

Amendment to Avanti Service Lift User's manual, Model Shark CE

This amendment replaces chapter 5 in the existing manual of the Avanti service lift, Model Shark installed with Tractel Greifzug BSO fall arrest device.

5. Daily inspection

If a safety device for fence doors is installed (see chapter 4.7 of the User's manual), every platform fence door must be closed to be able to drive the cabin.

5.1 Service lift

a) Before each operation, ensure that the traction hoist, the Fall arrest device and all auxiliary components (stoppers, wire guide wheels, etc.) are mounted in accordance with the specifications and without any noticeable defects.

b) Check lifting capacity: (see the rating plate or section 4.5.3) – the extra load (persons and materials!) must not exceed the maximum rated lifting capacity.

5.2 Operating area

a) Ensure that there are no obstacles within the service lift's operating area which may obstruct the travel of the cabin or cause the cabin to hit the ground.

b) Ensure that all relevant and required protection measures below the cabin are in place. Such measures could include pent roofs or barriers to protect the staff from falling objects.

5.3 Control function

a) Close the doors. Press the EMERGENCY STOP button. The lift should remain still when the UP/ DOWN button is pressed. To restart, turn the EMERGENCY STOP button clockwise. If a FIXED EMERGENCY STOP button is installed (Fig. 9) test as above.

b) Test the top limit stop switch: During upward travel, press the switch manually, and the service lift should stop immediately. Pressing the limit stop switch should enable the lift to travel down again.

c) Test the EMERGENCY top limit stop switch: During upward travel, press the switch manually, and the service lift should stop immediately. Neither upward nor downward travel should now be possible.

d) Bottom safety stop. Lower the lift; it should stop before the rubber feet of the cabin reach the tower ground level. When the "bypass switch" is activated, it should be possible to lower the lift all the way to the ground.

e) Door stop switch: Open the door - it should not be possible to move the lift upwards or downwards.

Sliding door service lift: Move the cabin at a height not corresponding to a platform - it should not be possible to open the door. The door will be only able to be opened

by pushing the emergency release red button from outside the cabin as well as using a M5 triangular key from inside the cabin.

f) If the optional AUTOMATIC function is installed. Set the HAND/AUTOM. selector to AUTOM. When holding the handle, the lift should remain still when the UP or DOWN buttons are activated.

g) If the Trapped-Key interlock system is installed. Turn the trapped-key switch to OFF - it should be not possible to move the lift upwards or downwards. See the Trapped-Key Interlock System Manual for further information.



Warning!

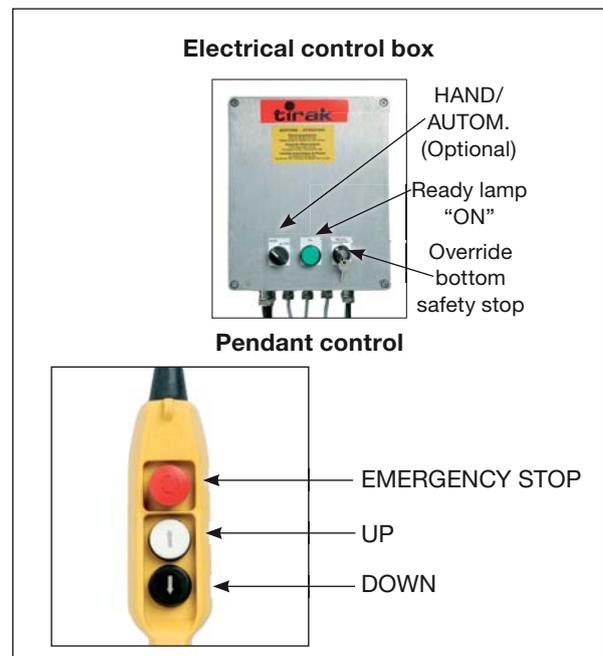
If any faults occur during work,
- stop working,
- if required secure the workplace and
- rectify the fault!



DANGER!

Make sure that nobody is exposed to danger below the service lift, for instance from falling parts. Suitable measures: Pent roof or barriers.

Fig. 13



5.4 Remote operation test

Perform this inspection only if the remote control function is installed.

- a) Set the electrical control box switch HAND/AUTOM to AUTOM (fig 7 a).
- b) On top of the remote operation receiver switch the device on (fig 7 b).
- c) Press the up arrow on the remote operation transmitter. The service lift should ascend.
- d) Press the down arrow on the remote operation transmitter. The service lift should descend.
- e) Once the test is complete, switch the remote operation function off.

5.5 BSO fall arrest device

During operation, regularly monitor the rotation of the centrifugal mechanism by looking through the window.

With a permanent marker, Mark the safety wire rope above the BSO such as the safety wire rope displacement can be measured once performed the over-speed test.

One of the following daily overspeed test is mandatory:

a) If the safety wire is installed with tensioning spring mounted on the safety wire beneath the landing floor as in figure 13c, the overspeed-test is executed according to 5.5.1.

b) If the safety wire is installed with counterweights and deflector rollers beneath the landing floor as in figure 13d, the overspeed-test is executed according to 5.5.2.

5.5.1. Installations with tensioning spring mounted on the safety wire beneath the landing floor (see figure 13c):



Figure 13c



This operation shall only be performed by personnel qualified for lift inspection or maintenance tasks.

Step 1 – Open the landing platform fence door, go inside the service lift cabin and move up the cabin lift between 0,2 mts – 0,3 mts above the landing platform by pressing the up button on the pendant control.

Step 2 – Go beneath the bottom landing floor platform. Uncoil the coiled safety wire end and fix the existing tensioning in the spring with 2 plastic cable ties. Then remove the two wire rope locks fixing the tensioned spring and slide down the spring by the safety wire.

Step 3 - Open the landing platform fence door and go inside the service lift cabin. Positioned on the cabin lift steps, open the lift cabin top hatch, and with a solid body position grab the hanging safety wire with a gloved hand, hold tight with arm angled so it's possible to perform a fast vertical hard jerk upwards – Then execute a fast hard jerk in upwards direction. One of the following cases will occur:

- The safety wire is arrested by the fall arrest device BSO during the fast hard jerk and the mark displacement is less or equal to 12 cm, the BSO is fulfilling its functioning and you continue directly to following step 4.
- The safety wire is not arrested by the fall arrest device BSO during the fast hard jerk or the safety wire is arrested but the mark displacement is more than 12 cm, the BSO is not fulfilling its function and it is necessary to Lock Out the installation immediately until an authorized technician approve the use of the installation again.

Step 4 – Engage the BSO manually by pressing the safety brake stop button and descend the cabin lift manually by pulling up the motor brake lever to check the lift is being held by the BSO and the safety wire.

Step 5 – Go down beneath the bottom landing platform and mount the tension spring again with the two wire rope locks and remove the plastic cable ties, so the tension spring is pulling in the safety wire. Check the coil of the safety wire is according to figure 13c again.

Step 6 – Re-establish the BSO by unlocking it, and drive cabin to the bottom landing floor – Be aware, it might be necessary to ascend the cabin a little in order to release the locked BSO.

5.5.2 Installations with counterweights and deflector rollers beneath the landing floor (see figure 13d):

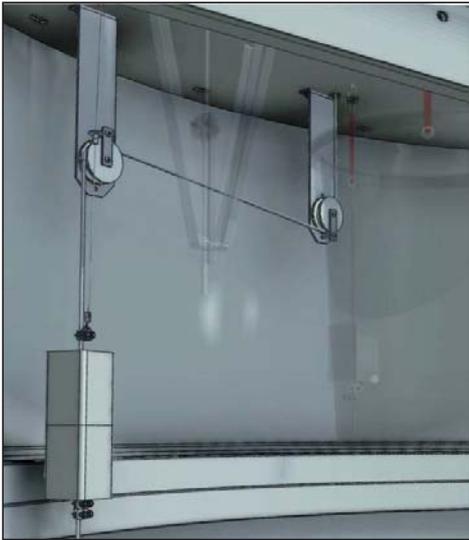


Figure 13d

The overspeed test must be performed by 2 technicians.

Step 1 - (Technician 1)

1.1 - Opens the landing platform fence door and goes inside the service lift cabin.

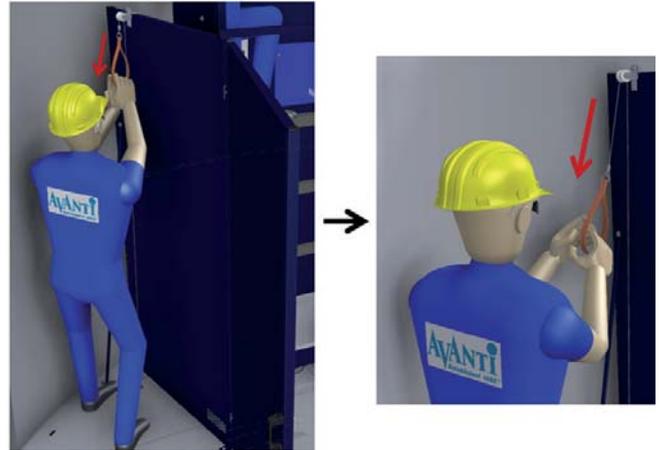
1.2 - Positioned on the cabin lift steps, opens the lift cabin top hatch and stands in a position that allows grabbing the safety wire rope with one or both hands.



Step 2 - (Technician 2)

2.1 Stands on the fence side where the handle is installed.

2.2 Lifts the counterweights up to release the tension on the safety wire rope by pulling downwards the handle which is attached on the fence side.



2.3 Holds on the handle while technician 1 performs the BSO pull test.

Step 3 - While technician 2 is holding on the counterweights up, technician 1 grips the safety wire rope by hand and performs a fast and hard pull upwards on the safety wire rope.



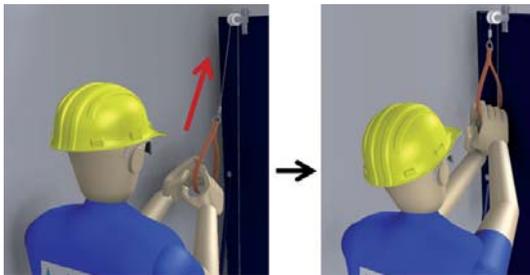
One of the following cases will occur:

- The safety wire is arrested by the fall arrest device BSO during the fast hard jerk and the mark displacement is less or equal to 12 cm, the BSO is fulfilling its functioning and you continue directly to following step 4.
- The BSO doesn't arrest or the safety wire is arrested but the mark displacement is more than 12 cm, it's necessary to Lock Out the installation immediately until an authorized technician approve the use of the installation again!

Step 4 - (Technician 1) - Manually opens the fall arrest device BSO by pressing the fall arrest device lever down until the device disengages.



Step 5 - (Technician 2) - Releases slowly the handle until the counterweights reach its operational position so that the safety wire rope gets tension again.



ATTENTION!

- ! After releasing the handle, user **must** check that:
 - The counterweights apply tension on the safety wire rope.
 - There is no slack wire on top of the BSO at any time.

Step 6 - (Technician 1) - Moves up the cabin lift 0,5 mts above the landing platform by pressing the up button on the pendant control.

Step 7 - (Technician 1) - Engages the BSO manually by pressing the safety brake stop button.

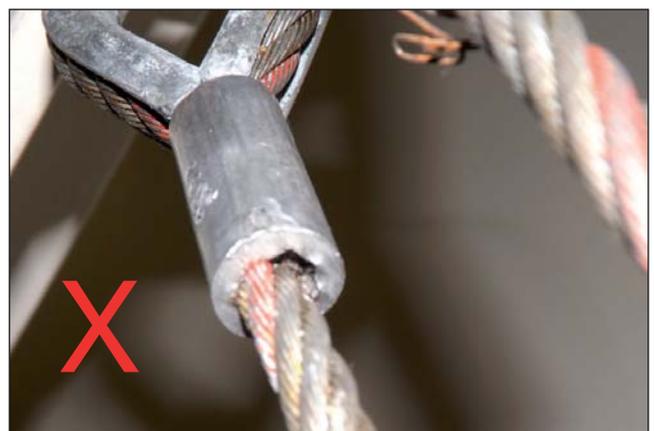
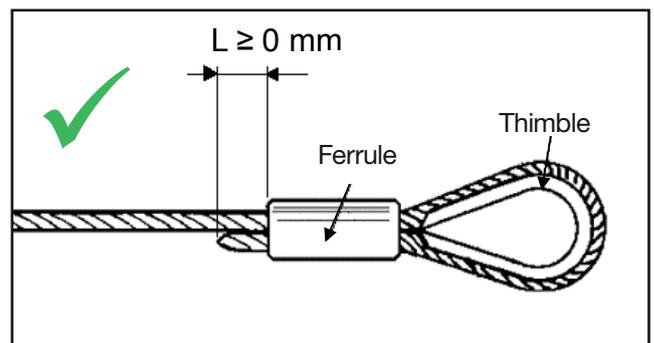
Step 8 - (Technician 1) - Descends the cabin lift manually by pulling up the motor brake lever to check the lift is being held by the BSO and the safety wire.

One of the following cases will occur:

- The lift is held by the BSO. Move up the cabin lift a few centimeters by pressing the up button of the pendant control, manually open the fall arrest device BSO by pressing the fall arrest device lever down until the device disengages and descend the cabin lift by pressing the down button of the pendant control until the bottom platform.
- The lift is not held by the BSO. Descend the lift to the landing platform and Lock Out the installation immediately until an authorized technician approves the use of the installation again.

5.6 Wire ropes

- a) Follow the 3 steps below to check that the traction and safety wire ropes are not tangled with tower internals.
 - a.1) Open the top hatch and look upwards in search of any unusual trajectory deviation of the traction and safety wire ropes.
 - a.2) Close the top hatch and ascend with the service lift to the following platform.
 - a.3) Repeat steps a.1) and a.2) until the complete length of the wire ropes is inspected.
 - a.4) If any wire rope is found tangled, climb up the ladder and untangle the wire rope by hand. Then, inform AVANTI.
- b) During operation, check that the traction and safety wire ropes pass freely through the traction hoist and the fall arrest device.
- c) Once the lift is at the top platform, inspect the top tower beam and the wire rope attachments.
- d) Check that the length (L) between the top end of each wire rope and its ferrule is equal to or more than 0 mm.



5.7 Wire ropes after an unusual event



After any unusual event (such as a tower jerk due to the wind turbine going into emergency mode) check that the traction and safety wire ropes have not got tangled with tower internals.

5.7.1 At the bottom platform

If the service lift is placed at the bottom platform when the unusual event occurs, follow the steps below.

- a.1) Open the top hatch and look upwards in search of any unusual trajectory deviation of the traction and safety wire ropes.
 - a.2) Close the top hatch and ascend with the service lift to the following platform.
 - a.3) Repeat steps a.1) and a.2) until the complete length of the wire ropes is inspected.
 - a.4) If any wire rope is found tangled, climb up the ladder and untangle the wire rope by hand. Then, inform AVANTI.
- b) Check that the length (L) between the top end of each wire rope and its ferrule is equal to or more than 0 mm.

5.7.2 At the top platform

If the service lift is at the top platform when the unusual event occurs, follow the steps below.

- a) From the platform look downwards through the platform hole in search of any unusual trajectory deviation of the traction and the safety wire ropes.
- b) Enter the lift and descend to the following platform.
- c) Exit the lift and repeat steps a) and b) until the complete length of the wire ropes is inspected.
- e) If any wire rope is found tangled, climb down the ladder and untangle the wire rope by hand. Then, contact AVANTI.