

# DFG / TFG 425s - 435s

04.11 -

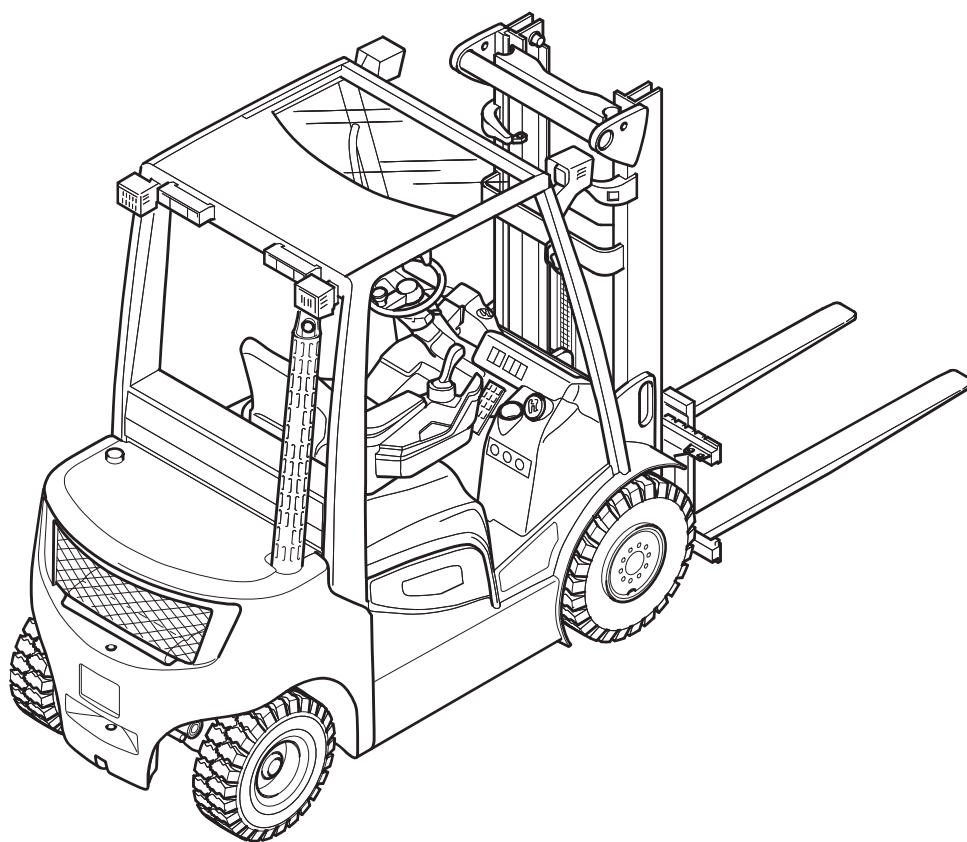
Operating instructions



51209061

03.13

DFG 425s  
DFG 430s  
DFG 435s  
TFG 425s  
TFG 430s  
TFG 435s



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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 "Lifting, transporting and depositing loads" on page 90.

- 
- Lifting and lowering loads.
  - Transporting lowered loads over short distances.
  - Do not travel with a raised load (>30 cm).
  - Do not carry or lift passengers.
  - Do push or pull load units.
  - Occasional towing of trailer loads.
  - When towing trailer loads the load must be secured on the trailer.
  - The permissible trailer load must not be exceeded.

## TFG 425s-435s

	Description	TFG 425s	TFG 430s	TFG 435s	
Q	Capacity (where C = 500 mm) 1)	2500	3000	3500	kg
C	Load centre distance	500	500	500	mm
	Travel speed* with / without load	19.6/19.6	20.8/20.8	20.8/20.8	km/h
	Lift speed, with / without load	0.56/0.56	0.56/0.56	0.48/0.48	m/s
	Lowering speed with / without load	0.56/0.56	0.56/0.56	0.56/0.56	m/s
	Gradeability 2)* with / without load	27	24	21	%
	Acceleration* with / without load to 15 m	5.7/5.0	6.0/5.1	6.1/5.2	s
	Available working pressure for attachments	160	160	160	bar
	Oil flow for attachments	30	30	30	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%.

<b>Item</b>	<b>Component</b>
20	Do not travel with raised load or mast forward tilt with raised load
21	Strap points for crane lifting
22	Data plate
23	Noise level
24	Do not carry passengers warning
26	Fuel
25	Wear seat belt
27	Serial number, engraved in chassis below the engine cover
28	Jack contact points
29	Do not step onto or beneath the load, risk of trapping with moving mast
30	Max. body size (○)
31	Tipover hazard
32	Read operating instructions
33	Test plaque (○)
34	Capacity
35	Capacity with attachment
36	Hydraulic oil specification
37	Model description

# D Fuelling the Truck

## 1 General

### 1.1 Safety regulations for handling diesel fuel and LPG

 **WARNING!**

**An unsecured industrial truck can cause accidents**

The truck can suddenly start to move.

- ▶ Switch off the truck securely before filling up or replacing the LPG bottle, see "Parking the truck securely" on page 79.
- 

 **WARNING!**

**Accident risk from ignition**

- ▶ Fuels and liquefied petroleum gas can ignite.
  - ▶ Smoking, naked flames and other ignition sources are strictly prohibited in the immediate vicinity when handling fuels and LPG.
  - ▶ Labels indicating the hazard are must be positioned where they are clearly visible.
  - ▶ Do not store flammable materials in this area.
  - ▶ Powder fire extinguisher must be provided within easy reach of the filling area.
  - ▶ Use only category A, B or C type powder fire extinguishers to fight LPG fires.
  - ▶ Bring any unsealed LPG bottles immediately outside, attach visible markings and notify the supplier.
- 

**Storage and Transport**

The diesel and LPG storage and transport devices must comply with statutory requirements.

If there is no filling point available, the fuel must be stored and transported in clean, approved containers.

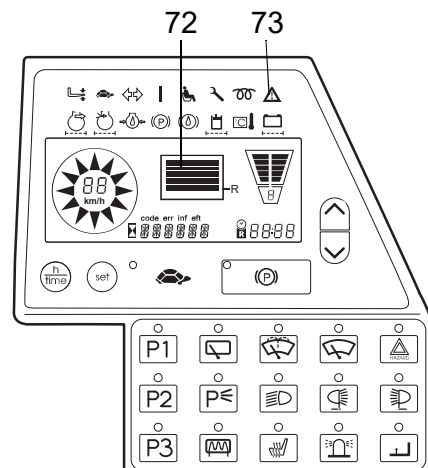
The contents must be clearly indicated on the container.

## 4 Fuel level indicator

### 4.1 Display unit

The fuel level indicator (72) shows the fuel level (only on DFG or TFG with gas tank).

If “R” appears in the display (72) the tank must be topped up. The warning light (73) will also flash and a warning sounds.



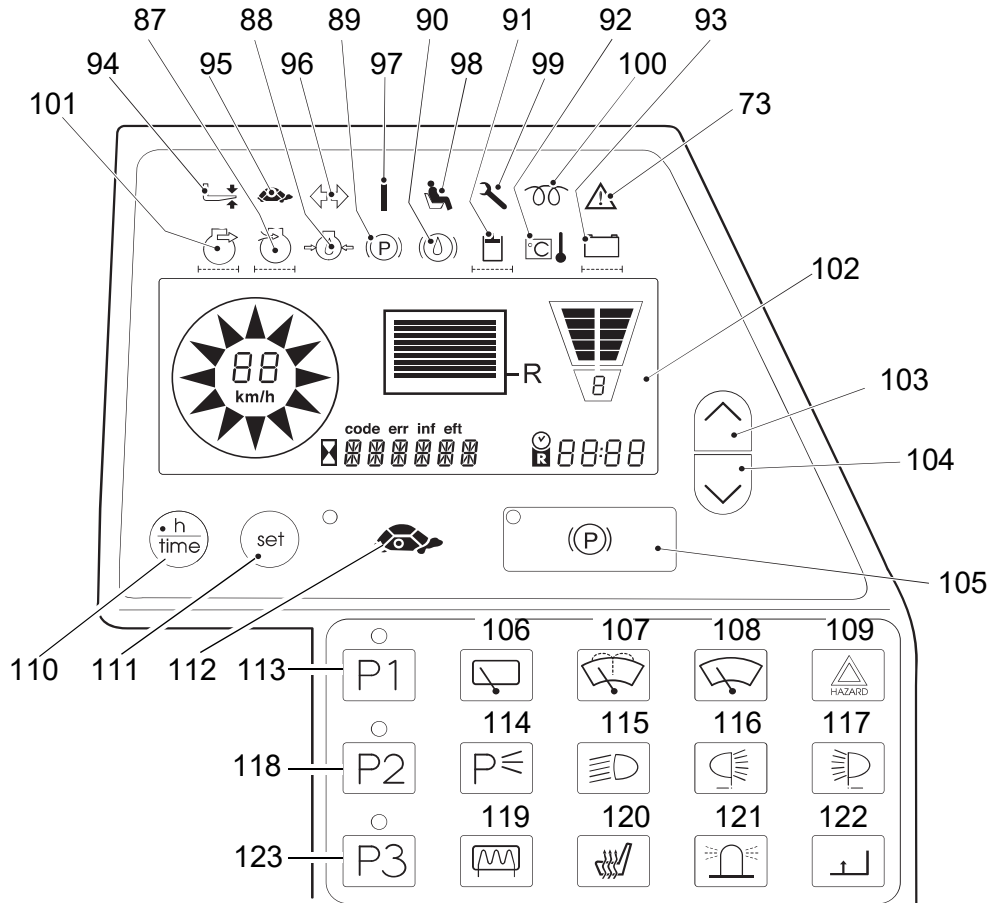
### 4.2 Level indicator for LPG bottles (○)





When the fuel indicator (72) and warning light (73) with an additional warning sound light up, this indicates that the LPG bottle is empty.

The remaining travel time will be 8 - 12 minutes, depending on the application and ambient conditions.

- Fluctuations in the liquid gas level caused by the travel mode can cause the level indicator to light up briefly. Only a permanently lit level indicator means that the LPG bottle is almost empty.

## 2.2 Control panel buttons



Item		Controls and displays	Function
103		Program selector	<ul style="list-style-type: none"> <li>Moves up a level in the travel program* list.</li> </ul>
104		Program selector	<ul style="list-style-type: none"> <li>Moves down a level in the travel program* list.</li> </ul>
105		LED on parking brake button and	<ul style="list-style-type: none"> <li>Truck switched off and exited securely.</li> <li>The parking brake is applied when the truck is switched on or when the parking brake button (105) is pressed.</li> <li>LED on the parking brake button (105) lights up red and parking brake indicator (89) lights up.</li> <li>Travel is not enabled when the accelerator pedal is pressed.</li> <li>Travel is enabled by pressing the parking brake button (105).</li> </ul>
89		Parking brake indicator lit simultaneously	

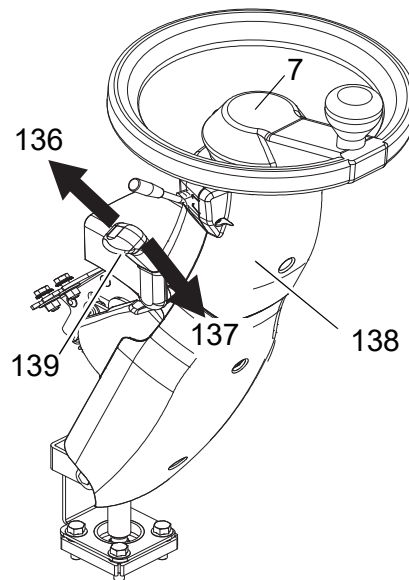
### 3.4.2 Adjusting the steering wheel / steering column

#### Individual steering wheel position

→ The steering wheel can be height- and tilt-adjusted to suit the operator.

##### *Procedure*

- Pull the steering wheel adjusting lever (139) in the direction of the arrow (137).
- Set the steering wheel (7) to the required position (height and tilt).
- Push the steering wheel adjusting lever (136) in the direction of the arrow.

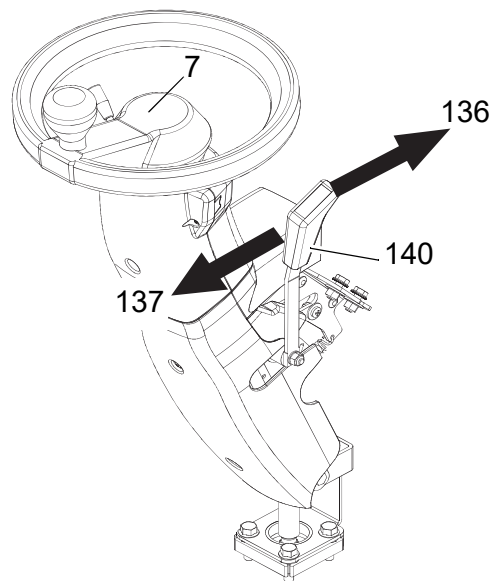


#### Setting the steering column to the parking position

→ The steering column can be moved forward to the parking position using the steering column / engine bonnet release lever (140). The individual steering wheel position remains intact.

##### *Procedure*

- Hold the steering column (138) against the steering wheel (7).
- It will be under spring tension when the steering column / engine bonnet release lever (140) is released.
- Pull the steering column / engine bonnet release lever (140) in the direction of the arrow (137) towards the driver's seat until the steering column moves forward.
- Move the steering column (138) forward as far as the stop and let go of the release lever.
- When resuming work, pull the steering column on the steering wheel in the direction of the arrow (137) towards the driver's seat until you feel it engage.



## 4.7 Travel

### **WARNING!**

#### **Improper travel can result in accidents**

- ▶ Do not get up from the driver's seat during travel.
- ▶ Do not drive the truck unless you are wearing a seat belt and the panels and doors are properly locked.
- ▶ Do not lean out of the truck while travelling.
- ▶ Make sure that the travel area is clear.
- ▶ Adapt your travel speed to the route conditions in the work area and the load.
- ▶ Tilt the mast back and raise the fork carriage approx. 200 mm.
- ▶ Make sure you have sufficient visibility when reversing.

#### **Travel**

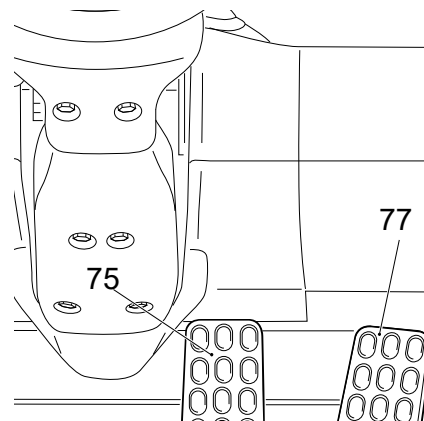
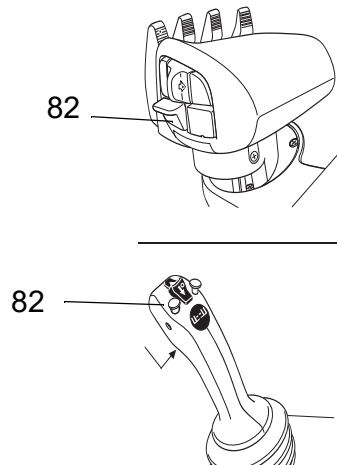
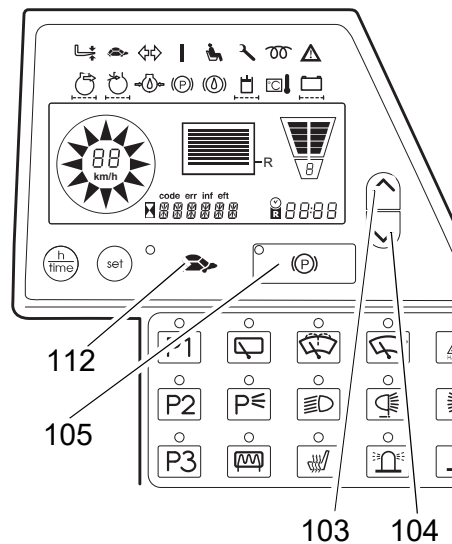
##### *Requirements*

- Truck prepared for operation, see "Preparing the truck for operation" on page 76.

##### *Procedure*

- Release the parking brake, to do this press the parking brake button (105).
- Select the travel direction with the travel direction switch (82).
- Select the travel speed if necessary, to do this press the slow travel button (112) or the program selector (104/103).
- Raise the load handler approx. 200 mm.
- Tilt the mast back.
- Apply the accelerator pedal (77). The travel speed is governed by the accelerator (77).

*The truck travels in the direction selected.*



## NOTE

Loads must not be deposited on travel or escape routes, in front of safety mechanisms or operating equipment that must be accessible at all times.

---

### ***Transporting loads***

#### *Requirements*

- Load raised correctly.
- Load handler lowered for transport (approx. 150 - 200 mm above the ground).
- Mast tilted back fully.

#### *Procedure*

- Accelerate and decelerate sensitively.
- Adapt your travel speed to the conditions of the route and the load you are transporting.
- Watch out for other traffic at crossings and passageways.
- Always travel with a lookout at blind spots.
- On slopes and inclines always carry the load facing uphill, never approach at an angle or turn.

### ***Depositing loads***

#### *Requirements*

- Storage location suitable for storing the load.

#### *Procedure*

- Set the mast vertical.
- Drive the truck carefully up to the storage location.
- Carefully lower the load handler so that the forks are clear of the load.
- ➔ Avoid depositing the load to prevent damage to the load and the load handler.
- Lowers the load handler.
- Carefully remove the forks from the pallet.

*The load is deposited.*

## 4.16 Operating additional attachments for the SOLO-PILOT


### **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.
- 

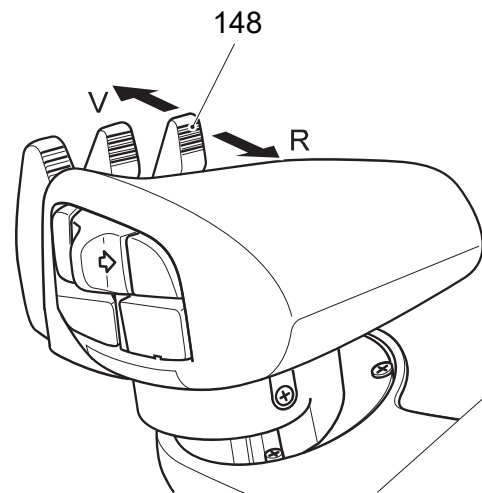
### 4.16.1 SOLO-PILOT with control of ZH1 hydraulic port

-  Depending on the attachments used the lever (148) is assigned the function of the attachment. Levers that are not required are void. For connections see "Fitting additional attachments" on page 105.

#### *Procedure*

- Operating the hydraulic port ZH1:  
Move the lever (148) in direction V or R.

*The attachment's function is performed.*



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The keypad consists of 10 digit keys, a Set key (157) and a  $\bigcirc$  key (159)

### Digit keys

The digit keys are used to enter the user or master code and select the travel program.

The green LEDs of the digit keys 1, 2 and 3 (154, 155, 156) show the travel program setting.

### $\bigcirc$ key

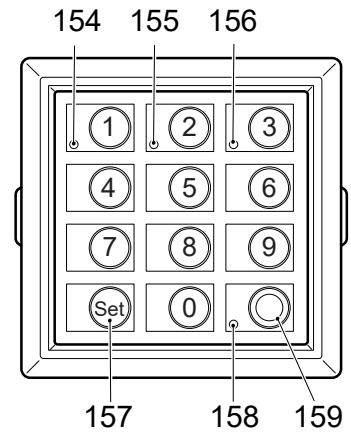
Pressing the  $\bigcirc$  key switches the truck off and sets it to "non operational" status.

The  $\bigcirc$  key indicates the follow operating conditions via a red / green LED (158):

- Code lock function (commissioning the truck).
- Error display configuring the user code.
- Adjusting the travel program depending on the setting and truck.
- Setting and changing parameters.

### SET key

When you change the parameters the SET key (157) acts as a confirmation key.



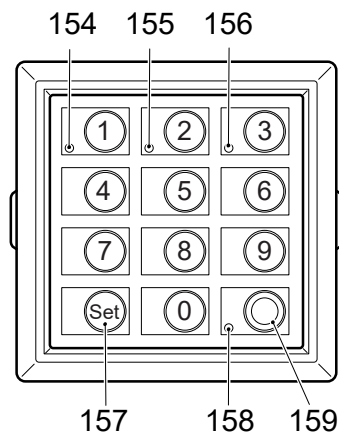
### 6.1.8 Delete all user codes,

#### Requirements

- To prepare the truck for operation, see "Preparing the truck for operation with the keypad (CanCode)" on page 112.

#### Procedure

- Press the O key (159).
- Enter the valid master code with the digit keys.  
*When you enter the valid master code the LED (158) flashes green.*
- Enter the parameters 0-0-4 with the digit keys.
- Confirm with the SET key (157).  
*The LEDs (156,158) flash green.*
- Enter the code 3-2-6-5 with the digit keys.
- Confirm with the SET key (157).  
*Wait until the LED (158) flashes green. All user codes are deleted.*
- Press the O key (159).  
*The truck is switched off and the LED (158) is lit red.*
- Check that the user codes have been deleted:
  - Switch on the truck with a previous user code, see "Preparing the truck for operation with the keypad (CanCode)" on page 112.  
*After entering the user code the LED (158) flashes red and the truck remains switched off.*
  - Press the O key (159).  
*The truck remains switched off and the LED (158) is lit red.*



## 6.3 Steel cab

For trucks fitted with a steel cabin, both doors can be closed.

### CAUTION!

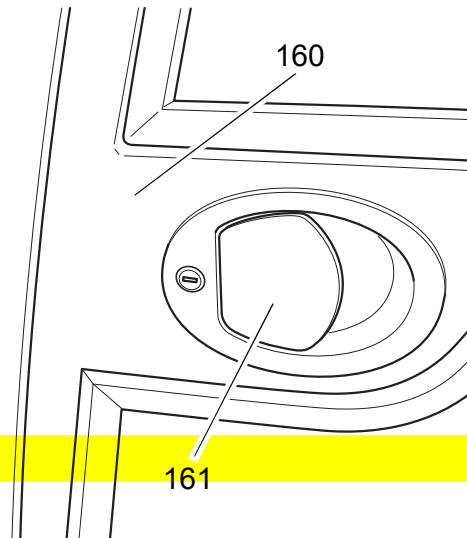
#### **An open door can cause accidents (160)**

- ▶ Do not travel with an open door (160). When opening the door make sure there is nobody in the door's swing range.
- ▶ Always close the door tightly and make sure it is locked.
- ▶ Closing the door does not release the driver from his responsibility to wear a seat belt, see "Seat Belt" on page 73.

#### **Opening and closing the door**

##### *Procedure*

- To unlock the cabin door turn the key anti-clockwise.
- To lock the cabin door turn the key clockwise.
- To open the cabin door, unlock the door and pull out the handle (161).



## 6.4 Sliding windows

### CAUTION!

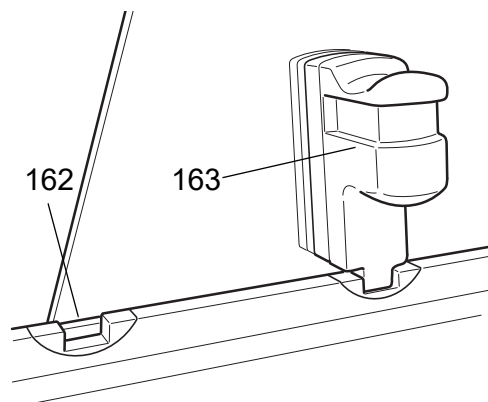
#### **An unlocked sliding window can cause accidents**

- ▶ The sliding windows must be locked at all times.

#### **Opening and closing the windows**

##### *Procedure*

- Push the lock (163) up.
- Move the window forward or back.
- Insert the lock in the stop (162).



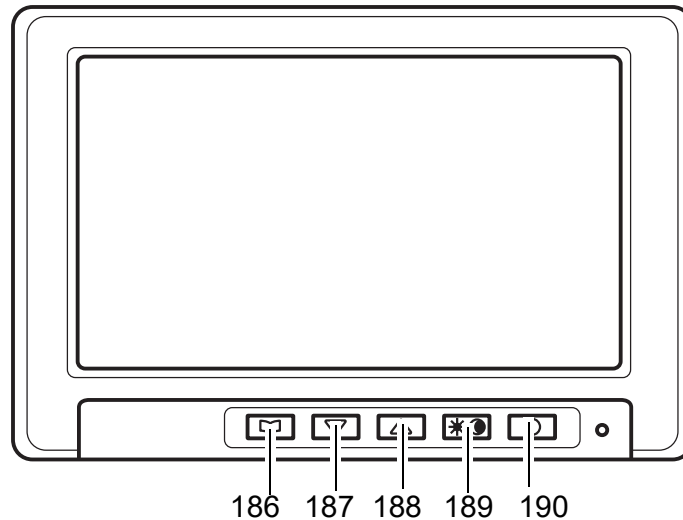
## 6.16 Camera system

### CAUTION!

#### Accident risk from hidden work areas

- ▶ The camera system acts as an aid to assist safe operation.
- ▶ Practice travelling and working with the camera system.
- ▶ Align the camera so that the hidden work area can be seen.

- When using the camera to reverse, the monitor automatically switches on when you engage reverse gear.



#### Using the camera system

- Press the button (190) on the monitor to switch the camera system on or off.
- Press the button (189) to lighten or darken the screen (day / night settings).
- Press the button (186) to open the menu.

- Pressing the button several times changes the menu item (contrast, brightness, colour saturation, language, video, light reflection) or quits the menu.

#### Adjusting the menu items

- Press the button (188) to go one step forward.
- Press the button (187) to go one step back.

- Clean a dirty screen or vent slots with a soft cloth or brush.

### 7.2.3 Emergency lowering

- The mast can be lowered manually if a fault occurs in the hydraulic system.

#### **WARNING!**

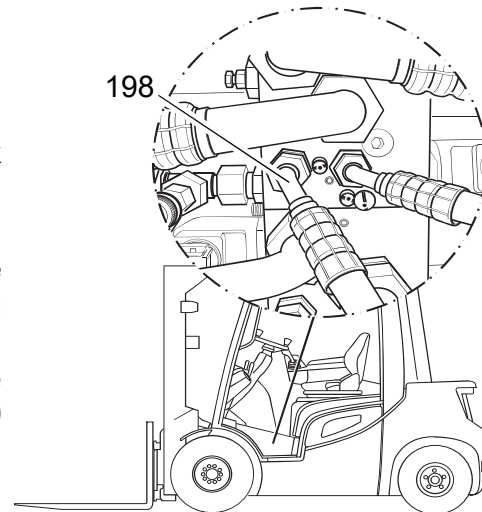
##### **Lowering the mast can result in injuries**

- ▶ Instruct other people to move out of the hazardous area of the truck during emergency lowering.
  - ▶ Never stand underneath a raised load handler.
  - ▶ Only operate the emergency lowering valve when standing next to the truck.
  - ▶ Emergency lowering of the mast cannot be applied when the load handler is in the rack.
  - ▶ Report any defects immediately to your supervisor.
  - ▶ Tag out and decommission a faulty lift truck.
  - ▶ Only return the truck to service when you have identified and rectified the fault.
- 

##### *Procedure*

- Set the Emergency Disconnect switch and the key switch to the "O" position.
  - Undo the setscrew (198) on the valve block by a maximum of 1.5 turns.
  - The mast and load handler will lower slowly.
- If necessary the lowering speed can be reduced by turning clockwise or the load can be stopped.
- When the mast and the load handler have been lowered, torque the setscrew to 2.5 - 3.0 Nm.

*The mast is now lowered.*



#### **WARNING!**

Only return the truck to service when you have identified and rectified the fault.

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### 3.3 Consumables

Code	Order no.	Quantity	Capacity	Description	Used for
A	51037495 51037499	1 l 5 l	55l	HVI Renolin B46	Hydraulic system
E	50055726	400 gr		Grease K-P-2K	Mast roller and sideshifter contact surfaces; steer axle
G	29201280	0.4 l		Chain spray	Chains
K	51210409	4.0 l	4.5 l	Titan GT 1 Pro C- 3 SAE 5W-30	Engine oil
M	51118018	1 l	7.0 l	Fricofin G12 Plus	Coolant *

\* The coolant consists of a 1:1 mixture ratio of Fricofin G12 Plus and water

→ The volumes indicated are approximate.

#### **WARNING!**

#### **Using incorrect hydraulic oil can be dangerous**

► Do not use hydraulic oils with a different specification or viscosity and do not mix with additives.

#### **Grease guidelines**

Code	Saponification	Dew point °C	Worked penetr. at 25°C	NLG1 class	Application temperature °C
E	Lithium	185	265-295	2	-35/+120

## 4.8 Hydraulic system

### CAUTION!

The hydraulic oil is pressurised during operation and is a hazard to health and to the environment.

- ▶ Do not touch pressurised hydraulic lines.
  - ▶ Dispose of used oil in accordance with regulations. Store used oil safely until it can be disposed of in accordance with regulations.
  - ▶ Do not spill hydraulic oil.
  - ▶ Remove any spilled hydraulic immediately with an appropriate bonding agent.
  - ▶ The bonding agent / consumable mixture must be disposed of in accordance with regulations.
  - ▶ Observe national regulations when handling hydraulic oil.
  - ▶ Wear safety gloves when handling hydraulic oil.
  - ▶ Prevent hydraulic oil from coming into contact with hot motor parts.
  - ▶ Do not smoke when handling hydraulic oil.
  - ▶ Avoid contact and digestion. If you swallow oil do not induce vomiting but seek medical assistance immediately.
  - ▶ Seek fresh air after breathing in oil fumes or vapours.
  - ▶ If oil has come into contact with your skin, rinse your skin with water.
  - ▶ If oil has come into contact with your eyes, rinse them with water and seek medical assistance immediately.
  - ▶ Replace oil-soaked clothing and shoes immediately.
- 

### CAUTION!

#### **Consumables and used parts are an environmental hazard**

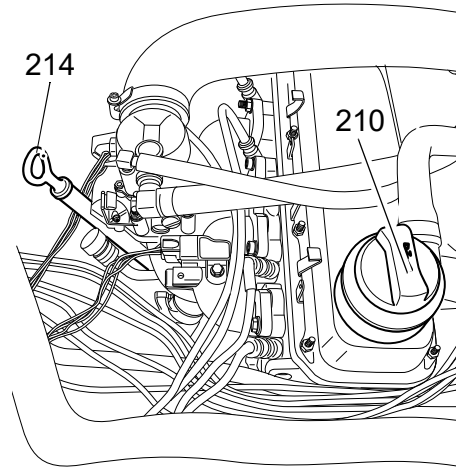
Used parts and consumables must be disposed of in accordance with the applicable environmental protection regulations. To change the oil contact the manufacturer's customer service department, who have been specially trained for this task.

- ▶ Note the safety regulations when handling these materials.
-

## Adding engine oil

### Procedure

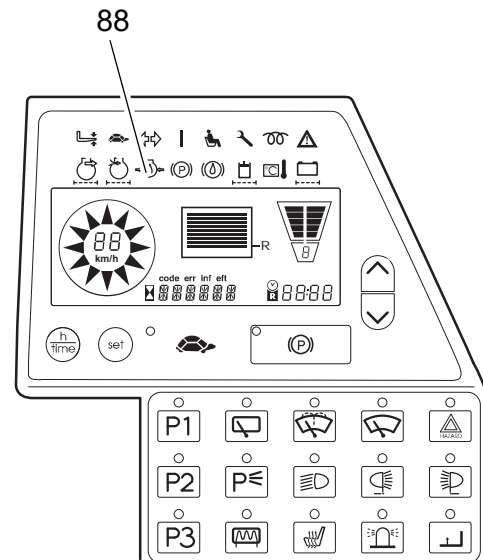
- Add fresh engine oil (see "Consumables" on page 161) through the filler port (210).
- Check the engine oil level with the dipstick (214) and top up if necessary.
- Screw the filler cap back on.
- Attach the floor plate.



### NOTE

**The incorrect amount of oil will damage the engine.**

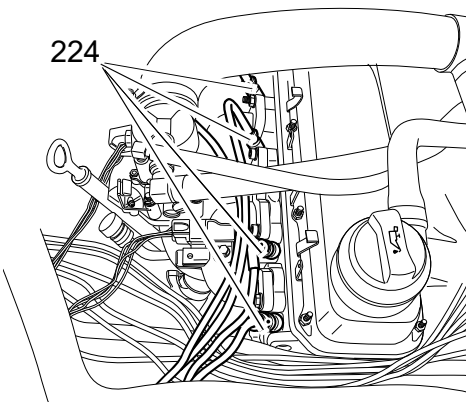
- ▶ After replacing the oil and oil filter carry out a test run and check the oil pressure display (88).
- ▶ Check that the oil drain plug and oil filter housing are tight.



## 4.9.6 Replacing spark plugs

### Procedure

- Remove spark plug connector (224).
  - Thoroughly clean around the spark plugs on the cylinder head.
  - Unscrew the spark plugs.
  - Check the electrode distance of the new spark plugs with a feeler gauge.
- ➔ Rated value: 1.0 mm ± 0.1mm.
- Screw in the spark plugs by hand and then torque them to 25 Nm.



● = Series equipment	○ = Optional equipment
----------------------	------------------------

## 5.3 Restoring the truck to service after decommissioning

### *Procedure*

- Thoroughly clean the truck, see "Cleaning" on page 194.
- Lubricate the truck according to the lubrication schedule, see "Lubrication Schedule" on page 160.
- Clean the starter battery, grease the terminals and connect the starter battery.
- Charge the starter battery, see "Starter battery" on page 196.
- Replace engine oil. Condensation water could have formed.
- Replace hydraulic oil. Condensation water could have formed.
- ➔ The manufacturer's customer service department is specially trained to carry out these operations.
- Start up the truck, see "Preparing the Truck for Operation" on page 65.

### **WARNING!**

#### **Faulty brakes can cause accidents**

As soon as the truck has been started, test the brakes several times.

- ▶ Report any defects immediately to your supervisor.
  - ▶ Tag out and decommission the faulty industrial truck.
  - ▶ Only return the truck to service when you have identified and rectified the fault.
-

## Audible warning devices

Electrical System		W	A	B	C
1	Test the buzzer / warning alarm, check for damage and make sure it is secure.			●	

## Trailer coupling

Chassis and Superstructure		W	A	B	C
1	Check trailer coupling or tow mechanism stop.			●	

## Work Platform

Hydraulic operations		W	A	B	C
1	Check attachment is properly secured to the truck and the supporting elements.			●	

## Work lights

Electrical System		W	A	B	C
1	Test lighting.			●	

## Strobe light/beacon

Electrical System		W	A	B	C
1	Test strobe light / beacon and check for damage.			●	

## Data recorder

Electrical System		W	A	B	C
1	Check data recorder is secure and check for damage.			●	

## Drive Control

Travel		W	A	B	C
1	Check the "Drive Control".			●	

## Electrical optional equipment

Electrical System		W	A	B	C
1	Test the electrical optional equipment and check for damage.			●	

## Fire extinguisher

Agreed performance levels		W	A	B	C
1	Check fire extinguisher is present, secure and Check test interval.				●

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