

DFG/TFG 540 - S50

05.16

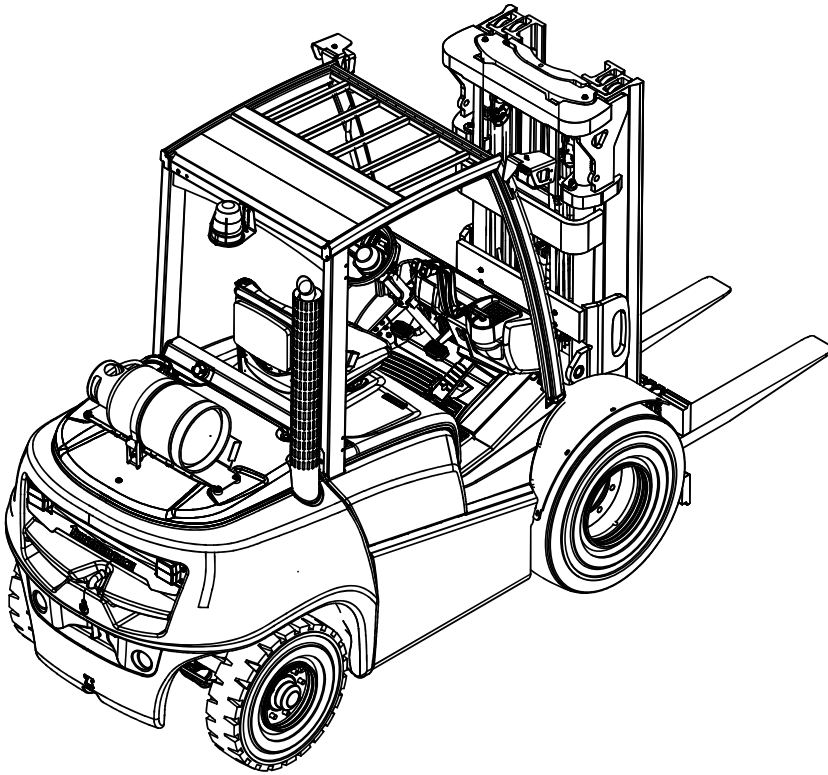
Operating instructions

Ⓒ

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DFG 540
DFG 545
DFG S50
TFG 540
TFG 545
TFG S50



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A Correct Use and Application

1 General

The truck must be used, operated and serviced in accordance with the present instructions. All other types of use are beyond its scope of application and may result in damage to personnel, the industrial truck or property.

2 Correct application

NOTE

The maximum load and load distance are indicated on the capacity plate and must not be exceeded.

The load must rest on the load handler or be lifted by an attachment approved by the manufacturer.

The load must be fully raised, see page 99.

The following operations are in accordance with regulations and are permitted:

- Lifting and lowering loads.
- Transporting lowered loads over short distances.
- Occasional towing of trailer loads.
- When towing trailers the load must be secured on the trailer.
- The permissible trailer load must not be exceeded.

The following operations are prohibited:

- Travelling with a raised load (>30 cm).
- Carrying and lifting passengers.
- Pushing or pulling loads.
- Transporting hanging loads. If the truck is to be operated with hanging loads, proof of sufficient safety distance under local operating conditions must be obtained from a specialist assessor.

3.1 Performance data

	Description	DFG 540	DFG 545	DFG S50	
Q	Rated capacity (where C = 500 mm) ¹⁾	4000	4500	5000	kg
C	Load centre distance	500	500	600	mm
	Travel speed * with / without load	17 / 18	17 / 17	17 / 17	km/h
	Lift speed with / without load	0.53 / 0.55	0.53 / 0.55	0.53 / 0.55	m/s
	Lowering speed with / without load	0.55 / 0.45	0.55 / 0.45	0.55 / 0.45	m/s
	Gradeability ²⁾ * with / without load	25 / 43	22.5 / 40	20 / 32	%
	Acceleration * with / without load to 15 m	5.4 / 4.3	5.6 / 4.5	5.9 / 4.7	s
	Available operating pressure for attachments	230	230	230	bar
	Oil volume for attachments	40	40	40	l/min

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	Lift speed with / without load	0.53 / 0.55	0.53 / 0.55	0.53 / 0.55	m/s
	Lowering speed with / without load	0.55 / 0.45	0.55 / 0.45	0.55 / 0.45	m/s
	Gradeability ²⁾ * with / without load	23.5 / 41	21.5 / 38	19 / 30	%
	Acceleration * with / without load to 15 m	5.2 / 4.6	5.4 / 4.7	5.7 / 4.9	s
	Available operating pressure for attachments	230	230	230	bar
	Oil volume for attachments	40	40	40	l/min

¹⁾ for vertical mast.

²⁾ The values shown represent the maximum gradeability to overcome short differences in height and surface unevenness (surface edges). The truck must not operate on inclines of more than 15%.

3 Securing the truck during transport

 **WARNING!**

Accidental movement during transport

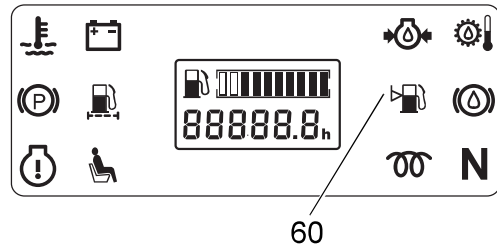
Improper fastening of the truck and mast during transport can result in serious accidents.

- ▶ Loading must only be performed by specialist personnel trained for this purpose. The specialist personnel must be instructed in securing loads on road vehicles and handling load securing devices. In each case correct measurements must be taken and appropriate safety measures applied.
 - ▶ The truck must be securely fastened when transported on a lorry or a trailer.
 - ▶ The lorry or trailer must have fastening rings.
 - ▶ Use wedges to prevent the truck from moving.
 - ▶ Use only fastening belts with sufficient strength.
 - ▶ Use non-slip materials to securing the load aids (pallet, wedges, ...) e. g. non-slip mats.
-

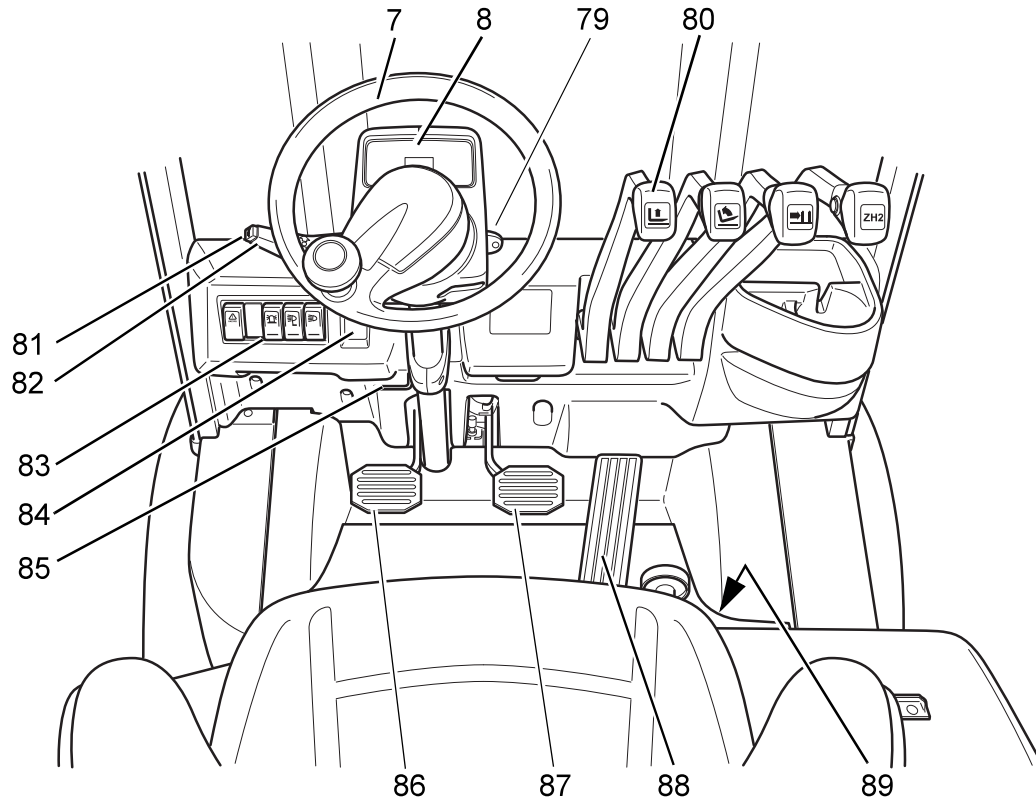
2.3 Fuel display (DFG only)

2.3.1 Display unit

When the spare indicator (60) is lit, the reservoir must be filled.



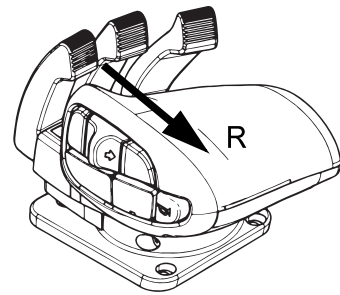
2 Displays and Controls



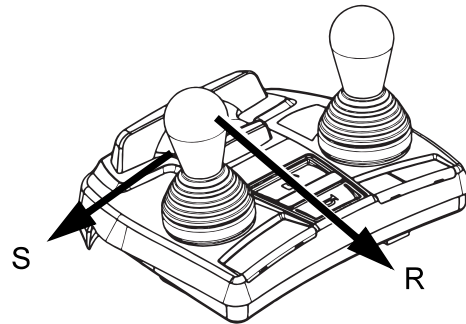
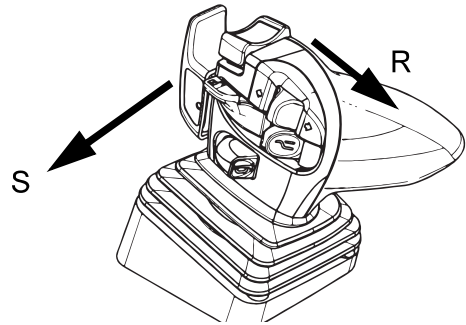
Item	Control/ display		Function
7	Steering wheel	●	Steering the industrial truck.
8	Display unit	●	Warning and information message display
79	Key switch	●	Switches control current on and off, and starts the engine. Removing the key prevents the truck from being switched on by unauthorised personnel.
80	SOLO-PILOT	●	Controls the following functions: <ul style="list-style-type: none"> – Load handler raise/lower – Mast forward/reverse tilt – Side shift left/right (○) – Auxiliary hydraulics (○)
81	Horn	●	Activates an audible warning.
82	Travel direction switch	●	Selects travel direction/neutral position.
83	Options switches	●	Options
84	Parking brake switch	●	Activates/deactivates the parking brake.
85	Steering-column adjusting lever	●	Adjusts the steering column tilt.
86	Slow-travel/brake pedal	●	1st zone: controls slow travel. 2nd zone: applies service brake.
87	Brake pedal	●	When pressed, the truck brakes to a halt.

The pictogram shows the direction of movement that is executed when the operator pulls the lever in direction (R).

The counter-movement of the work function is achieved by the operator pushing the lever accordingly.



For controls that operate at right angles to the travel direction, the function is shown with the actuation to the left (S) from the operator's perspective. The counter-movement of the work function is achieved by actuating the lever to the right from the operator's perspective.



4.3.2 Adjusting the comfort seat (○)

⚠ WARNING!

Risk of accidents and damage to health

An incorrectly adjusted driver's seat can result in accidents and damage to health.

- ▶ Do not adjust the driver's seat while travelling.
- ▶ The driver's seat should lock in position after adjustment.
- ▶ Check and adjust the individual driver's seat setting before starting up the truck.
- ▶ Hold the weight setting lever only by the recess, do not reach through underneath the lever.

Setting the driver's weight

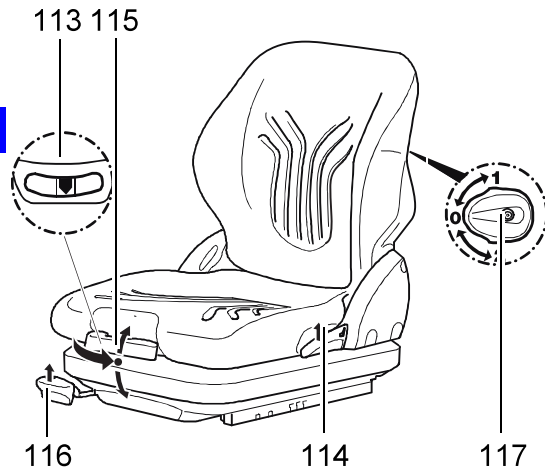
NOTE

Incorrectly adjusted seat cushioning can damage your health

To achieve optimal seat cushioning, the driver's seat must be adjusted according to the driver's weight.

Set the driver's weight when the seat is occupied.

- ▶ Hold the weight adjustment lever only by the recess; do not reach through underneath the weight adjustment lever.



Procedure

- Fold out the weight adjustment lever (115) as far as it will go in the arrow direction.
- Move the weight adjustment lever (115) up and down to set the seat to a higher weight.
- Move the weight adjustment lever (115) down and up to set the seat to a lower weight.

→ The driver's weight is correctly set when the arrow is in the middle of the display window (113). The minimum or maximum weight setting is reached when you can feel a return stroke on the lever.

- After setting the weight, fully fold back in the weight adjustment lever (115).

The driver's weight is now set.

→ Hold the weight setting lever (115) only by the recess, never reach through underneath the lever.

Adjusting the backrest

Procedure

- Sit on the driver's seat.
- Pull the lever (114) to adjust the backrest.
- Adjust the backrest tilt.
- Release the lever (114) again. The backrest is locked.

5.3 Parking the truck securely

WARNING!

Switching off an LPG truck under ground level areas could result in explosions. LPG is heavier than air. An explosive LPG/air mixture could therefore form under ground level areas without sufficient ventilation.

- ▶ LPG trucks may only be switched off in ground level rooms or higher and providing they are adequately ventilated. They must not be switched off near to cellar doors and entry points, hollows, drains, drain inlets or other recesses below the parked truck.

WARNING!

An unsecured truck can cause accidents

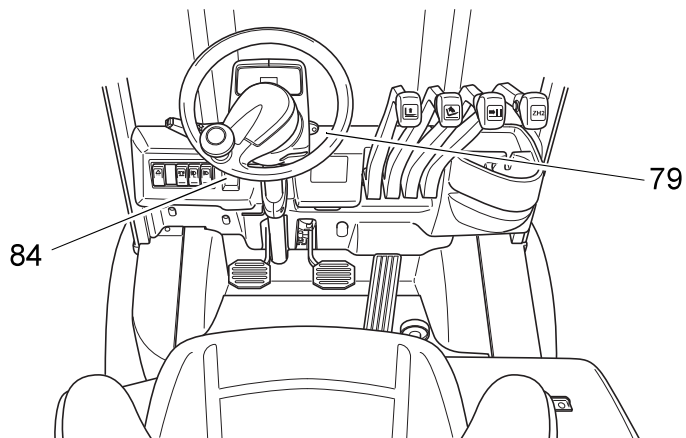
Parking the truck on an incline, without the brakes applied or with a raised load / load handler is dangerous and is strictly prohibited.

- ▶ Always park the truck on a level surface. In special cases the truck may need to be secured with wedges.
- ▶ Always fully lower the mast and load handler.
- ▶ Tilt the mast forward.
- ▶ Always apply the parking brake switch before parking the truck.
- ▶ Choose a place to park where no other people are at risk of injury from lowered forks.
- ▶ Do not park and abandon a truck on an incline.

Parking and leaving the truck

Procedure

- Apply the parking brake (84).
- Lowers the load handler.
- Turn the key in the key switch (79) to the "0" position.
- Remove the key from the key switch (79).



TFG only: If the key is set to "0" while the engine is running, the engine will continue to run for a short time. This ensures that the remaining gas in the lines between the engine and the automatic shutoff valve of the LPG system is used up. If the engine has accidentally switched off, start up the engine and switch it off again in the correct manner at the end of the journey.

5.11 Operating the Lift Mechanism and Integrated Attachments

WARNING!

Operating the lifting device and integrated attachments can be hazardous

Other people can be injured in the truck's hazardous area.

The hazardous area is defined as the area in which people are at risk from the truck movement, the load handler, attachments etc. This also includes areas which can be reached by falling loads or lowering operating equipment.

Apart from the operator (in the normal operating position) there should be no other people in the truck's hazardous area.

- ▶ Instruct other people to move out of the hazardous area of the truck. Stop working with the truck if people do not leave the hazardous area.
- ▶ If people do not leave the hazardous area despite the warning, prevent the truck from being used by unauthorised people.
- ▶ Only carry loads that have been correctly secured and positioned. Use suitable precautions to prevent parts of the load from tipping or falling down.
- ▶ Do not exceed the maximum loads specified on the capacity plate.
- ▶ Do not stand underneath a raised load handler.
- ▶ Do not stand on the load handler.
- ▶ Do not lift other people on the load handler.
- ▶ Do not reach through the mast.
- ▶ The controls should only be operated from the driver's seat, and never suddenly.
- ▶ The operator must be trained to handle the lift mechanism and the attachments.

WARNING!

An offset load centre can result in accidents


The capacity of the truck is reduced when using side shifts that are more than 100 mm outside the truck centre.

- ▶ Observe the capacity plate with the reduced capacity.

NOTE

If the seat is not occupied, the hydraulic functions are disabled.

If the operator leaves the seat for more than 1.5 seconds without putting the truck into neutral, the hydraulic functions are disabled. The hydraulic functions are released again if the operator sits down again and puts the truck into neutral. If the truck is equipped with belt lock control (○), the belt must also be closed again to release the hydraulic functions.

-  The controls return to the neutral position on their own and the hydraulic functions are stopped.

When the mechanical end stop has been reached for the relevant functions (there will be a noise from the pressure relief valve), immediately move the control lever back to the neutral position.

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5.14 Operating Additional Attachments for SOLO-PILOT on the Armrest


WARNING!

Incorrect symbols can cause accidents

Symbols on controls that do not depict the function of the attachments can cause accidents.

- ▶ Mark the controls with symbols that indicate their function.
 - ▶ Specify the attachments' direction of movement in accordance with ISO 3691-1 so that they match the controls' direction of movement.
-

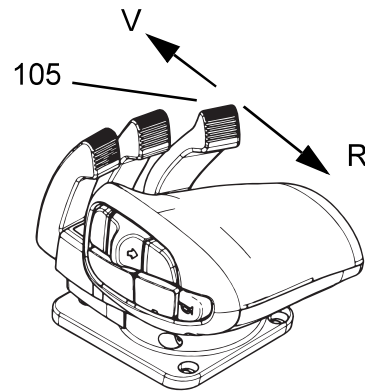
5.14.1 Solo Pilot with control of ZH1 hydraulic port


-  Depending on the attachments used the lever (105) is assigned the function of the attachment. Unused levers have no function. For connections see page 120.

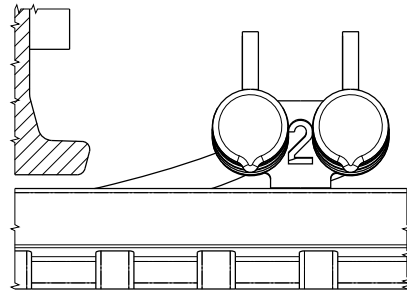
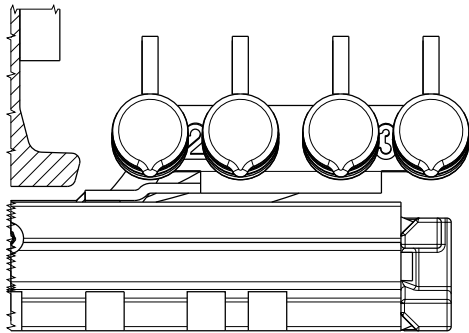
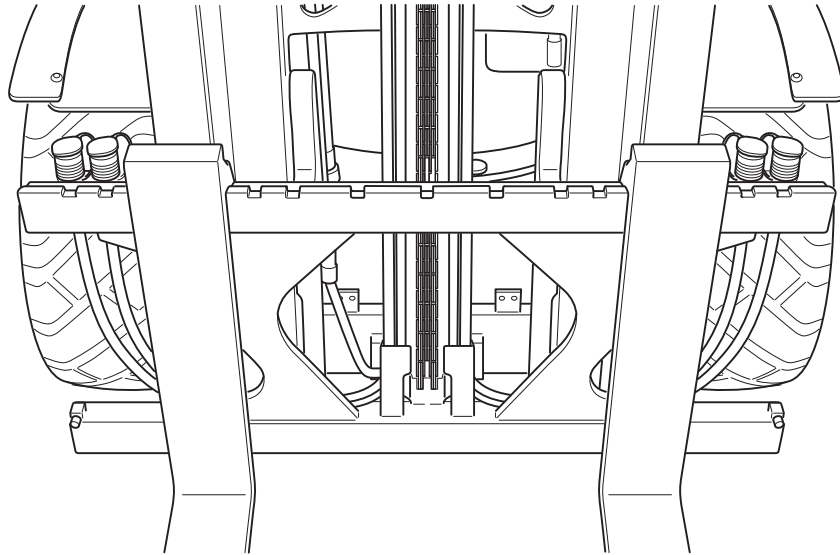
Procedure

- Operating hydraulic port ZH1:
Move the lever (105) in direction V or R.

The attachment performs its operation.



-  When the limit position for the operation has been reached (there will be a noise from the pressure relief valve) release the lever. The lever will revert automatically to neutral.



Spilled hydraulic oil must be set using a suitable agent and disposed of in accordance with environmental regulations.

If hydraulic oil comes into contact with the skin, wash it off immediately with soap and water. If it comes into contact with the eyes rinse them immediately with flowing water and call for a doctor.

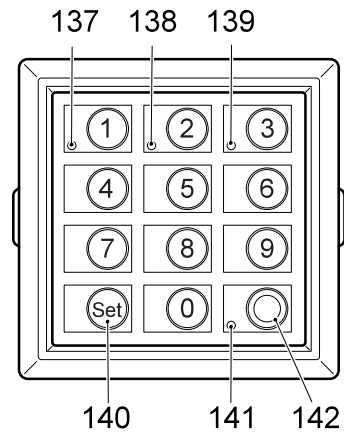
7.4.5 Add operator code

Requirements

- To prepare the truck for operation, see page 128.

Procedure

- Press the O key (142).
- Enter the valid master code with the digit keys.
When you enter the valid master code the LED (141) flashes green.



- Enter the parameters 0-0-1 with the digit keys.
The LEDs (138,141) flash green.



- Enter the new user code with the digit keys.
The length (4-6 digit) of the new user code must be the same as that of the previously entered master code. The new user code must also be different from the existing master code.
- Confirm with the SET key (140).
The LEDs (139,141) flash green.
- Enter the new user code again with the digit keys.
- Confirm with the SET key (140).
Wait until the LED (141) flashes green. The setting is saved.
- Press the O key (142).
The truck is switched off and the LED (141) is lit red.
- Check the new user code:
 - Switch on the truck with the new user code, see page 128
After entering the valid user code the LED (141) lights up green, the travel program setting is shown by the illumination of the corresponding LEDs (137,138,139) and the truck is switched on.
 - Press the O key (142).
The truck is switched off and the LED (141) is lit red.

7.5 Control Layout "N" on the Armrest

WARNING!

Persons standing under or on a raised load handler are at risk of accidents

Do not allow anyone to stand under or on a raised load.

- ▶ Do not stand on the load handler.
- ▶ Do not lift any persons on the load handler.
- ▶ Instruct other people to move out of the hazardous area of the truck.
- ▶ Do not stand underneath a raised and unsecured load handler.

- With control layout "N", the lift and tilt functions are swapped compared with the standard operation. The Pilot must only be operated from the driver's seat. The operator must be trained to handle the lift mechanism and the attachments.

NOTE

- ▶ The lift/lower and tilt speeds are determined by the inclination of the Pilot. Do not deposit the load handler suddenly to avoid damaging the load and the racking.

Multi-Pilot

Lifting

Procedure

- Push the Multipilot to the right (direction H) to raise the load.
- Push the Multipilot to the left (direction S) to lower the load.

Tilting

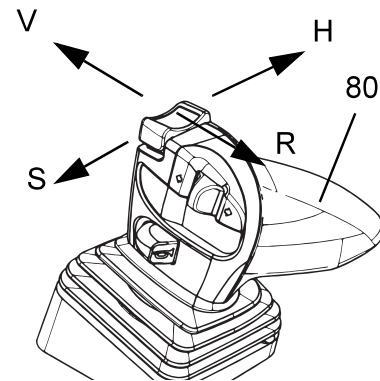
CAUTION!

Trapping hazard from inclined mast

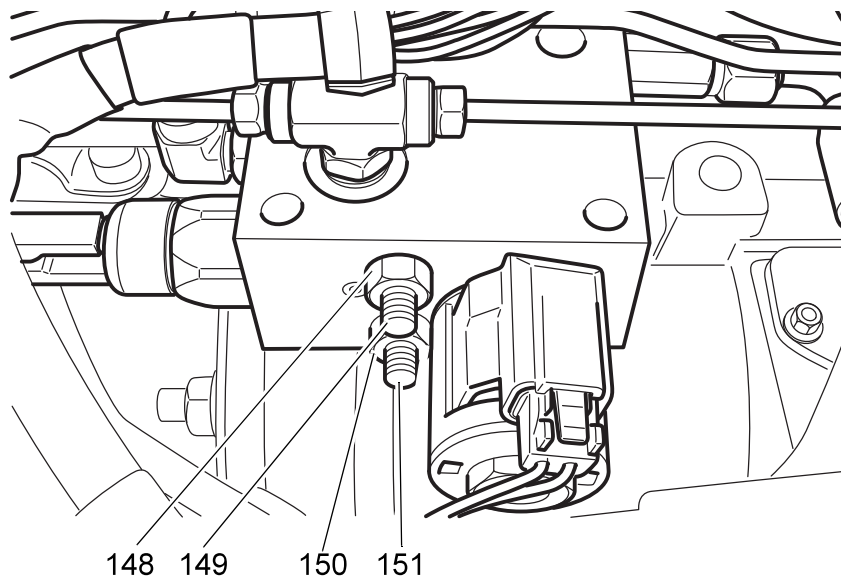
- ▶ When tilting the mast back, keep all parts of your body from between the mast and the front wall.

Procedure

- Push the Multipilot forward (direction V) to tilt the load forward.
- Pull the Multipilot back (direction R) to tilt the load back.



- When the limit position for the operation has been reached (there will be a noise from the pressure relief valve) release the lever. The lever will revert automatically to neutral.



Applying the parking brake

Procedure

- Undo the top screw (148) by a maximum of 3 turns.
- Insert the bottom screw (151) and torque to 15 Nm.
- Tighten the top nut (148) and the bottom nut (150).

Parking brake is activated.

3 Lubricants and Lubrication Schedule

3.1 Handling consumables safely

Handling consumables

Consumables must always be handled correctly. Follow the manufacturer's instructions.

WARNING!

Improper handling is hazardous to health, life and the environment

Consumables can be flammable.

- ▶ Keep consumables away from hot components and naked flames.
 - ▶ Always keep consumables in prescribed containers.
 - ▶ Always fill consumables in clean containers.
 - ▶ Do not mix up different grades of consumable. The only exception to this is when mixing is expressly stipulated in the operating instructions.
-

CAUTION!

Spilled consumables can cause slipping and endanger the environment

Risk of slipping from spilled consumables. The risk is greater when combined with water.

- ▶ Do not spill consumables.
 - ▶ Spilled consumables must be removed immediately with an appropriate bonding agent.
 - ▶ The bonding agent / consumable mixture must be disposed of in accordance with regulations.
-

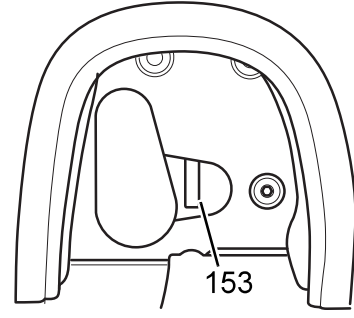
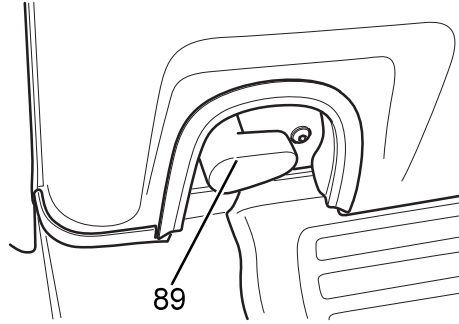
Opening the engine cover (first stage)

Requirements

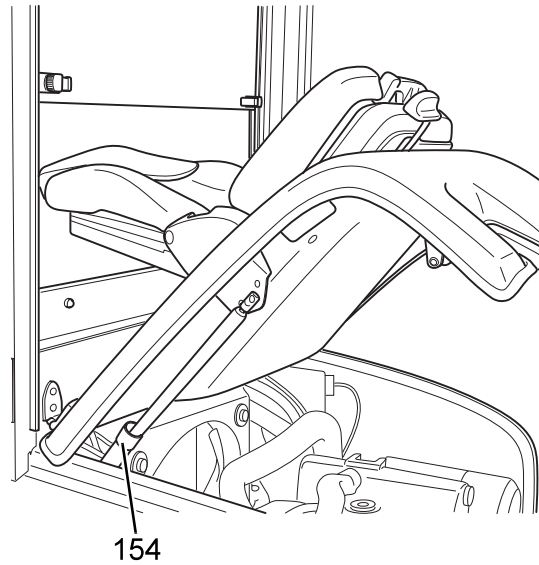
- For trucks with a closed cab, open both cab doors before lifting the engine cover (○).

Procedure

- Turn and remove the battery isolator (89).
- Press the pushbutton (153) to unlock the engine cover.
- Lift the engine cover (15).
- The backrest swings under the open rear windscreen.
- Open the engine cover until the backrest touches the frame of the rear windscreen.
- The lower section of the gas strut (154) engages and holds the engine cover in position.



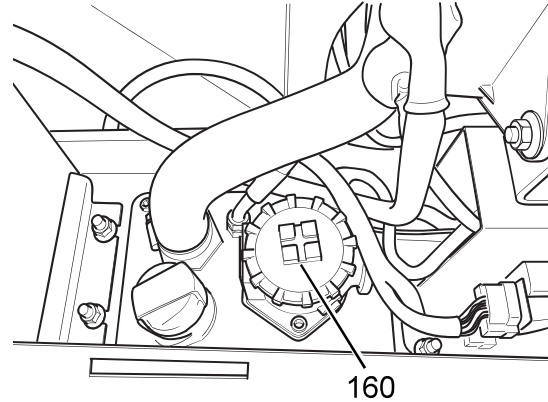
The engine cover has been opened in the first stage.



4.9.3 Replacing the hydraulic oil filter

Procedure

- Unscrew the lid (160).
- Remove the hydraulic oil filter in the lid.
- Insert a new hydraulic oil filter and screw the lid back on (15 Nm).



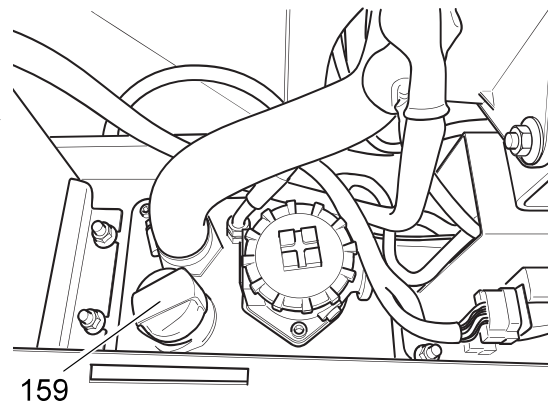
- Collect any spilled hydraulic oil. Dispose of the hydraulic oil and hydraulic oil filter and fuel in accordance with environmental regulations.

4.9.4 Replacing the ventilation/discharge filter

Procedure

- Pull off the filter (159).
- Install the new filter.

- Replace the breather filter if contaminated.

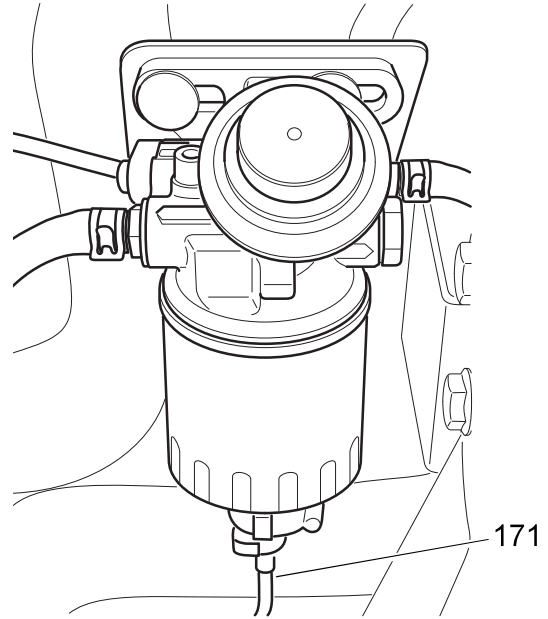


- Collect any spilled hydraulic oil. Dispose of the hydraulic oil and hydraulic oil filter and fuel in accordance with environmental regulations.

4.10.10 Emptying the fuel/water separator

Procedure

- Drain the fuel/water mixture from the fuel/water separator (171) into a suitable container.
- Bleed the fuel system.



4.12 Cleaning

CAUTION!

Fire hazard

The truck must not be cleaned with flammable fluids.

If flammable materials are not removed from the engine compartment, they can come into contact with hot components and cause a fire.

- ▶ Carry out all necessary safety measures to prevent sparking before cleaning (e.g. by short-circuiting).
 - ▶ Remove all deposits / accumulations of flammable materials from the engine compartment.
-

CAUTION!

Risk of component damage when cleaning the truck

Cleaning with a pressure washer can result in malfunctions due to humidity.

- ▶ Cover all electronic system assemblies (controllers, sensors, motors etc.) before cleaning the truck with a pressure washer.
 - ▶ Do not hold the jet of the pressure washer by the marked points to avoid damaging them (see page 31).
 - ▶ Do not clean the truck with pressurised water.
-

Cleaning the truck

Requirements

- Prepare the truck for maintenance and repairs (see page 167).

Tools and Material Required

- Water-based solvents
- Sponge or cloth

Procedure

- Clean the surface of the truck with water-based solvents and water. Use a sponge or cloth to clean.
- In particular, clean the following areas:
 - Windows
 - All walk-on areas
 - Oil filler ports and their surroundings
 - Grease nipples (before lubrication)
- Dry the truck after cleaning, e.g. with compressed air or a dry cloth.
- Carry out all the tasks in the section "Recommissioning the truck after cleaning or maintenance work" (see page 207).

The truck is now clean.

6 Safety tests to be performed at intervals and after unusual incidents

The truck must be inspected at least annually (refer to national regulations) or after any unusual event by a qualified inspector. The manufacturer offers a safety inspection service which is performed by personnel specifically trained for this purpose.

A complete test must be carried out on the technical condition of the truck with regard to safety. The truck must also be examined thoroughly for damage.

The operating company is responsible for ensuring that faults are rectified immediately.

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