Rescue, Towing, Lashing, Crane-Lifting

7 Rescue, Towing, Lashing, Crane-Lifting

7.1 Rescue, Towing, Lashing

7.1.1 Rescue/Towing of the swing loader in case of engine or transmission failure

DANGER
On public roads, first secure the rescue area.

ATTENTION
- Do not attempt to tow-start the swivel loader. Any attempt to do so will cause damage.
- Towing is permitted to remove the loader from hazardous areas only, and when loading onto a low-loader.

NOTE
Preparatory steps before towing depend on whether the engine has failed, and thus the hydraulic system is inoperable, or only the transmission has failed and the engine can still power the hydraulic subsystem.

7.1.1.1 Towing the swing loader in case of engine failure

ATTENTION
- When the engine has failed, towing is only permitted to rescue the machine out of the danger area.
- Remove both cardan shafts prior to towing if the machine must be towed over a longer distance and cannot be loaded.

(1) Press the rocker switch for the hazard warning lights (4-8/11).

(2) Chock both front wheels in both directions to prevent the vehicle from to ensure that the vehicle does not roll.

(3) Put the gear selector (4-7/3) in neutral (position "0").

NOTE
The preparation in points (4), (6), (7) and (13) is only to be carried out if the rescue location is **not** on a public road.

(4) Align the wheels on the front axle and then use the steering selector lever (4-6/4) to set the steering mode to "rear-wheel-steering".

(5) Release the parking brake (4-7/4).

(6) Apply the bucket protector to protect the lip and teeth of the bucket (5-4/arrow).

(7) Insert the bucket protector plug in the socket (5-5/arrow).

(8) Push the valve control lever for main hydraulics (4-7/2) forwards through its pressure point to the front position.

(9) Using a suitable lifting device, e.g. a second loader with an attached bucket, lift the bucket arm of the loader to be towed until the mechanical bucket arm support can be inserted at the loader to be towed (7-1).


Fig. 7-1

NOTE

- If the vehicle breakdown occurred some time ago, ensure that the hydraulic hoses are disconnected from the lift cylinder before attaching the lifting equipment. Use an oil tray with appropriate dimensions to catch any hydraulic oil that seeps out.
- After completing towing, remember to fill the lift cylinder with hydraulic oil and vent the cylinder by repeatedly raising and dropping the loader arm.

(10) Lift and mechanically prop up bucket arm [e.g. by inserting the bucket arm support (option) (1-1/arrow)] and lower bucket arm until it rests on the bucket arm support.

(11) Close both stop valves (1-2/1 and 1-2/2).

(12) Return the valve control for main hydraulics (4-7/2) to its original position.

(13) Block the swivel mechanism by inserting the blocking wedge (1-3/arrow) in the swivel blocking mechanism (1-4/arrow).

(14) Attach the towing rod to the loader to be towed [(7-2/1 - for towing forwards) or (7-4/1 - for towing backwards)] and to the towing vehicle.

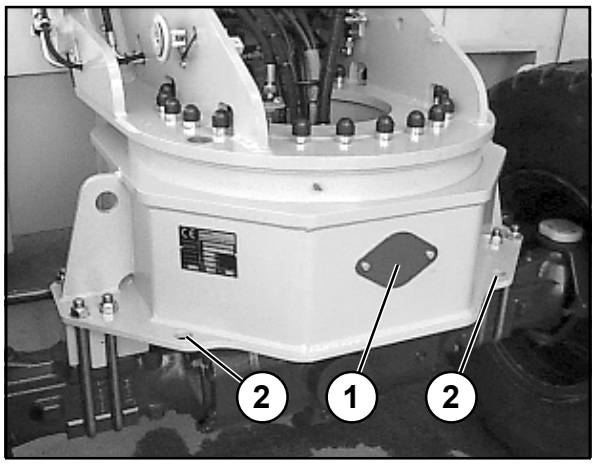

Fig. 7-2

ATTENTION

If the loader does not have a forward shunting and towing coupling, the loader can only be towed backwards.

Fig. 7-3

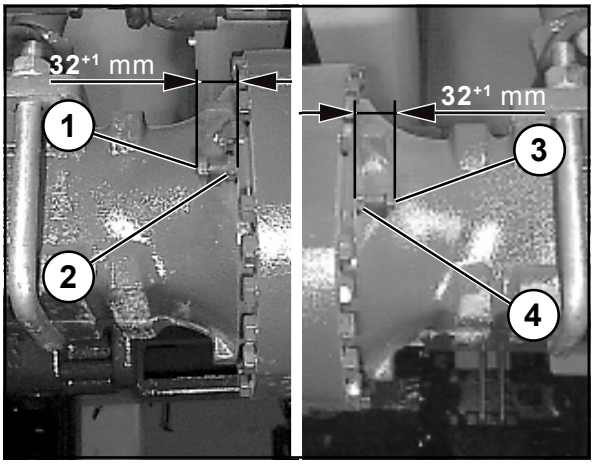

Fig. 7-4

(15) Detach the spring brake. To do so, loosen the counter nuts (7-4/2 and 7-4/4) and set screws (7-4/1 and 7-4/3) a quarter turn in sequence.
One turn is required to slacken the spring brake.

ATTENTION

- Do not exceed one turn!
- Tighten the set screws in sequence. That is, when you tighten the screws, you must tighten each screw a quarter turn in sequence to prevent jamming or canting.
- Detach the spring brakes to the left and right of the axle assembly separately.

Adjustment after manual slackening

- Remove the set screws (7-4/1 and 7-4/3), counter nuts (7-4/2 and 7-4/4) and gaskets.
- Lubricate the set screws with silicon grease TECNO LUBE 101.
- Refit the set screws, counter nuts and gaskets.

(16) Tighten the set screws to a point where the measurement between the screw head and the axle assembly is 32^{+1} mm.

(17) Use counter nuts to fix the set screws in position.

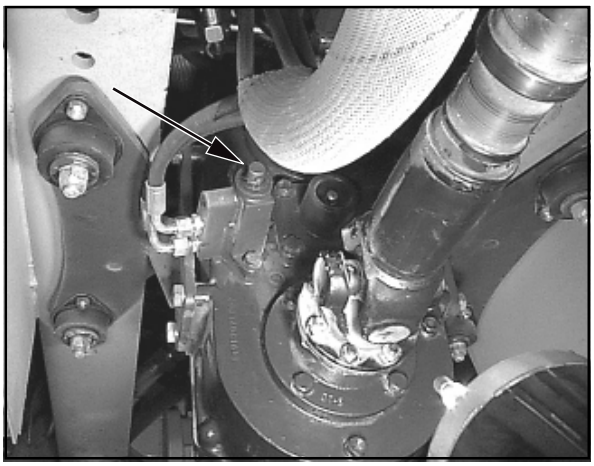

Fig. 7-5

ATTENTION

The screws must protrude by exactly 32^{+1} mm (7-4).

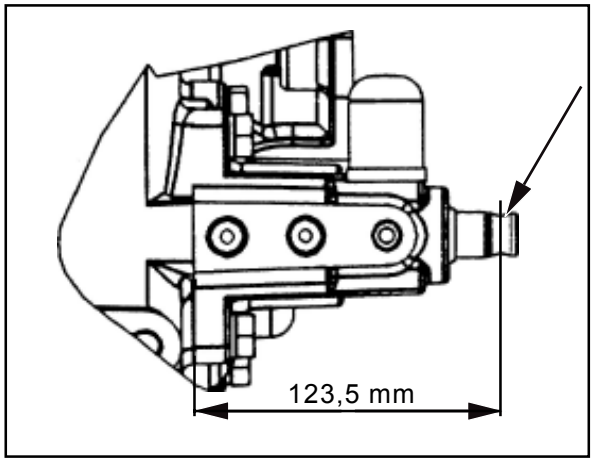

Fig. 7-6

Applies to slow-runners
» Type "20 km/h" and "25 km/h" «

(18) Put the gear lever (7-5/arrow and 7-6/arrow) into neutral.

NOTE

- The gear lever will snap noticably into place. The correct position is between first gear (pressed in) and second gear (pulled out).
- The measurement will be 123,5 mm (7-6).

(19) Remove chocks.

DANGER

- In case of engine failure considerably more force is required to steer the vehicle.
- Tow the vehicle at slow speed (2 km/h).
- For longer towing distances, the defective vehicle should be loaded (see 7-2/1 and 7-2/2, 7-3/1 and 7-3/2) for lashing points.
  - The max. permissible load of the front towing and shunting coupling (7-2/1) is 8.0 t horizontally and axially.
  - The max. permissible load of the rear towing and shunting coupling (7-3/1) is 8.0 t horizontally and axially.
  - The max. permissible load of the lashing points/ loading points (7-2/2, and 7-3/2) is x t assuming an angle of 45°.
  - Note maximum height restrictions!

7.1.1.2 Towing the swing loader in case of transmission failure

(1) Press the rocker switch for the hazard warning lights (4-8/11).
(2) Chock both front wheels in both directions to prevent the vehicle from to ensure that the vehicle does not roll.
(3) Put the gear selector (4-7/3) in neutral (position "0").

NOTES

Preparatory tasks (4), (6), (7), and (10) are only required if the rescue area is **not** in a publicly accessible area:

(4) Align the wheels on the front axle and then use the steering selector lever (4-6/4) to set the steering mode to "rear-wheel-steering".
(5) Apply the bucket protector to protect the lip and teeth of the bucket (5-4/arrow).
(6) Insert the bucket protector plug in the socket (5-5/ arrow).
(7) Lift and mechanically prop up bucket arm [e.g. by inserting the bucket arm support (option) (1-1/arrow)] and lower bucket arm until it rests on the bucket arm support.
(8) Close both stop valves (1-2/1 and 1-2/2).
(9) Block the swivel mechanism by inserting the blocking wedge (1-3/arrow) in the swivel blocking mechanism (1-4/arrow).
(10) Attach the towing rod to the loader to be towed [(7-2/1 - for towing forwards) or (7-4/1 - for towing backwards)] and to the towing vehicle.

ATTENTION

If the loader does not have a forward shunting and towing coupling, the loader can only be towed backwards.

(11) Switch off the engine.
(12) Release the parking brake (4-7/4).

(13) Detach the spring brake. To do so, loosen the counter nuts (7-4/2 and 7-4/4) and set screws (7-4/1 and 7-4/3) a quarter turn in sequence.
One turn is required to slacken the spring brake.

ATTENTION

- Do not exceed one turn!
- Tighten the set screws in sequence. That is, when you tighten the screws, you must tighten each screw a quarter turn in sequence to prevent jamming or canting.
- Detach the spring brakes to the left and right of the axle assembly separately.

Adjustment after manual slackening

- Remove the set screws (7-4/1 and 7-4/3), counter nuts (7-4/2 and 7-4/4) and gaskets.
- Lubricate the set screws with silicon grease TECNO LUBE 101.
- Refit the set screws, counter nuts and gaskets.

(14) Tighten the set screws to a point where the measurement between the screw head and the axle assembly is 32^{+1} mm.

(15) Use counter nuts to fix the set screws in position.

ATTENTION

The screws must protrude by exactly 32^{+1} mm (7-4).

Applies to slow-runners
» Type "20 km/h" and "25 km/h" «

(16) Put the gear lever (7-5/arrow and 7-6/arrow) into neutral.

NOTE

- The gear lever will snap noticably into place. The correct position is between first gear (pressed in) and second gear (pulled out).
- The measurement will be 123,5 mm (7-6).

(17) Remove chocks.

DANGER

- In case of engine failure considerably more force is required to steer the vehicle.
- Tow the vehicle at slow speed (2 km/h).

- For longer towing distances, the defective vehicle should be loaded (see 7-2/1 and 7-2/2, 7-3/1 and 7-3/2) for lashing points.
  - The max. permissible load of the front towing and shunting coupling (7-2/1) is 8.0 t horizontally and axially.
  - The max. permissible load of the rear towing and shunting coupling (7-3/1) is 8.0 t horizontally and axially.
  - The max. permissible load of the lashing points/ loading points (7-2/2, and 7-3/2) is ? t assuming an angle of 45°.
  - Note maximum height restrictions!

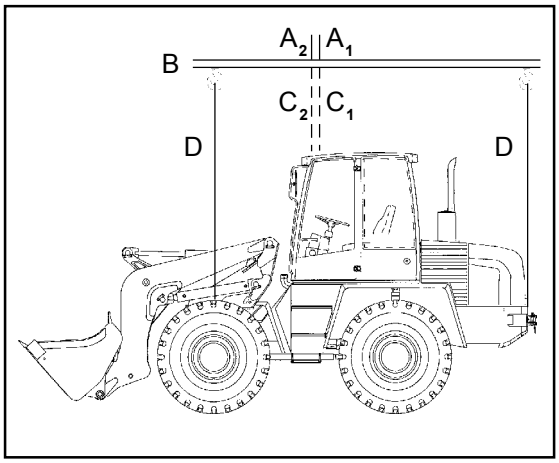

Fig. 7-7

7.2 Crane Lifting

The following steps are required to prepare the vehicle for crane lifting:

(1) Apply the parking brake (4-7/4).
(2) Put the gear selector (4-7/3) in neutral (position "0").
(3) **- Applies to slow-runners only**
» Type 20 km/h and 25 km/h «
- Select first gear (4-8/4).
- Select hydraulic gear I (4-7/1).

- Applies to fast-runners only
» Type 40 km/h «
Select "Alpha max. (Turtle symbol)" (4-7/1).

(4) Raise or lower the loader arm to a position where the bucket heel is at least 30 cm above the ground (5-2).
(5) Close stop valves for main and auxiliary hydraulics (1-2/1 and 1-2/2).
(6) Block the swivel mechanism by inserting the blocking wedge (1-3/arrow) in the swivel blocking mechanism (1-4/arrow).
(7) Lock the doors.
(8) Fold the outside mirrors in.

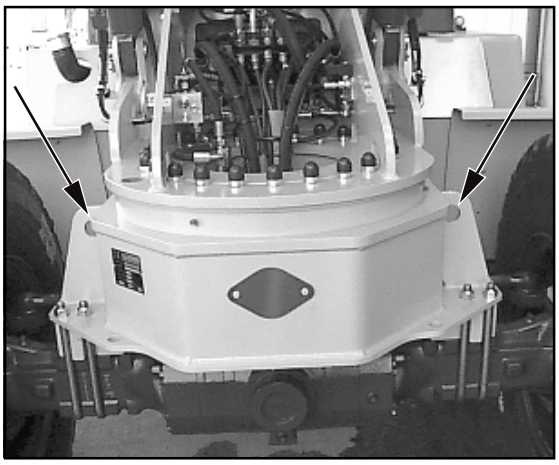

Fig. 7-8

ATTENTION

Pay particular attention to the following points when crane lifting a loader, see figure 7-7:

- The lifting point (A_1 - vehicles without standard bucket or A_2 - vehicles with standards bucket) of the lifting equipment (B) must be exactly vertically above the center of gravity (C_1 bzw. C_2) of the vehicle, to allow the lifting device to be placed **horizontally** above the longitudinal axis of the loader.
- The lifting gear (D) must lead vertically upwards from the lifting points of the loader (7-8/ arrows and 7-9/arrows).

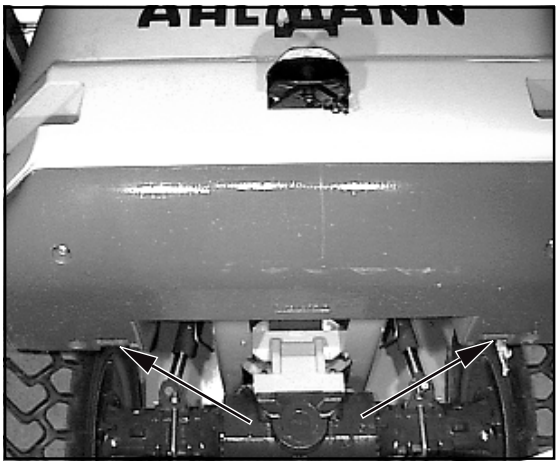

Fig. 7-9

DANGER

The lifting gear must have a lifting capacity of at least 6.5 t.