

Rescue, Towing, Lashing, Lifting by Crane

7 Rescue, towing, lashing, lifting by crane

7.1 Rescue, towing, lashing

7.1.1 Rescue/towing of the swivel shovel loader if the engine or drive has failed



DANGER

Secure the rescue location if it is on a public road.



CAUTION

- The swivel shovel loader must not be tow-started. Any attempt to tow-start leads to damage.
- Towing is permitted only to remove the loader from a danger zone and to load it onto a low loader.



NOTE

Preparation for towing depends on whether the engine has failed, thus causing a failure of the entire hydraulic system, or if only the drive has failed and the engine can drive the rest of the hydraulic system.

7.1.1.1 Towing the swivel shovel loader if the engine has failed

- (1) Actuate the toggle switch for the hazard flasher (4-5/2).
- (2) Secure both wheels of the front axle against rolling away in both directions.
- (3) Set the drive switch (4-11/6) to "0".



NOTE

The preparations described in steps (4), (6), (7) and (13) are only to be carried out if the rescue location is **not** on a public road:

- (4) After the front-axle wheels have been straightened, switch the switching lever for the steering (4-10/4) to the „rear-axle steering“ position.
- (5) Release the parking brake (4-11/4).

(6) Cover the bucket cutting edge and teeth with the bucket protector (5-4/arrow).

(7) Insert the plug of the bucket protector into the socket (5-5/arrow, option).

(8) Push the valve lever for the working hydraulics (4-11/5) beyond its pressure point into the forward position.

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



Figure 7-1



NOTE

- If the loader has been out of operation for a longer period of time, the hydraulic hoses must be disconnected from the lifting cylinders before attaching the lifting gear. Collect the escaping hydraulic oil in a sufficiently large oil pan.
- After towing has been completed, fill the lifting cylinders with hydraulic oil and deaerate them by raising and lowering the bucket arm several times.

(10) Mechanically prop up the bucket arm [e.g. by inserting the bucket arm supports (option) (1-2/arrows)] and lower the bucket arm until it rests on the bucket arm support.

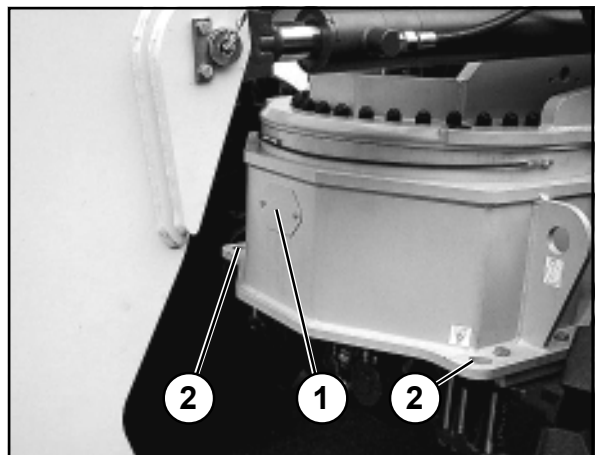


Figure 7-2

(11) Close the ball block valve for the working and auxiliary hydraulics (4-10/3).

(12) Set the pilot valve for the working hydraulics (4-11/5) to its starting position.

(13) Block the swivel unit by inserting the blocking wedge (1-3/arrow) into the swivel block (1-4/arrow).

(14) Attach the tow rod to the loader to be towed [7-2/1 – forwards towing (optional shunting and towing coupling) or 7-3/1 – rearwards towing] and to the towing vehicle.

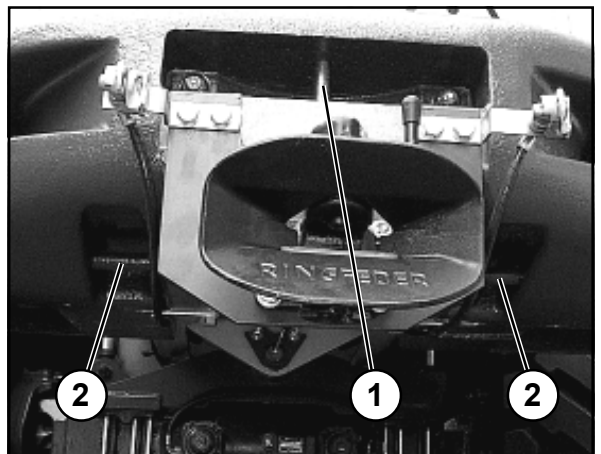


Figure 7-3



CAUTION

If the front of the loader does not have a shunting and towing coupling, the loader may only be towed rearwards.

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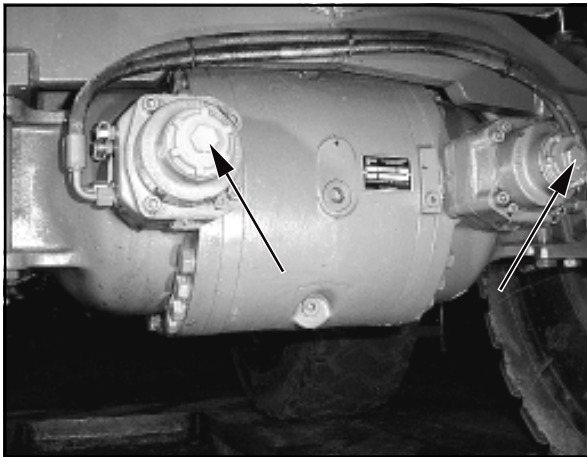


Figure 7-4

(15) Loosen the spring. To do this, loosen and remove the two caps (7-4/arrows).

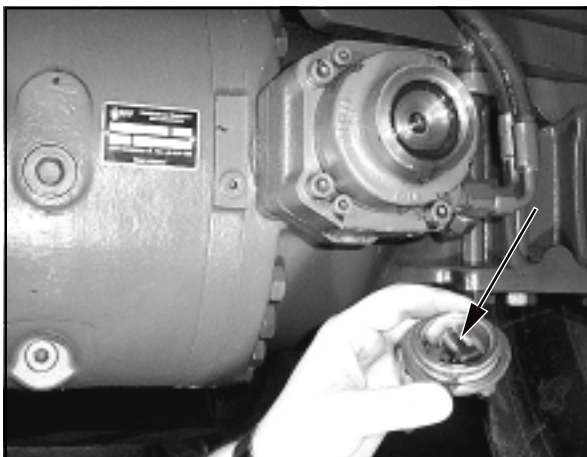


Figure 7-5

(16) Remove the quick-release hex screws (7-5/arrow) within the caps and screw them into the spring cylinder (7-6/arrow) until a definite stop can be felt. This tensions the spring package.

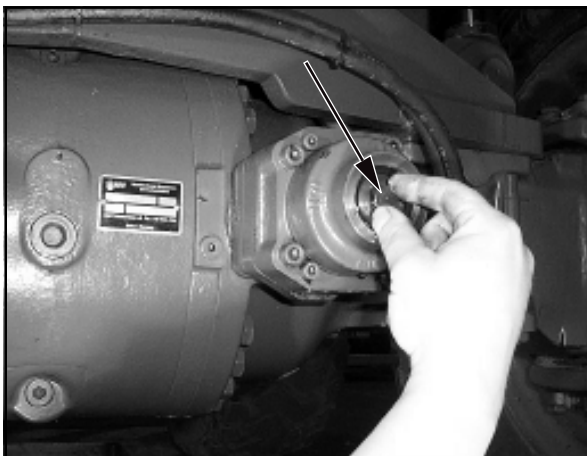


Figure 7-6

(17) Screw both caps on again and tighten manually.



NOTE

After towing is completed, unscrew the caps (7-4/arrows) again, remove the quick-release hex screws (7-6/arrow), insert them in the caps (7-5/arrow) and tighten the caps again by hand.

(18) Switch the hydrostatic drive motor to free oil flow before towing. For this purpose, screw in the setscrews at both high-pressure relief valves (7-7/arrows) of the drive pump until they are level with the hexagon nuts (size 13) loosened beforehand. Then tighten the hexagon nuts.



NOTE

After towing has been completed, loosen the hexagon nuts again. Screw the setscrews out of both high-pressure relief valves until they stop. Tighten the lock nuts.

(19) Remove the chocks.



DANGER

- More power is required to steer if the engine has failed.
- Tow the loader at walking speed (2 km/h).
- For a longer towing distance, the defective loader must be loaded onto a truck (for the lashing points, see 7-2/1 and 7-2/2 or 7-3/1 and 7-3/2).
 - The max. permissible load of the shunting and towing coupling (7-2/1) is 8.0 t horizontally in the longitudinal direction.
 - The max. permissible load of the rear shunting and towing coupling (7-3/1) is 12.0 t horizontally in the longitudinal direction.
 - The max. permissible load of the lashing points/loadbearing points (7-2/2 and 7-3/2) is 4.0 t at an assumed bracing angle of 45°.
- Pay attention to clearances under structures!

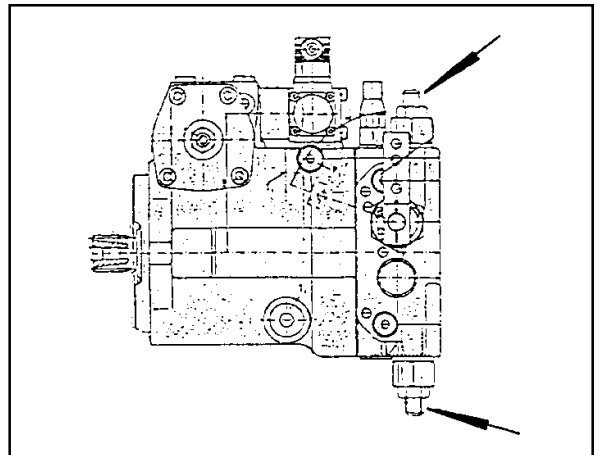


Figure 7-7

7.1.1.2 Towing the swivel shovel loader if the drive has failed

- (1) Actuate the toggle switch for the hazard flasher (4-5/2).
- (2) Apply the parking brake (4-11/4).



CAUTION

If the rescue location is on a slope, wheel chocks must be placed on the sloping side of both front axle wheels in addition to applying the parking brake.

- (3) Set the drive switch (4-11/6) to "0".



NOTE

The preparations described in steps (4), (5), (6) and (9) are only to be carried out if the rescue location is **not** on a public road:

(4) After the front-axle wheels have been straightened, switch the switching lever for the steering (4-10/4) to the „rear-axle steering“ position.

(5) Cover the bucket cutting edge and teeth with the bucket protector (5-4/arrow).

(6) Insert the plug of the bucket protector into the socket (5-5/arrow, option).

(7) Lift and mechanically prop up the bucket arm [e.g. by inserting the bucket arm support (option) (1-2/arrows)] and lower the bucket arm by activating the pilot valve for the working hydraulics (4-11/5) until the arm rests on the bucket arm support.

(8) Close the ball block valve for the working and auxiliary hydraulics (4-10/3).

(9) Block the swivel unit by inserting the blocking wedge (1-3/arrow) into the swivel block (1-4/arrow).

(10) Attach the tow rod to the loader to be towed [7-2/1 – forwards towing – or 7-3/1 – rearwards towing] and to the towing vehicle.



CAUTION

If the front of the loader does not have a shunting and towing coupling, the loader may only be towed rearwards.

(11) Switch the hydrostatic drive motor to free oil flow before towing. For this purpose, screw in the setscrews at both high-pressure relief valves (7-7/arrows) of the drive pump until they are level with the hexagon nuts (size 13) loosened beforehand. Then tighten the hexagon nuts.



NOTE

After towing has been completed, loosen the hexagon nuts again. Screw the setscrews out of both high-pressure relief valves until they stop. Tighten the lock nuts.

(12) Remove the chocks (if applicable).

(13) Release the parking brake (4-11/4).



NOTE

If the loader cannot be towed, remove both cardan shafts (8-29 to 8-32).



DANGER

- More power is required to steer if the engine has failed.
- Tow the loader at walking speed (2 km/h).



- For a longer towing distance, the defective loader must be loaded onto a truck (for the lashing points, see 7-2/1 and 7-2/2 or 7-3/1 and 7-3/2).
- The max. permissible load of the shunting and towing coupling (7-2/1) is 8.0 t horizontally in the longitudinal direction.
- The max. permissible load of the rear shunting and towing coupling (7-3/1) is 12.0 t horizontally in the longitudinal direction.
- The max. permissible load of the lashing points/load-bearing points (7-2/2 and 7-3/2) is 4.0 t at an assumed bracing angle of 45°.
- Pay attention to clearances under structures!

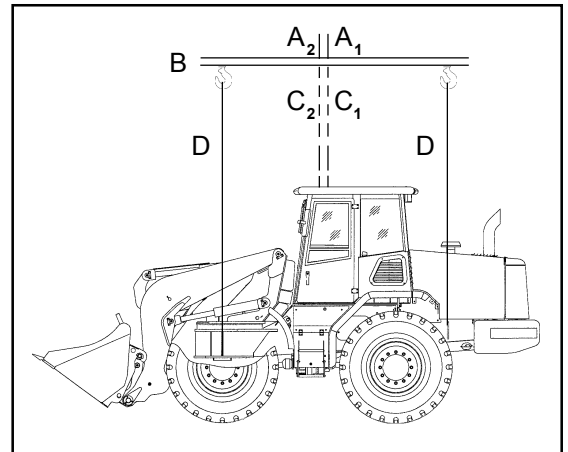


Figure 7-8

7.2 Lifting by crane

The loader to be lifted must be prepared as follows:

- (1) Apply the parking brake (4-11/4).
- (2) Set the drive switch (4-11/6) to "0".
- (3) Switch to gear stage „Alpha max.“ (4-11/7).
- (4) Lift or lower the bucket arm until the lowest point of the bucket arm or of the bucket is at least 30 cm above the road (5-4).
- (5) Close the ball block valve for the working and auxiliary hydraulics (4-10/3).
- (6) Block the swivel unit by inserting the blocking wedge into the swivel block (1-4/arrow).
- (7) Lock both doors.
- (8) Fold the outside mirror inwards.

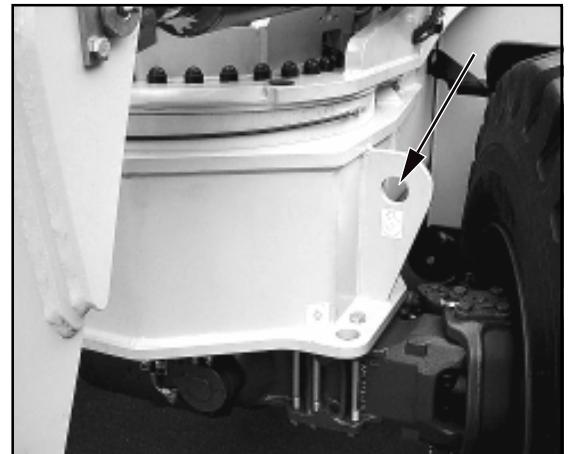


Figure 7-9



CAUTION

The following items must be observed when lifting the loader by crane (Figure 7-8):

- The lifting point (A_1 - loader without standard bucket or A_2 - loader with standard bucket) of the lifting device (B) must be precisely vertically over the centre of gravity (C_1 or C_2) of the loader so that the lifting device is **horizontally** above the longitudinal centre axis of the loader.
- The lifting gear (D) must lead vertically upwards from the lifting points to the left and right of the loader (7-9/arrow and 7-10/arrow).



Figure 7-10



DANGER

The lifting gear must have a lifting capacity of at least 7.0 t.

