor Circuit - Voltage above normal, or shorted to high source
1928	3480	4	Amber	Aftertreatment Fuel Pressure	Aftertreatment Fuel Pressure Sensor Circuit - Voltage below normal, or shorted to low source
1932	3556	2	Amber	Aftertreatment Hydrocarbon Doser	Aftertreatment Doser - Data erratic, intermittent or incorrect
1938	3597	18	Amber	ECU Power Output Supply Voltage #1	ECU Power Output Supply Voltage 1 - Data Valid But Below Normal Operating Range - Moderately Severe Level
1939	3597	3	Amber	ECU Power Output Supply Voltage #1	ECU Power Output Supply Voltage 1 - Voltage above normal, or shorted to high source
1941	3597	4	Amber	ECU Power Output Supply Voltage #1	ECU Power Output Supply Voltage 1 - Voltage below normal, or shorted to low source
1942	101	2	Amber	Engine Crankcase Pressure	Crankcase Pressure - Data erratic, intermittent or incorrect
1943	3555	17	None	Ambient Air Density	Ambient Air Density - Data Valid But Below Normal Operating Range - Least Severe Level
1961	2791	15	Amber	Engine Exhaust Gas Recirculation 1 (EGR1) Valve Control	EGR Valve Control Circuit Over Temperature - Data Valid But Above Normal Operating Range - Least Severe Level
1962	641	15	Amber	Engine Variable Geometry Turbo-charger Actuator #1	VGT Actuator Driver Over Temperature (Calculated) - Data Valid But Above Normal Operating Range - Least Severe Level
1963	3482	7	Amber	Aftertreatment 1 Fuel Enable Actuator	Aftertreatment Fuel Shutoff Valve - Mechanical system not responding or out of adjustment
1964	3556	7	Amber	Aftertreatment Hydrocarbon Doser	Aftertreatment Doser - Mechanical system not responding or out of adjustment

Diesel Engine fault codes chart

Fault Code	SPN	FMI	Lamp	SPN description	Cumins Description
1974	101	15	Amber (Blink-ing)	Engine Crankcase Pressure	Crankcase Pressure - Data Valid But Above Normal Operating Range - Least Severe Level
1977	3556	5	Amber	Aftertreatment Hydrocarbon Doser	Aftertreatment Doser Circuit - Current below normal or open circuit.
1978	3938	3	Amber		Generator Speed / Load Governing Bias Circuit - Voltage above normal, or shorted to high source
1979	3938	4	Amber		Generator Speed / Load Governing Bias Circuit - Voltage below normal, or shorted to low source
1981	3936	15	Amber	Aftertreatment Diesel Particulate Filter System	Aftertreatment 1 Diesel Particulate Filter System - Data Valid But Above Normal Operating Range - Level
1992	190	16	Red	Engine Speed	Engine Crankshaft Speed/Position - Data Valid But Above Normal Operating Range - Moderately Severe Level
1993	4795	31	Amber	Aftertreatment 1 Diesel Particulate Filter Missing	Aftertreatment 1 Diesel Particulate Filter Missing - Condition Exists
2182	1072	3	Amber	Engine (Compression) Brake Output #1	Engine Brake Actuator Driver 1 Circuit - Voltage above normal, or shorted to high source
2183	1072	4	Amber	Engine (Compression) Brake Output #1	Engine Brake Actuator Driver 1 Circuit - Voltage below normal, or shorted to low source
2185	3512	3	Amber	Sensor supply volt-age 4	Sensor Supply 4 Circuit - Voltage above normal, or shorted to high source
2186	3512	4	Amber	Sensor supply volt-age 4	Sensor Supply 4 Circuit - Voltage below normal, or shorted to low source
2198	641	11	Amber	Engine Variable Geometry Turbocharger Actuator #1	VGT Actuator Driver Circuit - Root Cause Not Known
2215	94	18	Amber	Engine Fuel Delivery Pressure	Fuel Pump Delivery Pressure - Data Valid But Below Normal Operating Range - Moderately Severe Level
2249	157	1	Amber	Engine Injector Metering Rail 1 Pressure	Injector Metering Rail 1 Pressure - Data valid but below normal operational range - Most Severe Level
2261	94	15	Amber (Blink-ing)	Engine Fuel Delivery Pressure	Fuel Pump Delivery Pressure - Data Valid But Above Normal Operating Range - Least Severe Level
2262	94	17	Amber (Blink-ing)	Engine Fuel Delivery Pressure	Fuel Pump Delivery Pressure - Data Valid But Below Normal Operating Range - Least Severe Level
2263	1800	16	Amber	Battery 1 Temperature	Battery Temperature - Data Valid But Above Normal Operating Range - Moderately Severe Level

Diesel Engine fault codes chart					
Fault Code	**SPN**	**FMI**	**Lamp**	**SPN description**	**Cumins Description**
2264	1800	18	Amber	Battery 1 Temperature	Battery Temperature - Data Valid But Below Normal Operating Range - Moderately Severe Level
2265	1075	3	Amber	Engine Electric Lift Pump for Engine Fuel Supply	Electric Lift Pump for Engine Fuel Supply Circuit - Voltage above normal, or shorted to high source
2266	1075	4	Amber	Engine Electric Lift Pump for Engine Fuel Supply	Electric Lift Pump for Engine Fuel Supply Circuit - Voltage below normal, or shorted to low source
2272	27	4	Amber	Engine Exhaust Gas Recirculation 1 Valve Position	EGR Valve Position Circuit - Voltage below normal, or shorted to low source
2273	411	3	Amber	Engine Exhaust Gas Recirculation 1 Differential Pressure	Exhaust Gas Recirculation Differential Pressure Sensor Circuit - Voltage above normal, or shorted to high source
2274	411	4	Amber	Engine Exhaust Gas Recirculation 1 Differential Pressure	Exhaust Gas Recirculation Differential Pressure Sensor Circuit - Voltage below normal, or shorted to low source
2288	103	15	None	Engine Turbocharger 1 Speed	Turbocharger 1 Speed - Data Valid But Above Normal Operating Range - Least Severe Level
2292	611	16	Amber	Fuel Inlet Meter Device	Fuel Inlet Meter Device - Data Valid But Above Normal Operating Range - Moderately Severe Level
2293	611	18	Amber	Fuel Inlet Meter Device	Fuel Inlet Meter Device flow demand lower than expected - Data Valid But Below Normal Operating Range
2311	633	31	Amber	Engine Fuel Actuator 1 Control Command	Electronic Fuel Injection Control Valve Circuit - Condition Exists
2321	190	2	None	Engine Speed	Engine Crankshaft Speed/Position - Data erratic, intermittent or incorrect
2322	723	2	None	Engine Speed 2	Engine Camshaft Speed / Position Sensor - Data erratic, intermittent or incorrect
2346	2789	15	None	Engine Turbocharger 1 Calculated Turbine Intake Temperature	Turbocharger Turbine Intake Temperature - Data Valid But Above Normal Operating Range - Least Severe
2347	2629	15	None	Engine Turbocharger 1 Compressor Outlet Temperature	Turbocharger Compressor Outlet Temperature (Calculated) - Data Valid But Above Normal Operating Range
2349	2791	5	Amber	Engine Exhaust Gas Recirculation 1 (EGR1) Valve Control	EGR Valve Control Circuit - Current below normal or open circuit

Diesel Engine fault codes chart					
Fault Code	**SPN**	**FMI**	**Lamp**	**SPN description**	**Cumins Description**
2353	2791	6	Amber	Engine Exhaust Gas Recirculation 1 (EGR1) Valve Control	EGR Valve Control Circuit - Current above normal or grounded circuit
2357	2791	7	Amber	Engine Exhaust Gas Recirculation 1 (EGR1) Valve Control	EGR Valve Control Circuit - Mechanical system not responding or out of adjustment
2363	1073	4	Amber	Engine (Compression) Brake Output #2	Engine Brake Actuator Driver Output 2 Circuit - Voltage below normal, or shorted to low source
2365	1112	4	Amber	Engine (Compression) Brake Output #3	Engine Brake Actuator Driver Output 3 Circuit - Voltage below normal, or shorted to low source
2367	1073	3	Amber	Engine (Compression) Brake Output #2	Engine Brake Actuator Driver Output 2 Circuit - Voltage above normal, or shorted to high source
2368	1112	3	Amber	Engine (Compression) Brake Output #3	Engine Brake Actuator Driver 3 Circuit - Voltage above normal, or shorted to high source
2372	95	16	Amber	Engine Fuel Filter Differential Pressure	Fuel Filter Differential Pressure - Data Valid But Above Normal Operating Range - Moderately Severe
2373	1209	3	Amber	Engine Exhaust Gas Pressure 1	Exhaust Gas Pressure Sensor 1 Circuit - Voltage above normal, or shorted to high source
2374	1209	4	Amber	Engine Exhaust Gas Pressure 1	Exhaust Gas Pressure Sensor 1 Circuit - Voltage below normal, or shorted to low source
2375	412	3	Amber	Engine Exhaust Gas Recirculation 1 Temperature	Exhaust Gas Recirculation Temperature Sensor Circuit - Voltage above normal, or shorted to high source
2376	412	4	Amber	Engine Exhaust Gas Recirculation 1 Temperature	Exhaust Gas Recirculation Temperature Sensor Circuit - Voltage below normal, or shorted to low source
2377	647	3	Amber	Engine Fan Clutch 1 Output Device Driver	Fan Control Circuit - Voltage above normal, or shorted to high source
2387	641	7	Amber	Engine Variable Geometry Turbocharger Actuator #1	VGT Actuator Driver Circuit (Motor) - Mechanical system not responding or out of adjustment
2398	171	2	Amber	Ambient Air Temperature	Ambient Air Temperature - Data erratic, intermittent or incorrect
2448	111	17	Amber (Blinking)	Engine Coolant Level	Coolant Level - Data Valid But Below Normal Operating Range - Least Severe Level
2449	641	13	Red	Engine Variable Geometry Turbocharger Actuator #1	VGT Actuator Controller - Out of Calibration

Diesel Engine fault codes chart

Fault Code	SPN	FMI	Lamp	SPN description	Cumins Description
2451	2789	16	None	Engine Turbocharger 1 Calculated Turbine Intake Temperature	Turbocharger Turbine Intake Temperature - Data Valid But Above Normal Operating Range - Moderately S
2468	190	16	Amber	Engine Speed	Engine Crankshaft Speed/Position - Data Valid But Above Normal Operating Range - Moderately Severe Level
2554	1209	2	Amber	Engine Exhaust Gas Pressure 1	Exhaust Gas Pressure 1 - Data erratic, intermittent or incorrect
2555	729	3	Amber	Engine Intake Air Heater Driver #1	Engine Intake Air Heater 1 Circuit - Voltage above normal, or shorted to high source
2556	729	4	Amber	Engine Intake Air Heater Driver #1	Engine Intake Air Heater 1 Circuit - Voltage below normal, or shorted to low source
2557	697	3	Amber	Auxiliary PWM Driver #1	Auxiliary PWM Driver 1 Circuit - Voltage above normal, or shorted to high source
2558	697	4	Amber	Auxiliary PWM Driver #1	Auxiliary PWM Driver 1 Circuit - Voltage below normal, or shorted to low source
2571	2630	3	Amber	Engine Charge Air Cooler 1 Outlet Temperature	Engine Charge Air Cooler Outlet Temperature - Voltage above normal, or shorted to high source
2572	2630	4	Amber	Engine Charge Air Cooler 1 Outlet Temperature	Engine Charge Air Cooler Outlet Temperature - Voltage below normal, or shorted to low source
2634	641	12	Red	Engine Variable Geometry Turbocharger Actuator #1	VGT Actuator Controller - Bad intelligent device or component
2635	641	31	Red	Engine Variable Geometry Turbocharger Actuator #1	VGT Actuator Driver Circuit - Condition Exists
2636	641	9	Red	Engine Variable Geometry Turbocharger Actuator #1	VGT Actuator Driver Circuit - Abnormal update rate
2637	5018	11	None	Aftertreatment Diesel Oxidation Catalyst	Aftertreatment 1 Diesel Oxidation Catalyst Face Plugged - Root Cause Not Known
2639	3251	15	None	Aftertreatment 1 Diesel Particulate Filter Differential Pressure	Aftertreatment Diesel Particulate Filter Differential Pressure - Data valid but above normal Operating Range
2646	110	31	Amber	Engine Coolant Temperature	Engine Coolant Temperature - Condition Exists
2659	110	31	None	Engine Coolant Temperature	Engine Coolant Temperature - Condition Exists
2661	629	31	Red	Controller #1	At Least One Unacknowledged Most Severe Fault - Condition Exists

Diesel Engine fault codes chart

Fault Code	SPN	FMI	Lamp	SPN description	Cumins Description
2662	629	31	Amber	Controller #1	At Least One Unacknowledged Moderately Severe Fault - Condition Exists
2683	3227	9	Amber	Aftertreatment 1 Outlet O2	Aftertreatment Outlet Oxygen Sensor Circuit - Abnormal update rate
2699	520320	7	Amber	Crankcase Depression Valve	Crankcase Depression Valve - Mechanical system not responding or out of adjustment
2721	599	2	Amber	Cruise Control Set Switch	Cruise Control Set Switch - Data erratic, intermittent or incorrect
2732	4097	3	Amber	Aftertreatment 1 Fuel Drain Actuator	Aftertreatment Fuel Drain Valve Circuit - Voltage above normal, or shorted to high source
2733	4097	4	Amber	Aftertreatment 1 Fuel Drain Actuator	Aftertreatment Fuel Drain Valve Circuit - Voltage below normal, or shorted to low source
2738	626	3	Amber	Engine Start Enable Device 1	Start Enable Device 1 Circuit (Ether Injection) - Voltage above normal, or shorted to high source
2739	626	4	Amber	Engine Start Enable Device 1	Start Enable Device 1Circuit (Ether Injection) - Voltage below normal, or shorted to low source
2741	3482	13	Amber	Aftertreatment 1 Fuel Enable Actuator	Aftertreatment Fuel Shutoff Valve Swapped - Out of Calibration
2742	3249	17	None	Aftertreatment 1 Exhaust Gas Temperature 2	Aftertreatment Exhaust Gas Temperature 2 - Data Valid But Below Normal Operating Range - Least Sever
2743	3249	18	Amber	Aftertreatment 1 Exhaust Gas Temperature 2	Aftertreatment Exhaust Gas Temperature 2 - Data Valid But Below Normal Operating Range - Moderately
2753	412	0	Red	Engine Exhaust Gas Recirculation 1 Temperature	Exhaust Gas Recirculation Temperature - Data valid but above normal operational range - Most Severe
2754	81	16	Amber	Engine Diesel Par-ticulate Filter Intake Pressure	Engine Diesel Particulate Filter Intake Pressure - Data Valid But Above Normal Operating Range - Moderately Severe Level
2755	520332	3	Amber	Intake Pressure	Cruise Control (Resistive) #2 Signal Circuit - Voltage above normal, or shorted to high source
2756	520332	4	Amber		Cruise Control (Resistive) #2 Signal Circuit - Voltage below normal, or shorted to low source
2764	1209	16	Amber	Engine Exhaust Gas Pressure 1	Exhaust Gas Pressure 1 - Data Valid But Above Normal Operating Range - Moderately Severe Level
2765	2797	13	None	Engine Injector Group 1	Engine Injector Bank 1 Barcodes - Out of Calibration
2771	3226	9	Amber	Aftertreatment 1 Outlet NOx	Aftertreatment 1 Outlet NOx Sensor - Abnormal update rate

Diesel Engine fault codes chart

Fault Code	SPN	FMI	Lamp	SPN description	Cumins Description
2777	3703	31	Amber (Blinking)	Diesel Particulate Filter Active Regeneration Inhibited Due to Inhibit Switch	Particulate Trap Active Regeneration Inhibited Due to Inhibit Switch - Condition Exists
2778	3481	16	Amber	Aftertreatment 1 Fuel Rate	Aftertreatment Fuel Rate - Data Valid But Above Normal Operating Range - Moderately Severe Level
2789	110	18	Amber	Engine Coolant Temperature	Engine Coolant Temperature - Data Valid But Below Normal Operating Range - Moderately Severe Level
2878	4097	7	Amber	Aftertreatment 1 Fuel Drain Actuator	Aftertreatment Fuel Drain Valve - Mechanical system not responding or out of adjustment
2881	3480	17	Amber	Aftertreatment Fuel Pressure	Aftertreatment Fuel Pressure Sensor - Data Valid But Below Normal Operating Range - Least Severe Level
2961	412	15	None	Engine Exhaust Gas Recirculation 1 Temperature	Exhaust Gas Recirculation Temperature - Data Valid But Above Normal Operating Range - Least Severe Level
2962	412	16	Amber	Engine Exhaust Gas Recirculation 1 Temperature	Exhaust Gas Recirculation Temperature - Data Valid But Above Normal Operating Range - Moderately Severe Level
2963	110	15	None	Engine Coolant Temperature	Engine Coolant Temperature - Data Valid But Above Normal Operating Range - Least Severe Level
2964	105	15	None	Engine Intake Manifold #1 Temperature	Intake Manifold 1 Temperature - Data Valid But Above Normal Operating Range - Least Severe Level
2973	102	2	Amber	Engine Intake Manifold #1 Pressure	Intake Manifold 1 Pressure - Data erratic, intermittent or incorrect
2976	3361	2	Amber	Aftertreatment 1 Diesel Exhaust Fluid Dosing Unit	Aftertreatment 1 Diesel Exhaust Fluid Dosing Unit Temperature - Data erratic, intermittent or incorrect
2998	1632	14	Amber	Engine Torque Limit Feature	Engine Torque Limit Feature - Special Instructions
3133	3610	3	Amber	Aftertreatment Diesel Particulate Filter Outlet Pressure	Aftertreatment 1 Diesel Particulate Filter Outlet Pressure Sensor Circuit - Voltage above normal, or shorted to high source
3134	3610	4	Amber	Aftertreatment Diesel Particulate Filter Outlet Pressure	Aftertreatment 1 Diesel Particulate Filter Outlet Pressure Sensor Circuit - Voltage below normal, or shorted to low source
3135	3610	2	Amber	Aftertreatment Diesel Particulate Filter Outlet Pressure	Aftertreatment 1 Diesel Particulate Filter Outlet Pressure - Data erratic, intermittent or incorrect
3136	5019	3	Amber	Engine Exhaust Gas Recirculation 1 Outlet Pressure	Engine Exhaust Gas Recirculation Outlet Pressure Sensor Circuit - Voltage above normal, or shorted to high source

Diesel Engine fault codes chart					
Fault Code	**SPN**	**FMI**	**Lamp**	**SPN description**	**Cumins Description**
3137	5019	4	Amber	Engine Exhaust Gas Recirculation 1 Outlet Pressure	Engine Exhaust Gas Recirculation Outlet Pressure Sensor Circuit - Voltage below normal, or shorted to low source
3138	5019	2	Amber	Engine Exhaust Gas Recirculation 1 Outlet Pressure	Engine Exhaust Gas Recirculation Outlet Pressure - Data erratic, intermittent or incorrect
3139	3667	3	Amber	Engine Air Shutoff Status	Engine Air Shutoff Circuit - Voltage above normal, or shorted to high source
3141	3667	4	Amber	Engine Air Shutoff Status	Engine Air Shutoff Circuit - Voltage below normal, or shorted to low source
3142	4360	3	Amber	Aftertreatment 1 SCR Catalyst Intake Gas Temperature	Aftertreatment 1 SCR Intake Temperature Sensor Circuit - Voltage above normal, or shorted to high source
3143	4360	4	Amber	Aftertreatment 1 SCR Catalyst Intake Gas Temperature	Aftertreatment 1 SCR Intake Temperature Sensor Circuit - Voltage below normal, or shorted to low source
3144	4360	2	Amber	Aftertreatment 1 SCR Catalyst Intake Gas Temperature	Aftertreatment 1 SCR Intake Temperature Sensor - Data erratic, intermittent or incorrect
3146	4363	3	Amber	Aftertreatment 1 SCR Catalyst Outlet Gas Temperature	Aftertreatment 1 SCR Outlet Temperature Sensor Circuit - Voltage above normal, or shorted to high source
3147	4363	4	Amber	Aftertreatment 1 SCR Catalyst Outlet Gas Temperature	Aftertreatment 1 SCR Outlet Temperature Sensor Circuit - Voltage below normal, or shorted to low source
3148	4363	2	Amber	Aftertreatment 1 SCR Catalyst Outlet Gas Temperature	Aftertreatment 1 SCR Outlet Temperature Sensor - Data erratic, intermittent or incorrect
3151	4794	31	Amber		Aftertreatment 1 SCR Catalyst System Missing - Condition Exists
3152	4809	3	Amber	Aftertreatment Warm Up Diesel Oxidation Catalyst Intake Temperature	Aftertreatment Warm Up Diesel Oxidation Catalyst Intake Temperature Sensor Circuit - Voltage above normal
3153	4809	4	Amber	Aftertreatment Warm Up Diesel Oxidation Catalyst Intake Temperature	Aftertreatment Warm Up Diesel Oxidation Catalyst Intake Temperature Sensor Circuit - Voltage below normal
3154	4809	2	Amber	Aftertreatment Warm Up Diesel Oxidation Catalyst Intake Temperature	Aftertreatment Warm Up Diesel Oxidation Catalyst Intake Temperature - Data erratic, intermittent or incorrect
3155	4810	3	Amber	Aftertreatment Warm Up Diesel Oxidation Catalyst Outlet Temperature	Aftertreatment Warm Up Diesel Oxidation Catalyst Outlet Temperature Sensor Circuit - Voltage above normal

Diesel Engine fault codes chart					
Fault Code	**SPN**	**FMI**	**Lamp**	**SPN description**	**Cumins Description**
3156	4810	4	Amber	Aftertreatment Warm Up Diesel Oxidation Catalyst Outlet Temperature	Aftertreatment Warm Up Diesel Oxidation Catalyst Outlet Temperature Sensor Circuit - Voltage below normal
3157	4810	2	Amber	Aftertreatment Warm Up Diesel Oxidation Catalyst Outlet Temperature	Aftertreatment Warm Up Diesel Oxidation Catalyst Outlet Temperature - Data erratic, intermittent or incorrect
3158	4793	31	Amber		Aftertreatment Warm Up Diesel Oxidation Catalyst Missing - Condition Exists
3162	4810	0	Red	Aftertreatment Warm Up Diesel Oxidation Catalyst Outlet Temperature	Aftertreatment Warm Up Diesel Oxidation Catalyst Outlet Temperature - Data valid but above normal operating Range –Most Severe level
3164	4360	15	None	Aftertreatment 1 SCR Catalyst Intake Gas Temperature	Aftertreatment 1 SCR Intake Temperature - Data Valid But Above Normal Operating Range - Least Severe
3165	4363	0	Red	Aftertreatment 1 SCR Catalyst Outlet Gas Temperature	Aftertreatment 1 SCR Outlet Temperature - Data valid but above normal operational range - Most Severe
3166	4809	13	Amber	Aftertreatment Warm Up Diesel Oxidation Catalyst Intake Temperature	Aftertreatment Warm Up Diesel Oxidation Catalyst Intake Temperature Sensor Swapped - Out of Calibration
3167	3556	18	Amber	Aftertreatment Hydrocarbon Doser	Aftertreatment Doser - Data Valid But Below Normal Operating Range - Moderately Severe Level
3169	4810	16	Red	Aftertreatment Warm Up Diesel Oxidation Catalyst Outlet Temperature	Aftertreatment Warm Up Diesel Oxidation Catalyst Outlet Temperature - Data Valid But Above Normal Operating Range
3173	4791	18	Amber		Aftertreatment 1 Warm Up Diesel Oxidation Catalyst Efficiency - Data Valid But Below Normal Operating Range
3186	1623	9	Amber	Tachograph output shaft speed	Tachograph Output Shaft Speed - Abnormal update rate
3213	1623	19	Amber	Tachograph output shaft speed	Tachograph Output Shaft Speed - Received Network Data In Error
3222	520435	12	Amber		Glow Plug Module - Bad intelligent device or component
3223	3490	4	Amber	Aftertreatment 1 Purge Air Actuator	Aftertreatment Purge Air Actuator Circuit - Voltage below normal, or shorted to low source
3224	3490	3	Amber	Aftertreatment 1 Purge Air Actuator	Aftertreatment Purge Air Actuator Circuit - Voltage above normal, or shorted to high source
3225	3490	7	Amber	Aftertreatment 1 Purge Air Actuator	Aftertreatment Purge Air Actuator - Mechanical system not responding or out of adjustment

Diesel Engine fault codes chart					
Fault Code	**SPN**	**FMI**	**Lamp**	**SPN description**	**Cumins Description**
3228	3216	2	Amber	Aftertreatment 1 Intake NOx	Aftertreatment 1 Intake NOx Sensor - Data erratic, intermittent or incorrect
3229	4360	0	Red	Aftertreatment 1 SCR Catalyst Intake Gas Temperature	Aftertreatment 1 SCR Intake Temperature - Data valid but above normal operational range - Most Severe Level
3231	4360	16	Red	Aftertreatment 1 SCR Catalyst Intake Gas Temperature	Aftertreatment 1 SCR Intake Temperature - Data Valid But Above Normal Operating Range - Moderately Severe Level
3232	3216	9	Amber	Aftertreatment 1 Intake NOx	Aftertreatment 1 Intake NOx Sensor - Abnormal update rate
3235	4363	16	Red	Aftertreatment 1 SCR Catalyst Outlet Gas Temperature	Aftertreatment 1 SCR Outlet Temperature - Data Valid But Above Normal Operating Range - Moderately Severe Level
3237	4340	3	Amber	Aftertreatment 1 Diesel Exhaust Fluid Line Heater 1 State	Aftertreatment 1 Diesel Exhaust Fluid Line Heater 1 Circuit - Voltage above normal, or shorted to high source
3238	4340	4	Amber	Aftertreatment 1 Diesel Exhaust Fluid Line Heater 1 State	Aftertreatment 1 Diesel Exhaust Fluid Line Heater 1 Circuit - Voltage below normal, or shorted to low source
3239	4342	3	Amber	Aftertreatment 1 Diesel Exhaust Fluid Line Heater 2 State	Aftertreatment 1 Diesel Exhaust Fluid Line Heater 2 Circuit - Voltage above normal, or shorted to high source
3241	4342	4	Amber	Aftertreatment 1 Diesel Exhaust Fluid Line Heater 2 State	Aftertreatment 1 Diesel Exhaust Fluid Line Heater 2 Circuit - Voltage below normal, or shorted to low source
3242	3363	7	Amber	Aftertreatment 1 Diesel Exhaust Fluid Tank 1 Heater	Aftertreatment 1 Diesel Exhaust Fluid Tank Heater - Mechanical system not responding or out of adjustment
3245	3936	7	Amber		Aftertreatment 1 Diesel Particulate Filter System - Mechanical system not responding or out of adjustment
3247	4809	16	Red	Aftertreatment Warm Up Diesel Oxidation Catalyst Intake Temperature	Aftertreatment Warm Up Diesel Oxidation Catalyst Intake Temperature - Data Valid But Above Normal Operating Range
3249	4810	15	Amber	Aftertreatment Warm Up Diesel Oxidation Catalyst Outlet Temperature	Aftertreatment Warm Up Diesel Oxidation Catalyst Outlet Temperature - Data Valid But Above Normal Operating Range
3251	4765	16	Red	Aftertreatment Diesel Oxidation Catalyst Intake Temperature	Aftertreatment 1 Diesel Oxidation Catalyst Intake Temperature - Data Valid But Above Normal Operating Range

Diesel Engine fault codes chart					
Fault Code	**SPN**	**FMI**	**Lamp**	**SPN description**	**Cumins Description**
3253	3242	16	Red	Aftertreatment 1 Diesel Particulate Filter Intake Gas Temperature	Aftertreatment 1 Diesel Particulate Filter Intake Temperature - Data Valid But Above Normal Operating Range
3254	3242	15	Amber	Aftertreatment 1 Diesel Particulate Filter Intake Gas Temperature	Aftertreatment 1 Diesel Particulate Filter Intake Temperature - Data Valid But Above Normal Operating Range
3255	3246	16	Red	Aftertreatment 1 Diesel Particulate Filter Outlet Gas Temperature	Aftertreatment 1 Diesel Particulate Filter Outlet Temperature - Data Valid But Above Normal Operating Range
3256	3246	15	Amber	Aftertreatment 1 Diesel Particulate Filter Outlet Gas Temperature	Aftertreatment 1 Diesel Particulate Filter Outlet Temperature - Data Valid But Above Normal Operating Range
3258	4340	5	Amber	Aftertreatment 1 Diesel Exhaust Fluid Line Heater 1 State	Aftertreatment 1 Diesel Exhaust Fluid Line Heater 1 Circuit - Current below normal or open circuit
3261	4342	5	Amber	Aftertreatment 1 Diesel Exhaust Fluid Line Heater 2 State	Aftertreatment 1 Diesel Exhaust Fluid Line Heater 2 Circuit - Current below normal or open circuit
3298	1194	13	Red	Anti-theft Encryption Seed Present Indicator	Anti-theft Encryption Seed - Out of Calibration
3311	3242	0	Red	Aftertreatment 1 Diesel Particulate Filter Intake Gas Temperature	Aftertreatment 1 Diesel Particulate Filter Intake Temperature - Data valid but above normal operation
3312	3246	0	Red	Aftertreatment 1 Diesel Particulate Filter Outlet Gas Temperature	Aftertreatment 1 Diesel Particulate Filter Outlet Temperature - Data valid but above normal operation
3313	4765	4	Amber	Aftertreatment Diesel Oxidation Catalyst Intake Temperature	Aftertreatment 1 Diesel Oxidation Catalyst Intake Temperature Sensor Circuit - Voltage below normal, or shorted to low source
3314	4765	3	Amber	Aftertreatment Diesel Oxidation Catalyst Intake Temperature	Aftertreatment 1 Diesel Oxidation Catalyst Intake Temperature Sensor Circuit - Voltage above normal, or shorted to high source
3315	4765	2	Amber	Aftertreatment Diesel Oxidation Catalyst Intake Temperature	Aftertreatment 1 Diesel Oxidation Catalyst Intake Temperature - Data erratic, intermittent or incorrect
3316	3242	4	Amber	Aftertreatment 1 Diesel Particulate Filter Intake Gas Temperature	Aftertreatment 1 Diesel Particulate Filter Intake Temperature Sensor Circuit - Voltage below normal, or shorted to low source
3317	3242	3	Amber	Aftertreatment 1 Diesel Particulate Filter Intake Gas Temperature	Aftertreatment 1 Diesel Particulate Filter Intake Temperature Sensor Circuit - Voltage above normal, or shorted to high source

Diesel Engine fault codes chart

Fault Code	SPN	FMI	Lamp	SPN description	Cumins Description
3318	3242	2	Amber	Aftertreatment 1 Diesel Particulate Filter Intake Gas Temperature	Aftertreatment 1 Diesel Particulate Filter Intake Temperature - Data erratic, intermittent or incorrect
3319	3246	3	Amber	Aftertreatment 1 Diesel Particulate Filter Outlet Gas Temperature	Aftertreatment 1 Diesel Particulate Filter Outlet Temperature Sensor Circuit - Voltage above normal, or shorted to high source
3321	3246	4	Amber	Aftertreatment 1 Diesel Particulate Filter Outlet Gas Temperature	Aftertreatment 1 Diesel Particulate Filter Outlet Temperature Sensor Circuit - Voltage below normal, or shorted to low source
3322	3246	2	Amber	Aftertreatment 1 Diesel Particulate Filter Outlet Gas Temperature	Aftertreatment 1 Diesel Particulate Filter Outlet Temperature - Data erratic, intermittent or incorrect
3325	4765	13	Amber	Aftertreatment Diesel Oxidation Catalyst Intake Temperature	Aftertreatment 1 Diesel Oxidation Catalyst Intake Temperature Swapped - Out of Calibration
3326	91	9	Red	Accelerator Pedal Position 1	SAE J1939 Multiplexed Accelerator Pedal or Lever Sensor System - Abnormal update rate
3328	191	9	Amber	Transmission Output Shaft Speed	Transmission Output Shaft Speed - Abnormal update rate
3329	1231	2	None		J1939 Network #2 - Data erratic, intermittent or incorrect
3331	1235	2	None		J1939 Network #3 - Data erratic, intermittent or incorrect
3337	5395	16	Amber	Engine Idle Fuel Quantity	Engine Idle Fuel Quantity - Data Valid But Above Normal Operating Range - Moderately Severe Level
3338	5395	18	Amber	Engine Idle Fuel Quantity	Engine Idle Fuel Quantity - Data Valid But Below Normal Operating Range - Moderately Severe Level
3341	107	16	Amber	Engine Air Filter 1 Differential Pressure	Engine Air Filter Differential Pressure - Data Valid But Above Normal Operating Range - Moderately Severe Level
3348	1176	1	Red	Engine Turbocharger 1 Compressor Intake Pressure	Turbocharger 1 Compressor Intake Pressure - Data valid but below normal operational range - Most Severe Level
3361	102	10	Amber	Engine Intake Manifold #1 Pressure	Intake Manifold 1 Pressure - Abnormal rate of change
3366	111	18	None	Engine Coolant Level	Coolant Level - Data Valid But Below Normal Operating Range - Moderately Severe Level
3367	4490	9	Amber	Specific Humidity	Specific Humidity Sensor - Abnormal update rate
3368	4490	19	Amber	Specific Humidity	Specific Humidity Sensor - Received Network Data In Error

Diesel Engine fault codes chart

Fault Code	SPN	FMI	Lamp	SPN description	Cumins Description
3369	1172	9	Amber	Engine Turbocharger 1 Compressor Intake Temperature	Turbocharger 1 Compressor Intake Temperature Sensor - Abnormal update rate
3371	1172	19	Amber	Engine Turbocharger 1 Compressor Intake Temperature	Turbocharger 1 Compressor Intake Temperature Sensor - Received Network Data In Error
3372	1176	9	Amber	Engine Turbocharger 1 Compressor Intake Pressure	Turbocharger 1 Compressor Intake Pressure - Abnormal update rate
3373	1176	19	Amber	Engine Turbocharger 1 Compressor Intake Pressure	Turbocharger 1 Compressor Intake Pressure - Received Network Data In Error
3374	1818	31	None	ROP Brake Control active	Roll Over Protection Brake Control Active - Condition Exists
3375	5397	31	Amber	Aftertreatment 1 Diesel Particulate Filter Regeneration too Frequent	Aftertreatment Diesel Particulate Filter Regeneration too Frequent - Condition Exists
3376	5319	31	Amber	Aftertreatment 1 Diesel Particulate Filter Incomplete Regeneration	Aftertreatment Diesel Particulate Filter Incomplete Regeneration - Condition Exists
3377	5396	31	Amber	Engine Crankcase Ventilation Hose Disconnected	Engine Crankcase Ventilation Hose Disconnected - Condition Exists
3385	105	18	Amber	Engine Intake Manifold 1 Temperature	Intake Manifold 1 Temperature - Data Valid But Below Normal Operating Range - Moderately Severe Level
3396	3750	31	Amber	Diesel Particulate Filter 1 Conditions Not Met for Active Regeneration	Diesel Particulate Filter 1 Conditions Not Met for Active Regeneration - Condition Exists
3418	191	19	Amber	Transmission Output Shaft Speed	Transmission Output Shaft Speed - Received Network Data In Error
3419	5125	3	Amber	Sensor supply voltage 7	Sensor Supply 7 Circuit - Voltage above normal, or shorted to high source
3421	5125	4	Amber	Sensor supply voltage 7	Sensor Supply 7 Circuit - Voltage below normal, or shorted to low source
3422	4344	3	Amber	Aftertreatment 1 Diesel Exhaust Fluid Line Heater 3 State	Aftertreatment Diesel Exhaust Fluid Line Heater 3 Circuit - Voltage above normal, or shorted to high source

Diesel Engine fault codes chart

Fault Code	SPN	FMI	Lamp	SPN description	Cumins Description
3423	4344	4	Amber	Aftertreatment 1 Diesel Exhaust Fluid Line Heater 3 State	Aftertreatment Diesel Exhaust Fluid Line Heater 3 Circuit - Voltage below normal, or shorted to low source
3425	4344	5	Amber	Aftertreatment 1 Diesel Exhaust Fluid Line Heater 3 State	Aftertreatment Diesel Exhaust Fluid Line Heater 3 Circuit - Current below normal or open circuit
3478	2630	2	Amber	Engine Charge Air Cooler 1 Outlet Temperature	Engine Charge Air Cooler Outlet Temperature - Data erratic, intermittent or incorrect
3488	563	9	Amber	Anti-Lock Braking (ABS) Active	Anti-Lock Braking (ABS) Controller - Abnormal update rate
3494	1081	7	Amber	Engine Wait to Start Lamp	Engine Wait to Start Lamp - Mechanical system not responding or out of adjustment
3497	1761	17	Amber (Blinking)	Aftertreatment 1 Diesel Exhaust Fluid Tank Level	Aftertreatment 1 Diesel Exhaust Fluid Tank Level - Data Valid But Below Normal Operating Range - Least Severe Level
3498	1761	18	Amber (Blinking)	Aftertreatment 1 Diesel Exhaust Fluid Tank Level	Aftertreatment 1 Diesel Exhaust Fluid Tank Level - Data Valid But Below Normal Operating Range - Moderately Severe Level
3525	84	19	Amber	Wheel-Based Vehicle Speed	Wheel-Based Vehicle Speed - Received Network Data In Error
3526	84	9	Amber	Wheel-Based Vehicle Speed	Wheel-Based Vehicle Speed - Abnormal update rate
3527	558	19	Red	Accelerator Pedal 1 Low Idle Switch	Accelerator Pedal or Lever Idle Validation Switch - Received Network Data In Error
3528	558	9	Red	Accelerator Pedal 1 Low Idle Switch	Accelerator Pedal or Lever Idle Validation Switch - Abnormal update rate
3531	171	9	Amber	Ambient Air Temperature	Ambient Air Temperature - Abnormal update rate
3532	171	19	Amber	Ambient Air Temperature	Ambient Air Temperature - Received Network Data In Error
3535	1213	9	Amber	Malfunction Indicator Lamp	Malfunction Indicator Lamp - Abnormal update rate
3543	4094	31	Amber	NOx limits exceeded due to Insufficient Diesel Exhaust Fluid Quality	NOx limits exceeded due to Insufficient Reagent Quality - Condition Exists
3545	3226	10	Amber	Aftertreatment 1 Outlet NOx	Aftertreatment 1 Outlet NOx Sensor - Abnormal rate of change

Diesel Engine fault codes chart					
Fault Code	**SPN**	**FMI**	**Lamp**	**SPN description**	**Cumins Description**
3547	4096	31	None	NOx limits exceeded due to Empty Diesel Exhaust Fluid Tank	Aftertreatment Diesel Exhaust Fluid Tank Empty - Condition Exists
3555	1081	9	Amber	Engine Wait to Start Lamp	Engine Wait to Start Lamp - Abnormal update rate
3556	1081	19	Amber	Engine Wait to Start Lamp	Engine Wait to Start Lamp - Received Network Data In Error
3558	3361	3	Amber	Aftertreatment 1 Diesel Exhaust Fluid Dosing Unit	Aftertreatment 1 Diesel Exhaust Fluid Dosing Unit - Voltage above normal, or shorted to high source
3559	3361	4	Amber	Aftertreatment 1 Diesel Exhaust Fluid Dosing Unit	Aftertreatment 1 Diesel Exhaust Fluid Dosing Unit - Voltage below normal, or shorted to low source
3562	5491	3	Amber	Aftertreatment 1 Diesel Exhaust Fluid Line Heater Relay	Aftertreatment Diesel Exhaust Fluid Line Heater Relay - Voltage above normal, or shorted to high source
3563	5491	4	Amber	Aftertreatment 1 Diesel Exhaust Fluid Line Heater Relay	Aftertreatment Diesel Exhaust Fluid Line Heater Relay - Voltage below normal, or shorted to low source
3567	5394	5	Amber	Aftertreatment Diesel Exhaust Fluid Dosing Valve	Aftertreatment Diesel Exhaust Fluid Dosing Valve - Current below normal or open circuit
3568	5394	7	Amber	Aftertreatment Diesel Exhaust Fluid Dosing Valve	Aftertreatment Diesel Exhaust Fluid Dosing Valve - Mechanical system not responding or out of adjustment
3571	4334	3	Amber	Aftertreatment 1 Diesel Exhaust Fluid Doser Absolute Pressure	Aftertreatment 1 Diesel Exhaust Fluid Pressure Sensor - Voltage above normal, or shorted to high source
3572	4334	4	Amber	Aftertreatment 1 Diesel Exhaust Fluid Doser Absolute Pressure	Aftertreatment 1 Diesel Exhaust Fluid Pressure Sensor - Voltage below normal, or shorted to low source
3574	4334	18	Amber	Aftertreatment 1 Diesel Exhaust Fluid Doser Absolute Pressure	Aftertreatment 1 Diesel Exhaust Fluid Pressure Sensor - Data Valid But Below Normal Operating Range
3575	4334	16	Amber	Aftertreatment 1 Diesel Exhaust Fluid Doser Absolute Pressure	Aftertreatment 1 Diesel Exhaust Fluid Pressure Sensor - Data Valid But Above Normal Operating Range
3577	4376	3	Amber	Aftertreatment 1 Diesel Exhaust Fluid Return Valve	Aftertreatment Diesel Exhaust Fluid Return Valve - Voltage above normal, or shorted to high source
3578	4376	4	Amber	Aftertreatment 1 Diesel Exhaust Fluid Return Valve	Aftertreatment Diesel Exhaust Fluid Return Valve - Voltage below normal, or shorted to low source

Diesel Engine fault codes chart					
Fault Code	**SPN**	**FMI**	**Lamp**	**SPN description**	**Cumins Description**
3582	4364	18	Amber	Aftertreatment 1 SCR Conversion Efficiency	Aftertreatment SCR Catalyst Conversion Efficiency - Data Valid But Below Normal Operating Range - Moderately Severe Level
3583	5031	10	Amber	Aftertreatment 1 Outlet Gas NOx Sensor Heater Ratio	Aftertreatment 1 Outlet NOx Sensor Heater - Abnormal rate of change
3596	4334	2	Amber	Aftertreatment 1 Diesel Exhaust Fluid Doser Absolute Pressure	Aftertreatment 1 Diesel Exhaust Fluid Pressure Sensor - Data erratic, intermittent or incorrect
3616	2633	7	None	Engine Variable Geometry Turbocharger (VGT) 1 Nozzle Position	Engine VGT Nozzle Position - Mechanical system not responding or out of adjustment
3633	5484	3	Amber	Engine Fan Clutch 2 Output Device Driver	Engine Fan Clutch 2 Control Circuit - Voltage above normal, or shorted to high source
3634	5484	4	Amber	Engine Fan Clutch 2 Output Device Driver	Engine Fan Clutch 2 Control Circuit - Voltage below normal, or shorted to low source
3641	748	9	Amber	Transmission Output Retarder	Transmission Output Retarder - Abnormal update rate
3649	5024	10	Amber	Aftertreatment 1 Intake Gas NOx Sensor Heater Ratio	Aftertreatment 1 Intake NOx Sensor Heater - Abnormal rate of change
3681	3228	2	Amber	Aftertreatment 1 Outlet Gas Sensor Power Status	Aftertreatment 1 Outlet NOx Sensor Power Supply - Data erratic, intermittent or incorrect
3682	3218	2	Amber	Aftertreatment 1 Intake Gas Sensor Power Status	Aftertreatment 1 Intake NOx Sensor Power Supply - Data erratic, intermittent or incorrect
3683	1127	7	Amber	Engine Turbocharger 1 Boost Pressure	Engine Turbocharger 1 Boost Pressure - Mechanical system not responding or out of adjustment
3694	4184	4	Amber		Gain Adjust Potentiometer Circuit - Voltage below normal, or shorted to low source
3695	4182	4	Amber		Generator Output Frequency Adjust Potentiometer Circuit - Voltage below normal, or shorted to low source
3696	4183	4	Amber		Droop Adjust Potentiometer Circuit - Voltage below normal, or shorted to low source
3697	630	12	Red		Engine Control Module Calibration Memory - Bad intelligent device or component
3712	5246	0	Red	Aftertreatment SCR Operator Inducement Severity	Aftertreatment SCR Operator Inducement - Data valid but above normal operational range - Most Severe level

Diesel Engine fault codes chart					
Fault Code	**SPN**	**FMI**	**Lamp**	**SPN description**	**Cumins Description**
3714	1569	31	Amber	Engine Protection Torque Derate	Engine Protection Torque Derate - Condition Exists
3715	188	16	Amber	Engine Speed At Idle, Point 1 (Engine Configuration)	Engine Speed At Idle - Data Valid But Above Normal Operating Range - Moderately Severe Level
3716	188	18	Amber	Engine Speed At Idle, Point 1 (Engine Configuration)	Engine Speed At Idle - Data Valid But Below Normal Operating Range - Moderately Severe Level
3717	3226	13	Amber	Aftertreatment 1 Outlet NOx	Aftertreatment 1 Outlet NOx Sensor - Out of Calibration
3718	3216	13	Amber	Aftertreatment 1 Intake NOx	Aftertreatment 1 Intake NOx - Out of Calibration
3724	168	17	Amber	Battery Potential / Power Input 1	Battery 1 Voltage - Data Valid But Below Normal Operating Range - Least Severe Level
3725	3216	10	Amber	Aftertreatment 1 Intake NOx	Aftertreatment 1 Intake NOx Sensor - Abnormal rate of change
3726	3216	16	Amber	Aftertreatment 1 Intake NOx	Aftertreatment 1 Intake NOx - Data Valid But Above Normal Operating Range - Moderately Severe Level
3727	5571	7	None	High Pressure Common Rail Fuel Pressure Relief Valve	High Pressure Common Rail Fuel Pressure Relief Valve - Mechanical system not responding or out of adjustment
3733	862	3	Amber		Crankcase Breather Filter Heater Circuit - Voltage above normal, or shorted to high source
3734	862	4	Amber		Crankcase Breather Filter Heater Circuit - Voltage below normal, or shorted to low source
3737	1675	31	None	Engine Starter Mode	Engine Starter Mode Overcrank Protection - Condition Exists
3741	5571	0	Amber	High Pressure Common Rail Fuel Pressure Relief Valve	High Pressure Common Rail Fuel Pressure Relief Valve - Data valid but above normal operational range
3748	3216	20	Amber	Aftertreatment 1 Intake NOx	Aftertreatment 1 Intake NOx Sensor - Data not Rational - Drifted High
3749	3226	20	Amber	Aftertreatment 1 Outlet NOx	Aftertreatment 1 Outlet NOx Sensor - Data not Rational - Drifted High
3751	4792	7	None		Aftertreatment SCR Catalyst System - Mechanical system not responding or out of adjustment
3753	3713	31	None	Diesel Particulate Filter Active Regeneration Inhibited Due to System Timeout	Diesel Particulate Filter Active Regeneration Inhibited Due to System Timeout - Condition Exists

Diesel Engine fault codes chart

Fault Code	SPN	FMI	Lamp	SPN description	Cumins Description
3755	5394	2	None		Aftertreatment Diesel Exhaust Fluid Dosing Valve - Data erratic, intermittent or incorrect
3765	442	3	Amber	Auxiliary Temperature 2	Auxiliary Temperature Sensor Input 2 Circuit - Voltage above normal, or shorted to high source
3766	442	4	Amber	Auxiliary Temperature 2	Auxiliary Temperature Sensor Input 2 Circuit - Voltage below normal, or shorted to low source
3838	2978	9	Amber	Estimated Engine Parasitic Losses - Percent Torque	Estimated Engine Parasitic Losses - Percent Torque - Abnormal update rate
3839	596	7	Amber	Cruise Control Enable Switch	Cruise Control Enable Switch - Mechanical system not responding or out of adjustment
3841	596	2	Amber	Cruise Control Enable Switch	Cruise Control Enable Switch - Data erratic, intermittent or incorrect
3842	596	13	Amber	Cruise Control Enable Switch	Cruise Control Enable Switch - Out of Calibration
3843	5603	9	None	Cruise Control Disable Command	Cruise Control Disable Command - Abnormal update rate
3844	5605	31	None	Cruise Control Pause Command	Cruise Control Pause Command - Condition Exists
3845	5603	31	None	Cruise Control Disable Command	Cruise Control Disable Command - Condition Exists
3866	3364	1	Amber	Aftertreatment 1 Diesel Exhaust Fluid Tank 1 Quality	Aftertreatment Diesel Exhaust Fluid Quality - Data valid but below normal operational range - Most Severe Level
3867	3364	18	Amber	Aftertreatment 1 Diesel Exhaust Fluid Tank 1 Quality	Aftertreatment Diesel Exhaust Fluid Quality - Data Valid But Below Normal Operating Range - Moderate Severe Level
3868	3364	9	Amber	Aftertreatment 1 Diesel Exhaust Fluid Tank 1 Quality	Aftertreatment Diesel Exhaust Fluid Quality - Abnormal update rate
3876	3364	7	Amber	Aftertreatment 1 Diesel Exhaust Fluid Tank 1 Quality	Aftertreatment Diesel Exhaust Fluid Quality Sensor - Mechanical system not responding or out of adjustment
3877	3364	12	Amber	Aftertreatment 1 Diesel Exhaust Fluid Tank 1 Quality	Aftertreatment Diesel Exhaust Fluid Quality Sensor - Bad intelligent device or component
3878	3364	2	Amber	Aftertreatment 1 Diesel Exhaust Fluid Tank 1 Quality	Aftertreatment Diesel Exhaust Fluid Quality - Data erratic, intermittent or incorrect
3899	5848	4	Amber	Aftertreatment 1 SCR Intermediate NH3	Aftertreatment 1 SCR Intermediate NH3 Sensor - Voltage below normal, or shorted to low source

Diesel Engine fault codes chart					
Fault Code	**SPN**	**FMI**	**Lamp**	**SPN description**	**Cumins Description**
3911	5848	9	Amber	Aftertreatment 1 SCR Intermediate NH3	Aftertreatment 1 SCR Intermediate NH3 Sensor - Abnormal update rate
3912	5853	10	Amber	Aftertreatment 1 SCR Intermediate NH3 Gas Sensor Heater Preliminary FMI	Aftertreatment 1 Outlet NH3 Gas Sensor Heater - Abnormal rate of change
3917	104	18	Amber	Engine Turbocharger Lube Oil Pressure 1	Engine Turbocharger Lube Oil Pressure - Data Valid But Below Normal Operating Range - Moderately Severe Level
3931	1109	0	Red	Engine Protection System Approaching Shutdown	Engine Protection System Approaching Shutdown - Data valid but above normal operational range - Most
3932	5851	16	Amber	Aftertreatment 1 SCR Intermediate NH3 Gas Sensor Power In Range	Aftertreatment 1 SCR Intermediate NH3 Gas Sensor Power Supply - Data Valid But Above Normal Operating Range – Most Severe Level
3933	5851	18	Amber	Aftertreatment 1 SCR Intermediate NH3 Gas Sensor Power In Range	Aftertreatment 1 SCR Intermediate NH3 Gas Sensor Power Supply - Data Valid But Below Normal Operating Range – Most Severe Level
3934	5851	2	Amber	Aftertreatment 1 SCR Intermediate NH3 Gas Sensor Power In Range	Aftertreatment 1 SCR Intermediate NH3 Gas Sensor Power Supply - Data erratic, intermittent or incorrect
3935	5848	13	Amber	Aftertreatment 1 SCR Intermediate NH3	Aftertreatment 1 SCR Intermediate NH3 Sensor - Out of Calibration
3936	5848	12	Amber	Aftertreatment 1 SCR Intermediate NH3	Aftertreatment 1 SCR Intermediate NH3 Sensor - Bad intelligent device or component
3937	5848	10	Amber	Aftertreatment 1 SCR Intermediate NH3	Aftertreatment 1 SCR Intermediate NH3 Sensor - Abnormal rate of change
3988	3265	9	Amber	Aftertreatment 2 Outlet NOx	Aftertreatment 2 Outlet NOx - Abnormal Update Rate
4143	5741	3	Amber		Aftertreatment 1 Outlet Soot Sensor - Voltage Above Normal, or Shorted to High Source
4144	5741	4	Amber		Aftertreatment 1 Outlet Soot Sensor - Voltage below normal, or shorted to low source
4145	3255	9	Amber	Aftertreatment 2 Intake NOx	Aftertreatment 2 Intake Nox Sensor - Abnormal update rate
4151	5742	9	Amber		Aftertreatment Diesel Particulate Filter Temperature Sensor Module - Abnormal update rate

Diesel Engine fault codes chart					
Fault Code	**SPN**	**FMI**	**Lamp**	**SPN description**	**Cumins Description**
4152	5743	9	Amber		Aftertreatment Selective Catalytic Reduction Temperature Sensor Module - Abnormal update rate
4153	5747	3	Amber		Aftertreatment 1 Outlet Soot Sensor Heater - Voltage Above Normal, or Shorted to High Source
4154	5747	4	Amber		Aftertreatment 1 Outlet Soot Sensor Heater - Voltage below normal, or shorted to low source
4155	5746	3	Amber		Aftertreatment 1 Diesel Exhaust Fluid Dosing Unit Heater Relay - Voltage Above Normal, or Shorted to high source
4156	5746	4	Amber		Aftertreatment 1 Diesel Exhaust Fluid Dosing Unit Heater Relay - Voltage below normal, or shorted to low source
4157	4376	7	Amber	Aftertreatment 1 Diesel Exhaust Fluid Return Valve	Aftertreatment Diesel Exhaust Fluid Return Valve - Mechanical system not responding or out of adjust
4158	5742	12	Amber		Aftertreatment Diesel Particulate Filter Temperature Sensor Module - Bad intelligent device or component
4159	5743	12	Amber		Aftertreatment Selective Catalytic Reduction Temperature Sensor Module - Bad intelligent device or component
4161	5742	3	Amber		Aftertreatment Diesel Particulate Filter Temperature Sensor Module - Voltage Above Normal, or Shorted to high source
4162	5742	4	Amber		Aftertreatment Diesel Particulate Filter Temperature Sensor Module - Voltage below normal, or shorted to low source
4163	5742	16	Amber		Aftertreatment Diesel Particulate Filter Temperature Sensor Module- Data Valid But Above Normal Operating Range
4164	5743	3	Amber		Aftertreatment Selective Catalytic Reduction Temperature Sensor Module - Voltage Above Normal, or Shorted to high source
4165	5743	4	Amber		Aftertreatment Selective Catalytic Reduction Temperature Sensor Module - Voltage below normal, or Shorted to low source
4166	5743	16	Amber		Aftertreatment Selective Catalytic Reduction Temperature Sensor Module - Data Valid But Above Normal

Diesel Engine fault codes chart					
Fault Code	**SPN**	**FMI**	**Lamp**	**SPN description**	**Cumins Description**
4168	5745	3	Amber		Aftertreatment 1 Diesel Exhaust Fluid Dosing Unit Heater - Voltage Above Normal, or Shorted to High
4169	5745	4	Amber		Aftertreatment 1 Diesel Exhaust Fluid Dosing Unit Heater - Voltage below normal, or shorted to low source
4171	5745	18	Amber		Aftertreatment 1 Diesel Exhaust Fluid Dosing Unit Heater - Data Valid But Below Normal Operating Range
4213	3695	2	Amber	Diesel Particulate Filter Regeneration Inhibit Switch	Aftertreatment Diesel Particulate Filter Regeneration Inhibit Switch - Data erratic, intermittent or incorrect
4215	563	31	None	Anti-Lock Braking (ABS) Active	Anti-Lock Braking (ABS) Active - Condition Exists
4233	3515	3	Amber	Aftertreatment 1 Diesel Exhaust Fluid Temperature 2	Aftertreatment 1 Diesel Exhaust Fluid Temperature 2 Sensor Circuit - Voltage above normal, or shorted to high source
4234	3515	4	Amber	Aftertreatment 1 Diesel Exhaust Fluid Temperature 2	Aftertreatment 1 Diesel Exhaust Fluid Temperature 2 Sensor Circuit - Voltage below normal, or shorted to low source
4235	3521	31	Red	Aftertreatment 1 Diesel Exhaust Fluid Property	Aftertreatment 1 Diesel Exhaust Fluid Property - Condition Exists
4241	3364	19	Amber	Aftertreatment 1 Diesel Exhaust Fluid Tank 1 Quality	Aftertreatment Diesel Exhaust Fluid Quality - Received Network Data In Error
4242	3515	2	Amber	Aftertreatment 1 Diesel Exhaust Fluid Temperature 2	Aftertreatment 1 Diesel Exhaust Fluid Temperature 2 - Data erratic, intermittent or incorrect
4243	3515	10	Amber	Aftertreatment 1 Diesel Exhaust Fluid Temperature 2	Aftertreatment 1 Diesel Exhaust Fluid Temperature 2 - Abnormal Rate of Change
4244	4337	2	Amber	Aftertreatment 1 Diesel Exhaust Fluid Dosing Tempera-ture	Aftertreatment 1 Diesel Exhaust Fluid Dosing Temperature - Data erratic, intermittent or incorrect
4245	5798	2	Amber		Aftertreatment 1 Diesel Exhaust Fluid Dosing Unit Heater Temperature - Data erratic, intermittent or incorrect
4249	4337	10	Amber	Aftertreatment 1 Diesel Exhaust Fluid Dosing Tempera-ture	Aftertreatment 1 Diesel Exhaust Fluid Dosing Temperature - Abnormal Rate of Change

Diesel Engine fault codes chart

Fault Code	SPN	FMI	Lamp	SPN description	Cumins Description
4251	5798	10	Amber		Aftertreatment 1 Diesel Exhaust Fluid Dosing Unit Heater Temperature - Abnormal Rate of Change
4252	1081	31	Amber	Engine Wait to Start Lamp	Engine Wait to Start Lamp - Condition Exists
4253	5797	12	Amber		Aftertreatment Warm Up Diesel Oxidation Catalyst Temperature Sensor Module - Bad intelligent device
4254	5797	3	Amber		Aftertreatment Warm Up Diesel Oxidation Catalyst Temperature Sensor Module - Voltage Above Normal, or shorted to high source
4255	5797	4	Amber		Aftertreatment Warm Up Diesel Oxidation Catalyst Temperature Sensor Module - Voltage below normal, or shorted to low source
4256	5797	16	Amber		Aftertreatment Warm Up Diesel Oxidation Catalyst Temperature Sensor Module - Data Valid But Above Normal Operating Range – Moderately Severe Level
4258	5797	11	Amber		Aftertreatment Warm Up Diesel Oxidation Catalyst Temperature Sensor Module - Root Cause Not Known
4259	5742	11	Amber		Aftertreatment Diesel Particulate Filter Temperature Sensor Module - Root Cause Not Known
4261	5743	11	Amber		Aftertreatment Selective Catalytic Reduction Temperature Sensor Module - Root Cause Not Known
4262	5571	3	Amber	High Pressure Common Rail Fuel Pressure Relief Valve	High Pressure Common Rail Fuel Pressure Relief Valve - Voltage Above Normal, or Shorted to High Source
4263	5571	4	Amber	High Pressure Common Rail Fuel Pressure Relief Valve	High Pressure Common Rail Fuel Pressure Relief Valve - Voltage below normal, or shorted to low source
4265	5571	11	Amber	High Pressure Common Rail Fuel Pressure Relief Valve	High Pressure Common Rail Fuel Pressure Relief Valve - Root Cause Not Known
4277	3364	10	Amber	Aftertreatment 1 Diesel Exhaust Fluid Tank 1 Quality	Aftertreatment Diesel Exhaust Fluid Quality - Abnormal Rate of Change
4278	5848	20	Amber	Aftertreatment 1 SCR Intermediate NH3	Aftertreatment 1 SCR Intermediate NH3 - Data not Rational - Drifted High
4279	5848	21	Amber	Aftertreatment 1 SCR Intermediate NH3	Aftertreatment 1 SCR Intermediate NH3 - Data not Rational - Drifted Low

Diesel Engine fault codes chart					
Fault Code	**SPN**	**FMI**	**Lamp**	**SPN description**	**Cumins Description**
4281	5848	2	Amber	Aftertreatment 1 SCR Intermediate NH3	Aftertreatment 1 SCR Intermediate NH3 - Data erratic, intermittent or incorrect
4284	5793	9	Amber		Desired Engine Fueling State - Abnormal Update Rate
4286	520595	3	Amber		Closed Crankcase Ventilation System Pressure Sensor - Voltage Above Normal, or Shorted to High Source
4287	520595	4	Amber		Closed Crankcase Ventilation System Pressure Sensor - Voltage below normal, or shorted to low source
4288	520595	2	Amber		Closed Crankcase Ventilation System Pressure - Data erratic, intermittent or incorrect
4293	5097	3	Amber	Engine Brake Active Lamp Data	Engine Brake Active Lamp - Voltage Above Normal, or Shorted to High Source
4294	5097	4	Amber	Engine Brake Active Lamp Data	Engine Brake Active Lamp - Voltage below normal, or shorted to low source
4437	1668	2	None		J1939 Network #4 - Data erratic, intermittent or incorrect
4449	5747	10	Amber		Aftertreatment 1 Outlet Soot Sensor Heater - Abnormal rate of change
4451	5741	2	Amber		Aftertreatment 1 Outlet Soot - Data erratic, intermittent or incorrect
4452	520668	31	Amber		Aftertreatment 1 Outlet NOx Sensor Closed Loop Operation - Condition Exists
4453	520669	31	Amber		Aftertreatment 1 Outlet NH3 Sensor Closed Loop Operation - Condition Exists
4454	5302	18	Amber		Aftertreatment 1 Post SCR NH3 Conversion Efficiency - Data Valid But Below Normal Operating Range -
4485	5838	31	Amber		EGR Valve Malfunction - Condition Exists
4486	5839	31	Amber		Diesel Exhaust Fluid Consumption Malfunction - Condition Exists
4487	5840	31	Amber		Diesel Exhaust Fluid Dosing Malfunction - Condition Exists
4488	5841	31	Amber		Diesel Exhaust Fluid Quality Malfunction - Condition Exists

Diesel Engine fault codes chart					
Fault Code	**SPN**	**FMI**	**Lamp**	**SPN description**	**Cumins Description**
4489	5842	31	Amber		SCR Monitoring System Malfunction - Condition Exists
4517	237	13	Amber	Vehicle Identification Number	Vehicle Identification Number - Out of Calibration
4526	521	2	Amber	Brake Pedal Position	Brake Pedal Position - Data erratic, intermittent or incorrect
4568	3482	16	Amber	Aftertreatment 1 Fuel Enable Actuator	Aftertreatment Fuel Shutoff Valve - Data Valid But Above Normal Operating Range - Moderately Severe
4572	3031	9	Amber	Aftertreatment 1 Diesel Exhaust Fluid Tank Temperature	Aftertreatment 1 Diesel Exhaust Fluid Tank Temperature - Abnormal Update Rate
4573	3826	18	Amber	Aftertreatment 1 Diesel Exhaust Fluid Average Consump-tion	Aftertreatment 1 Diesel Exhaust Fluid Average Consumption - Data Valid But Below Normal Operating Range
4584	3936	14	Red		Aftertreatment Diesel Particulate Filter System - Special Instructions
4585	4792	14	Red		Aftertreatment 1 SCR Catalyst System - Special Instructions
4586	4339	31	Amber	Aftertreatment 1 SCR Feedback Control Status	Aftertreatment 1 SCR Feedback Control Status - Condition Exists
4615	94	0	Red	Engine Fuel Delivery Pressure	Engine Fuel Delivery Pressure - Data Valid but Above Normal Operational Range - Most Severe Level
4658	4331	18	Amber	Aftertreatment 1 Diesel Exhaust Fluid Actual Dosing Quantity	Aftertreatment SCR Actual Dosing Reagent Quantity - Data Valid But Below Normal Operating Range - Mo
4679	1761	5	Amber	Aftertreatment 1 Diesel Exhaust Fluid Tank Level	Aftertreatment 1 Diesel Exhaust Fluid Tank Level Sensor Circuit - Current below normal or open circuit
4682	3031	5	Amber	Aftertreatment 1 Diesel Exhaust Fluid Tank Temperature	Aftertreatment 1 Diesel Exhaust Fluid Tank Temperature Sensor Circuit - Current below normal or open circuit
4688	6301	3	Amber		Water in Fuel Indicator 2 Sensor Circuit - Voltage above normal, or shorted to high source
4689	6301	4	Amber		Water in Fuel Indicator 2 Sensor Circuit - Voltage below normal, or shorted to low source
4691	5585	18	Amber		Engine Injector Metering Rail 1 Cranking Pressure - Data Valid But Below Normal Operating Range - Mo

Diesel Engine fault codes chart					
Fault Code	**SPN**	**FMI**	**Lamp**	**SPN description**	**Cumins Description**
4713	5357	31	Amber		Engine Fuel Injection Quantity Error for Multiple Cylinders - Condition Exists
4721	237	31	Amber	Vehicle Identification Number	Vehicle Identification Number - Condition Exists
4722	237	2	Amber	Vehicle Identification Number	Vehicle Identification Number - Data erratic, intermittent or incorrect
4724	702	5	Amber	Auxiliary I/O #02	Auxiliary Input/Output 2 Circuit - Current below normal or open circuit
4725	702	6	Amber	Auxiliary I/O #02	Auxiliary Input/Output 2 Circuit - Current above normal or grounded circuit
4726	1239	16	Amber	Engine Fuel Leakage 1	Engine Fuel Leakage - Data Valid But Above Normal Operating Range - Moderately Severe Level
4727	157	15	Amber	Engine Injector Metering Rail 1 Pressure	Injector Metering Rail 1 Pressure - Data Valid But Above Normal Operating Range - Least Severe Level
4734	701	14	Red	Auxiliary I/O #01	Auxiliary Input/Output 1 - Special Instructions
4736	3031	6	Amber	Aftertreatment 1 Diesel Exhaust Fluid Tank Temperature	Aftertreatment 1 Diesel Exhaust Fluid Tank Temperature Sensor Circuit - Current above normal or grounded circuit
4737	3031	11	Amber	Aftertreatment 1 Diesel Exhaust Fluid Tank Temperature	Aftertreatment 1 Diesel Exhaust Fluid Tank Temperature - Root Cause Not Known
4738	1761	6	Amber	Aftertreatment 1 Diesel Exhaust Fluid Tank Level	Aftertreatment 1 Diesel Exhaust Fluid Tank Level Sensor Circuit - Current above normal or grounded circuit
4739	1761	11	Amber	Aftertreatment 1 Diesel Exhaust Fluid Tank Level	Aftertreatment 1 Diesel Exhaust Fluid Tank Level Sensor - Root Cause Not Known
4741	3364	5	Amber	Aftertreatment 1 Diesel Exhaust Fluid Tank 1 Quality	Aftertreatment Diesel Exhaust Fluid Quality Sensor Circuit - Current below normal or open circuit
4742	3364	6	Amber	Aftertreatment 1 Diesel Exhaust Fluid Tank 1 Quality	Aftertreatment Diesel Exhaust Fluid Quality Sensor Circuit - Current above normal or grounded circuit
4743	3515	5	Amber	Aftertreatment 1 Diesel Exhaust Fluid Temperature 2	Aftertreatment 1 Diesel Exhaust Fluid Temperature 2 Sensor Circuit - Current below normal or open circuit

Diesel Engine fault codes chart

Fault Code	SPN	FMI	Lamp	SPN description	Cumins Description
4744	3515	6	Amber	Aftertreatment 1 Diesel Exhaust Fluid Temperature 2	Aftertreatment 1 Diesel Exhaust Fluid Temperature 2 Sensor Circuit - Current above normal or grounded
4745	3515	11	Amber	Aftertreatment 1 Diesel Exhaust Fluid Temperature 2	Aftertreatment 1 Diesel Exhaust Fluid Temperature 2 - Root Cause Not Known
4768	3521	11	Amber	Aftertreatment 1 Diesel Exhaust Fluid Property	Aftertreatment 1 Diesel Exhaust Fluid Property - Root Cause Not Known
4769	1761	10	Amber	Aftertreatment 1 Diesel Exhaust Fluid Tank Level	Aftertreatment 1 Diesel Exhaust Fluid Tank Level Sensor - Abnormal Rate of Change
4789	1639	0	Amber	Fan Speed	Fan Speed - Data Valid but Above Normal Operational Range - Most Severe Level
4791	1639	1	Amber	Fan Speed	Fan Speed - Data Valid but Below Normal Operational Range - Most Severe Level
4841	6653	16	Amber		Cold Start Injector Metering Rail 1 Pressure - Data Valid But Above Normal Operating Range - Moderate Severe Level
4842	3364	15	None	Aftertreatment Die-sel Exhaust Fluid Quality	Aftertreatment Diesel Exhaust Fluid Quality - Data Valid But Above Normal Operating Range - Least Severe Level
4863	5245	31	Amber	Aftertreatment Selective Catalytic Reduction Operator Inducement Active	Aftertreatment SCR Operator Inducement Active - Condition Exists
4867	5571	31	Amber	High Pressure Common Rail Fuel Pressure Relief Valve	High Pressure Common Rail Fuel Pressure Relief Valve - Condition Exists
4951	6655	3	Amber	ECU Power Lamp	Maintain ECU Power Lamp - Voltage Above Normal, or Shorted to High Source
4952	6655	4	Amber	ECU Power Lamp	Maintain ECU Power Lamp - Voltage Below Normal, or Shorted to Low Source
4953	3353	3	Amber	Alternator 1 Status	Alternator 1 Status - Voltage Above Normal, or Shorted to High Source
4954	3353	4	Amber	Alternator 1 Status	Alternator 1 Status - Voltage Below Normal, or Shorted to Low Source
5133	2006	9	Amber		Source Address 6 - Abnormal Update Rate
5167	111	17	Amber	Engine Coolant Level	Coolant Level - Data Valid But Below Normal Operating Range - Least Severe Level

Diesel Engine fault codes chart					
Fault Code	**SPN**	**FMI**	**Lamp**	**SPN description**	**Cumins Description**
5193	1632	31	Amber	Engine Torque Limit Feature	Engine Torque Limit Feature - Condition Exists
5215	520791	2	Amber	Engine Boost Curve Selection	Engine Boost Curve Selection - Data erratic, intermittent or incorrect
9952	524286	31	Amber		Reserved for temporary use - Condition Exists
9953	524286	31	Amber		Reserved for temporary use - Condition Exists
9999	524286	31	Amber		Reserved for temporary use - Condition Exists

D 30 Mode of operation

1 Vehicle control elements

1.1 Control elements on the operator's control station

⚠ WARNING	**Danger of falling from the vehicle**
	Entering and leaving the vehicle and the driver's seat during operation poses a risk of falling from the vehicle, which can cause severe to fatal injuries! - The operator must be at the intended driver's seat during operation. - Never jump onto or off a moving vehicle. - Keep accessible surfaces free of any soiling, e.g. operating substances, to avoid the risk of slipping. - Use the steps provided and hold onto the handrail with both hands. - Comply with all further information in these instructions and in the safety manual.

Ladder

A ladder (1) and a folding step (2) on the drive units are located on both sides of the vehicle.

- The step (2) has to be folded down to ascend or descend.

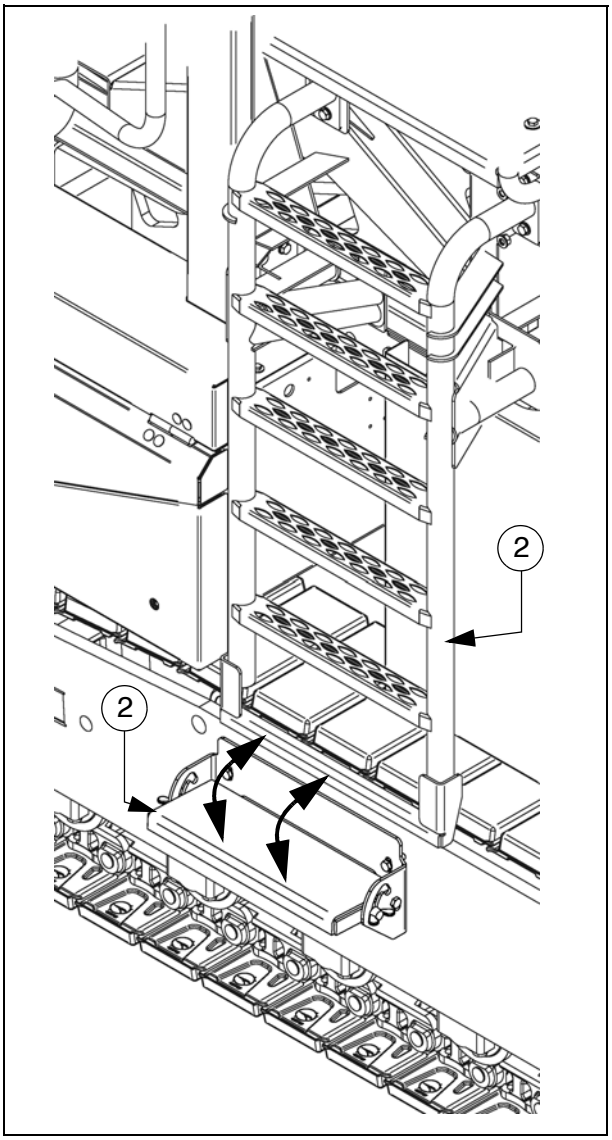
STOP Never climb up/down on the vehicle during travel. Hold tight when climbing up and down.

STOP The ladder must not be used when the control platform is raised!

⚠ Folded down, the step increases the basic width of the vehicle.

STOP During transportation in road traffic and when transporting the vehicle on transporters, the step must be folded up!

STOP Always choose the ladder on the side away from road traffic!



Raisable platform

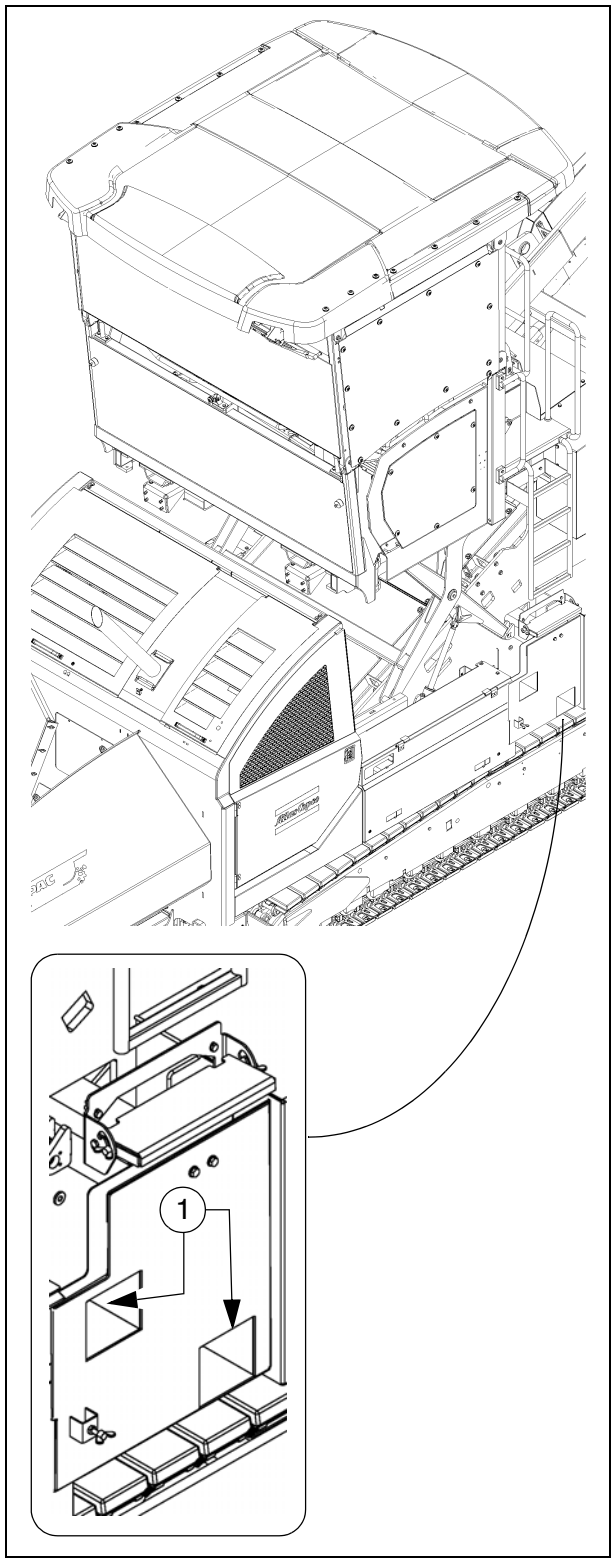
The entire control platform can be raised for better clarity.

The permissible transportation height must be checked. When negotiating bridges, tunnels, overhead wires, underpasses, etc., always ensure that you maintain a safe distance from them at all times.

During transportation in road traffic and when transporting the vehicle on transporters, the control platform must be lowered!

Emergency descent

An emergency descent is available if it should prove impossible to lower the platform.
In addition to the descent, two steps (1) are also available in the covering for safely climbing down.



Protective roof (○)

NOTE	**Caution! Possible collision of parts**
	The following adjustments must be made before lowering the roof: - Seat consoles swivelled in and locked - Operating panel locked in a central position in front of one of the driver's seats. - Side windows closed. - Engine hood and lateral flaps closed. - Rotary beacon swivelled inwards and in lowest setting

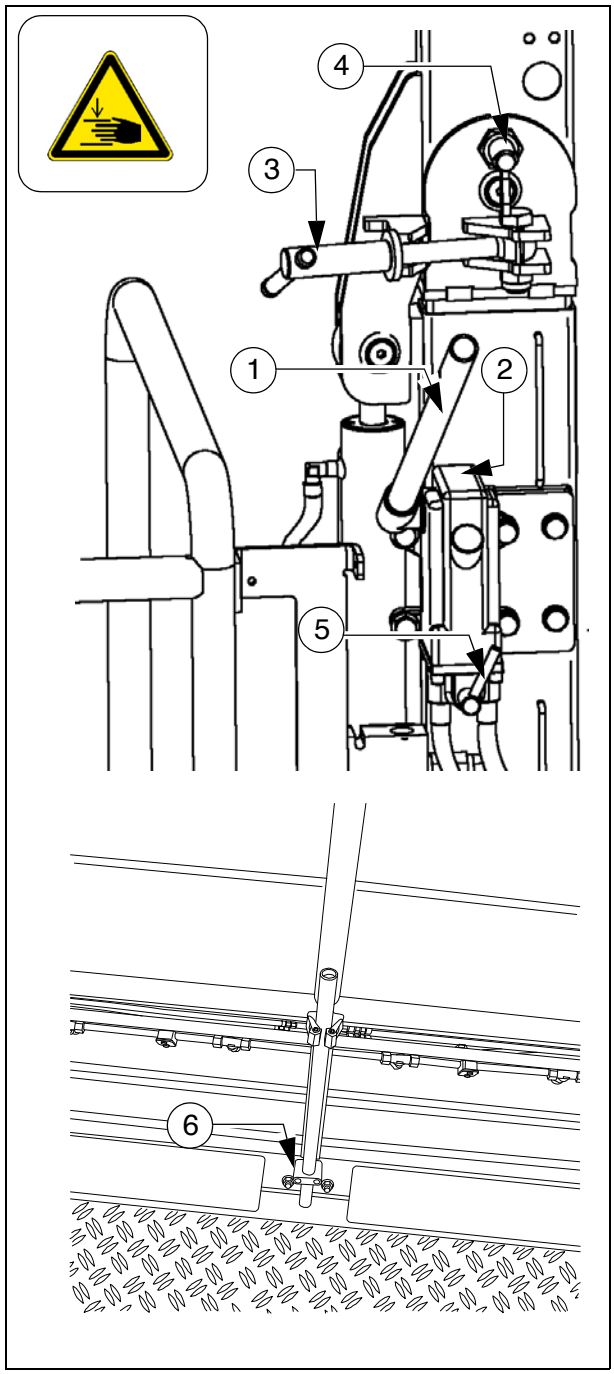
The protective roof can be raised and lowered with a manual hydraulic pump.

☞ The exhaust pipe is lowered or raised together with the roof.

☞ sn < 1460

- Connect the pump lever (1) to the pump (2).
  - Lower the roof: The locks (3) on both sides of the roof must be released.
  - Raise the roof: the locks (4) on both sides of the roof must be released.
- Set the adjustment lever (5) to the "Raise" or "Lower" position.
  - Raise the roof: The lever points forwards.
  - Lower the roof: The lever points backwards.
- Operate the pump lever (1) until the roof has reached the upper or lower limit position.
  - Roof in uppermost position: Set the locks (3) on both sides of the roof.
  - Roof lowered: set the lock (4) on both sides of the roof.

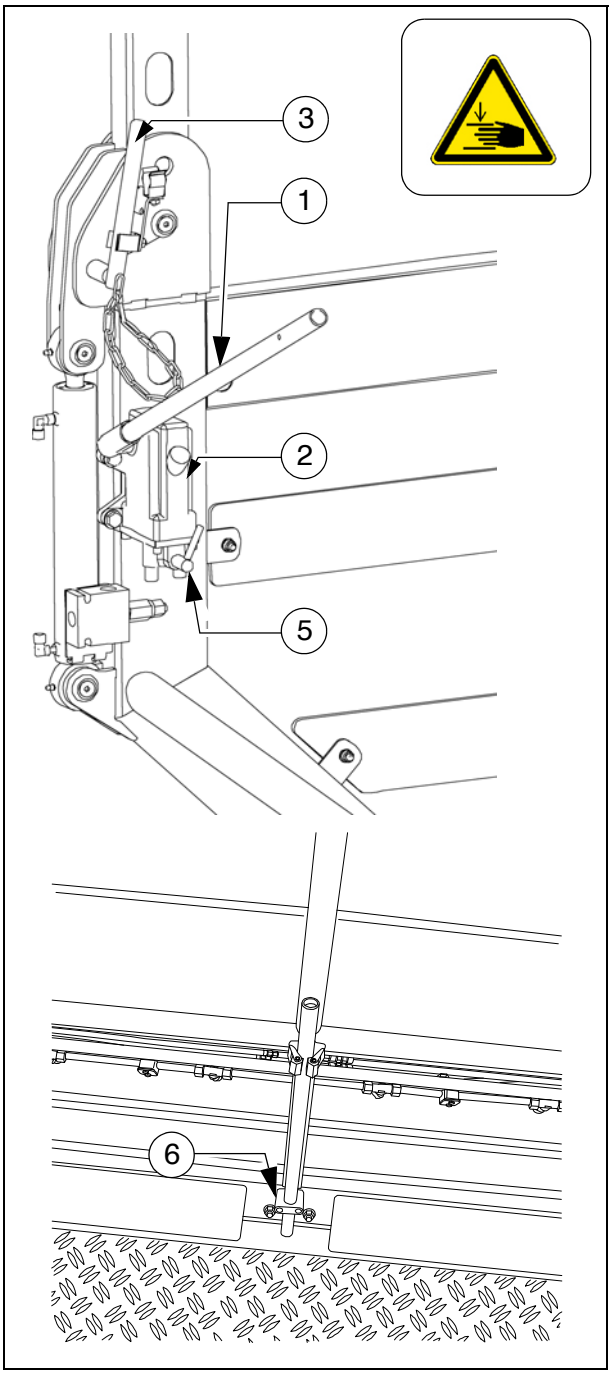
☞ Place the pump lever in the bracket (6).



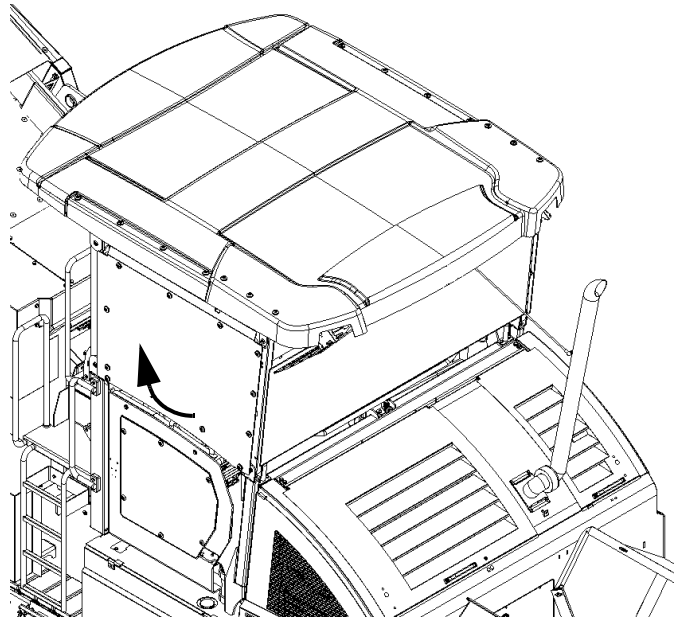
☞ sn >/=1460

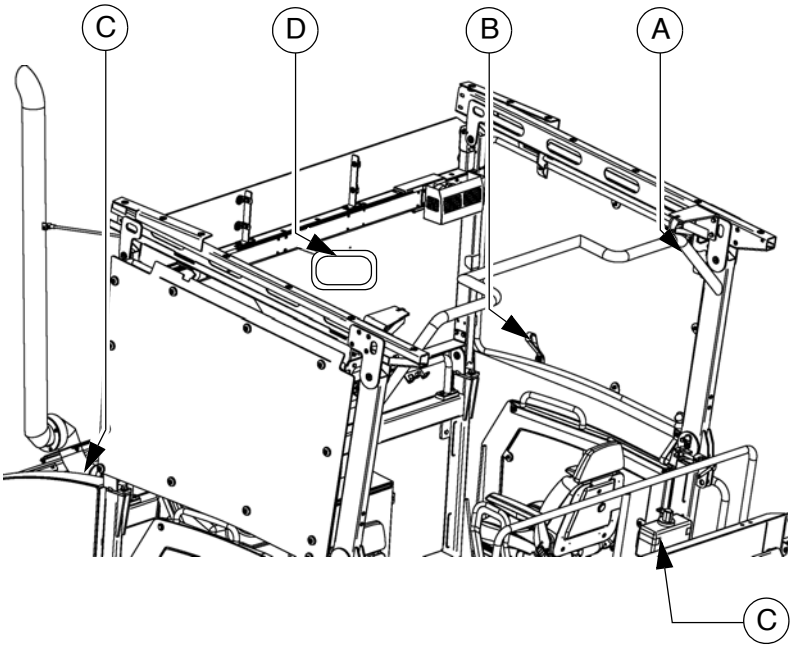
- Connect the pump lever (1) to the pump (2).
  - Tighten bolts (3) on both sides of the roof.
- Operate the pump lever (1) until the roof has reached the upper or lower limit position.
  - Set bolts (3) in the respective position on both sides of the roof.

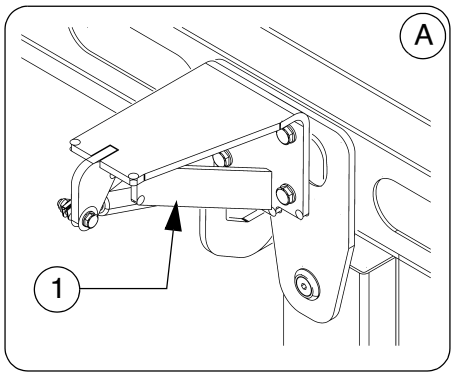
☞ Place the pump lever in the bracket (6).

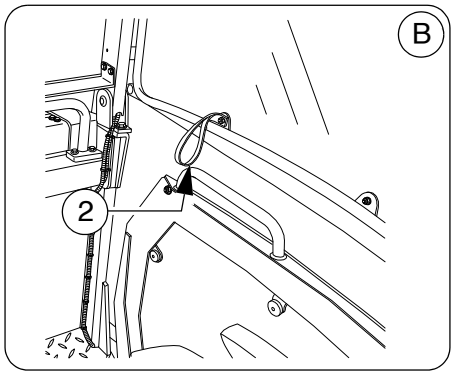


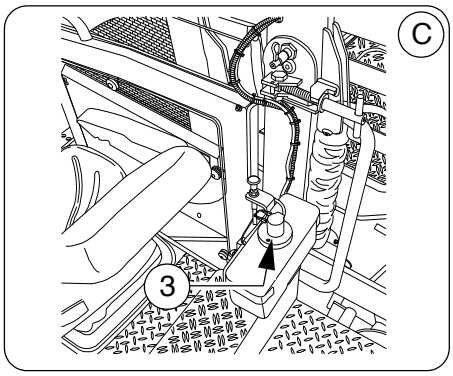
Protective roof (○)

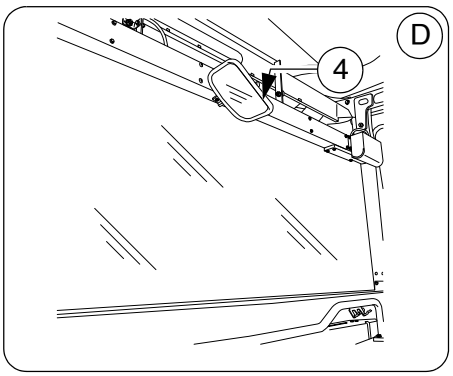












⚠ CAUTION	**Risk of crushing hands**
	When closing the spring-loaded front and side windows, there is a risk of crushing which can cause injuries! - Do not reach into the danger zone. - Set the latches correctly. - Comply with further instructions in the safety manual.

The protective roof is equipped with an additional front window and two side windows.

- The side windows can be swivelled out to the side at the sliding frame.
  To close the side windows, press the latch (1) and pull the sliding frame at the strap (2).

Windscreen wiper

- Engage the windscreen wiper / screen wash on the operating panel if necessary.

☞ Ensure that the washer fluid tank (3) is always adequately filled.

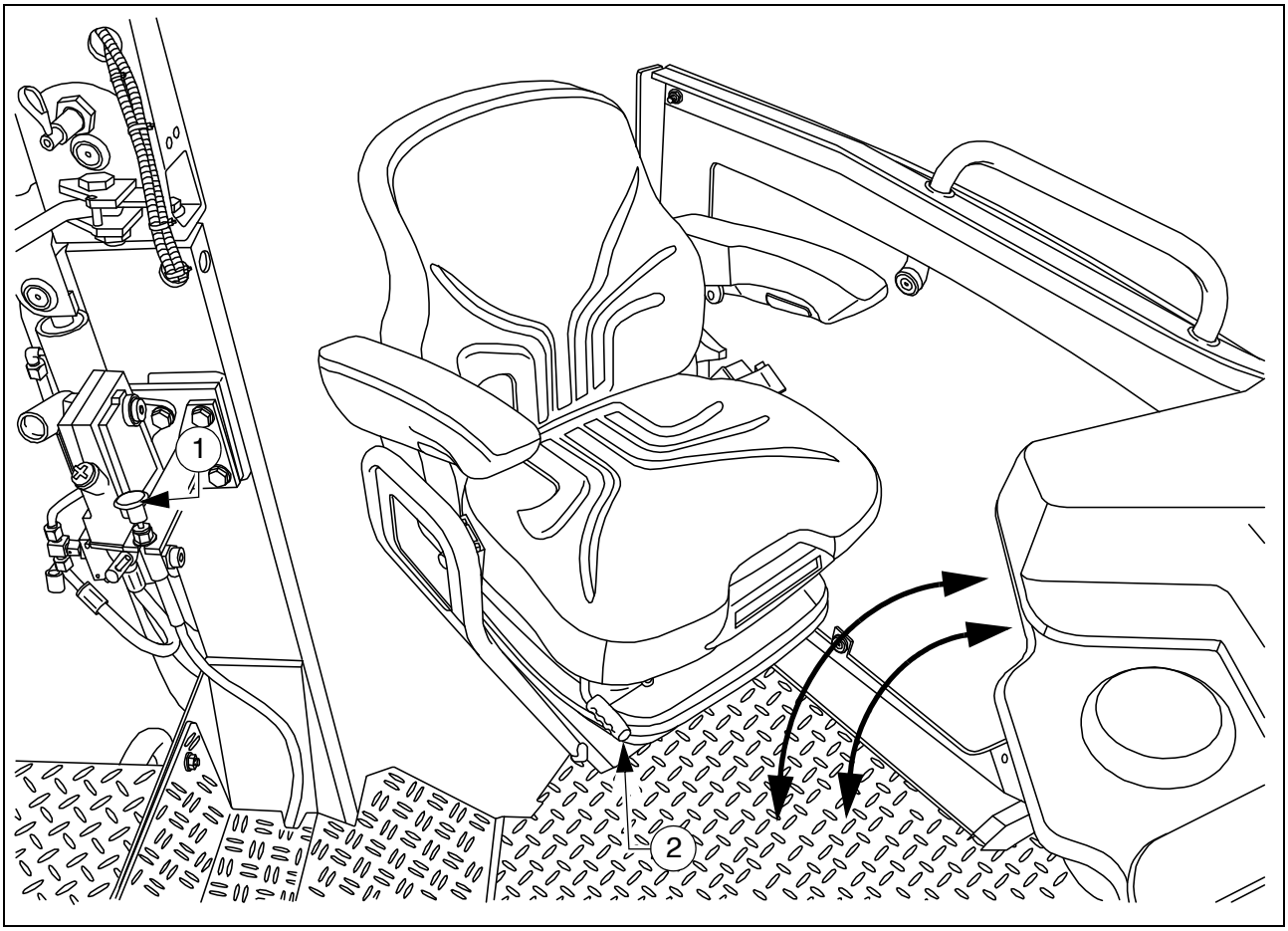
⚠ Replace worn wiper blades immediately.

Mirror

- The mirror (4) enables a better view into the hopper.

☞ If necessary, turn the mirror on its bracket.

Seat bracket and seat console, swivelling



☞ The left/right seat consoles can be pushed out beyond the outer edge of the vehicle. This provides the driver with a better view of the paving area and material transfer.

Swivelling seat console:

⚠ **Caution! Possible collision of parts"**
Before swivelling the seat console out, the driver's seat must be moved to the foremost position and the side window (○) must be swivelled open.

- Release the latch (1) and swivel the seat console out to stop.
- To swivel the seat console in, release the latch (1) again.

☞ The latch must audibly engage in both positions.

⚠ When swivelled out, the seat consoles increase the basic width of the vehicle.

⚠ Make sure it is latched properly!

STOP Always choose the driver position on the side away from road traffic!

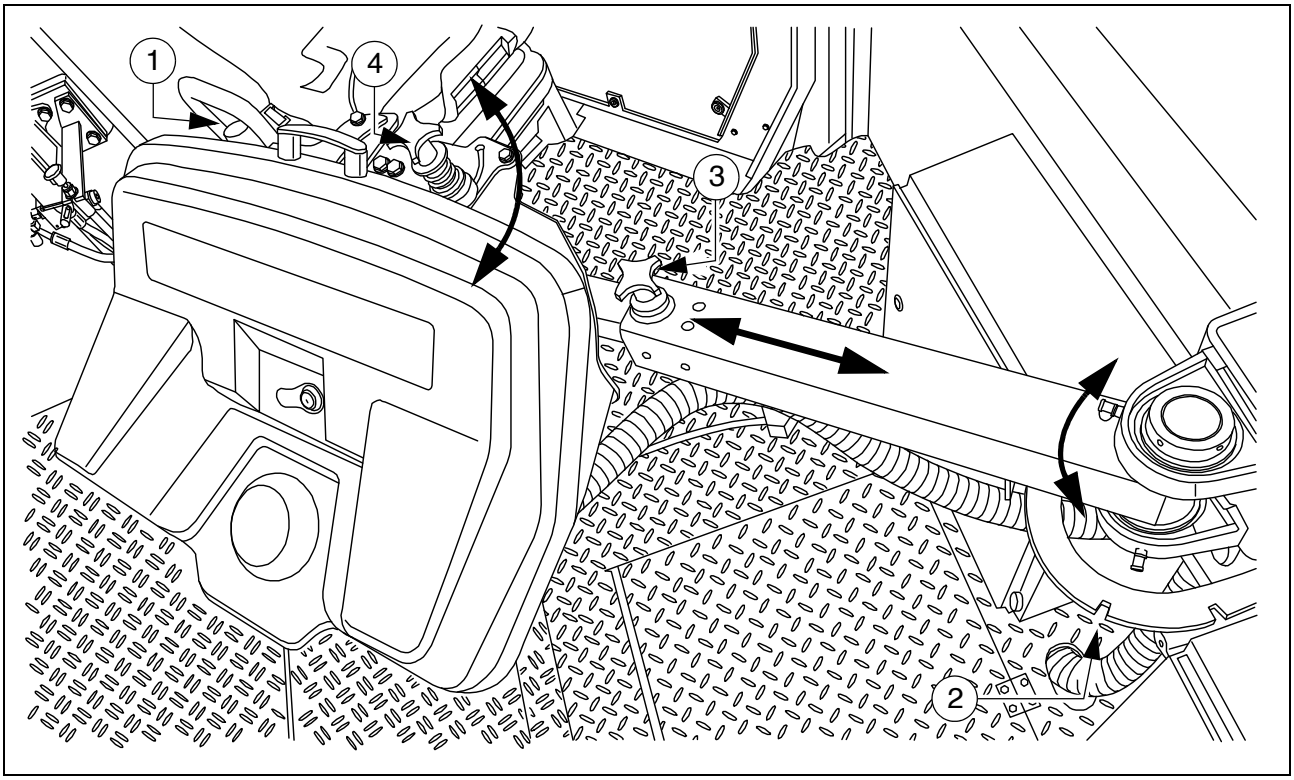


During transportation in road traffic and when transporting the vehicle on transporters, the seat console must be swivelled in!



Only adjust the operating position whilst the vehicle is stationary!

Operating panel console, swivelling and telescopic



The operating panel console can be set-up for the various working positions.

Swivelling the operating panel:

- Release the latch (1), swivel the panel bracket to the desired position and allow to engage in one of the detent positions (2).

Extending / shortening the operating panel bracket:

- Release the latch (3), set the panel bracket to the desired length and lock the latch.

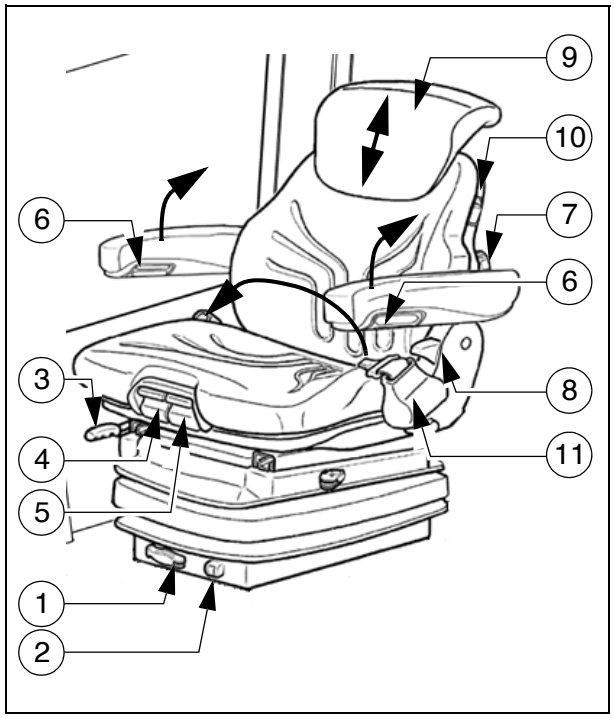
Swivelling the operating panel console:

- Release the latch (4), swivel the panel console to the desired position and lock the latch.

STOP Only adjust the operating position whilst the vehicle is stationary!

⚠ Make sure it is latched properly!

Driver's seat, type I



To avoid damage to health, the individual seat settings should be checked and adjusted before starting the vehicle.

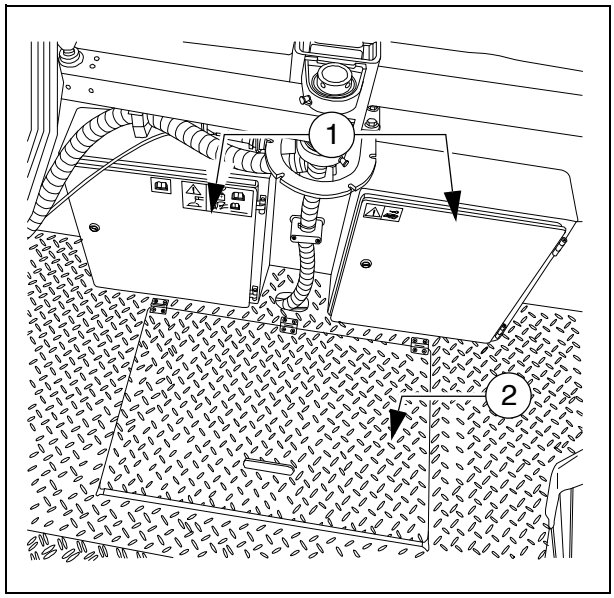
After locking the individual elements, it must no longer be possible to shift then to another position.

- **Weight setting (1):** The relevant driver's weight should be set by turning the weight adjustment lever when the driver's seat is unoccupied.
- **Weight indicator (2):** The set driver's weight can be read off at the viewing window.
- **Longitudinal adjustment (3):** Longitudinal adjustment is released by actuating the locking lever.
  The locking lever must engage in the desired position.
- **Seat depth adjustment (4):** The seat depth can be individually adjusted. Raise the button to adjust the seat depth. The desired position is set by simultaneously sliding the seat surface forwards or backwards.
- **Seat inclination adjustment (5):** The seat surface's longitudinal inclination can be individually adjusted. Raise the button to adjust the inclination. The seat surface inclines to the desired position by simultaneously loading or relieving it.
- **Armrest inclination (6):** The armrest's longitudinal inclination can be adjusted by turning the hand wheel. Turning outwards raises the front of the armrest; turning inwards lowers it at the front.
  In addition, the armrests can be folded up fully.
- **Lumbar support (7):** Both the height and the extent of the convexity in the backrest padding can be individually adjusted by turning the hand wheel to the left or right.
- **Backrest adjustment (8):** The backrest is adjusted via the locking lever. The locking lever must engage in the desired position.
- **Back extension (9):** By pulling out via perceptible detents, the height can be individually adjusted up to a limit stop. To remove the back extension, the limit stop is overcome with a jolt.
- **Seat heating ON/OFF (10):** The seat heating is switched on and off by actuating the switch.
- **Seat belt (11):** The seat belt must be applied before starting up the vehicle.

The seat belts must be replaced following an accident.

Storage space

- The storage space (1) can be used to store the on-board tool kit, operating instructions and other attachments.



☞ Keep the storage space closed after work has been completed.

WARNING	**Danger from damaged or missing operating instructions**
	Failure to comply with the operating instructions can cause severe to fatal injuries! - Familiarise yourself with the contents of the operating instructions. - Always keep the operating instructions in the intended place on the vehicle. - Replace any missing or damaged operating instructions immediately. - Comply with all further information in the operating instructions and in the safety manual.

Conveyor belt maintenance flap

The conveyor belt can be accessed through the open maintenance flap (2) for maintenance work.

STOP Keep the maintenance flap closed during operation; never open whilst the conveyor belt is running!

Batteries

The batteries (1) of the 24 V system are located in the vehicle footwell.

☞ For the specifications, refer to chapter B, "Technical data". For maintenance, see chapter "F".

⚠ External starting must only be carried out according to the instructions (see section "Starting the feeder, external starting (starting aid)"

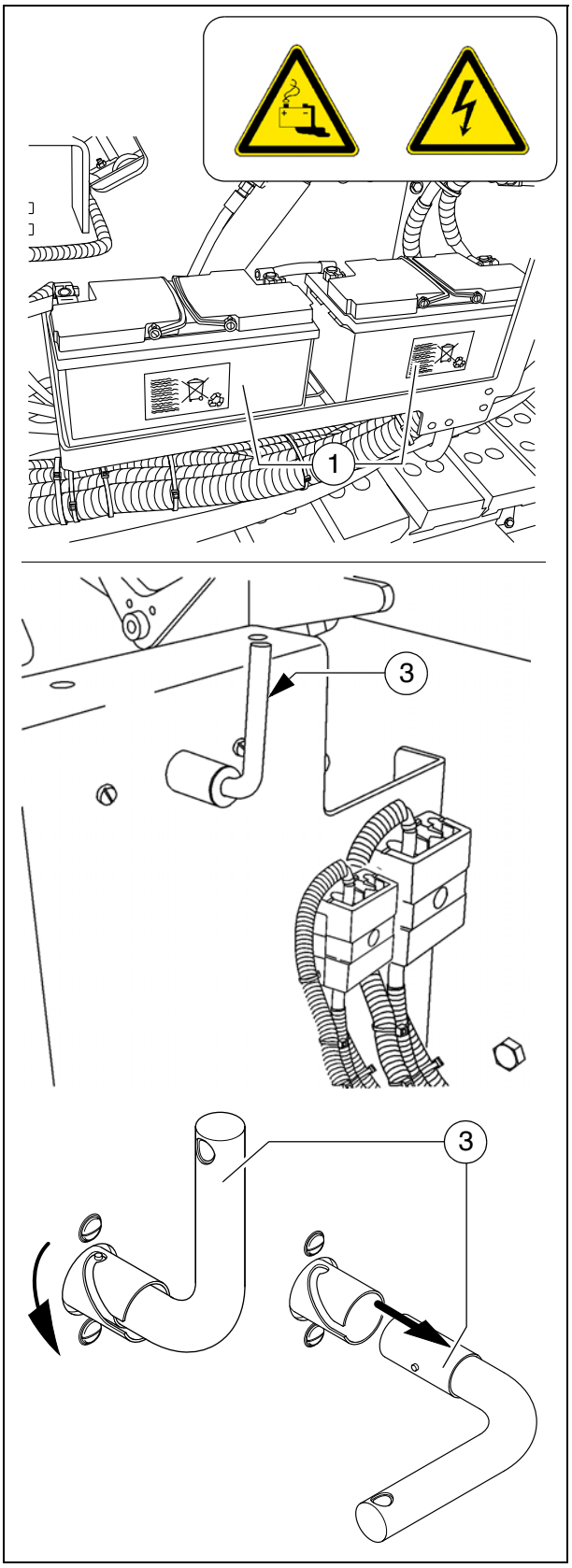
Main battery switch

The main battery switch separates the current circuit from the battery to the main fuse.

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

- To interrupt the battery's current circuit, turn the key pin (3) to the left and pull it out.

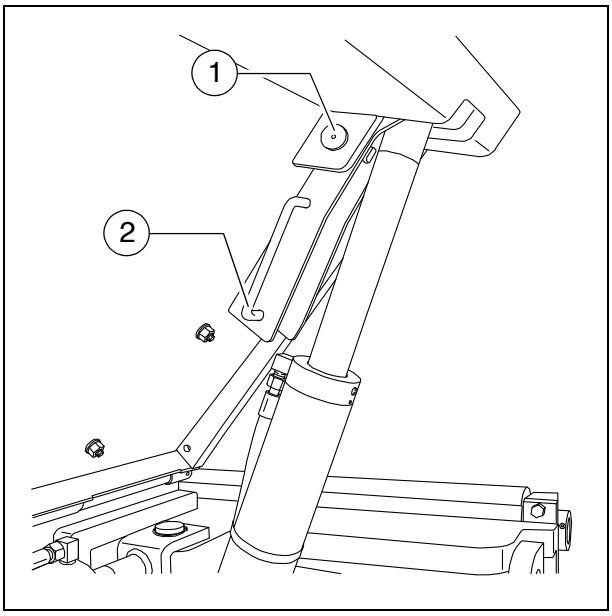
☞ Do not lose the key pin as in this case the feeder can no longer be moved!



Hopper transport safeguard

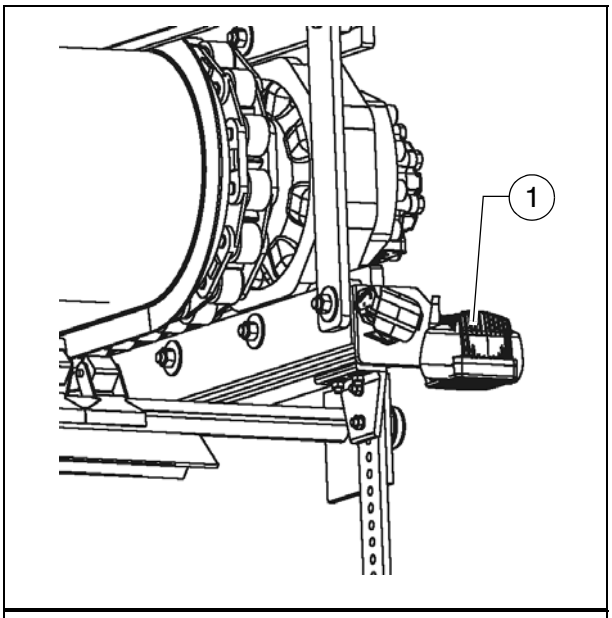
Before transporting or in order to park the vehicle, the hopper lids must be swung upwards and the transport safeguards for the hopper must be inserted on both sides of the vehicle.

- Pull the locking pin (1) and place the transport safeguard (2) with the handle above the hopper cylinder's piston rod.



STOP Without transport safeguards inserted, the hopper lids will slowly open; danger during transportation!

Conveyor belt lighting (○)

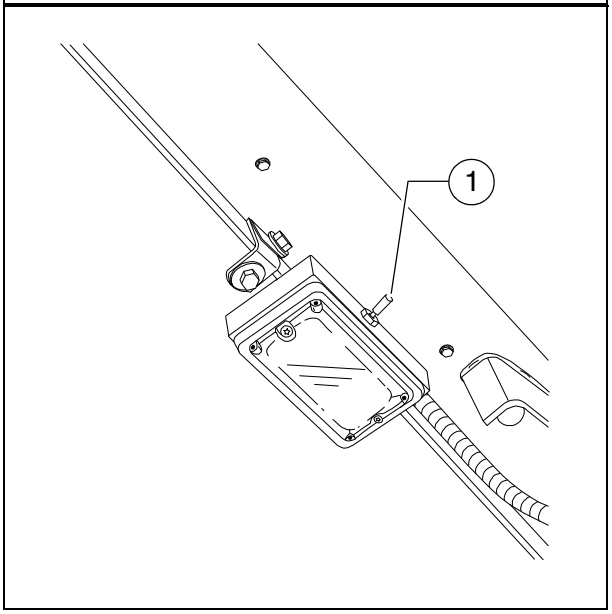


☞ Two swivelling headlights (1) are located on the left and right of the conveyor belt for illuminating the transfer point.

- They are engaged together with the working lights.

☞ These are activated together with the other working lights on the operating panel!

Engine compartment lighting (○)

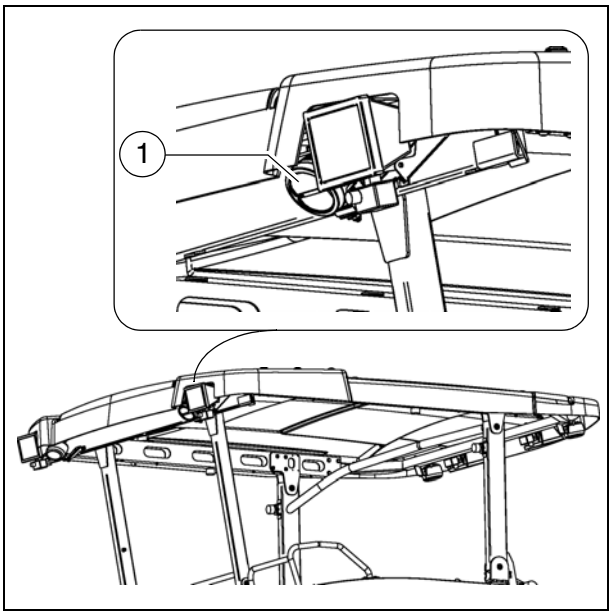


☞ The engine compartment lighting can be activated when the ignition is switched on.

- On/off switch (1) for the engine compartment lighting.

LED working light (○)

There are two LED spotlights (1) at the front and rear of the vehicle.



Always align the working lights to avoid dazzling the operating personnel or other road users!

Camera system (○)

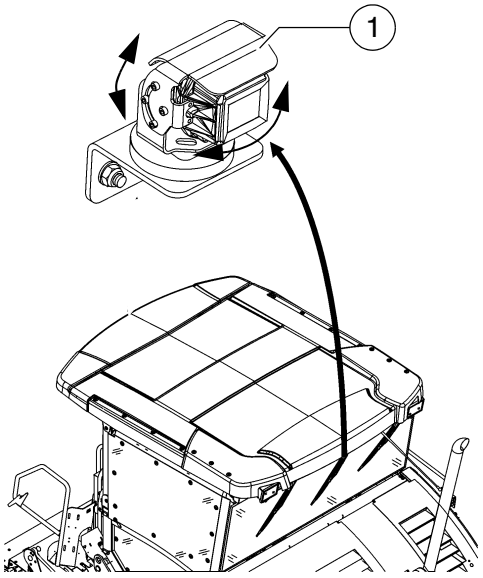
Cameras for monitoring blind spots are located in several positions on the vehicle.

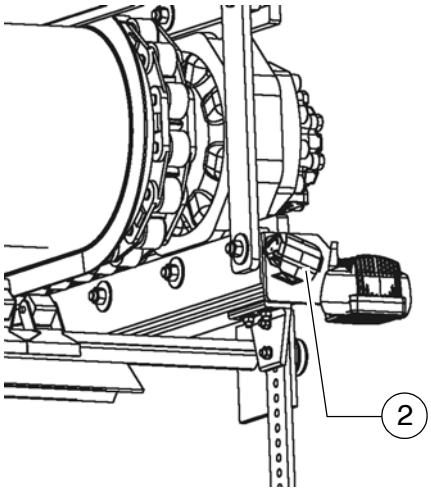
- The cameras can be swivelled in various directions.

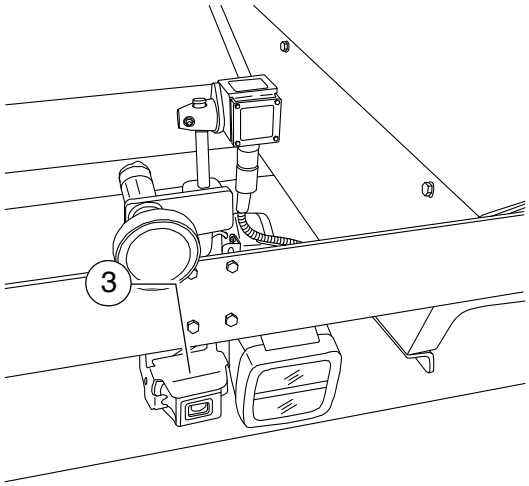
- Front of vehicle (hopper) (1)
- Material transfer area (2)
- Rear of vehicle (3)

The pictures are shown in the control panel display.

Several cameras are located in the vehicle's danger zone!
Carry out set-up work only when the vehicle is stationary!







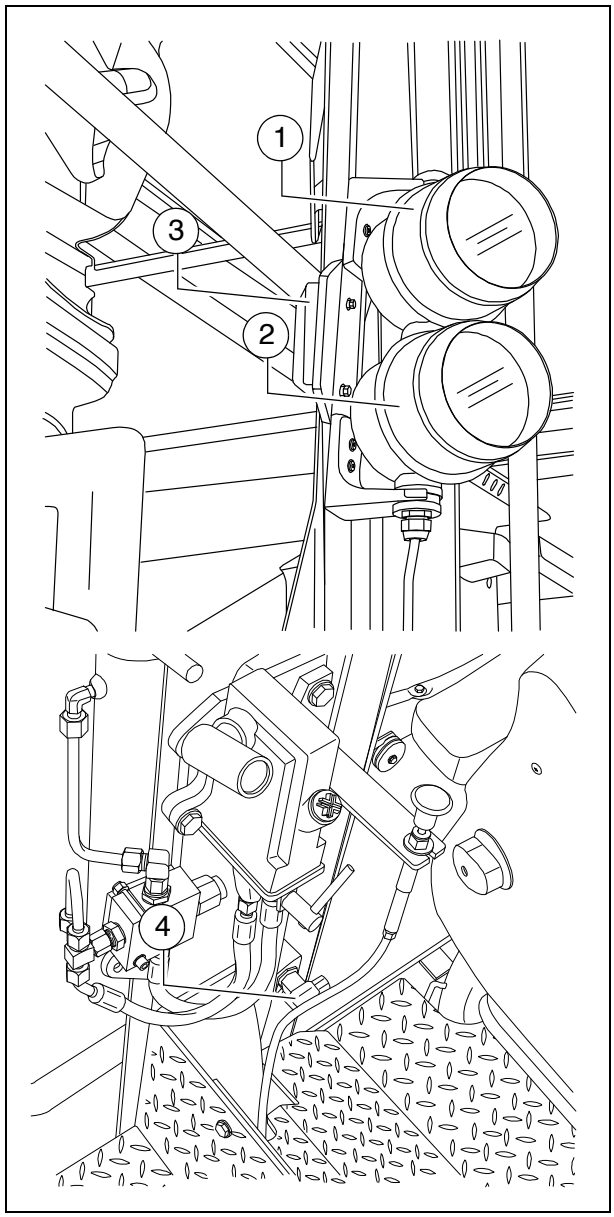
Surface course / binder course signal lamps (○)

Two removable signal lamps for controlling the material flow are located at the front and rear of the vehicle.
During compact asphalt paving, the signal lamps can be used to indicate to the drivers of the material transporters and the paver finisher whether surface or binder course material is required or the material with which the paver finisher is fed.

- Red signal lamp (1) - surface course
- Green signal lamp (2) - binder course

- Insert the lamp unit in the intended bracket (3); connect the connection cable to the relevant socket (4).

☞ The signal lamps are switched using the operating panel.



Emulsion spraying system

Used to spray the parts coming into contact with asphalt with a separator emulsion. The emulsion spraying system tank (1) is located behind the right lateral flap.

The spraying system consists of:

- a manual spray with hose reeling device (2)
- a spraying bar (3) above the conveyor belt
- a manual spray with hose (4) (○)

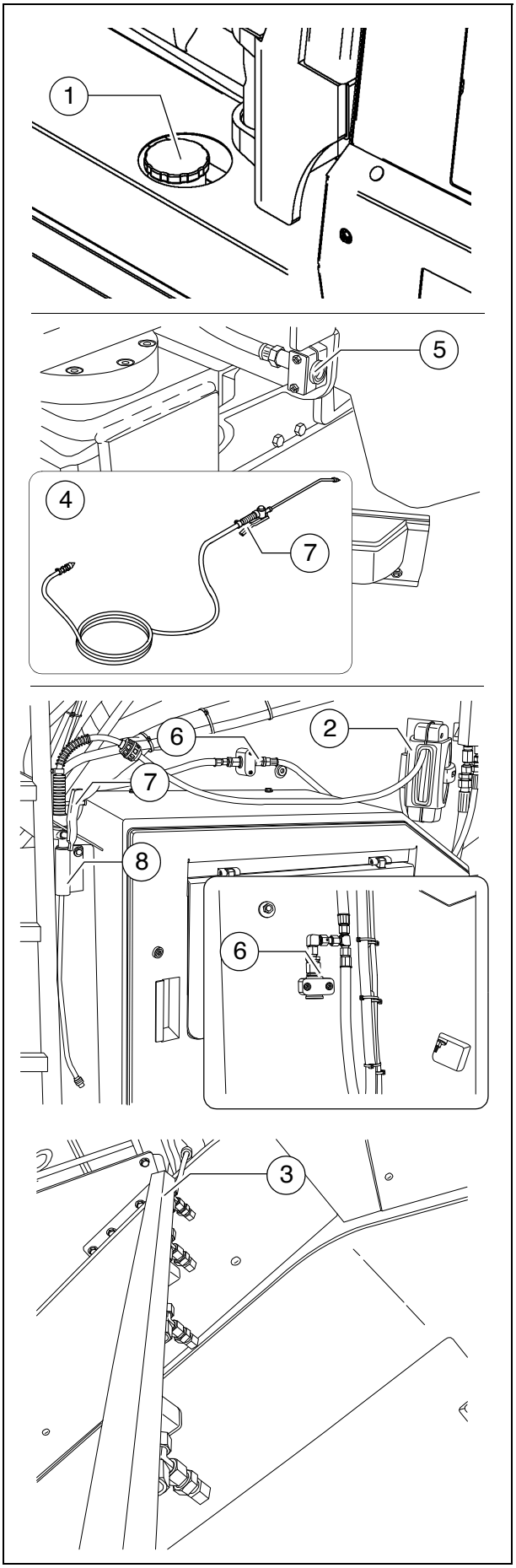
☞ The hose reeling device can be mounted on both sides of the vehicle.

- Connection options (quick-action couplers) for the spray hose are located on the left/right in the front and rear area of the vehicle (5), (6).

☞ The spraying bar installed on the conveyor belt is engaged with time control on activation of the conveying function.

☞ The separator fluid functions most efficiently when it is sprayed on the conveyor belt while it is still hot to removed any material residues! This means that the conveyor belt should be sprayed immediately in case of longer interruptions in work and immediately after the end of work.

☞ Repeat spraying 2-3 times to completely spray the conveyor belt.



☞ The scraper scrapes the separator fluid off the belt again, causing it to be wetted and protected against material adhesions.

☞ Repeat spraying regularly in the continuous working gear; see the following table for orientation:

	Base course	Binder course / Surface course
- Truck loads between two spraying processes	4	2
- Separator fluid consumption of feeder	approx. 10 l	approx. 20 l
- Separator fluid consumption of feeder with slewing belt	approx. 20 l	approx. 40 l

☞ Spray all other parts which come into contact with asphalt using the manual spray. Engagement is carried out on the operating panel / side operating unit.

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

STOP Refill the tank only whilst the vehicle is stationary!

STOP Do not spray into open flame or on hot surface! Danger of explosion!

⚠ Use only approved separator fluid!
See section entitled "Lubricants and operating substances".

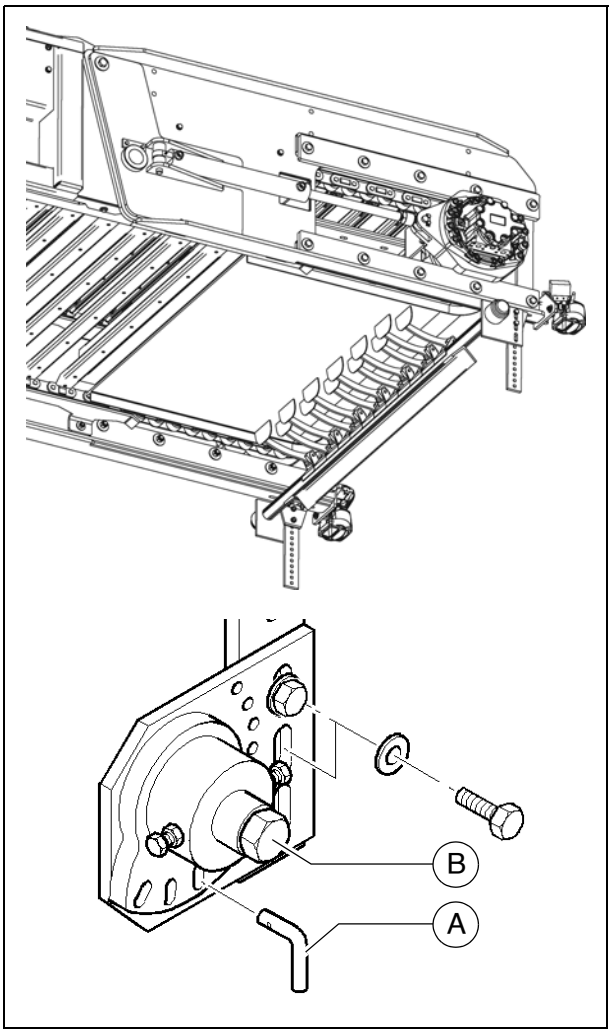
- Hose reeling device: connect supply hose with quick-action coupling.
- Pull the spray hose out of the device until a click is audible. When released, the hose automatically engages here. The hose is automatically rolled up again by pulling and letting go again.
- Actuate the manual valve (7) to spray.
- If the system is not in use, place the spray lance in the holder (8) provided.

Spring arm scraper

☞ A scraper is available to minimise dirt and wear on the conveyor belt.

☞ The scraper is equipped with several scraper plates which scrape off bonded material residues during conveyor belt operation.

⚠ Risk of damage to equipment!
Only allow the conveyor belt to run in reversing mode if the conveyor belt scraper has been disengaged!



Disengage scraper:

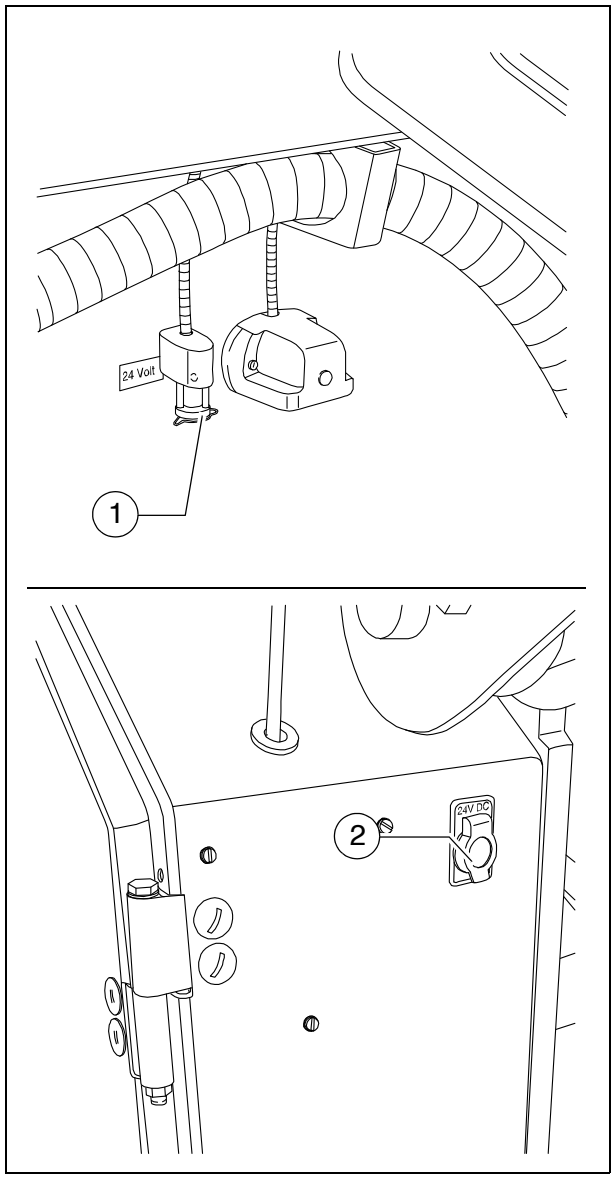
- Remove tensioning fixture bolts (A) on both sides of the vehicle.
- Place an appropriate wrench on the hexagon head (B) and relieve scraper.
- Insert bolts (A) in the next possible position to secure the scraper in the lower position.

24 volt / 12 volt sockets (○)

Additional 2 V / 24 V sockets (1) are located in several positions.
Additional working lights can be connected here, for example.

- Control platform (1)
- Rear of vehicle (2)

☞ Voltage is present when the main switch is switched on.



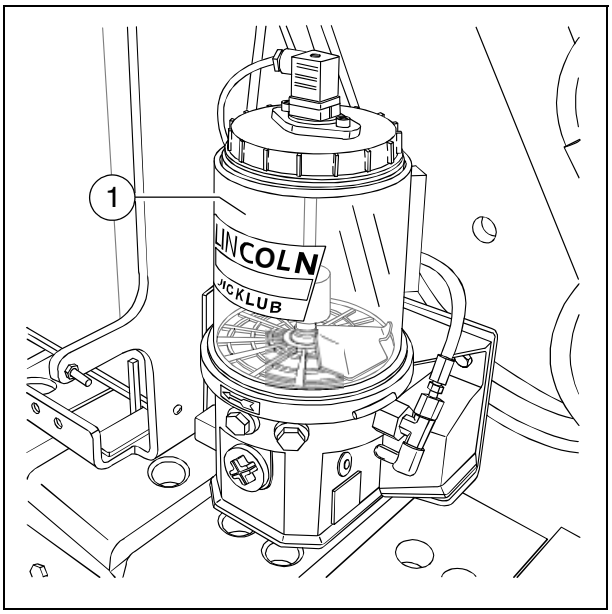
Chain lubricating system

☞ The central lubrication unit is located behind the left lateral flap.

The reservoir (1) is filled with chain oil and ensures that the conveyor belt chain links are lubricated at set intervals of time.

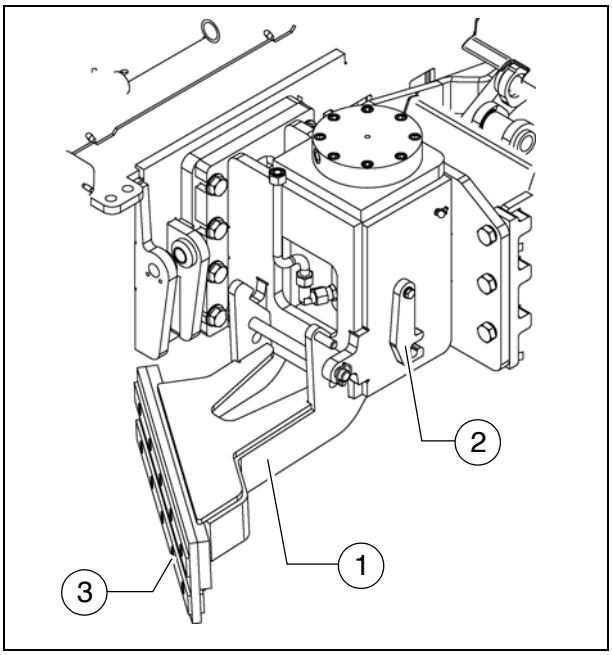
☞ Factory setting of the chain lubrication system operating intervals when the conveyor belt is running:
4 minutes' operation / 20 minutes' break.

☞ Observe the instructions in section "Maintenance"!



Lane clearer (○)

A swivelling lane clearer (1), which deflects small obstacles away to one side, is located in front of both drive units.



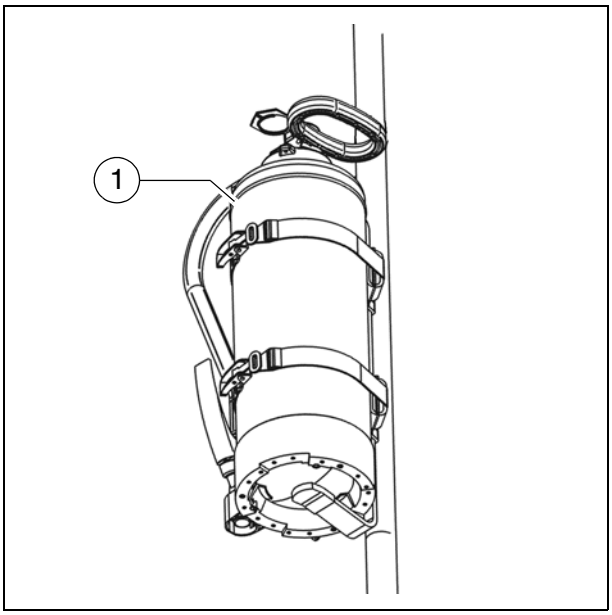
☞ The lane clearers should only be swivelled down in operating mode.

Swivelling the lane clearers:

- Swivel the lane clearers (1) up and secure in the uppermost position with a hook (2).

⚠ To avoid collisions in operating mode, the lane clearer may only be lowered so that a space of a few mm is available between the ground and the blade (3).

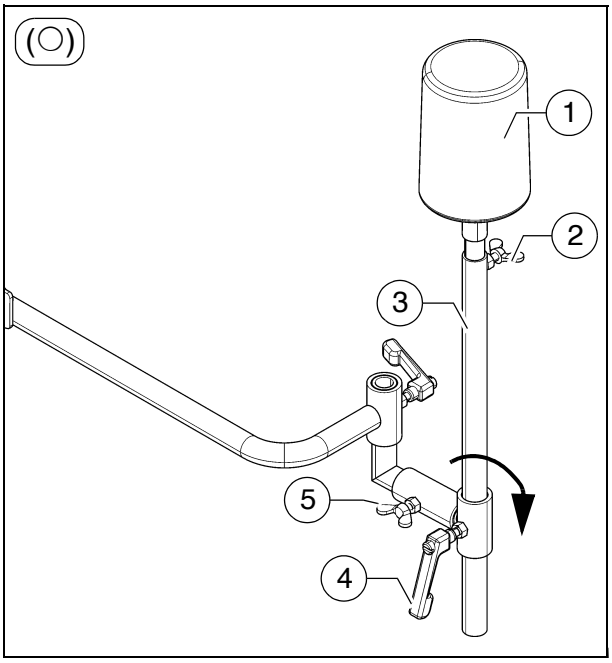
Fire extinguisher (○)



☞ The machine personnel must be familiarised with operation of the fire extinguisher (1).

☞ Observe the inspection interval for the fire extinguisher!

Rotary beacon (○)

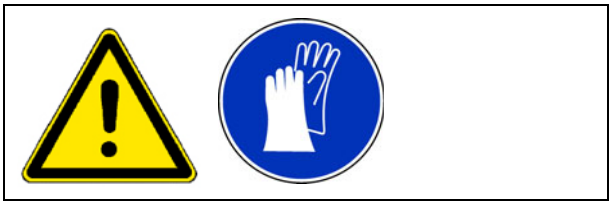


⚠ The function of the rotary beacon must be checked daily before starting work.

- Place the rotary beacon (1) onto the plug-in contact and secure with a wing bolt (2).
- Extend the rotary beacon with tube (3) to the desired height and secure with the clamping bolt (4).
  - Activate the function on the operating panel as necessary.
- On completion of work, release the bolt (5) and swivel the bracket 90°.

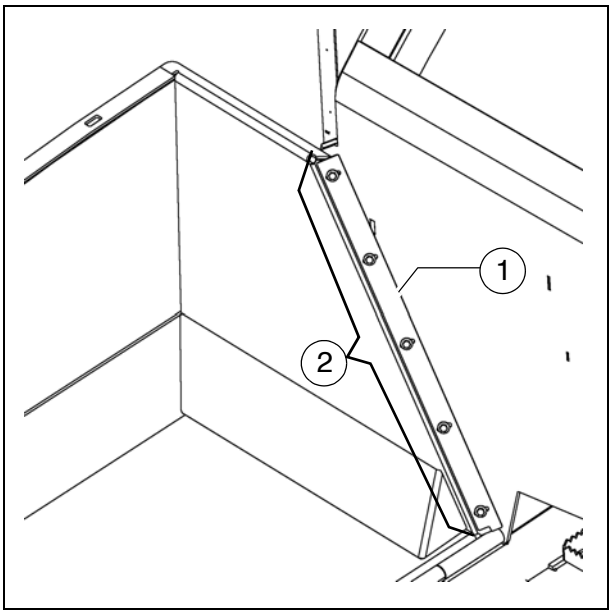
☞ The rotary beacon is easy to remove and should be stored securely at the end of work.

Hopper scraper



To reduce the gap between hopper and vehicle frame, the hopper scrapers (1) must be adjusted on both hopper lids.

- Loosen the mounting screws (2).
- Set a gap of 6 mm across the whole length of the scraper.
- Retighten the mounting screws (2) properly.



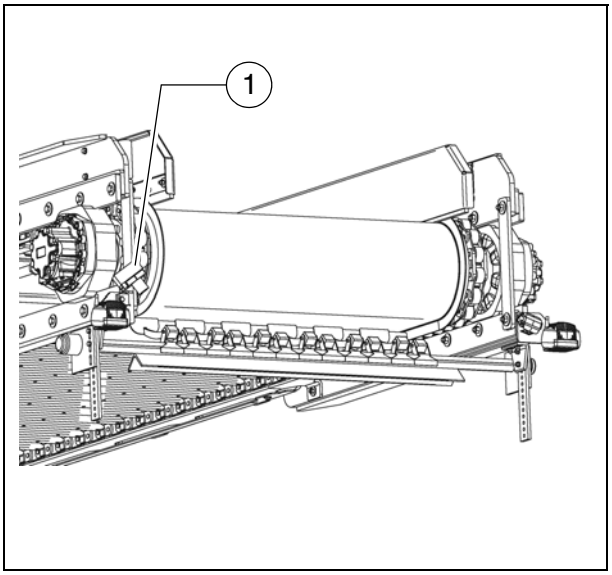


Risk of injury due to sharp-edged parts! Wear suitable safety gloves to protect your hands!

Ultrasonic sensor for height sensing:

The ultrasonic sensor is used to sense the height of the material in the paver finisher's hopper.
The lever (1) is used to clamp the sensor in the retaining fixture.
Rough adjustment can be undertaken by swivelling gently.

☞ The deactivation point is defined using the terminal on the operating panel.

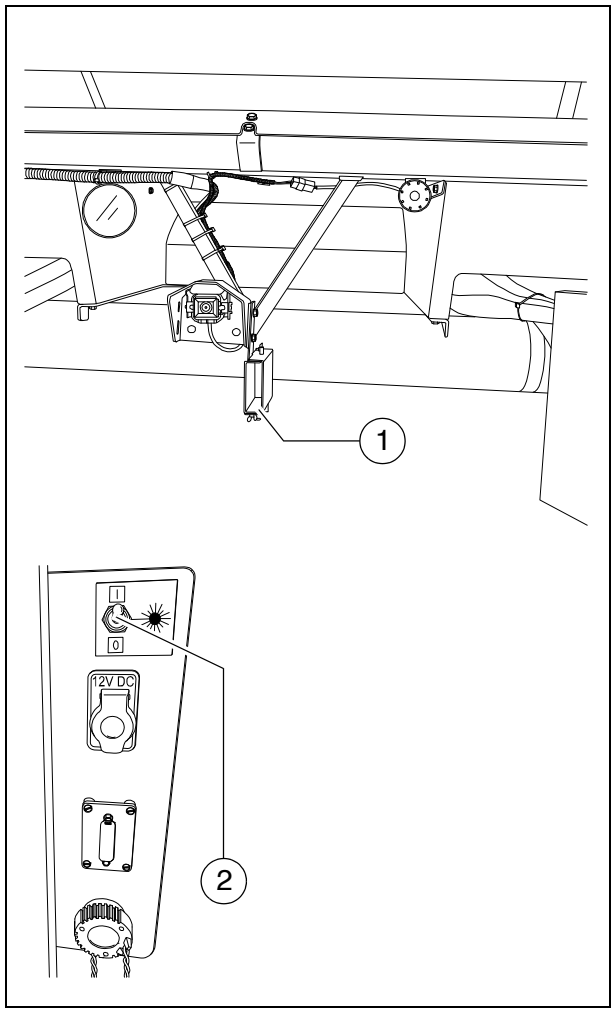


Distance sensor

The laser sensor (1) on the rear of the vehicle is used to sense the distance between the feeder and the paver finisher. As soon as the engaged sensor registers the paver finisher on approaching, the feeder's speed is adjusted to that of the paver finisher and the distance is maintained.

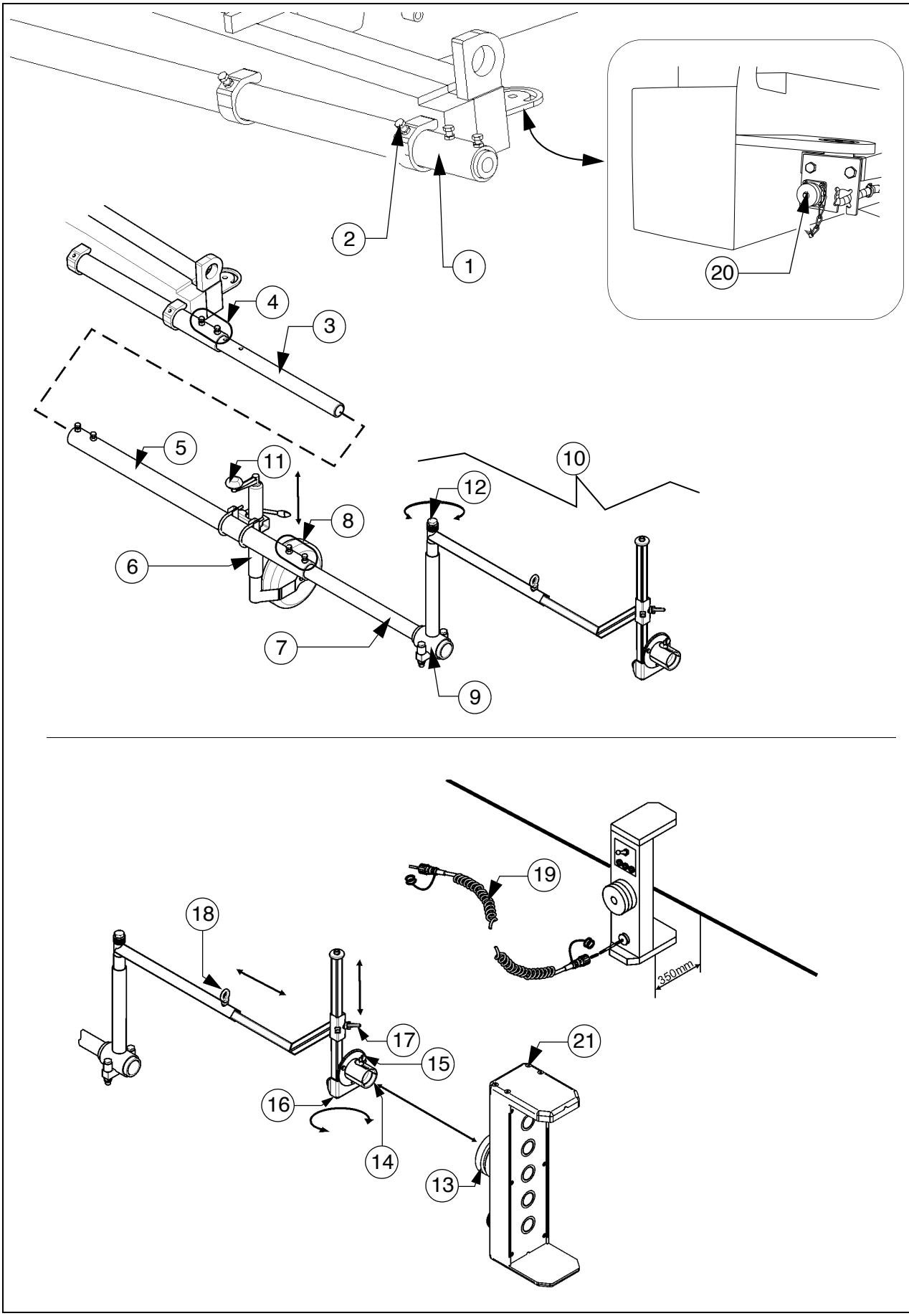
☞ The function is engaged and disengaged on the operating panel.

☞ There is a switch (2) in the terminal box for switching the laser off by hand. (type-dependent)



⚠ WARNING	**Danger due to laser beam**
	Improper handling of the laser system can cause severe injuries! - Do not look into the laser beam. - Do not enter the danger zone. - Assembly, electrical connection, commissioning, operation and maintenance may only be undertaken by specialist personnel! - Immediately decommission damaged lasers or supply cables. - Only commission correctly aligned lasers.

Automatic steering unit



1.1 Mounting the automatic steering unit on the feeder

⚠ During operation, no work may be carried out on the automatic steering unit!

☞ Depending on the desired sensing side on the vehicle, the sensor rod tube may have to be removed and re-inserted on the other side of the vehicle!

- Pull the sensor rod tube (1) at the front of the vehicle out to the desired length and secure with the clamping bolts (2).

☞ Only for 14 m automatic steering unit:
-Push the connecting tube (3) into the sensor rod tube (1), fix with bolts and lock nuts (4).
-Push extension (5) onto the connection tube and fix in the same way.
-Fix support wheel (6) in a suitable position using the corresponding assembly parts.
-Heed vertical alignment!

- Insert tube (7) to the required length and also fix with bolts and lock nuts (8).
- Fit the clamping piece (9) with extension arm (10) to the end of the tube.

☞ Heed vertical alignment!

- If necessary, adjust the height of the support wheel at the adjustment knob (11) until all extension tubes are horizontally in line.
- Swivel the extension arm (9) to the desired angle and secure by tightening the bolt (12).

⚠ Use of the automatic steering unit increases the basic width of the vehicle!

☞ If the automatic steering unit is used, ensure that there are no persons or obstacles in the danger area.

Mounting and aligning the sensor

- Insert the sensor mounting (13) into the bracket (14) and secure with a wing nut (15).
- Align the angle between the sensor and reference and secure with the relevant clamping bolt (16).

☞ The sensor and reference must be at right angles to each other!

- The sensing height can be set by loosening the fixing screw (17).

☞ The reference should run centrally along the sensor.

- The sensor's distance from the reference can be set by loosening the fixing screw (18).

☞ The distance between the sensor and reference (cable) should be 350 mm!

☞ All assembly parts must be mounted and tightened properly to ensure safe and precise operation of the automatic steering unit!

Connecting the sensor

☞ A socket for connecting the sensing system to the vehicle's control system is located on the left and right sides of the vehicle on the inner side of the bumper.

- Connect the relevant connection cable (19) to the socket (20) and sensor (21).

☞ A connection socket for the automatic steering unit is located on both sides of the vehicle.

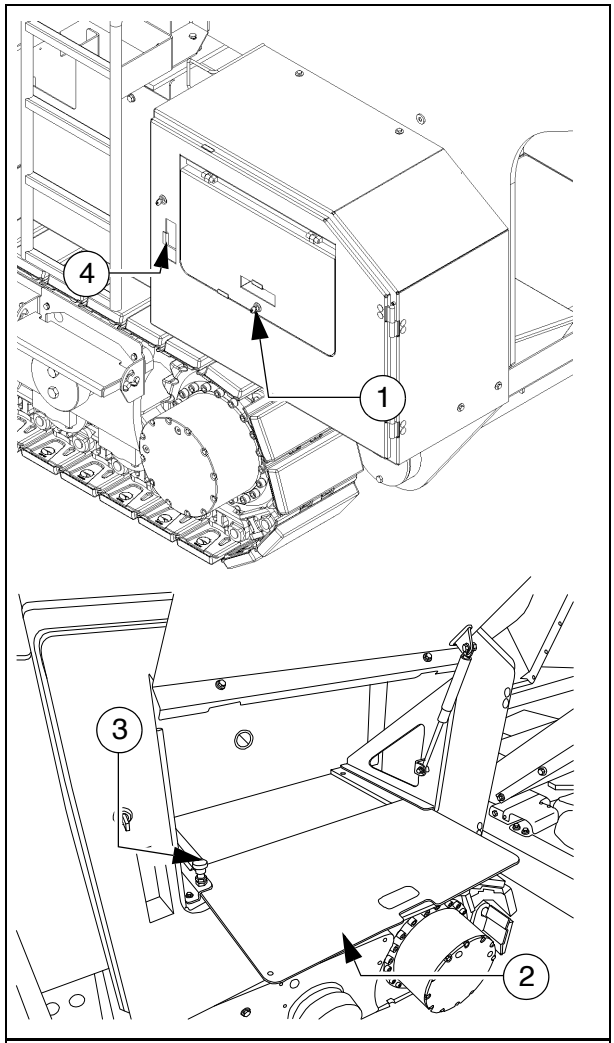
⚠ Route the connection cable so that it cannot be damaged during operation.

⚠ Seal unused sockets with the relevant protective caps.

Tray

- Open the flap (1) to use the extendable tray (2).
- Secure the tray in the front or rear position with the latch (3).

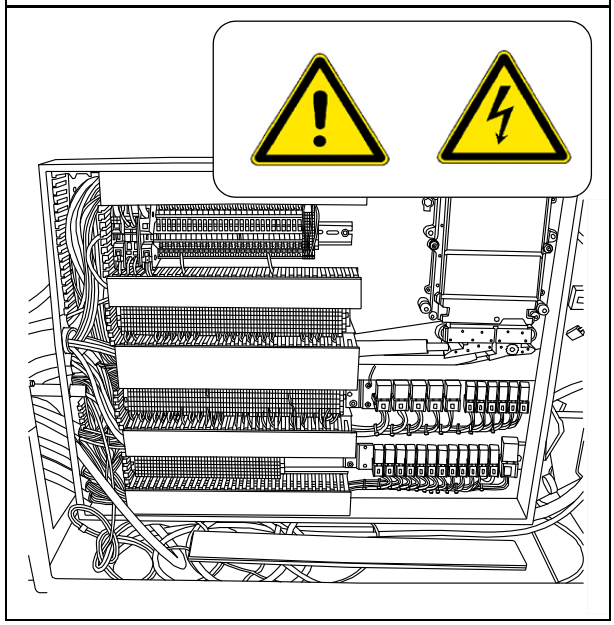
☞ Construction site documents can be completed or a laptop set down on the tray.



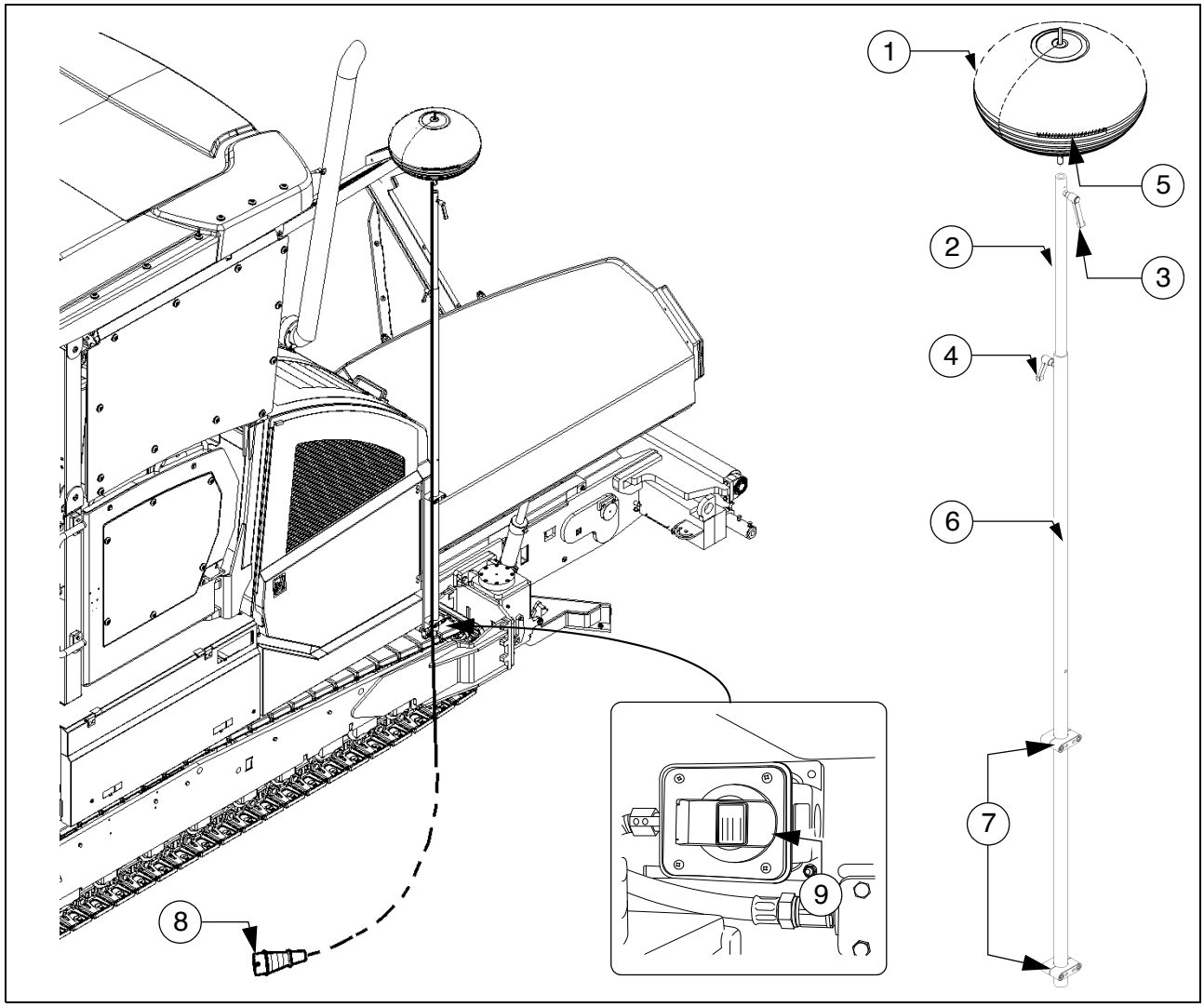
Fuse box

Open the door (4) to access the terminal box.
The terminal box contains all fuses and relays, etc.

☞ An assignment plan for fuses and relays can be found in chapter F8.



Illuminated balloon (○)



The illuminated balloon generates shadow-reducing and anti-dazzle light.

STOP The illuminated balloon makes the vehicle higher and wider.

STOP Note the passage height of bridges and tunnels and the enlarged vehicle width.

STOP Always disconnect the power supply before working on the illuminated balloon!

STOP Never look directly in the balloon when it is switched on!

STOP The illuminated balloon must not be used in the vicinity of highly flammable materials (e.g. petrol and gas); a safety distance of at least 1 metre must be maintained from combustible materials.

Danger due to electric shock. Voltage flashover poses the risk of severe or fatal injuries! Adhere to the following safety distances from high-voltage lines:
< 125 kV 5 m
> 125 kV 15 m

The illuminated balloon must not be operated if the electric supply cables or connectors are damaged.

Before starting up, check that the zip fastener of the balloon skin is closed. If the skin is damaged, it must be repaired or replaced. The bulbs must be checked for firm seating and damage.

The balloon cannot be operated with a damaged skin.

Never operate the balloon unattended!

Maximum wind speed for using the balloon: 80 km/h.

Installation and operation

- Fasten the illuminated balloon (1) to the holding tube (2) and pull the clamping lever (3) tight.
- Set the telescopic tube to the desired height using the clamping lever (4).
- Close the zip fastener (5) in the balloon skin and smooth away any large wrinkles in the skin.
- Guide the holding tube (6) into the pre-mounted holder (7) and tighten the clamping screws correctly to fix the holding tube.
- Once the illuminated balloon is completely mounted and secured, connect the plug (8) of the illuminated balloon in the corresponding switch cabinet sockets (9).

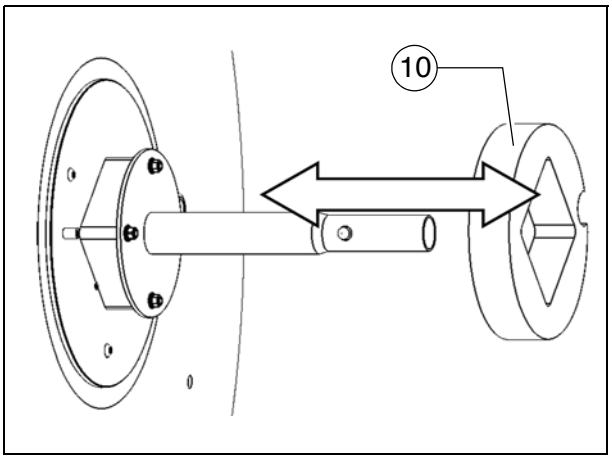
Route the supply lines so as to rule out any risk of stumbling or damage to the lines.

- After it has been engaged at the switch cabinet, the illuminated balloon inflates automatically.
- The skin of the illuminated balloon collapses again on being switched off.
- Remove the plug and open the zip of the balloon skin. Let the lamps cool down completely.
- Store any dry illuminated balloons that are not needed in the corresponding transport cover.

The holding tube most be removed during transport or to lower the roof!

Maintenance

⚠ Occasionally clean or replace the air filter (10) beneath the connection plate.



⚠ Do not use solvents to clean the balloon skin!

Replacing the lamp

- Disconnect the power cable and open the zip fastener of the skin.

STOP Let lamp cool down completely!

⚠ Always wear the supplied cotton glove to touch the lamp!

- Press the lamp down gently to remove it.
- Insert the new lamp in the socket.

- Close the zip fastener of the balloon skin.

D 41 Mode of operation

1 Preparing for operation

Required devices and aids

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

- Diesel fuel
- Engine oil and hydraulic oil, lubricants
- Separator fluids (emulsion) and manual injector
- Shovel and broom
- Any devices required to clean various parts of the vehicle
- Protective clothing, signal vest, gloves, ear protection

⚠ CAUTION	**Danger due to restricted vision**
	Restricted vision poses a risk of injury! - Before starting work, arrange the intended driver's seat to ensure adequate vision. - Signalmen must be used when vision is restricted, also to the sides and when reversing. - Only reliable persons may be used as signalmen who must have been received instructions about their task before taking up their activity. This refers in particular to the hand signals to be used. Standardised hand signals must be used. - Adequate lighting must be provided when working at night. - Comply with all further information in these instructions and in the safety manual.

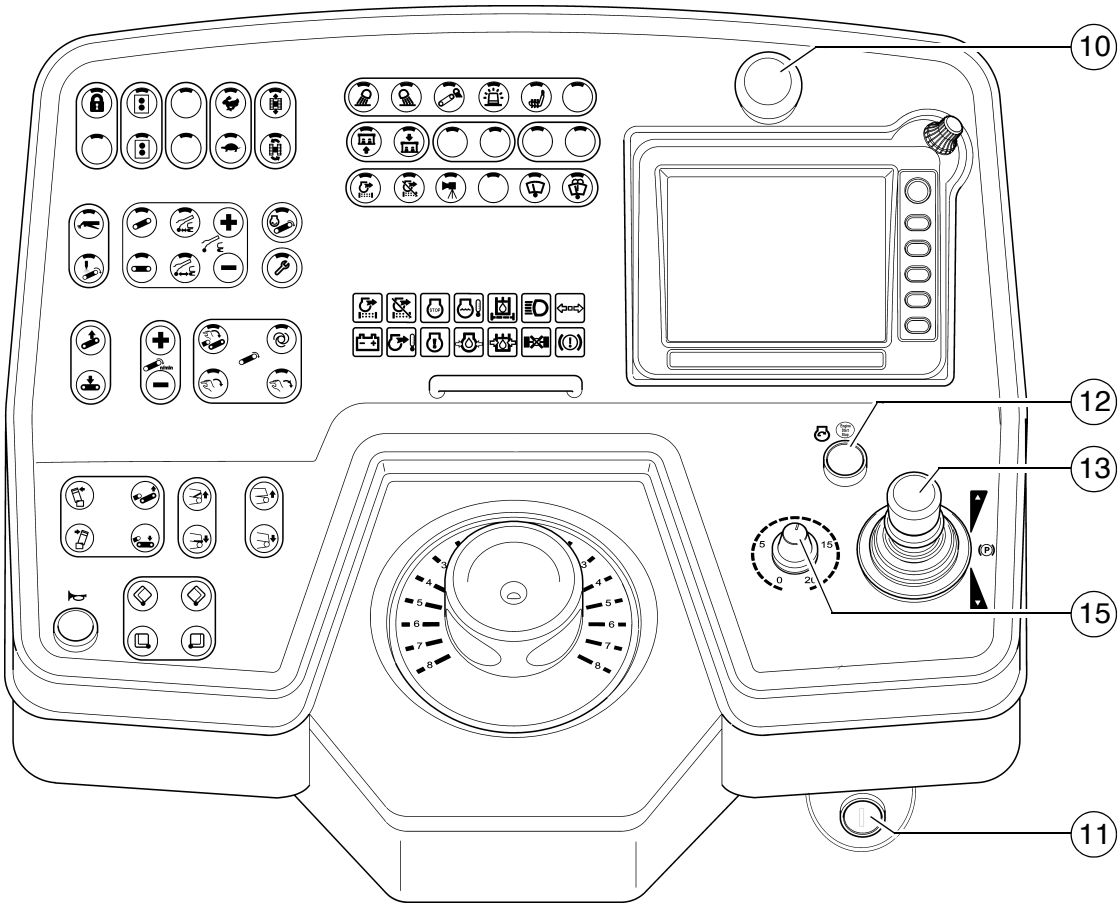
⚠ WARNING	**Danger of falling from the vehicle**
	Entering and leaving the vehicle and the driver's seat during operation poses a risk of falling from the vehicle, which can cause severe to fatal injuries! - During operation, the operator must be at the intended driver's seat and be seated properly. - Never jump onto or off a moving vehicle. - Keep accessible surfaces free of any soiling, e.g. operating substances, to avoid the risk of slipping. - Use the steps provided and hold onto the handrail with both hands. - Comply with all further information in these instructions and in the safety manual.

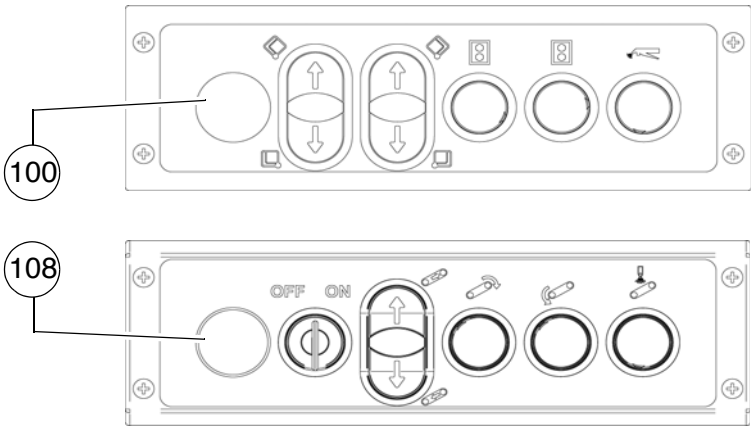
Before starting work
(in the morning or when starting paving)

- Heed the safety instructions.
- Check the personal protective equipment .
- Take walk around the vehicle to inspect it and check for any leaks and damage.
- Install parts removed for transportation or for the night.
- Perform the check according to the "Checklist for the vehicle operator" given below.

Check list for the vehicle operator

Check!	How?
Emergency stop button - on the operating panel - on the side operating units	Push in the button. The diesel engine and all running drives must stop immediately.
Steering	The feeder must immediately and precisely follow every steering movement. Check straight ahead travel.
Horn - On the operating panel	Briefly press the horn button. Horn signal must sound.
Lights	Switch on with the ignition key, walk around the vehicle, check and switch off again.
Warning lights	The warning lights must be engageable when the ignition is switched on.
Hopper transport safeguard	When the hopper is closed, it must be possible to swivel the safeguards over the hopper cylinders.
Protective roof	The locking bolts must be set properly.
Other facilities: - Engine panels - Lateral flaps - Covers	Check that the coverings, flaps and covers are securely seated.
Accessories: - First aid box	Equipment must be present on the vehicle! ☞ Always observe the local regulations!


10
12
13
15
11


100
108
OFF
ON



1.1 Starting the vehicle

Before starting the vehicle

The following must be carried out before the diesel engine can be started and the vehicle can be operated:

- Daily maintenance of the vehicle (see chapter F).

⚠ Check the operating hours counter to determine whether further maintenance work should be conducted.

- Check the safety devices and protective devices.

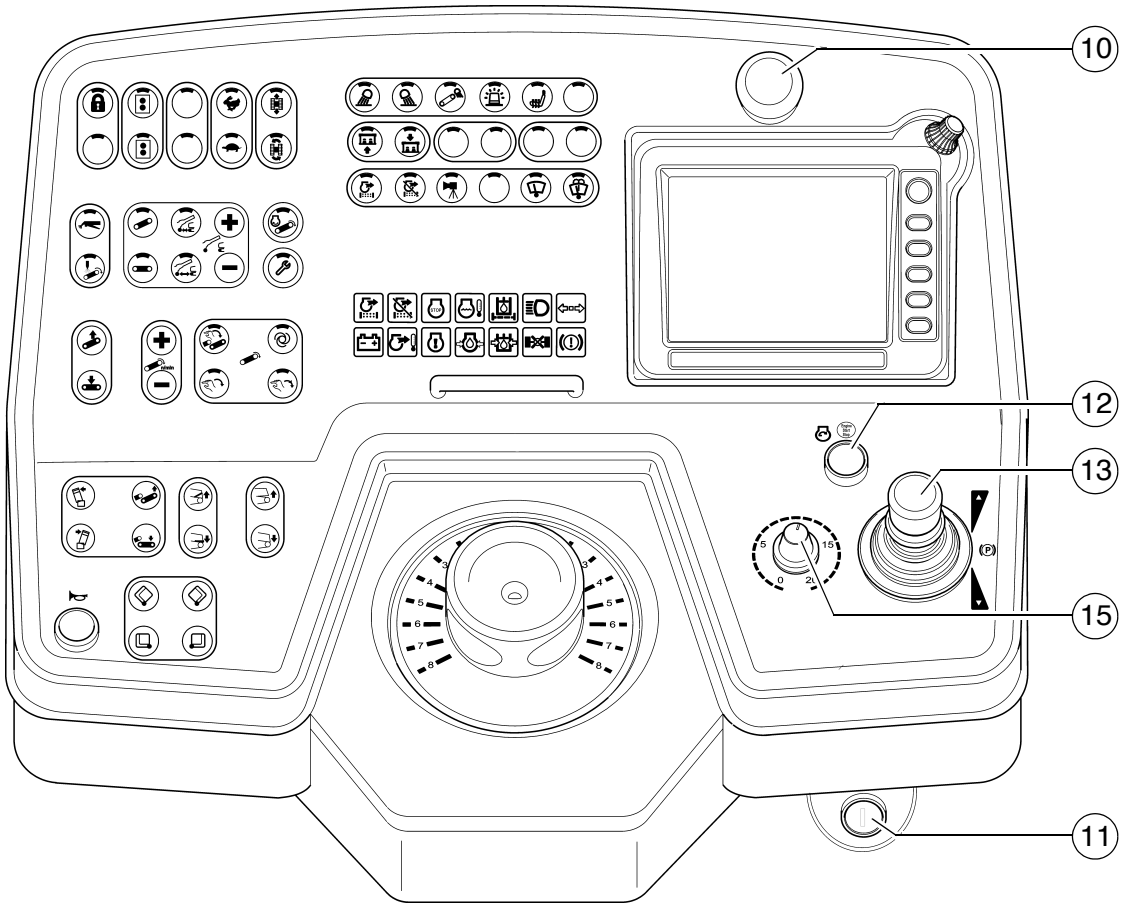
"Normal" starting

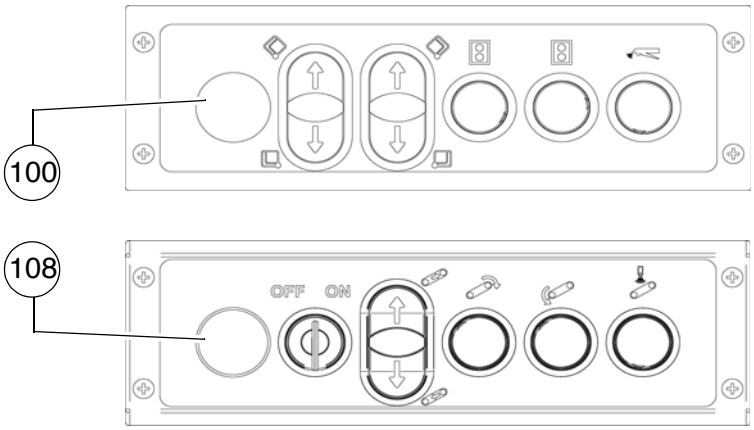
- Set the drive lever (13) to the centre position and the travel drive preselector (15) to minimum.
- Insert the ignition key (11) in position "0".

⚠ The lights should be switched off during starting to reduce the current drain on the battery.

☞ It is impossible to start the vehicle if an emergency stop button (10) / (100, 108) is pressed.
(Error shown on the display)

- Press the starter button (12) to start the engine. Run the starter continuously for a maximum of 20 seconds, then take a break for 2 minutes!


10
12
13
15
11


100
108
OFF
ON



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:

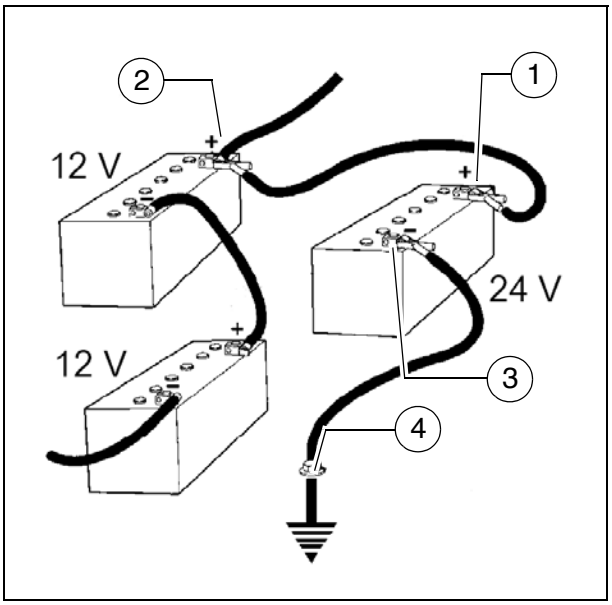
- Other vehicles with a 24V system
- Additional 24V battery
- Start device that is suitable for external starting (24 V/90 A).

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

To externally start the engine:

- Switch on the ignition (11), set the drive lever (13) to the centre position and the travel drive preselector (15) to minimum.

The starting aid cable must be connected to 24 V.



- First connect the positive terminal (1) of the starting aid battery to the positive terminal (2) of the vehicle battery.
- Then connect the negative terminal (3) of the starting aid battery to the ground of the discharged vehicle, e.g. to the engine block or to a bolt (4) on the vehicle frame.

Do not connect the starting aid cable to the negative terminal of the discharged battery! Danger of explosion!

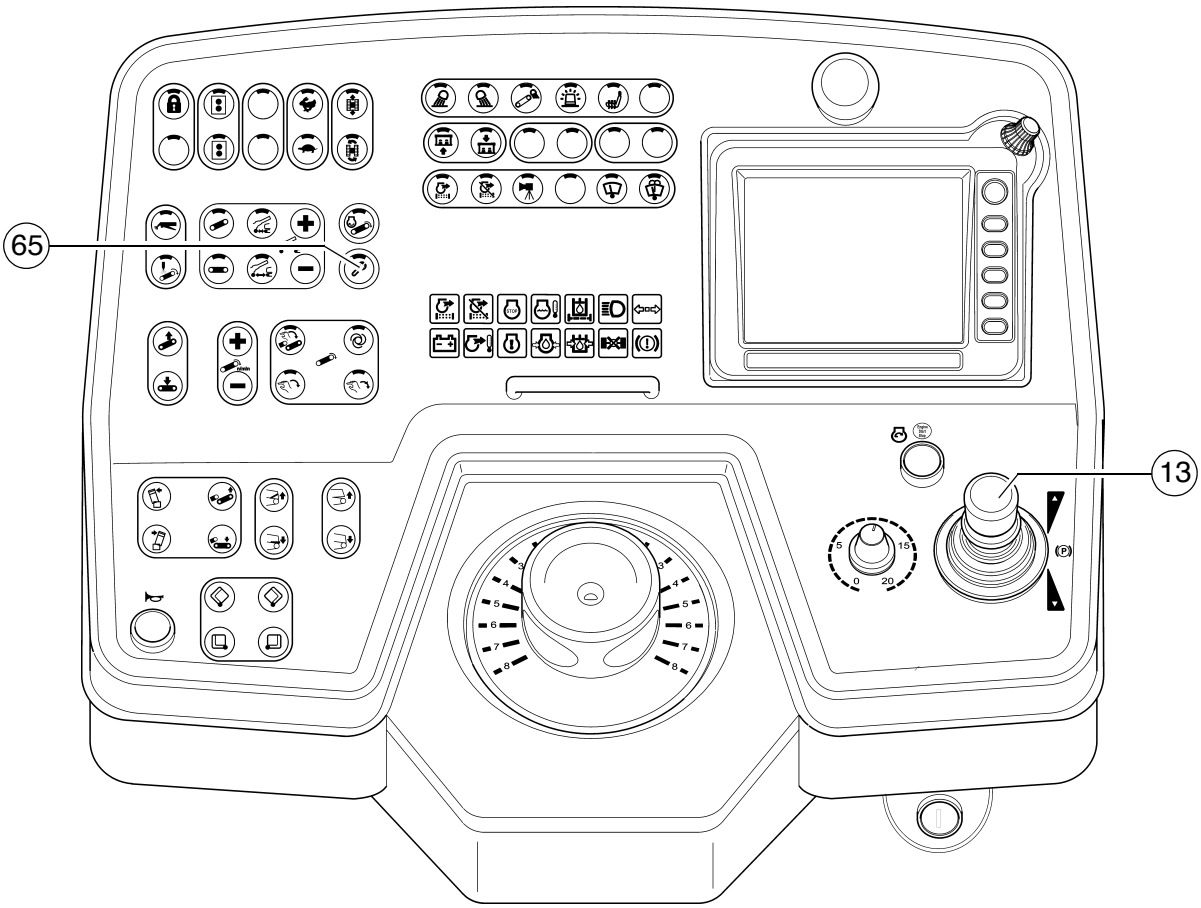
Lay the starting aid cable so that it can be disconnected once the engine is running.

It is impossible to start the vehicle if an emergency stop button (10) / (100, 108) is pressed.
(Error shown on the display)

- If necessary, start the engine of the vehicle supplying power and leave to run for a while.

Now try to start the other vehicle:

- Press the starter button (12) to start the engine. Run the starter continuously for a maximum of 20 seconds, then take a break for 2 minutes!
- If the engine still has not started after two attempts, ascertain the cause!
- If the engine starts up: disconnect the starting aid cable again in reverse order.


65
13



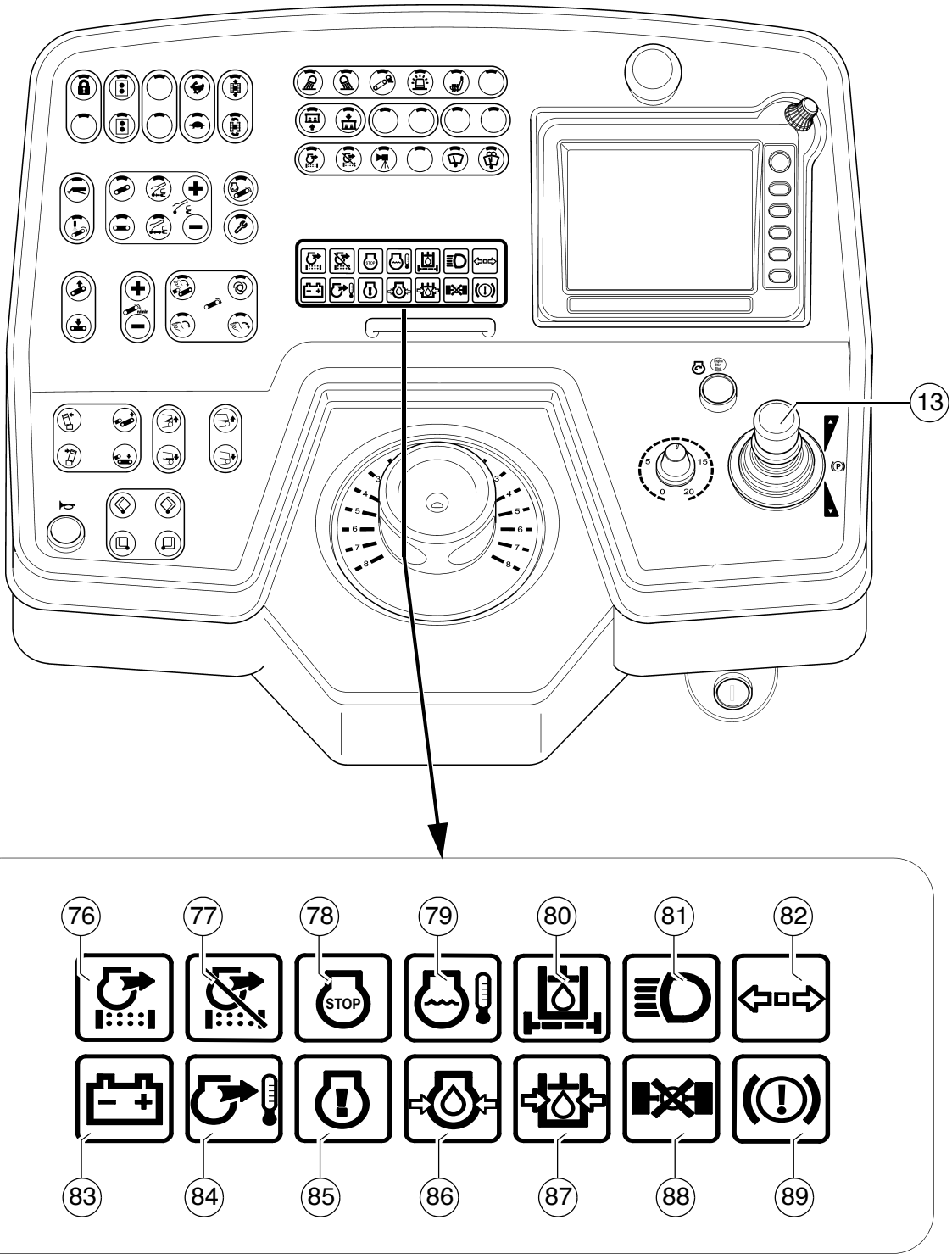
After starting

To increase the engine speed:

- Press button (65) to increase engine speed.

☞ The engine speed is increased to the preset value.

⚠ Let the vehicle warm up for approx. 5 minutes if the engine is cold.


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STOP
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86
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88
89



Observe indicator lamps

The following indicator lamps must be observed under all circumstances:

For further possible faults, see Engine's operating instructions.

Engine coolant temperature check (79)

Lights up when the engine temperature is outside of the permissible range.

⚠ Stop the vehicle (drive lever in centre position), let the engine cool down while idling. Determine the cause and correct it if necessary.

☞ The engine performance will be throttled down automatically.
(Driving mode remains possible).
After cooling down to normal temperature, the engine will run with full performance again.

Battery charge indicator (83)

Must go out after starting when the engine revs up.

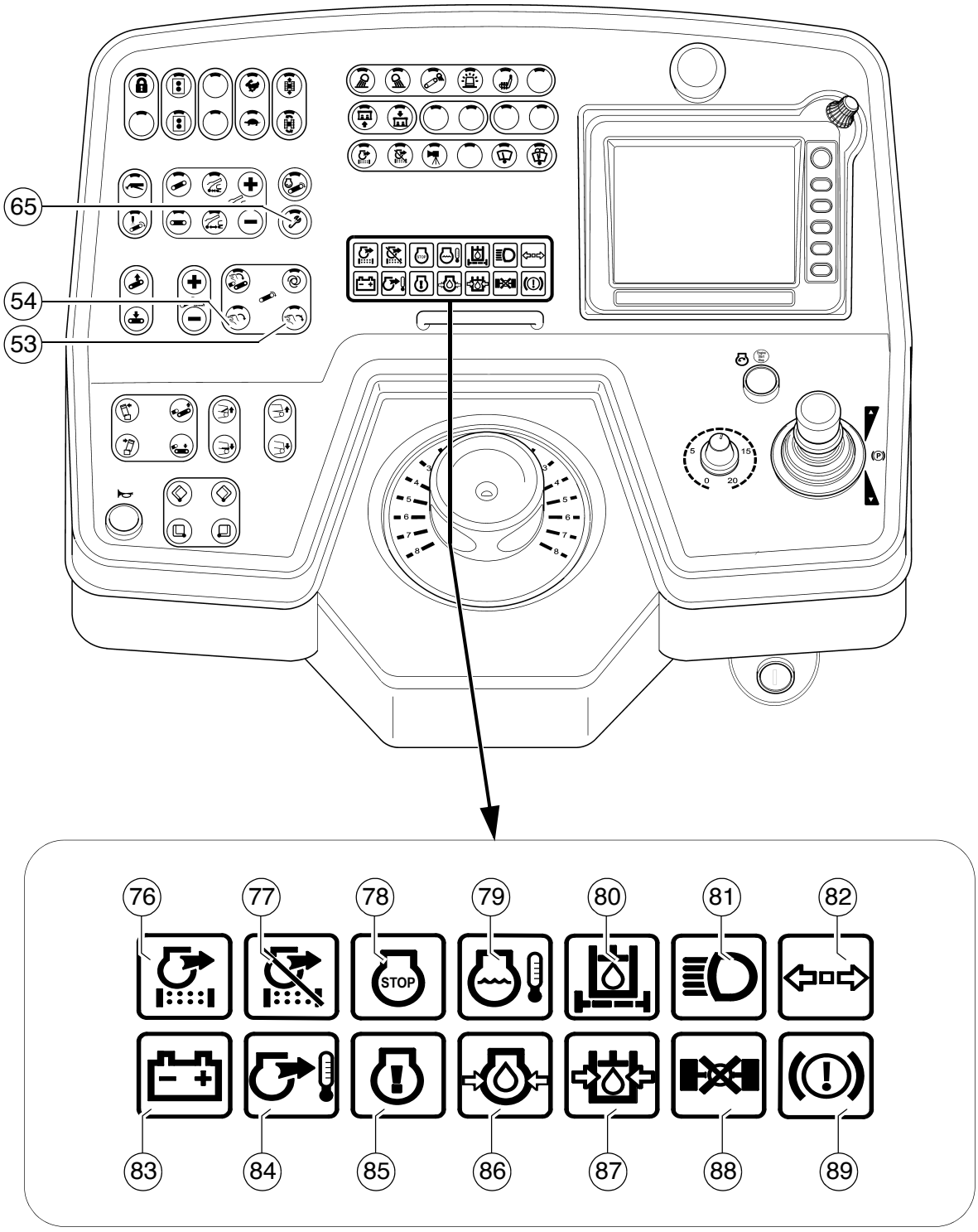
⚠ If the lamp does not go out or lights up during operation: Briefly rev up the engine. Switch off the engine and determine the fault if the lamp does not go out.

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

Oil pressure indicator lamp for the diesel engine (86)

Must go out 15 seconds after starting at the latest.

⚠ If the lamp does not go out or lights up during operation: switch off engine immediately and determine fault.


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STOP
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Oil pressure indicator lamp for the travel drive (87)

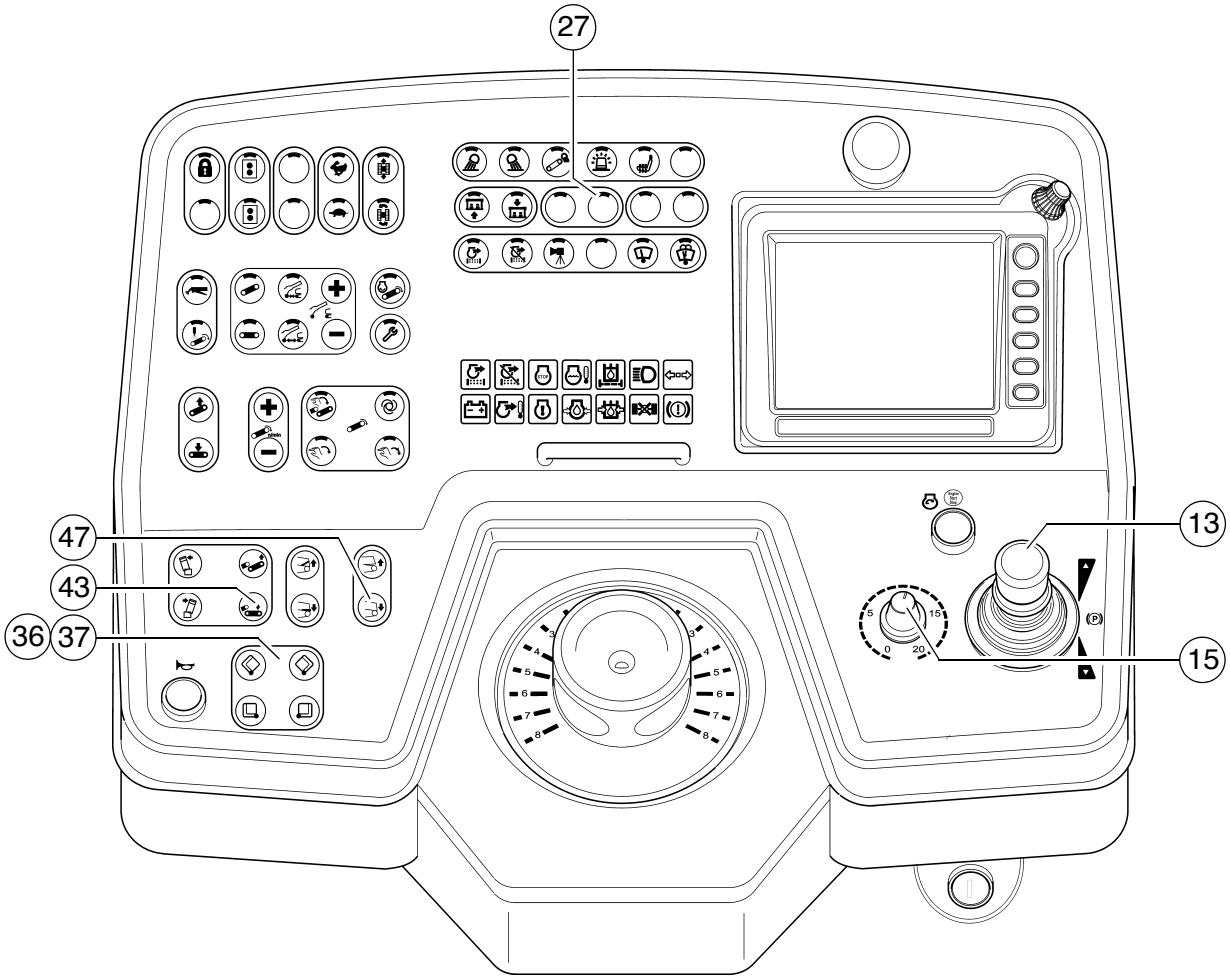
- Must go out after starting.

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

- Activate set-up mode function (65).
- Set conveyor belt functions (53) or (54) to "manual".
  The conveyor belts start to operate
- 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 faults, refer to the section "Malfunctions".

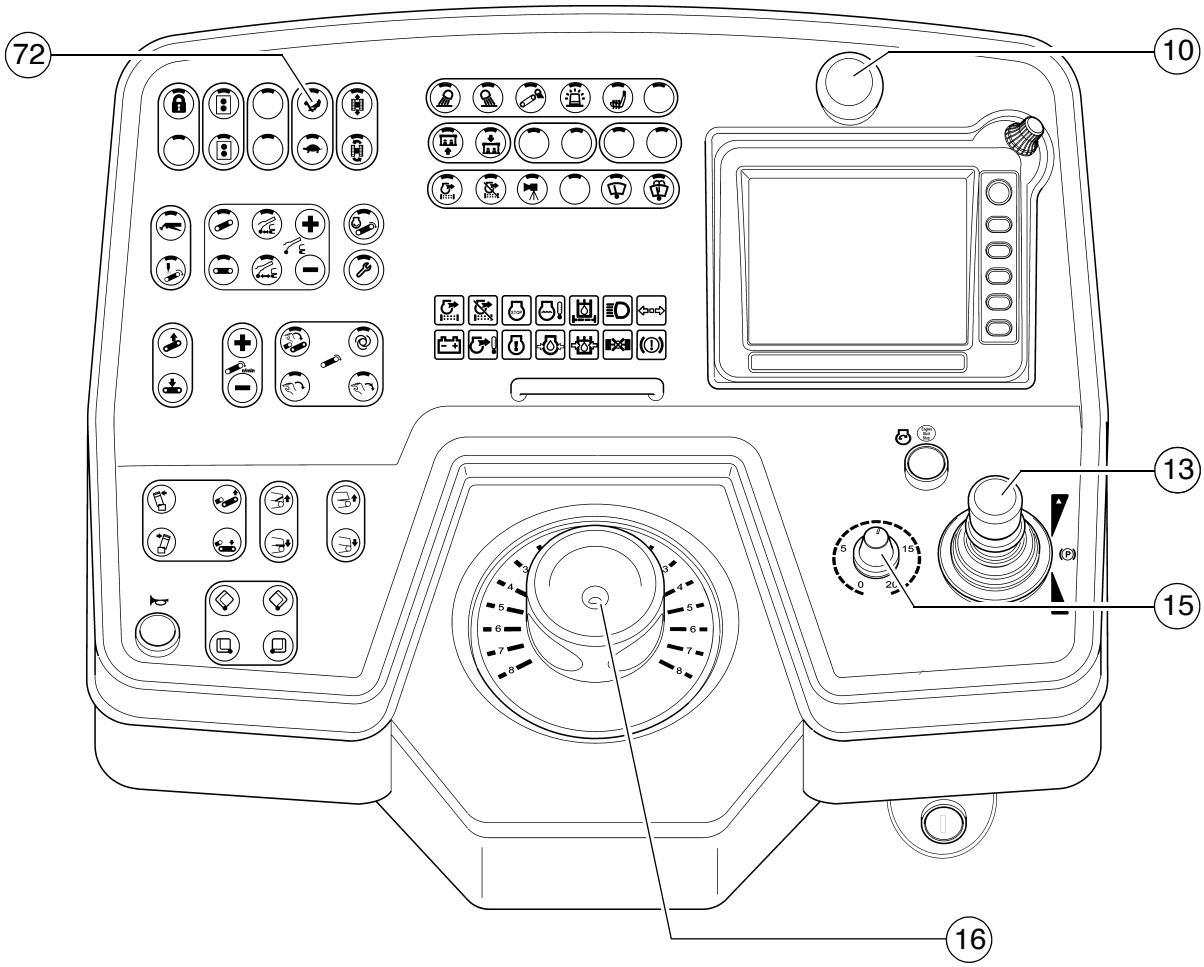

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1.2 Preparation for transportation

- Move the drive lever (13) to the centre position.
- Turn the travel drive preselector (15) to zero.
- Close the hopper with buttons (36)//(37).
- Lower the platform with button (25) (○).
- Lower the main conveyor belt with button (49).
- Lower the slewing conveyor belt (○) with button (43).
- Engage both hopper transport safeguards.

☞ If the engine is started with the drive lever swivelled, the travel drive is blocked. To be able to start the travel drive, the drive lever must first be returned to the centre position.


72
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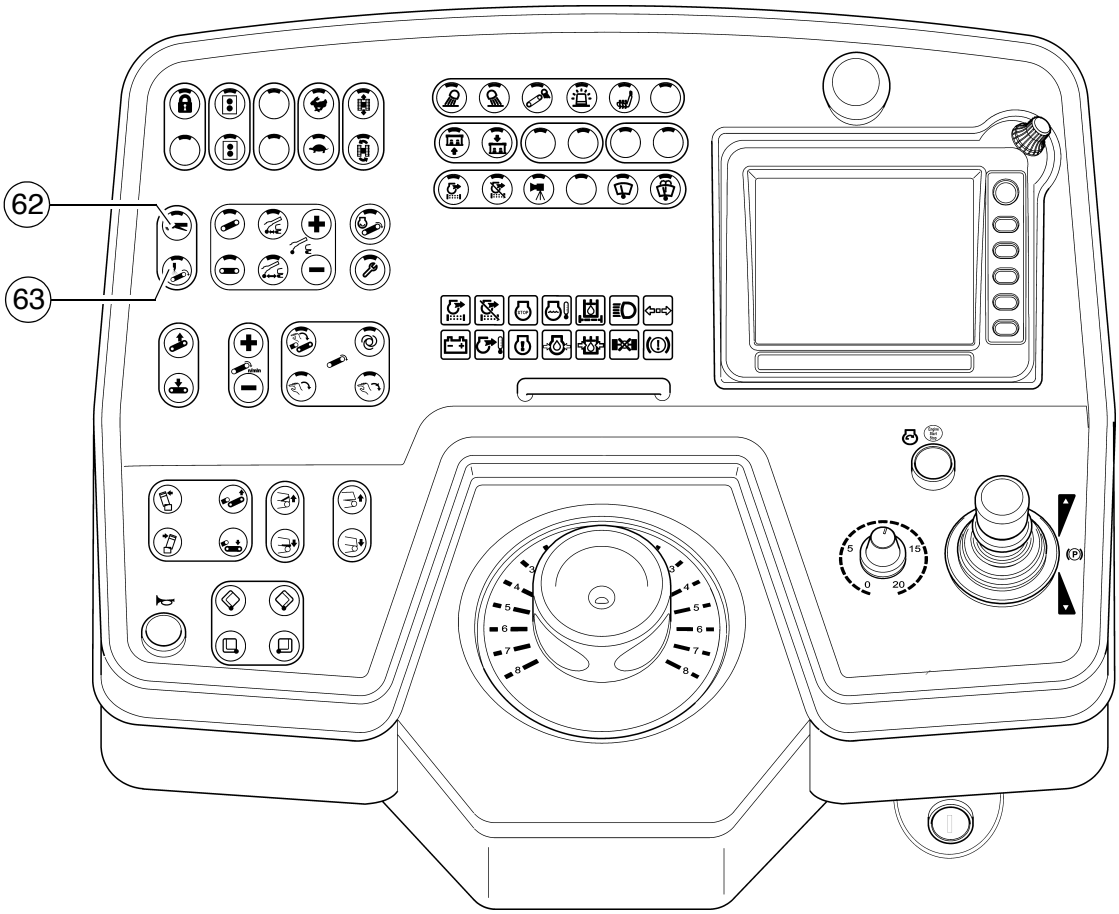
Driving and stopping the vehicle

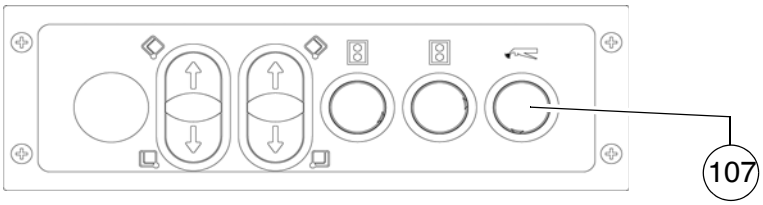
- Set the Fast/Slow switch (72) to "Hare".
- Set the preselector (15) to mark 10.
- For driving, carefully tilt the drive lever (13) forward or backward according to the drive direction desired.
  - Adjust the speed with the preselector (15).
- Carry out steering movements by actuating the steering potentiometer (16).



In case of an emergency, press the emergency stop button (10)!

- To stop, set the preselector (15) to "0" and move the drive lever (13) into its centre position.

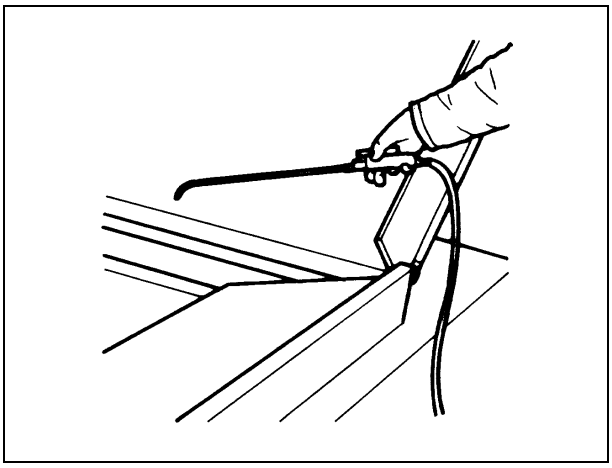

62
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107



1.3 Preparations for feeder operation

Separator fluid



- Engage the separator fluid spraying system with button (62) or (107).

☞ Spray all surfaces coming into contact with asphalt material (hopper, push rollers, scraper) with separator fluid.

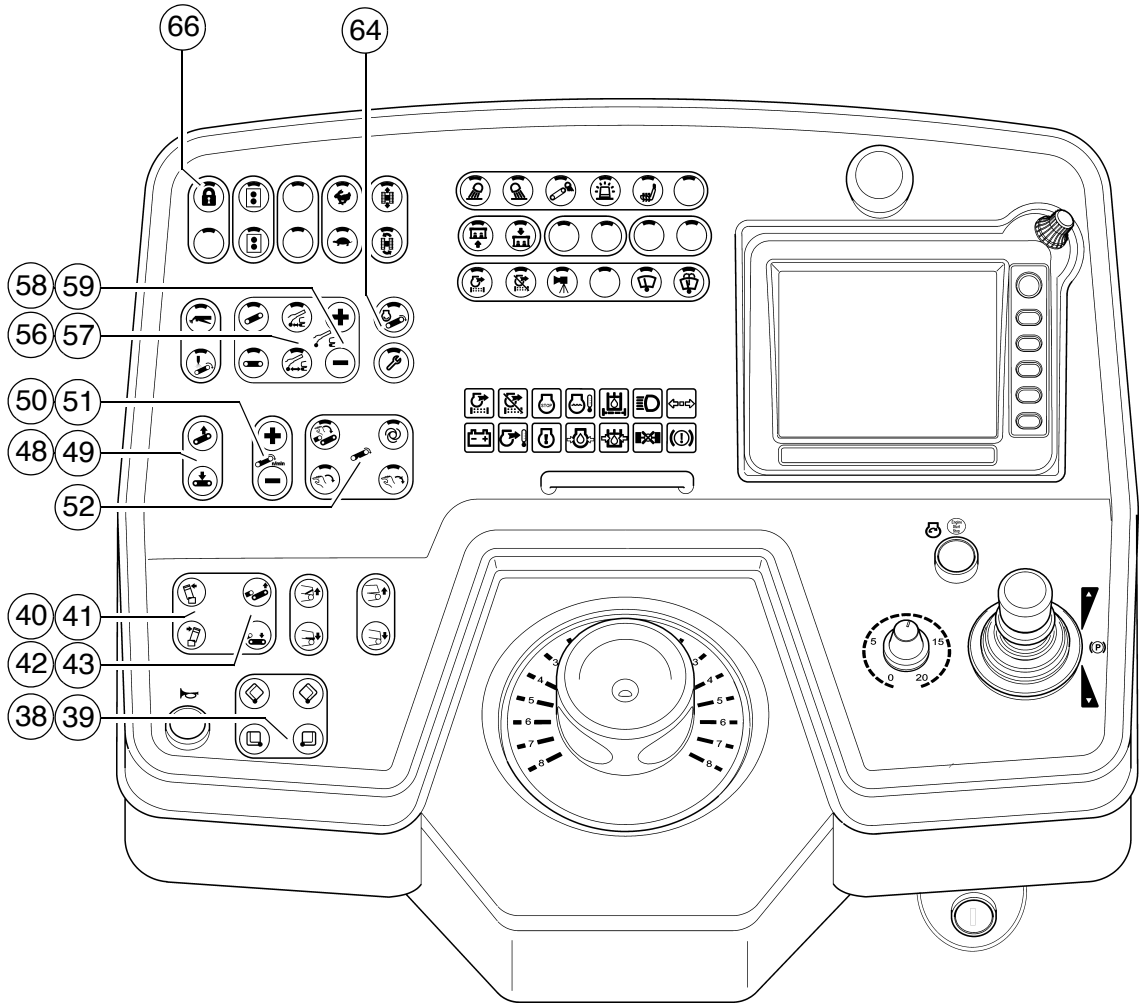
⚠ Do not use diesel fuel as it dissolves the bitumen (prohibited in Germany!).

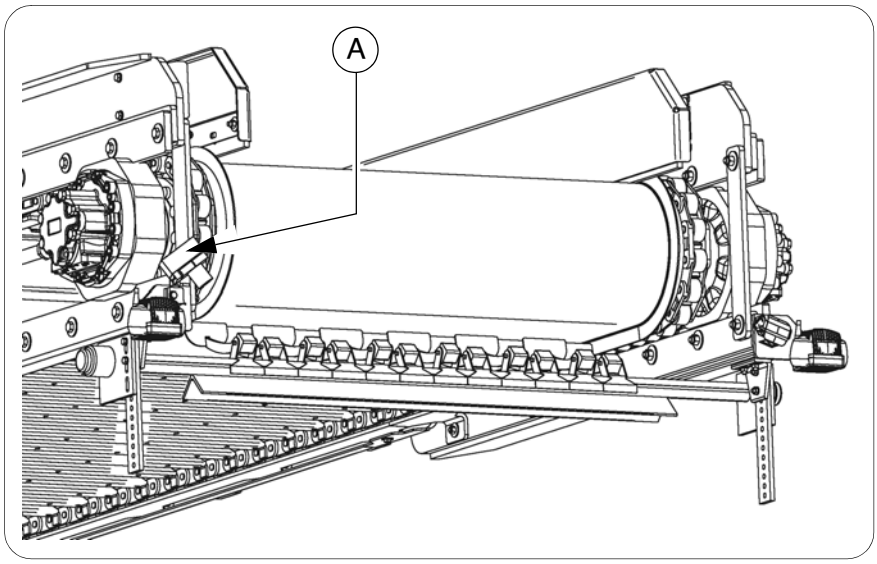
- Switch the conveyor belt spraying system function to "AUTO" with button (63).

☞ The conveyor belt spraying system is switched on on engaging the conveying function.

☞ Automatic shut-off takes place after one complete conveyor belt revolution.

⚠ Repeat the process after long interruptions!


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A

Loading/conveying material

⚠ To convey material, the feeder must be in the correct transfer position in front of the paver finisher.

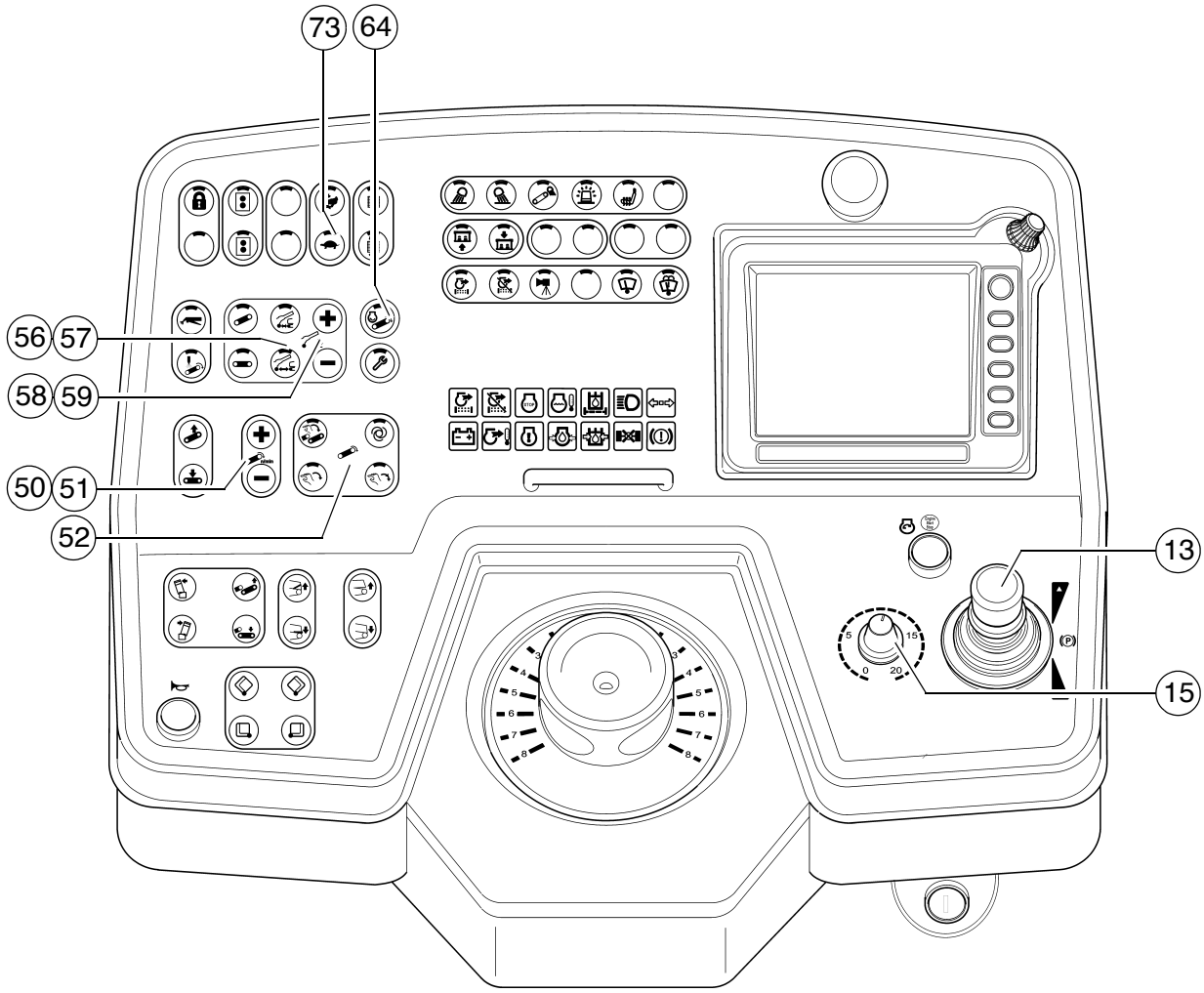
- Function (66) must be switched off.
- Set the main conveyor belt to the required transfer height using buttons (48)/(49) (○).
- Set the slewing conveyor belt (○) to the required transfer height using buttons (40)/(41) and (42)/(43) and set-up the transfer position.

⚠ **MF2500CS**: For joint use of slewing conveyor belt (○) and height-adjustable main conveyor belt (○), the main conveyor belt must be set up to its lowest position!

- If necessary, activate distance control (56)/(57) and adjust the distance (58)/(59).
- Use switch (38)/(39) to open the hopper.
  Instruct the truck driver to dump the material.
- Switch the conveyor belt functions (52) to "AUTO".
- Activate function (64) to fill the vehicle for the paving process.
  The paver finisher hopper is now filled to the set height.

- If necessary, regulate the output of the main conveyor belt and the cross conveyor (○) using buttons (50)/(51).

☞ If necessary, adjust material height scanning at the ultrasonic sensor (A).


73
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1.4 Starting for feeder operation

Set the following switches, levers and controls to the specified positions when the paver finisher has been filled with sufficient material:

Pos.	Travelling direction	Position
64	Filling function	LED "OFF"
73	Travel drive fast/slow	Tortoise-operating speed
15	Travel drive preselector	Mark 6-7
52	Main conveyor belt / slewing conveyor belt (○)	"AUTO"
50/51	Output control Main conveyor belt + slewing conveyor belt (○)	adapted to the paving situation

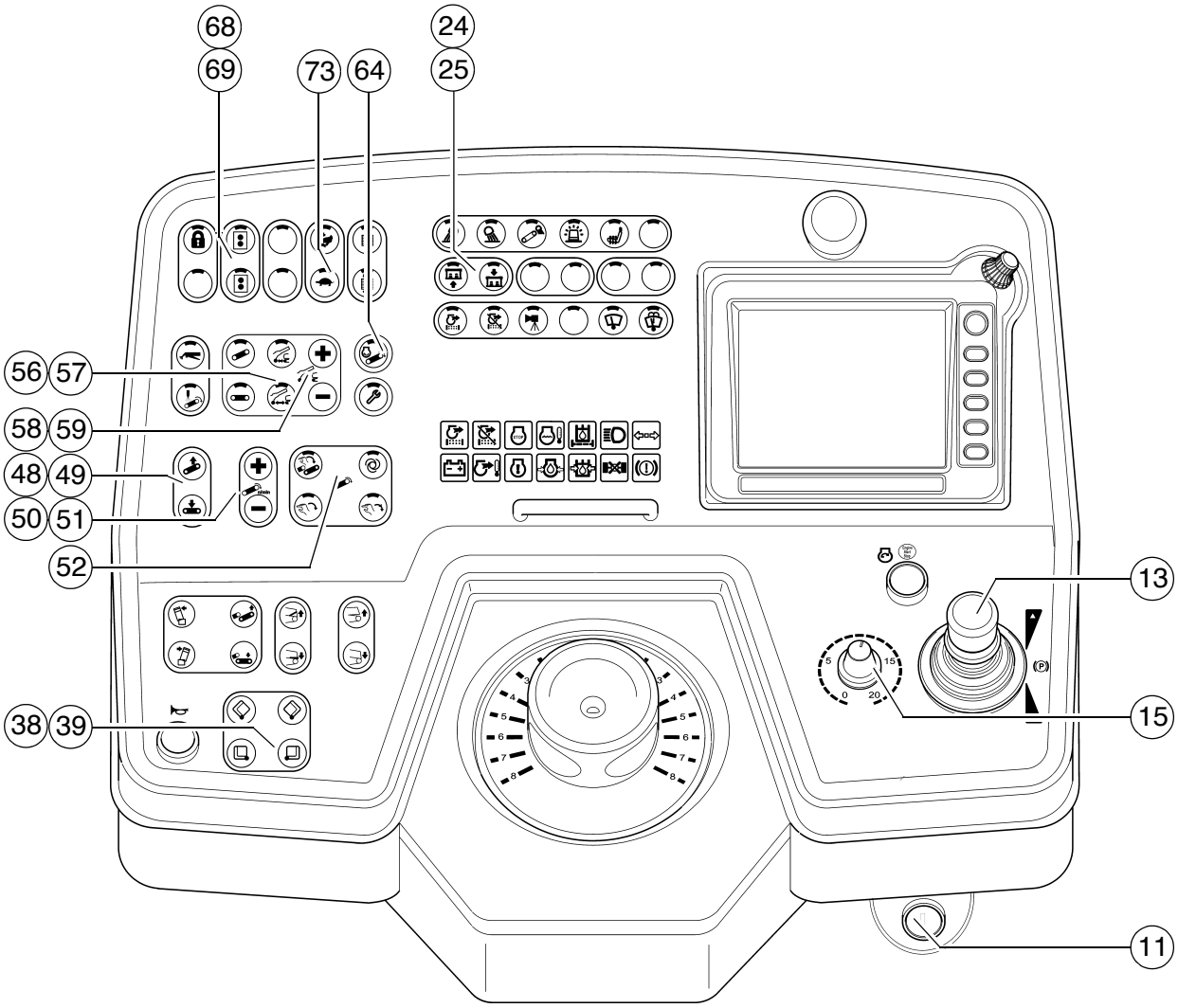
- Push the drive lever (13) all the way to the front and start driving.
  Regulated by material scanning, the main conveyor belt and cross conveyor (○) are started up.

- As soon as the desired distance between the paver finisher and feeder has been reached, activate distance control (56)/(57) (LED "ON") and adjust the distance (58)/(59) if necessary.



During feeder operation without distance control (○), always adjust the vehicle speed to the paver finisher's speed!
Always equip and operate the paver finisher with the "Emergency stop during feeder operation" function!

- Observe the distribution of the material and adjust the limit switch if necessary.


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Operation during compact asphalt paving

- Move the feeder to the correct position in front of the paver finisher.
- Use buttons (38)/(39) to open the hopper.
- Use buttons (68)/(69) to indicate to the truck drivers whether surface course of binder course material is to be delivered.
- Instruct the truck driver to dump the material.
- Set the main conveyor belt to the required transfer height using buttons (48)/(49).
- Switch the conveyor belt functions (52) to "AUTO".
- Activate function (64) to fill the vehicle for the paving process.
  The paver finisher hopper is now filled to the set height.
- Switch function (64) "OFF".
- Push the drive lever (13) all the way to the front and start driving.
  Regulated by material scanning, the main conveyor belt and cross conveyor (○) are started up.
- As soon as the desired distance between the paver finisher and feeder has been reached, activate distance control (56)/(57) (LED "ON") and adjust the distance (58)/(59) if necessary.
- If necessary, regulate the output of the main conveyor belt using buttons (50)/(51).
- Raise/lower the operator's platform using buttons (24)/(25) if necessary.

Material change with empty hopper

- Switch the conveyor belt functions (52) to "OFF".
- Set the main conveyor belt to the required transfer height using buttons (48)/(49).

☞ If the distance between the feeder and paver finisher has to be changed to set-up correct material transfer, distance control must be deactivated.

- As soon as the desired distance between the paver finisher and feeder has been reached, activate distance control (56)/(57) (LED "ON") and adjust the distance (58)/(59) if necessary.
- Switch the conveyor belt functions (52) (○) and (54) to "AUTO".
- Use buttons (38)/(39) to open the hopper.
- Switch the signal lamps to the different material type using buttons (68)/(69).
- Instruct the truck driver to dump the material.

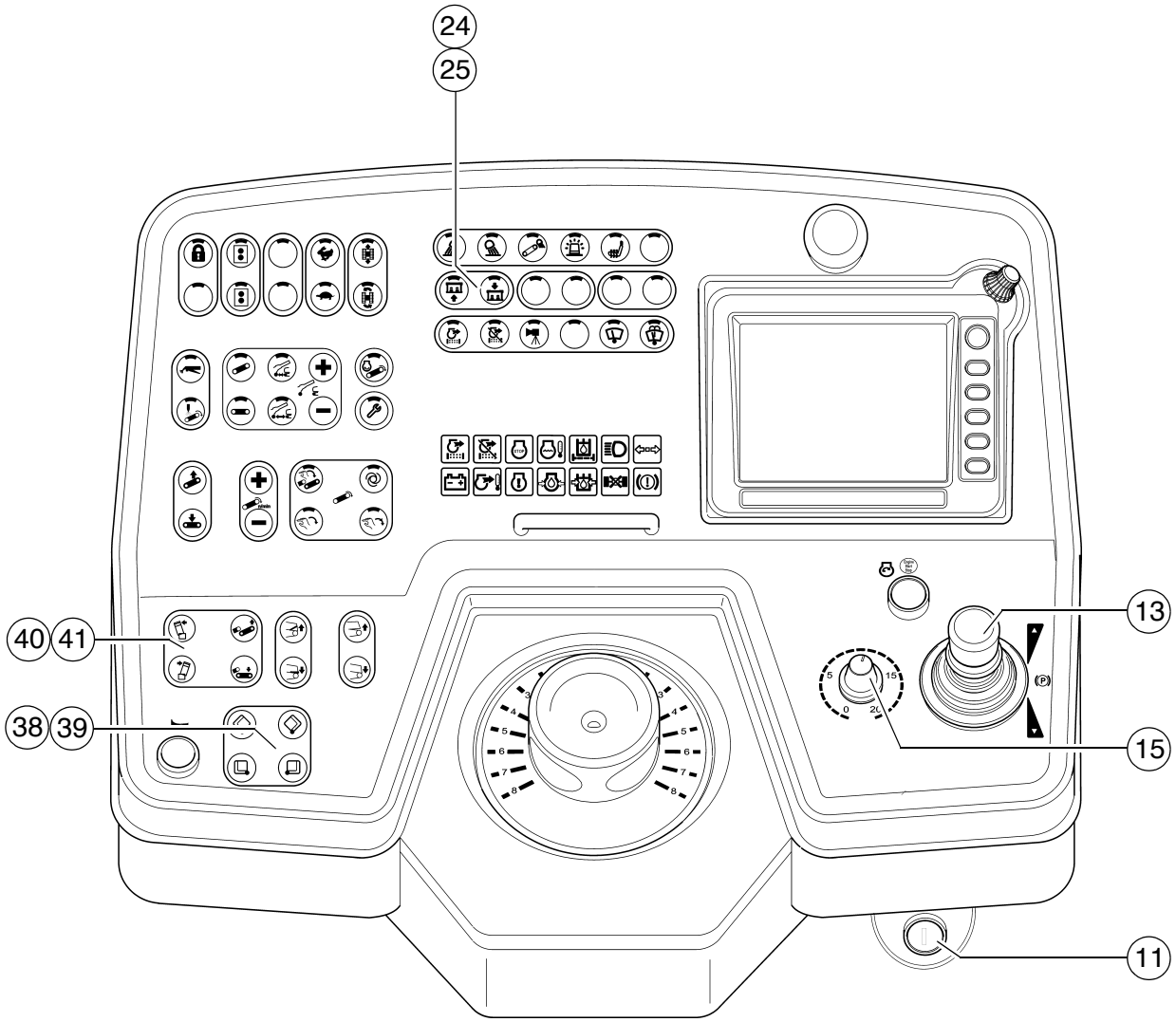
1.5 Interrupting/terminating operation

During breaks in paving (e.g. delay due to material trucks)

- Determine the approximate duration.
- Run the vehicle empty if it is anticipated that the material will cool below the minimum paving temperature.
- Set the drive lever (13) to the centre position.

During longer interruptions (e.g. lunch break)

- Set the drive lever (13) to the centre position and the speed adjuster (15) to minimum.
- Switch off the ignition (11).


24
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When work is finished

- Run the vehicle empty and stop it.
- Set the drive lever (13) to the centre position and the speed adjuster (15) to minimum.
- Swivel the slewing conveyor belt (○) in to the centre position (40)/(41)
- Use buttons (36)/(37) to close the hopper.
- Lower the operator's platform using button (25) if necessary.
- Switch off the ignition (11).
- Remove any accessories that have been used and stow them in the storage boxes, close flaps.
- Remove or secure all projecting parts if the vehicle is to be transported over public roads on a low-loader.
- Read and check the operating hour counter to determine whether maintenance work must be performed (see chapter F).
- Cover and lock the operating panel.
- Remove material residues from the vehicle and spray all parts with separator fluid.

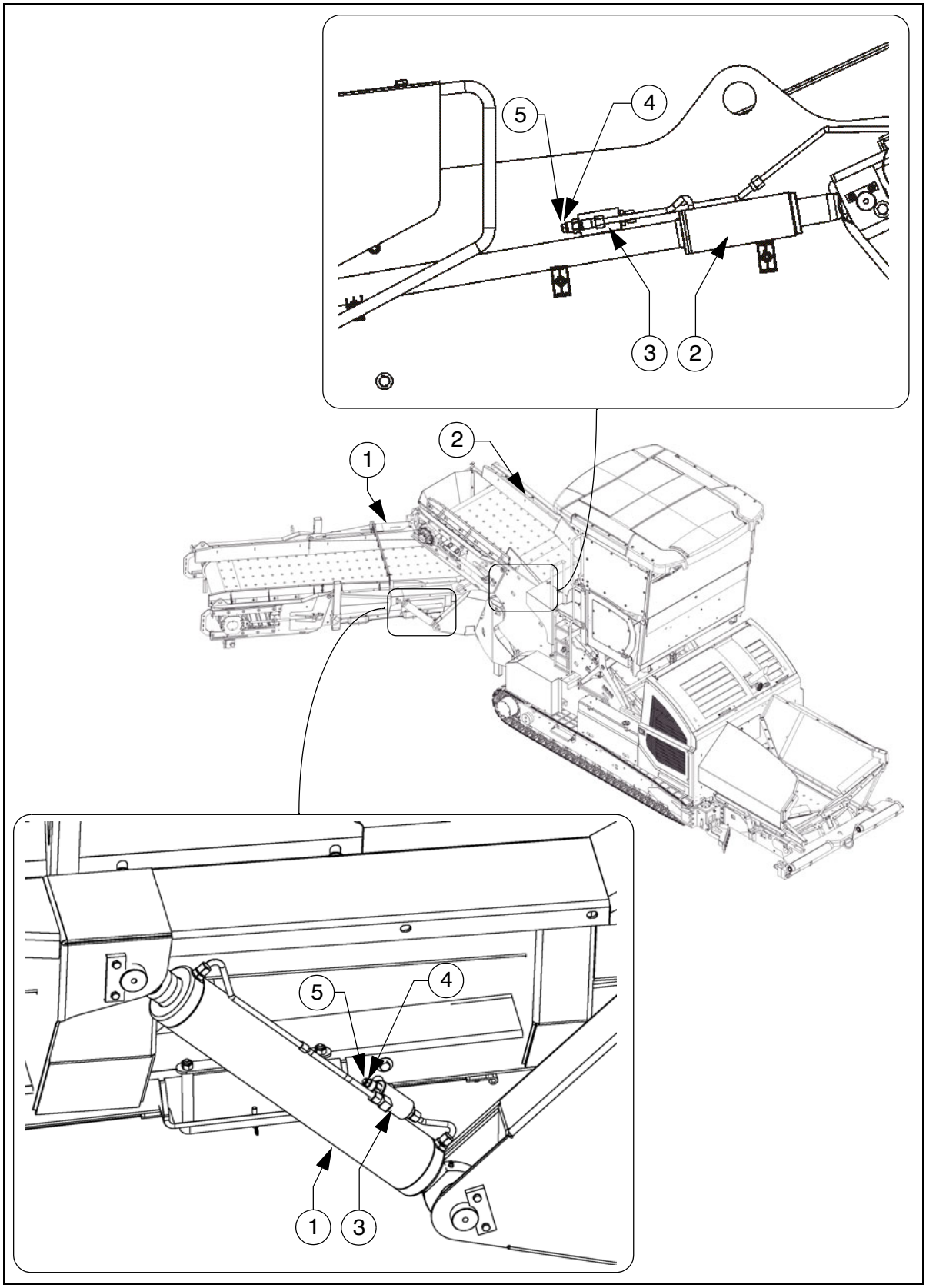
2 Malfunctions

2.1 Malfunctions - cause - remedy

Malfunction	Cause	Remedy
At the diesel engine	Various	See operating instructions for the engine
Diesel engine does not start	Batteries empty	See "External starting" (start assistance)
	Various	see "Towing"
Conveyor belt runs too slowly	Hydraulic oil level in the tank is too low	Top up oil
	Power supply is interrupted	Check fuses and cables; replace if necessary
	Switch is defective	Replace the switch
	Pressure limiting valves defective	Repair or exchange valve
	Pump shaft broken	Replace the pump
	Pump is defective	Check the high pressure filter for dirt particles; replace if necessary
	Oil filter is soiled	Clean the filter; if necessary, replace the filter
Conveyor belt cannot be raised	Oil pressure too low	Increase the oil pressure
	Leaking seal	Replace
	Power supply is interrupted	Check fuse and cables; replace if necessary
	Switch is defective	Replace the switch
Conveyor belt lowers inadvertently	Control valve is defective	Replace
	Leaking hydraulic cylinder sleeves	Replace
Hopper cannot be swung open	Engine speed is too low	Increase the speed
	Hydraulic oil level is too low	Top up 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
Hoppers lowers inadvertently	Control valve is defective	Replace
	Leaking hydraulic cylinder sleeves	Replace

Malfunction	Cause	Remedy
Traction does not work	Travel drive fuse defective	Replace
	Power supply is interrupted	Check potentiometer, cables, connectors; replace if necessary
	Travel drive monitoring 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
	Electrical power defect (line break or short circuit)	Check potentiometer, cables, connectors; replace if necessary

2.2 Lower slewing belt (○) / hydraulic end piece (○) in the event of a malfunction



A hydraulic emergency function can be used if a technical defect means it is no longer possible to lower the slewing belt or hydraulic end piece.

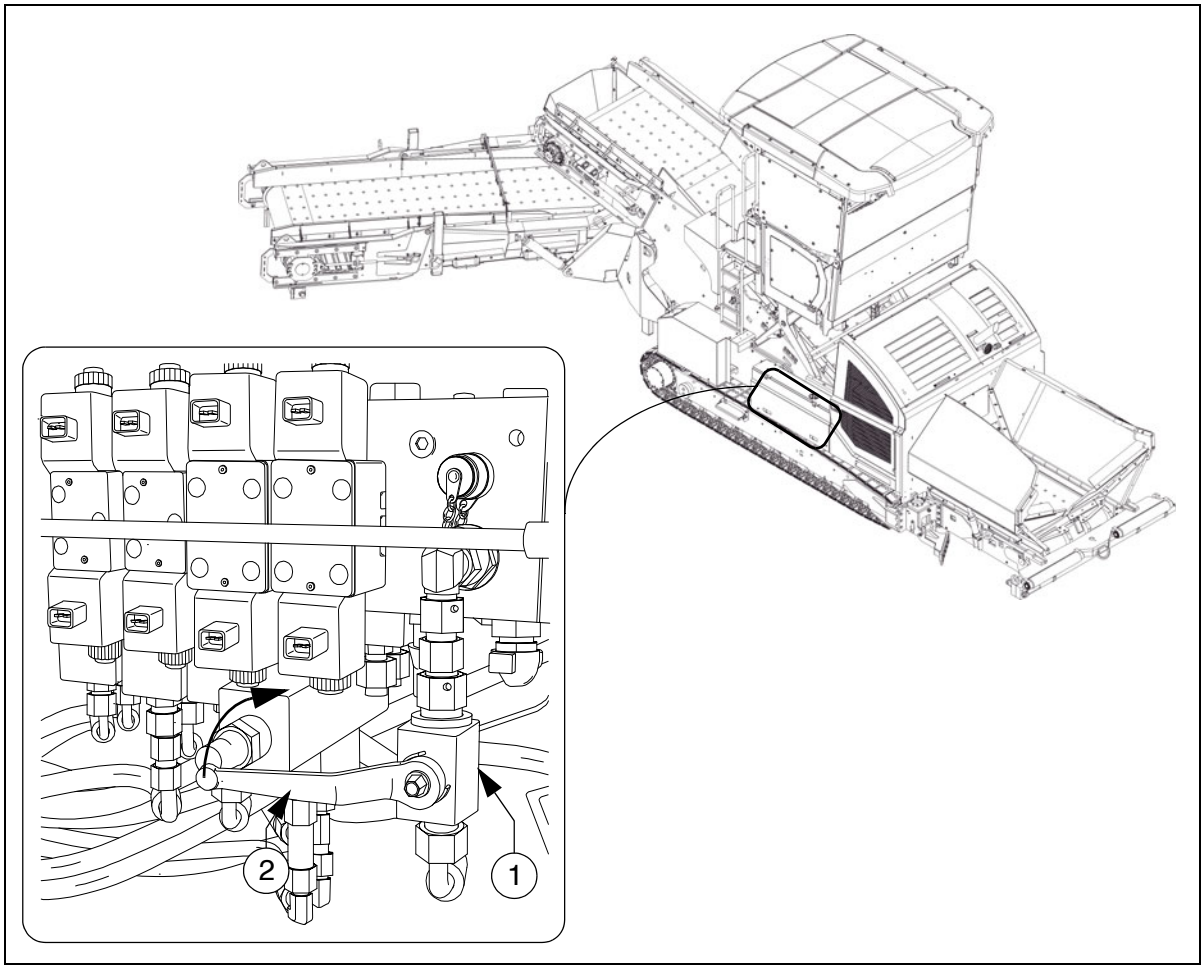
⚠ Observe the danger zone of the conveyor belt being lowered! Proceed with two people (one person on each side of the machine).

☞ There is a lowering brake valve (3). in each case on both hoisting cylinders (1) on the left and right of the slewing belt / on both hoisting cylinders (2) of the hydraulic end piece.

- Remove the protective cap from the lowering brake valve.
- Loosen the lock nut (4) of the hexagon socket screw (5).
- Tighten the hexagon socket screw (5) a quarter of a turn clockwise alternately at the left and right hoisting cylinder until the conveyor belt starts to lower and finally reaches its end position.

☞ There is no possibility of readjusting the lowering brake valve on site.
This is why the lowering brake valve then has to be replaced at both cylinders!

2.3 Lower height-adjustable platform (○) in the event of a malfunction



A hydraulic emergency function can be used if a technical defect means it is no longer possible to lower the platform.

⚠ Observe the danger zone of the platform being lowered!

☞ There is a ball valve (1) on the hydraulic block.

- Slowly swivel the valve lever (2) upwards until the platform begins to lower.
- Close the valve again once the platform has reached the lowest position.

E Set-up and modification

1 Special safety instructions

Danger to personnel by inadvertent starting of the engine, travel drive, conveyor belt, raising or slewing equipment.
Unless otherwise specified, work may only be performed when the engine is at a standstill!

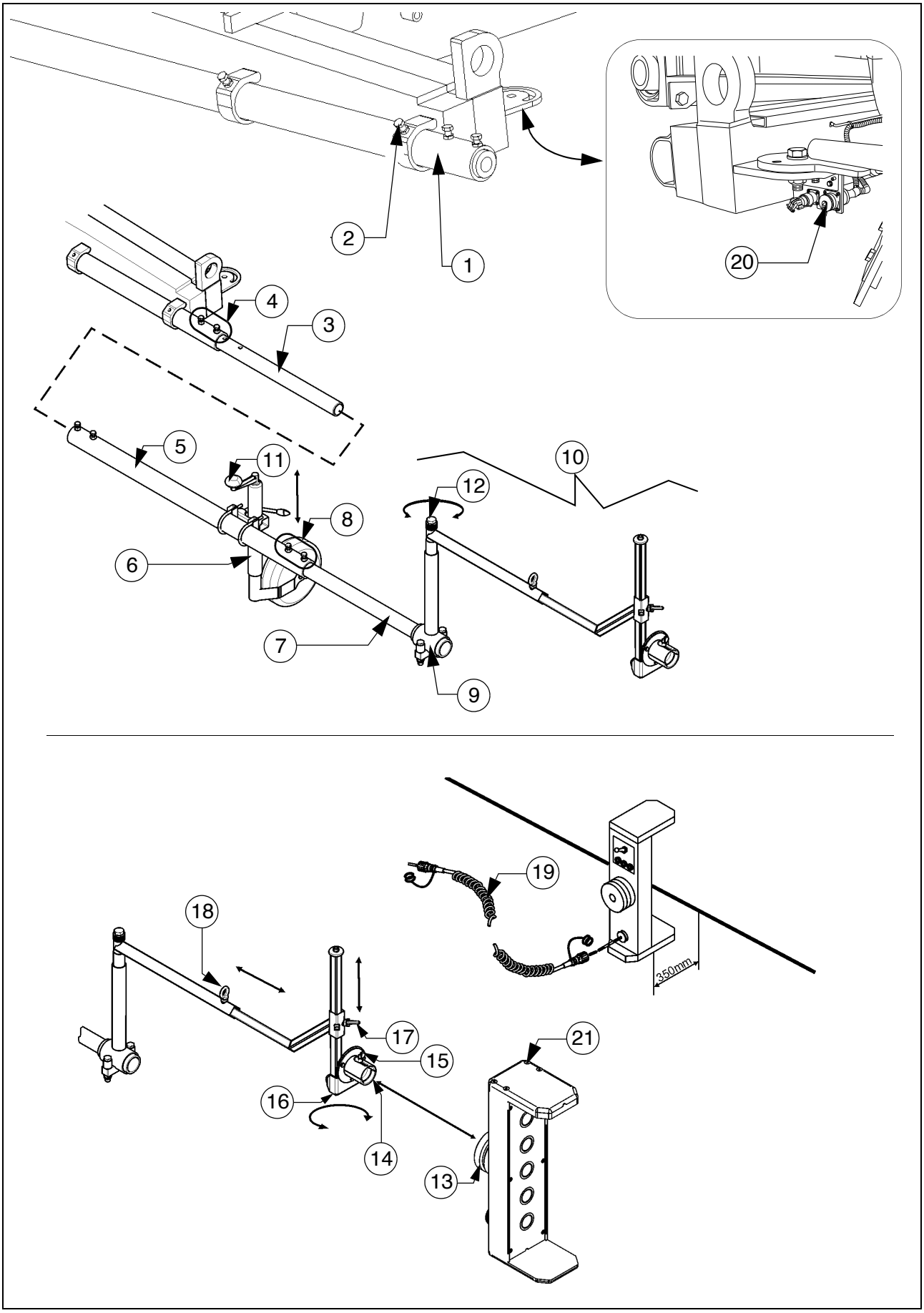
- Protect machine to prevent it from being started accidentally:
  Move drive lever into centre position and turn preselector controller to zero, remove ignition key and battery main switch.
- Protect lifted vehicle parts (e.g. control platform, conveyor belt or hopper) against lowering by means of mechanical safeguards.
- Replace parts or have them replaced as stipulated.

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

- Mount all protective devices before re-commissioning the feeder.

DANGER	**Danger due to changes at the vehicle**
	Structural chances to the vehicle make the operating licence null and void and can cause severe to fatal injuries! - Only use original spare parts and approved accessories. - After maintenance and repair work, ensure that any dismantled protective and safety devices are all completely fitted again. - Comply with all further information in these instructions and in the safety manual.

2 Automatic steering unit



2.1 Mounting the automatic steering unit

⚠ During operation, no work may be carried out on the automatic steering unit!

☞ Depending on the desired sensing side on the vehicle, the sensor rod tube may have to be removed and re-inserted on the other side of the vehicle!

- Pull the sensor rod tube (1) at the front of the vehicle out to the desired length and secure with the clamping bolts (2).

☞ Only for 14 m automatic steering unit:
-Push the connecting tube (3) into the sensor rod tube (1), fix with bolts and lock nuts (4).
-Push extension (5) onto the connection tube and fix in the same way.
-Fix support wheel (6) in a suitable position using the corresponding assembly parts.
-Heed vertical alignment!

- Insert tube (7) to the required length and also fix with bolts and lock nuts (8).
- Fit the clamping piece (9) with extension arm (10) to the end of the tube.

☞ Heed vertical alignment!

- If necessary, adjust the height of the support wheel at the adjustment knob (11) until all extension tubes are horizontally in line.
- Swivel the extension arm (9) to the desired angle and secure by tightening the bolt (12).

⚠ Use of the automatic steering unit increases the basic width of the vehicle!

☞ If the automatic steering unit is used, ensure that there are no persons or obstacles in the danger area.

Mounting and aligning the sensor

- Insert the sensor mounting (13) into the bracket (14) and secure with a wing nut (15).
- Align the angle between the sensor and reference and secure with the relevant clamping bolt (16).

☞ The sensor and reference must be at right angles to each other!

- The sensing height can be set by loosening the fixing screw (17).

☞ The reference should run centrally along the sensor.

- The sensor's distance from the reference can be set by loosening the fixing screw (18).

☞ The distance between the sensor and reference (cable) should be 350 mm!

☞ All assembly parts must be mounted and tightened properly to ensure safe and precise operation of the automatic steering unit!

Connecting the sensor

☞ A socket for connecting the sensing system to the vehicle's control system is located on the left and right sides of the vehicle on the inner side of the bumper.

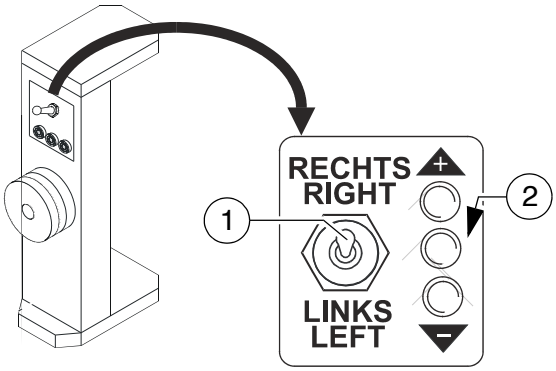
- Connect the relevant connection cable (19) to the socket (20) and sensor (21).

☞ A connection socket for the automatic steering unit is located on both sides of the vehicle.

⚠ Route the connection cable so that it cannot be damaged during operation.

⚠ Seal unused sockets with the relevant protective caps.

Automatic steering unit operating instructions



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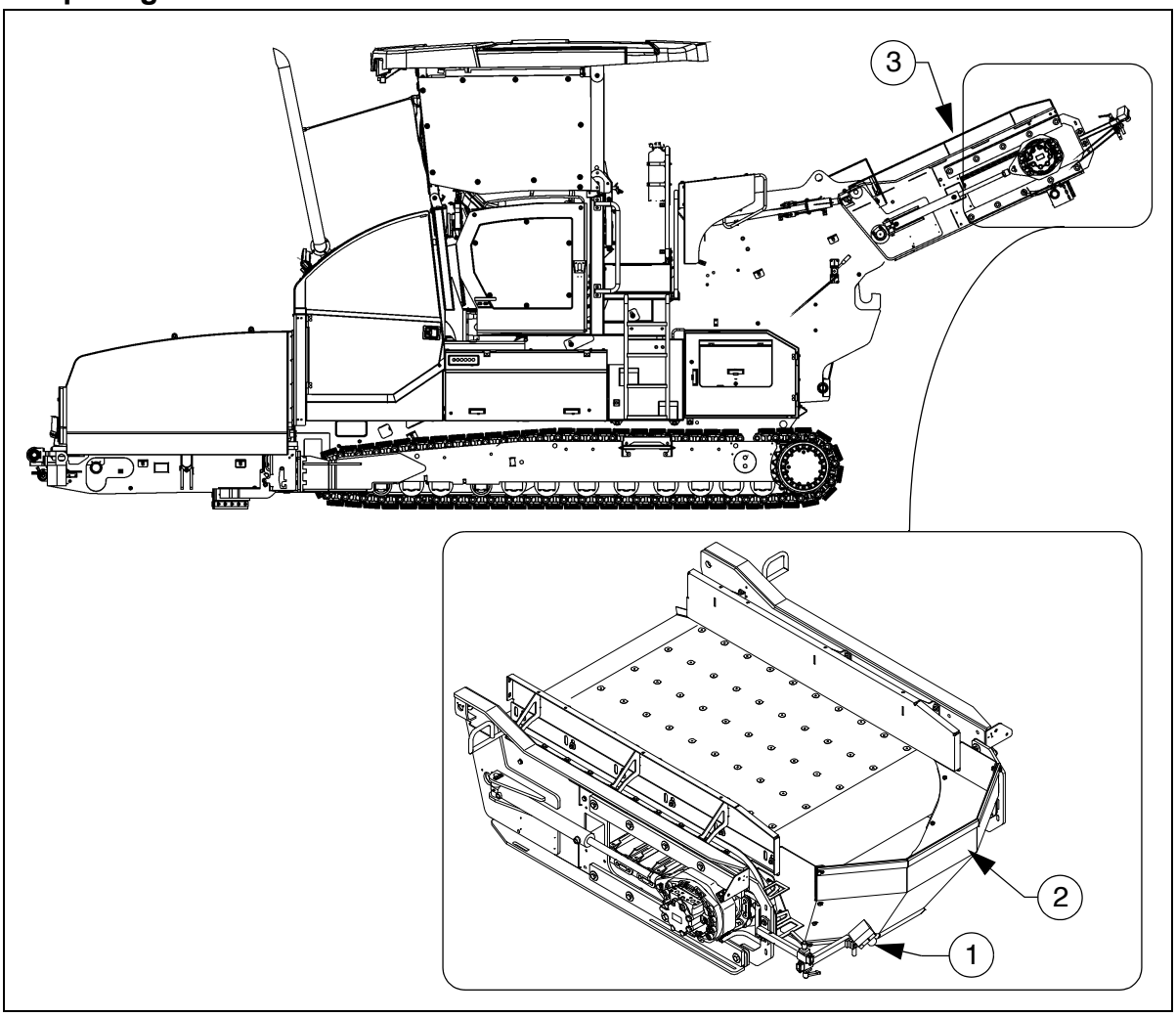
- When the automatic steering unit is activated, the steering potentiometer is deactivated. Steering is carried out automatically via ski cable sensing.
- Activate the function on the operating panel as necessary.
- The automatic steering unit can be overridden by actuating the steering potentiometer.

- The switch (1) is used to set the sensing side:
  - Right: Automatic steering unit on the right side of the vehicle.
  - Left: Automatic steering unit on the left side of the vehicle.

- The LEDs (2) indicate the distance from the reference.
  - LED + / - : Distance from the reference too high / too low.
  - Centre LED: Distance correct.

3 Mount slewing belt (○)

Preparing the vehicle

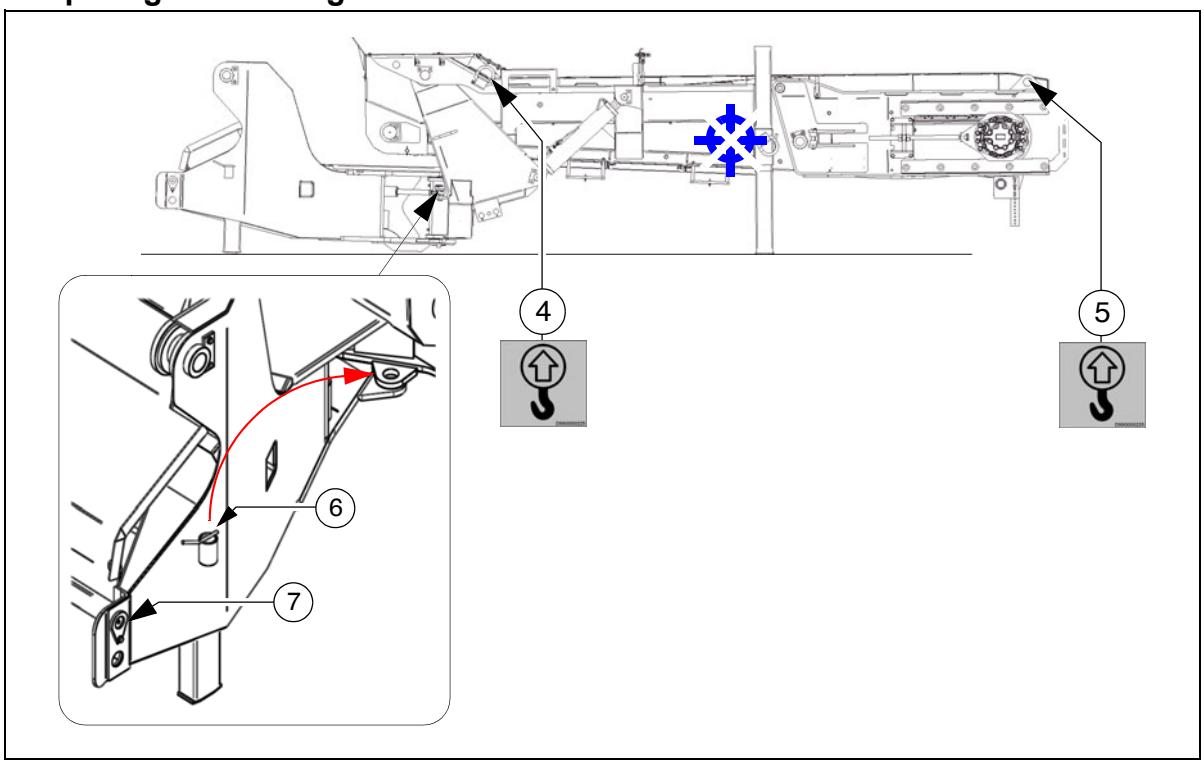


- Place the vehicle on a flat surface with adequate load rating.
- Dismantle the ultrasonic sensor and holder (1).
- Fit the material chute (2) to the conveyor belt.

☞ The material chute is included in the scope of supply of the slewing belt.

- Raise the conveyor belt (3) to max. position (○).
- Switch the drive engine off and remove the main key.

Preparing the slewing belt



☞ Four lifting eyes (4,5) are provided for lifting the conveyor belt with a crane.

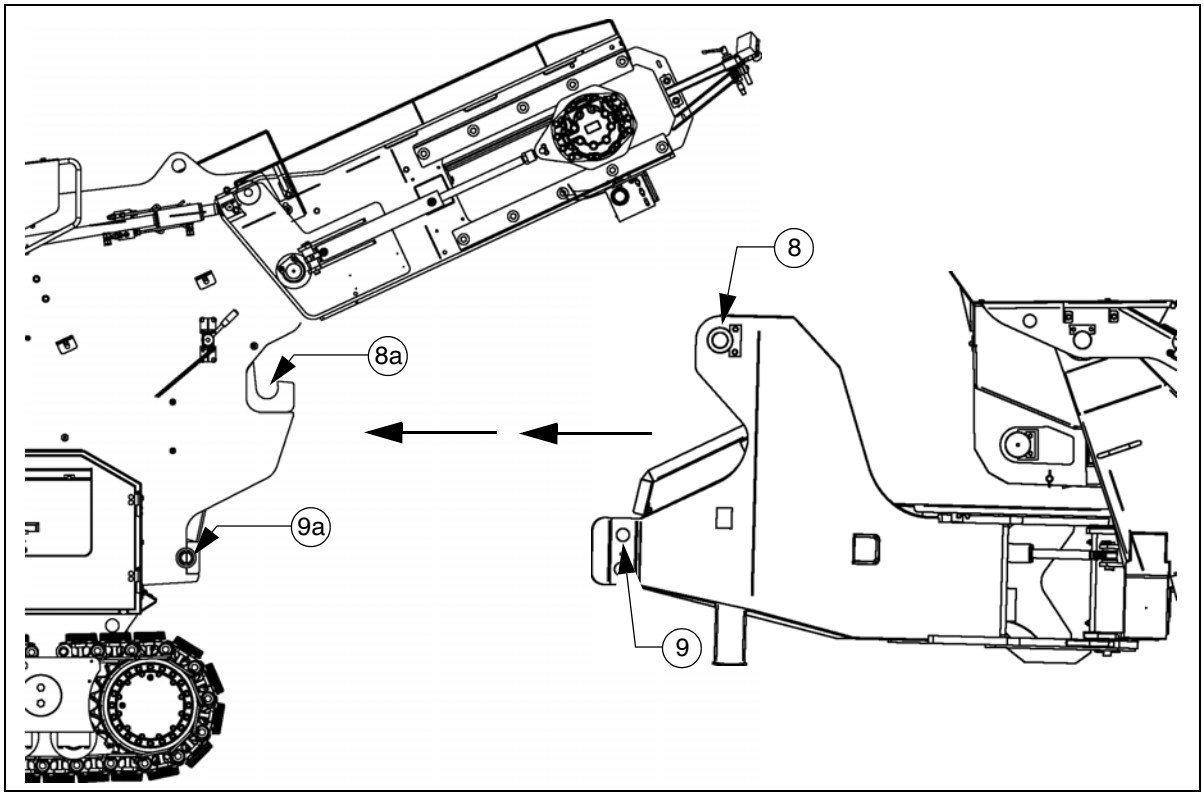
- The conveyor belt must be cleaned, all material deposits removed and all maintenance flaps closed correctly.

⚠ The retaining pin (6) must be inserted at the swivel arm.

- Remove the bolts (7) on both sides.
- Attach lifting gear to the four attachment points (4, 5).

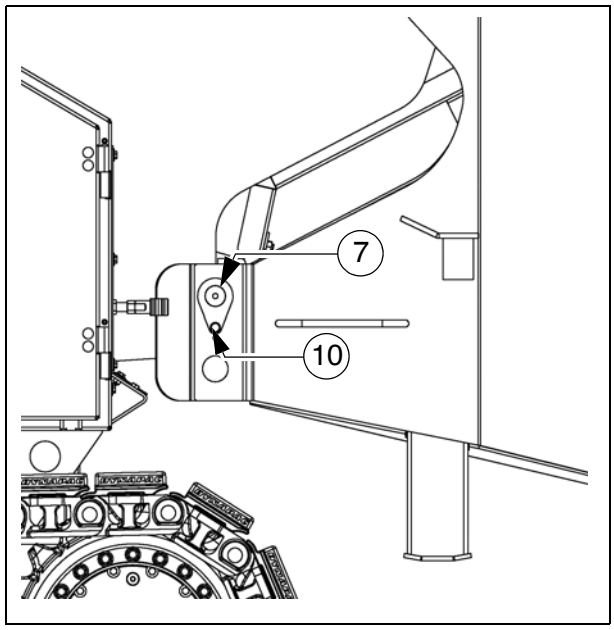
Raise the slewing belt and fasten to the feeder

⚠ WARNING	**Danger from suspended loads**
	Crane and/or lifted slewing belt can tip when lifted and cause injuries! - The slewing belt may only be raised at the marked lifting points. - Heed the overall weight of the slewing belt. - Do not enter the danger zone. - Use only lifting gear that can bear the load. - Attachment and loading equipment must meet the conditions of the applicable accident prevention regulations! - Heed the centre of gravity of the slewing belt! - Do not leave any load or loose parts on the slewing belt. - Comply with all further information in these instructions and in the safety manual.

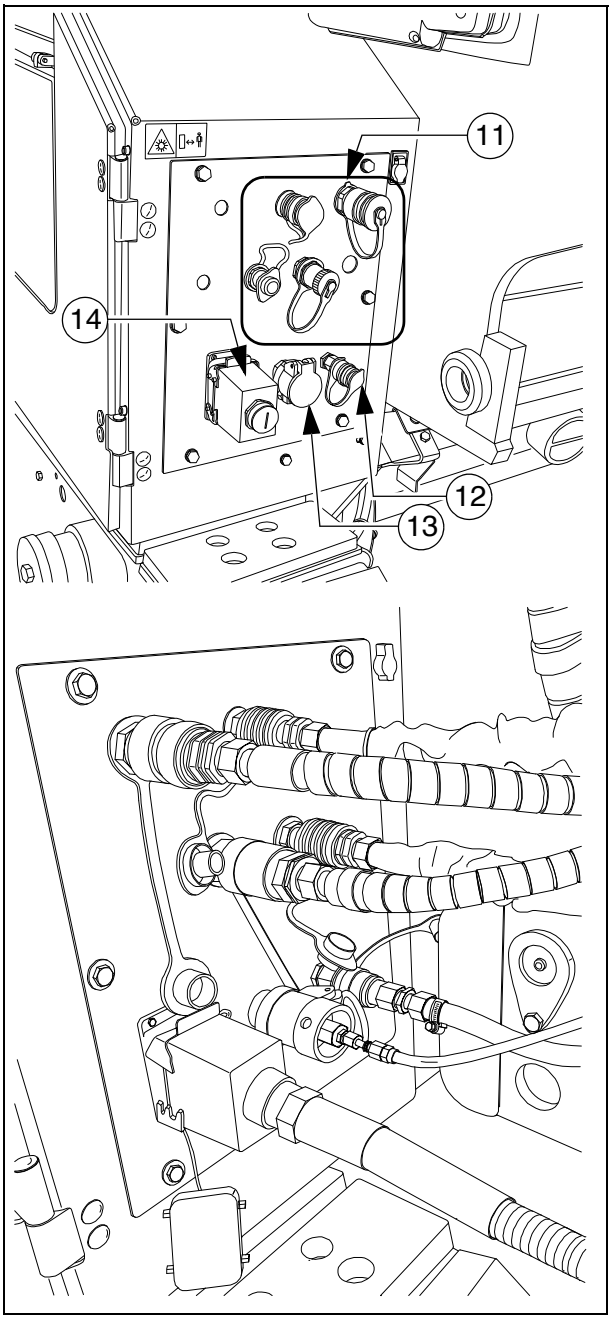


- Raise slewing belt.
- Guide the raised slewing belt slowly and on the correct height setting up to the frame of the feeder.
- Insert the collar (8) in the opening (8a) on both sides and lower the slewing belt slowly until the drilled hole (9) is in line with the bearing (9a).

- Insert the bolts (7) on both sides and secure with the screw (10).
- Lower the lifting gear and take the crane hook out of the lifting eyes.

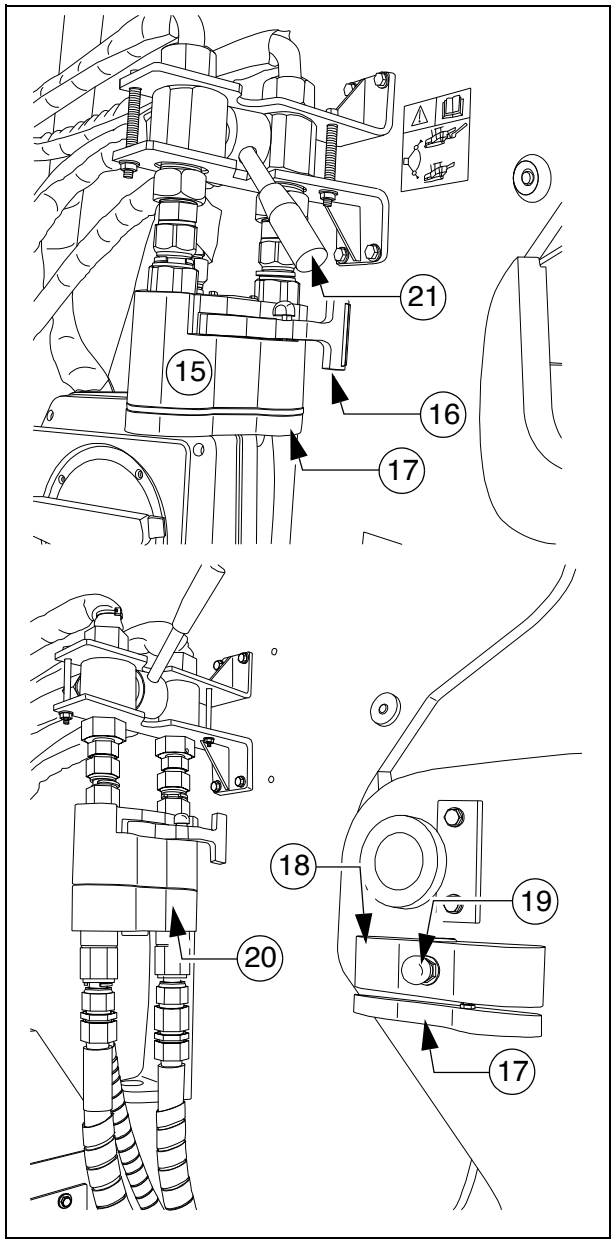


- Connect the hydraulic hoses (11) and the supply line of the spraying system (12) and chain lubrication system (13) of the slewing belt with the corresponding quick-release couplings of the feeder.
- Remove the dummy connector (14) and insert the slewing belt connector; secure it with the corresponding shackles.

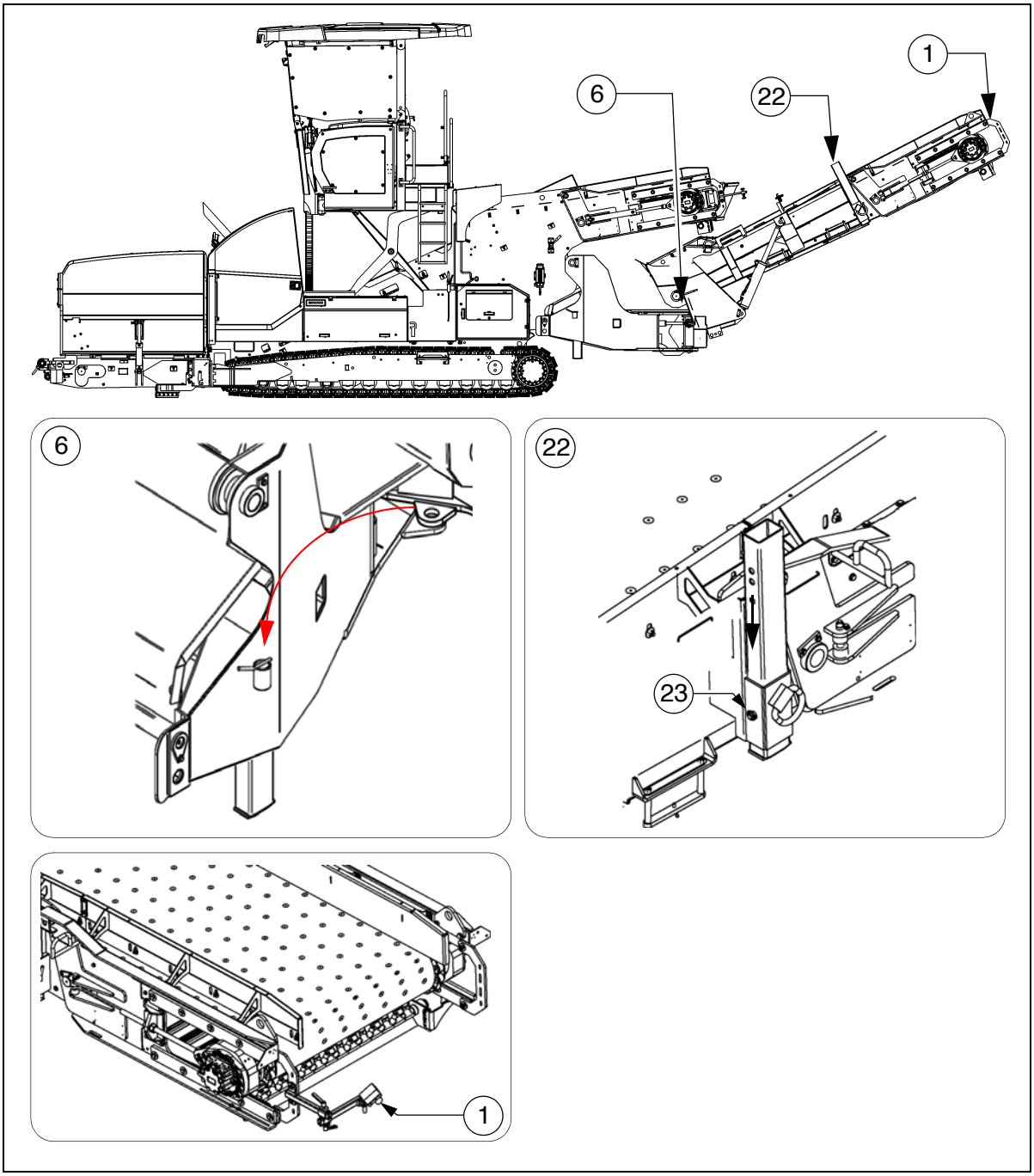


Connect the hydraulic compact coupling:

- Move the locking clamp (16) on the compact coupling (15) and remove the plate (17).
- Pull the knob (19) on the parking coupling (18), remove the hose package (20) and insert in the compact coupling (15).
- Move the locking clamp (16) into locking position.
- Insert the plate (17) in the parking coupling (18).
- Open the valve (21) (swivel the handle upwards).



If the swivel conveyor belt is not mounted to the machine, the hose package (20) must always be fastened to the parking coupling (18)!

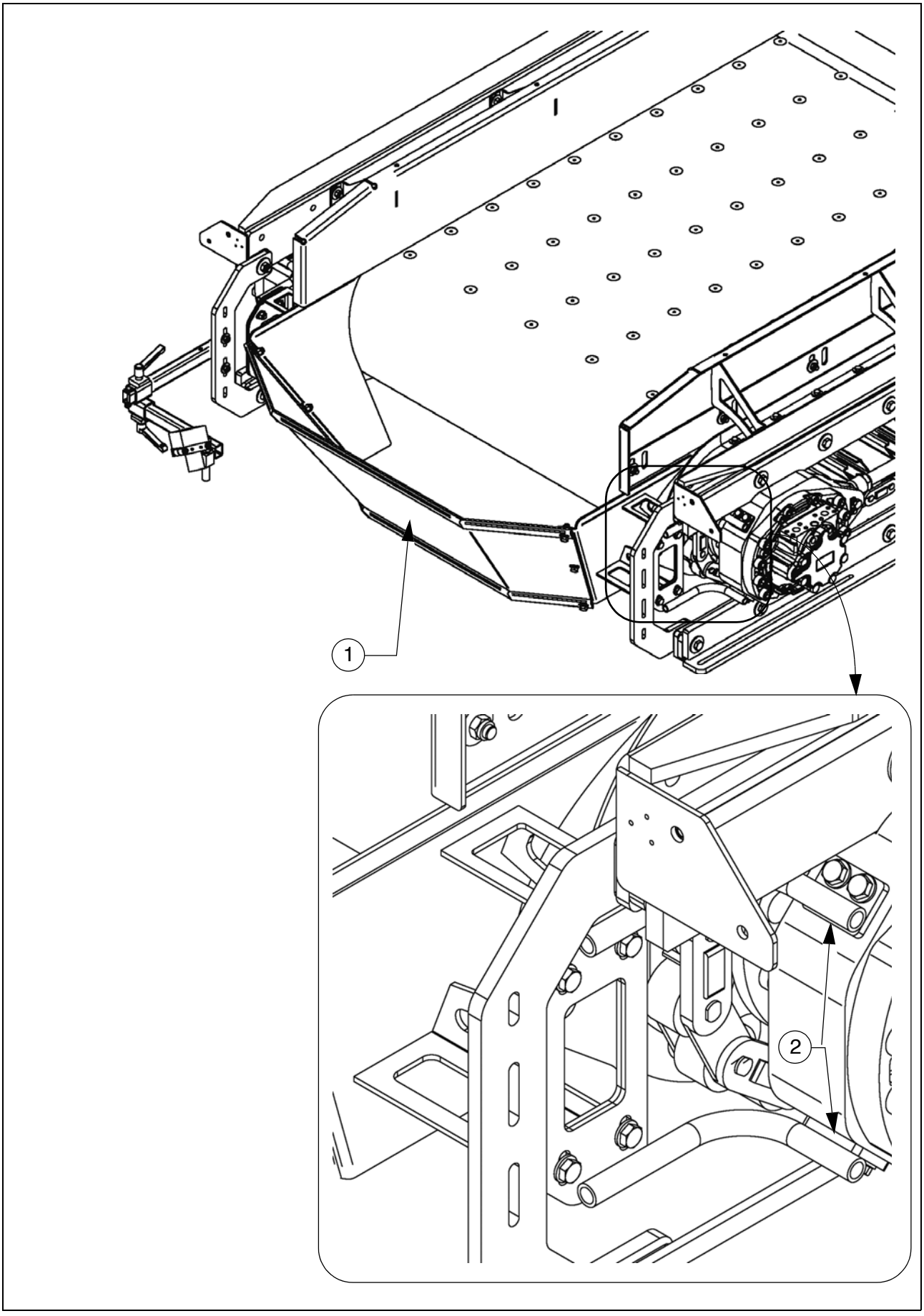


- Remove the retaining pin (6) from the swivel arm.
- Secure the standing legs (22) in the top position with the bolt (23).
- Mount the ultrasonic sensor and holder (1) to the slewing belt.

- Check the tension of the conveyor belt, proceed with maintenance if necessary.

- Trial operation:
  - Proceed with trial operation of the slewing belt, test slewing and height adjustment.
  - Check functions of the chain lubrication system and spraying system.

4 Material chute (○)



Mount the material chute

NOTE	**Caution! Disrupted material flow possible!**
	Use of the material chute depends on the specific application: - For applications with slewing conveyor belt, the material chute must be fitted to the main conveyor belt. - For standard applications without slewing conveyor belt, the material chute may not be fitted to the main conveyor belt.

☞ To warrant smooth transfer of material to the slewing conveyor belt, the material chute (1) must be fitted to the main conveyor belt:

- Mount the holders (2) of the premounted material chute (1) to the housing of the conveyor belt drive on both sides of the vehicle.

F 11 Maintenance

1 Maintenance safety instructions

DANGER	Danger due to incorrect vehicle maintenance
	Incorrectly performed maintenance and repair work can cause severe or fatal injuries! - Ensure that maintenance and repair work is always only carried out by trained, specialist staff. - All maintenance, repair and cleaning work should only be carried out with the engine turned off. Remove ignition key and main switch. - Affix a sign "Do not start" to the vehicle. - Perform a visual inspection and check all functions every day. - Proceed with all maintenance tasks according to the maintenance schedule. - Proceed with expert inspection every twelve months. - Eliminate all ascertained faults straight away. - Do not restart the vehicle until all ascertained faults have been eliminated. - Failure to comply with the prescribed inspection and maintenance work renders the operating licence null and void! - Comply with all further information in these instructions and in the safety manual.

DANGER	Danger due to changes at the vehicle
	Structural chances to the vehicle make the operating licence null and void and can cause severe to fatal injuries! - Only use original spare parts and approved accessories. - After maintenance and repair work, ensure that any dismantled protective and safety devices are all completely fitted again. - Comply with all further information in these instructions and in the safety manual.

⚠ CAUTION	**Hot surfaces!**
	Surfaces including those behind covering parts, together with engine combustion gases can be very hot and cause injuries! - Wear your personal safety gear. - Do not touch hot parts of the vehicle. - Only perform maintenance and repair work after the vehicle has cooled down. - Comply with all further information in these instructions and in the safety manual.

⚠ CAUTION	**Danger due to electric shock**
	Injuries can be caused by touching live parts directly or indirectly! - Do not remove any protective safeguards. - Never spray water on electric or electronic components. - Maintenance work to the electric system should only be carried out by trained specialist staff. - Comply with all further information in these instructions and in the safety manual.

⚠ CAUTION	**Danger from heavy loads**
	Lowering vehicle parts may cause injuries! - When the vehicle is parked and during maintenance and transport, close both hopper lids and fit the corresponding hopper transport safeguards. - When the vehicle is parked and during maintenance and transport, secure the conveyor belt mechanically to prevent lowering. - Ensure that opened hoods and covering parts are locked properly. - Comply with all further information in these instructions and in the safety manual.



Cleaning: 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 enclosed environments: Exhaust fumes must be conducted into the open air. Propane gas bottles must not be stored in closed rooms.



As well as this maintenance manual, always also pay close attention to the maintenance manual provided by the engine manufacturer. All maintenance work and service intervals itemised here are binding in nature.

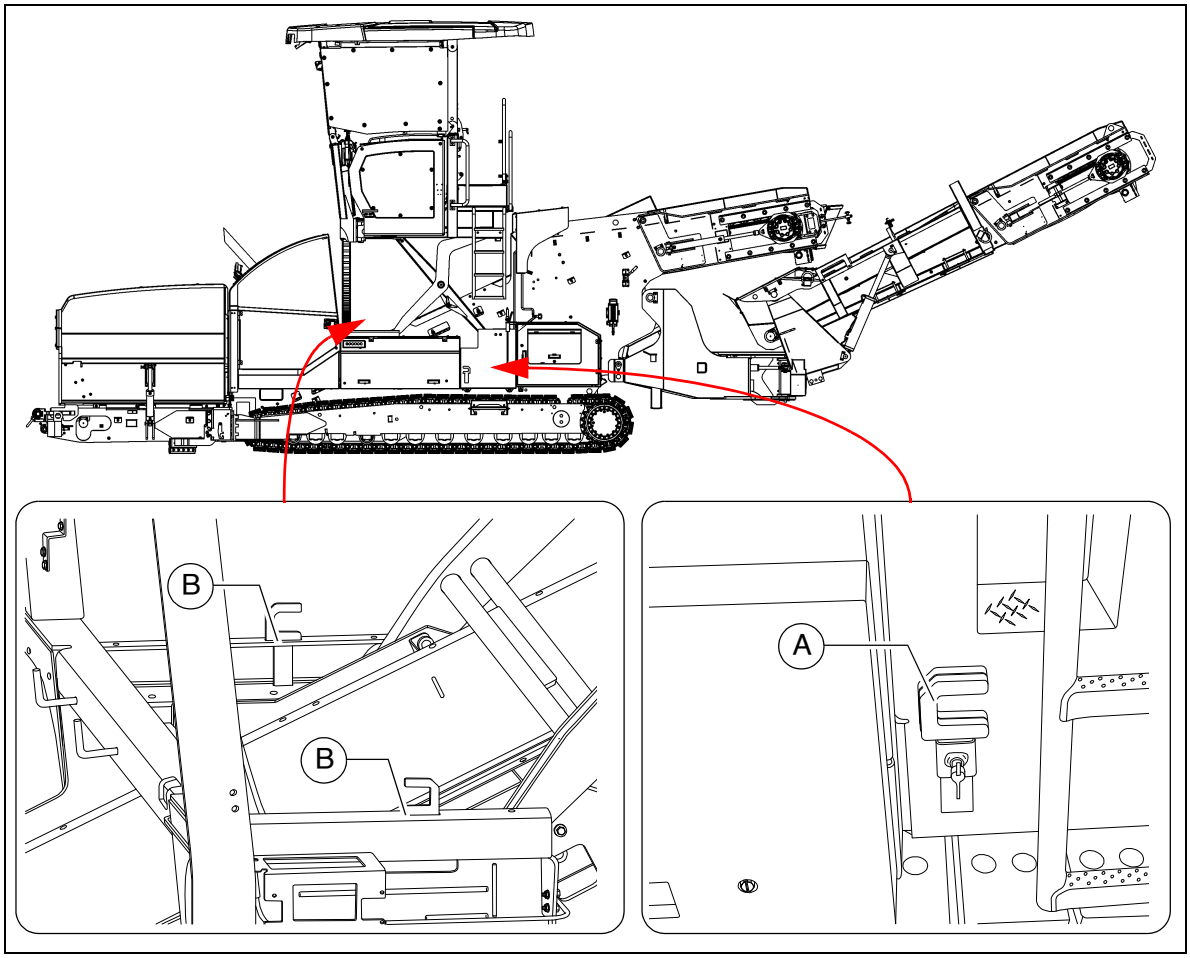


Information on how to maintain the optional equipment can be found in the individual sub-sections of this chapter!

2 Maintenance and repair work with height-adjustable control platform (○)

DANGER	**Danger from lowering control platform**
	Severe to fatal injuries can be incurred when working below the raised control platform if this has not been locked! - Raise the control platform completely and insert the corresponding locking mechanisms correctly according to the instructions. - After maintenance and repair work, keep the locking mechanisms in the holder provided. - Comply with all further information in these instructions and in the safety manual.

2.1 Insert the platform locking mechanisms



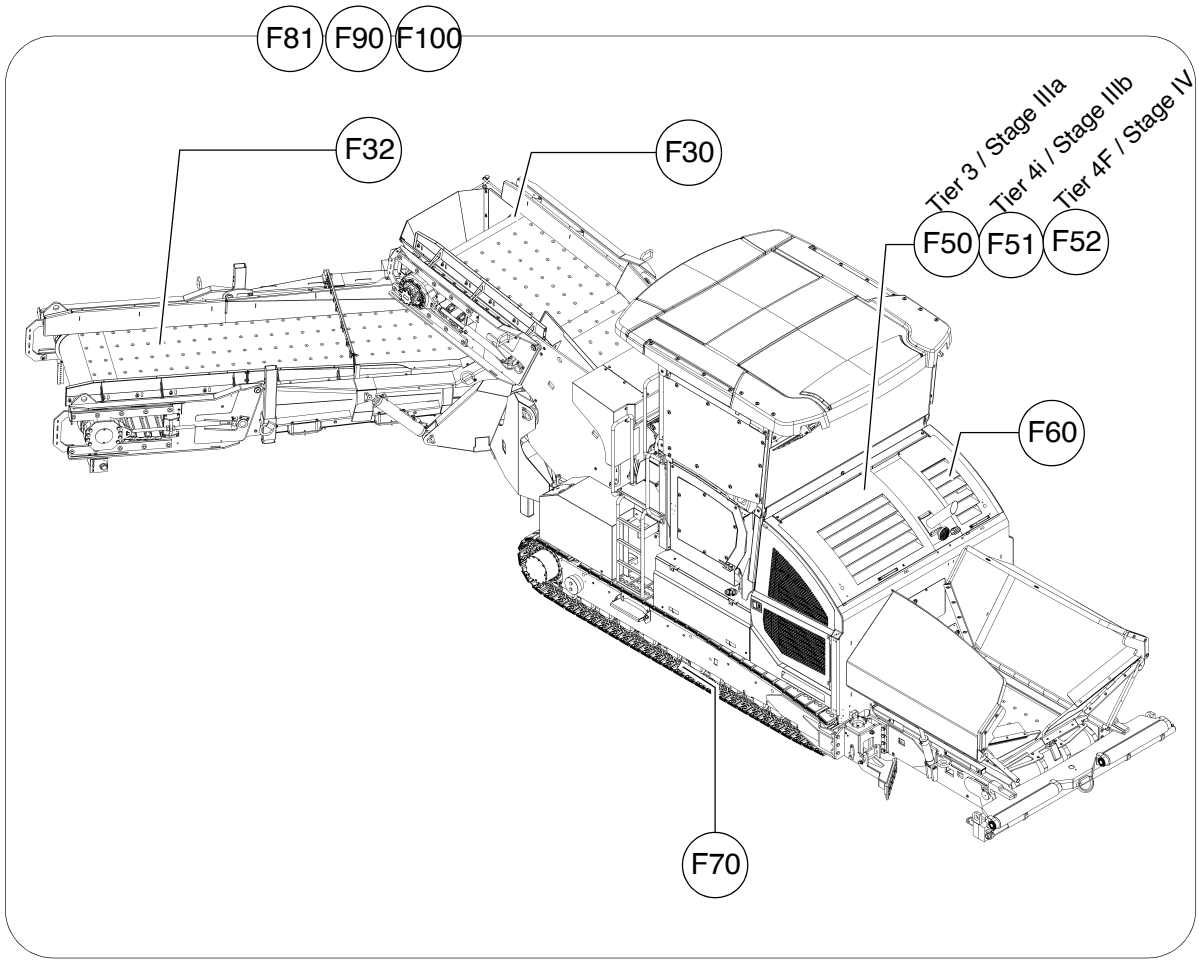
- Raise the control platform completely.
- Remove locking mechanisms (A) from the holder.
- Insert locking mechanisms (A) in the corresponding recesses (B) on the vehicle frame.

STOP Always wear a safety helmet when working beneath the control platform!

- After completing the work, remove the two locking mechanisms and keep them in the holder provided. If necessary, the platform may have to be raised again to remove the locking mechanisms.

F 25 Maintenance overview

1 Maintenance overview



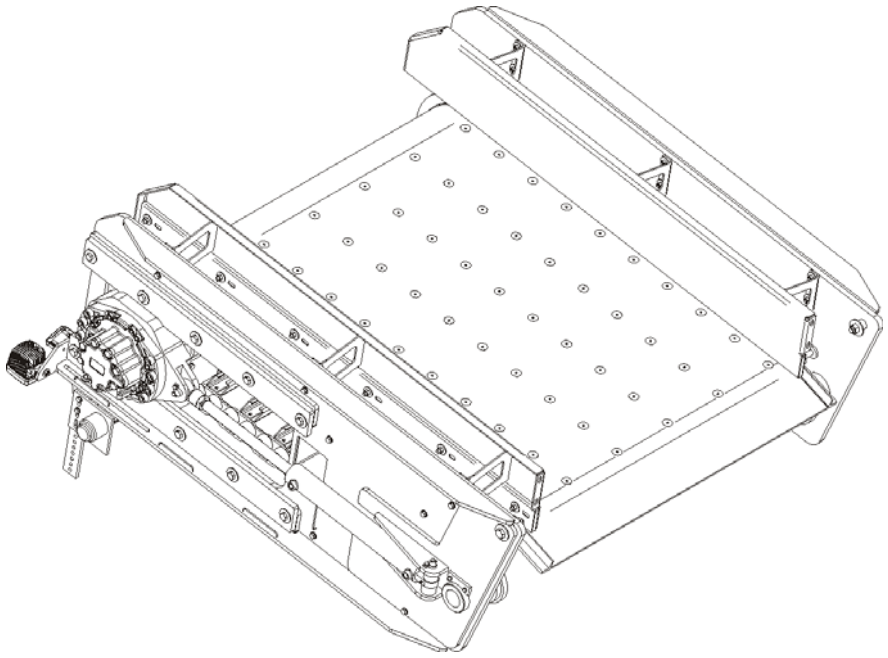
Assembly	Chapter	Maintenance necessary after operating hours										
		10	50	100	250	500	1000 / annually	2000 / every 2 years	4000	5000	20000	If necessary
Conveyor belt	F30	■	■	■	■	■						■
Conveyor belt	F32	■	■	■	■	■						■
Drive engine - Tier 3 / Stage IIIa	F50	■			■	■	■	■				■
Drive engine - Tier 4i / Stage IIIb	F51	■			■	■	■	■		■		■
Drive engine - Tier4F / Stage IV	F52	■			■	■	■	■	■			■
Hydraulic system	F60	■	■			■	■	■				■
Drive units	F70	■	■	■	■	■	■					■
Electrical system	F81	■	■	■	■							■
Lubrication points	F90	■	■					■				■
Checking/shutdown	F100	■					■					■

Maintenance required	■

☞ In this overview, you will find the maintenance intervals for optional machine equipment!

F 30 Maintenance - conveyor belt

1 Maintenance - conveyor belt



⚠ WARNING	**Danger of being pulled in by rotating or conveying vehicle parts**
	Rotating or conveying vehicle parts can cause severe or fatal injuries! - Do not enter the danger zone. - Do not reach into rotating or conveying parts. - Only wear close-fitting clothing. - Comply with the warning and information signs on the vehicle. - Stop the engine and remove the ignition key before any maintenance work. - Comply with all further information in these instructions and in the safety manual.

⚠ WARNING	**Danger from heavy loads**
	The raised machine can slide away and cause severe to fatal injuries! - The vehicle may only be raised at the marked lifting points. - Heed the operating weight of the vehicle. - Do not enter the danger zone. - Only use approved ramps and adequately dimensioned ramps or pits. - Use only lifting gear that can bear the load. - Do not leave any load or loose parts on the vehicle. - Comply with all further information in these instructions and in the safety manual.

⚠ CAUTION	**Hot surfaces!**
	Surfaces including those behind covering parts, together with engine combustion gases can be very hot and cause injuries! - Wear your personal safety gear. - Do not touch hot parts of the vehicle. - Only perform maintenance and repair work after the vehicle has cooled down. - Comply with all further information in these instructions and in the safety manual.

1.1 Maintenance intervals

Pos.	Interval								Points of maintenance	Note
	10	50	100	250	500	1000 / annually	2000 / every 2 years	If necessary		
1	1								- Conveyor belt - Check tension	
								■	- Conveyor belt - Adjust tension	
								■	- Conveyor belt - Replace chain	
		■							- Conveyor belt - Check for damage	
		■							- Conveyor belt - Check screw connections	
								■	- Conveyor belt - Repair / exchange conveyor belt	
2	■								- Emulsion spraying system - Check filling level	
								■	- Emulsion spraying system - Top up tank	

Maintenance	■
Maintenance during the running-in period	▼

Item	Interval								Points of maintenance	Note
	10	50	100	250	500	1000 / annually	2000 / every 2 years	If necessary		
3	■								- Central lubrication system - Check filling level	
								■	- Central lubrication system - Top up oil	
		■							- Central lubrication system - Function check / check oil brush	
								■	- Central lubrication system - Exchange oil brush	
4			■					■	- Scraper - Check tightness	Variant 1
								■	- Scraper - Adjust tension	Variant 1
					■				- Scraper - Check scraper blade wear	Variant 1
								■	- Scraper - Exchange scraper blades	Variant 1

Maintenance	■
Maintenance during the running-in period	▼

Item	Interval								Points of maintenance	Note
	10	50	100	250	500	1000 / annually	2000 / every 2 years	if necessary		
4								■	- Relieve scraper	Variant 2
	■							■	- Scraper - Check function	Variant 2
								■	- Scraper - Adjust distance	Variant 2
	■							■	- Scraper - Cleaning / routine check	Variant 2
		■							- Scraper - Wear check for blades	Variant 2
								■	- Scraper - Replace blades	Variant 2
								■	- Scraper - Carry out basic setting	Variant 2

Maintenance	■
Maintenance during the running-in period	▼

Item	Interval								Points of maintenance	Note
	10	50	100	250	500	1000 / annually	2000 / every 2 years	if necessary		
5				■					- Screw connections - Check screw connections	
								■	- Screw connections - Tighten screw connections	
6			■						- Lubrication points - Grease belt drive guide	
		■							- Lubrication points - Lubricate bearing points	
7						■		■	- Guide rails - Check wear	
								■	- Guide rails - Replacing the guide rails	

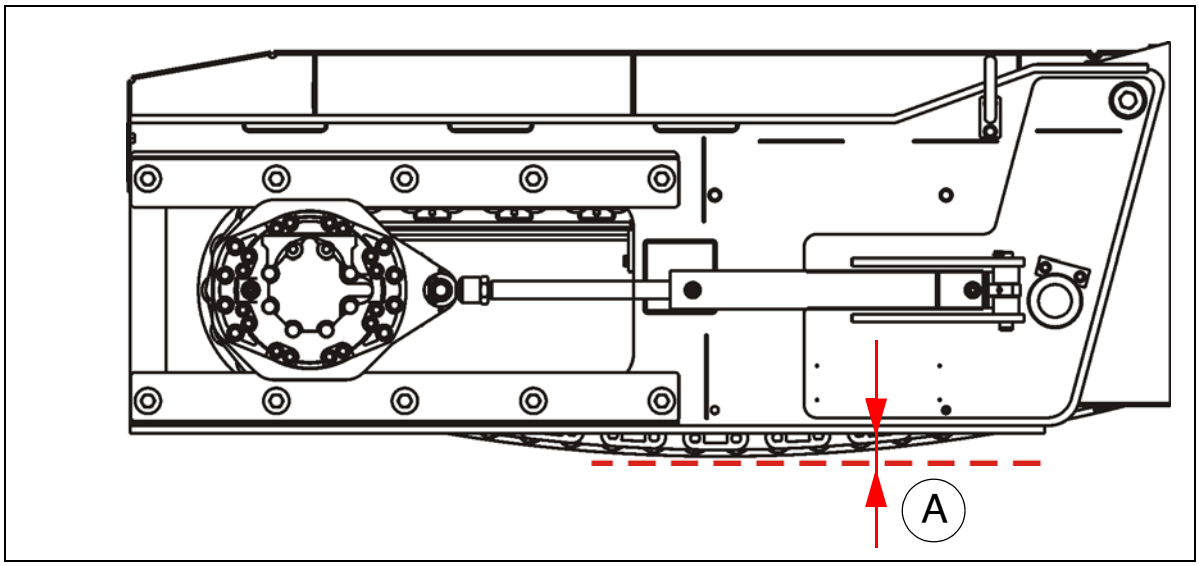
Maintenance	■
Maintenance during the running-in period	▼

1.2 Points of maintenance

Conveyor belt tension (1)

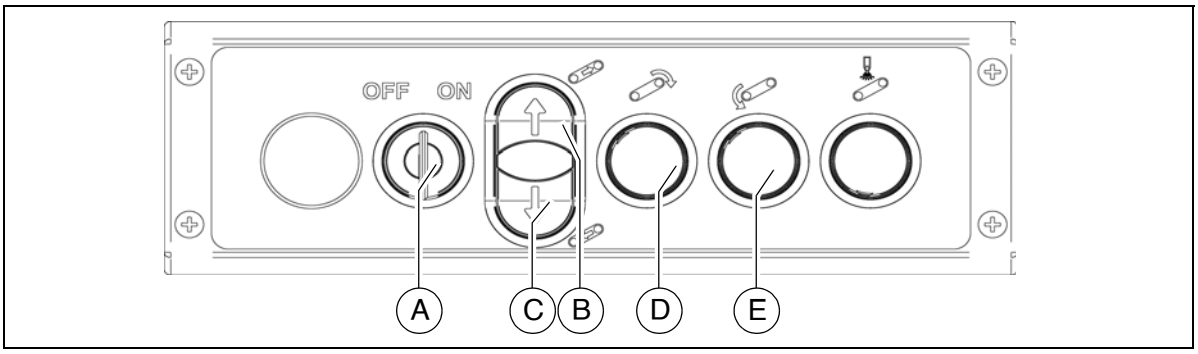
Check tension:





⚠ When the conveyor belt end piece is in the horizontal position, conveyor belt sag (A) must be correctly at the marked position to the lower edge of the chain must be 0 mm +/- 5 mm!

Adjust belt tension:



To adjust the tension, key switch (A) of the lateral control unit must first be switched to position I.

- To increase the tension, press switch (B) until the desired tension is achieved.
- To reduce the tension, press switch (C) until the desired tension is achieved.
- After adjusting the tension, allow the conveyor belt to run briefly again and check its sag again; readjust if necessary.

☞ If the conveyor belt has been slackened e.g. for cleaning purposes, it can be driven slackened condition by pressing switches (D) and (E).

⚠ Risk of damage to equipment!
Only allow the conveyor belt to run in reversing mode if the conveyor belt scraper has been disengaged!

STOP Ensure that nobody is located in the danger area when working on the conveyor belt!
Danger of crushing

☞ At the latest, the drive chains and conveyor belt must be exchanged when their elongation has progressed so far that they can no longer be re-tensioned.

⚠ Chain links must not be removed to shorten the chain!
Incorrectly dividing the chains would lead to destruction of the drive wheels!

Conveyor belt - Replace chain

NOTE	**Caution! Heed wear limits!**
	The chain must be replaced if the conveyor belt chain has lengthened to such an extent that it is no longer possible to adjust the prescribed conveyor belt sag.

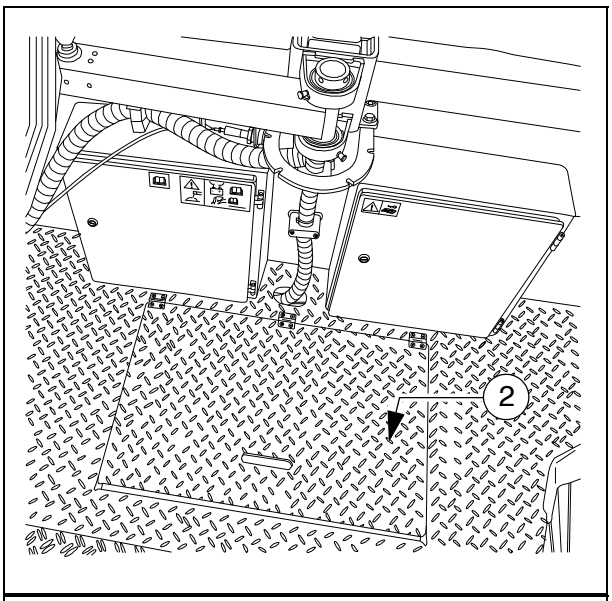
Check conveyor belt for damage and soiling



STOP Perform inspection, cleaning and repairs whilst the drive motor is stationary!

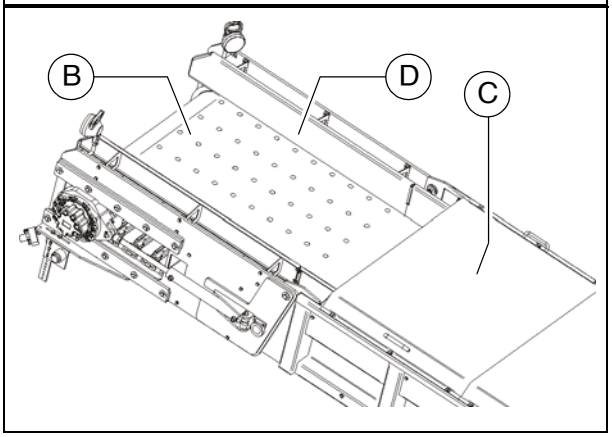
☞ If discovered early on, conveyor belt damage can be repaired permanently!

☞ The conveyor belt can be accessed through the open maintenance flap (A) for maintenance work.



STOP Keep the maintenance flap closed during operation; never open whilst the conveyor belt is running!

- To inspect it, lower the conveyor belt and secure the conveyor belt drive to prevent reactivation.
- Gradually move and check the conveyor belt using the lateral operating unit.



☞ Check the entire conveyor belt (B) for the following defects:

- Cracks, breakage and wear on the surface and at the sides.
- Missing or loose assembly parts.
- Wear, damage and soiling on the drive chains and chain sprockets.

☞ If necessary, remove covers (C) to check the conveyor belt.

- Remove encrusted material from the sealing plates (D).

☞ Your Dynapac customer service will be happy to provide support during maintenance, repair and the replacement of wearing parts!

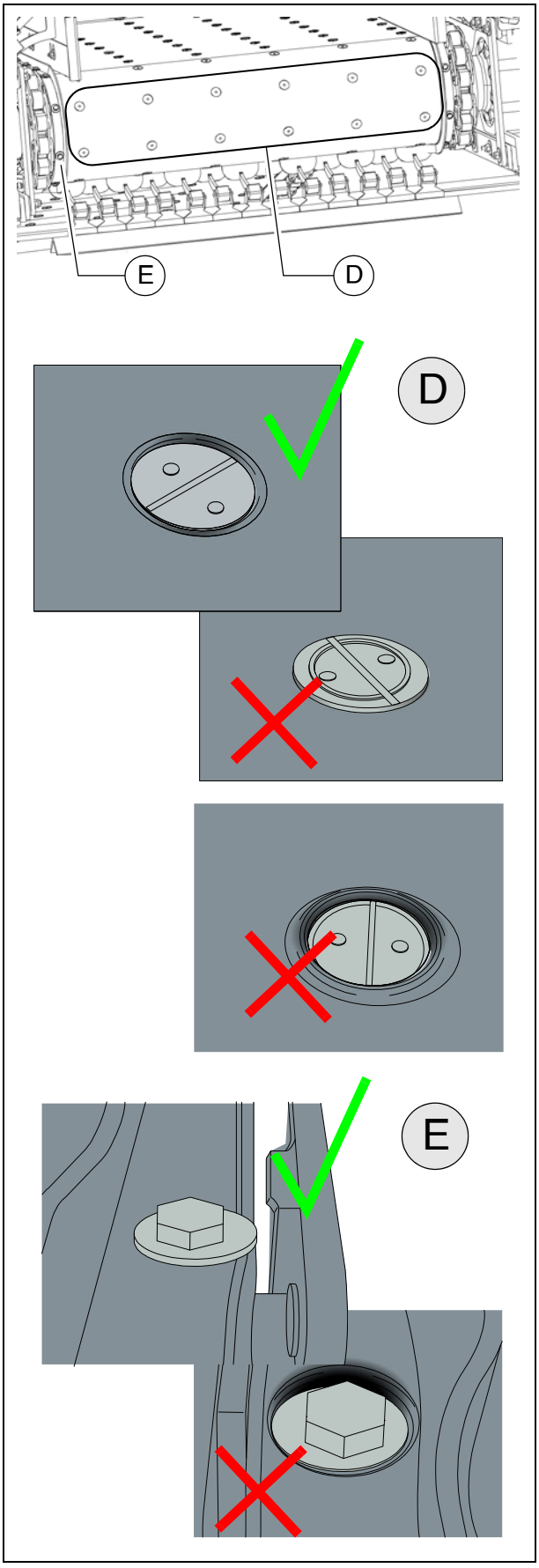
Conveyor belt - screw connections

⚠ Incorrectly installed conveyor belt bolts can lead to severe damage to the entire conveyor belt.

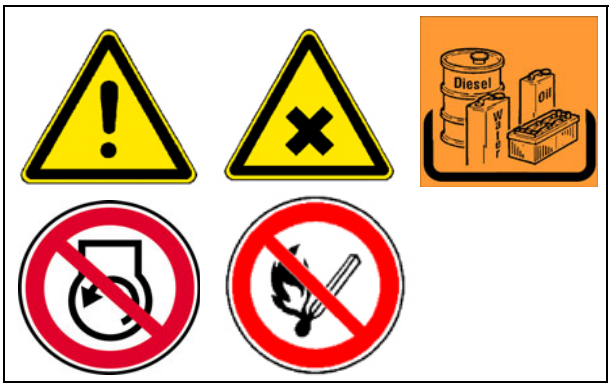
⚠ Visually and mechanically check that the screw connections are fastened correctly.

- Conveyor belt - conveyor belt web (D) (flat-headed bolts):
  - The bolt head must be positioned plane with the rubber surface and may be recessed by max. 1 mm.
- Drive chain - conveyor belt (E) (hexagonal bolts):
  - The bolts must not be tightened too tightly.

⚠ Self-locking nuts must be replaced and must not be retightened!



Emulsion spraying system (2)



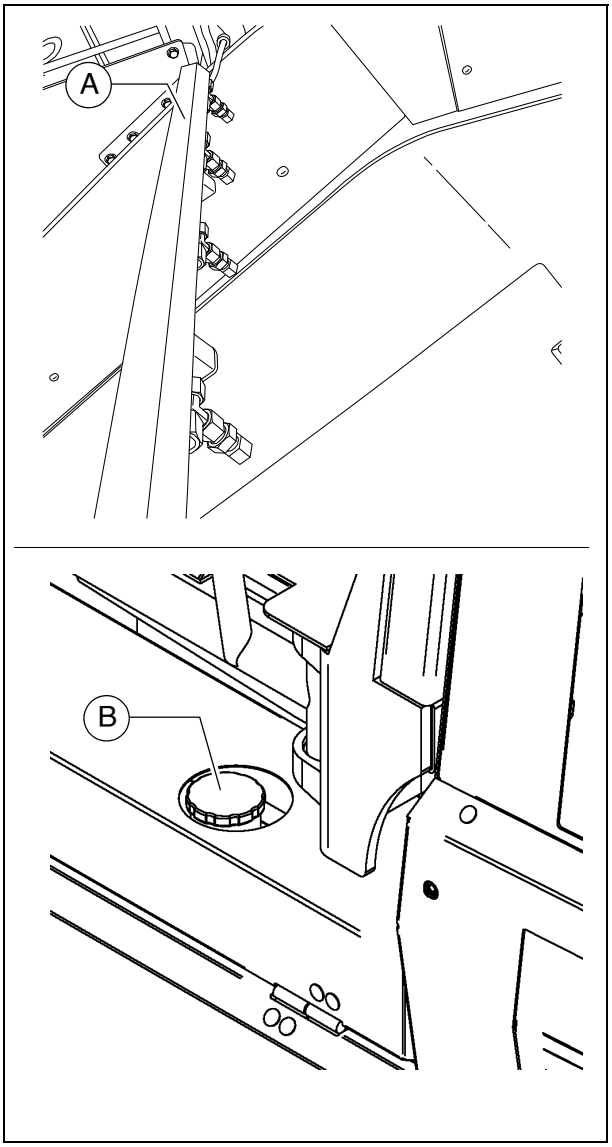
☞ The spraying bar (A) installed above the conveyor belt is engaged on activation of the conveying function.

- Check the **filling level** using the display on the operating panel.

☞ Increased emulsion consumption due to use of the manual spray.

To **top up** the tank:

- Remove cap (B).
- Fill in emulsion through the filler opening until the required filling level is achieved.
- Screw cap (B) on again.

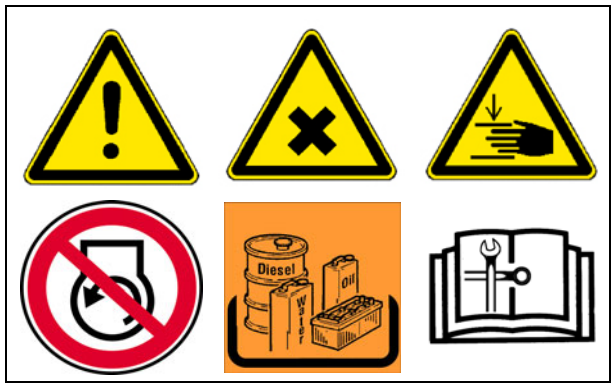


STOP Refill the tank only whilst the vehicle is stationary!

⚠ Only operate the spraying system with approved emulsion!

Central lubrication system (3)

Danger of injuries!



STOP Do not reach into the tank when the pump is running!

STOP The central lubrication system must only be operated with the safety valve installed!

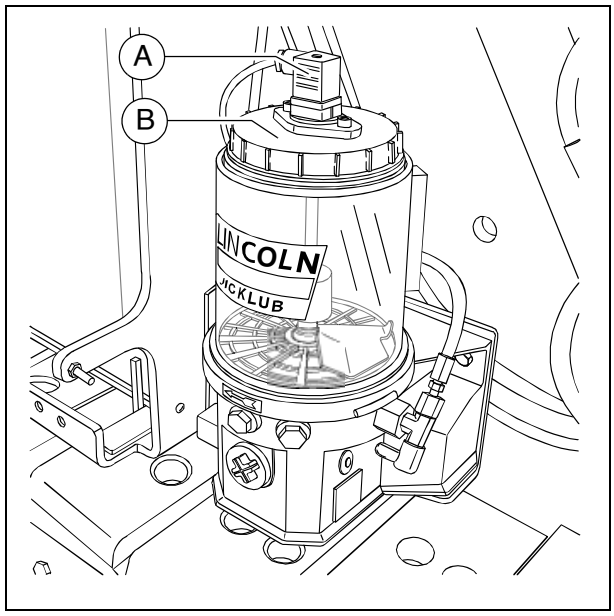
STOP Do not undertake any work on parts of the system during operation!

STOP Ensure that the diesel engine cannot be started when working on the system!

STOP Observe safety regulations for handling hydraulic systems!

⚠ Ensure maximum cleanliness when working on the central lubrication system!

Central lubrication system
Check filling level

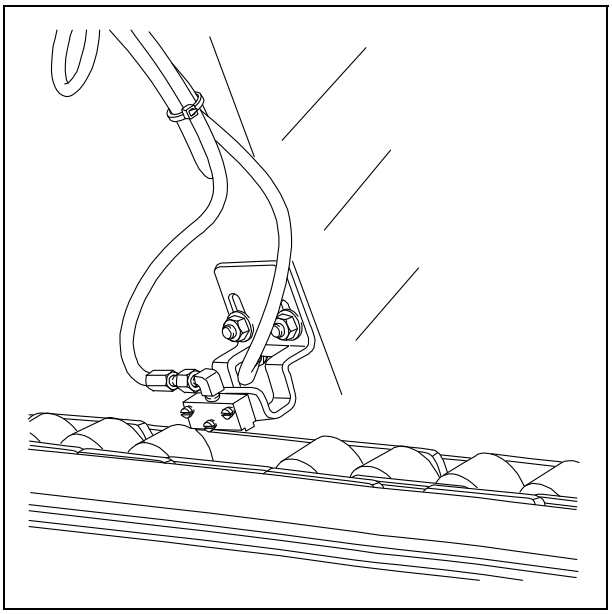


⚠ The lubricant tank should always be filled sufficiently to ensure that the system cannot "run dry" and that sufficient drive chain lubrication is ensured.

To **top up** with lubricant:

- Top up the tank to the "MAX" mark before starting work or on receipt of an electronic empty message.
  - Release and pull off connector (A).
  - Unscrew tank cap (B).
  - Top the tank up to the "MAX" mark with the specified oil.
  - Screw on the tank cap (B) again and position the connector properly.

Function check / check oil brush



Perform inspection, cleaning and repairs whilst the drive motor is stationary!

A pair of oil brushes, which apply the lubricant onto the drive chain, is located on both sides of the conveyor belt.

- After trial operation, check whether an oil film was applied onto the chain when the central lubricating system was running.
- In the event of malfunctions, determine and immediately rectify the cause.
- If the brushes are worn on visual inspection, they must be exchanged immediately.

A disturbed lubricant flow leads to increased wear!

Spring arm scraper (4)



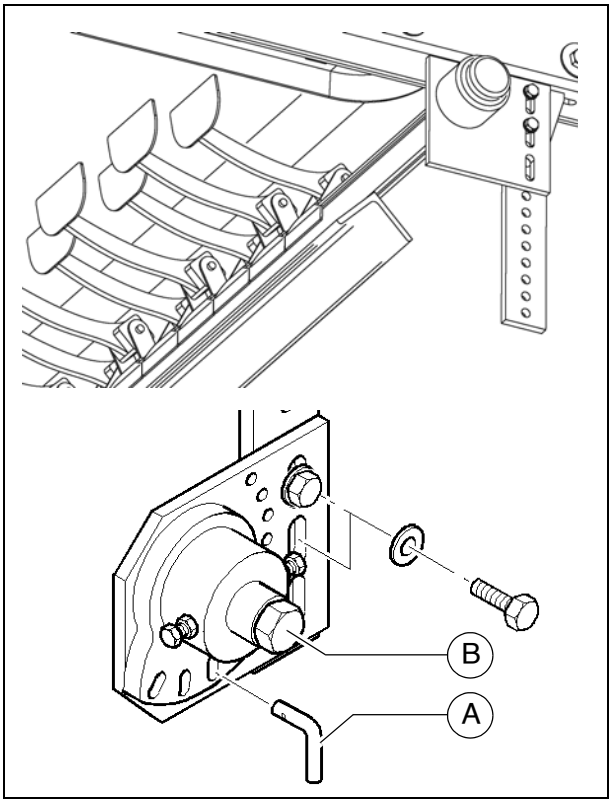
☞ A scraper is available to minimise dirt and wear on the conveyor belt.

Scraper - Variant1

☞ The scraper is equipped with several scraper plates which scrape off bonded material residues during conveyor belt operation.

Check tension:

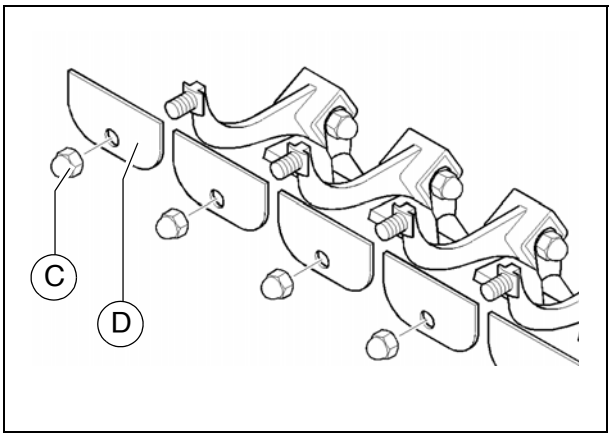
⚠ The tension must be readjusted as soon as the scraper no longer operates correctly and material residues stick to the conveyor belt.



Adjust tension:

- Remove tensioning fixture bolts (A) on both sides of the vehicle.
- Place an appropriate wrench on the hexagon head (B) and tension scraper.
  - After scraper blade contact with the belt, continue turning one hole division.
- Insert and secure bolt (A).
- Insert and secure bolt (A) in the identical hole on the other side.
- Observe scraping effect, ret-ension if necessary.

Check scraper blade wear:



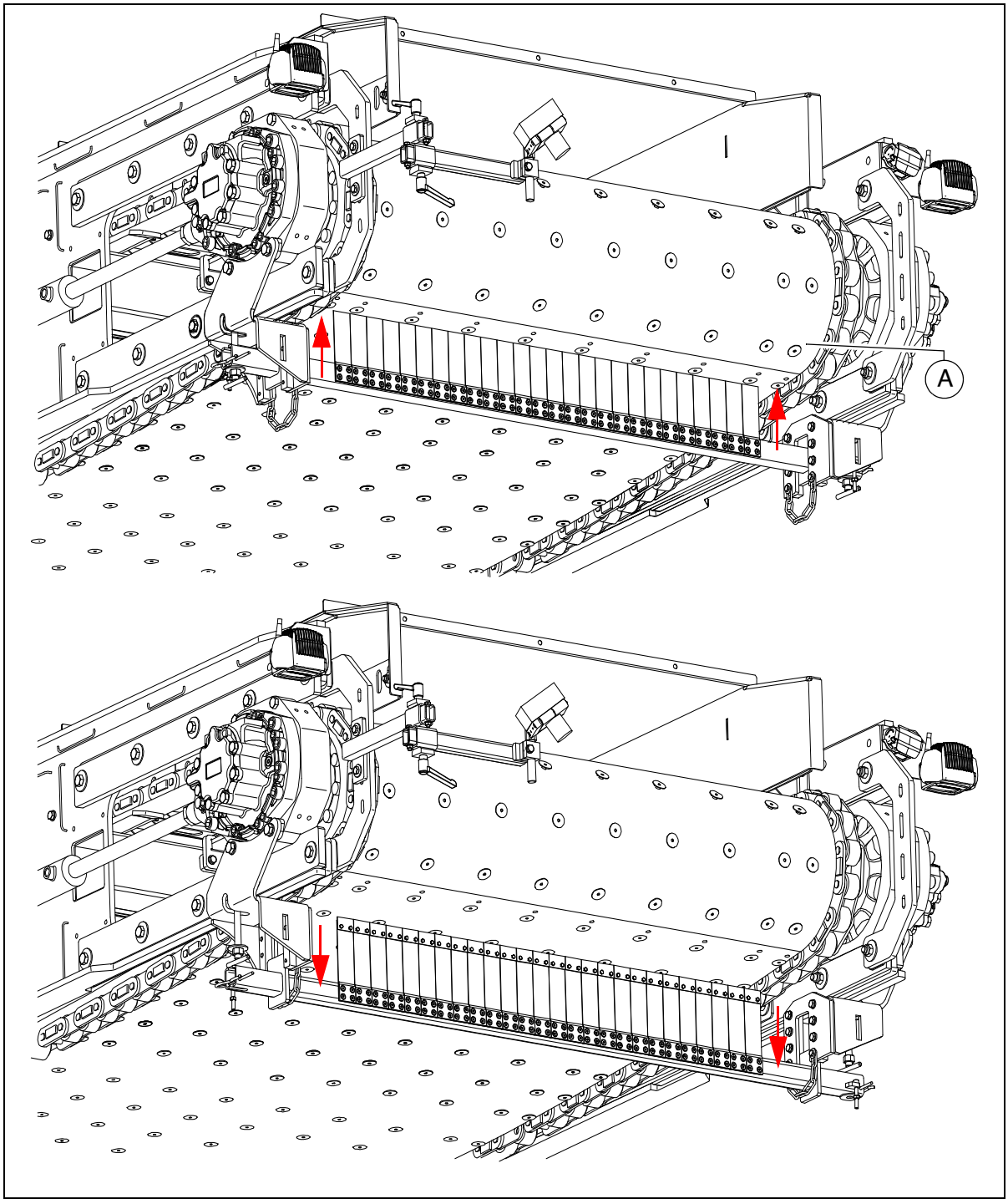
⚠ The scraper blades must be exchanged as soon as the scraper can no longer be re-tensioned correctly, final wear is anticipated soon or the scraper blades are damaged.

Replace scraper blades:

- Relieve the scraper.
- Remove the hexagon nut (C), remove worn scraper blade.
- Position new scraper blade (D) and tighten hexagon nut (C) properly again.
- Adjust scraper tension.

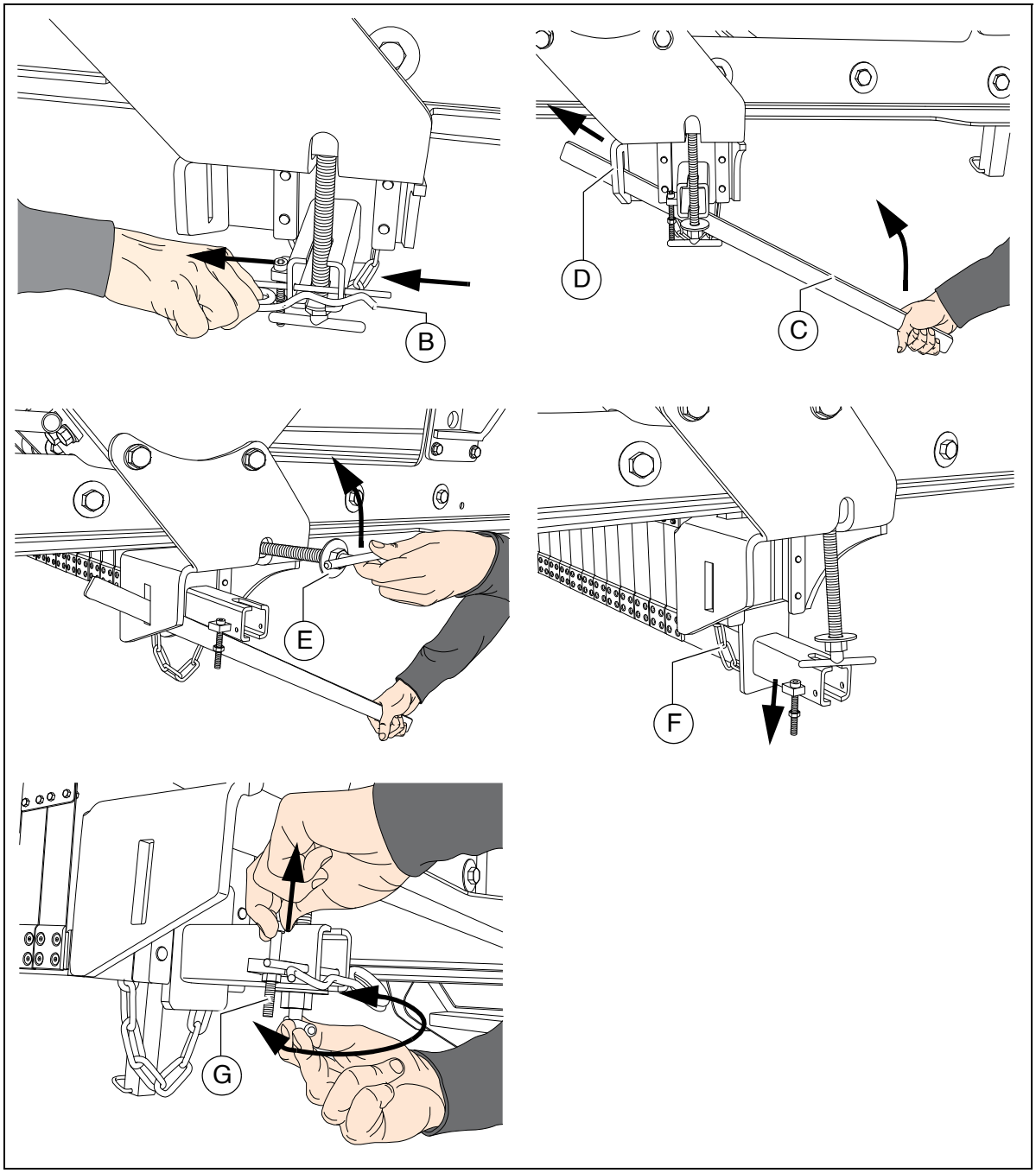
☞ Always replace scraper blades in sets!

Main scraper - Variant 2



☞ A scraper (A) is available to protect the conveyor belt against asphalt residues during and after work.
The scraper is equipped with several scraper blades that scrape off material residues during operation.
The scraper can be disengaged for cleaning and maintenance.

Relieve scraper



- Remove spring cotter pin (B).
- Push mounting lever (C) into recess (D) and slightly raise scraper.
- Fold away adjusting screw (E) to side.
- Carefully set down scraper in chain (F).
- Repeat process on other side.

Move scraper into working position before starting work, carry out function test/adjust distance

- Move scraper into working position:
  - Raise scraper with mounting lever (C).
  - Swivel adjusting screw (E) into related groove of scraper tube.
  - Relieve mounting lever and remove.
  - Insert spring cotter pin (B) properly.
- Repeat process on other side.
- Exit danger area and carry out test run:
  Visually check whether all scraper blades are in permanent contact with belt while conveyor belt is running.
  Carry out a complete belt circulation when doing so.
- If necessary, switch off conveyor belt and retension adjusting screws (D) on both sides in steps of 0.5 rotations.

☞ Locking pin (G) must be raised for adjustment.

- Repeat process until correct setting is achieved.
- Spray scraper with separator fluid again if necessary.

Clean scraper/routine check

⚠ CAUTION	**Sharp-edged components!**
	Surfaces subject to wear can be very sharp-edged and can cause injuries! - Wear your personal safety gear. - Comply with all further information in these instructions and in the safety manual.

⚠ CAUTION	**Hot surfaces!**
	Surfaces including those behind covering parts, together with engine combustion gases, can be very hot and cause injuries! - Wear your personal safety gear. - Do not touch hot parts of the vehicle. - Only perform maintenance and repair work after the vehicle has cooled down. - Comply with all further information in these instructions and in the safety manual.

⚠ WARNING	**Danger from burner**
	Incorrectly performed work on burners can cause severe or fatal injuries! - Wear your personal safety gear. - See the burner operating instructions and familiarise yourself with all notes contained in them.

⚠ Clean the scraper after each working day.

⚠ Danger of subsequent damage! Never clean the scraper in the working position!

- Relieve scraper (see "Relieve scraper" section)
- Clean scraper completely under the influence of flames.

⚠ Protect the conveyor belt from excessing heating.

- Heat the back for this purpose. This results in asphalt residues falling down at the front.
- Rework with a spatula if necessary.



Allow scraper to cool down.

- Move scraper into working position (see section entitled "Move scraper into working position")
- Spray scraper with separator fluid.

Routine check following cleaning:

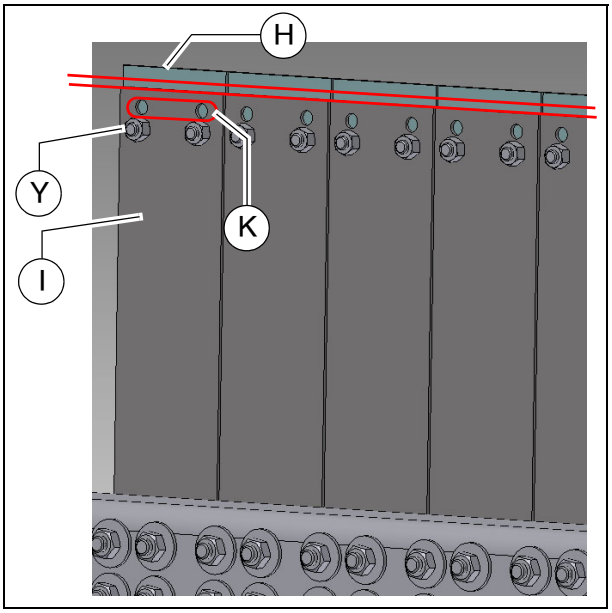
⚠ Check that all fastening parts have been tightened correctly.
Tighten any loose connections properly.

Wear check, readjust/replace scraper blades

⚠ CAUTION	**Sharp-edged components!**
	Surfaces subject to wear can be very sharp-edged and can cause injuries! - Wear your personal safety gear. - Comply with all further information in these instructions and in the safety manual.

If the scraper blade (H) is less than 2mm above the blade holder (I), the wear limit has been reached.

- If the second blade wear level is still available:
  - Loosen assembly parts (J) of scraper blade
  - Install scraper blades properly at installation position II (K).



☞ All scraper tripper blades must always be installed at the same position.

☞ If the scraper blades are worn at the upper position, they must be replaced as a set for the entire scraper.

⚠ Following adjustment or reinstallation of the scraper blades, a basic setting must be carried out (see section entitled "Scraper basic setting")

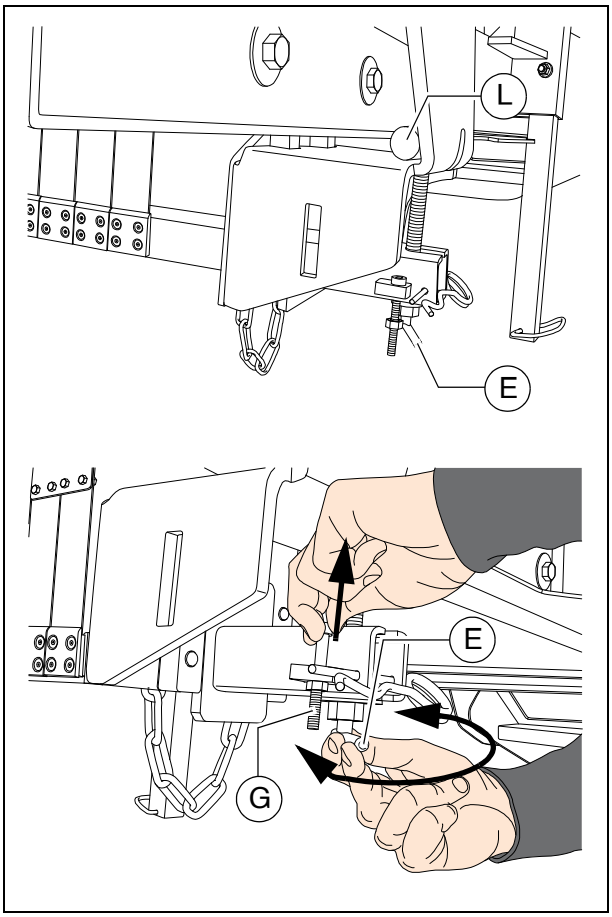
Scraper basic setting

A basic setting must be carried out after changing or adjusting the blades.

- Screw the adjusting screws (E) on both sides of the scraper into the pins (L) until the thread ends flush with the surface of the pin.

☞ Locking pin (G) must be raised for adjustment.

- Evenly tighten the adjusting screws (E) in steps on both sides of the scraper until all scraper blades have permanent contact with the conveyor belt.
- Exit danger area and carry out test run:
  Visually check whether all scraper blades are in permanent contact with belt while conveyor belt is running.
  Carry out a complete belt circulation when doing so.
- If necessary, switch off conveyor belt and retension adjusting screws (E) on both sides in steps of 0.5 rotations.
- Repeat process until correct setting is achieved.



⚠ Should the conveyor belt chain tension be changed, then the adjustment of the scraper must also be checked and, if necessary, adjusted.

☞

NOTE	**Caution! Possible collision of parts**
	The following adjustment must be made before starting up the slewing belt: - Move the scraper of the main conveyor belt located over the slewing belt into the working position. - Carry out a collision check by slowly slewing the slewing belt. - If necessary, adjust the height adjustment of the main belt to prevent a collision.

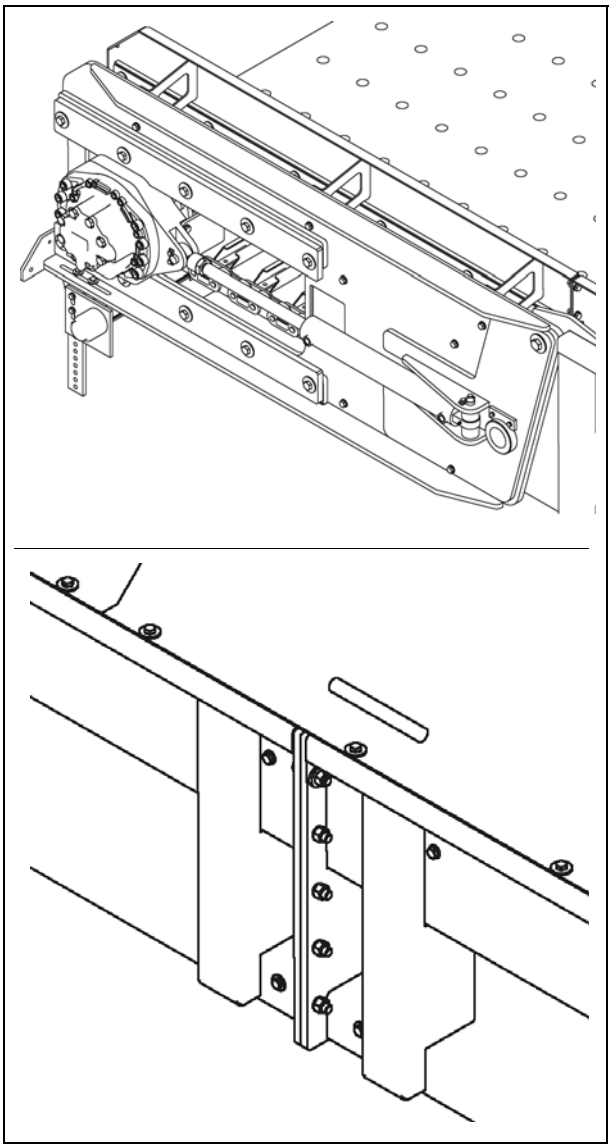
Screw connections (5)



⚠ After approx. 250 hours of operation at full load, check that all mounting and connecting screws are firmly seated.

⚠ Improperly tightened screws may lead to increased wear and to the destruction of components!

- Tighten loose or loosened screw connections properly.

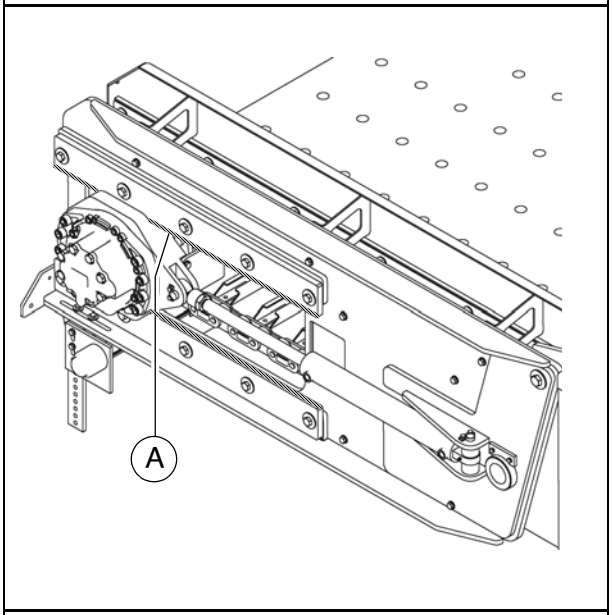


Lubrication points (6)



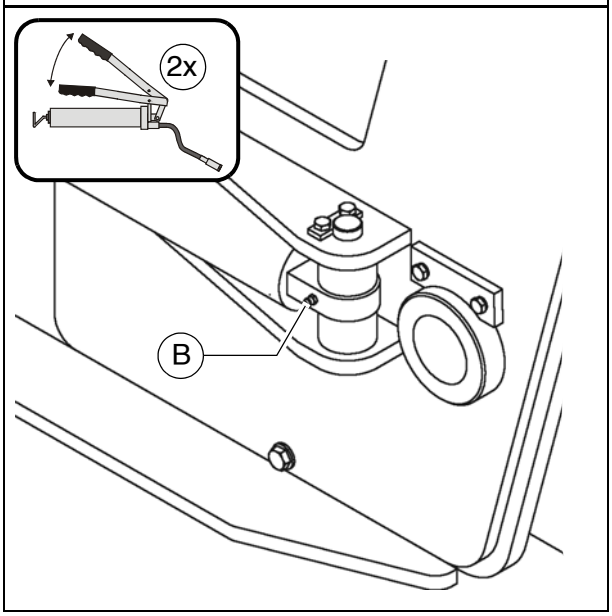
Belt drive guide

☞ Grease the belt drive guide surfaces (A) on both sides of the conveyor belt.



Bearing points

☞ One lubricating nipple (B) is located at each hydraulic cylinder bearing point.



Guide rails (7)



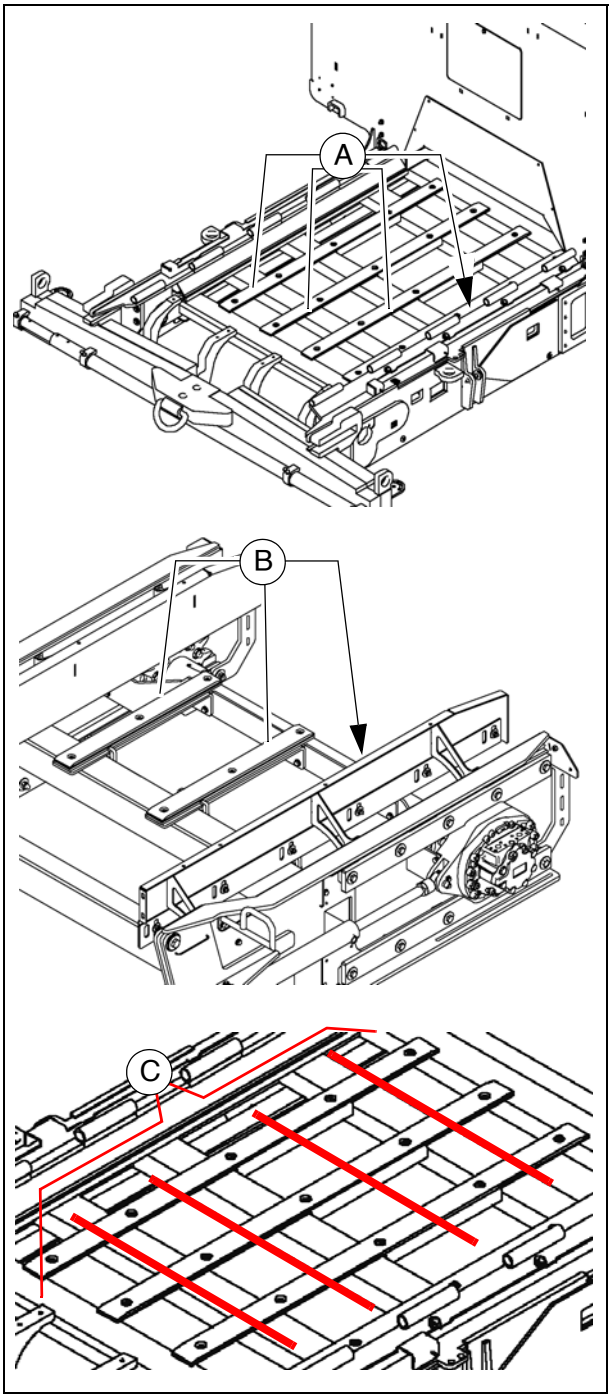
☞ There are 4 wear rails (A) at the hopper and 3 wear rails (B) at the conveyor belt end piece.

☞ Check wear at the prescribed intervals and every time that the belt is changed.

☞ The guide rails (A) / (B) must be replaced at the latest when the wear limit of 7 mm is no longer achieved in the marked areas (C).

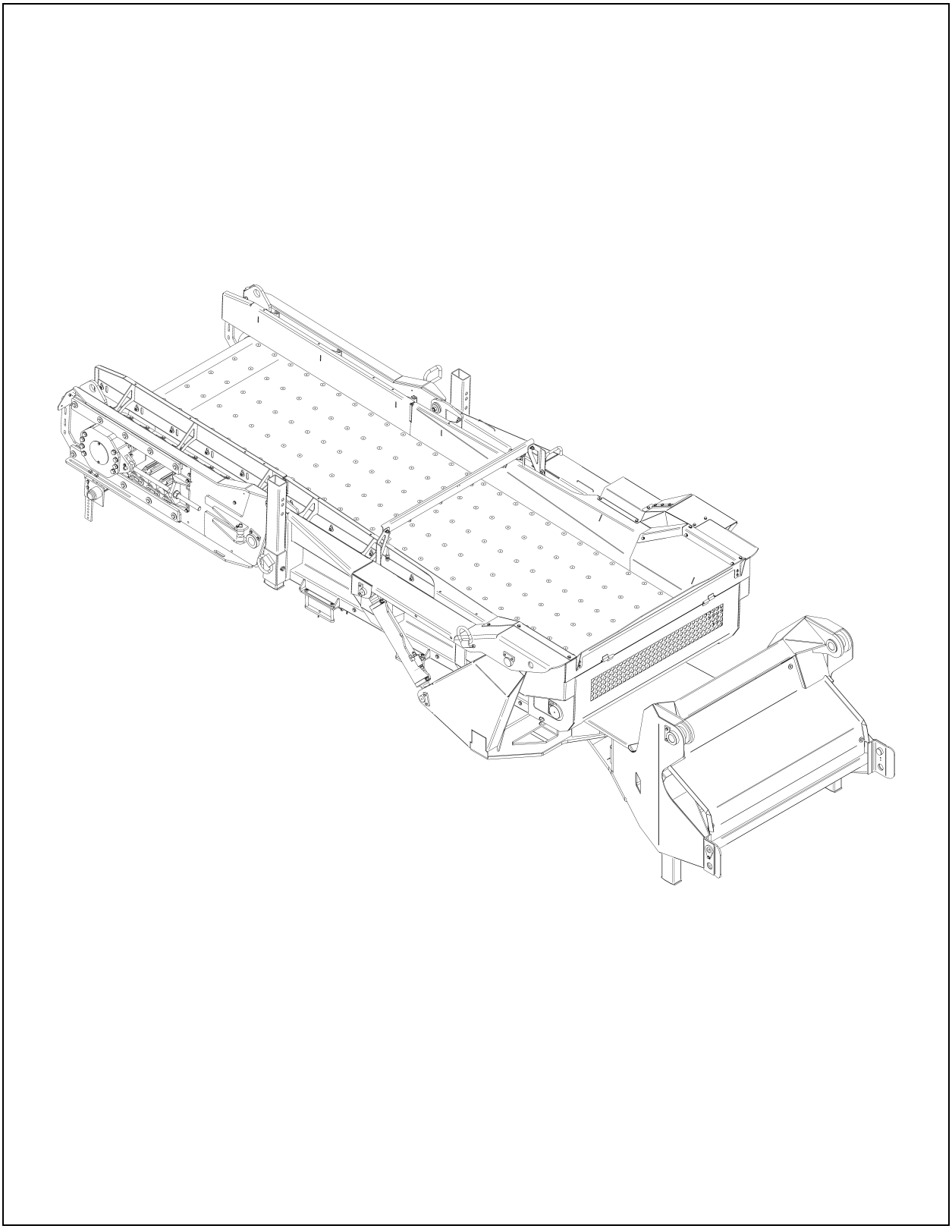
⚠ If the guide rails have to be replaced, this always has to happen in complete sets.

☞ Your Dynapac customer service will be happy to provide support during maintenance, repair and the replacement of wearing parts!



F 32 Maintenance - slewing belt

1 Maintenance - conveyor belt



⚠ WARNING	**Danger of being pulled in by rotating or conveying vehicle parts**
	Rotating or conveying vehicle parts can cause severe or fatal injuries! - Do not enter the danger zone. - Do not reach into rotating or conveying parts. - Only wear close-fitting clothing. - Comply with the warning and information signs on the vehicle. - Stop the engine and remove the ignition key before any maintenance work. - Comply with all further information in these instructions and in the safety manual.

⚠ WARNING	**Danger from heavy loads**
	The raised machine can slide away and cause severe to fatal injuries! - The vehicle may only be raised at the marked lifting points. - Heed the operating weight of the vehicle. - Do not enter the danger zone. - Only use approved ramps and adequately dimensioned ramps or pits. - Use only lifting gear that can bear the load. - Do not leave any load or loose parts on the vehicle. - Comply with all further information in these instructions and in the safety manual.

⚠ CAUTION	**Hot surfaces!**
	Surfaces including those behind covering parts, together with engine combustion gases can be very hot and cause injuries! - Wear your personal safety gear. - Do not touch hot parts of the vehicle. - Only perform maintenance and repair work after the vehicle has cooled down. - Comply with all further information in these instructions and in the safety manual.

1.1 Maintenance intervals

Item	Interval								Points of maintenance	Note
	10	50	100	250	500	1000 / annually	2000 / every 2 years	If necessary		
1	■								- Conveyor belt - Check tension	
								■	- Conveyor belt - Adjust tension	
								■	- Conveyor belt - Replace chain	
		■							- Conveyor belt - Check for damage	
		■							- Conveyor belt - Check screw connections	
								■	- Conveyor belt - Repair / exchange conveyor belt	
2	■								- Conveyor belt frame- Check for deposits	
								■	- Conveyor belt frame- Clean	
3		■							- Central lubrication system - Function check / check oil brush	
								■	- Central lubrication system - Exchange oil brush	

Maintenance	■
Maintenance during the running-in period	▼

Item	Interval								Points of maintenance	Note
	10	50	100	250	500	1000 / annually	2000 / every 2 years	If necessary		
4			■					■	- Scraper - Check tightness	Variant 1
								■	- Scraper - Adjust tension	Variant 1
					■				- Scraper - Check scraper blade wear	Variant 1
								■	- Scraper - Exchange scraper blades	Variant 1
4								■	- Relieve scraper	Variant 2
	■							■	- Scraper - Check function	Variant 2
								■	- Scraper - Adjust distance	Variant 2
	■							■	- Scraper - Cleaning / routine check	Variant 2
		■							- Scraper - Wear check for blades	Variant 2
								■	- Scraper - Replace blades	Variant 2
								■	- Scraper - Carry out basic setting	Variant 2

Maintenance	■
Maintenance during the running-in period	▼

Item	Interval								Points of maintenance	Note
	10	50	100	250	500	1000 / annually	2000 / every 2 years	if necessary		
5				■					- Screw connections - Check screw connections	
								■	- Screw connections - Tighten screw connections	
6	■								- Lubrication points - Swivel joint - lubricate bearing	
			■						- Lubrication points - Grease belt drive guide	
		■							- Lubrication points - Lubricate bearing points	
7						■		■	- Guide rails - Check wear	
								■	- Guide rails - Replacing the guide rails	

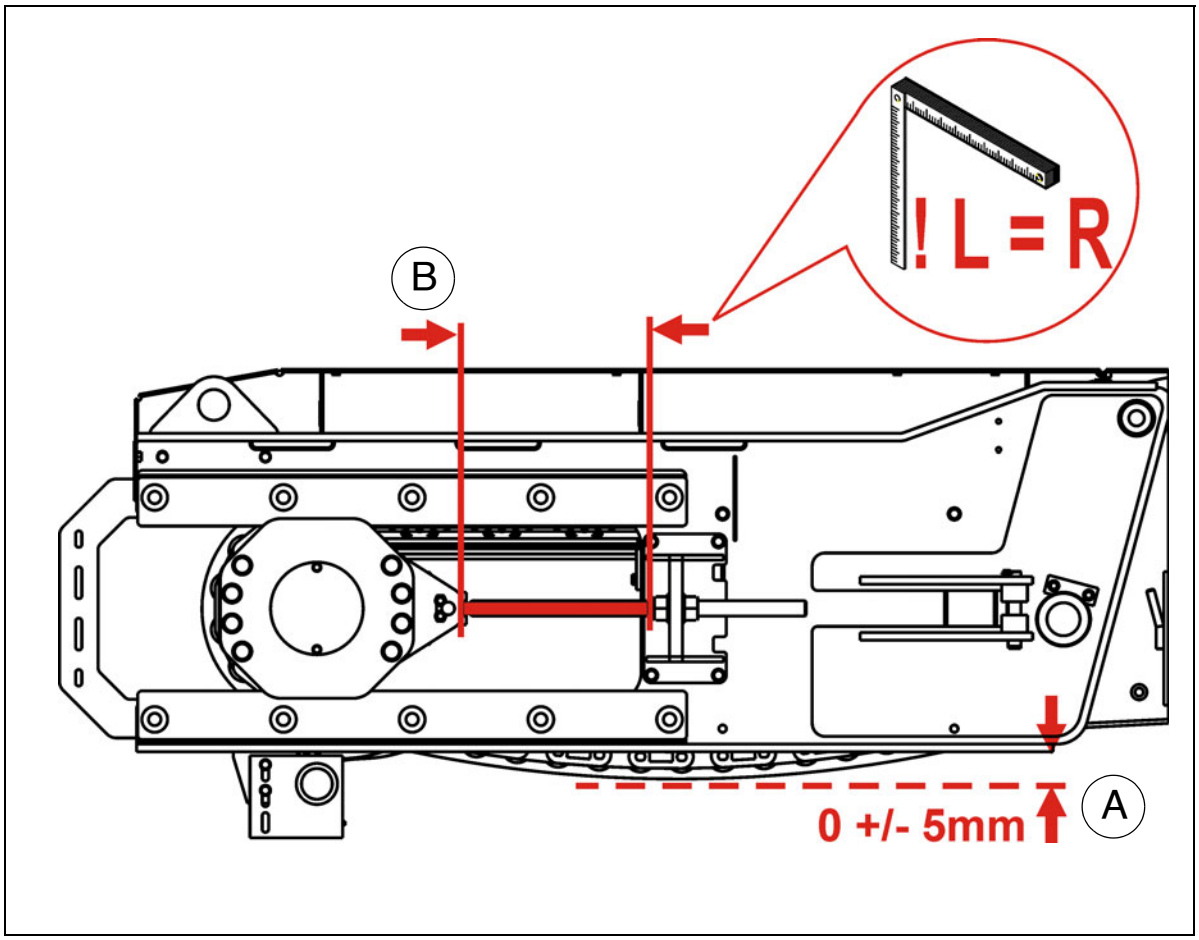
Maintenance	■
Maintenance during the running-in period	▼

1.2 Points of maintenance

Conveyor belt tension (1)

Check tension:

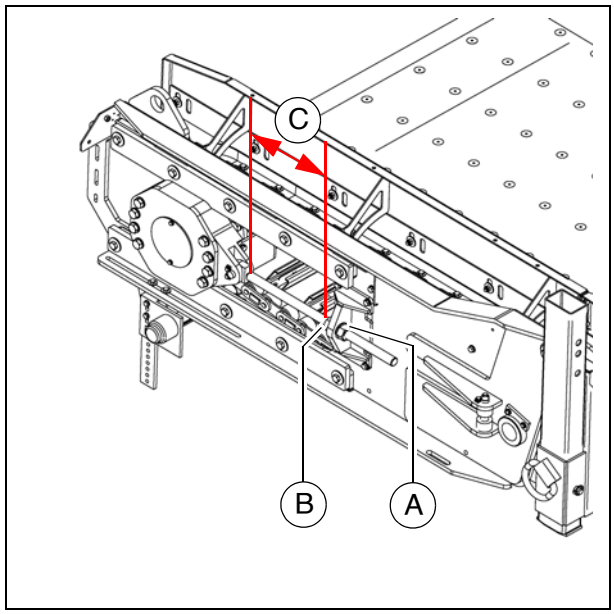




⚠ When the conveyor belt end piece is in the horizontal position, conveyor belt sag (A) must be correctly at the marked position to the lower edge of the chain must be 0 mm +/- 5 mm!

⚠ After completing the adjustments, check whether the belt tension has been restored evenly on both sides. The length of the spindle (B) must be identical on both sides!

Belt tension



⚠ Check belt tension on a daily basis. If there is too much slack in the belt, adjust the tension.

Increasing the tension:

- Unfasten lock nuts (A) on both sides of the tensioning fixtures.
- Use an open-end wrench to adjust tension on both sides evenly on the adjusting nuts (B).
- Tighten lock nuts (A) back down after the adjustment procedure.

☞ If the belt on the reversing drum is running to one side, tighten the right-hand spindle or loosen the left-hand spindle if the drum is rotating clockwise, or vice versa for anti-clockwise rotation.

⚠ Avoid an inclined position of the reversing drum because this can cause damage to the conveyor belt.

⚠ After completing the adjustments, check whether the belt tension has been restored evenly on both sides. The length of the spindle (C) must be identical on both sides!

☞ At the latest, the drive chains and conveyor belt must be exchanged when their elongation has progressed so far that they can no longer be re-tensioned.

⚠ Chain links must not be removed to shorten the chain!
Incorrectly dividing the chains would lead to destruction of the drive wheels!

Conveyor belt - Replace chain

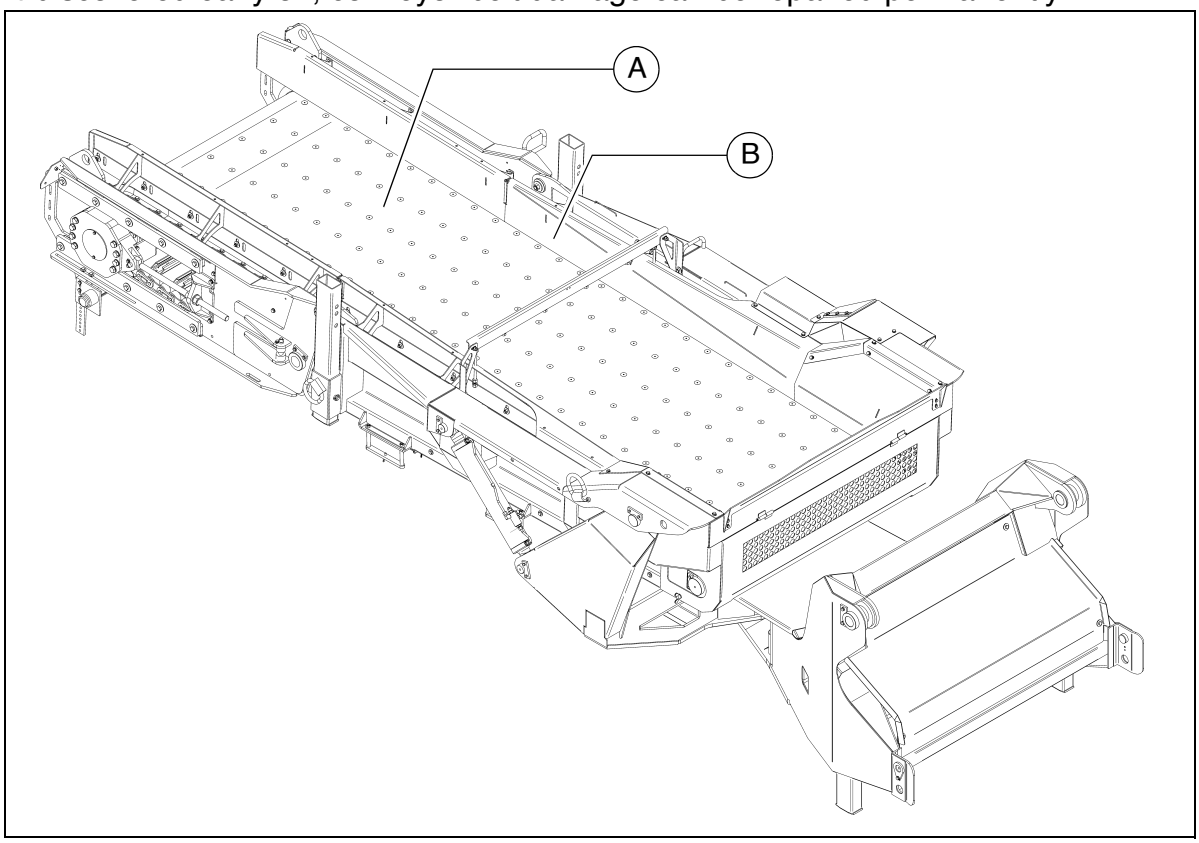
NOTE	**Caution! Heed wear limits!**
	The chain must be replaced if the conveyor belt chain has lengthened to such an extent that it is no longer possible to adjust the prescribed conveyor belt sag.

Check conveyor belt for damage and soiling



Perform inspection, cleaning and repairs whilst the drive motor is stationary!

If discovered early on, conveyor belt damage can be repaired permanently!



- To inspect it, lower the conveyor belt and secure the conveyor belt drive to prevent reactivation.

Check the entire conveyor belt (A) for the following defects:

- Cracks, breakage and wear on the surface and at the sides.
- Missing or loose assembly parts.
- Wear, damage and soiling on the drive chains and chain sprockets.

- Remove encrusted material from the sealing plates (B).

Your Dynapac customer service will be happy to provide support during maintenance, repair and the replacement of wearing parts!

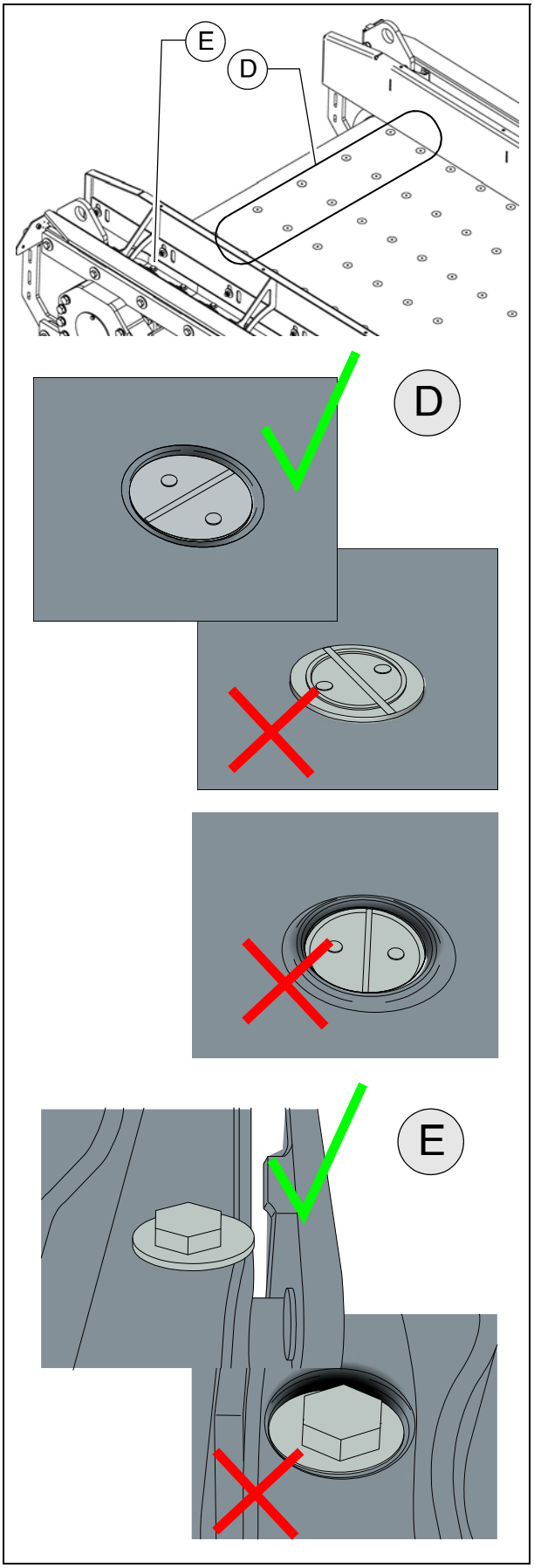
Conveyor belt - screw connections

⚠ Incorrectly installed conveyor belt bolts can lead to severe damage to the entire conveyor belt.

⚠ Visually and mechanically check that the screw connections are fastened correctly.

- Conveyor belt - conveyor belt web (D) (flat-headed bolts):
  - The bolt head must be positioned plane with the rubber surface and may be recessed by max. 1 mm.
- Drive chain - conveyor belt (E) (hexagonal bolts):
  - The bolts must not be tightened too tightly.

⚠ Self-locking nuts must be replaced and must not be retightened!



Check conveyor belt frame for deposits, clean (2)



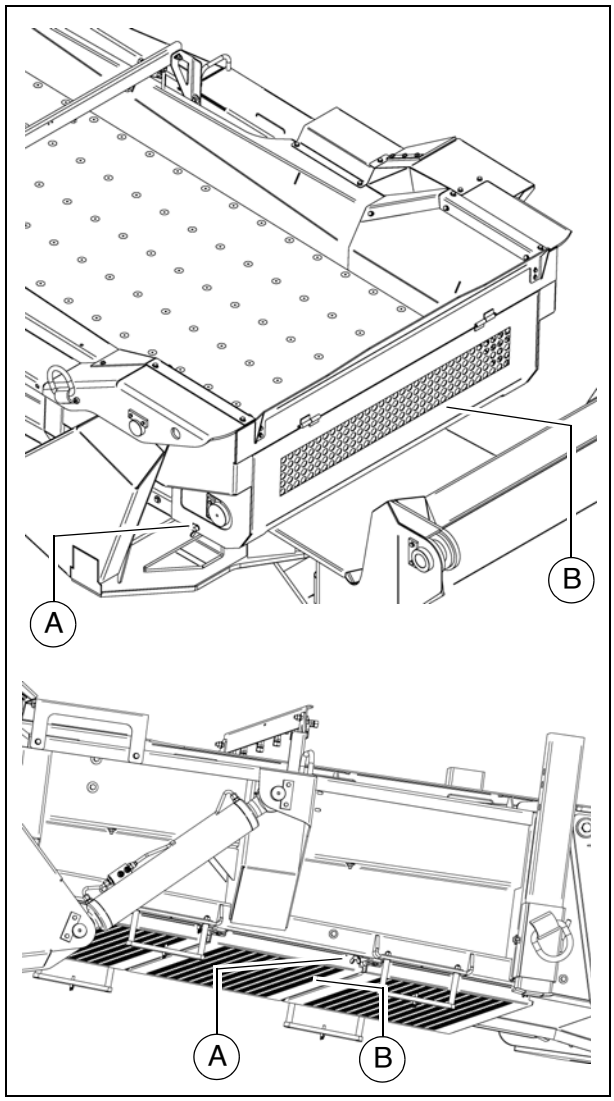
STOP Perform inspection, cleaning and repairs whilst the drive motor is stationary!

☞ Material deposits in the frame of the conveyor belt can cause subsequent damage!

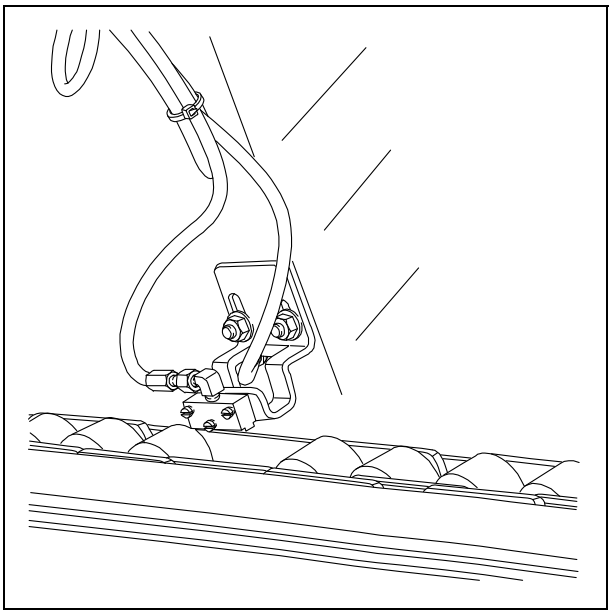
☞ There are maintenance flaps underneath the frame and at the rear reversal.

- Loosen wind bolts (A) and open all flaps (B).
- Remove material deposits, possibly spray the surfaces with separator fluid.
- Close all maintenance flaps again correctly.

STOP All maintenance flaps must be closed during operation!



Function check / Check oil brush (3)



Perform inspection, cleaning and repairs whilst the drive motor is stationary!

A pair of oil brushes, which apply the lubricant onto the drive chain, is located on both sides of the conveyor belt.

- After trial operation, check whether an oil film was applied onto the chain when the central lubricating system was running.
- In the event of malfunctions, determine and immediately rectify the cause.
- If the brushes are worn on visual inspection, they must be exchanged immediately.

A disturbed lubricant flow leads to increased wear!

Spring arm scraper (4)



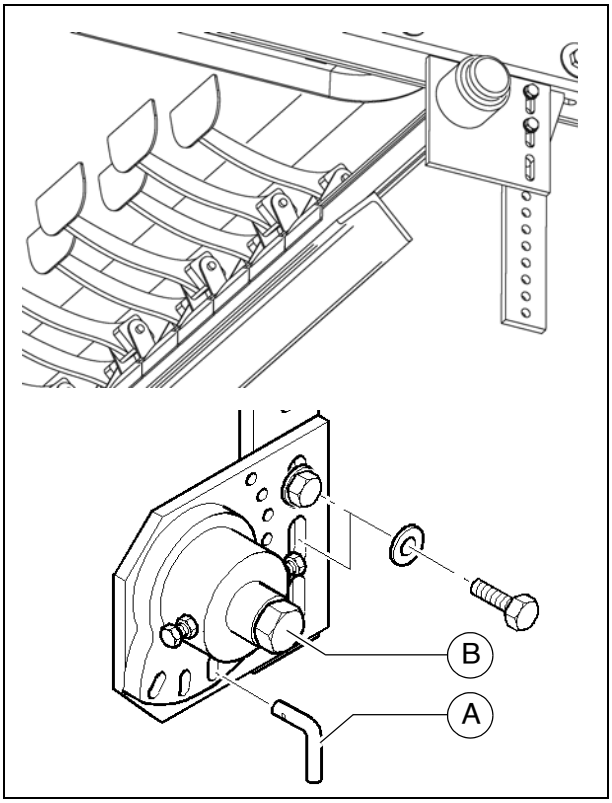
☞ A scraper is available to minimise dirt and wear on the conveyor belt.

Scraper - Variant1

☞ The scraper is equipped with several scraper plates which scrape off bonded material residues during conveyor belt operation.

Check tension:

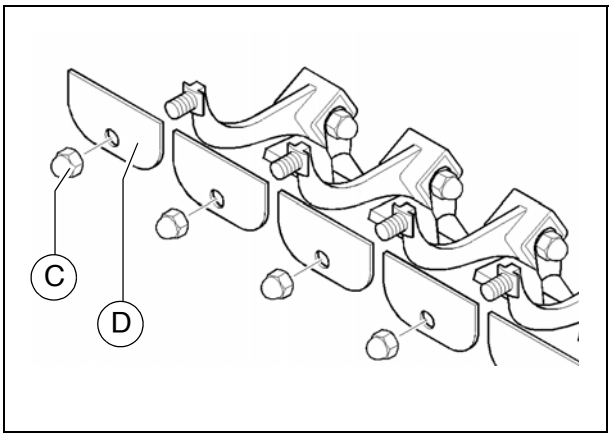
⚠ The tension must be readjusted as soon as the scraper no longer operates correctly and material residues stick to the conveyor belt.



Adjust tension:

- Remove tensioning fixture bolts (A) on both sides of the vehicle.
- Place an appropriate wrench on the hexagon head (B) and tension scraper.
  - After scraper blade contact with the belt, continue turning one hole division.
- Insert and secure bolt (A).
- Insert and secure bolt (A) in the identical hole on the other side.
- Observe scraping effect, re-tension if necessary.

Check scraper blade wear:



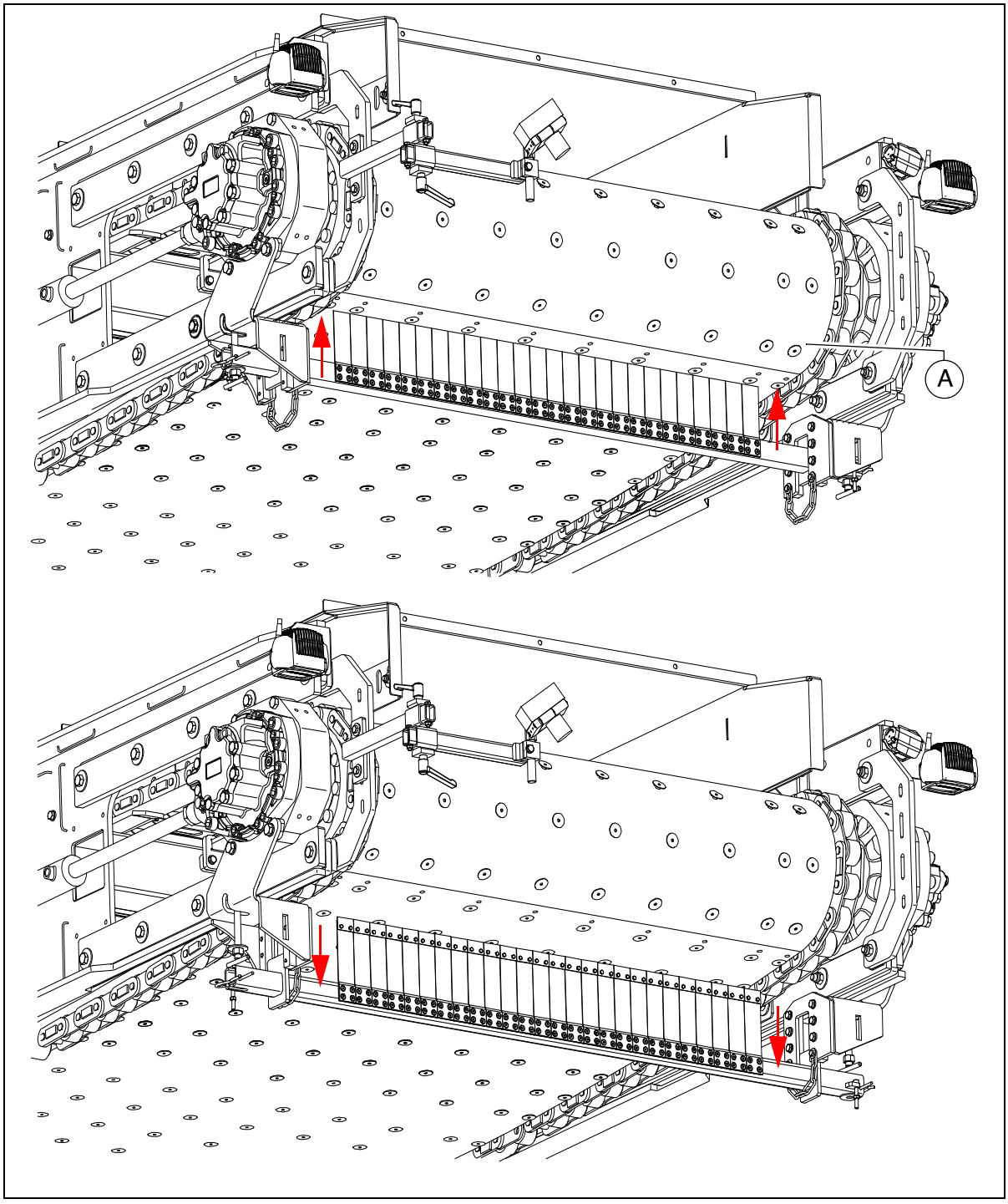
⚠ The scraper blades must be exchanged as soon as the scraper can no longer be re-tensioned correctly, final wear is anticipated soon or the scraper blades are damaged.

Exchange scraper blades:

- Relieve the scraper.
- Remove the hexagon nut (C), remove worn scraper blade.
- Position new scraper blade (D) and tighten hexagon nut (C) properly again.
- Adjust scraper tension.

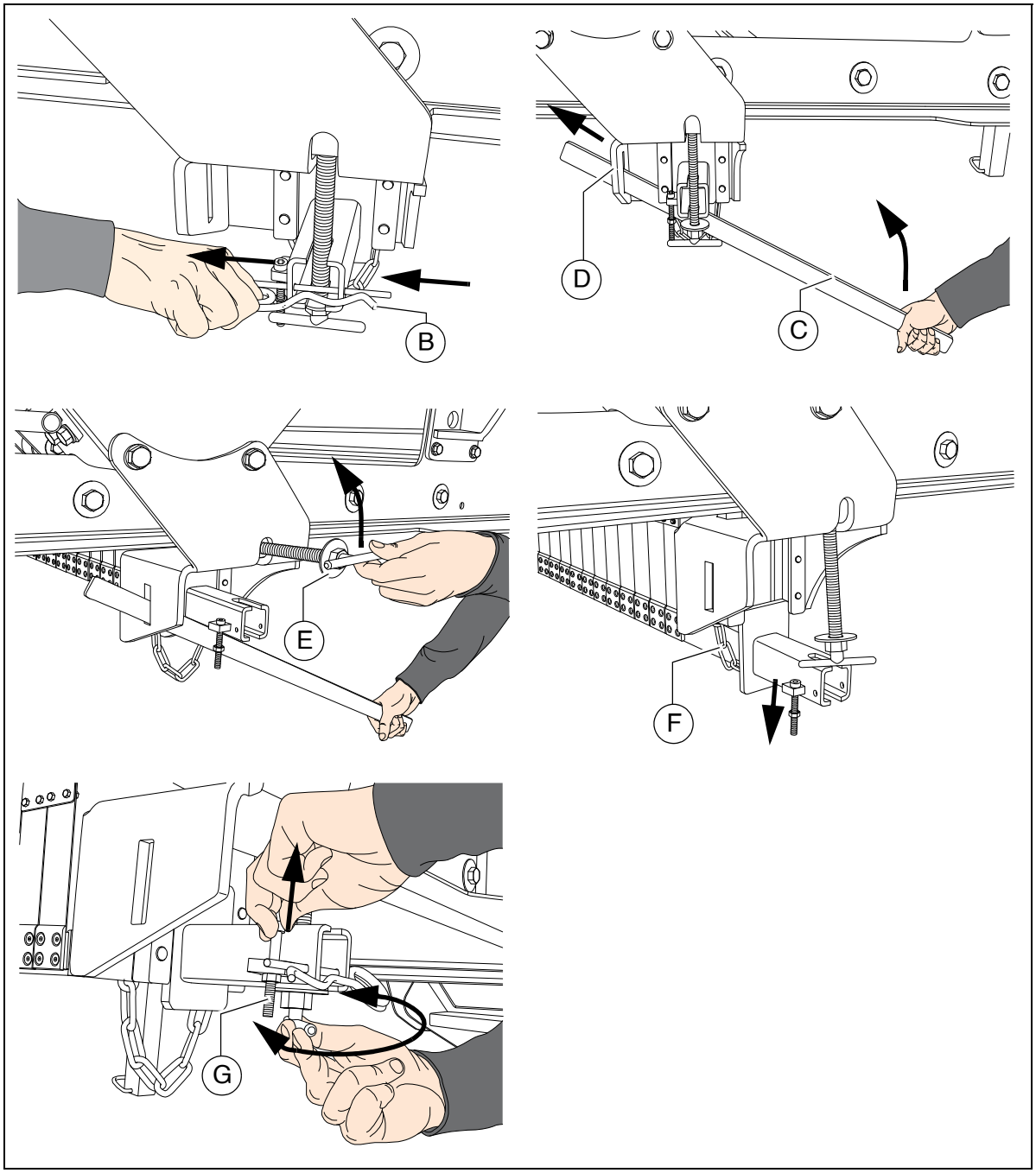
☞ Always replace scraper blades in sets!

Main scraper - Variant 2



☞ A scraper (A) is available to protect the conveyor belt against asphalt residues during and after work.
The scraper is equipped with several scraper blades that scrape off material residues during operation.
The scraper can be disengaged for cleaning and maintenance.

Relieve scraper



- Remove spring cotter pin (B).
- Push mounting lever (C) into recess (D) and slightly raise scraper.
- Fold away adjusting screw (E) to side.
- Carefully set down scraper in chain (F).
- Repeat process on other side.

Move scraper into working position before starting work, carry out function test/adjust distance

- Move scraper into working position:
  - Raise scraper with mounting lever (C).
  - Swivel adjusting screw (E) into related groove of scraper tube.
  - Relieve mounting lever and remove.
  - Insert spring cotter pin (B) properly.
- Repeat process on other side.
- Exit danger area and carry out test run:
  Visually check whether all scraper blades are in permanent contact with belt while conveyor belt is running.
  Carry out a complete belt circulation when doing so.
- If necessary, switch off conveyor belt and retension adjusting screws (D) on both sides in steps of 0.5 rotations.

☞ Locking pin (G) must be raised for adjustment.

- Repeat process until correct setting is achieved.
- Spray scraper with separator fluid again if necessary.

Clean scraper/routine check

⚠ CAUTION	**Sharp-edged components!**
	Surfaces subject to wear can be very sharp-edged and can cause injuries! - Wear your personal safety gear. - Comply with all further information in these instructions and in the safety manual.

⚠ CAUTION	**Hot surfaces!**
	Surfaces including those behind covering parts, together with engine combustion gases, can be very hot and cause injuries! - Wear your personal safety gear. - Do not touch hot parts of the vehicle. - Only perform maintenance and repair work after the vehicle has cooled down. - Comply with all further information in these instructions and in the safety manual.

⚠ WARNING	**Danger from burner**
	Incorrectly performed work on burners can cause severe or fatal injuries! - Wear your personal safety gear. - See the burner operating instructions and familiarise yourself with all notes contained in them.

⚠ Clean the scraper after each working day.

⚠ Danger of subsequent damage! Never clean the scraper in the working position!

- Relieve scraper (see "Relieve scraper" section)
- Clean scraper completely under the influence of flames.

⚠ Protect the conveyor belt from excessing heating.

- Heat the back for this purpose. This results in asphalt residues falling down at the front.
- Rework with a spatula if necessary.



Allow scraper to cool down.

- Move scraper into working position (see section entitled "Move scraper into working position")
- Spray scraper with separator fluid.

Routine check following cleaning:

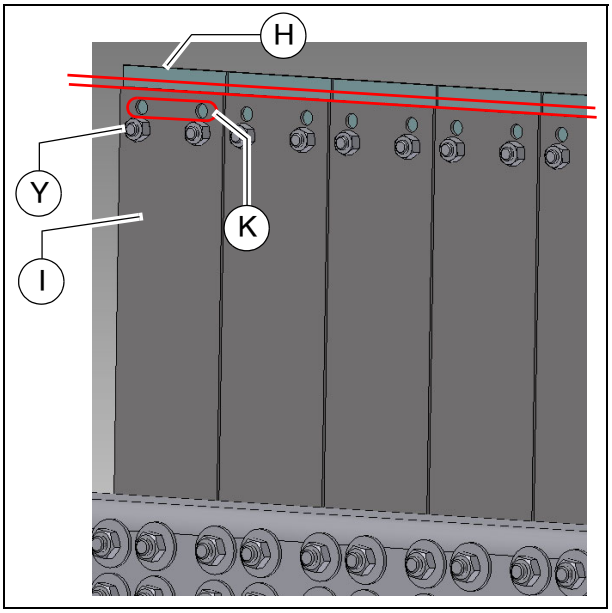
⚠ Check that all fastening parts have been tightened correctly.
Tighten any loose connections properly.

Wear check, readjust/replace scraper blades

⚠ CAUTION	**Sharp-edged components!**
	Surfaces subject to wear can be very sharp-edged and can cause injuries! - Wear your personal safety gear. - Comply with all further information in these instructions and in the safety manual.

If the scraper blade (H) is less than 2mm above the blade holder (I), the wear limit has been reached.

- If the second blade wear level is still available:
  - Loosen assembly parts (J) of scraper blade
  - Install scraper blades properly at installation position II (K).



☞ All scraper tripper blades must always be installed at the same position.

☞ If the scraper blades are worn at the upper position, they must be replaced as a set for the entire scraper.

⚠ Following adjustment or reinstallation of the scraper blades, a basic setting must be carried out (see section entitled "Scraper basic setting")

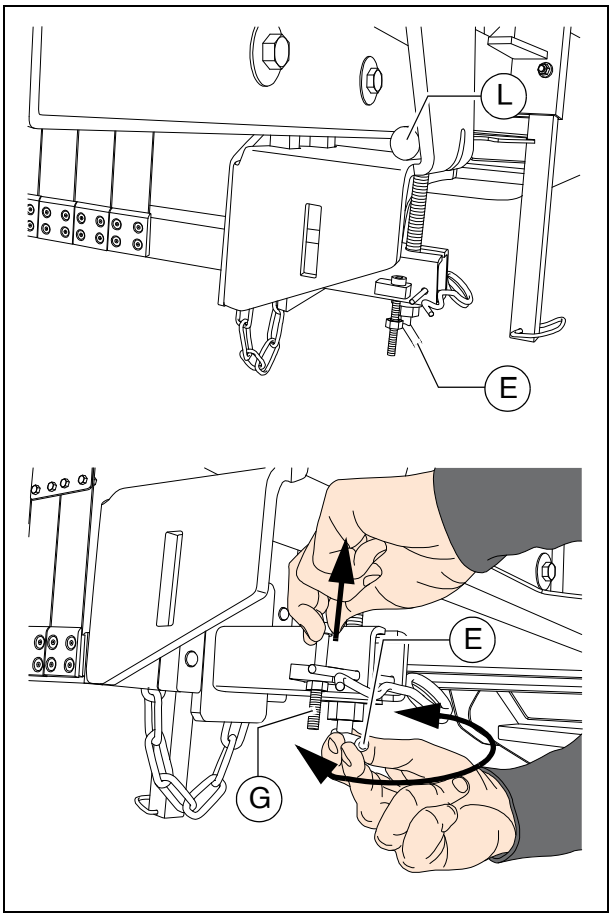
Scraper basic setting

A basic setting must be carried out after changing or adjusting the blades.

- Screw the adjusting screws (E) on both sides of the scraper into the pins (L) until the thread ends flush with the surface of the pin.

☞ Locking pin (G) must be raised for adjustment.

- Evenly tighten the adjusting screws (E) in steps on both sides of the scraper until all scraper blades have permanent contact with the conveyor belt.
- Exit danger area and carry out test run:
  Visually check whether all scraper blades are in permanent contact with belt while conveyor belt is running.
  Carry out a complete belt circulation when doing so.
- If necessary, switch off conveyor belt and retension adjusting screws (E) on both sides in steps of 0.5 rotations.
- Repeat process until correct setting is achieved.



⚠ Should the conveyor belt chain tension be changed, then the adjustment of the scraper must also be checked and, if necessary, adjusted.

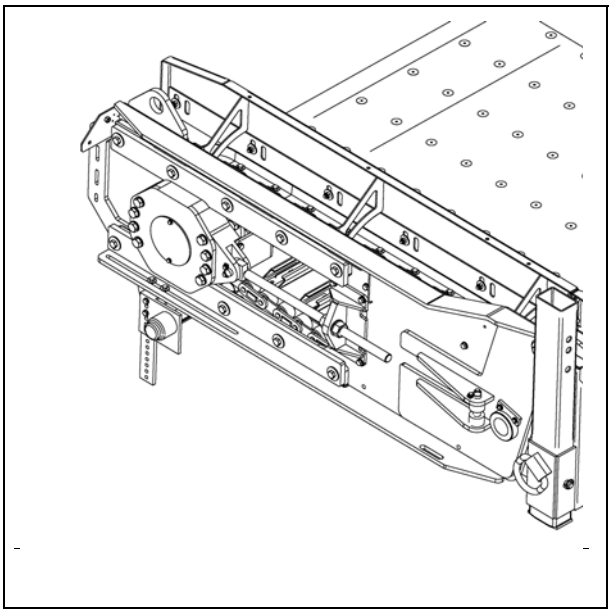
☞

NOTE	**Caution! Possible collision of parts**
	The following adjustment must be made before starting up the slewing belt: - Move the scraper of the main conveyor belt located over the slewing belt into the working position. - Carry out a collision check by slowly slewing the slewing belt. - If necessary, adjust the height adjustment of the main belt to prevent a collision.

Screw connections (5)



⚠ After approx. 250 hours of operation at full load, check that all mounting and connecting screws are firmly seated.



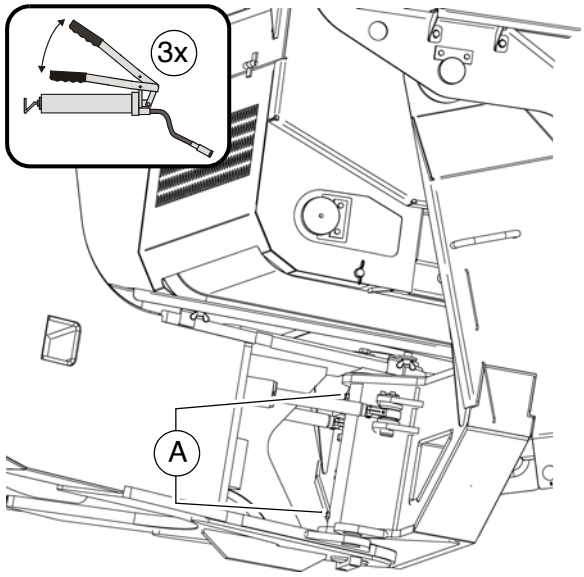
⚠ Improperly tightened screws may lead to increased wear and to the destruction of components!

- Tighten loose or loosened screw connections properly.

Lubrication points (6)

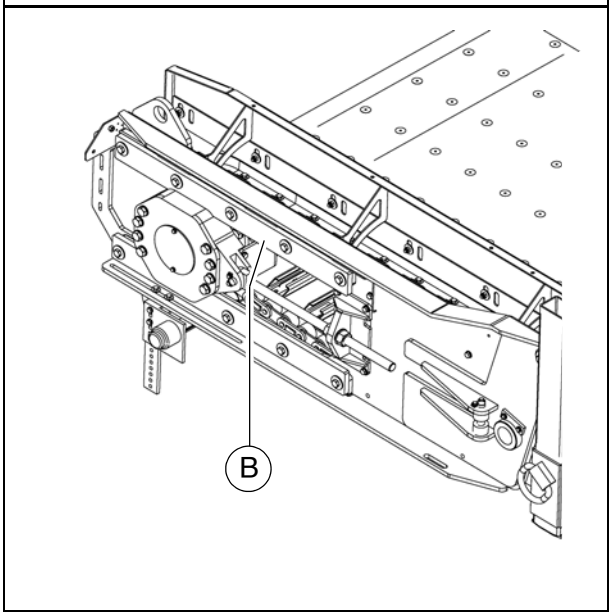


Swivel joint - bearing



☞ One lubricating nipple (A) is located at each bearing point.

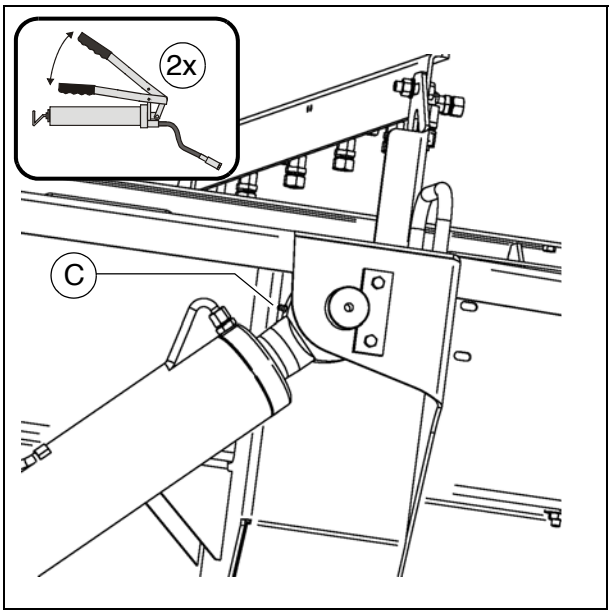
Belt drive guide



☞ Grease the belt drive guide surfaces (B) on both sides of the conveyor belt.

Bearing points

☞ One lubricating nipple (C) is located at each hydraulic cylinder bearing point.



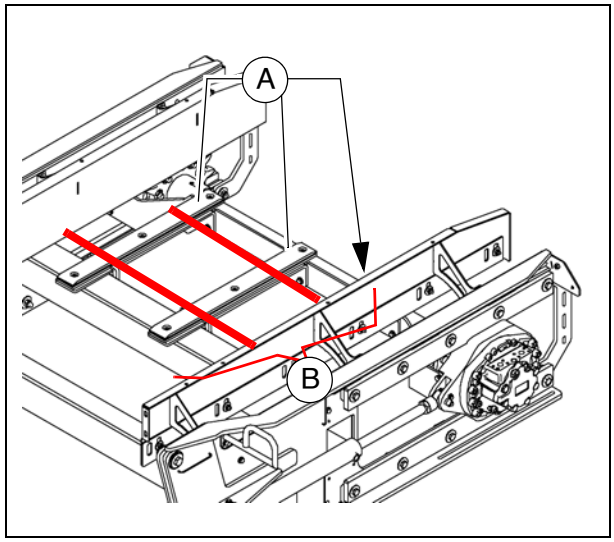
Guide rails (7)



☞ There are 3 wear rails (A) at the conveyor belt end piece.

☞ Check wear at the prescribed intervals and every time that the belt is changed.

☞ The guide rails (A) must be replaced at the latest when the wear limit of 7 mm is no longer achieved in the marked areas (B).

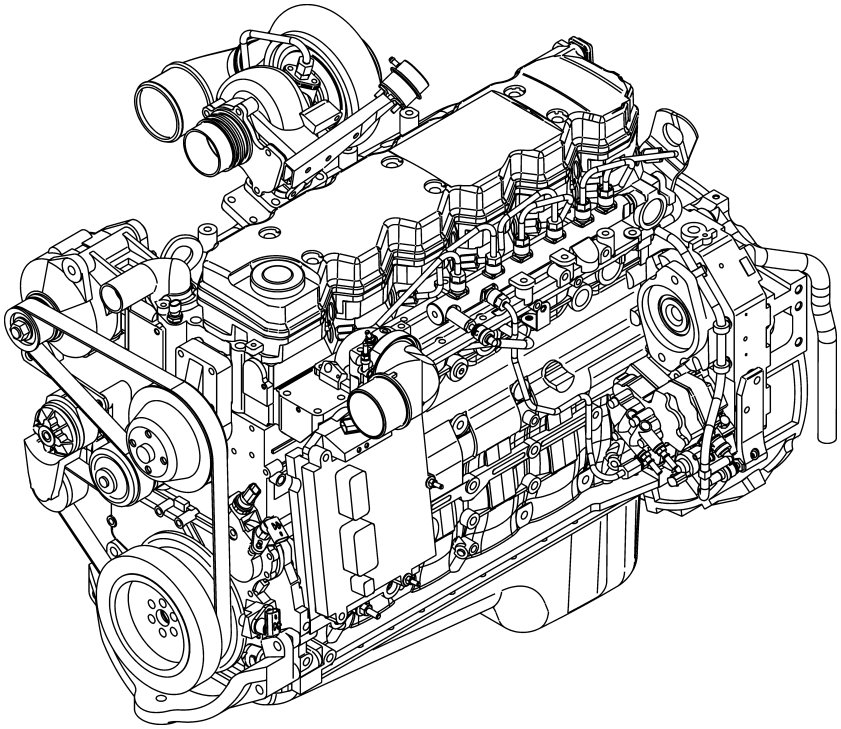


⚠ If the guide rails have to be replaced, this always has to happen in complete sets.

☞ Your Dynapac customer service will be happy to provide support during maintenance, repair and the replacement of wearing parts!

F 50 Maintenance - engine assembly Tier 3 (○)

1 Maintenance - engine assembly



⚠ As well as this maintenance manual, always also pay close attention to the maintenance manual provided by the engine manufacturer. All maintenance work and service intervals itemised here are binding in nature.

⚠ WARNING	**Danger of being pulled in by rotating or conveying vehicle parts**
	Rotating or conveying vehicle parts can cause severe or fatal injuries! - Do not enter the danger zone. - Do not reach into rotating or conveying parts. - Only wear close-fitting clothing. - Comply with the warning and information signs on the vehicle. - Stop the engine and remove the ignition key before any maintenance work. - Comply with all further information in these instructions and in the safety manual.

⚠ CAUTION	**Hot surfaces!**
	Surfaces including those behind covering parts, together with engine combustion gases can be very hot and cause injuries! - Wear your personal safety gear. - Do not touch hot parts of the vehicle. - Only perform maintenance and repair work after the vehicle has cooled down. - Comply with all further information in these instructions and in the safety manual.

1.1 Maintenance intervals

Pos.	Interval								Maintenance point	Note
	10	50	100	250	500 / annually	1000 / annually	2000 / every 2 years	If necessary		
1	■								- Fuel tank Check filling level	
								■	- Fuel tank Refill with fuel	
							■		- Fuel tank Clean the tank and system	
2	■								- Engine lube oil system Check oil level	
								■	- Engine lube oil system Top up oil	
					■				- Engine lube oil system Change oil	
					■				- Engine lube oil system Change oil filter	
3	■								- Engine fuel system Fuel filter (drain the water separator)	
					■				- Engine fuel system Replace fuel pre-filter	
					■				- Engine fuel system Replace fuel filter	
								■	- Engine fuel system Bleed fuel system	

Maintenance	■
Maintenance during the running-in period	▼

Pos.	Interval								Maintenance point	Note
	10	50	100	250	500 / annually	1000 / annually	2000 / every 2 years	If necessary		
4	■								- Engine air filter Check air filter	
	■								- Engine air filter Empty dust collector	
						■		■	- Engine air filter Exchange air filter insert	
5	■								- Engine cooling system Check radiator fins	
				■				■	- Engine cooling system Clean radiator fins	
				■					- Engine cooling system Check level of the coolant	
								■	- Engine cooling system Top up coolant	
					■				- Engine cooling system Check coolant concentration	
								■	- Engine cooling system Adjust coolant concentration	
							■		- Engine cooling system Change coolant	

Maintenance	■
Maintenance during the running-in period	▼

Pos.	Interval								Maintenance point	Note
	10	50	100	250	500 / annually	1000 / annually	2000 / every 2 years	If necessary		
6				■					- Engine drive belt Check drive belt	
								■	- Engine drive belt Tighten drive belt	
						■			- Engine drive belt Replace drive belt	

Maintenance	■
Maintenance during the running-in period	▼

1.2 Maintenance points

Engine fuel tank (1)

- Check the **filling level** using the display on the operating panel.

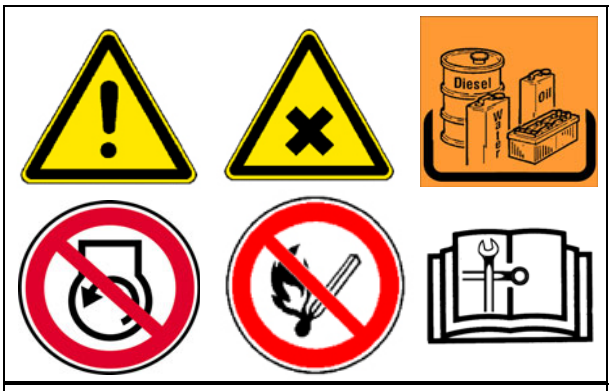
☞ Fill the fuel tank each time before starting work so that the fuel system cannot "run dry" and time-consuming venting (bleeding) can therefore be avoided.

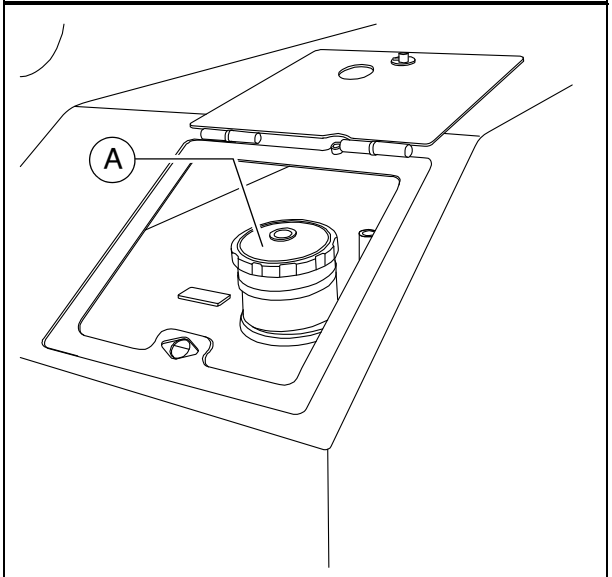
For **filling in** the fuel:

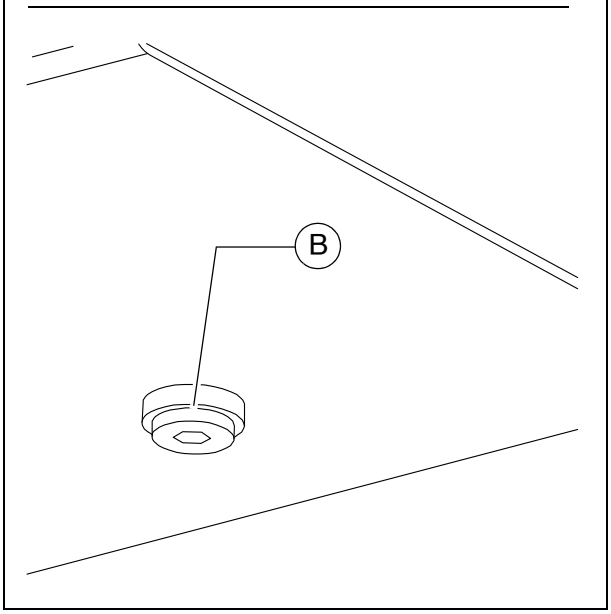
- Remove cap (A).
- Fill in fuel through the filling port until the required fill lever is achieved.
- Replace the cap (A).

Clean the tank and system:

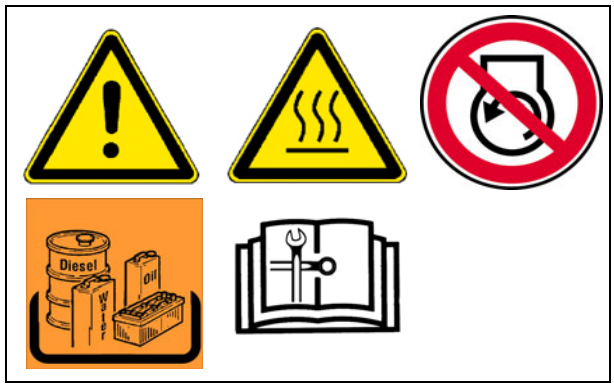
- Unscrew the drain plug (B) at the bottom of the tank and drain into a collection pan about 1 l fuel.
- When fastening the screw again after draining, make sure to use a new seal.







Engine lube oil system (2)

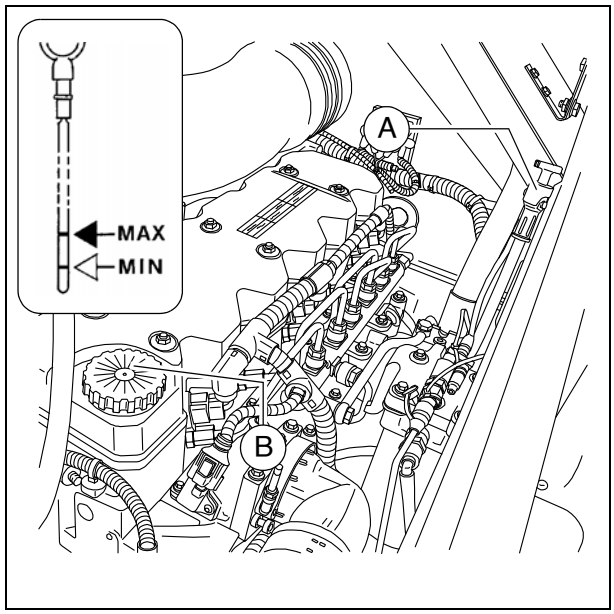


Check oil level

☞ In case of correct oil level, the oil is between the two notches of the sensor rod (A).

☞ Only check the oil level when the vehicle is in a horizontal position!

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



For **filling in** the oil:

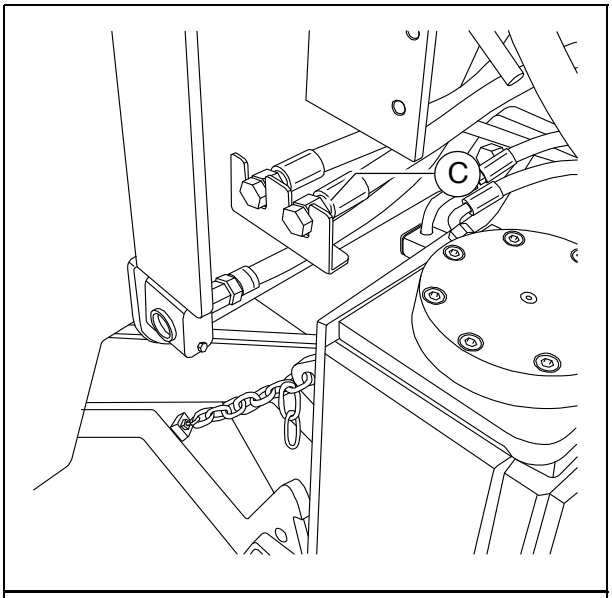
- Remove cap (B).
- Fill up oil to correct level.
- Return cap (B).
- Use sensor rod to check level again.

Oil change:

☞ Change the oil when the engine is at operating temperature.

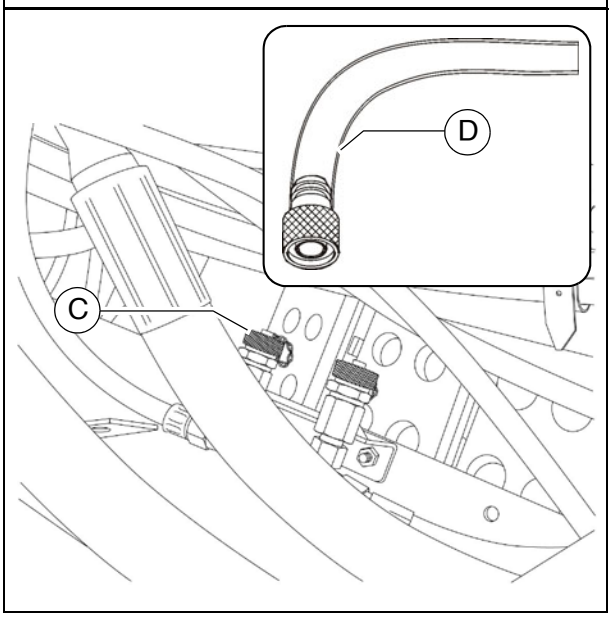
☞ **Oil change < / = s/n XXXX**

- Place the end of the oil drain port hose (C) in the collection container.
- Remove the screw cap with a wrench and allow the oil to drain completely.
- Replace the screw cap and tighten properly.
- Fill in the specified quality of oil through the filler opening (B) on the engine until the oil level rises to the correct mark on the sensor rod (A).



☞ **Oil change > / = s/n XXXX**

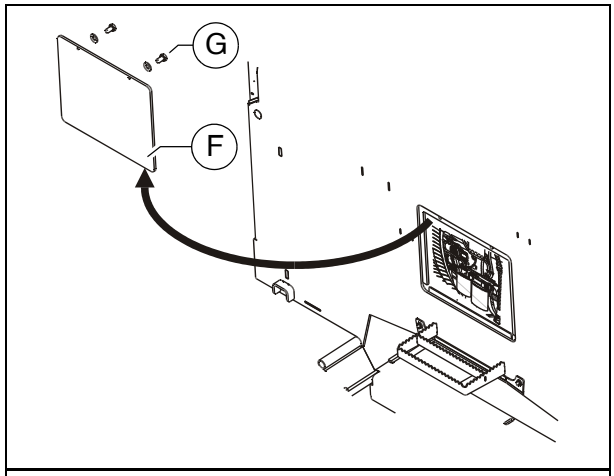
- Unscrew seal cap (C).
- Screwing on the oil drainage hose (D) opens the valve to let the oil drain out.
- Place the end of the hose in the collecting vessel and let the oil drain completely.
- Unscrew the drainage hose and return the screw cap.



Changing the oil filter:

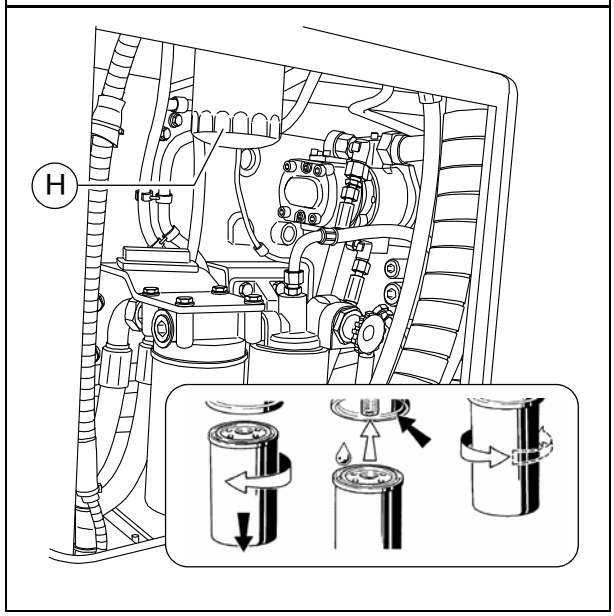
☞ All filters are accessed via the service flap (F) on the vehicle's centre wall:

- Remove the screws (G) from the inner side of the frame and remove the service flap (F).
- After completing the maintenance work, reinstall the service flap (F) properly.



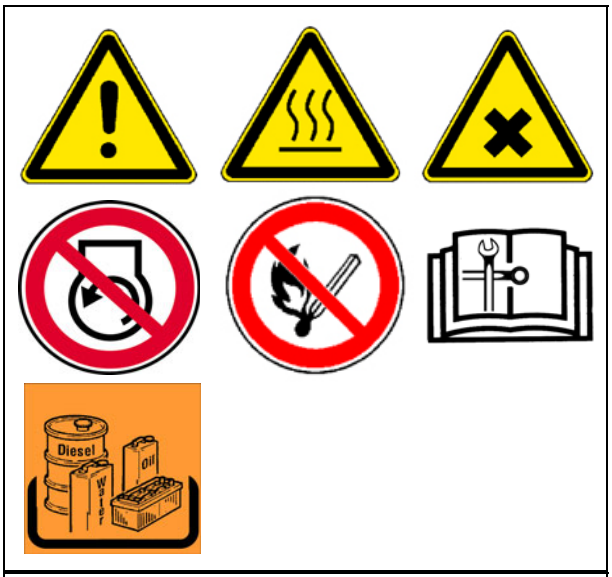
☞ The new filter is inserted during an oil change once the used oil has been drained out.

- Loosen the filter (H) with a filter wrench or filter strap and unscrew it. Clean the contact surface.
- Apply light coating of oil to the gasket on the new filter and fill filter with oil before installing it.
- Tighten filter by hand.



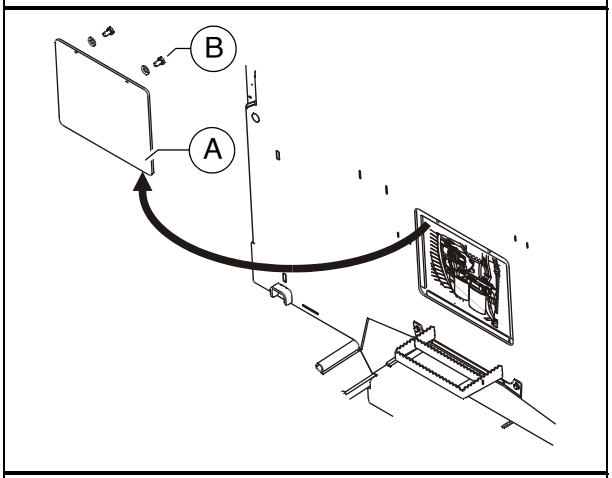
☞ After installing the oil filter, attention must be paid to the oil pressure display and good sealing during the test run. Check oil level again.

Engine fuel system (3)



☞ All filters are accessed via the service flap (A) on the vehicle's centre wall:

- Remove the screws (B) from the inner side of the frame and remove the service flap (A).
- After completing the maintenance work, reinstall the service flap (A) properly.



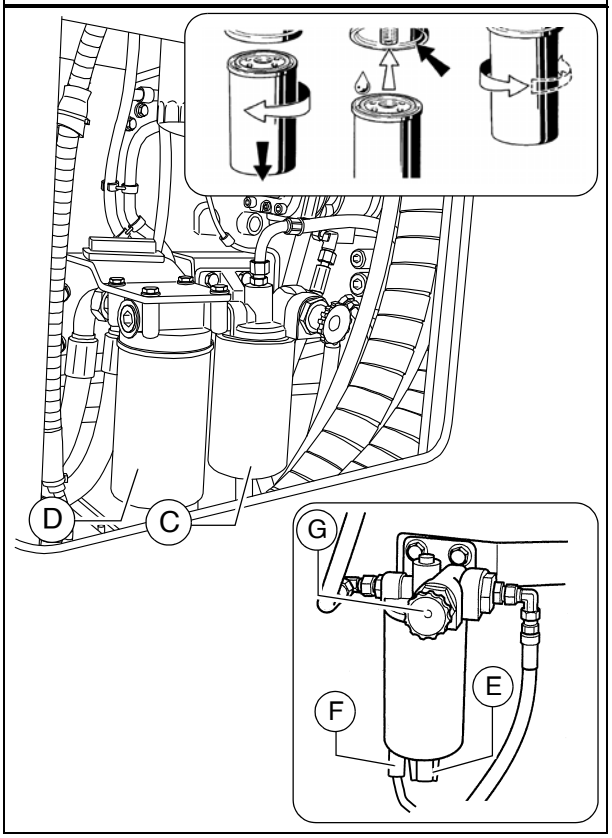
☞ The fuel filter system consists of two filters:

- Prefilter with water separator (C)
- Main filter (D)

Prefilter - draining of water

☞ Drain the collecting vessel at regular intervals, or in response to an error message from the engine control unit.

- Drain off separated water at the cock (E) and collect, then close the cock again.



Changing the prefilter:

- Drain off separated water at the cock (E) and collect, then close the cock again.
- Pull off the water sensor (F) connector.
- Loosen the filter cartridge (C) using a filter wrench or filter strap and unscrew.
- Clean sealing surface of filter bracket.
- Lightly oil filter cartridge seal and screw hand-tight under the bracket.
- Reconnect the water sensor (F) connector.

Bleeding the pre-filter:

- Release the manual fuel pump's (G) bayonet lock by pressing and simultaneously turning counter-clockwise.
- The pump plunger is now pressed out via the spring.
- Pump until a very high resistance is perceptible and pumping can only be carried out very slowly.
- Now continue pumping a few more times. (The return line must be filled).
- Start the engine and operate for approx. 5 minutes at idle speed or low load.
- Check the prefilter for leaks whilst doing this.
- Lock the manual fuel pump's (G) bayonet lock by pressing and simultaneously turning clockwise.

Replacing the main filter:

- Loosen the filter cartridge (D) using a filter wrench or filter strap and unscrew.
- Clean sealing surface of filter bracket.
- Lightly oil filter cartridge seal and screw hand-tight under the bracket.

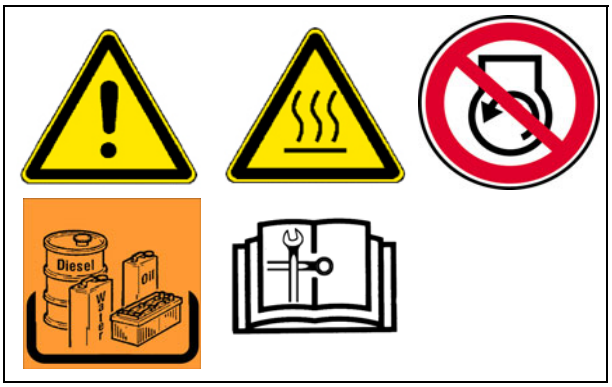
☞ After fitting the filter, ensure good sealing action during the test run.

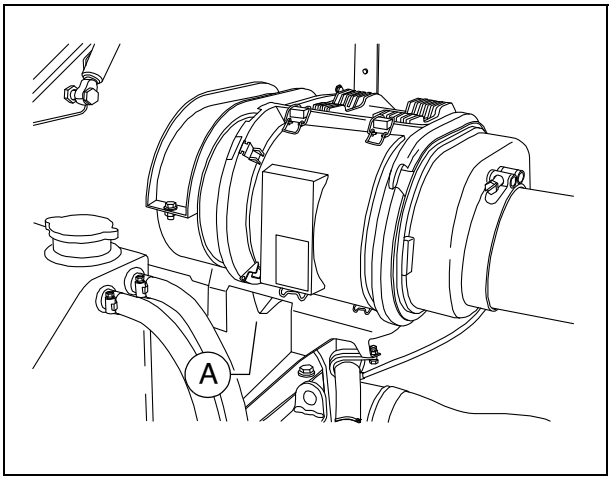
Engine air filter (4)

Empty dust collector

- Empty the dust removal valve (A) on the air filter housing by compressing the discharge slot.
- Remove any baked on dust by pressing together the upper valve section.

☞ Clean the dust removal valve from time to time.





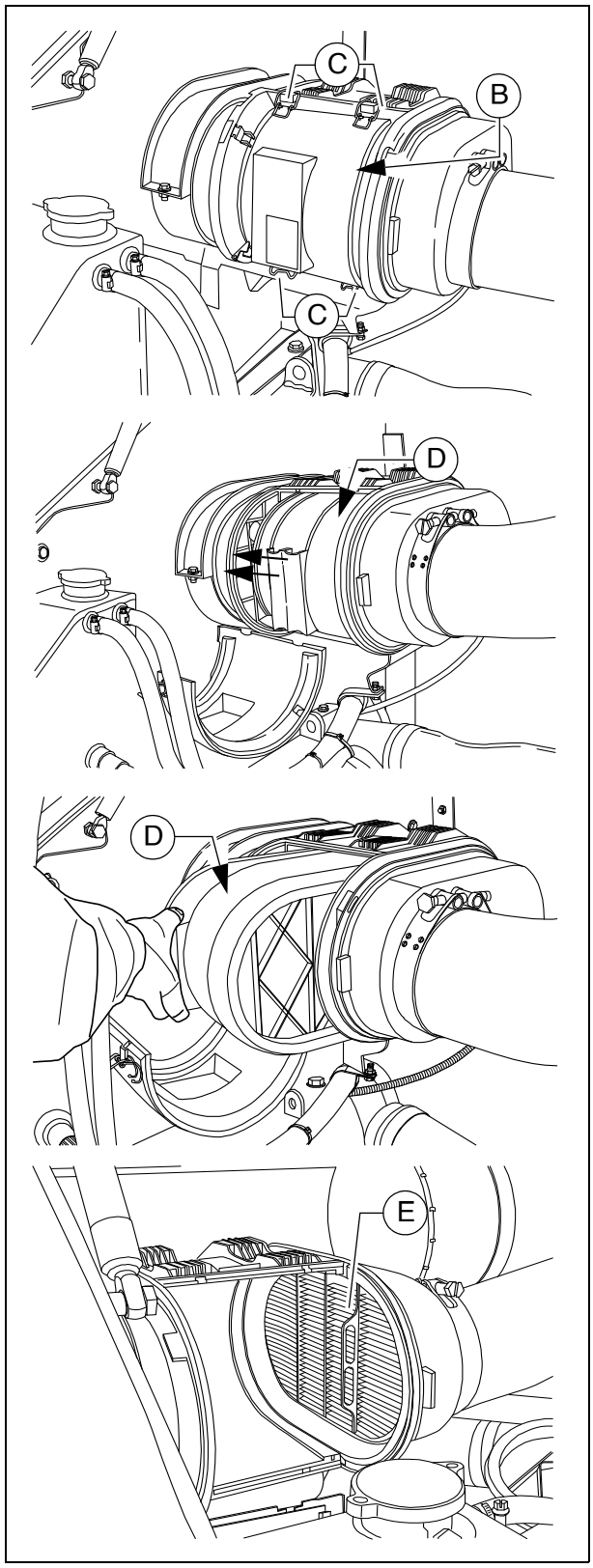
Exchange air filter insert

☞ Maintenance of the filter becomes necessary if:

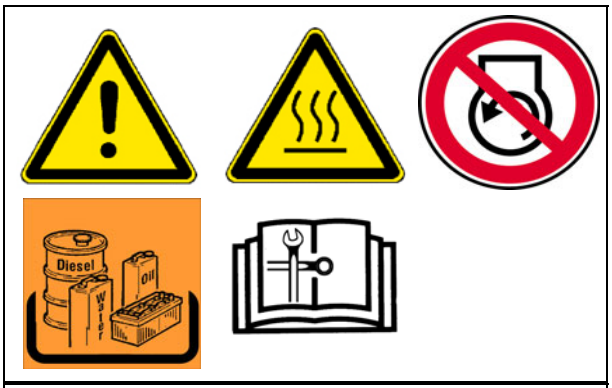
- Engine electronics service indicator

- Open the air filter housing (B) at the clips (C).
- Move filter element (D) to the side a little and then pull it out of the housing.
- Pull out the safety element (E) and check for damage.

☞ Replace the safety element (E) after the filter has been serviced 3 times, but after 2 years at the latest (never clean it!).



Engine cooling system (5)

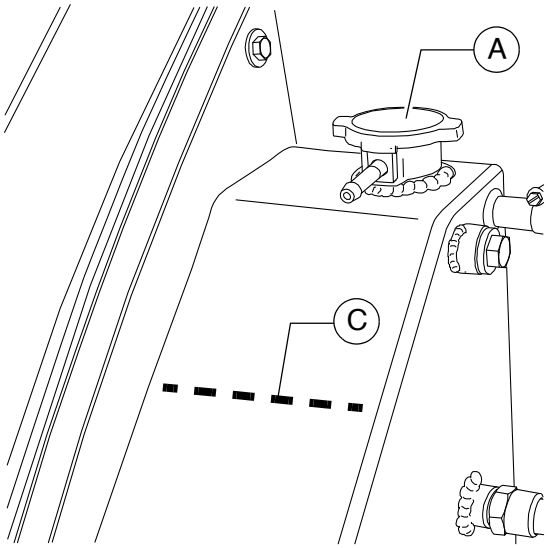


Checking / topping up coolant

The cooling water level must be checked when the system is cold. Make sure that sufficient anti-freeze and anti-corrosion agent is available (-25°C).

When hot, the system is under pressure. When opening, there is a danger of scalding!

- If necessary fill in a sufficient amount of coolant through the open port (A) of the compensating tank.



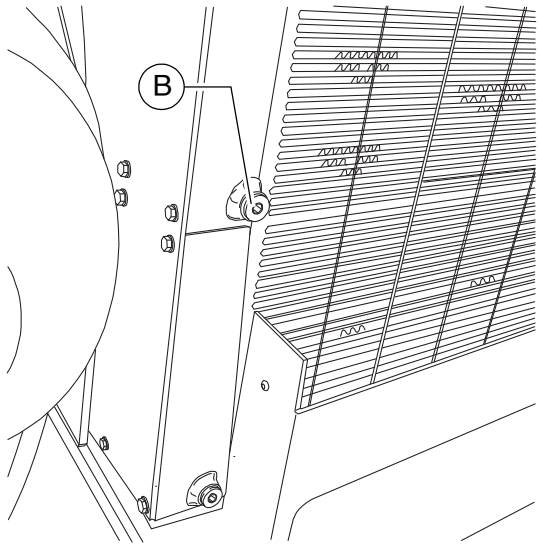
Change coolant

When hot, the system is under pressure. When opening, there is a danger of scalding!

Use only approved coolants!

Observe the instructions in the chapter entitled "Operating substances"!

- Remove the drain screw (B) on the radiator and let the coolant drain completely.
- Reinstall the drain screw (B) and tighten properly.
- Fill in coolant through the filling opening (A) on the compensation tank up to approx. 7 cm (C) from the top edge of the compensation tank.



The air is only able to escape completely from the cooling system once the engine has reached its operating temperature (at least 90°C).
Check the fluid level again, top up if necessary.

Checking and cleaning the radiator fins

- If necessary, remove leaves, dust or sand from the radiator.

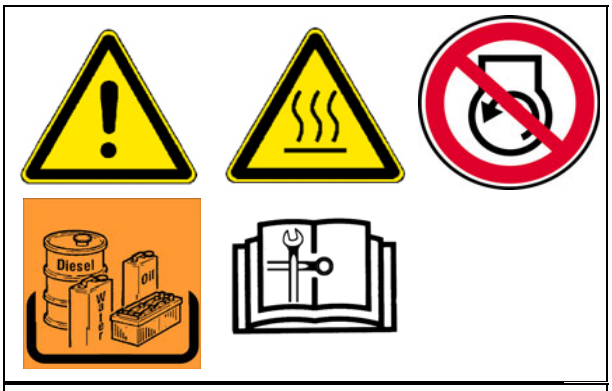
☞ Observe engine's operating instructions

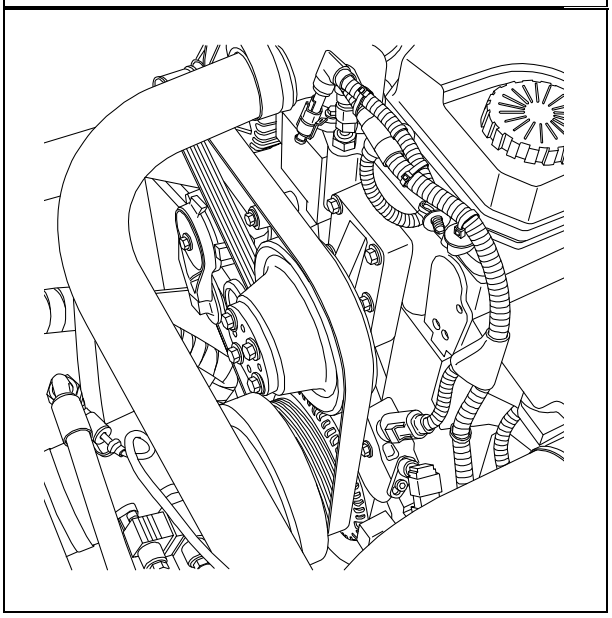
Check coolant concentration

- Check the concentration using a suitable tester (hydrometer).
- Adjust the concentration if necessary.

☞ Observe engine's operating instructions!

Engine drive belt (6)





Check drive belt

- Check the drive belt for damage.

☞ Small transverse cracks in the belt are acceptable.

⚠ In the event of longitudinal cracks which intersect with transverse cracks and damaged material surfaces, belt replacement is necessary.

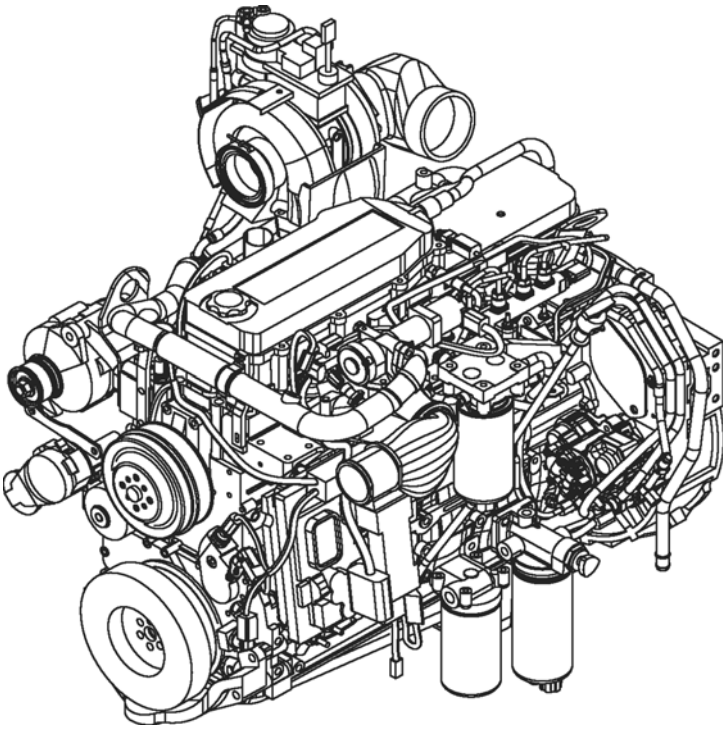
☞ Observe engine's operating instructions!

Replace drive belt

☞ Observe engine's operating instructions!

F 51 Maintenance - engine assembly Tier 4i (○)

1 Maintenance - engine assembly



⚠ As well as this maintenance manual, always also pay close attention to the maintenance manual provided by the engine manufacturer. All maintenance work and service intervals itemised here are binding in nature.

⚠ WARNING	**Danger of being pulled in by rotating or conveying vehicle parts**
	Rotating or conveying vehicle parts can cause severe or fatal injuries! - Do not enter the danger zone. - Do not reach into rotating or conveying parts. - Only wear close-fitting clothing. - Comply with the warning and information signs on the vehicle. - Stop the engine and remove the ignition key before any maintenance work. - Comply with all further information in these instructions and in the safety manual.

⚠ CAUTION	**Hot surfaces!**
	Surfaces including those behind covering parts, together with engine combustion gases can be very hot and cause injuries! - Wear your personal safety gear. - Do not touch hot parts of the vehicle. - Only perform maintenance and repair work after the vehicle has cooled down. - Comply with all further information in these instructions and in the safety manual.

1.1 Maintenance intervals

Pos.	Interval								Maintenance point	Note
	10	50	250	500 / annually	1000 / annually	2000 / every 2 years	5000	If necessary		
1	■								- Fuel tank Check filling level	
								■	- Fuel tank Refill with fuel	
						■			- Fuel tank Clean the tank and system	
2	■								- Engine lube oil system Check oil level	
								■	- Engine lube oil system Top up oil	
				■					- Engine lube oil system Change oil	
				■					- Engine lube oil system Change oil filter	
3	■								- Engine fuel system Fuel filter (drain the water separator)	
				■					- Engine fuel system Replace fuel pre-filter	
				■					- Engine fuel system Replace fuel filter	
								■	- Engine fuel system Bleed fuel system	

Maintenance	■
Maintenance during the running-in period	▼

Pos.	Interval								Maintenance point	Note
	10	50	250	500 / annually	1000 / annually	2000 / every 2 years	5000	If necessary		
4	■								- Engine air filter Check air filter	
	■								- Engine air filter Empty dust collector	
					■			■	- Engine air filter Exchange air filter insert	
5	■								- Engine cooling system Check radiator fins	
			■					■	- Engine cooling system Clean radiator fins	
			■						- Engine cooling system Check level of the coolant	
								■	- Engine cooling system Top up coolant	
				■					- Engine cooling system Check coolant concentration	
								■	- Engine cooling system Adjust coolant concentration	
						■			- Engine cooling system Change coolant	

Maintenance	■
Maintenance during the running-in period	▼

Pos.	Interval								Maintenance point	Note
	10	50	250	500 / annually	1000 / annually	2000 / every 2 years	5000	If necessary		
6			■						- Engine drive belt Check drive belt	
								■	- Engine drive belt Tighten drive belt	
					■				- Engine drive belt Replace drive belt	
7						■			- Crankshaft ventilation filter Replace filter element	
8							■		- Exhaust system Inspect the particulate filter	

Maintenance	■
Maintenance during the running-in period	▼

1.2 Maintenance points

Engine fuel tank (1)

- Check the **filling level** using the display on the operating panel.

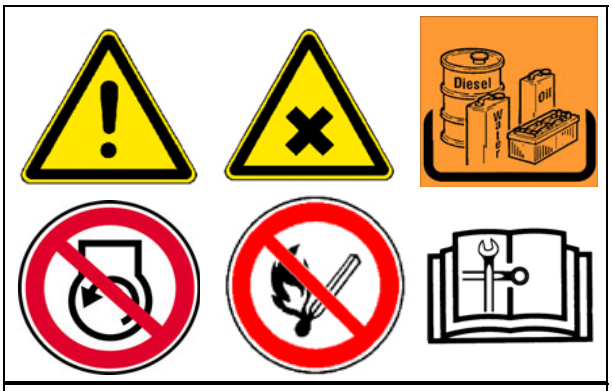
☞ Fill the fuel tank each time before starting work so that the fuel system cannot "run dry" and time-consuming venting (bleeding) can therefore be avoided.

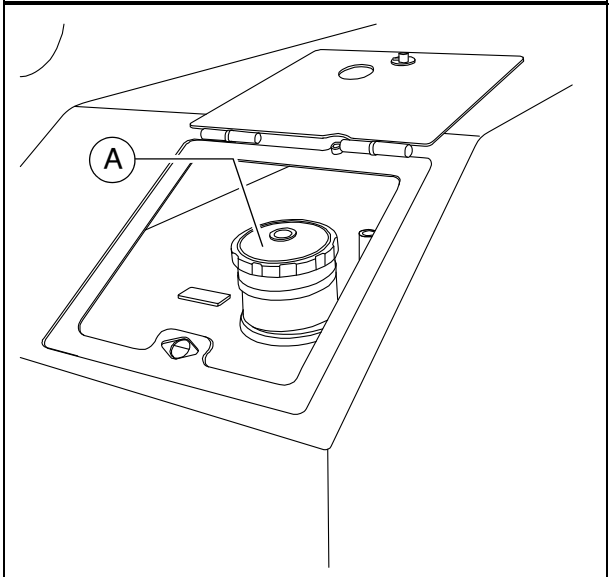
For **filling in** the fuel:

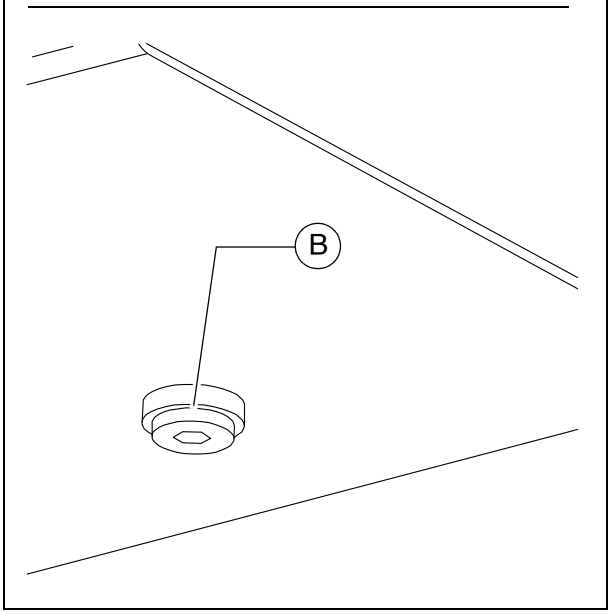
- Remove cap (A).
- Fill in fuel through the filling port until the required fill lever is achieved.
- Replace the cap (A).

Clean the tank and system:

- Unscrew the drain plug (B) at the bottom of the tank and drain into a collection pan about 1 l fuel.
- When fastening the screw again after draining, make sure to use a new seal.

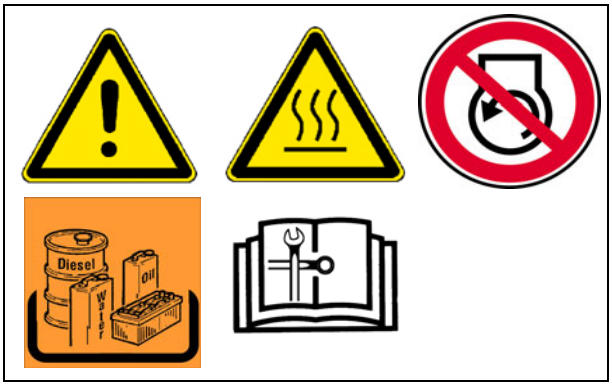






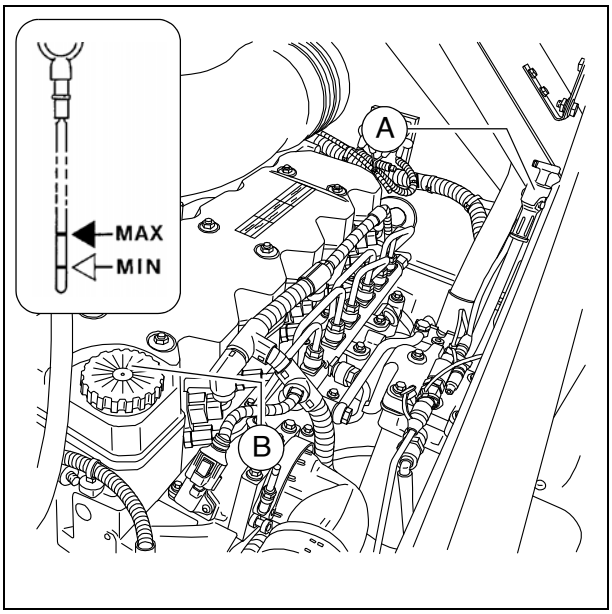
Engine lube oil system (2)

Check oil level



☞ In case of correct oil level, the oil is between the two notches of the sensor rod (A).

☞ Only check the oil level when the vehicle is in a horizontal position!



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

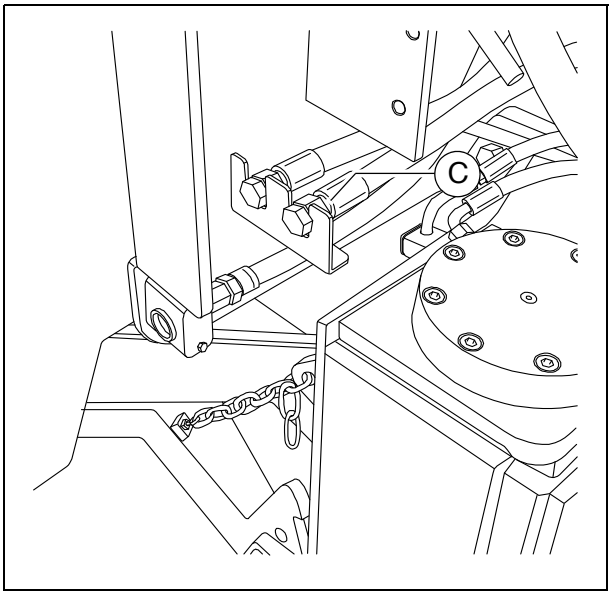
For **filling in** the oil:

- Remove cap (B).
- Fill up oil to correct level.
- Return cap (B).
- Use sensor rod to check level again.

Oil change:

☞ Change the oil when the engine is at operating temperature

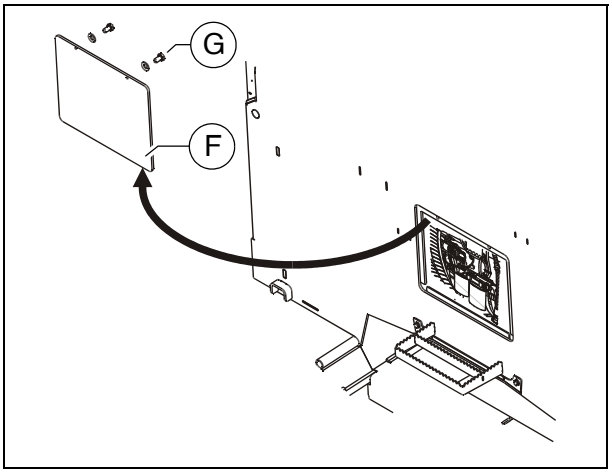
- Place the end of the oil drain port hose (C) in the collection container.
- Remove the screw cap with a wrench and allow the oil to drain completely.
- Replace the screw cap and tighten properly.
- Fill in the specified quality of oil through the filler opening (B) on the engine until the oil level rises to the correct mark on the sensor rod (A).



Changing the oil filter:

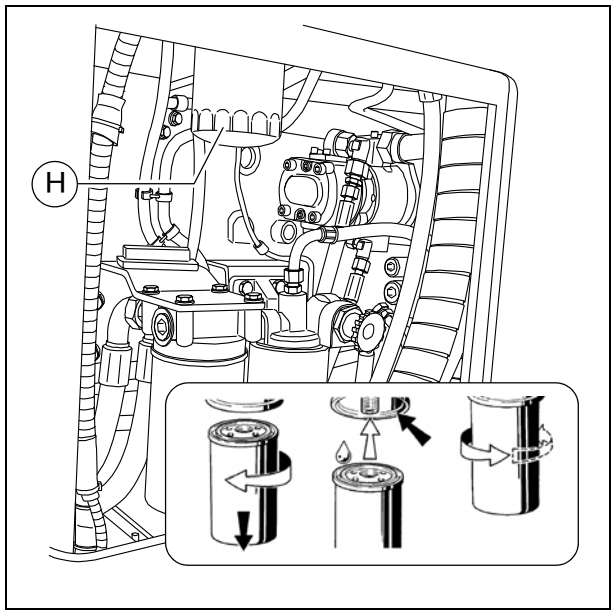
☞ All filters are accessed via the service flap (F) on the vehicle's centre wall:

- Remove the screws (G) from the inner side of the frame and remove the service flap (F).
- After completing the maintenance work, reinstall the service flap (F) properly.



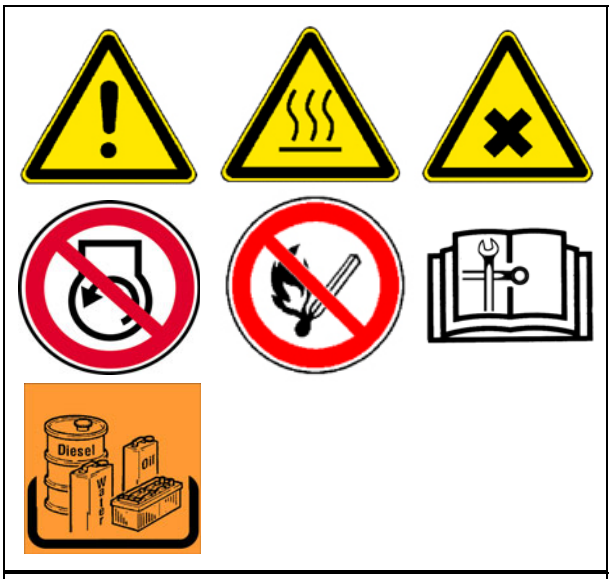
☞ The new filter is inserted during an oil change once the used oil has been drained out.

- Loosen the filter (H) with a filter wrench or filter strap and unscrew it. Clean the contact surface.
- Apply light coating of oil to the gasket on the new filter and fill filter with oil before installing it.
- Tighten filter by hand.



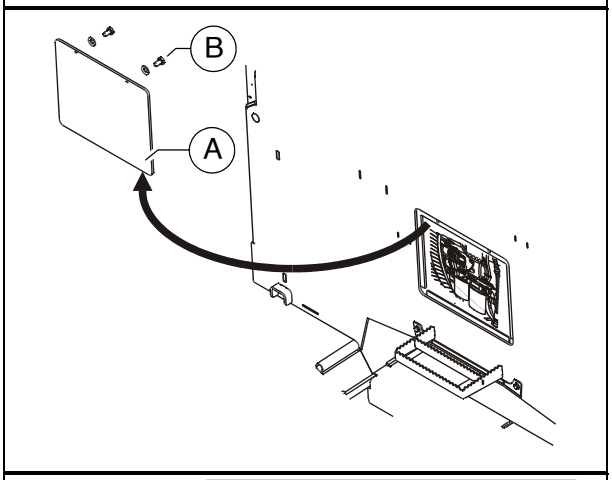
☞ After installing the oil filter, attention must be paid to the oil pressure display and good sealing during the test run. Check oil level again.

Engine fuel system (3)



☞ All filters are accessed via the service flap (A) on the vehicle's centre wall:

- Remove the screws (B) from the inner side of the frame and remove the service flap (A).
- After completing the maintenance work, reinstall the service flap (A) properly.



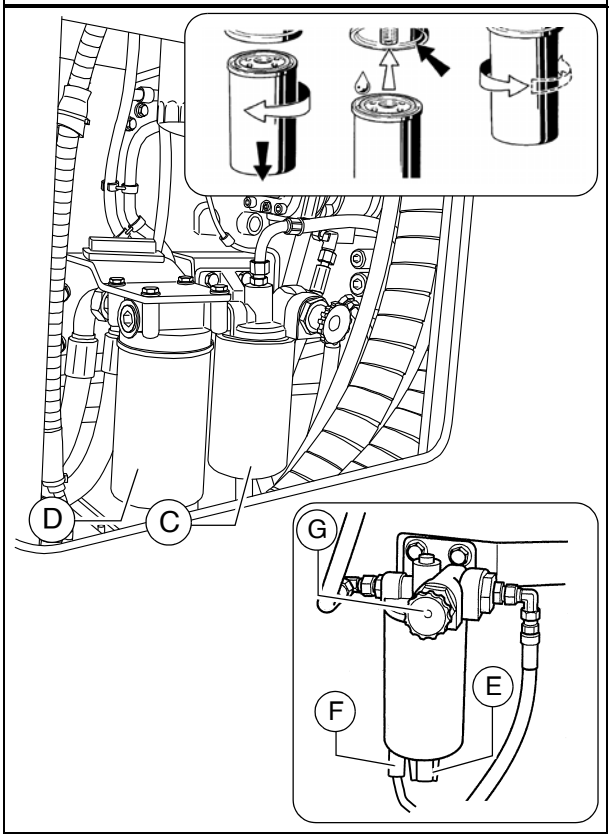
☞ The fuel filter system consists of two filters:

- Prefilter with water separator (C)
- Main filter (D)

Prefilter - draining of water

☞ Drain the collecting vessel at regular intervals, or in response to an error message from the engine control unit.

- Drain off separated water at the cock (E) and collect, then close the cock again.



Changing the prefilter:

- Drain off separated water at the cock (E) and collect, then close the cock again.
- Pull off the water sensor (F) connector.
- Loosen the filter cartridge (C) using a filter wrench or filter strap and unscrew.
- Clean sealing surface of filter bracket.
- Lightly oil filter cartridge seal and screw hand-tight under the bracket.
- Reconnect the water sensor (F) connector.

Bleeding the pre-filter:

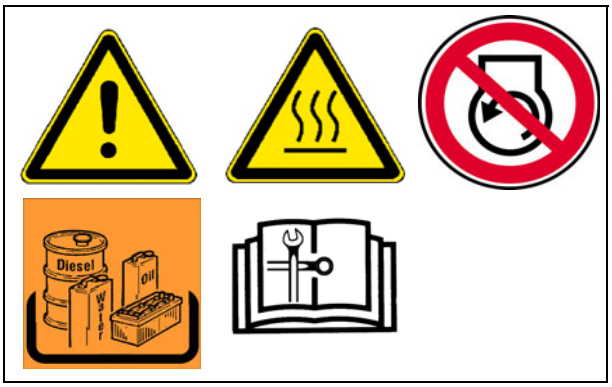
- Release the manual fuel pump's (G) bayonet lock by pressing and simultaneously turning counter-clockwise.
- The pump plunger is now pressed out via the spring.
- Pump until a very high resistance is perceptible and pumping can only be carried out very slowly.
- Now continue pumping a few more times. (The return line must be filled).
- Start the engine and operate for approx. 5 minutes at idle speed or low load.
- Check the prefilter for leaks whilst doing this.
- Lock the manual fuel pump's (G) bayonet lock by pressing and simultaneously turning clockwise.

Replacing the main filter:

- Loosen the filter cartridge (D) using a filter wrench or filter strap and unscrew.
- Clean sealing surface of filter bracket.
- Lightly oil filter cartridge seal and screw hand-tight under the bracket.

☞ After fitting the filter, ensure good sealing action during the test run.

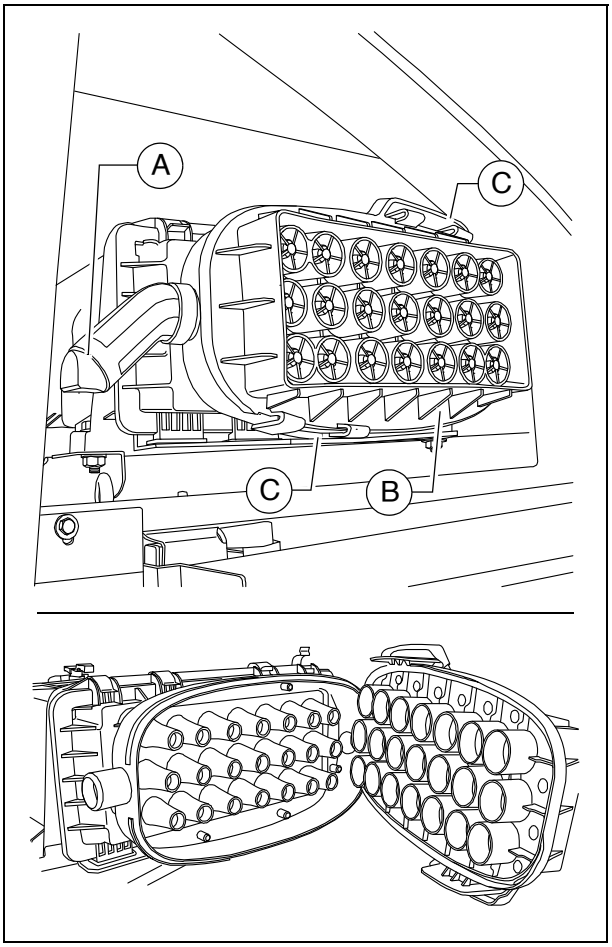
Engine air filter (4)



Empty dust collector

- Empty the dust removal valve (A) on the air filter housing by compressing the discharge slot.
- Remove any baked on dust by pressing together the upper valve section.

- Open the collector housing (B) at the clips (C) and remove dust accumulations.
- Properly reposition the collector housing and lock at the clips (C).



☞ Clean the dust removal valve from time to time.

Cleaning / replacing the air filter cartridge

☞ Maintenance of the filter becomes necessary if:

- Engine electronics service indicator

- Open the collector housing (B) at the clips (C)
- Open the collector housing (D) at the clips (E).
- Pull out the filter element (F) and safety element (G).

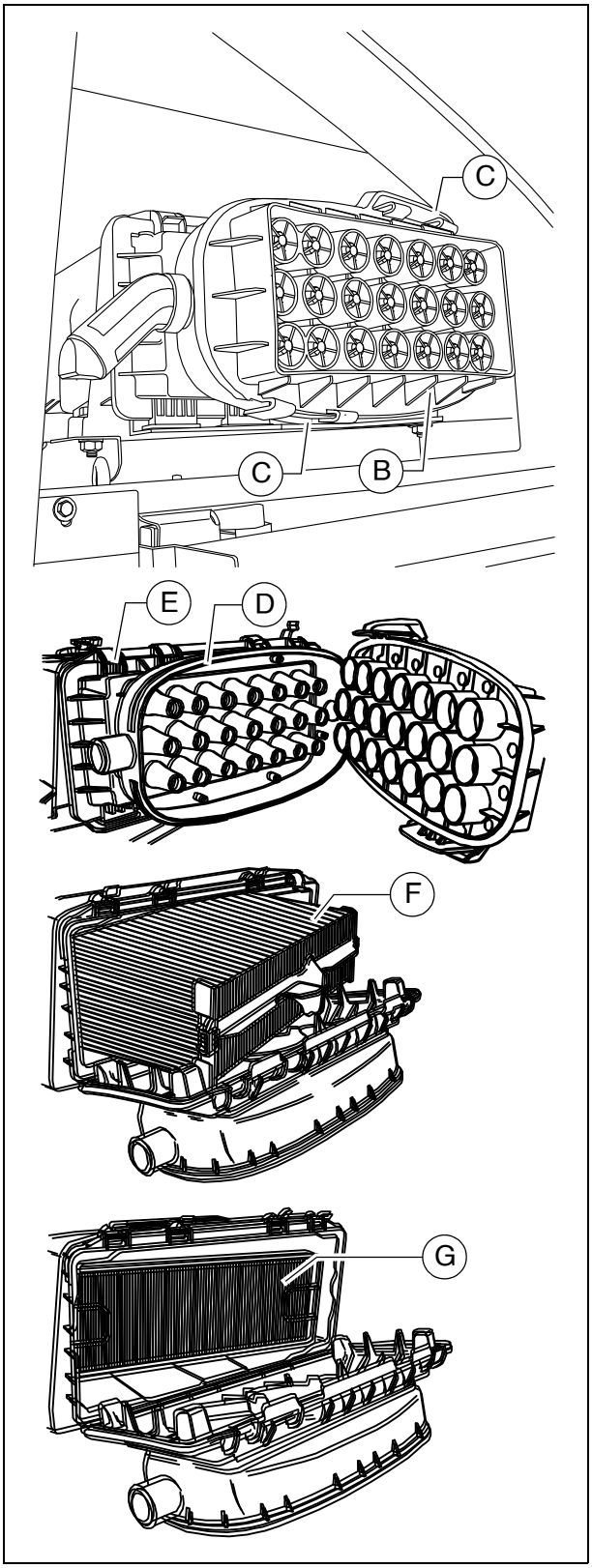
☞ Clean the filter element (F) and replace after one year at the latest.

- Blow out with dry pressure air (max. 5 bar) from inside out or tap it (in case of emergency only).

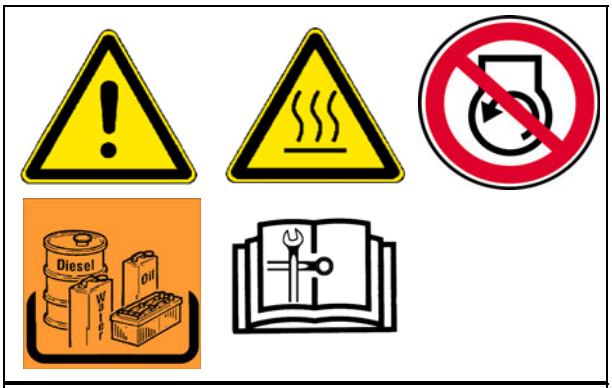
☞ Do not damage cartridge when doing so.

- Check the soundness of the filter papers of the filter cartridge (by exposing to light) and the soundness of the seals. Replace them if necessary.

☞ Replace the safety element (G) after the filter has been serviced 5 times, but after 2 years at the latest (never clean it!).



Engine cooling system (5)

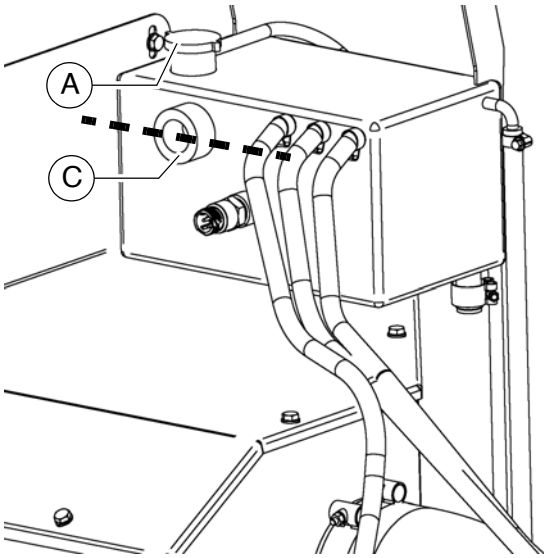


Checking / topping up coolant

The cooling water level must be checked when the system is cold. Make sure that sufficient anti-freeze and anti-corrosion agent is available (-25°C).

When hot, the system is under pressure. When opening, there is a danger of scalding!

- If necessary fill in a sufficient amount of coolant through the open port (A) of the compensating tank.



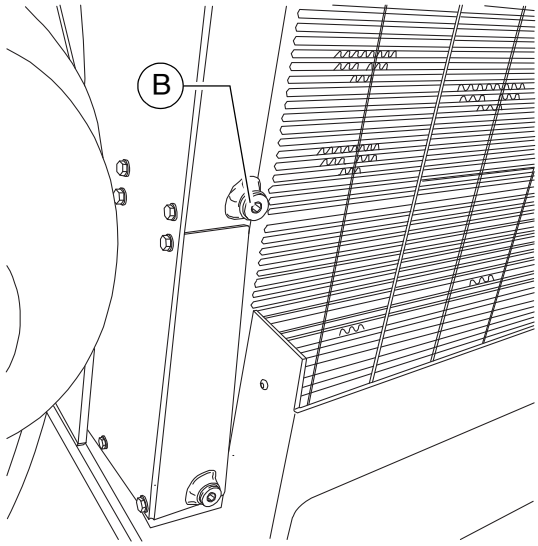
Change coolant

When hot, the system is under pressure. When opening, there is a danger of scalding!

Use only approved coolants!

Observe the instructions in the chapter entitled "Operating substances"!

- Remove the drain screw (B) on the radiator and let the coolant drain completely.
- Reinstall the drain screw (B) and tighten properly.
- Fill in coolant through the filling opening (A) on the compensation tank until the coolant level rises to the centre of the sight glass (C).



The air is only able to escape completely from the cooling system once the engine has reached its operating temperature (at least 90°C).
Check the fluid level again, top up if necessary.

Checking and cleaning the radiator fins

- If necessary, remove leaves, dust or sand from the radiator.

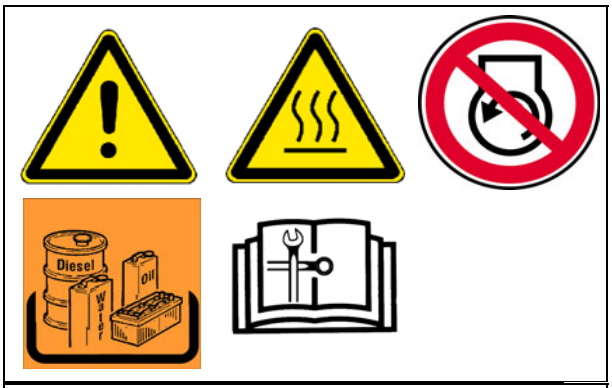
☞ Observe engine's operating instructions!

Check coolant concentration

- Check the concentration using a suitable tester (hydrometer).
- Adjust the concentration if necessary.

☞ Observe engine's operating instructions!

Engine drive belt (6)



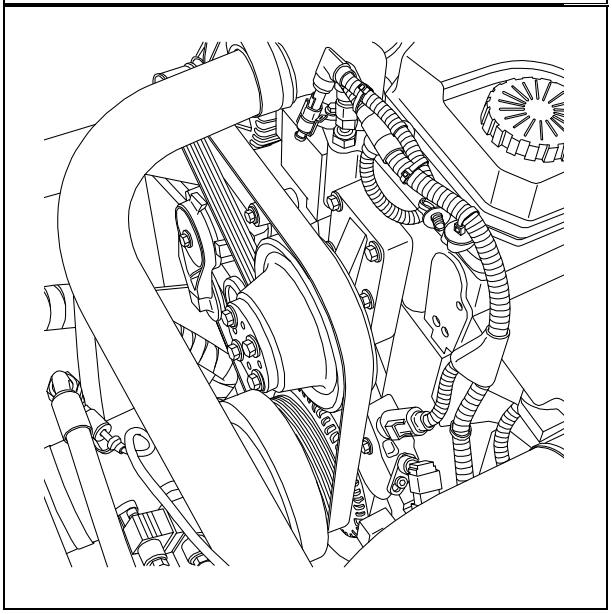
Check drive belt

- Check the drive belt for damage.

☞ Small transverse cracks in the belt are acceptable.

⚠ In the event of longitudinal cracks which intersect with transverse cracks and damaged material surfaces, belt replacement is necessary.

☞ Observe engine's operating instructions!



Replace drive belt

☞ Observe engine's operating instructions!

Crankshaft ventilation filter (7)

Replace filter element

- Take the cover off (A) and remove the filter cover (B)
- Remove the depleted filter.

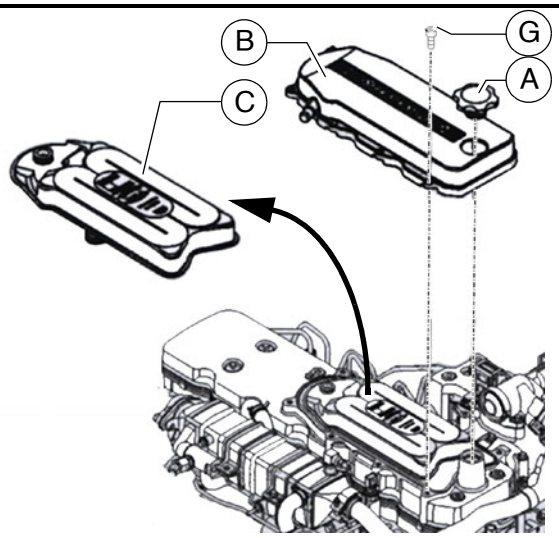
☞ Check the cover and cover seal for any signs of damage and replace if necessary!



- Clean the contact surface (D) of the filter and the sealing surfaces of the O-rings with a cloth and light solvent and then dry them with a clean cloth.
- Clean the filter cover with warm soapy water (E) and dry it with compressed air.

STOP Wear protective goggles when using working with compressed air! Never blow compressed air towards other people!

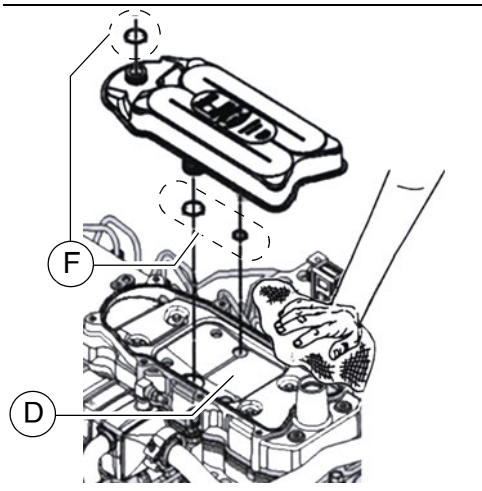
STOP Use personal safety equipment when cleaning with solvents! Avoid contact with skin!

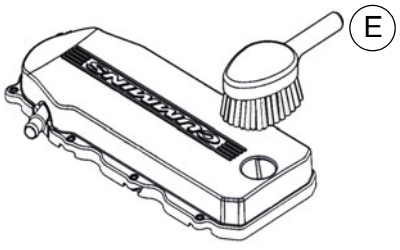


- Apply a little fresh engine oil to the O-rings (F) of the new filter and set the filter correctly on its contact surface.
- Fit the cover (B):
  - Start with the inside screw (G) and work forwards clockwise.

⚠ The torque for the cover screws is 7 Nm.

⚠ After installation, check correct sealing during a trial run.



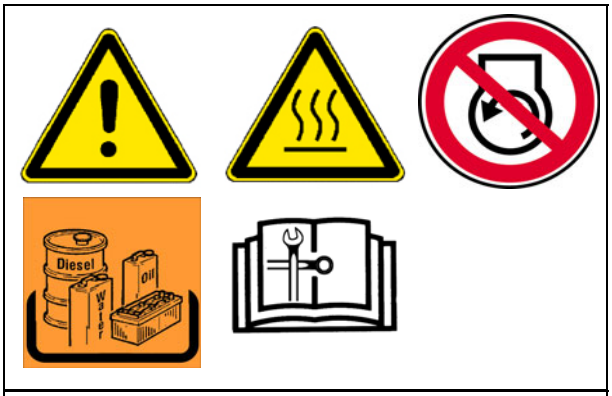


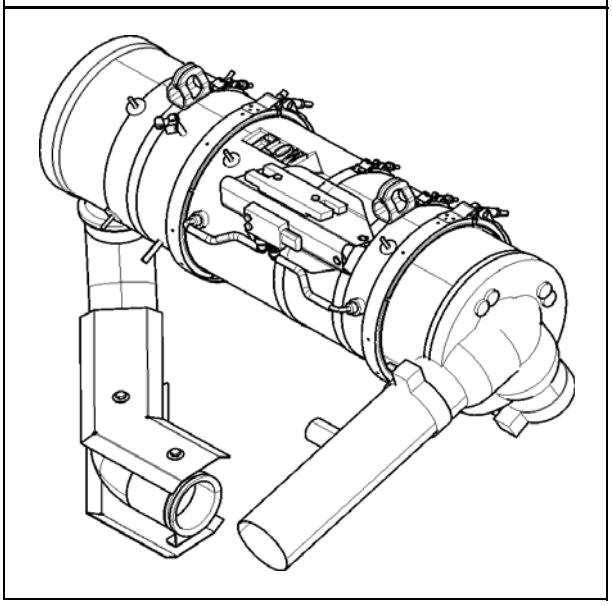
Exhaust system - particulate filter (8)

Inspect the particulate filter

☞ The particular filter must be dismantled for full inspection.
A detailed description can be found in the operating manual for the engine.

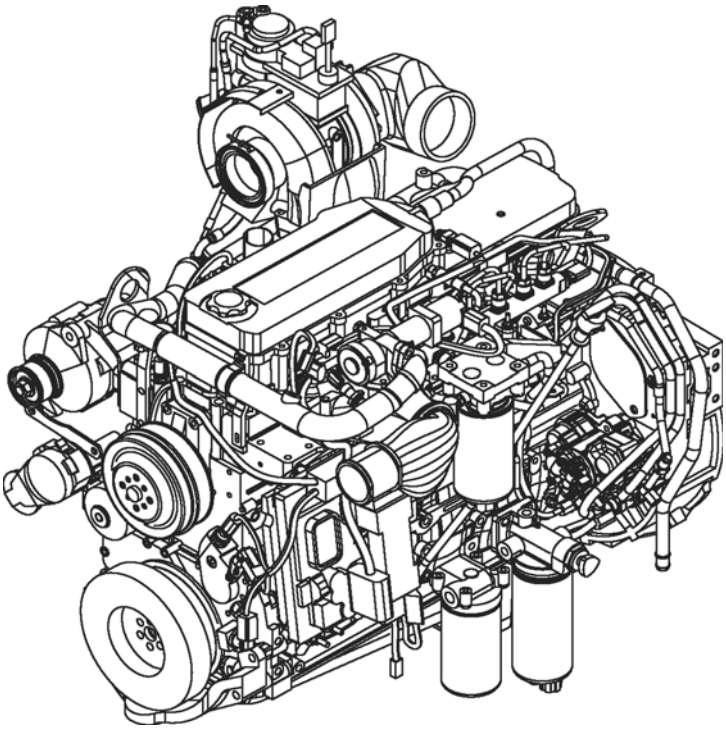
⚠ All safety instructions can be found in the operating manual for the engine, together with the details of the prescribed torques or required aids (e.g. locking the screws).





F 52 Maintenance - engine assembly Tier 4F (○)

1 Maintenance - engine assembly



⚠ As well as this maintenance manual, always also pay close attention to the maintenance manual provided by the engine manufacturer. All maintenance work and service intervals itemised here are binding in nature.

⚠ WARNING	**Danger of being pulled in by rotating or conveying vehicle parts**
	Rotating or conveying vehicle parts can cause severe or fatal injuries! - Do not enter the danger zone. - Do not reach into rotating or conveying parts. - Only wear close-fitting clothing. - Comply with the warning and information signs on the vehicle. - Stop the engine and remove the ignition key before any maintenance work. - Comply with all further information in these instructions and in the safety manual.

⚠ CAUTION	**Hot surfaces!**
	Surfaces including those behind covering parts, together with engine combustion gases can be very hot and cause injuries! - Wear your personal safety gear. - Do not touch hot parts of the vehicle. - Only perform maintenance and repair work after the vehicle has cooled down. - Comply with all further information in these instructions and in the safety manual.

1.1 Maintenance intervals

Pos.	Interval									Maintenance point	Note
	10	50	250	500 / annually	1000 / annually	2000 / every 2 years	4000 / every 3 years	5000	If necessary		
1	■									- Fuel tank Check filling level	
									■	- Fuel tank Refill with fuel	
						■				- Fuel tank Clean the tank and system	
2	■									- Engine lube oil system Check oil level	
									■	- Engine lube oil system Top up oil	
				■						- Engine lube oil system Change oil	
				■						- Engine lube oil system Change oil filter	
3	■									- Engine fuel system Fuel filter (drain the water separator)	
				■						- Engine fuel system Replace fuel pre-filter	
				■						- Engine fuel system Replace fuel filter	
									■	- Engine fuel system Bleed fuel system	

Maintenance	■
Maintenance during the running-in period	▼

Pos.	Interval									Maintenance point	Note
	10	50	250	500 / annually	1000 / annually	2000 / every 2 years	4000 / every 3 years	5000	If necessary		
4	■									- Engine air filter Check air filter	
	■									- Engine air filter Empty dust collector	
					■				■	- Engine air filter Exchange air filter insert	
5	■									- Engine cooling system Check radiator fins	
			■						■	- Engine cooling system Clean radiator fins	
			■							- Engine cooling system Check level of the coolant	
									■	- Engine cooling system Top up coolant	
				■						- Engine cooling system Check coolant concentration	
									■	- Engine cooling system Adjust coolant concentration	
						■				- Engine cooling system Change coolant	

Maintenance	■
Maintenance during the running-in period	▼

Pos.	Interval									Maintenance point	Note
	10	50	250	500 / annually	1000 / annually	2000 / every 2 years	4000 / every 3 years	5000	If necessary		
6	■									- AdBlue® / DEF tank Check level	
									■	- AdBlue® / DEF tank Top up with AdBlue® / DEF	
						■			■	- AdBlue® / DEF tank Replace suction filter	
			■							- AdBlue® / DEF tank Check tank cover	
									■	- AdBlue® / DEF tank Clean tank cover	
							■			- AdBlue® / DEF dosing unit Inspection and cleaning	
							■		■	- AdBlue® / DEF dosing unit Change filter	
							■			- Check hoses and lines for damage	

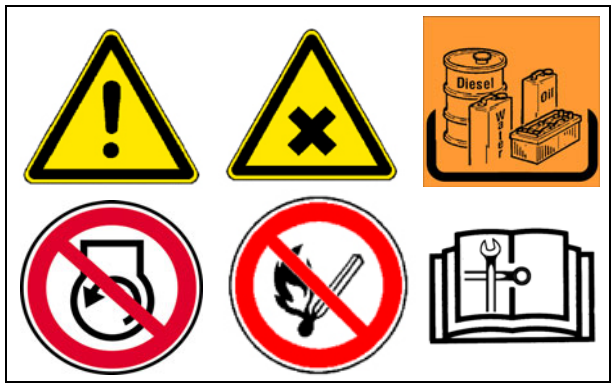
Maintenance	■
Maintenance during the running-in period	▼

Pos.	Interval									Maintenance point	Note
	10	50	250	500 / annually	1000 / annually	2000 / every 2 years	4000 / every 3 years	5000	If necessary		
7			■							- Engine drive belt Check drive belt	
									■	- Engine drive belt Tighten drive belt	
					■					- Engine drive belt Replace drive belt	
8						■				- Crankshaft ventilation filter Replace filter element	
9							■			- Exhaust system / Inspect diesel oxidisation catalytic converter	

Maintenance	■
Maintenance during the running-in period	▼

1.2 Maintenance points

Engine fuel tank (1)



- Check the **filling level** using the display on the operating panel.

☞ Fill the fuel tank each time before starting work so that the fuel system cannot "run dry" and time-consuming venting (bleeding) can therefore be avoided.

⚠ Observe the instructions for fuel recommendations and the specification in the chapter on "Lubricants and operating substances"!

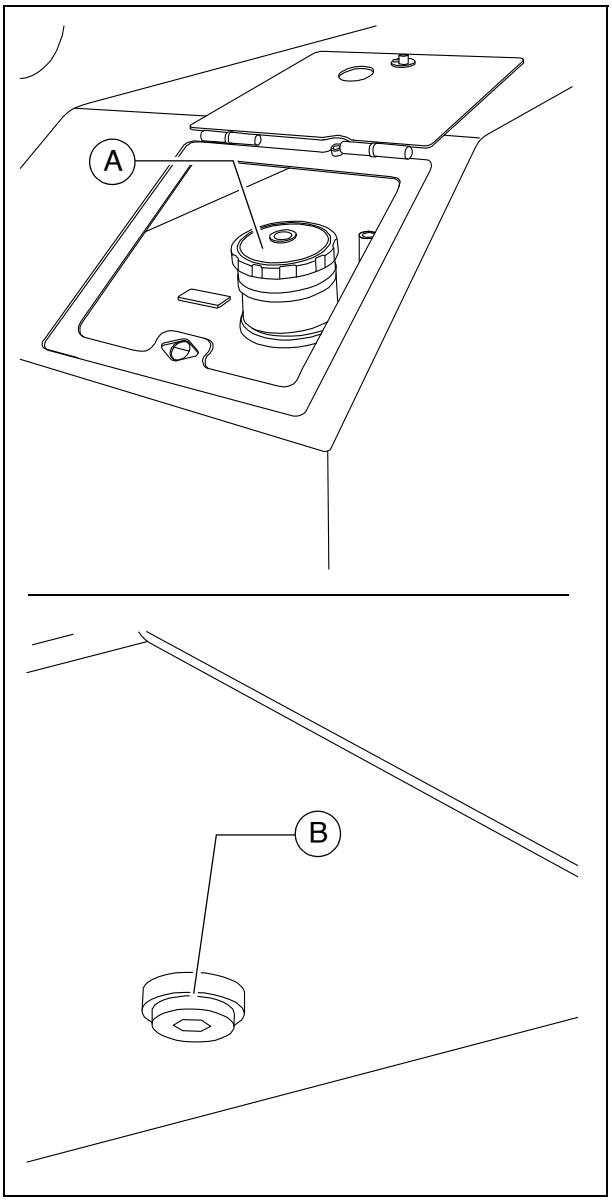
⚠ DANGER	**Danger from ultra low-sulphur diesel**
	Ultra low-sulphur diesel (ULSD) poses a greater risk of combustion from static electricity than earlier grades of diesel that contained more sulphur. An explosion or combustion can cause severe to fatal injuries ! - When refuelling vehicles, always ensure that the fuel pump is earthed with equipotential bonding to the vehicle. - When a fuel pump has correct equipotential bonding, there is a continuous electrically conductive connection between all components of the fuel pump and the vehicle being refuelled. - Contact your fuel supplier or the supplier of your refuelling system to ensure that the fuel pump complies with the currently valid refuelling standards and that correct earthing and equipotential bonding is warranted.

For **filling** in the fuel:

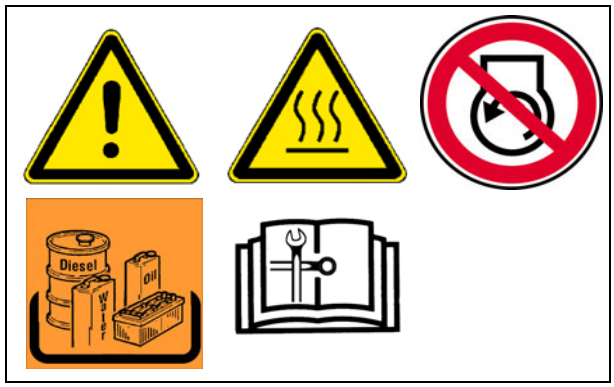
- Remove cap (A).
- Fill in fuel through the filling port until the required fill lever is achieved.
- Replace the cap (A).

Clean the tank and system:

- Unscrew the drain plug (B) at the bottom of the tank and drain into a collection pan about 1 l fuel.
- When fastening the screw again after draining, make sure to use a new seal.



Engine lube oil system (2)

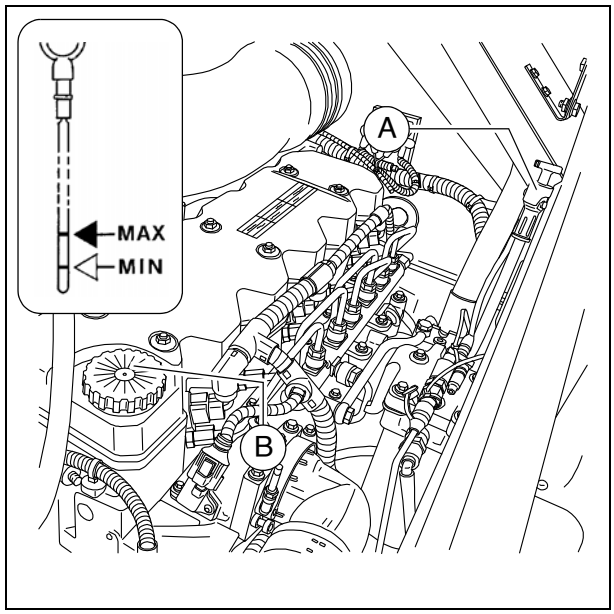


Check oil level

☞ In case of correct oil level, the oil is between the two notches of the sensor rod (A).

☞ Only check the oil level when the vehicle is in a horizontal position!

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



For **filling** in the oil:

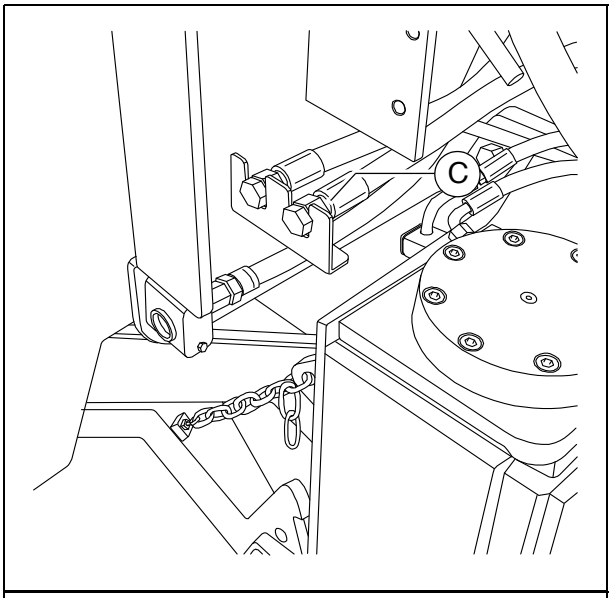
- Remove cap (B).
- Fill up oil to correct level.
- Return cap (B).
- Use sensor rod to check level again.

Oil change:

☞ Change the oil when the engine is at operating temperature.

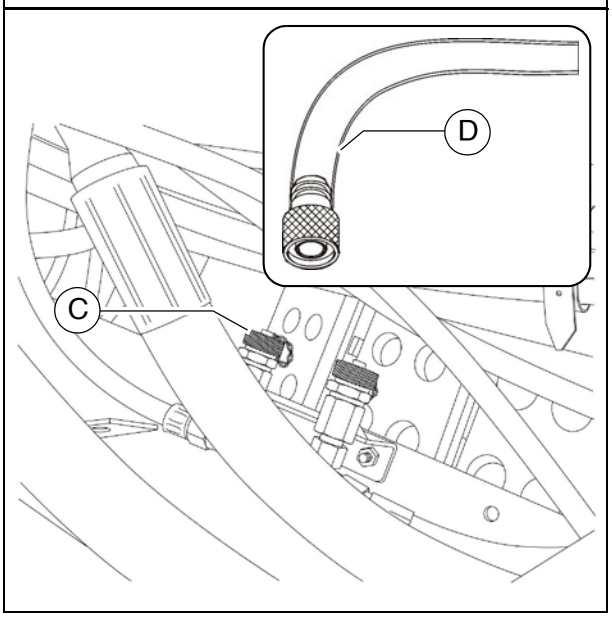
☞ **Oil change < / = s/n XXXX**

- Place the end of the oil drain port hose (C) in the collection container.
- Remove the screw cap with a wrench and allow the oil to drain completely.
- Replace the screw cap and tighten properly.
- Fill in the specified quality of oil through the filler opening (B) on the engine until the oil level rises to the correct mark on the sensor rod (A).



☞ **Oil change > / = s/n XXXX**

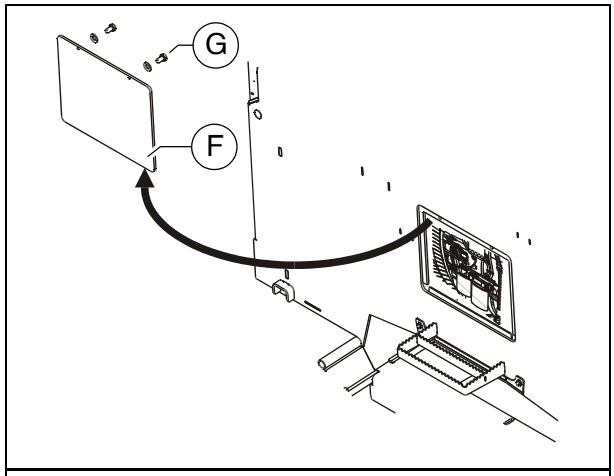
- Unscrew seal cap (C).
- Screwing on the oil drainage hose (D) opens the valve to let the oil drain out.
- Place the end of the hose in the collecting vessel and let the oil drain completely.
- Unscrew the drainage hose and return the screw cap.



Changing the oil filter:

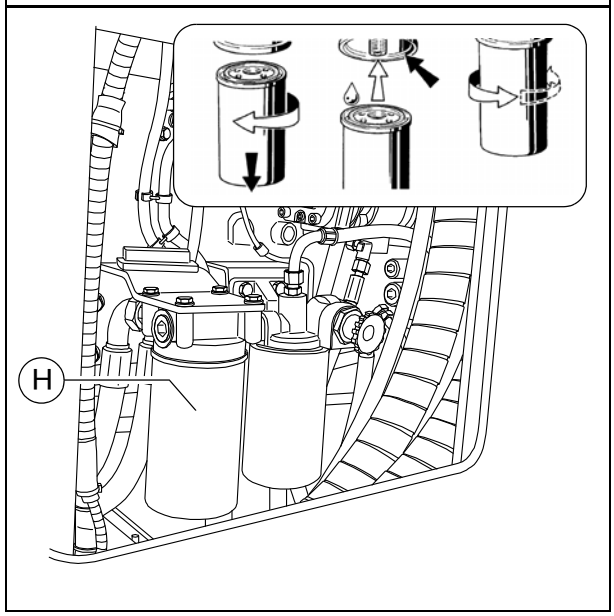
☞ All filters are accessed via the service flap (F) on the vehicle's centre wall:

- Remove the screws (G) from the inner side of the frame and remove the service flap (F).
- After completing the maintenance work, reinstall the service flap (F) properly.



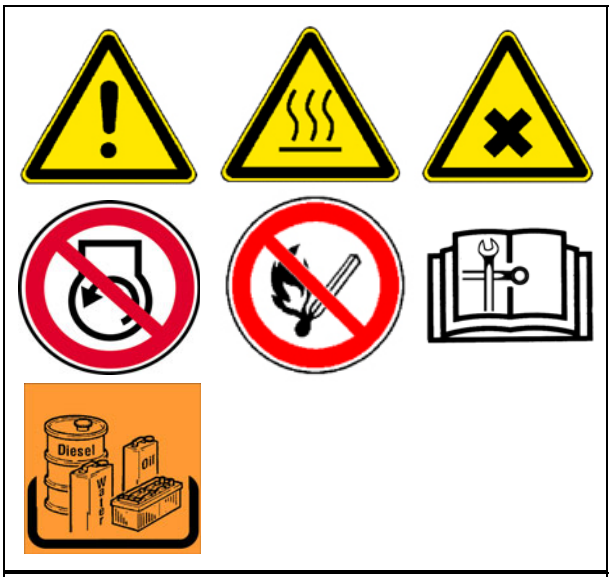
☞ The new filter is inserted during an oil change once the used oil has been drained out.

- Loosen the filter (H) with a filter wrench or filter strap and unscrew it. Clean the contact surface.
- Apply light coating of oil to the gasket on the new filter and fill filter with oil before installing it.
- Tighten filter by hand.



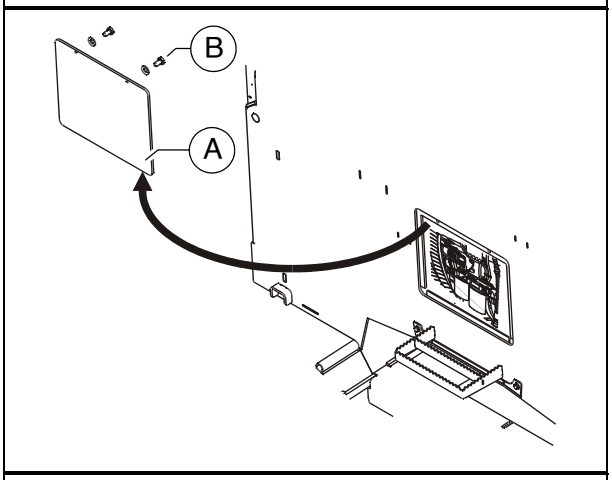
☞ After installing the oil filter, attention must be paid to the oil pressure display and good sealing during the test run. Check oil level again.

Engine fuel system (3)



☞ All filters are accessed via the service flap (A) on the vehicle's centre wall:

- Remove the screws (B) from the inner side of the frame and remove the service flap (A).
- After completing the maintenance work, reinstall the service flap (A) properly.



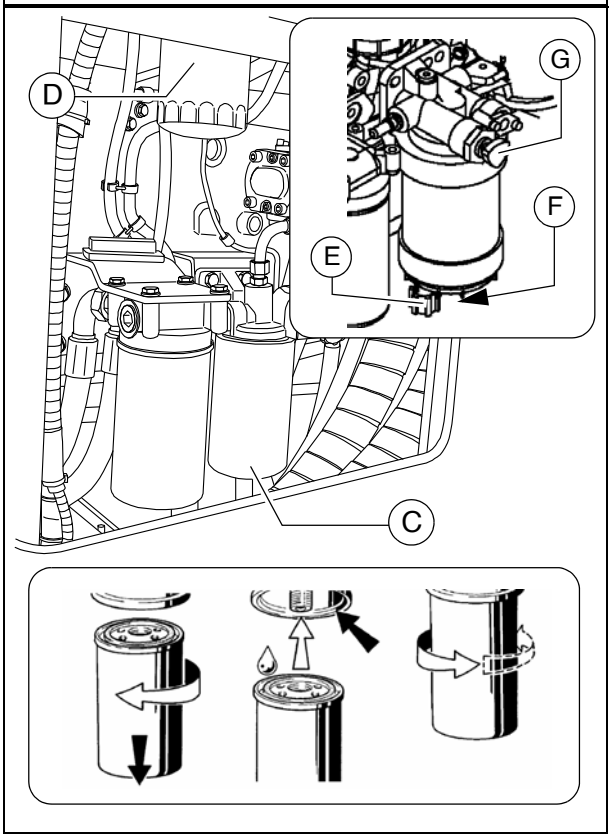
☞ The fuel filter system consists of two filters:

- Prefilter with water separator (C)
- Main filter (D)

Prefilter - draining of water

☞ Drain the collecting vessel at regular intervals, or in response to an error message from the engine control unit.

- Drain off separated water at the cock (E) and collect, then close the cock again.



Changing the prefilter:

- Drain off separated water at the cock (E) and collect, then close the cock again.
- Pull off the water sensor (F) connector.
- Loosen the filter cartridge (C) using a filter wrench or filter strap and unscrew.
- Clean sealing surface of filter bracket.
- Lightly oil filter cartridge seal and screw hand-tight under the bracket.
- Reconnect the water sensor (F) connector.

Bleeding the pre-filter:

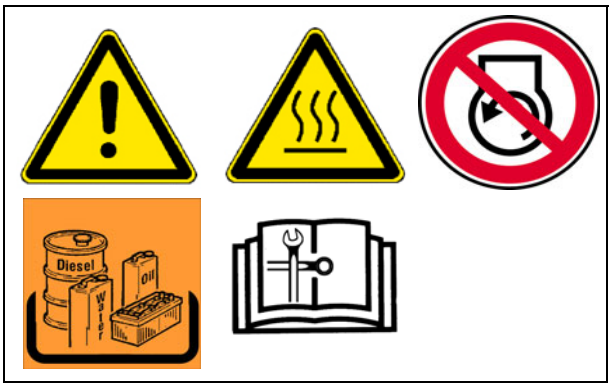
- Release the manual fuel pump's (G) bayonet lock by pressing and simultaneously turning counter-clockwise.
- The pump plunger is now pressed out via the spring.
- Pump until a very high resistance is perceptible and pumping can only be carried out very slowly.
- Now continue pumping a few more times. (The return line must be filled).
- Start the engine and operate for approx. 5 minutes at idle speed or low load.
- Check the prefilter for leaks whilst doing this.
- Lock the manual fuel pump's (G) bayonet lock by pressing and simultaneously turning clockwise.

Replacing the main filter:

- Loosen the filter cartridge (D) using a filter wrench or filter strap and unscrew.
- Clean sealing surface of filter bracket.
- Lightly oil filter cartridge seal and screw hand-tight under the bracket.

☞ After fitting the filter, ensure good sealing action during the test run.

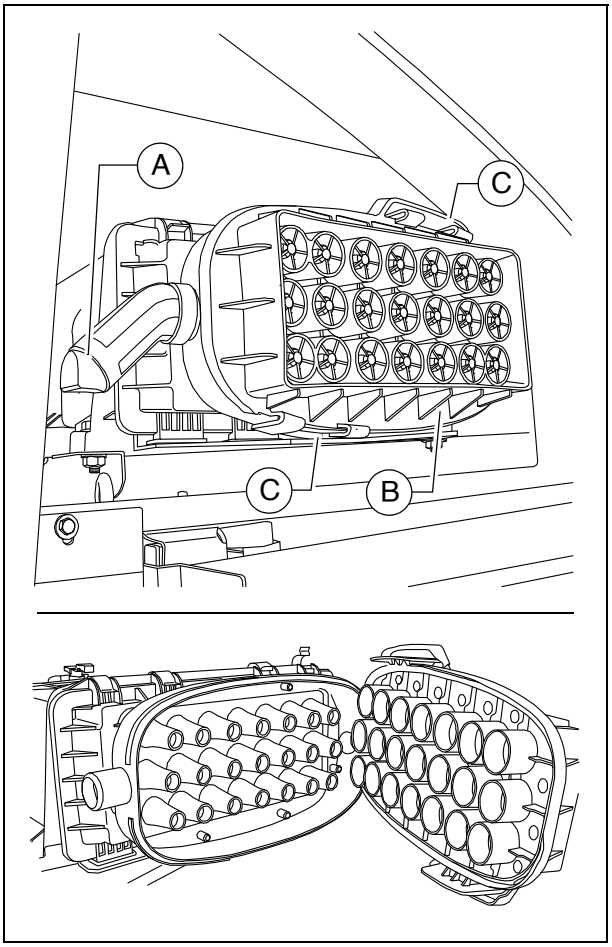
Engine air filter (4)



Empty dust collector

- Empty the dust removal valve (A) on the air filter housing by compressing the discharge slot.
- Remove any baked on dust by pressing together the upper valve section.

- Open the collector housing (B) at the clips (C) and remove dust accumulations.
- Properly reposition the collector housing and lock at the clips (C).



☞ Clean the dust removal valve from time to time.

Cleaning / replacing the air filter cartridge

☞ Maintenance of the filter becomes necessary if:

- Engine electronics service indicator

- Open the collector housing (B) at the clips (C)
- Open the collector housing (D) at the clips (E).
- Pull out the filter element (F) and safety element (G).

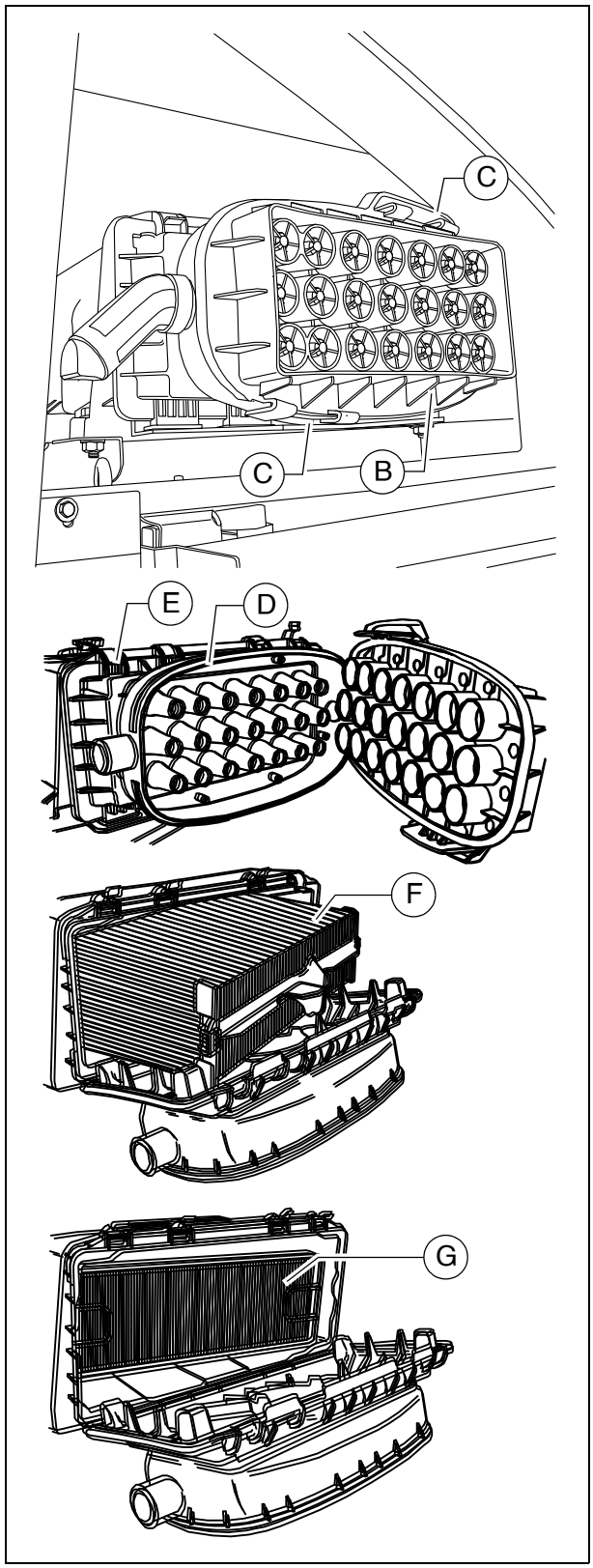
☞ Clean the filter element (F) and replace after one year at the latest.

- Blow out with dry pressure air (max. 5 bar) from inside out or tap it (in case of emergency only).

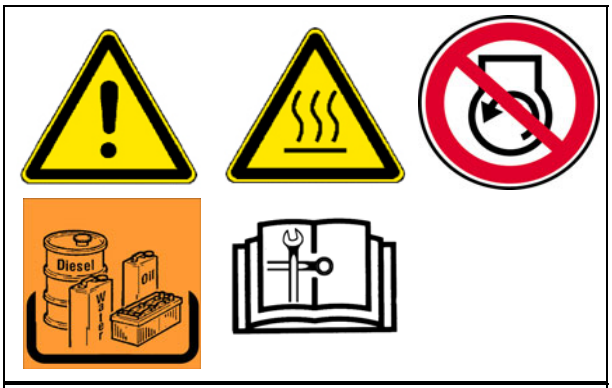
☞ Do not damage cartridge when doing so.

- Check the soundness of the filter papers of the filter cartridge (by exposing to light) and the soundness of the seals. Replace them if necessary.

☞ Replace the safety element (G) after the filter has been serviced 5 times, but after 2 years at the latest (never clean it!).



Engine cooling system (5)

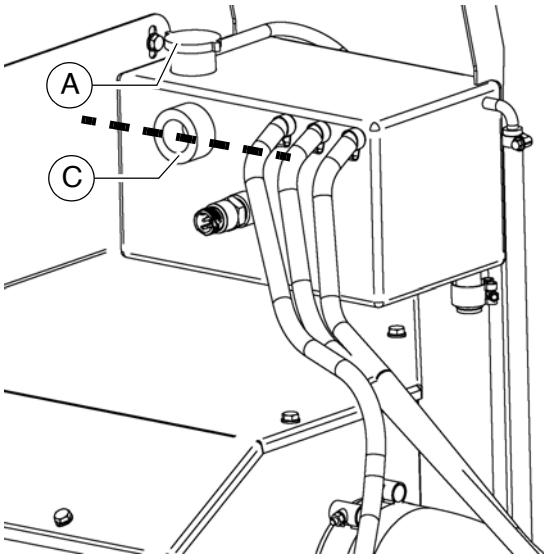


Checking / topping up coolant

The cooling water level must be checked when the system is cold. Make sure that sufficient anti-freeze and anti-corrosion agent is available (-25°C).

When hot, the system is under pressure. When opening, there is a danger of scalding!

- If necessary fill in a sufficient amount of coolant through the open port (A) of the compensating tank.



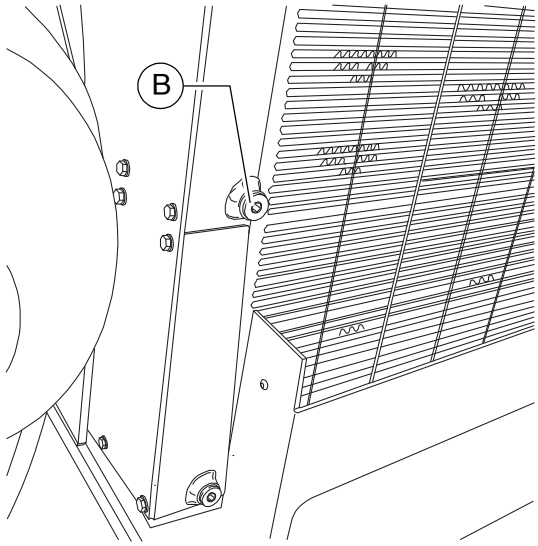
Change coolant

When hot, the system is under pressure. When opening, there is a danger of scalding!

Use only approved coolants!

Observe the instructions in the chapter entitled "Operating substances"!

- Remove the drain screw (B) on the radiator and let the coolant drain completely.
- Reinstall the drain screw (B) and tighten properly.
- Fill in coolant through the filling opening (A) on the compensation tank until the coolant level rises to the centre of the sight glass (C).



The air is only able to escape completely from the cooling system once the engine has reached its operating temperature (at least 90°C).
Check the fluid level again, top up if necessary.

Checking and cleaning the radiator fins

- If necessary, remove leaves, dust or sand from the radiator.

☞ Observe engine's operating instructions!

Check coolant concentration

- Check the concentration using a suitable tester (hydrometer).
- Adjust the concentration if necessary.

☞ Observe engine's operating instructions

AdBlue® / DEF tank (6)

- Check the **filling level** using the display on the operating panel.

☞ Top up with AdBlue® / DEF if necessary.



NOTE	**Storage and handling AdBlue® / Diesel Exhaust Fluid (DEF)**

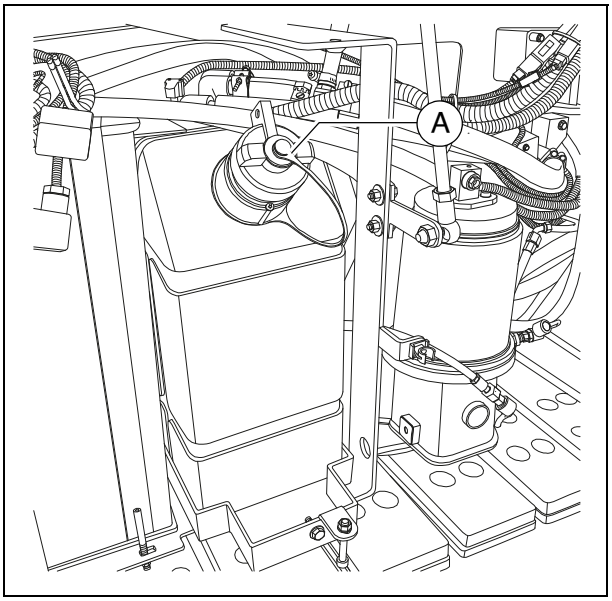
	Incorrect handling of AdBlue® / DEF can cause major damage to the vehicle:
	- Never fill oil, diesel or other fluids into the AdBlue® /DEF system:
	  - Do not start the engine after filling incorrectly
	  - Consult the Dynapac Service Department
	- Only use AdBlue® / DEF as per ISO 22241-1 / DIN 70070.
	- The storage temperature for AdBlue® / DEF is between -5°C and 25°C (23°F and 77°F)
	- Store in sealed containers to avoid impurities.
	- No direct sunlight.
	- It is not advisable to store in a vehicle for longer than 6 months. Seal the tank breathers when stored in the urea tank.
	- If AdBlue® / DEF is spilt on painted surfaces or aluminium surfaces when topping up, rinse the affected areas immediately with water.
	- Do not fill the AdBlue® / DEF tank until it overflows, otherwise it can be damaged at very low temperatures.
	- Always heed the local rules and regulations when disposing of AdBlue® / DEF!
	- Comply with all further information in the engine operating instructions.

⚠ WARNING	**Danger from AdBlue® / Diesel Exhaust Fluid (DEF)**
	Inadequate preparations for using AdBlue® / DEF can result in severe injuries! AdBlue® / DEF should never be in contact with the skin, eyes or clothing or be swallowed. Keep AdBlue® / DEF out of reach of children. - Before handling AdBlue® / DEF, make yourself familiar with the safety data sheet. - If you get AdBlue® / DEF in your eyes, rinse your eyes immediately and thoroughly in clear water for at least 15 minutes. Seek medical advice immediately! - Wash AdBlue® / DEF off your skin immediately with soap and water. - If you have swallowed AdBlue® / DEF, rinse your mouth out with water and drink plenty of water. Seek medical advice immediately! - Change any clothing soiled with AdBlue® / DEF immediately. - Comply with all further instructions in the AdBlue® / DEF safety data sheet. - Comply with all further information in the engine operating instructions.

⚠ WARNING	**Danger from ammonia vapours, overpressure in the tank**
	If you open the AdBlue® / DEF tank cap at high temperatures, ammonia vapours can escape and cause injuries! - Only fill the AdBlue® / DEF tank in well ventilated areas. - Always be careful when opening the AdBlue® / DEF, as this can cause pressure to be released. AdBlue® / DEF may leak as a result. - Do not inhale the ammonia vapours! - Ammonia vapours have a biting smell and cause irritation above all to the skin, mucous membranes and eyes. - Consult a doctor immediately if injured. - Comply with all further instructions in the AdBlue® / DEF safety data sheet. - Comply with all further information in the engine operating instructions.

To **top up** with AdBlue® / DEF

- Remove cap (A).
- Top up with AdBlue® / DEF through the filling port until the required level is reached.
- Replace the cap (A).



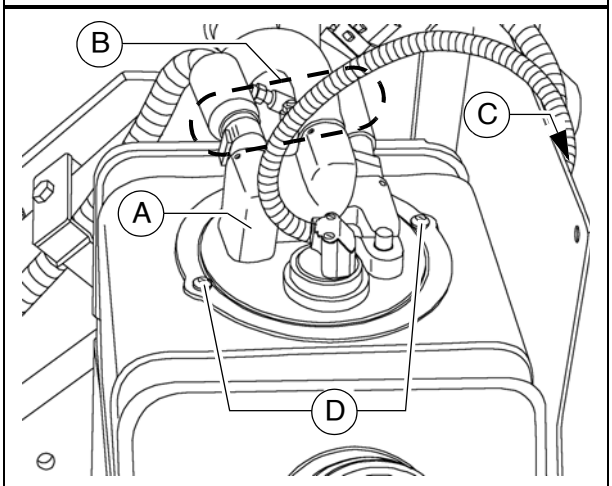
AdBlue® / DEF tank - suction filter

Replace filter element

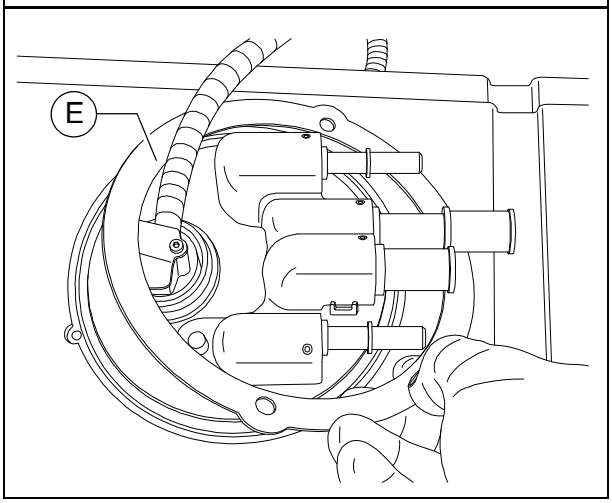


- To change the filter, the supply lines (B) at the AdBlue® / DEF multi-head (A) must be dismantled and the electrical connection (plug) (C) disconnected.

☞ Use a suitable container or cloth to take up any leaked residues.

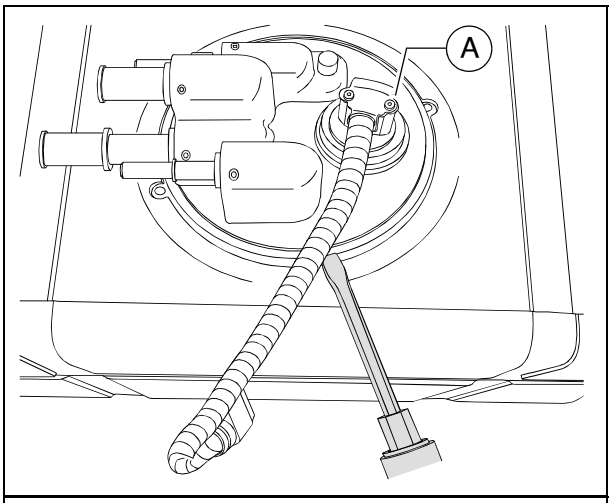


- Loosen screws (D) and remove retaining ring (E).

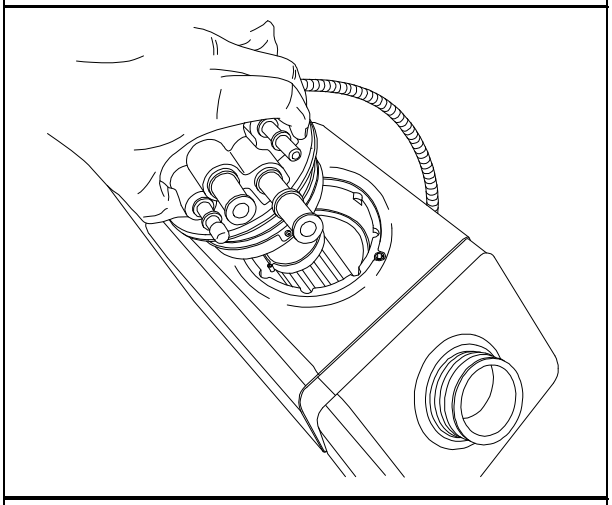


- Carefully lever the multi-head (A) from the tank surface by applying a suitable slotted screwdriver around the edge. Pull the head at the same time.

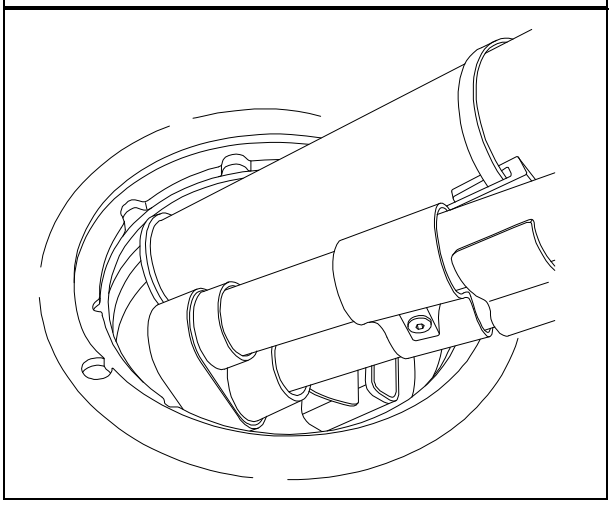
⚠ Do not pull the connection cable or connection port!



- Carefully pull the multi-head up until the lower part is beneath the tank opening.

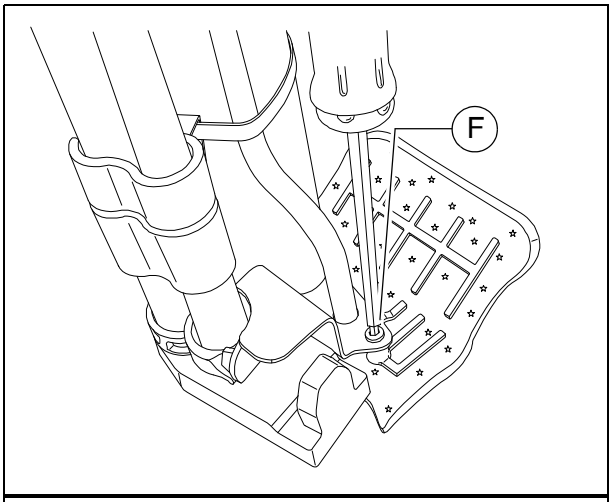


- Carefully tilt the lower part up and turn the head until the lower part is at the tank opening.
- Carefully pull the lower part out of the tank opening.

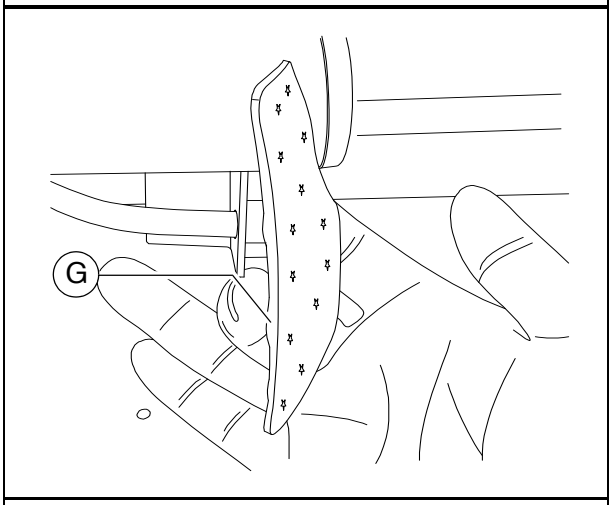


Filter change < / = s/n 003055

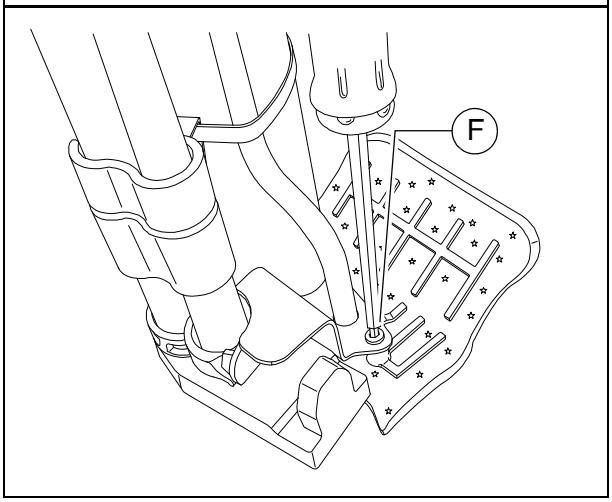
- Loosen the fastening screw (F) of the filter.



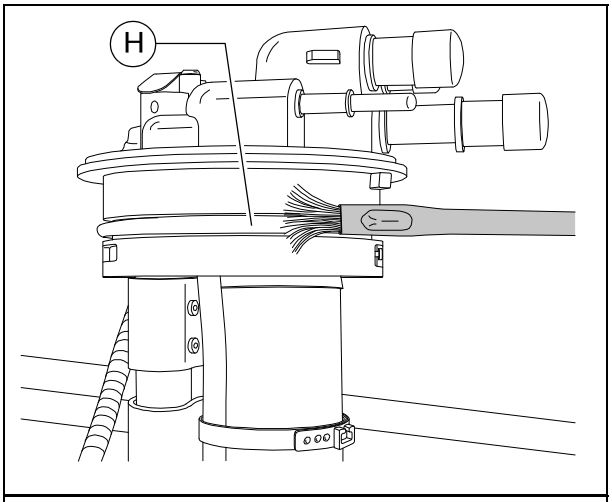
- Pull the used filter (G) from the suction pipe.



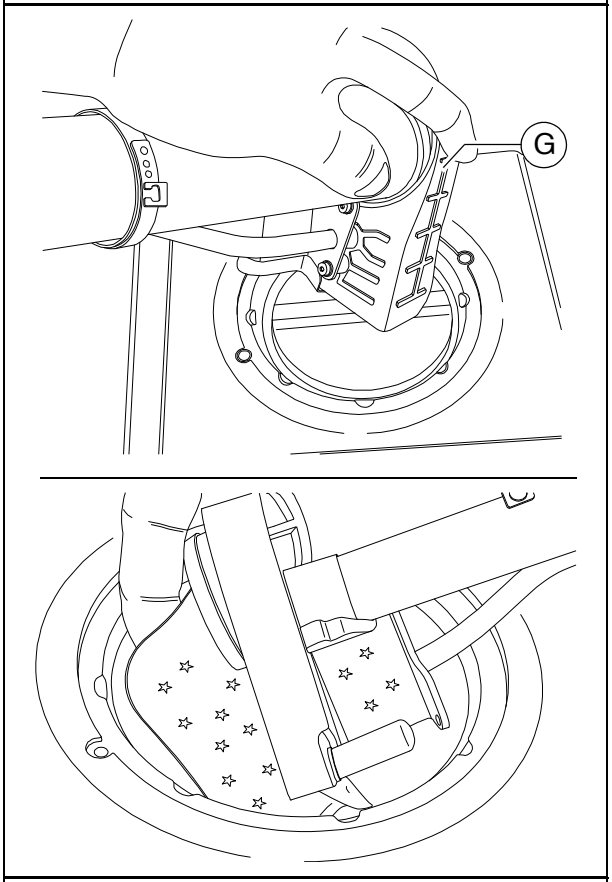
- Fit the new filter onto the suction pipe and fasten with a new fastening screw (F).



- Lightly grease the O-ring (H) of the multi-head.

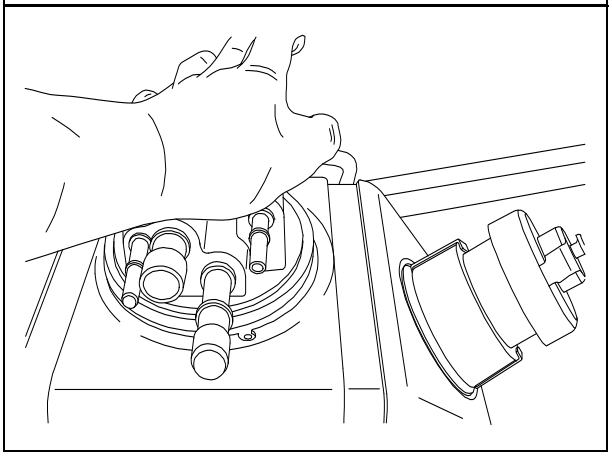


- Fold the filter element (G) in the middle towards the underside of the lower part.
- Tilt the lower part at an angle of about 45°.
- Place the filter side and the tip of the lower part in the tank opening as shown.
- Gradually insert the lower part in the tank opening, proceeding carefully.

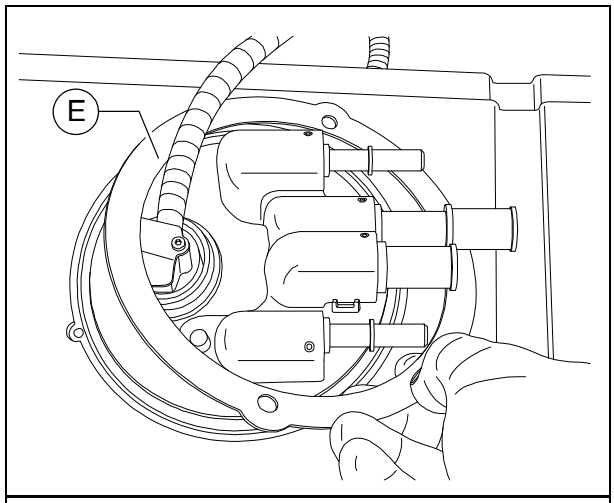


⚠ Do not push the parts with force directly into the tank opening. This will cause damage!

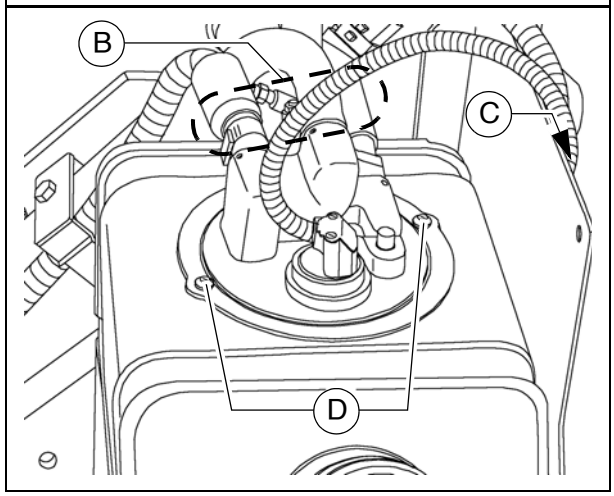
- Position the head in the required alignment and press on the top until the head fits completely in the tank opening.



- Place the retaining ring (E) over the filter head.



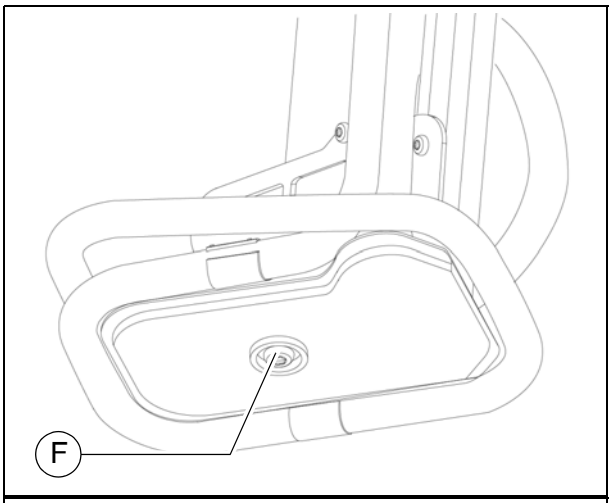
- Tighten the screws (D) properly.
- Then mount the supply lines (B) and connect up to the power supply (plug) (C).



⚠ After installation, check correct sealing during a trial run.

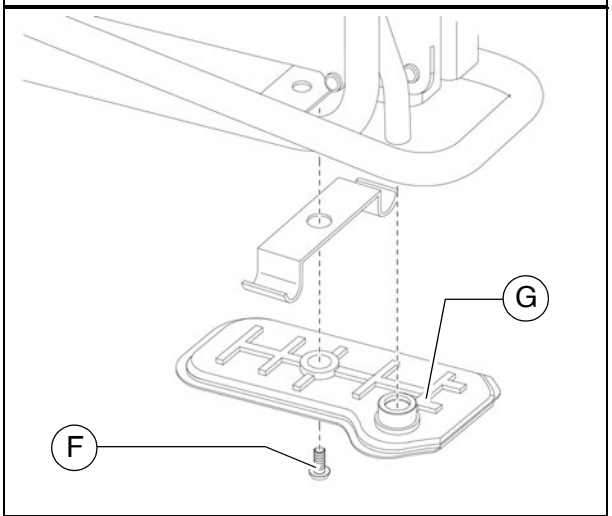
Filter change > / = s/n 003056

- Loosen the fastening screw (F) of the filter.

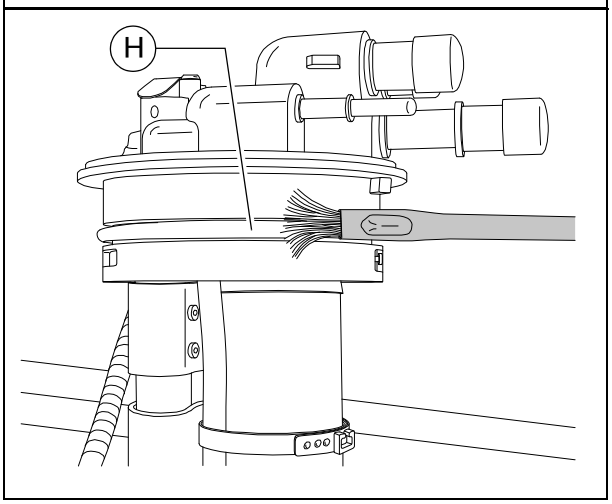


- Pull the used filter (G) from the suction pipe.
- Fit the new filter onto the suction pipe and fasten with a new fastening screw (F).

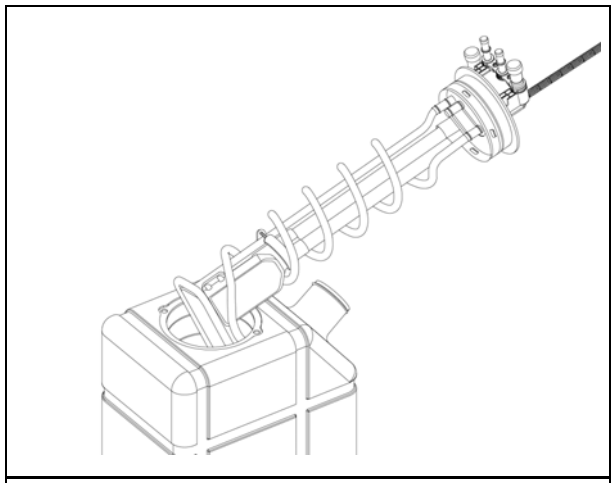
☞ Ensure correct alignment of filter and holders!



- Lightly grease the O-ring (H) of the multi-head.

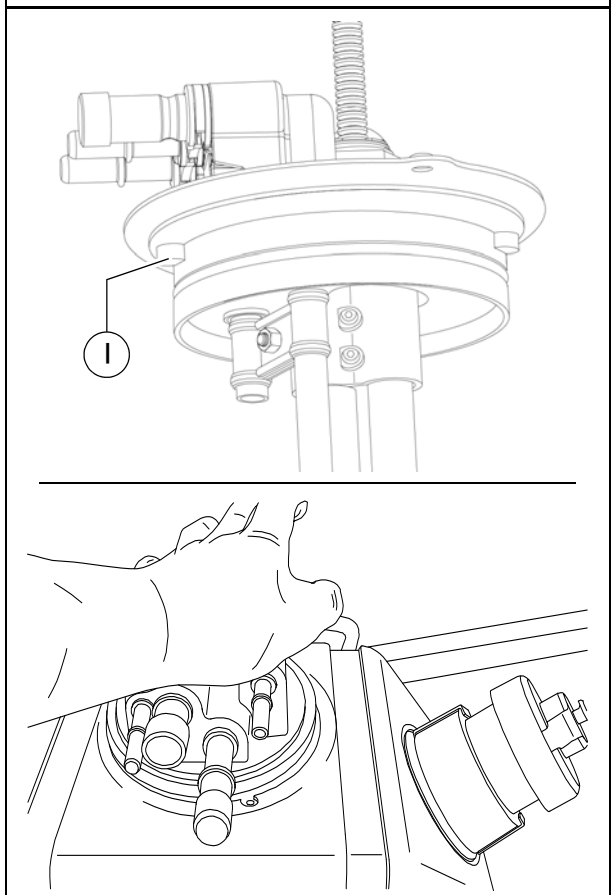


- Introduce the filter side into the tank opening as shown.
- Gradually introduce the whole unit I into the tank opening, using due caution.

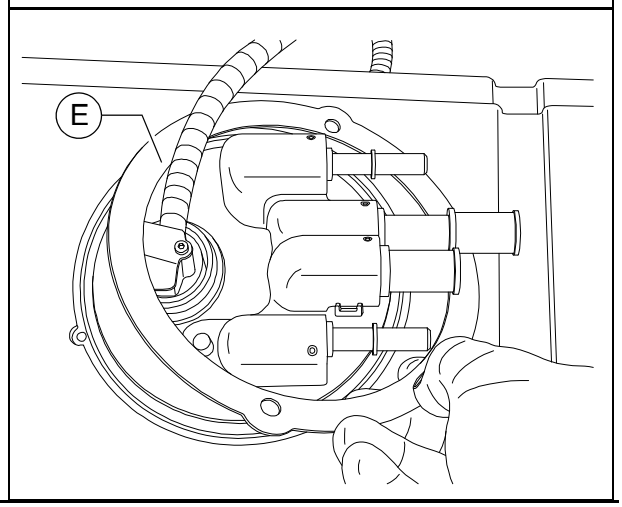


⚠ Do not push the parts with force directly into the tank opening. This will cause damage!

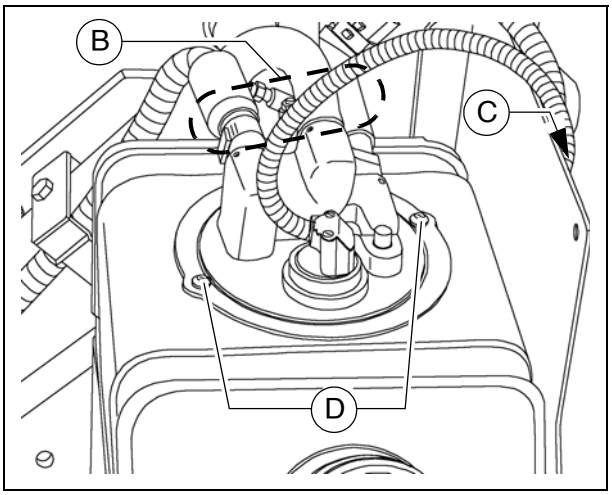
- Position the head in the required alignment.
  Ensure that the two noses (I) at the flange of the filter head fit in the corresponding recesses at the tank!
  Press on the top until the head fits completely in the tank opening.



- Place the retaining ring (E) over the filter head.



- Tighten the screws (D) properly.
- Then mount the supply lines (B) and connect up to the power supply (plug) (C).



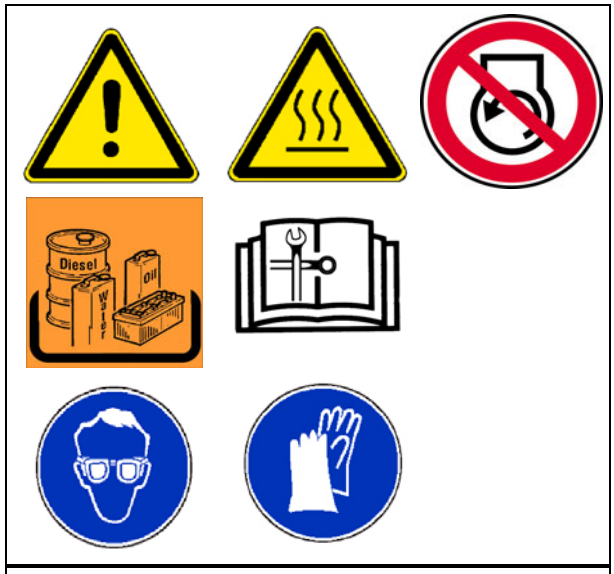
⚠ After installation, check correct sealing during a trial run.

AdBlue® / DEF tank - tank cover

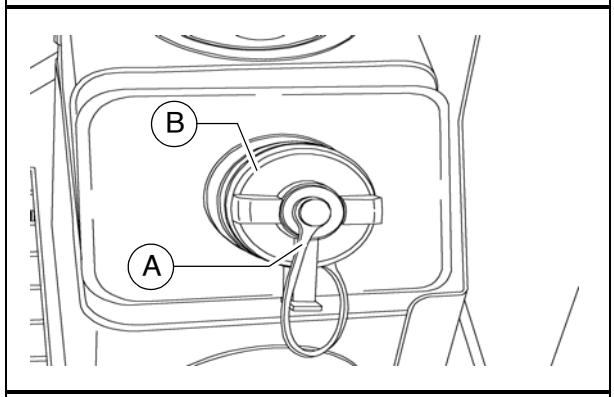
Clean tank cover

⚠ Impurities or crystals of AdBlue® / DEF on the outside and inside of the tank cover can considerably interfere with the system!

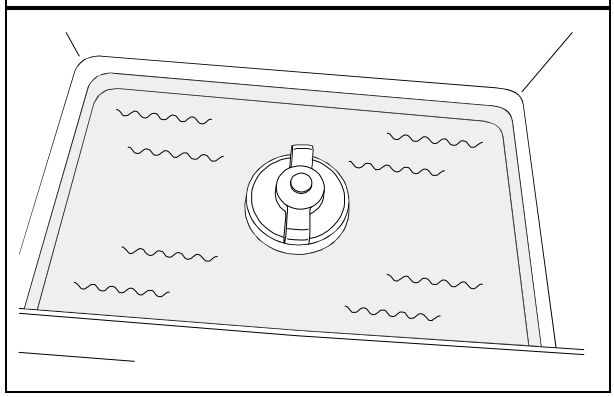
☞ If the tank cover is visibly soiled, it must be cleaned as follows.



- Loosen the retaining tab (A) and unscrew the tank cover (B) from the tank.

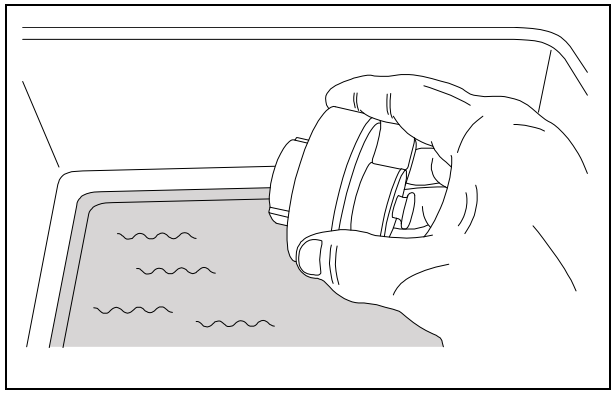


- Put the cover in a vessel filled with water so that the water comes up to half the height of the blue edge (large diameter).
  Leave the cap to soak for about five minutes.



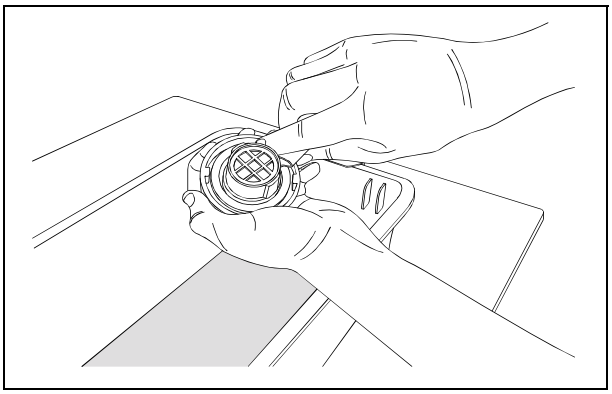
⚠ Make sure that the cover is not completely covered with water as this interferes with the ventilation function.

- Shake the cap to let any residual water drain out.

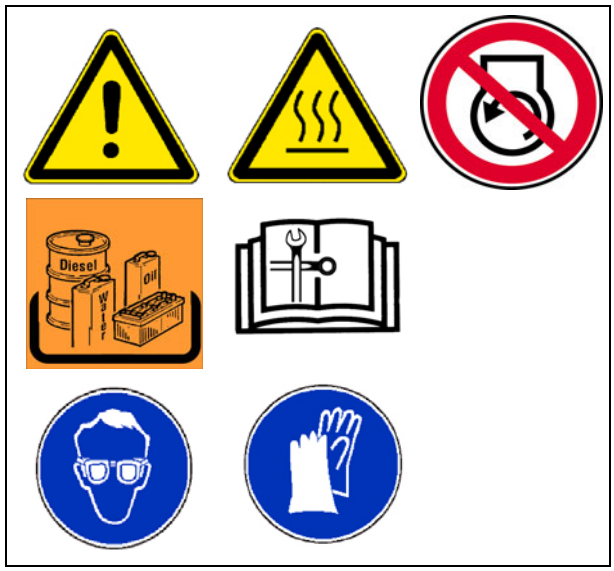


- Wipe the gasket with a damp cloth to remove any remaining DEF crystals or dirt.

- Then connect the tank cover with the previously loosened retaining tab and screw onto the tank.



AdBlue® / DEF dosing unit



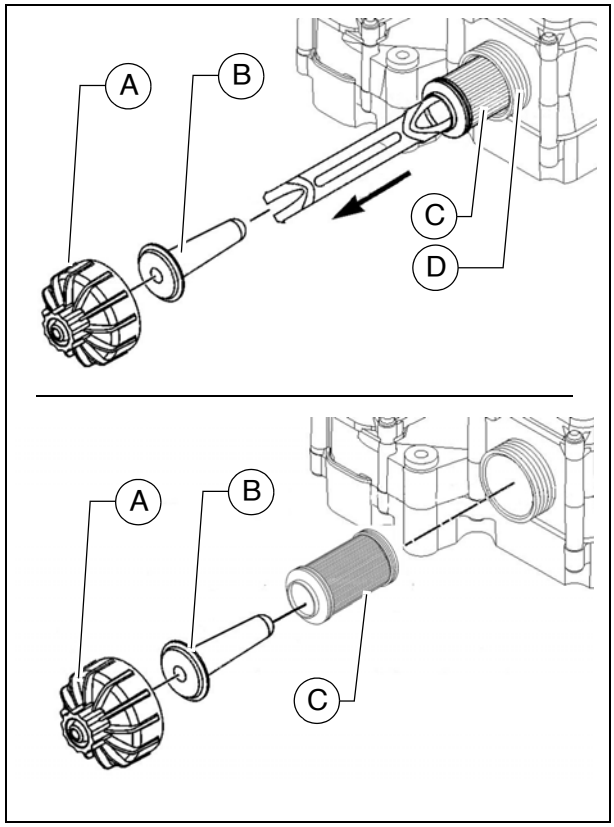
⚠ Do not disconnect the vehicle batteries until the dosing system has finished the rinsing cycle. Wait for at least 5 minutes after the ignition has been switched off before starting to work on the dosing unit.

Replace filter element

- Place a suitable container under the filter housing to catch any AdBlue® / DEF residues.
- Unscrew the cover (A) (27mm wrench) and compensating element (B).
- Remove the filter (C) using the corresponding service tool (supplied with the filter). The tool engages on the filter with a "click".

☞ Use the side of the service tool with the same colour markings as the filter.

⚠ Depending on their condition, the compensation element and filter **must** be replaced after they have been removed.



☞ Check the cover (A), cover thread and thread (D) of the dosing unit for any damage and replace if necessary!

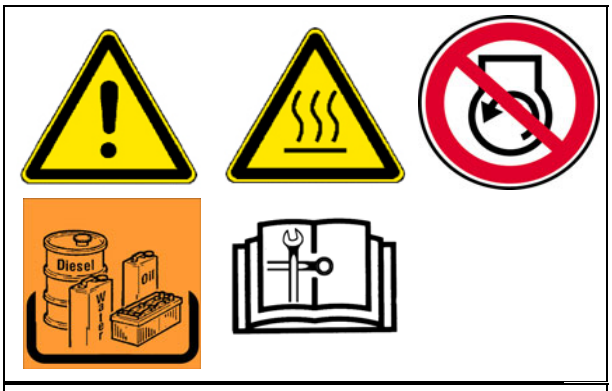
- Clean the cover (A), the cap thread and the dosing unit with warm water and a clean cloth.

☞ Do not oil the O-rings and gaskets of the filter!

- Insert the compensating element (B) in the filter cartridge (C) and push this into the dosing unit.
- Fit the cover (A).
  Torque: 20 Nm.

⚠ Let the engine run for at least 15 minutes so that the system reaches operating temperature. Look out for any leaks.

Engine drive belt (7)



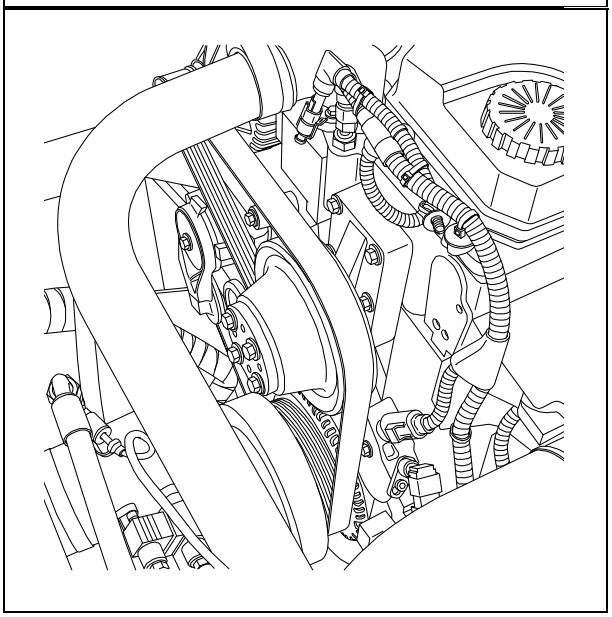
Check drive belt

- Check the drive belt for damage.

☞ Small transverse cracks in the belt are acceptable.

⚠ In the event of longitudinal cracks which intersect with transverse cracks and damaged material surfaces, belt replacement is necessary.

☞ Observe engine's operating instructions



Replace drive belt

☞ Observe engine's operating instructions

Crankshaft ventilation filter (8)

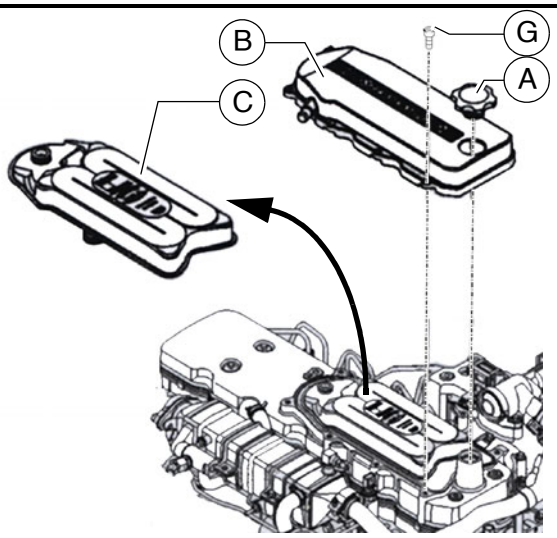
Replace filter element

- Take the cover off (A) and remove the filter cover (B)
- Remove the depleted filter.

☞ Check the cover and cover seal for any signs of damage and replace if necessary!



- Clean the contact surface (D) of the filter and the sealing surfaces of the O-rings with a cloth and light solvent and then dry them with a clean cloth.
- Clean the filter cover with warm soapy water (E) and dry it with compressed air.



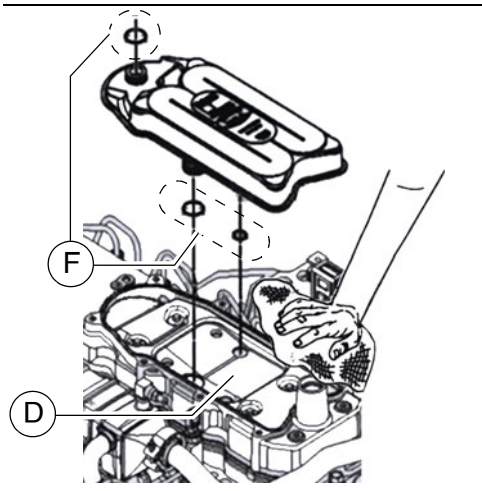
STOP Wear protective goggles when using working with compressed air! Never blow compressed air towards other people!

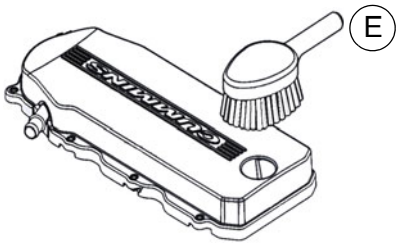
STOP Use personal safety equipment when cleaning with solvents! Avoid contact with skin!

- Apply a little fresh engine oil to the O-rings (F) of the new filter and set the filter correctly on its contact surface.
- Fit the cover (B):
  - Start with the inside screw (G) and work forwards clockwise.

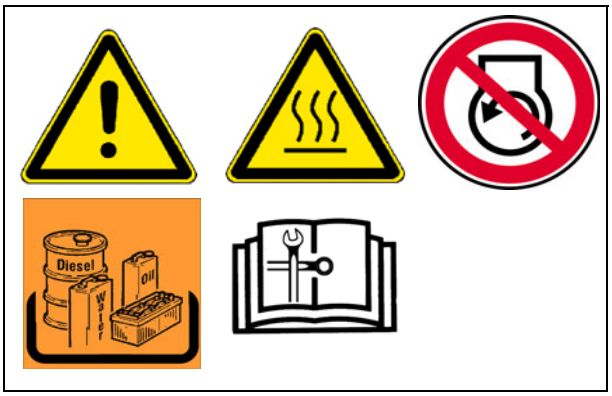
⚠ The torque for the cover screws is 7 Nm.

⚠ After installation, check correct sealing during a trial run.





Exhaust system - diesel oxidisation catalytic converter (9)



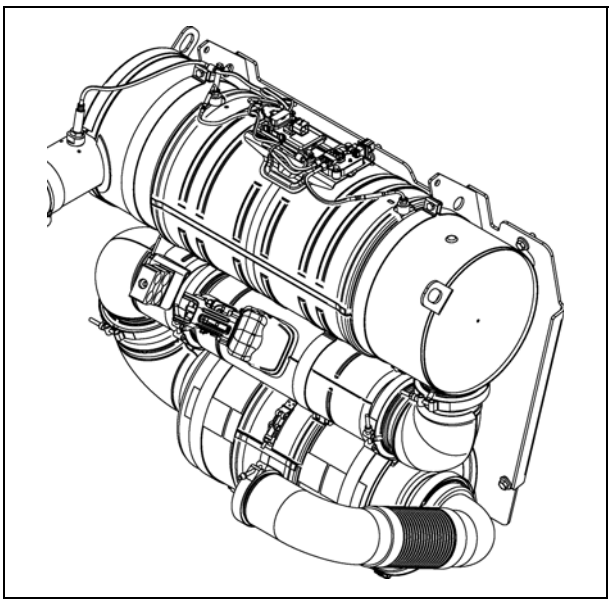
Inspect the exhaust system

☞ Basically the exhaust system does not need any maintenance.
Inspection consists of a visual check:

- damaged parts?
- loose screwed connections, plugs or lines?

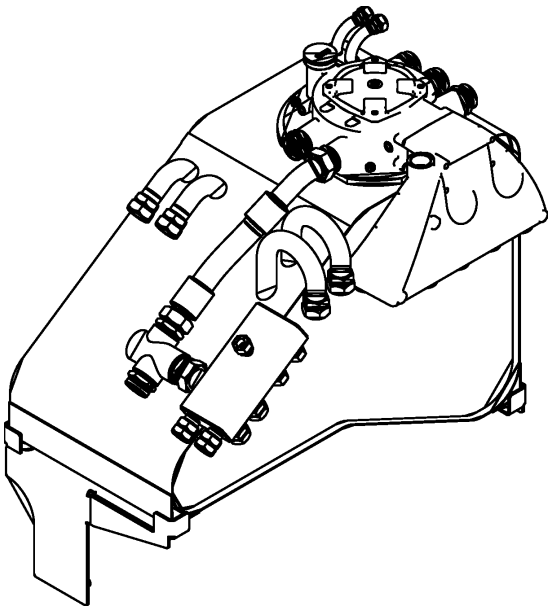
⚠ WARNING	**Risk from hot surfaces!**
	During system cleaning, the exhaust temperature and the surface temperature of the exhaust system is very hot and can cause severe injuries! The exhaust and exhaust components remain hot after the engine has stopped. - Let the exhaust system cool down before starting inspection work. - Make sure that no flammable materials can come into contact with the exhaust system. - Wear your personal safety gear. - Do not touch hot parts of the vehicle. - Comply with all further information in the engine operating instructions and in the safety manual.

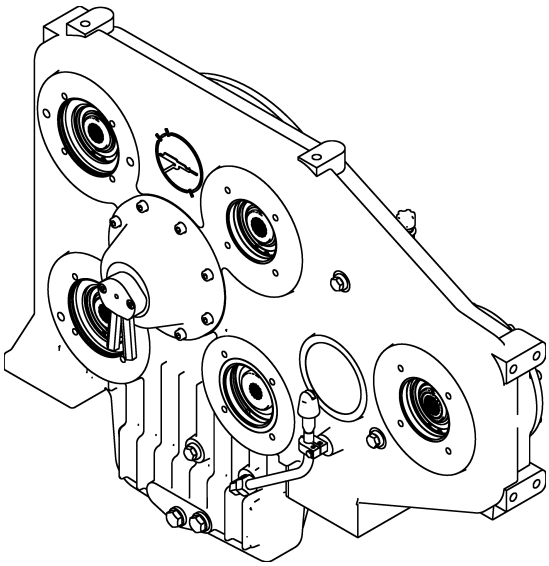
⚠ The Dynapac Customer Service must be consulted whenever the exhaust system is to be repaired!



F 60 Maintenance - hydraulic system

1 Maintenance - hydraulic system





⚠ WARNING	**Danger due to hydraulic oil**
	Hydraulic oil under high pressure can cause severe to fatal injuries! - Only competent staff should work on the hydraulic system! - Any hydraulic hoses that are cracked or soaked through must be replaced immediately. - Depressurise the hydraulic system. - Open hopper, lower conveyor belt if necessary - Stop the engine and remove the ignition key before any maintenance work. - Secure the vehicle to prevent it being switched on again. - Consult a doctor immediately if injured. - Comply with all further information in these instructions and in the safety manual.

⚠ CAUTION	**Hot surfaces!**
	Surfaces including those behind covering parts, together with engine combustion gases can be very hot and cause injuries! - Wear your personal safety gear. - Do not touch hot parts of the vehicle. - Only perform maintenance and repair work after the vehicle has cooled down. - Comply with all further information in these instructions and in the safety manual.

⚠ WARNING	**Safety during hydraulic maintenance**
	Inadequate preparations for hydraulic maintenance can cause severe or fatal injuries! - Park the vehicle on a smooth surface and prevent it from rolling away. Activate the parking brake if necessary! - Retract the hopper cylinder completely; when working on the hopper cylinder, secure the hopper. - Move all conveyor lifting cylinders to lower limit position. - Bring conveyor swivel cylinders to middle position and insert retaining pin. - Retract conveyor tensioning cylinders. - Move platform lifting cylinders to lower limit position. - Move front hopper cylinder to lower limit position. - Turn diesel engine off and secure to prevent it starting up again without authorisation. - Disconnect battery from vehicle electrical system. - Let the hydraulic oil cool down. - Allow a waiting period to relieve residual pressures. - After depressurising, open screwed connections slowly and carefully. Continue to loosen the screwed connections with caution in order to notice possible dangers resulting from any still remaining pressure in the hydraulic fluid so that precautions can be taken. - Do not continue loosening the screwed connection if there is still any remaining pressure in the system. Depressurise the system again and check once more that this has been effective.

1.1 Maintenance intervals

Pos.	Interval								Maintenance point	Note
	10	50	100	250	500	1000 / annually	2000 / every 2 years	If necessary		
1	■								- Hydraulic oil tank - Check filling level	
								■	- Hydraulic oil tank - Top up with oil	
							■		- Hydraulic oil tank - Change oil and clean	
2	■								- Hydraulic oil tank - Check maintenance indicator	
						■		■	- Hydraulic oil tank - Change and vent the suction/return flow hydraulic filter	
3	■								- High-pressure filter - Check maintenance indicator	
						■		■	- High-pressure filter - Replace filter element	
4		■							- Pump distribution gear - Check oil level	
								■	- Pump distribution gear - Top up oil	
						■			- Pump distribution gear - Change oil	
		■							- Pump distribution gear - Check bleeder	
								■	- Pump distribution gear - Clean bleeder	

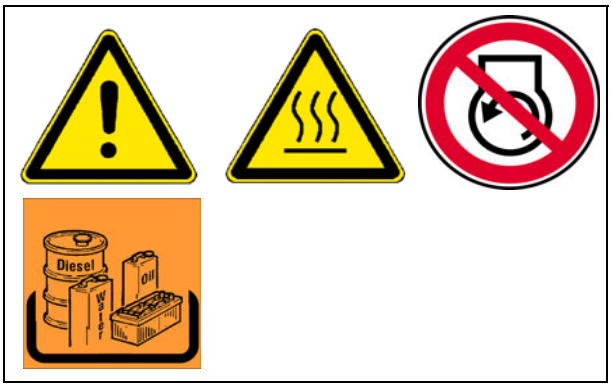
Maintenance	■
Maintenance during the running-in period	▼

Pos.	Interval								Maintenance point	Note
	10	50	100	250	500	1000 / annually	2000 / every 2 years	If necessary		
5	▼ ■								- Hydraulic hoses - Visual inspection	
	▼ ■								- Hydraulic system Leak test	
								■	- Hydraulic system Retighten screw connections	
							■	■	- Hydraulic hoses - Replace hoses	
6					■			■	- Auxiliary flow filter- Change filter element	(○)

Maintenance	■
Maintenance during the running-in period	▼

1.2 Maintenance points

Hydraulic oil tank (1)

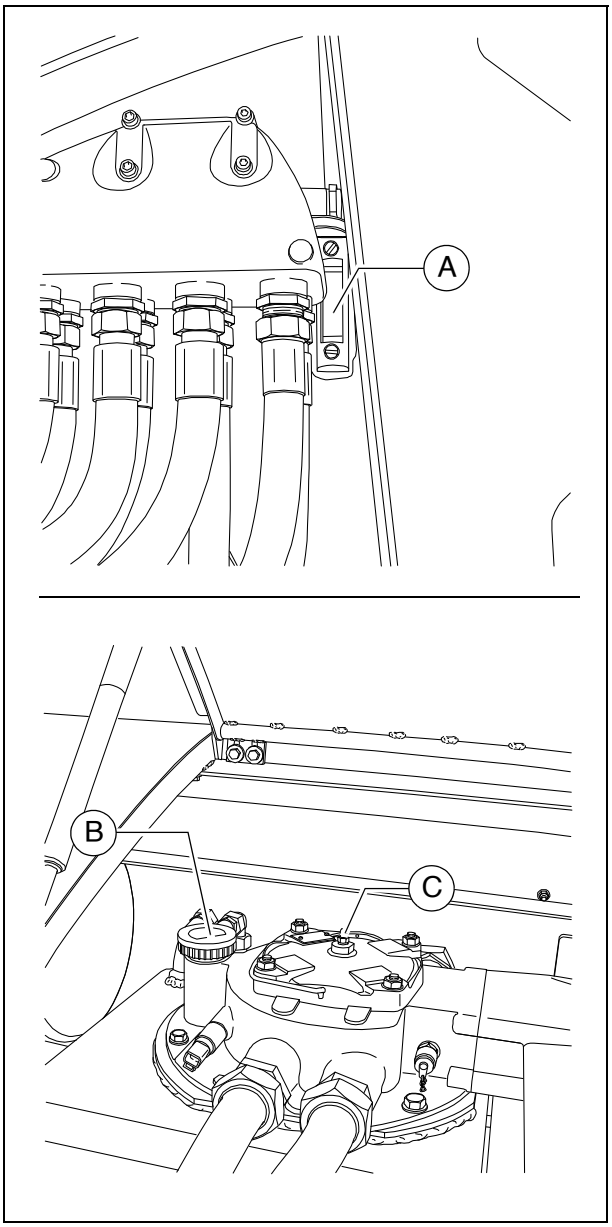


- **Check** oil level on sight glass (A).

☞ The oil level must be up to the centre of the sight glass when the cylinders are retracted.

☞ If all the cylinders are extended, the level can fall below the sight glass.

☞ The sight glass is located on the side of the tank.



For **filling** in the oil:

- Remove cap (B).
- Fill in oil through the filler opening until the oil level rises to the centre of the sight glass (A) (+/- 5 mm).
- Screw cap (B) on again.

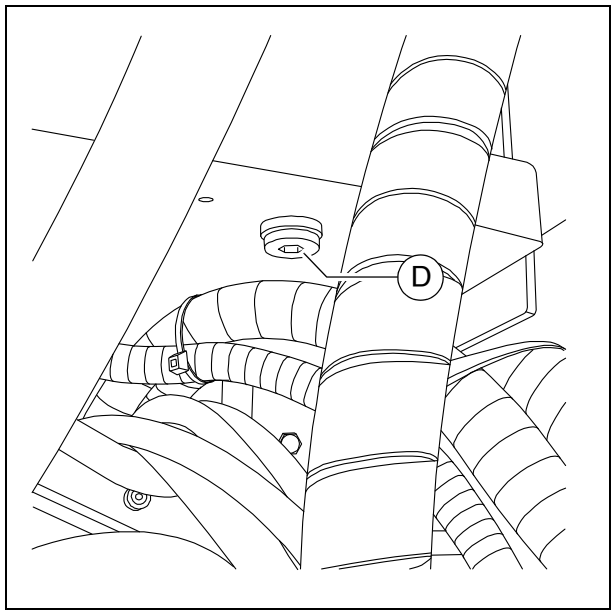
☞ Regularly remove dust and dirt from the oil tank vent (C). Clean the surfaces of the oil cooler.

⚠ Use only the recommended hydraulic oils - see section "Recommended hydraulic oils".

☞ When filling for the first time, all hydraulic cylinders should be extended/retracted at least 2x for ventilation!

To **change** oil:

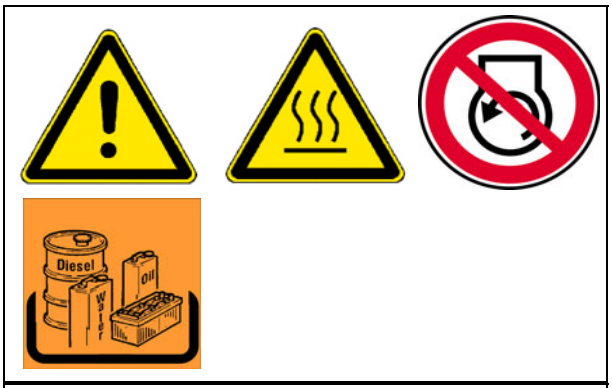
- To drain the hydraulic oil unscrew the drain plug (D) at the bottom of the tank.
- Collect the oil in a container using a funnel.
- When fastening the screw again after draining, make sure to use a new seal.



The oil should be changed when at operating temperature.

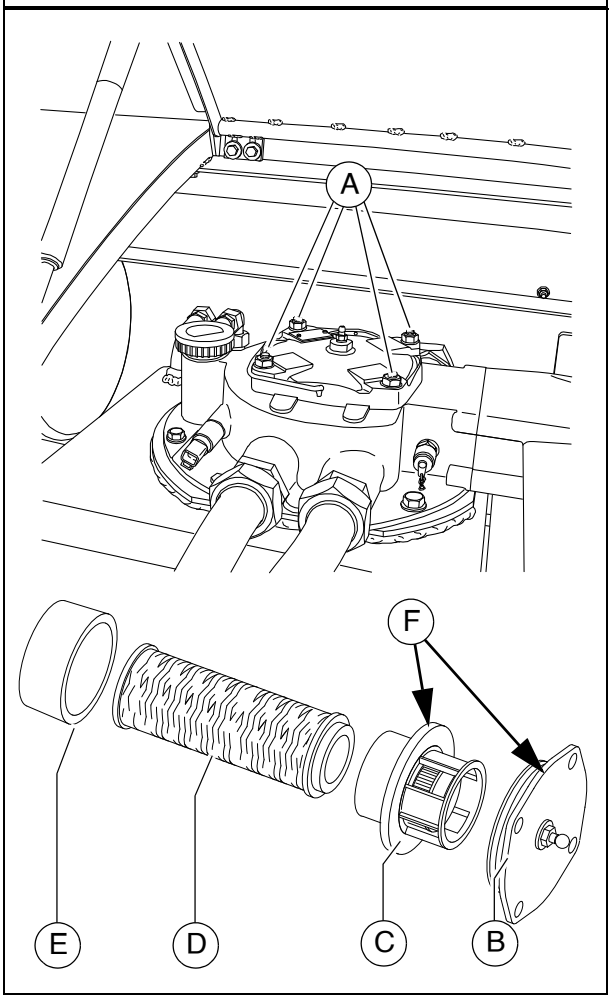
When changing the hydraulic oil also change the filter.

Suction/return flow hydraulic filter (2)



Carry out filter replacement according to the interval or the indicator lamp in the operating panel!

- Remove cover securing screws (A) and lift off cover.
- Disassemble the removed unit into:
  - Cover (B)
  - Separating plate (C)
  - Filter (D)
  - Dirt trap (E)
- Clean the filter housing, cover, separating plate and dirt trap.
- Check the O-rings (F), replace if necessary.
- Coat the sealing surfaces and O-rings with clean operating fluid.



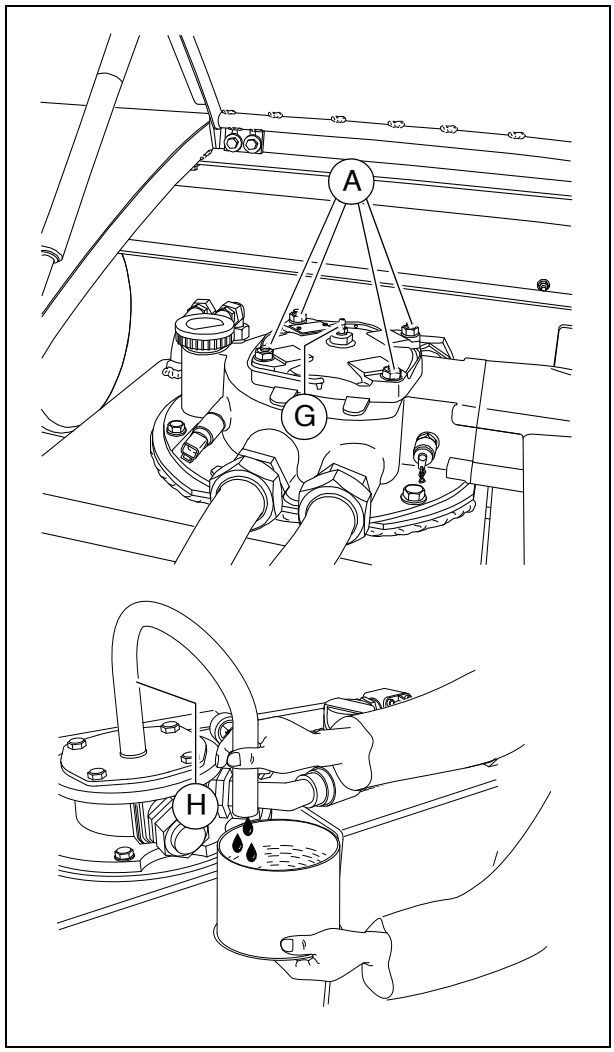
⚠ The filter must be bled following filter replacement!

Bleeding the filter

- Fill the opened filter housing with hydraulic oil up to approx. 2 cm below the top edge.
- If the oil level drops, replenish oil again.

☞ Slow oil level reduction of approx. 1 cm / min. is normal!

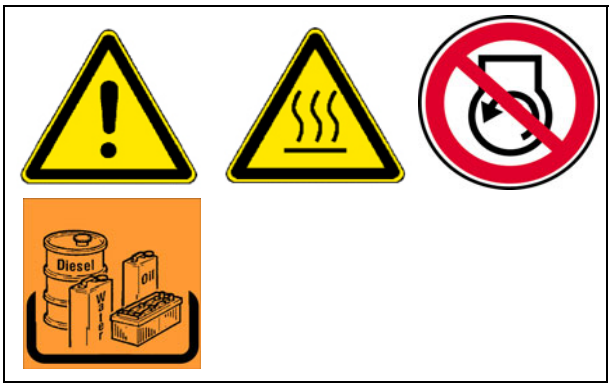
- If the oil level remains stable, slowly insert the assembled unit with new filter element into the housing and tighten the cover mounting screws (A).
- Open the bleed screw (G).
- Place a transparent hose (H) onto the bleed screw, ending in a suitable container.
- Start the up drive engine at idle speed.
- Close the bleed screw (G) as soon as the oil forced through the hose is clear and therefore free of air bubbles.



☞ The process from assembling the filter cover to starting the drive engine should take place in less than 3 minutes, as the oil level in the filter housing otherwise falls too far.

⚠ Ensure seal integrity is good after changing the filter.

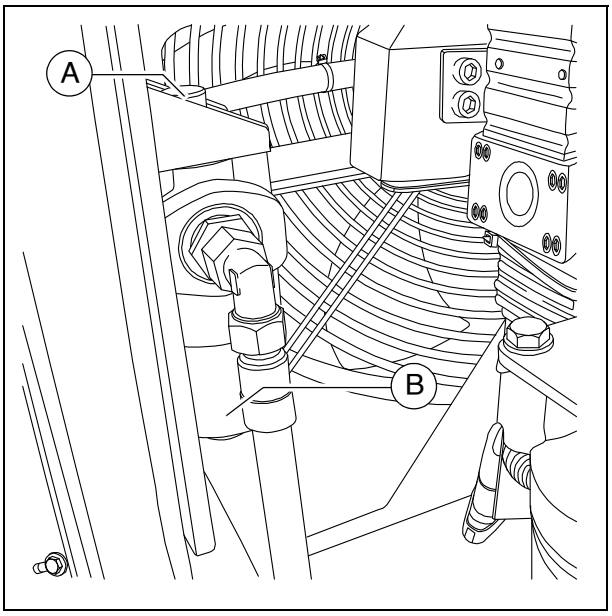
High-pressure filter (3)



The filter elements must be replaced when the maintenance indicator (A) turns red.

☞ The vehicle's hydraulic system contains 2 high-pressure filters.

- Unscrew filter housing (B).
- Remove the filter cartridge.
- Clean the filter housing.
- Insert the new filter cartridge.
- Replace the seal ring of the filter housing.
- Turn on the filter housing by hand and tighten it using a wrench.
- Start trial operation and check the tightness of the filter.



☞ Replace the seal ring whenever the filter cartridge is replaced.

☞ After replacing the filter element, the red mark in the maintenance indicator (A) automatically reverts to green.

Pump distribution gear (4)

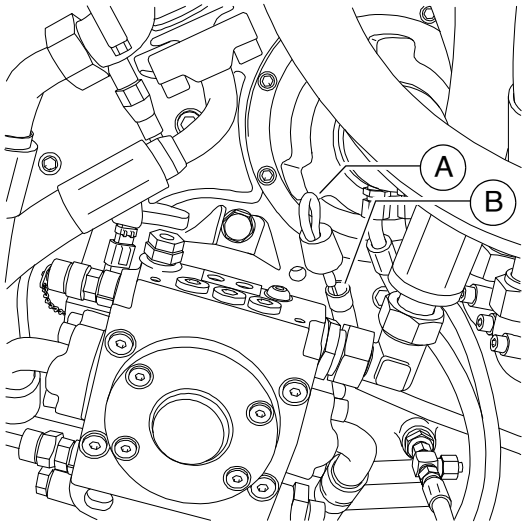


- **Check oil level** check on sensor rod (A).

☞ The oil level must lie between the upper and lower marks.

For **filling** in the oil:

- Pull out the sensor rod (A) completely.
- Replenish new oil through the sensor rod opening (B).
  - Check the fluid level using the sensor rod.



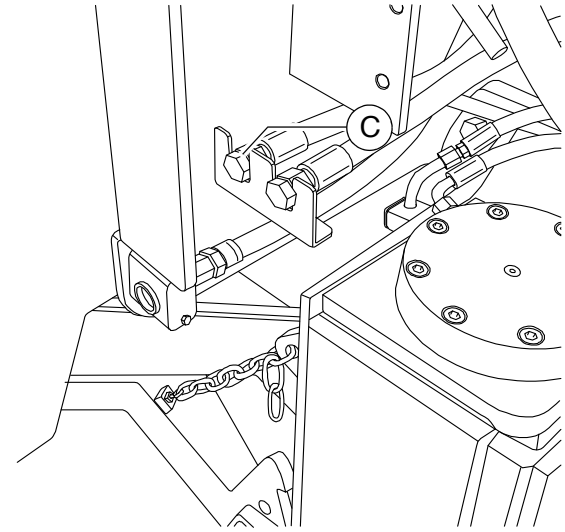
☞ Before checking with the sensor rod, wait for a moment, as the oil which has been poured in first has to flow off.

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

Oil change

☞ The oil should be changed when at operating temperature.

Oil change< / = s/n XXXX

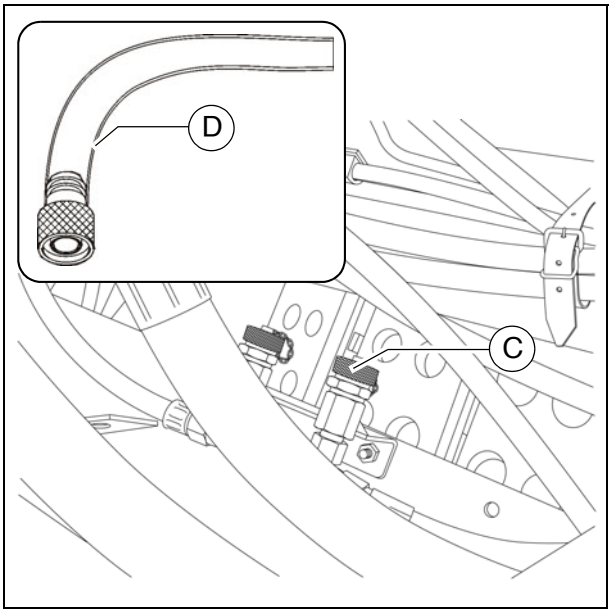


- Place the end of the oil drain port hose (C) in the collection container.
- Remove the screw cap with a wrench and allow the oil to drain completely.
- Replace the screw cap and tighten properly.
- Pour in the prescribed quality of oil through the sensor rod opening (B).
  - Check the fluid level using the sensor rod.

☞ The oil should be changed when at operating temperature.

Oil change > / = s/n XXXX

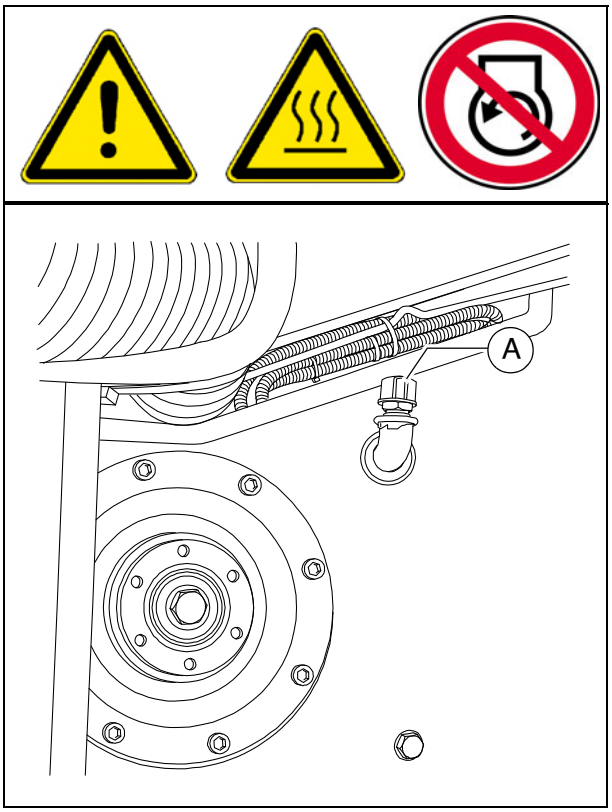
- Unscrew seal cap (C).
- Screwing on the oil drainage hose (D) opens the valve to let the oil drain out.
- Place the end of the hose in the collecting vessel and let the oil drain completely.
- Unscrew the drainage hose and return the screw cap.



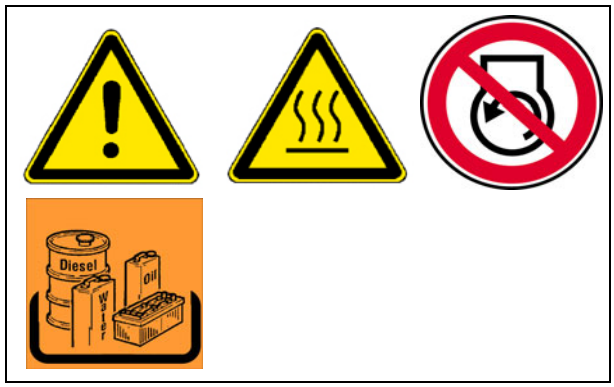
Bleeder

The bleeder (A) can be found on the rear of the pump distribution gear housing.

- The functioning of the bleeder must be ensured.
  If soiling has occurred, the bleeder should be cleaned.



Hydraulic hoses (5)



- Specifically check the condition of the hydraulic hoses.
- Immediately replace any damaged hoses.

☞ Replace hydraulic hoses if the following criteria are found on inspection:

- damage of the outer layer to the inlay (e.g. chafing, cuts, cracks).
- brittleness of the outer layer (cracking of the hose material).
- deformation that does not correspond to the natural shape of the hose or pipe when depressurised or under pressure or when bent (e.g. separated layers, blistering, pinched or buckled points).
- leaks.
- damage or deformation to the hose fittings (affecting the sealing function); replacements are not necessary for minor damage to the surface.
- hose coming away from the fitting.
- corrosion of the fitting with a detrimental effect on function and strength.
- failure to comply with the installation requirements.
- period of use has exceeded 6 years. Here it is the date of manufacture of the hydraulic hose stated on the fitting that counts, plus 6 years. If the fitting states "2004" as the date of manufacture, the period of use ends in February 2010.

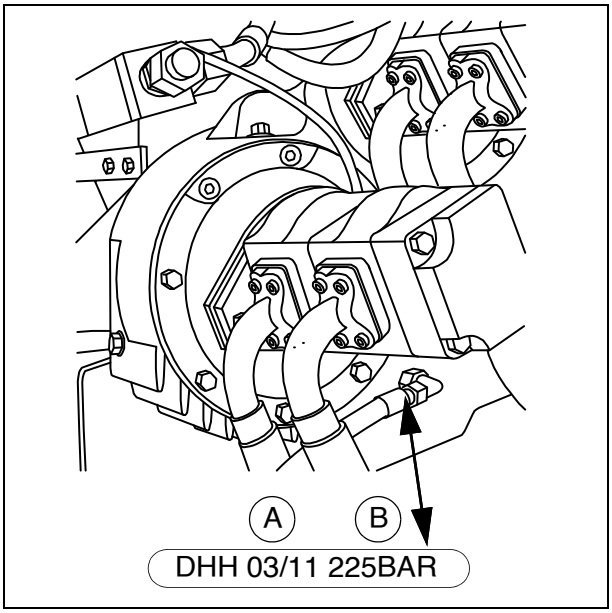
☞ See the section on "Marking hydraulic hoses".

STOP Ageing hoses become porous and may burst! Danger of accidents!

⚠ Always comply with the following instructions when installing and removing hydraulic hoses:

- Always only use original Dynapac hydraulic hoses!
- Always observe high standards of cleanliness!
- Hydraulic hoses must always be fitted to ensure that in all operating statuses,
  - there is no tensile load apart from dead weight.
  - there is no compressive load for short lengths.
  - any external mechanical impact on the hydraulic hoses is avoided.
  - appropriate positioning and fastening of the hoses prevents them from chafing on components or on each other.
    components with sharp edges must be covered when installing hydraulic hoses.
  - bending radii are not smaller than the permitted values.
- When hydraulic hoses are connected to moving parts, the length of the hose must be dimensioned to ensure that the bending radii are not smaller than the permitted smallest values right across the full range of movement and/or that the hydraulic hose is not also exposed to tension.
- Fasten the hydraulic hoses to the provided fastening points. the hoses must not be hindered in their natural movement and change in length.
- Painting the hydraulic hoses is forbidden!

Marking hydraulic hoses / storage period, period of use



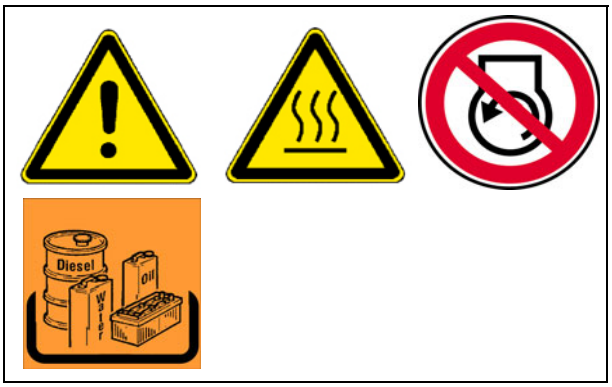
A number stamped onto the screwed connection provides information about the date of manufacture (A) (month / year) and the maximum pressure permitted for this hose (B).

Never install hoses on top of one another and always ensure that they are at the correct pressure.

In individual cases, the period of use can be stipulated according to experience and may differ from the following general indications:

- When producing the hose pipe, the hose (purchased by the meter) should not be more than four years old.
- The period of use of a hose pipe should not exceed six years, including any possible storage period.
  The storage period should not exceed two years.

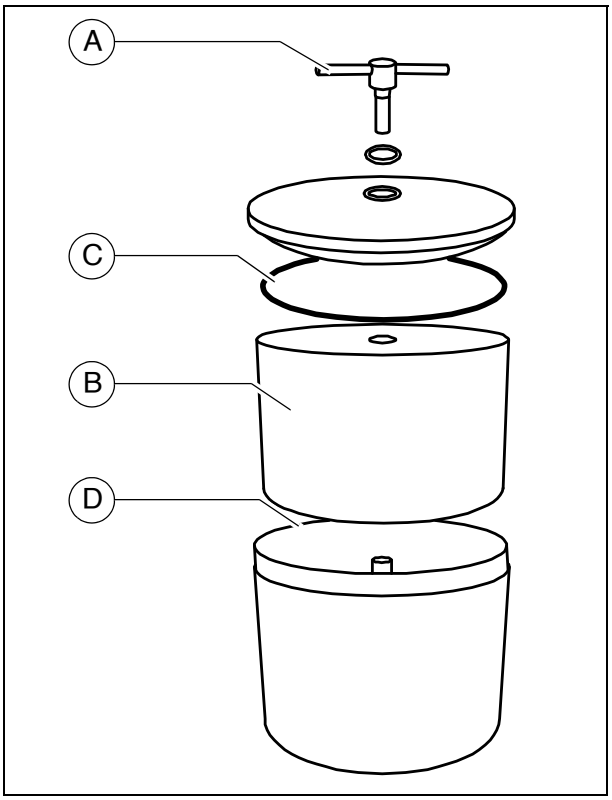
Auxiliary flow filter (6)



☞ The hydraulic oil change is omitted on use of an auxiliary flow filter!
The quality of the oil must be checked regularly.
The oil level must be topped up if necessary!

Replace filter element:

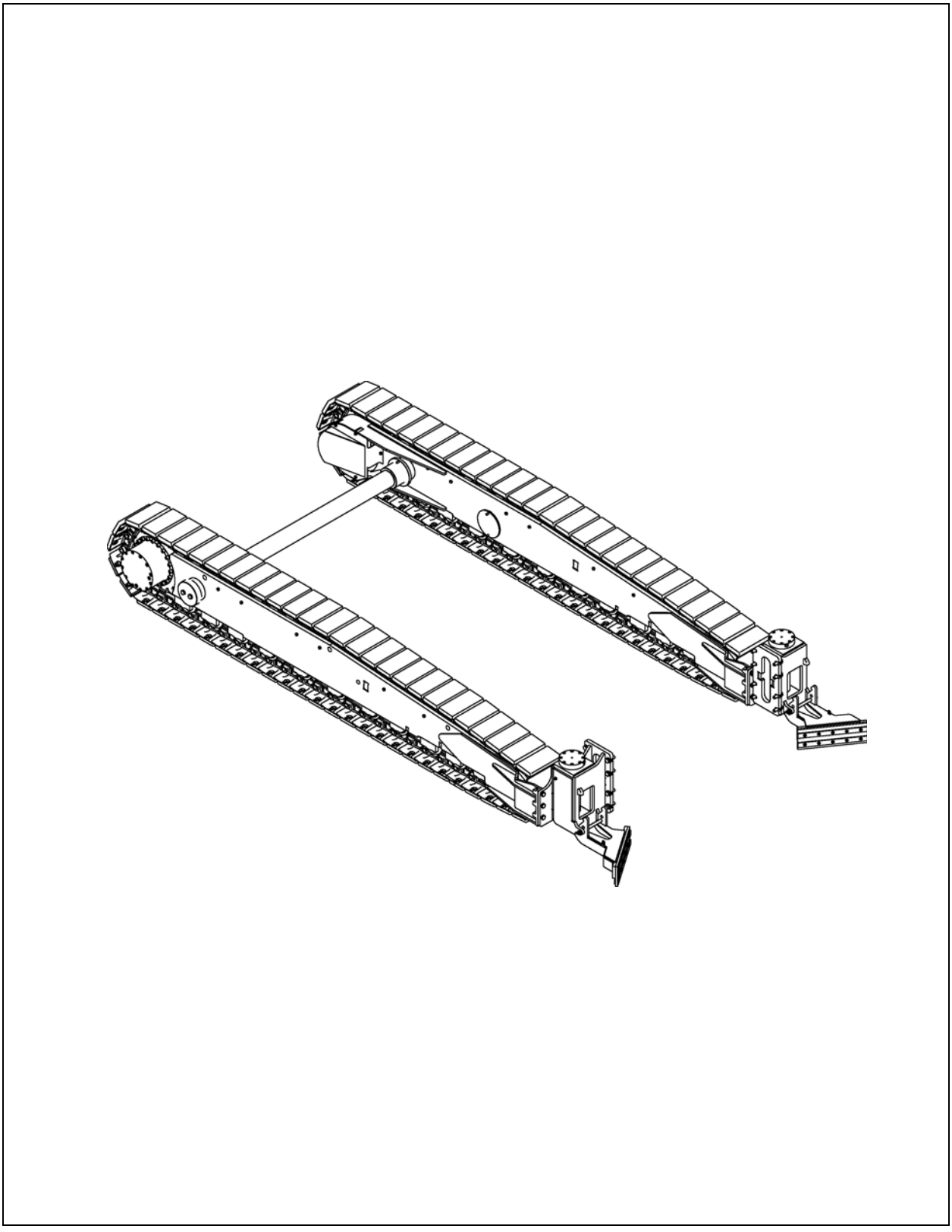
- Release the threaded cover connection (A) then open the non-return valve briefly to lower the oil level in the filter, then close the non-return valve again.
- Replace filter element (B) and sealing ring (C):
  - Turn filter element clockwise with the help of carrier straps and, at the same time, raise it slightly.
  - Wait for a moment until the oil has escaped downwards, then remove the filter element.
- Check inlet and outlet in filter housing (D).
- As required, top up hydraulic oil level in filter housing then screw down the cover.
- Bleed the hydraulic system.



⚠ Do not remove the cardboard sleeve from the filter element! This is part of the filter!

F 71 Maintenance - drive units

1 Maintenance - drive units



⚠ WARNING	**Danger of being pulled in by rotating or conveying vehicle parts**
	Rotating or conveying vehicle parts can cause severe or fatal injuries! - Do not enter the danger zone. - Do not reach into rotating or conveying parts. - Only wear close-fitting clothing. - Comply with the warning and information signs on the vehicle. - Stop the engine and remove the ignition key before any maintenance work. - Comply with all further information in these instructions and in the safety manual.

⚠ WARNING	**Danger from heavy loads**
	The raised machine can slide away and cause severe to fatal injuries! - The vehicle may only be raised at the marked lifting points. - Heed the operating weight of the vehicle. - Do not enter the danger zone. - Only use approved ramps and adequately dimensioned ramps or pits. - Use only lifting gear that can bear the load. - Do not leave any load or loose parts on the vehicle. - Comply with all further information in these instructions and in the safety manual.

⚠ CAUTION	**Hot surfaces!**
	Surfaces including those behind covering parts, together with engine combustion gases can be very hot and cause injuries! - Wear your personal safety gear. - Do not touch hot parts of the vehicle. - Only perform maintenance and repair work after the vehicle has cooled down. - Comply with all further information in these instructions and in the safety manual.

1.1 Maintenance intervals

Pos.	Interval								Maintenance point	Note
	10	50	100	250	500	1000 / annually	2000 / every 2 years	If necessary		
1	■								- Chain tension - Check	
								■	- Chain tension - Adjust	
								■	- Chains - Relieve	
2				■					- Bottom plates - Check wear	
								■	- Bottom plates - Replace	
3	■								- Rollers - Check for leaks	
				■					- Rollers - Check wear	
								■	- Rollers - Replace	

Maintenance	■
Maintenance during the running-in period	▼

Pos.	Interval								Maintenance point	Note
	10	50	100	250	500	1000 / annually	2000 / every 2 years	If necessary		
4		■							- Planetary gear - Check oil level	
								■	- Planetary gear - Top up oil	
			▼			■			- Planetary gear - Change oil	
					■				- Planetary gear - Check oil quality	
				■					- Planetary gear - Check screw connections	
								■	- Planetary gear - Tighten screw connections	
5					■				- Lubrication points - Grease the track guide	

Maintenance	■
Maintenance during the running-in period	▼

WARNING	Danger from pretensioned springs
	Incorrectly performed maintenance and repair work can cause severe or fatal injuries! - Always observe the maintenance instructions. - Do not perform any unauthorised maintenance or repair work to pretensioned springs. - Comply with all further information in these instructions and in the safety manual.

Any work on the pretensioned spring element must only be carried out by trained, specialist personnel!

The spring elements must only be removed by a specialist workshop! The following applies to all spring elements in the event of a necessary repair: replace the complete unit only!

Repairing the spring elements involves significant safety measures and should only be carried out by a specialist workshop!

Your Dynapac customer service will be happy to provide support during maintenance, repair and the replacement of wearing parts!

1.2 Maintenance points

Chain tension (1)

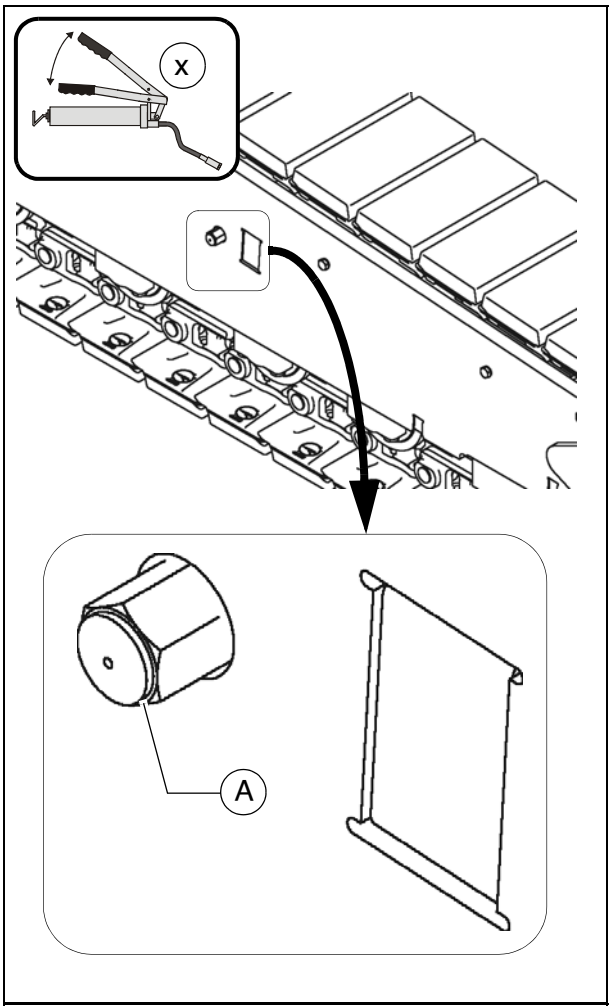


⚠ If the chains are not tensioned sufficiently, they can slip out of their guide formed by rollers, drive gear and idler wheel, thereby increasing wear levels.

⚠ If the chains are tensioned too tightly, this increases wear on the idler wheel and drive unit mounting, and also increases wear on track bolts and bushes.

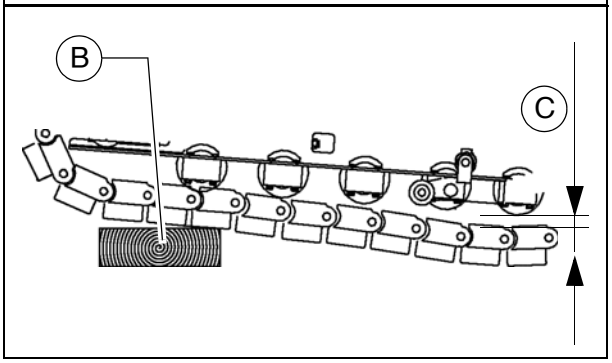
Checking / adjusting chain tension

- The chain tension is adjusted with grease tensioners. The filling ports (A) are located on the RH and LH sides of the drive unit frame.
- Run vehicle drive unit onto a suitable piece of square timber (B) or onto a similar object.
- To relieve strain on the chain, reverse a short distance, ensuring that the vehicle remains on the angled timber.



☞ The chain tension is correct if the chain slack (C) between centre roller and chain is 30-40 mm.

☞ If a different level of slack is detected during the measurement process, proceed as follows:



- Drive the vehicle forwards slightly, to relieve strain on the upper track section.
- Screw head section for flat nipple (toolbox) onto the grease gun.
- Refill the chain tensioner with grease at the filler connection (A), then remove the grease gun.
- Next, drive the vehicle forwards and backwards a few times.
- Check the chain tension once again, as described above.

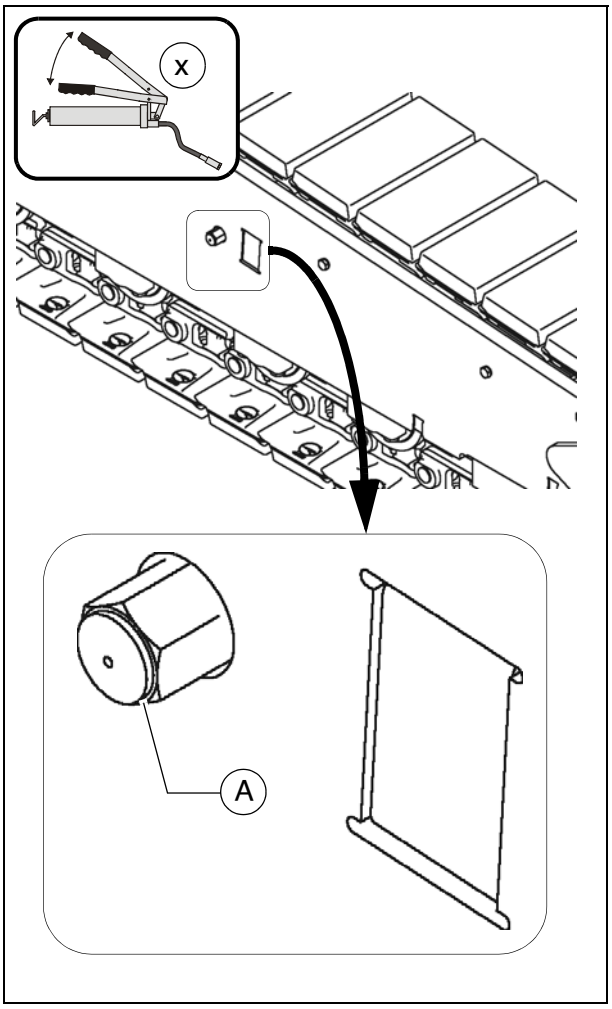
☞ Repeat this procedure on both drive units!

Relieving the chain:

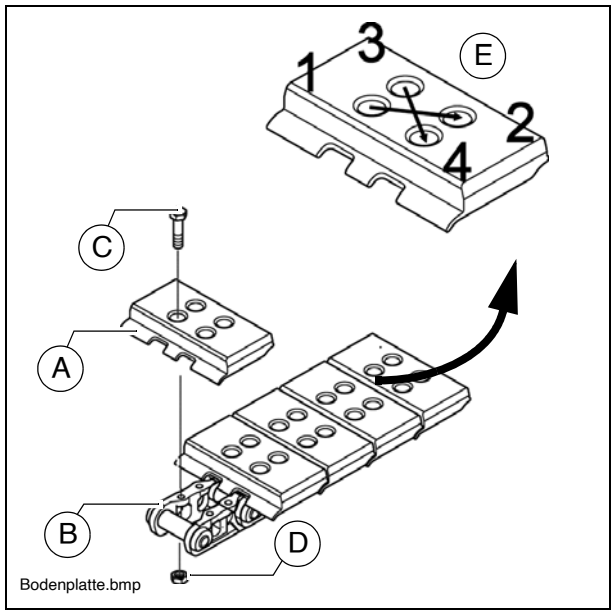
The grease in the tensioning element is under pressure. Carefully and slowly unscrew the filling valve, but not too far.

- Unscrew the lubricating nipple (A) on the grease tensioner using a tool until the grease is able to emerge from the nipple's lateral hole.

The idler wheel moves back independently or must be reset manually.



Bottom plates (2)

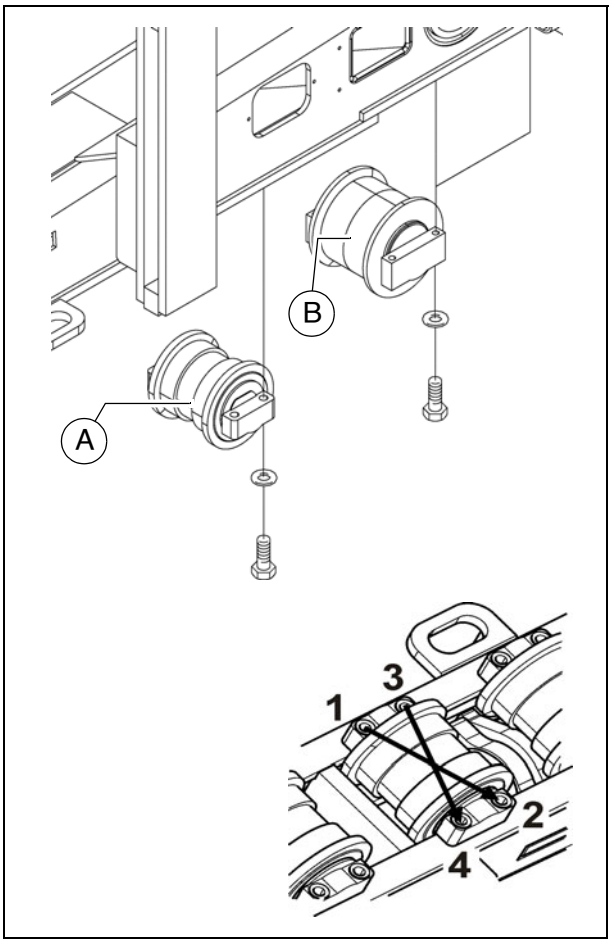


⚠ Always use new bolts and nuts when installing new bottom plates!

- After removing the worn bottom plates, the adhesions must be cleaned from the contact surfaces of the chain links and the nut seats.
- Place the bottom plate with the front edge (A) over the chain links' bolt eye (B).
- Lubricate the threads and the contact surfaces beneath the bolt heads with a thin film of oil or grease.
- Insert the bolts (C) into the holes and screw them into the nuts (D) a few turns.
- Tighten the bolts without applying significant torque.
- Tighten the bolts diagonally (E) to the required torque 155 ± 8 Nm.

⚠ Check that each bolt has attained the full tightening torque!

Rollers (3)



⚠ Rollers with damaged surfaces or which are leaking should be replaced immediately!

- Relieving the caterpillar chain:
- Raise the track chassis using suitable lifting equipment and remove adhering dirt.

STOP Observe the safety measures when raising and securing loads!

- Remove the defective roller.
- Install the new roller using new assembly parts.

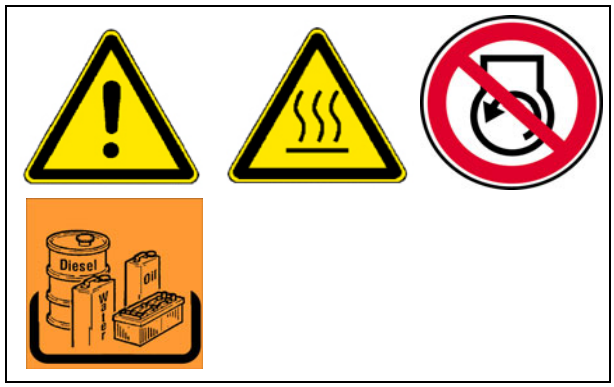
- Tighten the bolts without applying significant torque.
- Tighten the bolts diagonally to the required torque.

- Tighten to the following torques:
  - Small rollers (A): 220 Nm
  - Large rollers (B): 87 Nm

⚠ Check that each bolt has attained the full tightening torque!

- Lower the track chassis and tension the caterpillar chain properly.

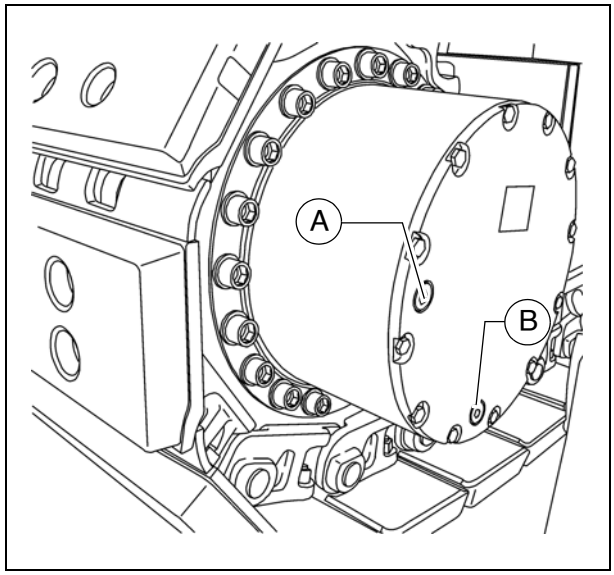
Planetary gear (4)



- Turn the conveyor chain sprocket so that the drain plug (B) is located at the bottom.
- For **oil level check** unscrew and remove the inspection bolt (A).

☞ When oil level is correct, the oil comes up to the lower edge of the inspection bore or a small amount of oil escapes through the aperture.

For **filling in** the oil:



- Unscrew the filler screw (A).
- Fill in the specified oil into the filler bore at (A) until the oil level has reached the lower edge of the filler bore.
- Screw the filler screw (A) back in.

Oil change:

☞ The oil should be changed when at operating temperature.

⚠ Ensure that no dirt or foreign bodies are able to enter the gear.

- Turn the conveyor chain sprocket so that the drain plug (B) is located at the bottom.
- Unscrew and remove the drain plug (B) and filler screw (A) and drain off oil.
- Check gaskets on both screws and replace if necessary.
- Screw the drain plug (B) in.
- Fill new oil through the filler opening until the lower edge of the opening is reached.
- Tighten the filler screw (A).

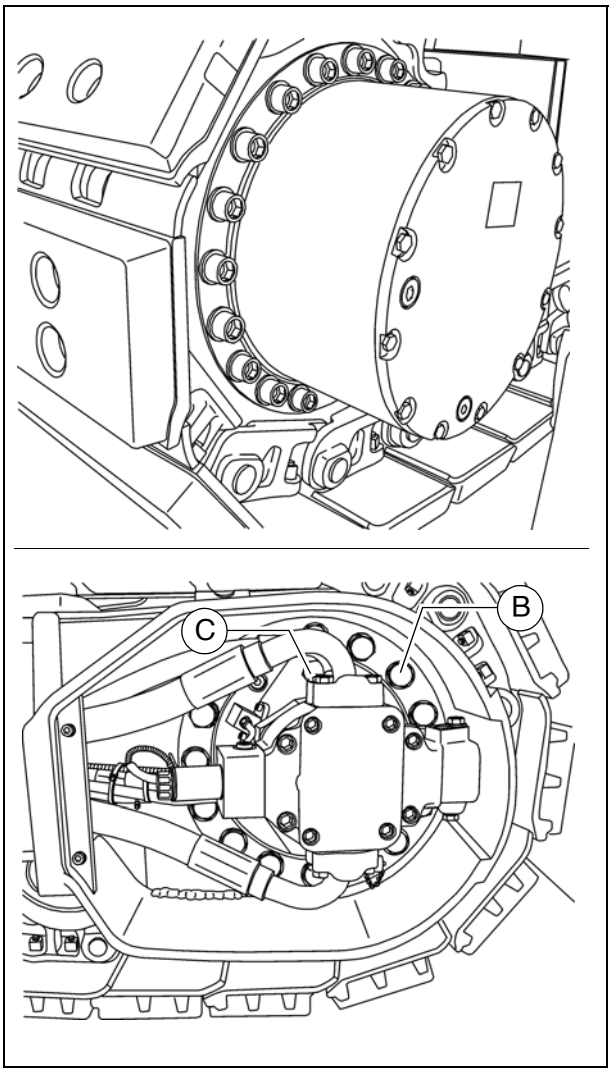
Screw connections



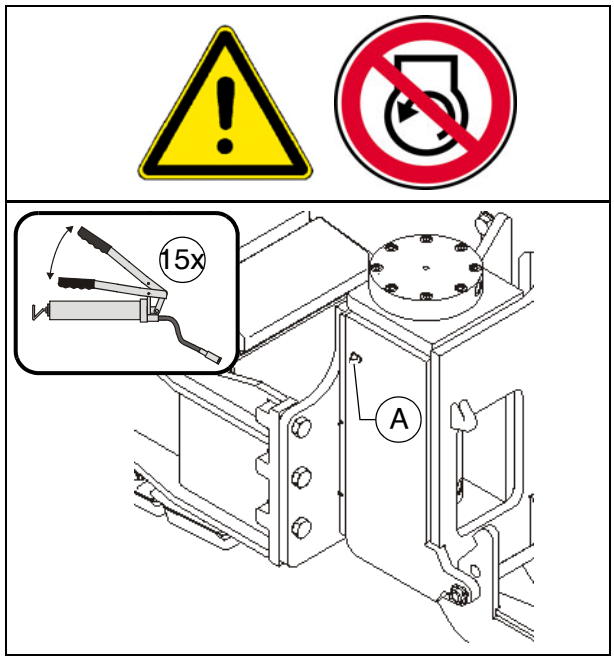
⚠ After approx. 250 hours of operation at full load, check that all gearbox mounting screws are firmly seated.

⚠ Improperly tightened screws may lead to increased wear and to the destruction of components!

- The correct torque for the gear/track chassis connecting screws (B) is: 500Nm +/- 50Nm
- The correct torque for the hydraulic motor/gear connecting screws (C) is: 410Nm



Lubrication points (5)

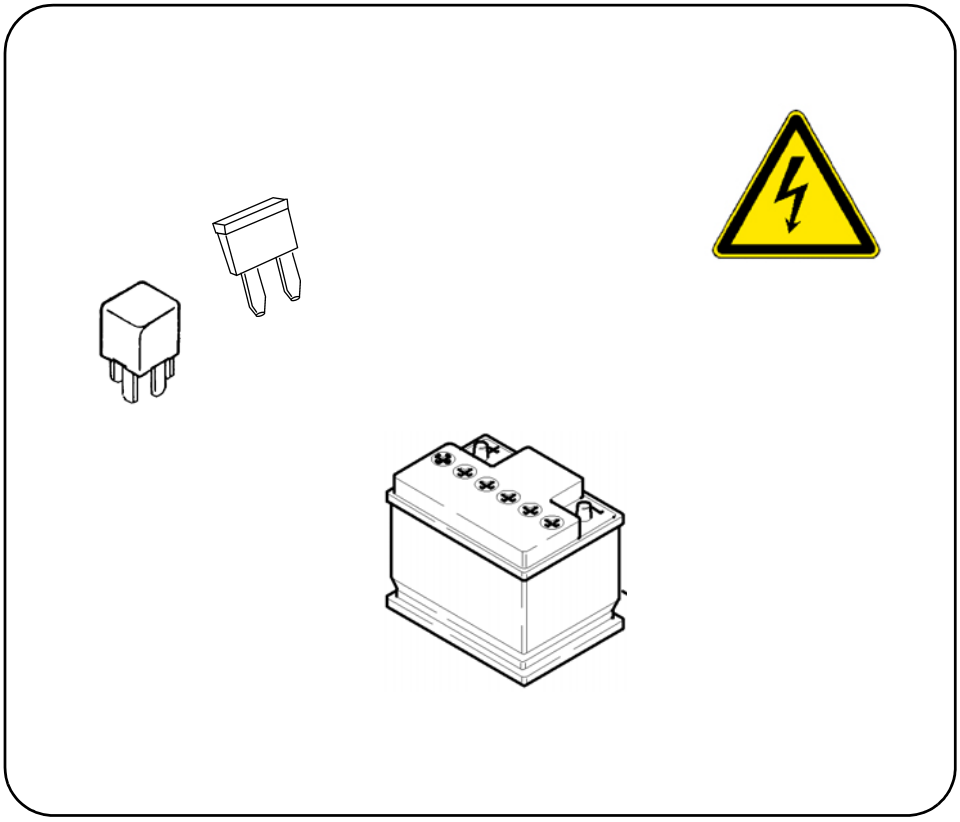


Drive unit guide

☞ There is a grease nipple (A) on both sides of the drive unit guide.

F 81 Maintenance - electrical system

1 Maintenance - electrical system



⚠ WARNING	**Danger of being pulled in by rotating or conveying vehicle parts**
	Rotating or conveying vehicle parts can cause severe or fatal injuries! - Do not enter the danger zone. - Do not reach into rotating or conveying parts. - Only wear close-fitting clothing. - Comply with the warning and information signs on the vehicle. - Stop the engine and remove the ignition key before any maintenance work. - Comply with all further information in these instructions and in the safety manual.

⚠ CAUTION	**Danger due to electric shock**
	Injuries can be caused by touching live parts directly or indirectly! - Do not remove any protective safeguards. - Never spray water on electric or electronic components. - Maintenance work to the electric system should only be carried out by trained specialist staff. - Comply with all further information in these instructions and in the safety manual.

⚠ CAUTION	**Danger from batteries**
	Incorrect handling of the batteries poses a danger of injuries! - Wear your personal safety gear. - Do not smoke, avoid any open flames. - Ensure the working area is well ventilated after opening the battery compartment. - Avoid short-circuiting the battery terminals. - Comply with all further information in these instructions and in the safety manual.

1.1 Maintenance intervals

Pos.	Interval								Maintenance point	Note
	10	50	100	250	500	1000 / annually	2000 / every 2 years	If necessary		
1			■						Check fill level of battery acid	
								■	Top up with distilled water	
				■					Apply grease to battery terminals	
2								■	Electrical fuses	

Maintenance	■
Maintenance during the running-in period	▼

1.2 Maintenance points

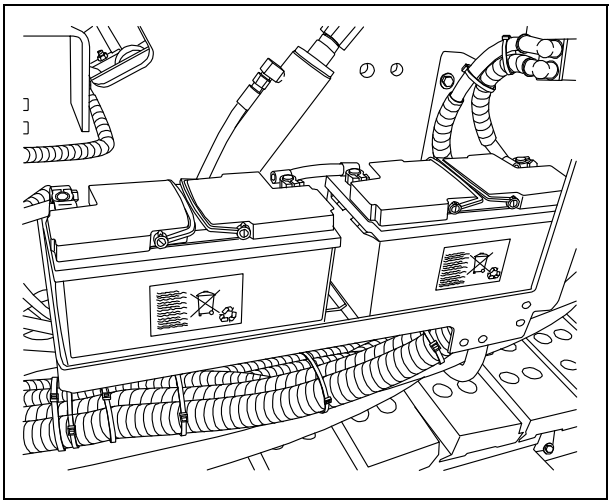
Batteries (1)

Maintenance of batteries



☞ The batteries are factory-filled with the correct quantity of acid.
Ensure than an electrolyte level of 10 to 15 mm above the plates or the marking is guaranteed accordingly; top up with distilled water only. Never overfill, as this affects performance and causes excessive corrosion.

☞ The amount of water that has evaporated from the batteries usually depends on the operating conditions, such as e.g. temperatures, number of starts, operating time between starting and stopping, etc.
If a battery has to be topped up with increasing frequency, this indicates overloading.
If a battery does not have to be topped up at all over a long period of operation, the battery may be underloaded e.g. due to poor cable connections.



⚠ The battery terminal clamps must be free of oxide and protected with a special terminal grease.

⚠ When removing the batteries, always first remove the negative terminal, ensuring that the battery terminals cannot be short circuited.

Recharging the batteries

Both batteries must be recharged individually and must be dismantled from the vehicle for this purpose.



Always keep batteries upright during transport!

Before and after recharging a battery, always check the electrolyte level in every cell; if this needs to be topped up, only use distilled water.



When recharging batteries, every cell must be opened, i.e. plugs and/or covers must be removed.



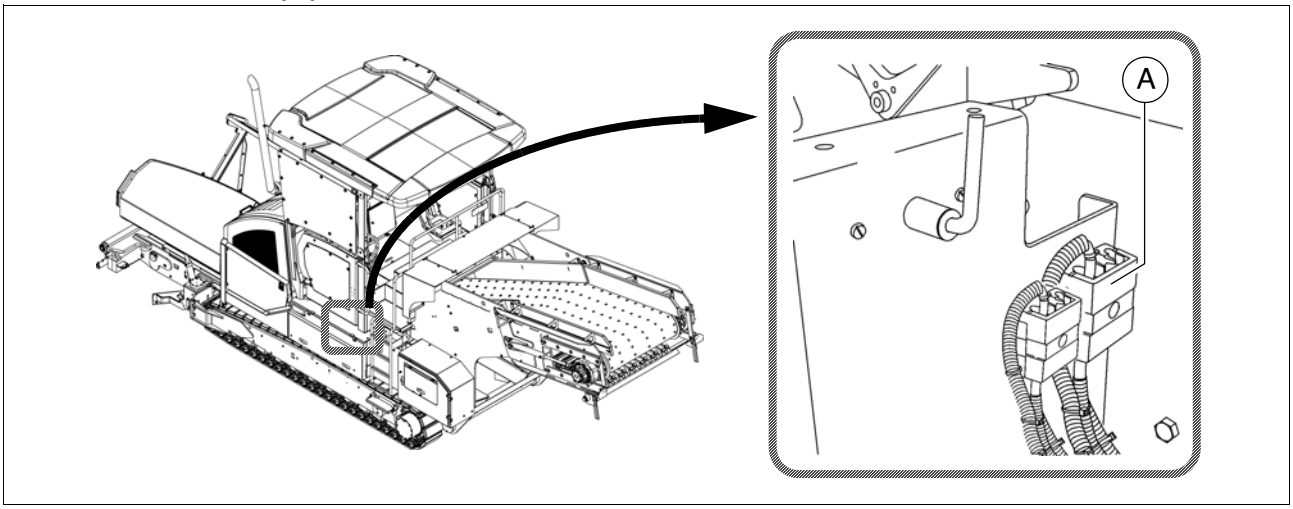
Only use commercially available automatic battery chargers according to the manufacturer's instructions.



Preferably use the slow recharging procedure and adjust the charge current according to the following rule of thumb:
Battery capacity in Ah divided by 20 results in the safe charge current in A.

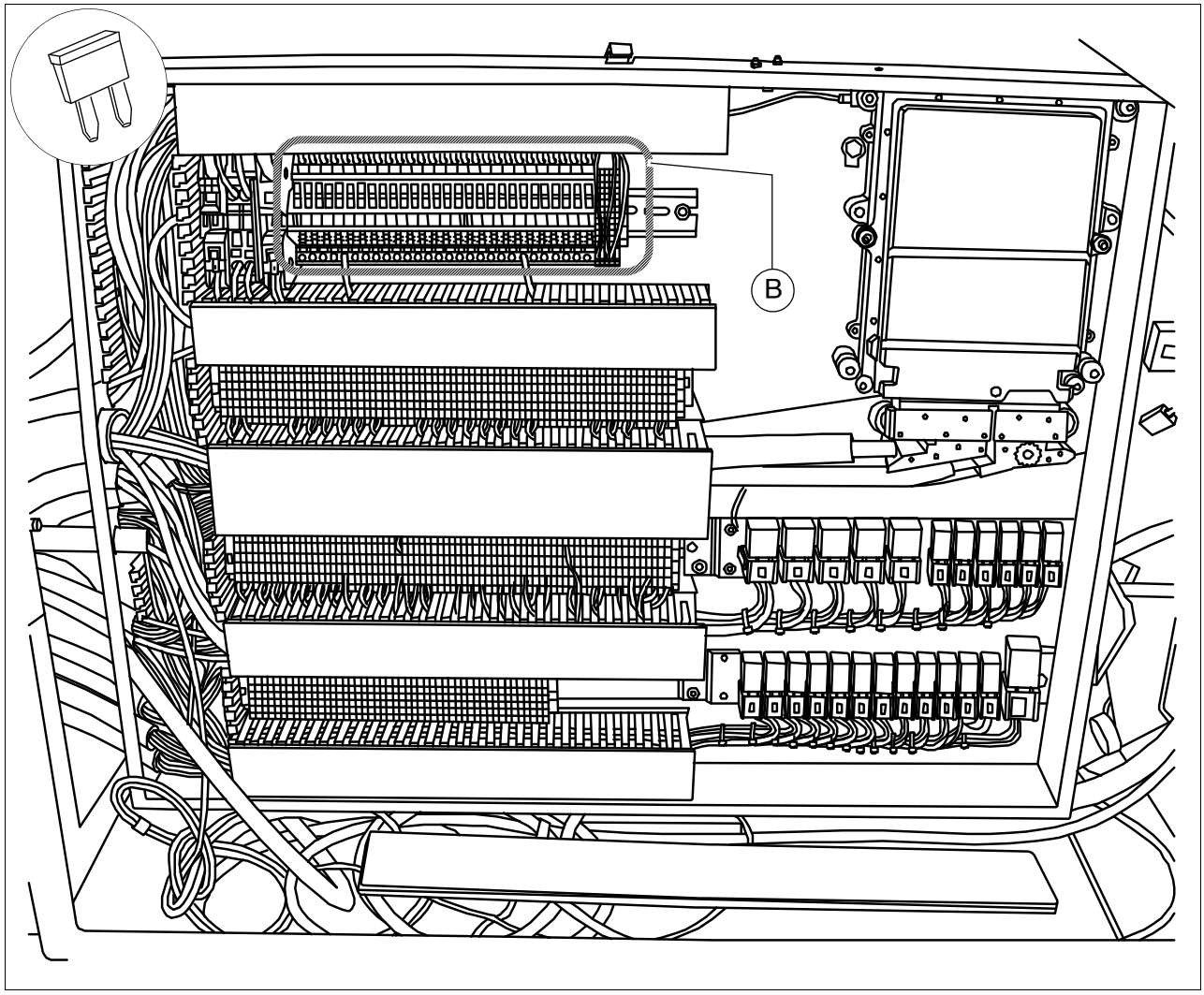
2 Electrical fuses / relays

2.1 Main fuses (A)



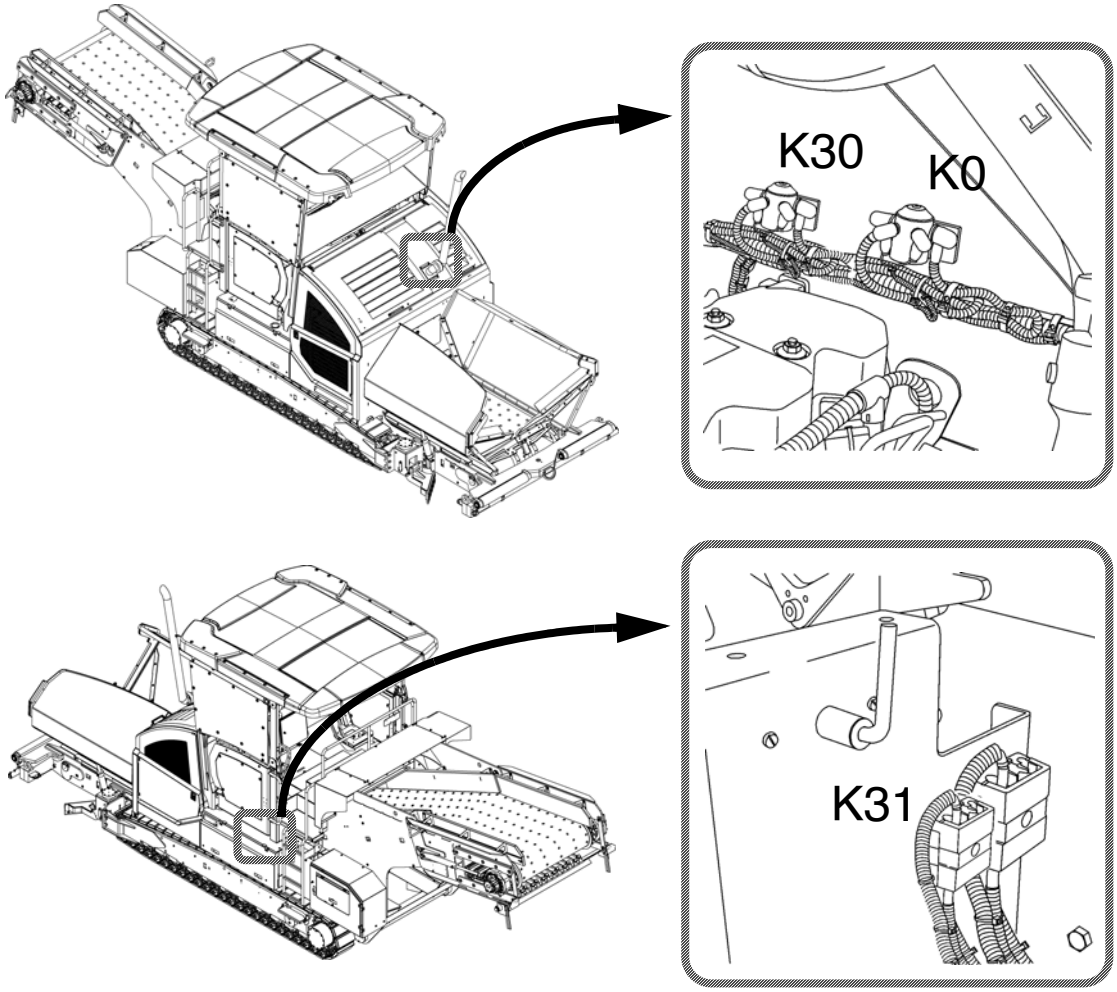
F		A
F1.1	Main fuse	50
F1.2	Main fuse	30
F1.3	Preheater T4f (O)	125
F1.4	Illuminated balloon	30

2.2 Fuses in terminal box (B)



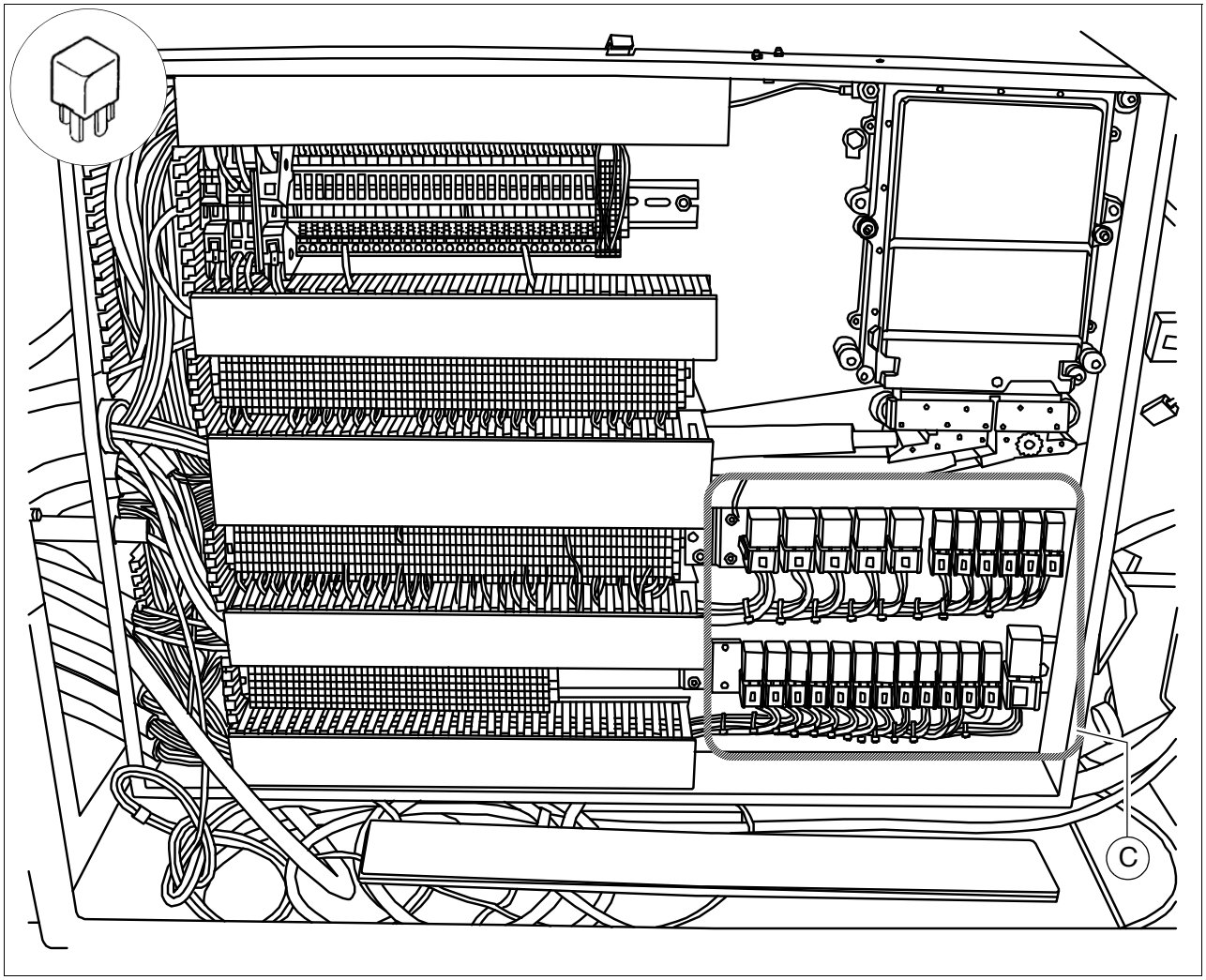
F	Usage	A
F2	Ignition, EMERGENCY STOP, horn button	3
F3	Main computer	25
F4	Main computer	25
F5	Main computer	20
F6	Engine control unit	30
F7	Keyboard and display constant positive	2
F8	Lights	10
F9	Lights	10
F10	Horn	10
F11	Engine interface	5
F12	Ignition for keyboard and display	5
F13	Windscreen wiper system	15
F14	Seat heating	15
F15	12V socket	10
F16	Lights	10
F17	Ignition for keyboard and display	10
F18	Keyboard	10
F19	Steering potentiometer, drive unit sensors	7.5
F20	Distance sensor	5
F21	Start-stop button	5
F22	Emulsion pumps	10
F23	24V sockets	10
F24	Traffic light system	10
F25	Engine compartment lighting	5
F26	Automatic steering unit	2
F27	Interface	10
F28	Interface	2
F29	Central lubrication system	10

Relays in the engine compartment



K	
0	Engine start
30	Preheater (O)
31	Illuminated balloon (O)

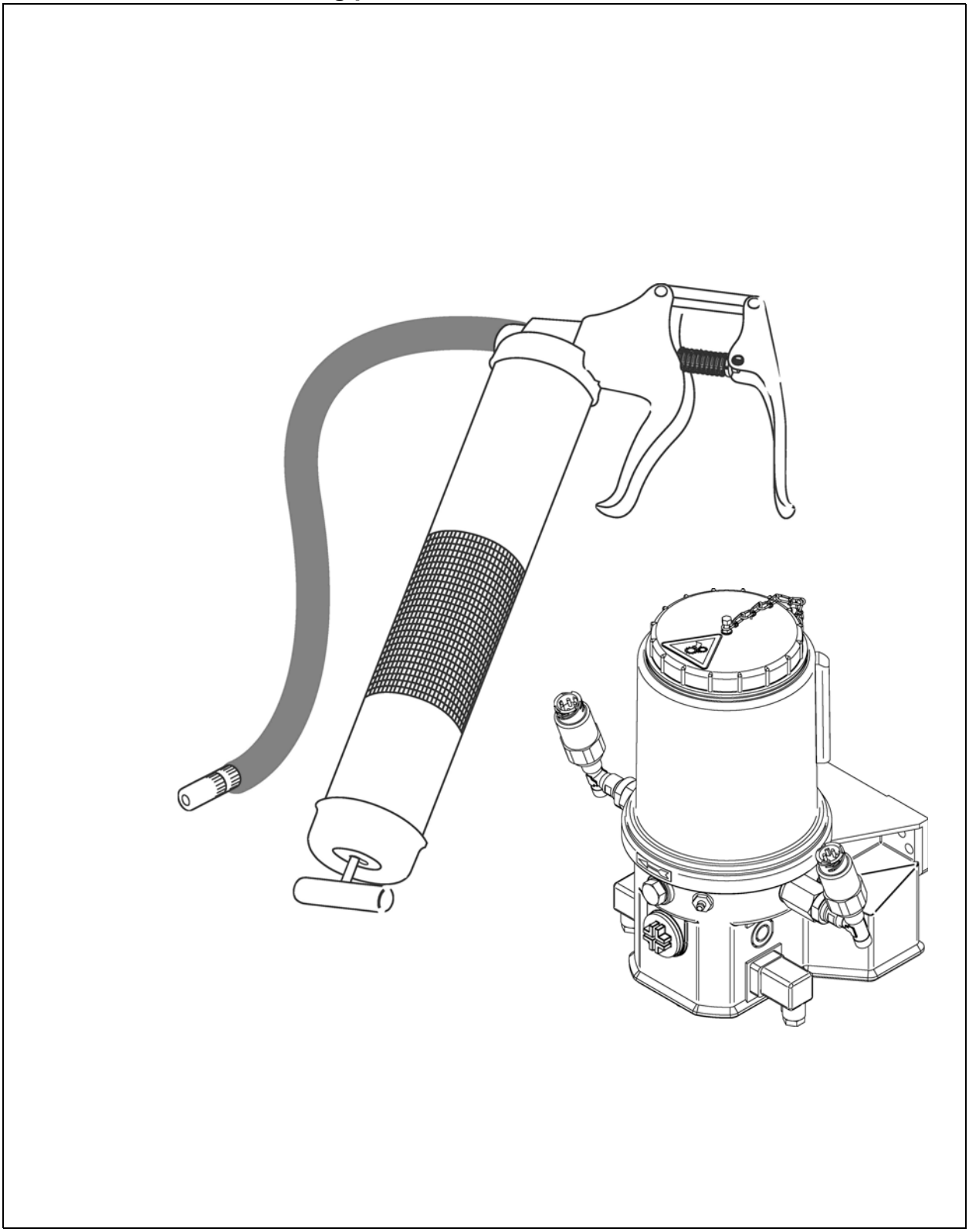
Relays in terminal box (C)



K	Function
1	Ignition
2	Main computer
3	Main computer
4	Engine stop
5	Main computer voltage supply
6	Display, keyboard
7	Headlights
8	Headlights
9	Horn
10	Emergency stop
11	Start inhibit
12	Rotary beacon
13	Seat heating
14	Windscreen wiper
15	Windscreen washer system
16	Reverse buzzer
17	Diesel pump
18	Emulsion spraying system, manual
19	Emulsion spraying system, conveyor
20	Headlights
21	Central lubrication system
22	Traffic light system (green)
23	Traffic light system (red)
24	Convenience light

F 90 Maintenance - lubricating points

1 Maintenance - lubricating points



☞ The information on the lubricating points for the various assemblies is assigned to the specific maintenance descriptions and must be read there!

☞ Due to the use of a central lubrication system (○), the number of lubricating points may deviate from the description.

1.1 Maintenance intervals

Pos.	Interval								Maintenance point	Note
	10	50	100	250	500	1000 / annually	2000 / every 2 years	If necessary		
1	■								- Check lubricant tank fill level	(○)
								■	- Top up lubricant tank	(○)
							■		- Bleed central lubrication system	(○)
	■								- Check pressure limiting valve	(○)
								■	- Check flow of lubricant at the consumer	(○)
2		■							- Bearing points	

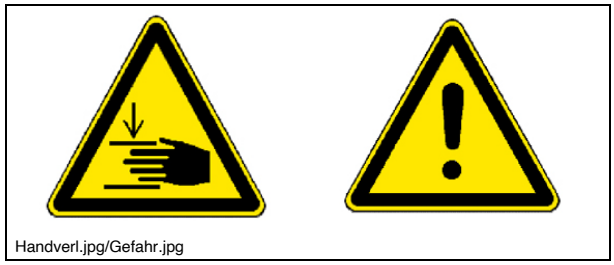
Maintenance	■
Maintenance during the running-in period	▼

1.2 Maintenance points

Chain lubricating system (1)

Danger of injuries!

Do not reach into the tank when the pump is running!


Handverl.jpg/Gefahr.jpg

The central lubrication system must only be operated with the safety valve installed!

Do not undertake any work on the pressure relief valve during operation!

Risk of injury due to escaping lubricant, as the system operates at high pressures!

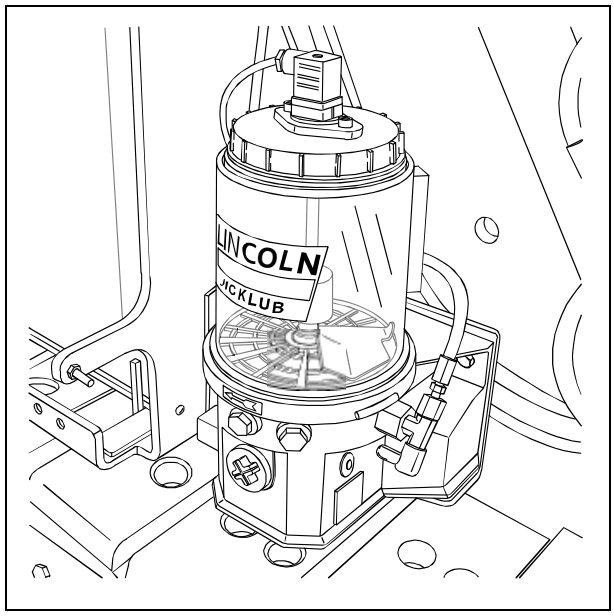
Ensure that the diesel engine cannot be started when working on the system!

Observe safety regulations for handling hydraulic systems!

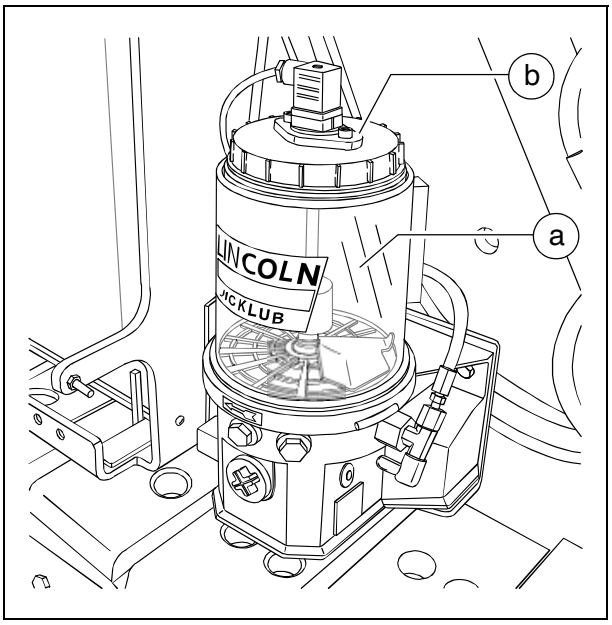
Ensure maximum cleanliness when working on the central lubrication system!

The following assemblies' lubricating points can be automatically supplied with oil by the central lubrication system:

- Chain conveyor belt drive



Central lubrication system
Check filling level



☞ The lubricant tank should always be filled sufficiently so that the system cannot "run dry", ensuring sufficient drive chain lubrication and eliminating the need for time-consuming bleeding of the system.

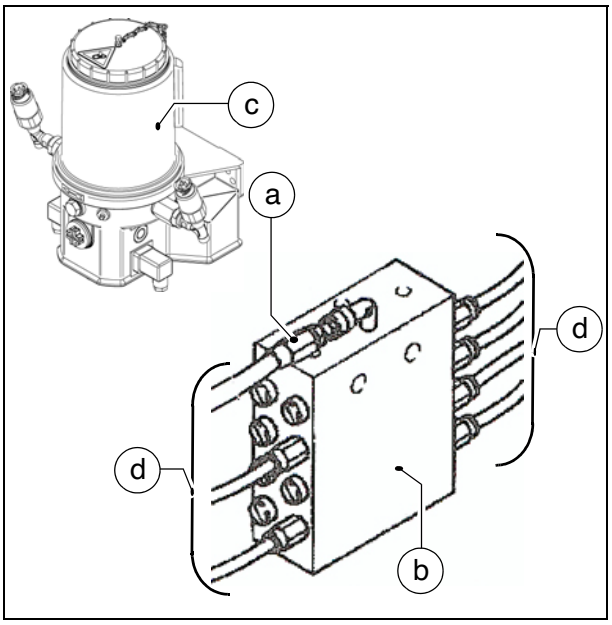
- Always maintain a fill level above the "MIN" mark (a) on the tank.

Top up lubricant tank

- Unscrew cap (b) and fill tank from above.

☞ When the lubricant tank is completely empty, the pump may have to run for up to 10 minutes until the full delivery rate is achieved after filling.

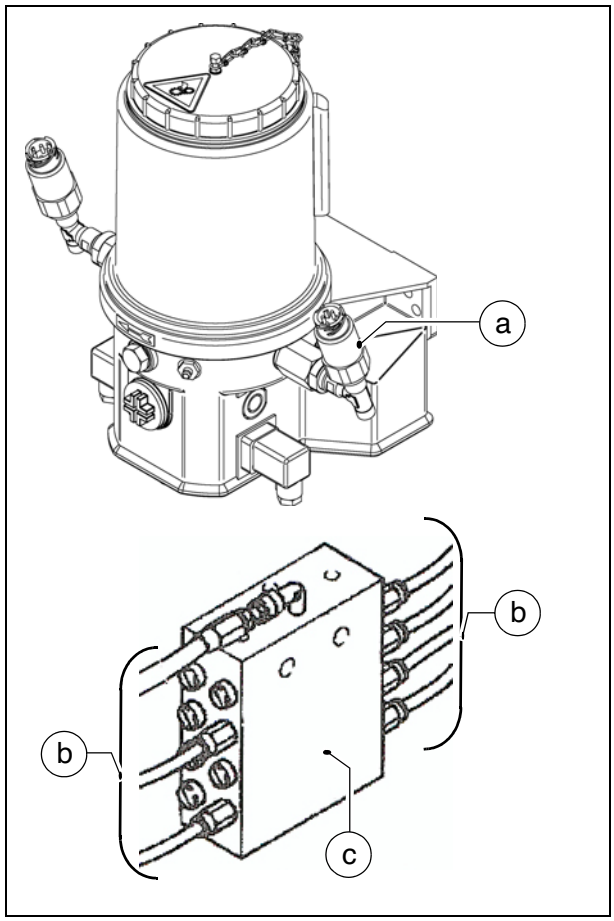
Bleed central lubrication system



Bleeding the lubrication system is necessary if the central lubrication system has been operated with an empty lubricant tank.

- Release the main lubrication line (a) at the distributor (b).
- Start up the central lubrication system with the filled lubricant tank (c).
- Allow the pump to run until lubricant emerges from the previously released main line (a).
- Reconnect the main line (a) to the distributor.
- Release all distribution lines (d) from the distributor.
- Reconnect all distribution lines as soon as lubricant has emerged.
- Check all connections and lines for leaks.

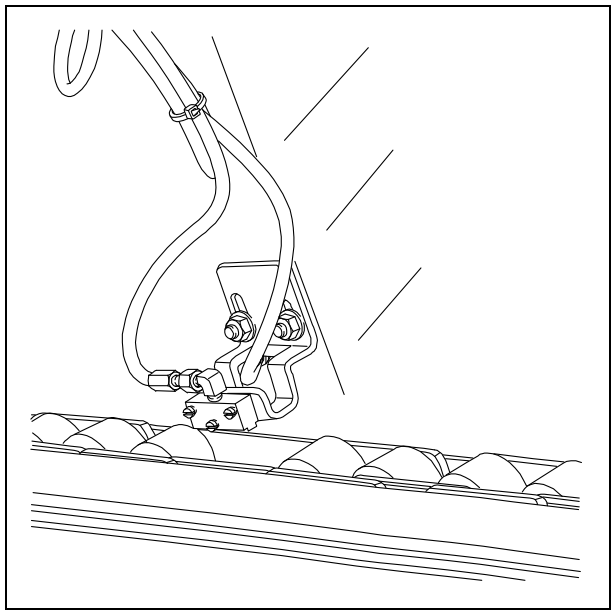
Check pressure limiting valve



⚠ If lubricant emerges at the pressure limiting valve (a), this indicates a malfunction in the system.
The consumers are no longer adequately supplied with lubricant.

- Release all distribution lines (b) leading from the distributor (c) to the consumers in succession.
- If lubricant emerges from one of the released distribution lines (b) under pressure, search in this lubrication circuit for the cause of the blockage which has triggered the pressure limiting valve.
- After rectifying the malfunction and reconnecting all lines, again check the pressure limiting valve (a) for lubricant emergence.
- Check all connections and lines for leaks.

Check the flow of lubricant at the consumers



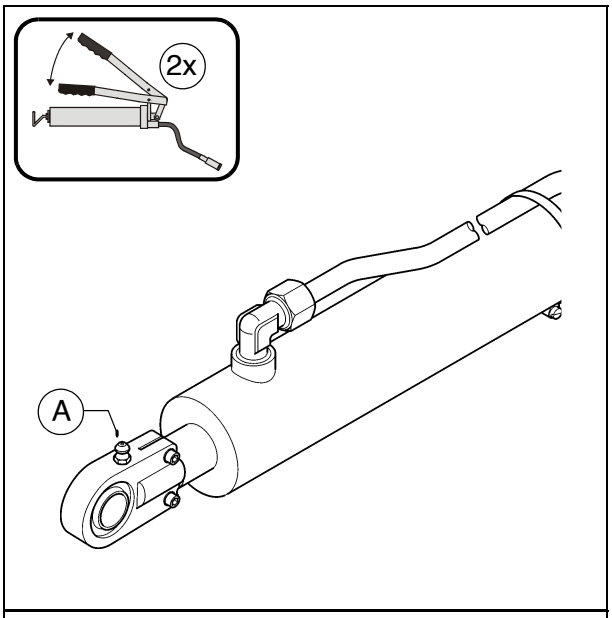
Each lubrication channel at the consumers must be checked as regards clearance.

☞ A pair of oil brushes, which apply the lubricant onto the drive chain, is located on both sides of the conveyor belt.

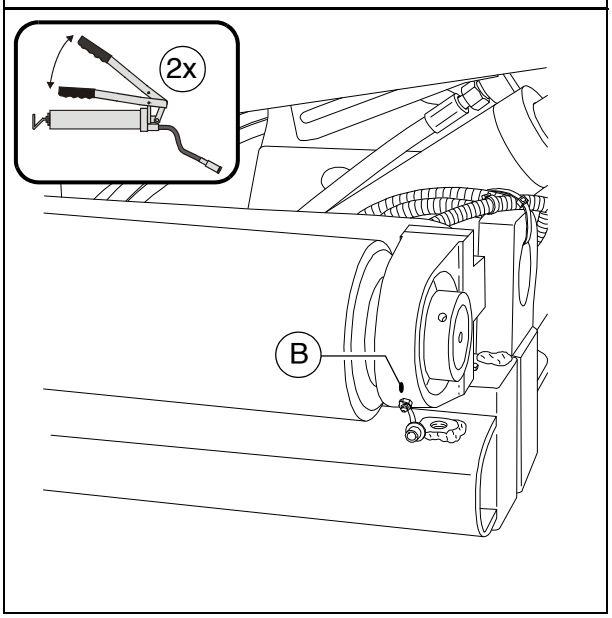
- Check whether an oil film is applied onto the chain when the central lubricating system is running.
- Check all connections and lines for leaks.

Bearing points (2)

☞ One lubricating nipple (A) is located at each hydraulic cylinder bearing point (top and bottom).

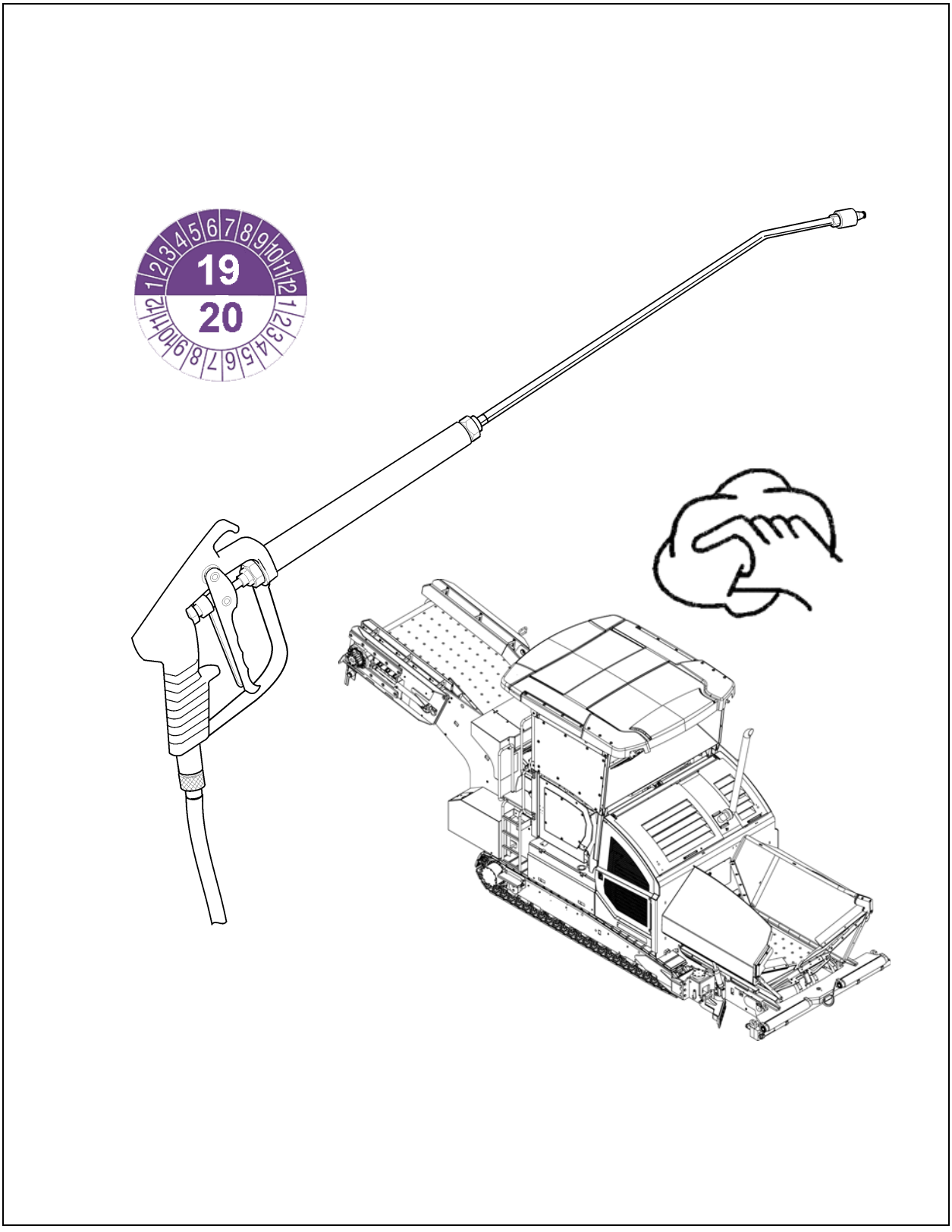


☞ One lubricating nipple (B) is located at each push roller bearing point.



F 100 Checking, shutdown ...

1 Tests, checks, cleaning, shutdown



1.1 Maintenance intervals

Pos.	Interval								Maintenance point	Note
	10	50	100	250	500	1000 / annually	2000 / every 2 years	If necessary		
1	■								- General visual inspection	
2	regularly								- Check that the bolts and nuts fit firmly	
3						■		■	- Inspection by an expert	
4						■			- Check ladders, steps	
5								■	- Cleaning	
6								■	- Preserving the feeder	

Maintenance	■
Maintenance during the running-in period	▼

2 General visual inspection

A walk around the vehicle and the following inspections form part of the daily routine:

- Are components or controls damaged?
- Are there leaks on the engine, the hydraulics, the gearbox, etc.?
- All fastening points OK?

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

3 Check that the bolts and nuts fit firmly

Bolts and nuts must be checked regularly to ensure that they fit firmly; retighten them if necessary.

☞ The spare parts catalogue states the special torques at the corresponding parts.

☞ For the necessary standard torques, please refer to the section "Bolts - torques"

4 Inspection by an expert

☞ The vehicle must be inspected by a skilled specialist

- when required (according to the operating conditions and the nature of application),
- however, at least once a year, check that they are all in good operational condition.

5 Ladders, steps

☞ The surface structure of steps and ladders becomes worn over time.

- The surfaces of areas and components designed to be non-slip must be checked to ensure that they are safe to operate at least once a year.

STOP Components which are no longer sufficiently non-slip must be exchanged immediately!

6 Cleaning

- Clean all parts coming into contact with paving material.
  - Spray contaminated parts with the separator fluid spraying system (○).

⚠ **Before** cleaning work with the high pressure cleaner, grease all lube points acc. to specification.

- Clean the vehicle with water after laying mineral aggregates, lean-mixed concrete, etc.

⚠ Do not spray bearing points, electrical or electronic components with water.



- Remove residual paving material.

⚠ **After** cleaning work with the high pressure cleaner, grease all lube points acc. to specification.

STOP Danger of slipping! Ensure that all steps and ladders are free of grease and oil!



6.1 Cleaning the hopper

Clean the hopper regularly

To clean the hopper, park the vehicle on a smooth surface with the hopper open. Switch off the engine.

CAUTION	**Hot surfaces!**
	Surfaces including those behind covering parts, together with engine combustion gases can be very hot and cause injuries! - Wear your personal safety gear. - Do not touch hot parts of the vehicle. - Only perform maintenance and repair work after the vehicle has cooled down. - Comply with all further information in these instructions and in the safety manual.

6.2 Cleaning the conveyor belt

⚠ Clean the conveyor belt regularly.

If necessary, let the conveyor belt run at low speed during cleaning.

⚠ WARNING	**Danger of being pulled in by rotating or conveying vehicle parts**
	Rotating or conveying vehicle parts can cause severe or fatal injuries! - Do not enter the danger zone. - Do not reach into rotating or conveying parts. - Only wear close-fitting clothing. - Comply with the warning and information signs on the vehicle. - Stop the engine and remove the ignition key before any maintenance work. - Comply with all further information in these instructions and in the safety manual.

NOTE	**Caution! Possible destruction of parts**
	The spring arm scraper is fitted with parts that are sensitive to heat. - Damage can be caused when using a blowtorch or similar equipment for cleaning!

7 Preserving the feeder

7.1 Shutdowns for up to 6 months

- Park the vehicle in a place where it is protected from great exposure to direct sunlight, wind, humidity and frost.
- Grease all lube points in accordance with specifications. Allow optional central lubricating unit to run if necessary.
- Change oil in diesel engine.
- Seal exhaust silencer to make it airtight.
- Remove batteries, charge them and store them in a well ventilated place at room temperature.

⚠ Recharge removed batteries every 2 months.

- Protect all bare metal components, e.g. piston rods on hydraulic cylinders, with a suitable corrosion inhibitor.
- If it is not possible to park the vehicle is an enclosed building or under cover, it must be covered with a suitable size of tarpaulin. In all cases, seal all air intake and exhaust apertures with plastic film and adhesive tape.

⚠ Move the conveyor belt(s) 2 to 3 meters every 2 months.

7.2 Shutdowns lasting from 6 months to 1 year

- Carry out all the actions listed for "Shutdowns of up to 6 months".
- Once the engine oil has been drained off, fill the diesel engine with a manufacturer-approved grade of preserving oil.

7.3 Recommissioning the machine

- Reverse all the steps described in the "Shutdown" sections.

8 Environmental protection, disposal

8.1 Environmental protection

☞ Packaging materials, used operating substances, cleaning agents and vehicle accessories must be correctly recycled.

☞ Always observe the local regulations!

8.2 Disposal

☞ Correctly sorted disposal must be carried out after replacing wear and spare parts and after the vehicle has been withdrawn from service (scrapped).
The materials must be sorted correctly according to metal, plastic, electronic scrap, various operating substances etc.
Any oily or greasy parts (hydraulic hoses, lube pipes etc.) must be treated separately.

☞ Electric devices, accessories and packaging should be recycled in an environment-friendly manner.

☞ Always observe the local regulations!

9 Bolts - torques

9.1 Standard metric threads - strength class 8.8 / 10.9 / 12.9

Treatment	dry/lightly oiled						Molykote ®					
	Torque (Nm)	Permitted deviation (+/- Nm)	Torque (Nm)	Permitted deviation (+/- Nm)	Torque (Nm)	Permitted deviation (+/- Nm)	Torque (Nm)	Permitted deviation (+/- Nm)	Torque (Nm)	Permitted deviation (+/- Nm)	Torque (Nm)	Permitted deviation (+/- Nm)
Strength class	8.8	8.8	10.9	10.9	12.9	12.9	8.8	8.8	10.9	10.9	12.9	12.9
M3	1	0.3	1.5	0.4	1.7	0.4	1	0.3	1.4	0.4	1.7	0.4
M4	2.4	0.6	3.5	0.9	4	1	2.3	0.6	3.3	0.8	3.9	1
M5	5	1.2	7	1.7	8	2	4.6	1.1	6.4	1.6	7.7	1.9
M6	8	2.1	12	3	14	3	7.8	1.9	11	2.7	13	3.3
M8	20	5	28	7.1	34	8	19	4.7	26	6.6	31	7.9
M10	41	10	57	14	70	17	37	9	52	13	62	16
M12	73	18	97	24	120	30	63	16	89	22	107	27
M14	115	29	154	39	195	45	100	25	141	35	169	42
M16	185	46	243	61	315	75	156	39	219	55	263	66
M18	238	60	335	84	402	100	215	54	302	76	363	91
M20	335	84	474	119	600	150	304	76	427	107	513	128
M22	462	116	650	162	759	190	410	102	575	144	690	173
M24	600	150	817	204	1020	250	522	131	734	184	881	220
M27	858	214	1206	301	1410	352	760	190	1067	267	1281	320
M30	1200	300	1622	405	1948	487	1049	262	1475	369	1770	443
M33	1581	395	2224	556	2669	667	1400	350	1969	492	2362	590
M36	2000	500	2854	714	3383	846	1819	455	2528	632	3070	767

9.2 Fine metric threads - strength class 8.8 / 10.9 / 12.9

Treatment	dry/lightly oiled						Molykote ®					
	Torque (Nm)	Permitted deviation (+/- Nm)	Torque (Nm)	Permitted deviation (+/- Nm)	Torque (Nm)	Permitted deviation (+/- Nm)	Torque (Nm)	Permitted deviation (+/- Nm)	Torque (Nm)	Permitted deviation (+/- Nm)	Torque (Nm)	Permitted deviation (+/- Nm)
Strength class	8.8	8.8	10.9	10.9	12.9	12.9	8.8	8.8	10.9	10.9	12.9	12.9
M3x0.35	1.2	0.3	1.7	0.4	2.1	0.5	1.1	0.3	1.5	0.4	1.8	0.5
M4x0.5	2.8	0.7	3.9	1	4.7	1.2	2.5	0.6	3.5	0.9	4.2	1
M5x0.5	5.7	1.4	8	2	9.6	2.4	5.1	1.3	7.1	1.8	8.5	2.1
M6x0.75	9.2	2.3	12.9	3.2	15.5	3.9	8.3	2.1	11.6	2.9	13.9	3.5
M8x1	21.7	5.4	30.6	7.6	36.7	9.2	19.5	4.9	27.4	6.8	32.8	8.2
M10x1.25	42.1	10.5	59.2	15	71	17.8	37.7	9.4	53	13	63.6	15.9
M12x1.25	75.7	18.9	106.2	26	127	31.9	67.2	16.8	94.5	24	113	28.3
M14x1.5	119	29.7	167	42	200	50.1	106	26	149	37	178	44.6
M16x1.5	183	45.6	257	64	308	77	162	40	227	57	273	68.2
M18x1.5	267	66.8	376	94	451	112.7	236	59	331	83	398	99.4
M20x1.5	373	93.2	524	131	629	157.3	328	82	461	115	553	138.3
M22x1.5	503	126	707	177	848	212.1	442	110	621	155	745	186.3
M24x2	630	158	886	221	1063	265.8	556	139	782	195	938	234.5
M27x2	918	229	1290	323	1548	387.1	807	202	1136	284	1363	340.7
M30x2	1281	320	1802	450	2162	540.6	1124	281	1581	395	1897	474.3
M33x2	1728	432	2430	607	2916	728.9	1514	378	2128	532	2554	638.5
M36x3	2126	532	2990	747	3588	897.1	1876	469	2638	659	3165	791.3

F 110 Lubricants and operating substances

1 Lubricants and operating substances

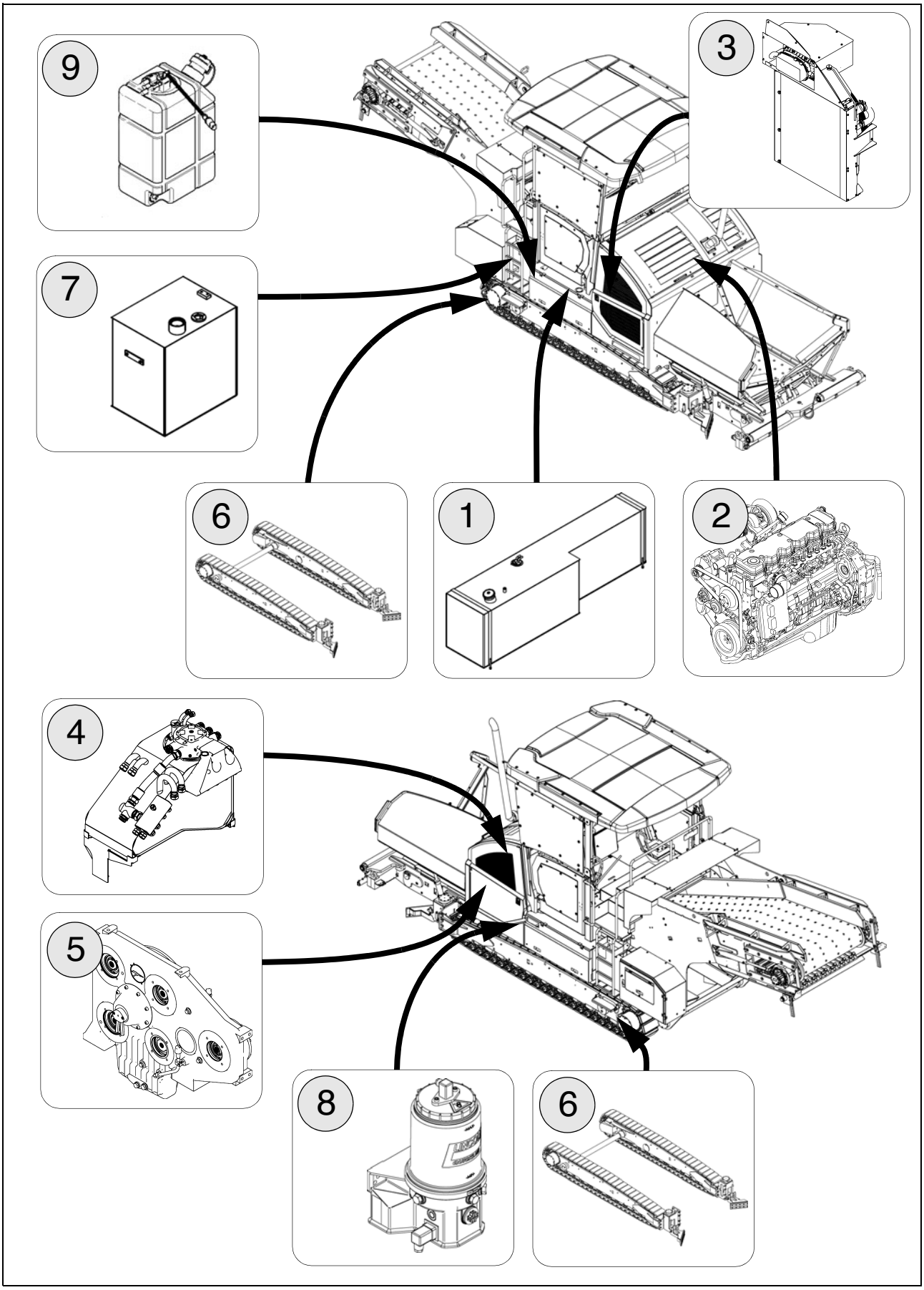
⚠ Use only the lubricants listed below or comparable qualities of well-known brands.

⚠ Only use containers which are clean on inside and outside for filling oil or fuel.

☞ Note capacities (see section "Capacities").

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

⚠ Never mix synthetic oils with mineral oils!


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1.1 Capacities

		Substance	Volume	
1	Fuel tank	Diesel fuel	300	litres
2	Diesel engine (with oil filter change)	Engine oil	13	litres
3	Engine cooling system	Cooling liquid	20	litres
4	Hydraulic oil reservoir	Hydraulic oil	200	litres
5	Pump distribution gear	Gearbox oil	7.0	litres
6	Planetary gear drive unit	Gearbox oil	2.5	litres
7	Emulsion spraying system	Emulsion	100	litres
8	Chain lubricating system	Chain oil	2.0	litres
9	AdBlue® / DEF tank (○)	AdBlue® / DEF fluid	19	litres
	Batteries	Distilled water		

⚠ Note specifications on the following pages!

2 Operating substance specifications

2.1 Drive engine TIER IV (○) - fuel specification

⚠ Low-sulphur diesel fuel is prescribed for correct operation of the exhaust-gas treatment system!
The maximum sulphur level must not exceed 15 ppm!
If low-sulphur diesel fuel is not used, the prescribed exhaust values cannot be met and damage will be caused to the engine and to the exhaust-gas treatment system!

STOP Danger of explosion! Never mix diesel fuel with ethanol, petrol or alcohol!

⚠ Diesel fuel contaminated with water or dirt can cause serious damage to the fuel system! Keep fuel and fuel system free of water and impurities!

⚠ Observe the instructions for fuel recommendations and the specification in the maintenance instructions of the engine manufacturer!

2.2 Drive engine TIER 3, 4i, 4F / Stage IIIa, IIIb, IV (○) - lubricating oil

Dynapac	Aral	BP	Esso / Exxon	Fuchs	Mobil	Shell	
Engine Oil 200 (*)							

☞ (*) = recommended

⚠ Observe the instructions for lubricant recommendations and the specification in the maintenance instructions of the engine manufacturer!

2.3 Cooling system

Dynapac	AGIP	Chevron	Caltex	Delo	Petronas		Finke
Coolant 200 (*)	-Antifreeze Spezial	Extended Life Coolant			Antifreeze G12		Aviaticon Finkofreeze P12+

☞ (*) = recommended

2.4 Hydraulic system

Dynapac	AGIP	Chevron	Caltex	Fuchs	Mobil	Shell	Finke
Hydraulic 100 (*)		Rando HDZ 46	Rando HDZ 46			-Tellus Oil S2 V46 -Tellus S2 VX46	Aviaticon HV 46

☞ (*) = recommended

2.5 Pump distribution gear

Dynapac	Aral	BP	Esso / Exxon	Fuchs	Mobil	Shell	
Gear Oil 400 (*)				-Titan ATF 6000 SL (*)		-Spirax S4 ATF HDX -Spirax S6 ATF VM	

☞ (*) = filled in at the factory

2.6 Drive unit planetary gear

Dynapac	Aral	BP	Esso / Exxon	Fuchs	Mobil	Shell	
Gear Oil 100 (*)						-Omala S2 GX 220	

☞ (*) = recommended

2.7 Emulsion

Dynapac							
Belt Guard 4812215842 (*)							

☞ (*) = recommended

2.8 Chain oil

Dynapac	Aral	BP	Esso / Exxon	Fuchs	Mobil	Shell	Chevron
Chain fluid D956921561 (*)							

☞ (*) = recommended

2.9 Grease

Dynapac	Aral	BP	Esso / Exxon	Fuchs	Mobil	Shell	Chevron
Paver Grease (*)						-Gadus S5 T460 1.5	-High Temp Premium2

☞ (*) = recommended

2.10 Drive engine - AdBlue® / DEF

⚠ For correct operation of the exhaust gas treatment system, the use of AdBlue® / DEF fluid is prescribed pursuant to ISO 22241-1 respectively DIN 70070!
For vehicles operating in North America, the use of a DEF fluid with API approval is urgently recommended!

⚠ Observe the instructions for the AdBlue® / DEF recommendations and specification in the maintenance instructions issued by the engine manufacturer!

Dynapac							

2.11 Hydraulic oil

NOTE	**Caution! Do not mix Panolin!**
	When using Panolin, it must not be mixed with other hydraulic fluids: - Keep Panolin in stock for topping up. - Heed the marking at the filling point.

Preferred hydraulic oils:

a) Synthetic hydraulic liquids based on ester, HEES

Manufacturer	**ISO viscosity class VG 46**
Dynapac	Hydraulic 120 (*)
Shell	Natural HF-E46
Panolin	HLP SYNTH 46
Esso	Univis HEES 46
Total	Total Biohydran SE 46
Aral	Vitam EHF 46
Finke	Aviaticon HY-HE 46

(*) = recommended

When changing from mineral oil pressure fluids to biodegradable pressure fluids, please contact our factory advisory service!

Parts & Service



Training

We offer our customers training courses on DYNAPAC equipment in our dedicated factory training centre. We hold regular training courses in this training centre as well as courses outside the scheduled hours.

Service

Please contact one of our responsible service outlets if you encounter any operational problems or have enquiries about spare parts.
Our trained, specialist staff will ensure that you receive prompt attention and repairs in the event of any accident or malfunction you may encounter.

Factory Advisory Service

If ever for any reason our dealership network encounters limits to what it is able to do for you, please always feel free to contact us directly.
Our team of technical advisers is on hand to assist you.
gmbh-service@atlascopco.com

Atlas Copco


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