

# Operation

### 5 Operation

Figures and descriptions may vary due to modifications in the construction that become possible and necessary to improve the loader and to develop it further technically. These modifications are summarised in section 13.

#### 5.1 Checks before start-up

- Engine oil level (see the operating instructions for the engine)
- Hydraulic oil level
- Fuel level
- Tyre pressure
- Profile depth
- Battery fluid level
- Lighting system
- Mirror positioning
- Seat position
- Swivel unit safeguard (1-4/arrow); remove if necessary » only if work is to be commenced «
- Bucket arm prop [(e.g. bucket arm support (option) (1-2/arrow)); remove if necessary
- Open ball block valves for the working and auxiliary hydraulics (1-2/1 and 1-2/2) if necessary » only if work is to be commenced «
- » For vehicles with hand throttle (option) only «  
The hand throttle (4-8/18) must be set to the leftmost position (0 position).
- » For vehicles with hand throttle (option) only «  
The „Switchover hand throttle/foot throttle“ (4-8/19) must be set to foot throttle (green control pin in the switch **not** visible).
- General state of the loader, e.g. check for leaks
- The presence of
  - a first aid kit
  - a warning triangle
  - a signal lamp
 must be verified.

#### 5.2 Commissioning

##### 5.2.1 Start the diesel engine

- (1) Engage the parking brake lever (4-7/4).
- (2) Insert the battery main switch (8-31/2).
- (3) Set the drive switch (4-7/3) to "0" (starter interlock!).
- (4) Insert the ignition key into the starter switch (4-8/13) and turn the key clockwise to position "I" (5-1).



#### NOTE

- Do not step on the accelerator (4-5/2) while starting the engine.
- The indicator lamps for battery charge, parking brake and engine oil pressure light up. The fuel level and coolant temperature instruments function.
- A warning buzzer sounds when you apply the parking brake while the ignition is switched on.

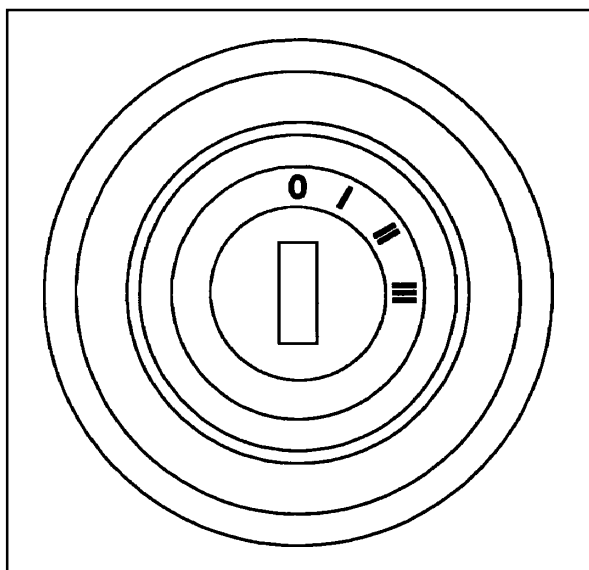


Figure 5-1

- (5) Turn the ignition key clockwise to position "III". As soon as the engine starts, release the ignition key.



### NOTE

- If the engine has not started after two attempts, determine the cause using the malfunction table in the operating instructions for the engine.
- For operation at extremely low temperatures, see the operating instructions for the engine.
- The clogging indicator (4-10/13) may light up prematurely after a cold start. It will go out when the hydraulic oil warms up. Operate the loader at a **low** speed until the indicator lamp (4-10/13) goes out. Never subject the loader to full loads in this state.

### 5.2.2 Winter operation



#### CAUTION

If the outside temperature is below 0 °C, the loader must be properly warmed up to avoid damage to certain assemblies. To do so, actuate all cylinders (lifting, tipping and swivelling cylinders) for some time (depending on the ambient temperature) with the machine idling.

Proper operation of the machine, even for subzero temperatures, can only be guaranteed if the following measures have been taken:

#### 5.2.2.1 Fuel

At low temperatures, paraffin precipitating from the fuel can cause the fuel system to clog up. For this reason, always use winter diesel fuel (suitable for temperatures down to -15 °C) when the outside temperature is below 0 °C.



### NOTE

The fuelling stations normally start offering winter diesel fuel in good time before the cold season starts. Often, they offer diesel fuel that can be used down to temperatures of 20 °C (super-grade diesel fuel).

If the temperature is below -15 °C or -20 °C, paraffin oil must be added to the diesel fuel. For the mixture ratio, refer to the diagram (5-2).

- I = Summer diesel fuel
- II = Winter diesel fuel
- III = Super-grade diesel fuel



#### CAUTION

Only mix the ingredients in the tank! First, fill in the required amount of paraffin oil, then top up with diesel fuel.

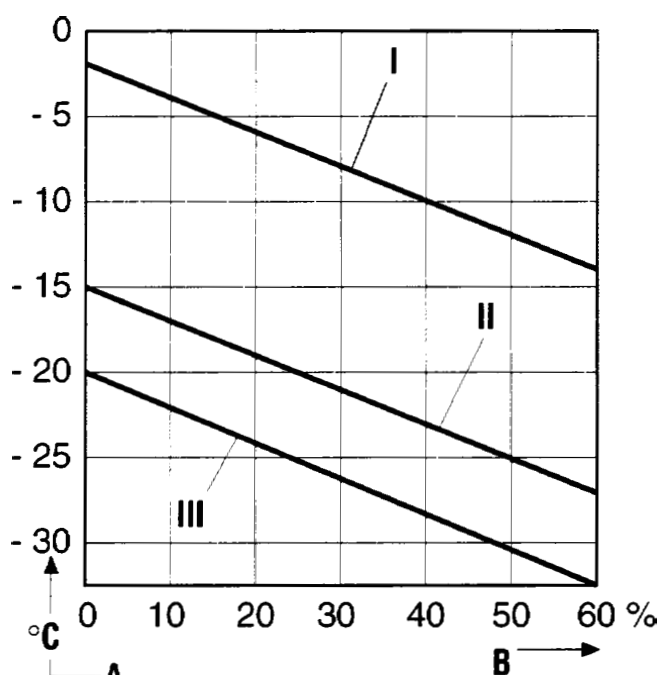


Figure 5-2

### 5.2.2.2 Engine oil change

See the operating instructions for the engine and for the machine (section 8.2.6).

### 5.2.2.3 Changing the oil in the hydraulic system



#### CAUTION

The viscosity of the hydraulic oil changes according to the temperature; therefore, the ambient temperature in the location where the machine will be used determines what viscosity class (SAE class) must be chosen. If the hydraulic oil used matches the expected ambient temperature, optimum operating conditions can be attained. Therefore, use hydraulic oil of an appropriate grade if required.

See section 8.2.10. for the oil change procedure required for the hydraulic system.



Figure 5-3

### 5.2.2.4 Anti-freezing agent for the windshield washer system



#### CAUTION

If the temperature is expected to drop below 0° C, add a sufficient amount of anti-freezing agent to the water in the windshield washer system (5-3/arrow) to prevent it from icing up. Heed the manufacturer's instructions for the mixture ratio.

### 5.2.3 Driving the loader on public roads



#### CAUTION

- Driving on public roads is **only** permitted with an **empty** standard or multi-purpose bucket and **only** with bucket protection.
- It is expressly forbidden to drive on public roads with the inching speed control (4-8/18) or the hand throttle (4-8/18 and 4-8/19) enabled.
- When the road lights (which are used solely to light up the road) are switched on, the highest permissible speed is 30 km/h.
- According to § 52 (4) No. 1 of the German Motor Vehicle Construction and Use Regulations, the warning beacon (optional equipment) may be switched on only if the loader is marked by red and white warning stripes.
- A warning triangle and a first-aid kit must be provided in the loader.

The driver of the loader must possess a valid driver's license for the respective machine type.

The driver must carry his driver's license (original) and the operating permit (original) with him.

Before driving on public roads, the following road safety measures must be taken:

### 5.2.3.1 Carrying a bucket

- (1) Lower the bucket arm until the lowest point of the bucket arm or the bucket is at least 30 cm above the road (5-4).
- (2) Close both ball block valves (1-2/1 and 1-2/2).



#### CAUTION

When closed, the levers of the ball block valves are perpendicular to the flow direction. This prevents the bucket arm from being inadvertently lowered and the bucket tipped while driving.



Figure 5-4

- (3) Block the swivel unit by inserting the blocking wedge (1-3/arrow) into the swivel block (1-4/arrow) and secure it with the spring locking lever.
- (4) Cover the bucket cutting edge and teeth with the bucket protector (5-4/arrow).
- (5) Insert the plug of the bucket protector into the socket (5-5/arrow, option).
- (6) Perform a function check.
- (7) Lock both doors.
- (8) Put on the safety belt.
- (9) Switch the switching lever for the steering to the "rear-wheel steering" position (4-6/4).



#### DANGER

The working lights (4-8/17) must be switched off.

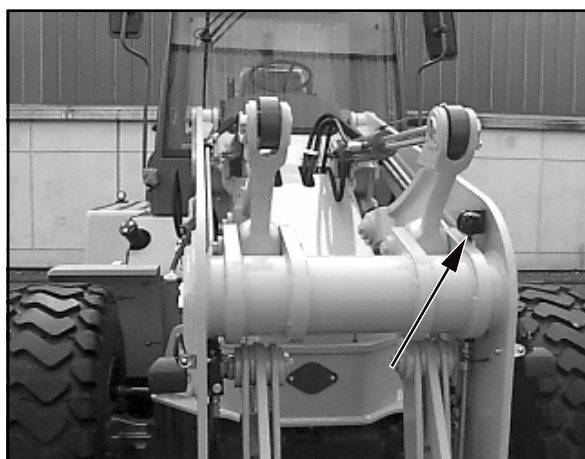


Figure 5-5

- (10) Release the parking brake (4-7/4).
- (11) Switch to gear stage "II2" (4-7/1).
- (12) Select the travel direction (4-7/3).
- (13) Press the accelerator pedal (4-5/2).



#### DANGER

Changing the travel direction during driving is **not** allowed to avoid any danger to other road users.

### 5.2.4 Working with the loader



#### DANGER

Always use seat belts when working with the swivel shovel loader.

Generally, all work is carried out in gear stage "2" (4-7/1). For special tasks which ask for a more sensitive control of the speed or a higher engine speed at reduced travel speed, gear stage "1" can be selected. This allows the maximum travel speed to be limited.

### Speed range/gear stage

#### "20 km/h" variant

Alpha max. (turtle symbol)	from	0	to	4 km/h
1	from	0	to	12 km/h
2	from	0	to	20 km/h

#### "25 km/h" variant

Alpha max. (turtle symbol)	from	0	to	4 km/h
1	from	0	to	12 km/h
2	from	0	to	25 km/h

#### "40 km/h" variant

Alpha max. (turtle symbol)	from	0	to	4 km/h
1	from	0	to	12 km/h
2	from	0	to	40 km/h



### NOTE

When you switch from the 2nd to the first gear at a speed higher than 8 km/h

- The switchover occurs when the loader reaches the permitted speed or falls below this speed
- when the accelerator (4-5/2) is briefly pressed.
- when the loader stops.

- (1) Lock both doors.
- (2) Release the parking brake (4-7/4).
- (3) Select the gear stage (4-7/1).
- (4) Select the travel direction (4-7/3).
- (5) Press the accelerator pedal (4-5/2).



### NOTE

- To attain full performance, the combined action of propulsion and of the working hydraulics is necessary. It is up to the operator to control the available power using the accelerator, the inching function and the hand lever for the working hydraulics.
- The travel speed and the thrust force are altered exclusively by depressing the accelerator pedal.
- When driving up gradients, the travel speed decreases in spite of full throttle in favour of the thrust force.
- The thrust forces and travel speeds are the same in the forward and the reverse direction.

### Overheat protection

The cooling water temperature of the diesel engine is compared with a parameterisable limit value. The overheat protection comes into action when this limit value is exceeded or when the oil temperature sensor indicates an overtemperature:

- The diesel engine control is restricted to a parameterisable value.
- The pump control is restricted to a parameterisable value.
- The angle of the variable displacement motor is restricted to a parameterisable value.
- Shifting up is no longer permitted.





### CAUTION

- If the hydraulic oil temperature indicator lamp (4-10/13) lights up during operation or the buzzer sounds, the loader must be switched off immediately, the cause must be determined by a hydraulics expert and the malfunction must be eliminated.
- The hydraulic quick-change device must only be locked if an attachment has been mounted.
- The attachment may be locked/unlocked only when the engine is at idling speed so that the insertion/retraction speed of the locking bolts does not become too high and to prevent leaks.



### DANGER

- If driving with the bucket arm swivelled is required in special cases, the bucket/attachment must be positioned close over the wheel and the travel distance must be kept as short as possible. If unevenness of the ground causes the support system to lift a wheel off the ground, the bucket arm must be briefly swivelled in the direction of travel so that the axle block can be cancelled.
- Operate the vehicle only with the hand throttle (option) enabled only if the drive switch (4-7/3) is set to „0“ and the parking brake (4-7/4) has been applied.  
It is expressly forbidden to move the vehicle with the hand throttle (4-8/18 and 4-8/19) enabled.

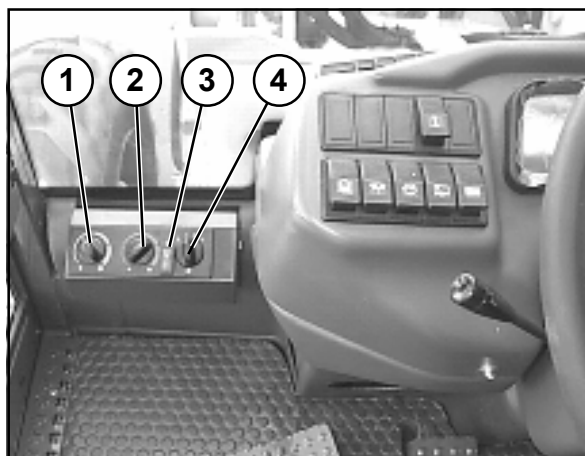


Figure 5-6

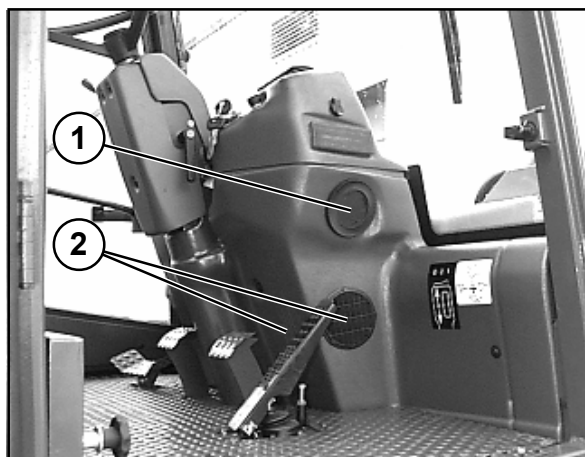


Figure 5-7

## 5.2.5 Heater and ventilation system/air-conditioning system (option)

### 5.2.5.1 Setting the air flow

- (1) Turn the rotary switch (5-6/4) for the blower to position 0, 1, 2, or 3 depending on the air flow desired.
- (2) Set the air flow direction at the left and right with the lateral air nozzles (5-7/1 and 5-8/1).

### 5.2.5.2 Switch on the heater

- (1) Turn the knob (5-6/2) in clockwise direction (warm) or in anti-clockwise direction (cold) to reach the desired temperature.

### 5.2.5.3 Switching on the air-conditioning system (option)

- (1) Press the "ON/OFF" switch (5-6/3) to control the air condition as desired.

Switch pressed in the upper half - Air condition "ON"  
Switch pressed in the lower half - Air condition "OFF"

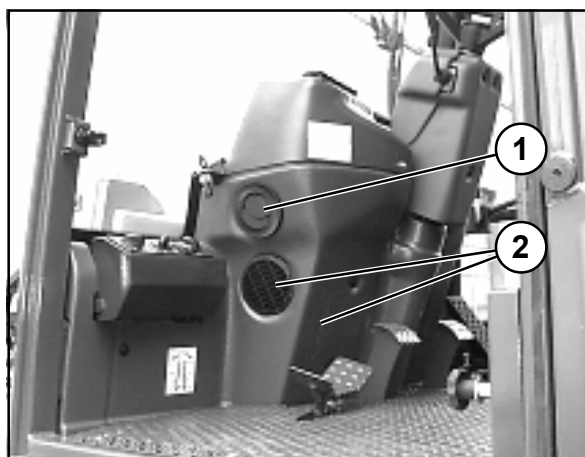


Figure 5-8

### 5.2.5.4 Setting the temperature

(1) The rotary switch (5-6/1) lets you control the temperature in the driver's cabin.

Rotary switch in clockwise direction - colder

Rotary switch in counter clockwise direction - warmer



#### NOTE

The air conditioning system takes in air via the four air intake openings (5-7/2 and 5-8/2).



#### CAUTION

For safety instructions and pertaining disposal regulations as well as for maintenance information, refer to the operating instructions that come with the air condition.

## 5.3 Decommissioning the loader

### 5.3.1 Parking the loader

(1) Stop the loader on solid ground; if possible, not on a slope.

(2) Apply the parking brake (4-7/4).

(3) Place the bucket or the attachment on the ground.

(4) Set the drive switch (4-7/3) to "0".



#### DANGER

If parking on a gradient cannot be avoided, wheel chocks must be used and placed on the sloping side in front of the front axle wheels **in addition** to applying the parking brake.

#### For vehicles with hand throttle (option) only

- The hand throttle (4-8/18) must be set to the leftmost position (0 position).

- The „Switchover hand throttle/foot throttle“ (4-8/19) must be set to foot throttle (green control pin in the switch **not** visible).

### 5.3.2 Switching off the diesel engine



#### CAUTION

If the diesel engine is very hot or has been subjected to heavy loads, let the engine idle for a short time before switching it off.

Turn the ignition key to the left to position "0" (5-1) and remove the key.

### 5.3.3 Switching off the heater and ventilation/air conditioning (option) system

(1) Shut off the hot air supply (5-6/2).

(2) Turn the rotary switch (5-6/4) for the blower to position "0".

(3) Switch off the air conditioning system (option) (5-6/3).



### 5.3.4 Leaving the loader

(1) Lock the hand levers for the working and auxiliary hydraulics (1-2/1 and 1-2/2).

(2) Remove the main battery switch (8-31/2).



#### NOTE

If the loader is to remain shut down for a long period of time, carry out the duties in Chapter 3 (Protection against theft).

(3) Remove the ignition key and lock the doors.

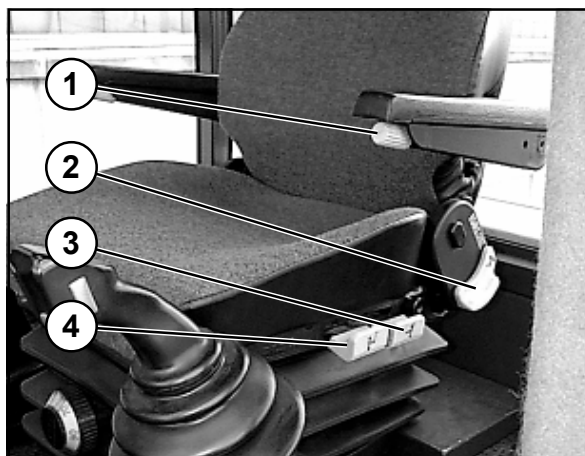


Figure 5-9

### 5.4 Adjusting the driver's seat

#### 5.4.1 Isri seat

(1) Adjust or swing forward the backrest using the hand lever (5-9/2).

(2) Adjust the seat height and rear inclination by pulling the hand lever (5-9/3) upwards.

(3) Adjust the seat height and front inclination by pulling the hand lever (5-9/4) upwards.

(4) The seat suspension can be adjusted to the driver's weight (40 - 130 kg) with the handwheel (5-10/1).

(5) Adjust the height of the arm rest by turning the knob (5-9/1).

(6) Readjust the position of the pilot valves for the working (4-7/8) and auxiliary hydraulics (4-6/8) if necessary.

(7) The operator's seat can be adjusted in the horizontal direction to suit the driver's requirements by pulling the handle (5-10/2) upwards and moving the seat forward or backward.

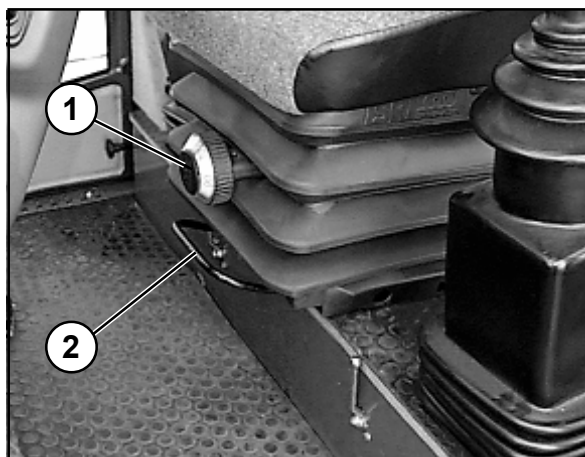


Figure 5-10

#### 5.4.2 Grammer seat

##### (1) Weight adjustment:

Adjust the seat to the driver's weight by actuating the weight adjustment lever. The set driver's weight is visible in the inspection window (5-11).

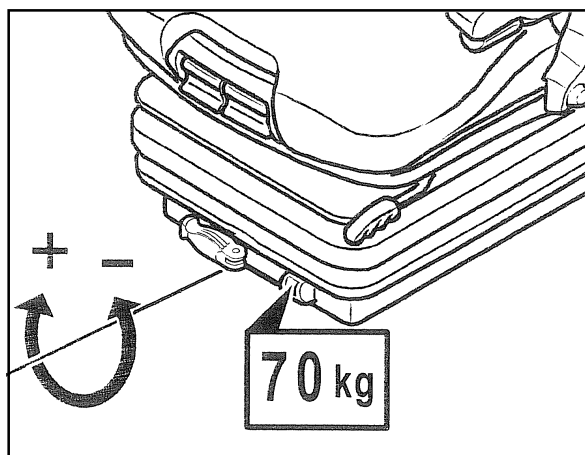


Figure 5-11

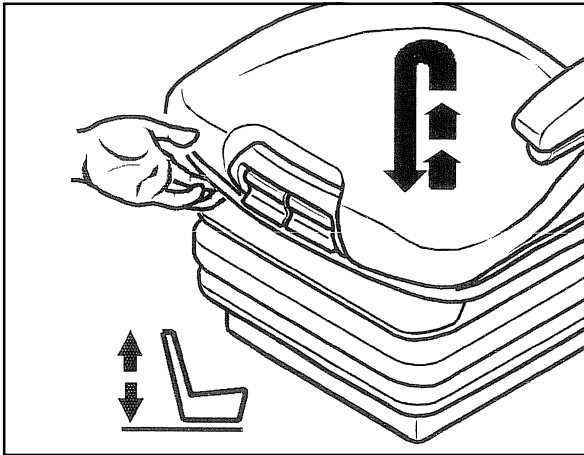


Figure 5-12

**(2) Height adjustment:**

The height can be adjusted in several steps. Lift the driver's seat to the desired height until it can be heard to engage. The seat returns to the lowest position when it is lifted over the topmost position (stop) (5-12).

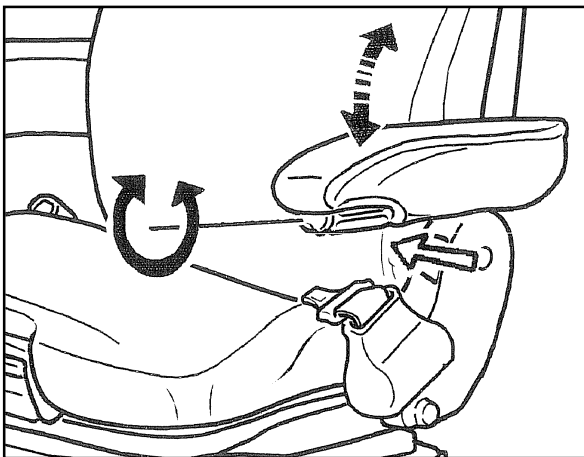


Figure 5-13

**(3) Armrest inclination:**

Turn the handwheel (5-13/arrow) to adjust the armrest in longitudinal direction.

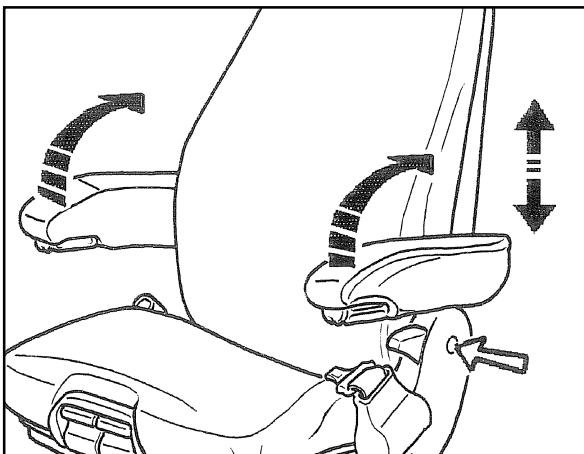


Figure 5-14

**(4) Arm rests:**

If desired, you can swing the armrests to the rear and adjust their height.

To adjust the armrest height, remove the round cap (5-14/arrow) in the covering.

Loosen the hex nut (wrench size 13 mm), set the armrest as desired and tighten the nut again. Push the removed cap onto the nut again.

### (5) Adjusting the backrest:

Use the locking lever (5-15/arrow) to adjust the backrest.



#### NOTE

The locking lever must engage in the desired position. It must be impossible to move the backrest to another position when the lever has engaged.

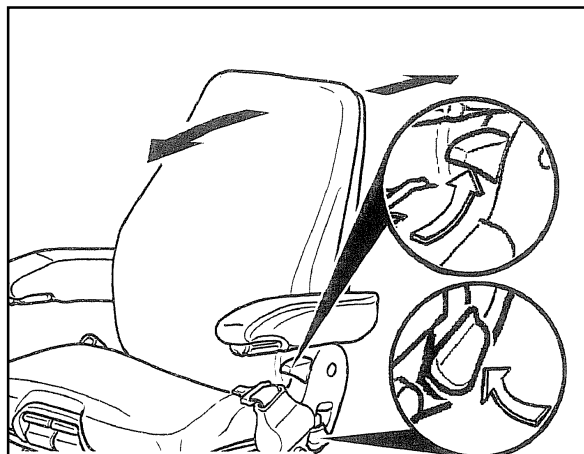


Figure 5-15

### (6) Longitudinal adjustment:

You can adjust the seat in longitudinal direction when you pull the lever (5-16) upwards.



#### NOTE

The locking lever must engage in the desired position. It must be impossible to move the driver's seat to another position when the lever has engaged.

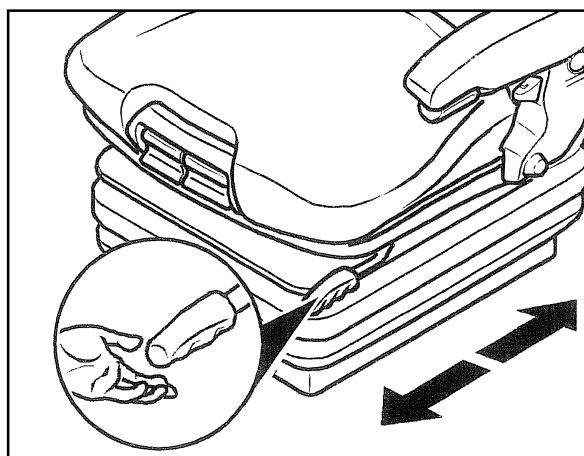


Figure 5-16

### 5.4.3 Grammer seat (air-cushioned)



#### CAUTION

- Adjust the seat only when the loader is not moving.
- Check fastening and locking parts from time to time.

#### (1) Seat depth adjustment (5-17/1):

You can adjust the seat depth to your wishes.

To adjust the seat depth, lift the right button (5-17/1). Push the set to the front or rear to obtain the correct position while keeping the button lifted.

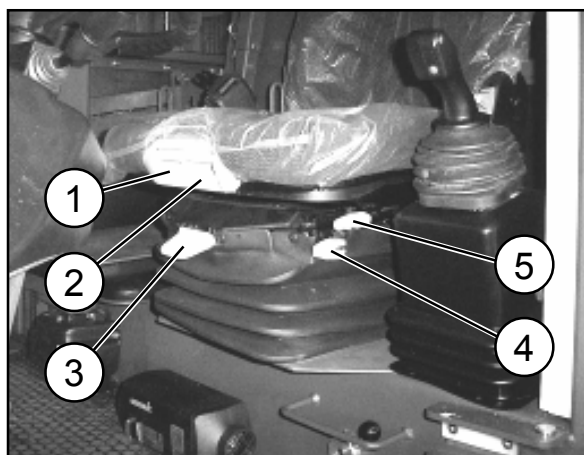


Figure 5-17

(2) **Seat inclination adjustment (5-17/2):**

You can adjust the seat inclination to your wishes.  
To adjust the seat inclination, lift the left button (5-17/2).  
Exert pressure on the seat or relieve the pressure while keeping the button lifted to set the desired inclination.

(3) **Height adjustment (5-17/3):**

The height can be continuously adjusted with compressed air.

Fully pull or push the lever (5-17/3) to adjust the seat height.  
When the upper or lower height limit is reached, an automatic height adjustment will occur to ensure a minimum suspension travel.



**NOTE**

The ignition must be switched on.



**CAUTION**

Operate the compressor for not more than one minute to avoid damage.

(4) **Horizontal suspension (5-17/4):**

We recommend enabling the horizontal suspension when certain conditions (e.g. trailer operation) prevail. In this setting, the driver's seat can better compensate for impacts in travelling direction.

Lever to the front: = Horizontal suspension "OFF"

Lever to the rear: = Horizontal suspension "ON"

(5) **Longitudinal adjustment (5-17/5):**

You can adjust the seat in longitudinal direction when you pull the locking lever upwards.



**NOTE**

The locking lever must engage in the desired position. It must be impossible to move the driver's seat to another position when the lever has engaged.

(6) **Lumbar support (5-18/1):**

Turn the knob to adjust the curvature of the back cushion to suit your needs.

This will increase the seating comfort and also the driver's performance.

(7) **Backrest adjustment (5-18/2):**

Use the locking lever (5-18/2) to adjust the backrest.



**CAUTION**

The locking lever must engage in the desired position. It must be impossible to move the backrest to another position when the lever has engaged.

(8) Readjust the position of the pilot valve for the auxiliary hydraulics (4-6/5) if necessary.



Figure 5-18

## 5.5 Switching the steering type



### CAUTION

- The wheels of the rear axle must be straight before the switching lever (5-19/arrow) can be applied.
- Enable the steering switch only when the loader is at a standstill. To switch the steering type, move the hand lever to the right (rear-wheel steering) or to the left (four-wheel steering).

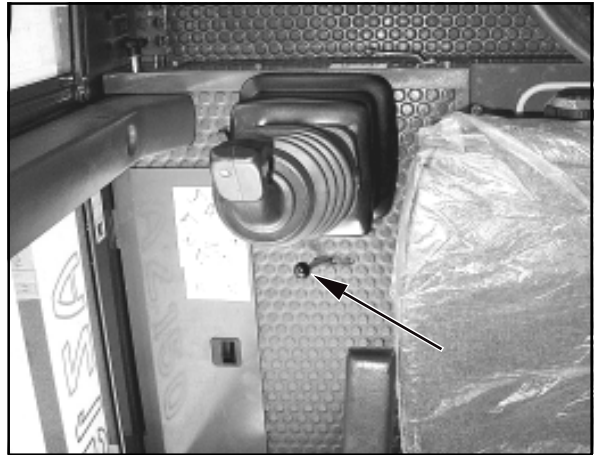


Figure 5-19

### 5.5.1 Synchronising the steering

- (1) Set the steering type selection valve to “four-wheel steering”.
- (2) Actuate the steering so that the front wheels are straight.
- (3) Set the steering type selection valve to “rear wheel steering”.
- (4) Actuate the steering so that the rear wheels are straight.

