

Original



AVANTI
Established 1885

Traction Hoist and Fall Arrest Device Manual

Model M508+ASL508 (600KG)

CE

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CERTIFICATE

for a Test of Conformity

Number of registration: 0249C/16

The certification body for machinery
at TÜV Rheinland Industrie Service GmbH
herewith confirms for the company

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Rønnevangs Allé 6
DK- 3400 Hillerød
Denmark

the close conformity of the product

Traction hoist
for devices for the lifting of persons

Type: M508

Technical data

- Rated load:	500 kg	600 kg
- Rated speed of the wire:	18 m/min (50 Hz)	or 21 m/min (60 Hz)
- Wire diameter:	8,4 mm	
- Specification of the wire:	min. break resistance 55 kN 5x19, galvanised	min. break resistance 59 kN 5x19, galvanised
- Power:	1,5 kW	2 kW
- Rated current:	400 V / 690 V	
- Unit weight:	50 kg	55 kg

Examination place: Avanti Wind Systems SL, La Muela, Spain

Modification C to the certificate 0249B/13 from 2013-10-21: - Added the 60 Hz version


with the requirements according to annex I of Directive 2006/42/EC about machinery and amending the Directive 95/16/EC of the European Parliament and the Council from May 2006 for adaptation of legal and administration regulations of the member countries regarding safety of machinery.

The verification was proved by EC-type approval test, Test-Report- No.: 16_022-1 from 2016-03-07 and is valid only duly considering the requirements mentioned in this document.

This certificate is valid until 2021-03-11

Cologne, 2016-03-11

Certification body for machinery
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Denmark

the close conformity of the product

Fall arrest device
for devices for the lifting of persons

Type: ASL 508

Technical data

- Rated load:	500 kg	600 kg
- Triggering speed:	30 m/min	
- Wire diameter:	8,4 mm	
- Rated speed of the wire:	18 m/min (50 Hz) or 21 m/min (60 Hz)	
- Specification of the wire:	min. break resistance 55 kN 5x19, galvanised	min. break resistance 59 kN 5x19, galvanised
- Unit weight:	7 kg	7 kg

Manufacturing facility: Avanti Wind Systems SL, La Muela, Spain

Examination place: Avanti Wind Systems GmbH, Elmshorn, Germany

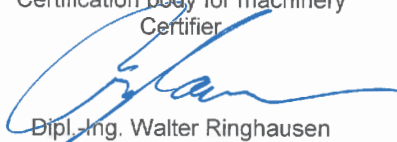
Modification C to the certificate 0252B/13 from 2013-10-21: - Application of the standard EN 1808:2015-04

with the requirements according to annex I of Directive 2006/42/EC about machinery and amending the Directive 95/16/EC of the European Parliament and the Council from May 2006 for adaptation of legal and administration regulations of the member countries regarding safety of machinery.

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This certificate is valid until 2021-04-25

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1. Limited Warranty

Avanti Wind Systems GmbH warrants that commencing from the date of shipment to the Customer and continuing for a period of the longer of 365 days thereafter, or the period set forth in the standard Avanti warranty, the Avanti M508 or ASL508 (“Product”) described in this Manual will be free from defects in material and workmanship under normal use and service when installed and operated in accordance with the provisions of this Manual.

This warranty is made only to the original user of the Product. The sole and exclusive remedy and the entire liability of Avanti under this limited warranty, shall be, at the option of Avanti, a replacement of the Product (including incidental and freight charges paid by the Customer) with a similar new or reconditioned Product of equivalent value, or a refund of the purchase price if the Product is returned to Avanti, freight and insurance prepaid. The obligations of Avanti are expressly conditioned upon return of the Product in strict accordance with the return procedures of Avanti.

This warranty does not apply if the Product (i) has been altered without the authorization of Avanti or its authorized representative; (ii) has not been installed, operated, repaired, or maintained in accordance with this Manual or other instructions from Avanti; (iii) has been subjected to abuse, neglect, casualty, or negligence; (iv) has been furnished by Avanti to Customer without charge; or (v) has been sold on an “AS-IS” basis.

Except as specifically set forth in this Limited Warranty,

ALL EXPRESS OR IMPLIED CONDITIONS, REPRESENTATIONS AND WARRANTIES, INCLUDING, BUT NOT LIMITED TO, ANY IMPLIED WARRANTY OR CONDITION OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE, NON-INFRINGEMENT, SATISFACTORY QUALITY, COURSE OF DEALING, LAW, USAGE OR TRADE PRACTICE ARE HEREBY EXCLUDED TO THE MAXIMUM EXTENT PERMITTED BY APPLICABLE LAW AND ARE EXPRESSLY DISCLAIMED BY AVANTI. IF, PURSUANT TO ANY APPLICABLE LAW, TO THE EXTENT AN IMPLIED WARRANTY CANNOT BE EXCLUDED AS PROVIDED IN THIS LIMITED WARRANTY, ANY IMPLIED WARRANTY IS LIMITED IN TIME TO THE SAME DURATION AS THE EXPRESS WARRANTY PERIOD SET FORTH ABOVE. BECAUSE SOME STATES DO NOT PERMIT LIMITATIONS ON THE DURATION OF IMPLIED WARRANTIES, THIS MAY NOT APPLY TO A GIVEN CUSTOMER. THIS LIMITED WARRANTY GIVES CUSTOMER SPECIFIC LEGAL RIGHTS, AND CUSTOMER MAY HAVE OTHER LEGAL RIGHTS UNDER APPLICABLE LAWS.

This disclaimer shall apply even if the express warranty fails of its essential purpose.

In any cases of dispute the English original shall be taken as authoritative.

2. Introduction

Only trained people may use this lift.

This manual must be available to staff at all times during installation, maintenance and operation. Additional copies are available from the manufacturer upon request.

This manual, including, but not limited to, measurements, procedures, components, descriptions, instructions, recommendations and requirements, is subject to change without prior notice. Please check Avanti website/manuals for the latest revisions of the manuals.

Any additional cost related to or arising from any changes in the manuals does not entitle Customer to any form of compensation or other legal remedies.



The pictures and sketches in this manual may not reflect the product aesthetics, colours, arrangement precisely. This has no impact on the function or safety.

2.1 Symbols

Symbol	Signal word	Meaning	Possible injury if not observed
--------	-------------	---------	---------------------------------

Safety instructions



DANGER!

IMMEDIATE or possibly imminent danger:

Death or severe injury!



DANGER!

IMMEDIATE or possibly imminent danger of hazardous voltage:

Death or severe injury!



CAUTION!

Potentially hazardous situation:

Light injury or material damage.

Additional instructions



ATTENTION!

Potentially dangerous situation:

Damage to equipment or workplace



IMPORTANT!

Useful tips for optimum working procedure

None



Reference to written specification/documentation

2.2 Terms and definitions

Terms	Definitions
Certified technician	Person who has gone through the relevant training associated with the scheduled task from Avanti or from a certified trainer and is in possession of a valid (non expired) certificate for the task.
User	Person who has gone through the relevant training associated with the Avanti service lift use and daily inspection and is in possession of a valid (non expired) certificate for the task.

3. Cautions



CAUTION!

Avoid injury – follow all instructions!

a) Avanti M508 hoist or Avanti ASL508 fall arrest device **are designed exclusively for installation in Avanti Service lift.**

For the AVANTI Service Lift, which is included in the appendix IV No. 17 of the MD 2006/42/EC, it is recommended to pass the procedure to show conformity related to article 12, passage 3 and 4 of the MD 2006/42/EC.

b) Installation and/or maintenance and/or operation of the traction hoist may be performed only by certified technicians, hired by the employer for the job at hand.

c) The personnel must be at least 18 years of age. The staff must be familiar with the relevant accident prevention instructions and must have received proper training in these.

d) Personnel is obliged to read and understand this Manual.

e) A copy of the Manual must be handed out to the personnel and must always be available for reference.

f) If more than one person is entrusted with one of the above tasks, the employer shall appoint a supervisor in charge of the operation.



WARNING!

g) Only fault-free suspension devices, M508, ASL508, original suspension and secondary wires shall be used.

h) The electrical connection of the hoist must be made in accordance with EN60204-32.

The power supply must be protected by a fuse and an earth leak circuit breaker (30mA).

i) Prior to mounting, all parts must be tested to ensure their completeness and full functionality.

j) The hoist **MUST NOT** be overloaded.

k) Only certified ropes approved by the manufacturer can be used. Ropes shall be greased regularly with standard multipurpose grease. Do not use bisulphide-containing lubricants like Molycote®.

l) All tests/repairs of electrical installations may be only performed by certified technicians.

m) All repairs to the M508, ASL508 and the system's supporting parts may be performed only by certified technicians.

n) Use of non-original parts, in particular use of wires other than the prescribed original traction hoist wire will render the manufacturer's warranty void and the CE approval invalid.

o) No warranty is provided against damage resulting from reconstruction or modification of equipment or use of non-original parts which are not approved by the manufacturer.

p) The traction hoist and Fall Arrest Device must be overhauled at an authorised workshop and furnished with a new certificate for every 250 hours of operation.

q) Check correct phase lay after first installation and after each work at control box and/or power supply.

r) When integrating the traction hoist into a service lift, the higher speed of the 60Hz version shall be considered in the design of the obstruction devices and of the service lift's acceleration and deceleration systems.

s) The service lift shall not be used in case of fire in the tower.

4. Description of equipment

4.1 Purpose

Avanti M508 hoists are electric hoists designed and constructed to be used exclusively on Avanti Service Lifts. M508 and ASL508 are to be used only with wire ropes approved by Avanti. The reliability, endurance and safety of the system is only possible with the use of approved wire ropes.

4.2 Function

Avanti M508 hoists and ASL508 Fall Arrest Device are installed on Avanti Service Lifts. Its function is to power the service lift up and down along the wire rope.

The hoist control is linked to the ASL508. Please refer to the ASL508 devices chapter for further details.

4.3 Temperature

The range of temperature use of Avanti M508 or Avanti ASL508 safety brake is described below:

Standard:

Operating temperature
-15°C - +60°C

Low temperature kit:

Operational temperature
-25°C - +40°C

4.4. Components

4.4.1 Overview

Fig.1 Avanti M508

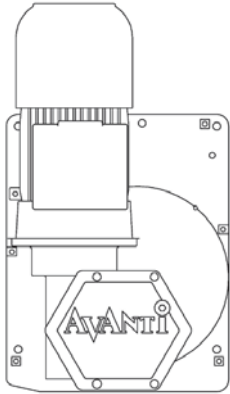


Fig. 2 Avanti ASL508

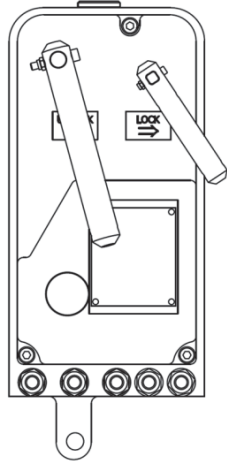
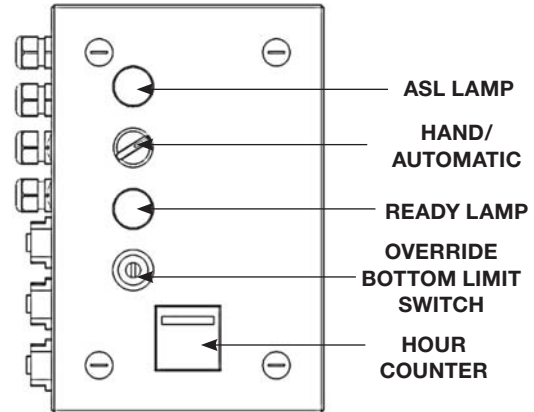


Fig. 3 Control Box



4.4.2 Technical specifications

Table 1. Traction hoist

Hoist	Rated load	Rated speed	Power	Rated current	Suspension wire Ø	Unit weight approx.	Measures/dimensions			
							a	b	c	d
Traction hoist type	Kg	m/min	kW	A	mm	Kg	mm	mm	mm	mm
M508 400V 50Hz CE	600	18	2	4.4	8.4	55	266	300	61	10.5
M508 690V 50Hz CE	600	18	2	2.6	8.4	55	266	300	61	10.5
M508 400V 60Hz CE	600	21	2.4	5.3	8.4	55	266	300	61	10.5
M508 690V 60Hz CE	600	21	2.4	3.1	8.4	55	266	300	61	10.5

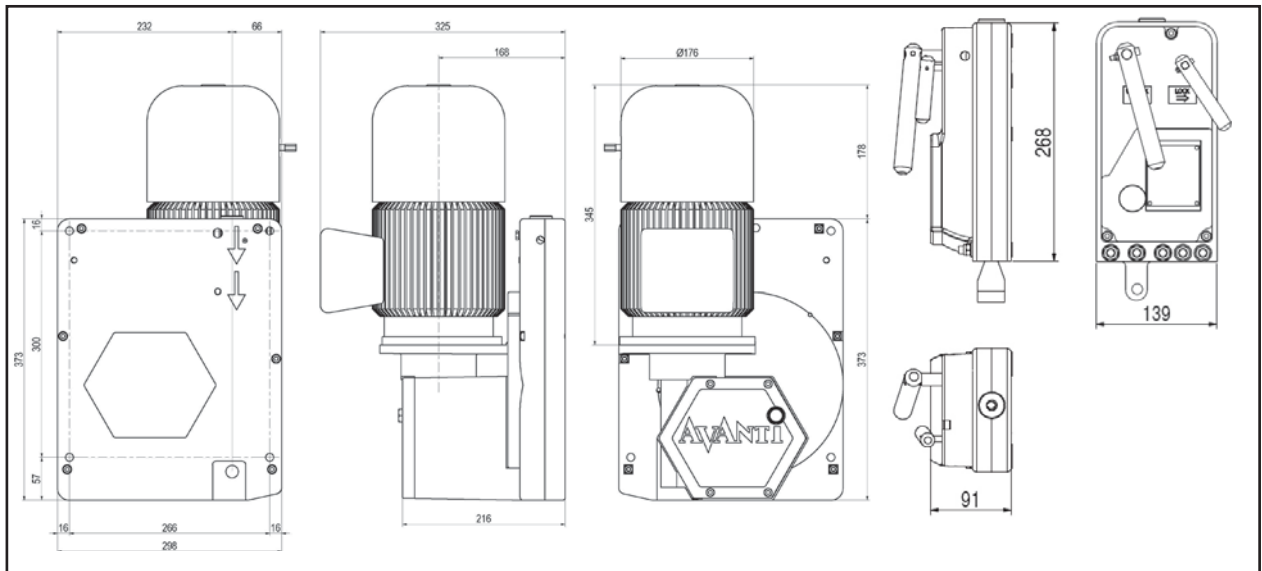
Table 2. Fall Arrest Service

Fall arrest device	Rated load	Triggering speed	Secondary wire Ø	Unit weight Approx.	Measures/dimensions		
					a	b	c
Fall arrest device	kg	m/min	mm	kg	mm	mm	mm
ASL 508 CE/UL	600	30	8.4	7	250	141	89

Table 3. Drive wire, safety wire

Wire type	Wire diameter	Surface treatment	Mark/feature	Min. break resistance	Attached with	Anchoring	Tighten to
M508 / ASL508 CE/UL	8.4 mm, 5x19	galvanised	no	59 kN	2 t shackle, Form C	-	-

Fig.4



4.4.3 Safety devices

4.4.3.1 Service Brake

The hoist integrates an electromagnetic spring-loaded brake engaging automatically

- On releasing the UP / DOWN control buttons and
- following a power failure.

4.4.3.2 Emergency stop

When the red EMERGENCY STOP switch is pushed in an emergency, all control is interrupted. After remedying the fault, control is reactivated by turning the switch clockwise, until it pops out again.

4.4.3.3 Mechanical overload detection device

The overload detection device is built into the wire traction system and will prevent upward travel in the event of an overload. A warning signal (buzzer) is triggered which will stop only when the cause of the overload has been removed.

Possible reasons for activation of the limiter:

- The service lift is overloaded
- The service lift encounters an obstacle during upward travel.

Operator intervention:

- Reduce the load to below the overload limit
- lower the lift until it is free of the obstacle and remove the obstacle before using the lift again.

4.4.3.4 No power-descent

The M508 is delivered with a lever allowing manual release of the electromagnetic motor brake. Once the motor brake is released, the motor speed is controlled by a centrifugal brake installed between the motor shaft and the gear box.

4.4.3.5 Fall arrest device ASL508

Service lift must be equipped with an ASL508 which will prevent the load from falling.

The overspeed fall arrest device ASL508 can be opened manually as shown in Fig.5.

The speed of the safety wire passing through the device is continuously monitored, and the jaws automatically close in the event of sudden excessive speed. This protects the lift from:

- a) Lifting wire breaks and
- b) Hoist failures

Unlocking lever turns clockwise to open. Locking emergency stop lever turns counterclockwise to lock.

The fall arrest device can also be engaged manually in emergency by turning counterclockwise the Locking emergency stop lever. For information on required intervention when the safety gripping device engages, see section 6.

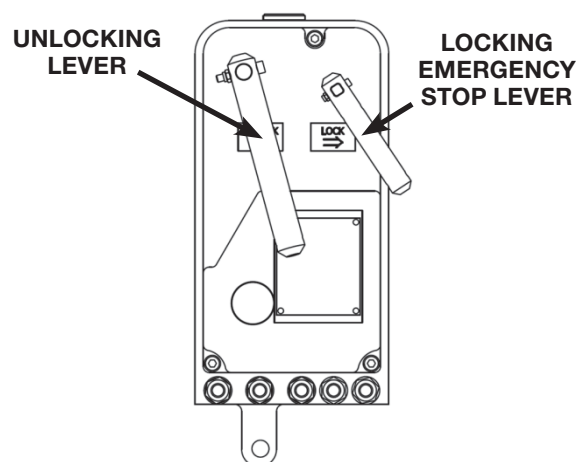
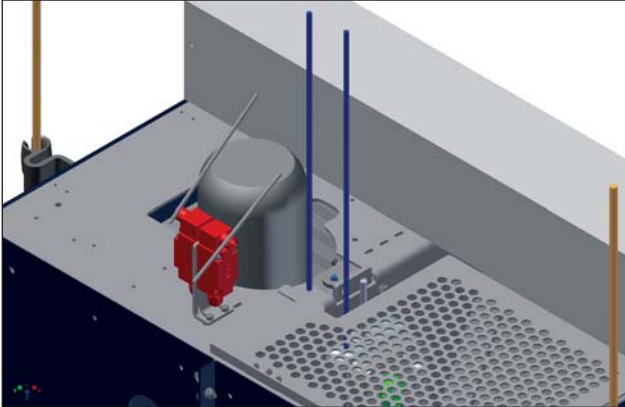


Fig.5

4.4.3.6 Top limit stop switch

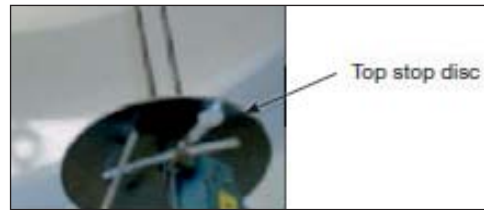
At the top of the cabin a top limit stop switch will stop upward travel when activated (Fig 6).

Fig.6



Downward travel will still be possible. A top stop disc activating the top stop switch is installed below the lifting wire attachment (Fig. 7)

Fig.7



ATTENTION!

When the top limit stop switch is engaged, activate the DOWN switch until the top limit stop switch is released.

4.4.4 Other risks (hazards)



CAUTION!

The following risks relating to the traction hoist and fall arrest device have not been specifically determined for the construction in question:

The safety function of the ASL508 will only work if the secondary wire between the wire attachment and the fall arrest device is tight (no loose wires!).

Therefore, any loose secondary wire must be coiled with minimum 3 wire strips approx. 20 cm below the access platform.

The hoist is always delivered with its overload detaching device setup to the maximum working load.

5. Operation

5.1 Stop / Emergency Stop

All the safety switches must be installed to be able to perform this.

- a) Release the Up or Down button; the service lift should stop.

If it does not stop:

- b) Push the EMERGENCY STOP switch, and all controls should be disabled.

5.2 Normal operation

All the safety switches must be installed to be able to perform this test.

- a) Turn the red EMERGENCY STOP switch on the control box clockwise and the switch should pop out. Do likewise with any other EMERGENCY STOP.

- b) To go up or down, push and hold Up or Down button.

- c) To place the service lift on the floor after the bottom safety stop has stopped the lift.

-Turn the override bottom safety stop switch (Fig. 3) clockwise and hold.

- Press the DOWN button until the service lift rests on the floor, then release.



CAUTION!

Locking Emergency Stop lever must not be used to stop the lift in normal operation as it may get damaged.

5.3 Automatic

Only in hoists with the AUTOMATIC function installed.

- a) Press the EMERGENCY stop button on the control box. Turn the HAND/AUTOM. switch on the power cabinet to activate automatic operation.
- b) Close door.
- c) Press the UP or DOWN button respectively and the cabin starts ascending/descending.
- d) Return the HAND/AUTOM button to HAND.

5.4 Overload detection device

- a) In case of an overload, the hoist's upward travel must be blocked, and a buzzer must sound in the connection cabinet.



WARNING!

Attempting to go up in an overloaded lift is prohibited!

- b) Remove enough of the load to make the buzzer stop and enable upward travel.



WARNING!

On entering and starting the lift, the buzzer may sound briefly. This is due to temporary load peaks occurring as the lift takes off.

The control box is designed not to activate the buzzer or stop the lift because of peak loads caused by the cabin swinging.

If the problem persists have an AVANTI expert adjust the overload limiter (See "Regulation of overload detection device" Appendix).

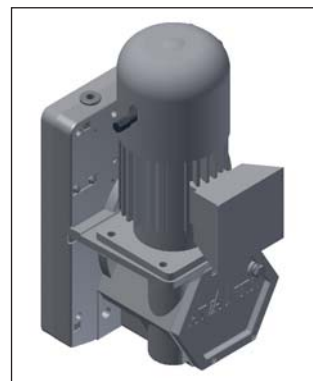
5.5 Manual Operation – No power descent

If a power failure or an operation fault etc. interrupts the hoist, a manual No power descent is possible.

- a) The lever is permanently installed inside the brake lever hole in front of the traction hoist (Fig.8).
- b) Pull the lever upwards. The service lift moves downwards. The built-in centrifugal brake limits the pace of descent.
- c) To stop, simply loosen the lever.

This procedure shall only be used for no power situations.

Fig.8



6. What to do if the ASL508 engages

If the fall arrest device engages simply disengage by turning the Unlocking lever clockwise (Fig. 5) until it clicks. However, this is not possible if the secondary wire is under tension - if so, see below.



WARNING!

In the event of suspension wire breaks or hoist fails, evacuate personnel from the service lift.

The secondary wire suspension and the attachment between the fall arrest device and the service lift are exposed to dynamic loads when a fall is blocked.

If the Fall arrest device has locked and the service lift is hanging on the secondary wire, ascending is blocked. Do as follows:

- a) Remove the load on the secondary wire by taking the service lift upwards a few centimetres by pushing the UP button.
 - In the event of a power failure, evacuate the lift

- b) Manually open the Fall arrest device by turning the unlocking lever clockwise (Fig. 5) until it disengages.

On ground level perform test as specified in 7.6 Inspection before initial use.



ATTENTION!

When the service lift has returned to ground level, test the fall arrest device function as specified in section 7.6 before resuming normal operation.



CAUTION!

If an ASL508 has engaged caused by a failure for a M508 or a breakage of the suspension wire rope, the ASL508 has to be replaced and the instructions in 7.6 have to be followed.

Remove any defective fall arrest device and return them for repair to AVANTI.

7. Installation in Avanti service lift

7.1 Electrical connections

7.1.1 Power supply



DANGER!

The electrical connection of the traction hoist must be made in accordance with EN 60204-32 and any local regulations.

The power supply must be protected by a fuse and an earth leak circuit breaker (30mA). Disconnect the main power supply before handling power units.

Verify that the rated grid and motor voltages are identical. The three-phase motor is normally supplied in a star connection configuration:

Necessary equipment to comply with EN60204-32, can be supplied by Avanti as an option.

7.1.2 Supply cable



Fig.9

a) Use all the time the power supply cable delivered with the lift. For further information see the lift manual.

b) An installed generator will have to provide at least 2.5 times the output of the traction hoist.

7.1.3 Power connection



IMPORTANT!

Check correct phase lay after first installation.

a) Push the EMERGENCY STOP button

b) Check that the various stop switch cables and fall arrest device cable are connected to the power cabinet according to colour code.

c) Connect the socket to the lift plug.

d) Connect the power cable plug to the grid: 400V / 3Ph + 0 + gnd. / 50 Hz
690V / 3Ph + gnd. / 50 Hz
Pre-fuse: 16 A.

e) Turn the EMERGENCY STOP button clockwise to deactivate.

f) The power is turned on and the green indicator on the electrical control box lit. In order for the hoist to be operational the door switch must be locked and the HAND/AUTOM switch must be in HAND mode.

The wiring diagram is found in the electrical control box.

7.2 Installation of suspension and secondary wire



CAUTION!

Wear protective gloves when handling wires.

7.2.1 Suspension wire installation

- Feed approx. 40cm of the wire into the traction hoist's wire inlet opening in the top. Make sure that the wire end is in a good condition.
- Push the UP button on the control box and feed wire through until the traction hoist starts pulling. To do so no large force is recommended. Ensure that the wire can exit without obstruction!

7.2.2 Secondary wire installation

- Open the fall arrest device by pushing the unlocking lever clockwise until it engages/clicks (Fig. 5).
- Feed the secondary wire through the fall arrest device from above and pull taught by hand.

7.3 Securing the suspension and secondary wire

The suspension wire shall be fastened on the bottom to a 11 Kg counterweight and remaining wire coiled in such way allowing free rotation of the wire. The secondary wire shall be fastened on the bottom with a counterweight or other system which will produce a tension force of 400 N approximately.



IMPORTANT!

Before fastening the secondary wire carry out the fall arrest device test (See section 7.7).

7.4 Fixing M508 hoist to the service lift

The traction hoist is fixed to the service lift structure by means of four M10 bolts.

The supporting structure shall be designed to comply with structural requirements as described in EN 1808 and any local legislation.

Special attention must be paid to ensure that entry and exit of wire rope is straight to avoid any damage or wearing of the traction hoist or the wire rope

7.5 Fixing ASL508 to the service lift

The fall arrest device is fixed to the service lift structure by means of one M12 bolt Class 8.8 hot dip galvanized.

The supporting structure shall be designed to comply with structural requirements as described in EN 1808.

Special attention must be paid to ensure that entry and exit of wire rope is straight to avoid any damage or wearing of the traction hoist or the wire rope

Inspection

M508 and ASL508 have been tested static and dynamic according to EN 1808.

7.6 Inspection before initial use



IMPORTANT!

Check correct phase lay after first installation and after each work at control box and/or power supply.

7.6.1 Control function

A certified technician must:

- Inspect the hoist as specified in section 7.6.2
- Carry out a test run with the maximum rated load.
- Check all the control and safety switches and check that they perform their function:
 - Emergency stop: completely stop cabin and cut off power
 - UP button: lift travels up
 - DOWN button: lift travels down
 - Top limit emergency travel switch: completely stop cabin and cut off power until released
 - End of travel top switch: stop cabin and prevents movement up (allow moving down)
 - ASL switch: prevents lift from moving down
- Check any other accessory switch from the lift connected to the traction hoist control according to the lift manual
- Overload test. Load the hoist to 125% of its lifting capacity (WLL = 600 Kg, Test load = 750 Kg). When an attempt is made to start the hoist, the hoist should stop, and the buzzer in the connection cabinet should sound. – If not, see: “Regulation of overload detection device” Appendix.



7.6.2 AVANTI M508 Hoist

Before start of tests make sure that nobody below the lift or who surrounds the lift is exposed to danger.

- Test correct anchoring of hoist and fall arrest device to the service lift.
- Test all the control and safety switches as specified on 7.6.1 c)
- Check whether mechanical damages are visible

7.6.3 AVANTI ASL508 Fall arrest device



IMPORTANT!

Before testing, the tightening device beneath the access platform must be removed. Remember to secure it again after testing!



DANGER!

If the fall arrest device is engaged, it must not be possible to pull the secondary wire upwards! (Fig.10)

- Engage the ASL508 by pulling the Locking lever.

Powered travel down should not be possible. Lower the lift with no power descent until load is hanging on ASL508. Powered travel up should be possible.

- Disengage the fall arrest device by turning the unlocking lever clockwise – the lever must engage. Pull up the secondary wire with a quick jerk – the fall arrest device should now engage automatically.

If any of these tests fail change the device and return it to the supplier for testing.



The results from this test must be recorded in writing and saved for later reference in the appropriate Inspection Appendix.

7.6.4 Wires and cables

- During operation: Check the suspension and secondary wires for free passage through hoist and fall arrest device.
- At the top end of travel, check the wire attachments and the suspension means.
- Check that all the electrical cables are properly attached and not damaged

7.6.5 Automatic operation test

Perform this inspection only if the AUTOMATIC function is installed. All the safety switches must be installed to be able to perform this test. Refer to the lift manual for daily inspection procedure.

7.7 Daily inspection by the supervisor

Before every operation ensure that no component has visible damages and are mounted according to specifications.

Check the instructions, labels and rating plate in order to be sure that maximum capacity is not exceeded.

- ! Check each day the functionality of the emergency buttons by pressing the buttons each day. If pressed "green light" should be dark and no electric driven movement of the M508 should be possible.

- Inspect M508 hoist according to 7.6.2
- Engage the ASL508 by turning the locking lever. Reopen the ASL508 by turning the unlocking lever clockwise – the lever must engage.
- Check control function as described on 7.6.1 c)
- Check wires and cables as described on 7.6.4

ATTENTION!

- ! If any defects occur during work,
 - Stop working
 - If required secure the workplace and rectify the fault the defect (see section 8)



8. Repair in the event of breakdown









DANGER!

Avoid serious injuries:

1. All tests and repairs to the electronic components should be performed by a certified technician only! The power chart is placed in the traction hoist's power cabinet.
2. Repairs to the traction hoist, the fall arrest device and to the system's supporting components should be performed by **certified technicians only!**

Breakdown	Cause	Solution
<p>The service lift will neither go up nor down!</p> 	 DANGER! <i>Attempting to use the lift will jeopardize work safety</i>	
	A1 The fixed EMERGENCY STOP button has been activated.	Deactivate the button in question by turning it clockwise until it pops out.
	A2 Wire loop on traction hoist. Damaged or defective wire or wire outlet causes problems.	Stop work immediately! Ask the supplier or manufacturer for help.
	A3 The safety brake aligning device is holding the service lift on the safety wire. a) Lift wire breakage b) Hoist failure	a) + b) Evacuate the service lift and follow the directions in section 9
	A4 The service lift is stuck on an obstacle.	Carefully remove the obstacle. Test the operational safety of affected building sections. Inform the supervisor.
	A5 Power failure a) Control not switched on or deactivated b) Grid voltage interrupted c) Supply between grid connection and control interrupted	a) Turn EMERGENCY STOP switch clockwise until it is released b) Find the cause and wait for the power to return c) Test and if necessary repair the supply cable, guide wires, fuses, and/or wiring from the control box
	A6 Limit stop switch functions a) EMERGENCY limit stop switch was pressed. b) Door limit stop switch blocks or is defective.	a) Manually take the lift down until the limit stop switch is released. b) Close the doors and test the limit stop switch.
	A7 Protection switch on overheating a) A phase is missing b) Motor is not cooling c) Voltage too high/low	a) Test/repair fuses, supply and connection. b) Clean the hood. c) Measure voltage and power consumption on the loaded motor. If voltage deviates from specifications, use cable with increased dimensions.
	A8 Brake does not open (no click on on/off) a) Supply, braking coil or rectifier defective. b) Braking rotor closes.	a) Have an electrician test, repair/replace the supply, braking coil and rectifier. b) Return traction hoist for repair.

Breakdown	Cause	Solution
The service lift will neither go up nor down	A9 The HAND/AUTOM. switch is on AUTOM.	Turn the HAND/AUTOM. switch back to HAND.
Service lift goes down but not up 	 DANGER! <i>Irresponsible behaviour jeopardizes system safety!</i> B1 The service lift is stuck on an obstacle.	Carefully move the service lift downwards and remove the obstacle. Test the operational safety of affected platform components. Inform the supervisor.
	B2 Overload - Buzzer sounds in the connection cabinet.	Test and possibly reduce load until buzzer stops.
	B3 Limit stop UP: a) Limit stop defective or not connected. b) Operation limit stop was activated.	a) Test the limit stop connection/function. Replace if necessary. b) Move lift down until the limit stop switch is released.
	B4 A phase is missing	Test fuses and power supply.
	B5 Fault in UP control circuit in control box or traction hoist	Test and possibly repair connections, wiring and relays.
Motor hums loudly or wire ropes squeak, but the lift can go both up and down.	C1 Wire ropes dirty  WARNING! <i>Further use of lift may result in damage to the wire traction.</i>	If possible, immediately replace the traction hoist and return it for test/repair at AVANTI.

Breakdown	Cause	Solution
<p>Service lift will go up but not down!</p> 	 <p>DANGER! <i>Irresponsible behaviour jeopardizes system safety!</i></p> <p>D1 The service lift has encountered or is stuck on an obstacle.</p>	<p>Carefully take the service lift up and remove the obstacle. Test the operational safety of affected platform components. Inform the supervisor.</p>
	<p>D2 The safety brake device is holding the service lift on the wire.</p> <p>a) Excessive hoist speed b) Too low release speed on safety brake.</p>	<p>a) + b) Take the service lift upwards to relieve the safety wire. Open the safety brake by pressing the handle, and test its function as specified in section 5.5. Functional test when the lift is back on the ground: Replace the hoist and safety brake and return them for testing.</p>
	 <p>DANGER! <i>A defective safety brake will threaten the safety of the service lift! Replace immediately!</i></p>	
	<p>D3 Fault in down controller circuit on traction hoist</p>	<p>Insert brake lever into the traction hoist and lower lift manually. (See details in section 5.5). Test, and if necessary have connections, wiring, and relays repaired.</p>
<p>Green lamp not lit although operation is normal</p>	<p>E The lamp is defective</p>	<p>Have an electrician replace the bulb.</p>
<p>Hoist goes down when up button is pressed and up when down button is pressed.</p>	<p>F Two phases changed in the supply</p>	<p>Have an electrician switch the two phases in the plug</p>
<p>Loud noise and / or smoke coming from hoist motor</p>	<p>G Brake closed or partially closed WARNING ! Damage of hoist brake leading to brake function lost</p>	<p>Stop work immediately! Call supervisor for advice and potential repair of hoist</p>

**If these steps do not identify the cause and rectify the fault:
Consult a certified technician or contact the manufacturer.**

9. Out of service

a) Securing the hoist:
Bring the service lift all the way down, until the contact plate switch stops the cabin.

b) Switch off the power supply to prevent inadvertent operation:
Push in the EMERGENCY STOP button fixed – all controls are now blocked. Mark the lift “OUT OF SERVICE”. Contact the service technician for repair.

10. Removing wires for replacement



CAUTION!

Wear protective gloves when handling wires.

10.1 Wire ends

Beneath the access platform:

- Loosen and uncoil all coiled and secured wire ends.
- Remove the tightening system (counterweights, springs, etc).

10.2 Removing the suspension wire

- Turn the “override bottom limit stop switch” key to the right and turn the direction selector towards DOWN. The wire will start getting out of the hoist at the top.
- From above the traction hoist remove the wire by hand.

10.3 Removing the secondary wire

- Keep the fall arrest device open and manually pull out the wire.
- Pull out the wire on top of the ASL508.

11. Maintenance

All the inspections / maintenance operations (periodical or extraordinary) must be logged in the appropriate Inspection Appendix. All inspections and service tasks made to the hoist and fall arrest device must be carried out by certified technicians. The relevant maintenance instructions are provided to each person during the training.

11.1 Recommended planning

Avanti recommends the following maintenance planning:

Frequency	Performed by	Components
Daily	User	Fall arrest device
Annually	Certified Technician	Traction hoist
		Fall arrest device
		Overload limiter
		Traction and safety wire ropes
Information signs and documents		
Every two years	Certified Technician	Fall arrest device
Every five years or 50 hours (whatever occurs first)	Certified Technician	Traction hoist
Every 20 years or 250 hours of operation (whatever occurs first)	At Avanti Workshop	Traction hoist
		Fall arrest device

11.2 Alternative planning

Owners who strictly follow the maintenance program and the daily inspections, and can document it could decide with taking over the responsibility as well to provide the following alternative planning:

Frequency	Performed by	Components
Daily	User	Fall arrest device
Annually	Certified Technician	Traction hoist
		Fall arrest device
		Overload limiter
		Traction and safety wire ropes
		Information signs and documents
Every ten years or every 125 hours of operation (whatever occurs first)	Certified Technician	Traction hoist
		Fall arrest device
Every 20 years or 250 hours of operation (whatever occurs first)	At Avanti Workshop	Traction hoist
		Fall arrest device

11.3 Cautions

Before any maintenance task, ensure that walking way surfaces are dry and not slippery. Before any maintenance operation, check that the service lift is properly out of service. In case of a fault, do not use the service lift until it is solved. If required secure workplace. Entire system shall be tested by a certified technician at least once a year, nevertheless local regulations may require more frequent inspections instead of every year.

During maintenance tasks, personnel shall:

- Wear at least the following PFPE: fall arrest equipment (when falling height is more than 2 m), hand gloves, helmet, safety glasses and working gear.
- Place cabin at bottom platform and disconnect power supply.
- Use an electricity measuring tool when performing inspection of electrical components.
- Use a hand winch attachable to the ladder when handling big/ heavy loads and shall be performed at least by 2 persons.
- Panel parts shall be removed to facilitate access to confined spaces.
- Keep cabin doors closed when using a 3-step ladder.



Only certified technicians shall perform electrical installation tasks.



When plugging the service lift to the power supply, ensure that supply phases are correct!

11.4 Annual inspection

Have the entire system tested by a certified technician at least once a year, especially the traction hoist and the fall arrest device. However, it may be required more frequently depending on use and the conditions of use and operation. The traction hoist and fall arrest device must be inspected according to intervals included in the sections 11.1 or 11.2 tables (see above). Hour counter is found in the main control box.



A certified technician must carry out the annual inspection following the appropriate Inspection Appendix.



Owner must ensure that the results of all annual and extraordinary inspections are logged in the appropriate Inspection Appendix.



In case of replacement of hoist, Fall Arrest Device and/or 8 mm. wire ropes, the operation/s and the related total hours of use of this/these component/s, must be logged in the appropriate Inspection Appendix.

11.4.1 Traction hoist

The traction hoist shall be maintained according to maintenance planning (please see sections 11.1 or 11.2). Relevant maintenance instructions are provided to each person during the training. These maintenance inspections must be only carried out by a certified technician.

11.4.2 Fall arrest device

The fall arrest device shall be maintained according to maintenance planning (please see sections 11.1 or 11.2). Relevant maintenance instructions are provided to each person during the training.

These maintenance inspections must be only carried out by a certified technician.



If fall arrest device has engaged due to a dynamic fall, a certified technician must verify the safety of the fall arrest device, the wire rope, and wire rope fastenings.



After FAD has engaged, if the FAD damper has moved downwards, the FAD unit must be replaced by a certified technician.

11.4.3 Wires/Cables

Always keep the wires clean and slightly greasy. Ropes shall be greased regularly with standard multipurpose grease. Greases containing disulphide or PTFE are not allowed to be used.

Annual test (only by certified technicians):

11.4.3.1 Measuring of the wire rope diameter



When measuring the diameter of the wire ropes, use a digital calliper with broad measuring faces.



In general, measure the diameter of the wire rope at each WTG tower platform, and under the service lift, where the wire rope is less loaded. Specifically, if a wire rope wear is detected, measure on the affected area.



Rotate the calliper around the wire rope to measure the minimum and maximum wire rope diameter at each measurement point.

11.4.3.2 Discard criteria



The discard criteria of the wire ropes should be based on ISO 4309: Cranes - Wire ropes - Care and Maintenance, inspection and discard.



Determine and eliminate the cause before installing a new wire rope.



AVANTI recommends to replace the traction and safety wire ropes after 250 hours of operation corresponding with the refurbishment of the traction hoist and fall arrest device. Please check with your local authority regulations if it's mandatory in your case.

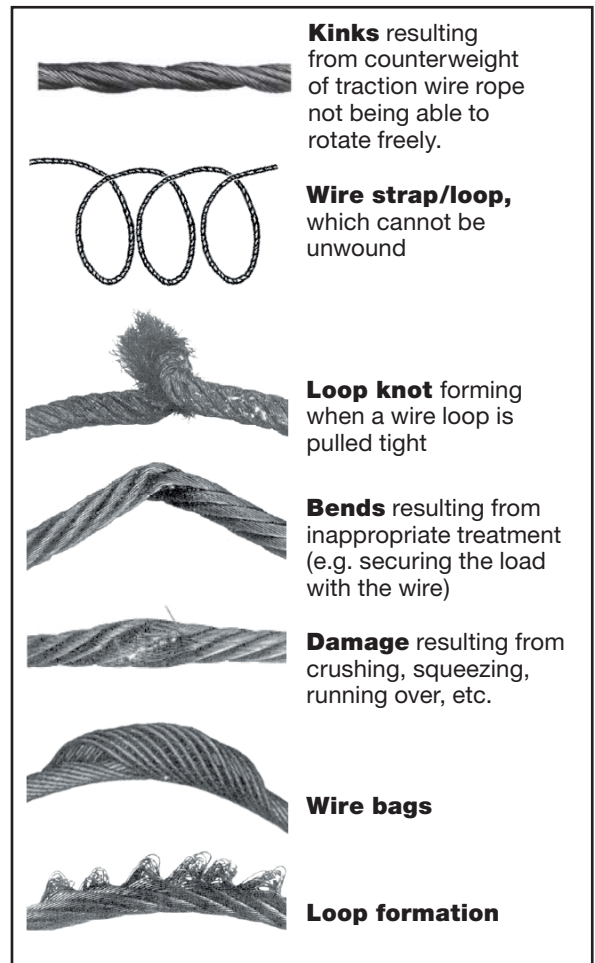
Check and replace the respective wire rope(s) if one of the following defects is found:

- For traction and safety wire ropes, there are more than one 4-wire strand break on a wire rope length of 250 mm.



- If there is severe corrosion on the surface or the inside.
- If there is heat damage, evident by the wire rope colour.

- For traction and safety wire ropes, if the wire rope diameter is less than 7,6 mm.
- If there is damage on the wire rope surface (see following figures for most common examples of wire rope damage).



Check and ensure all wires are mounted at the top and ground level in accordance with the mounting instructions.

11.4.4 Overload limiter/information signs

Annual test:

Test switches as specified in section 7.6.1 c) of this manual. Perform overload test as specified on section 7.6.1 e). Verify completeness and legibility of all rating plates and information signs. Replace missing or illegible plates and signs!

For all components a general overhaul after 250 hours is mandatory.

11.5 Repairs

Repairs to traction hoist equipment may ONLY be performed by AVANTI, and only using original spare parts. If the gearbox oil needs to be replaced, use the lubricant specified below, corresponding to the temperature range in which the traction hoist equipment is used.

Amount required: 1,5 l

Traction hoist M508

Oil: Mobil SHC 632.

12. Ordering spare parts

12.1 Wire/ropes

In addition to the item number and name of the spare part, always state the traction hoist type, wire diameter and production number!

12.2 Motor and brake

In addition to the item number and name of the spare part, always state the motor type and the type and coil voltage of the brake!

12.3 Electric control

When ordering spare parts or making requests, always state the electricity category and wiring chart number. See the rating plate on the connection cabinet. There is a wiring chart in the connection cabinet and in the motor terminal box.

12.4 Fall arrest device

In addition to the item number and name of the spare part, always state the safety brake type, the wire diameter and lift serial no.

12.5 Rating plate/information signs

Verify the completeness and legibility of all rating plates/information signs (see Fig. 14+15). Replace missing or illegible plates/signs.

Fig. 14

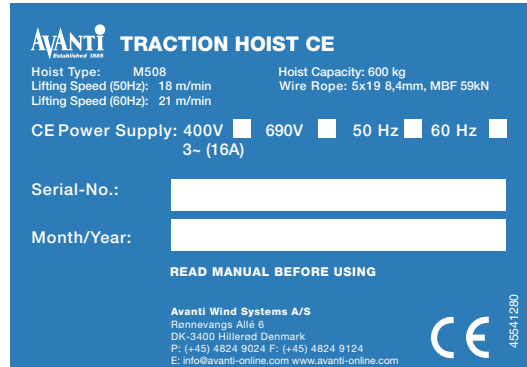
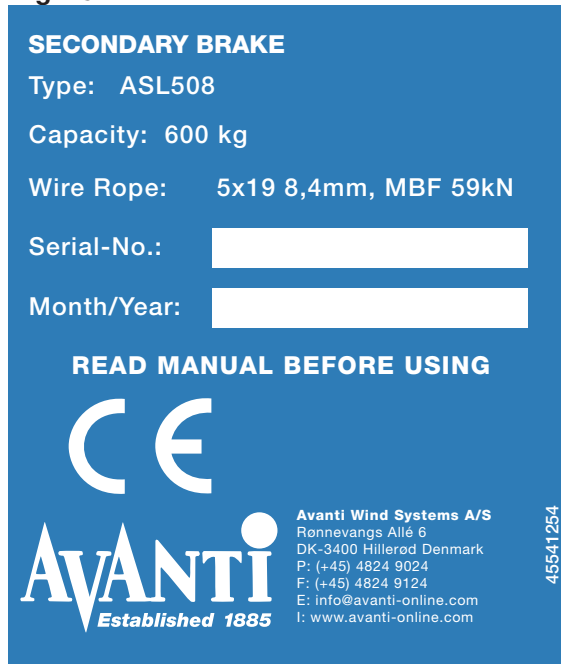


Fig. 15



Appendix A: Regulation of overload detection device



CAUTION!

Avoid injury by strictly following the instructions!

- a) Verification and/or adjustment of the overload device on the service lift can only be done by a certified technician, who must have been instructed by AVANTI to perform this task.
- b) Verification and/or adjustment must be performed under the supervision of a certified technician.
- c) One copy of this instruction must be provided and always be available to the personnel.
- d) Alterations/modifications of the service lift other than those necessary for adjusting the overload device are not allowed, unless the manufacturer has agreed in writing.
- e) AVANTI assumes no liability for damage due to retrofitting/alterations to equipment or where non-original spare parts are used, which have not been approved by the company in writing, especially the prescribed traction hoist wire rope.
- f) The manufacturer of the service lift assumes no liability for damage due to retrofitting or alterations to equipment or where non-original spare parts are used, which have not been approved by the company in writing. In the event of violation, the CE certification approval becomes invalid.
- g) The result of the verification/adjustment of the overload device must be written down in the "Test report of annual inspection" and signed by the supervisor. If only adjusting takes place (no annual inspection) simply fill in point 4.9 and sign.

1 Purpose of this instruction

It is possible that the overload detection device inside the traction hoist of the service lift stops upwards travel even through the service lift is not overloaded. Where other causes can be excluded by following the instructions of section 2.2, the overload limiter must be adjusted according to section 2.3.

2 Adjusting instruction

2.1 Preparation

Required tools/material:

- **Ballast** for applying the **test load**;
- **M508 overload tool**

Note! Before driving to the service lift

make sure that the service lift can be loaded with the **permissible test load**, i.e. "safe working load" + weight of power cable + 25%.



IMPORTANT!

Before leaving for the tower make sure you bring the required test load of 300-400kg.

We recommend:

- **weighing personnel** who may climb into the lift during the test procedure, and
- **bringing** adequate **weighed ballast** (sand-bags or similar).

2.2 Exclusion of other causes

Before modifying the overload limiter settings check if the upwards travel stopping is caused by other reasons:

- a) If the cage is guided by wire ropes or ladder: Check for obstructions on the guiding device(s) and remove them.
 - b) Check that the wire rope moves freely at the diverter or similar:
 - Is the rope blocked/pinched at any point?
 - Do the pulleys freely rotate? (Check with the service lift set to ground with no load on the ropes, or by a person from outside the cage, when going up and down.)
 - c) When starting, does the service brake open? You can hear the "click" sound or feel a mechanical shock when putting your hand on the motor fan cover.
- In the cases b) or c) have the problem corrected/ repaired by a certified technician.

2.3 Adjustment of overload

There is a specific tool for adjustment of overload supplied by AVANTI as an option. (See Fig. 17) Insert the tool approx 100 to 110 mm in the hole shown on figure 17 until the setup bolt is reached. Turn the bolt **CLOCKWISE** to increase the lifting capacity. Turn the bolt **COUNTERCLOCKWISE** to decrease the lifting capacity. After each turning of the bolt the hoist has to be un-loaded to settle the mechanical system.

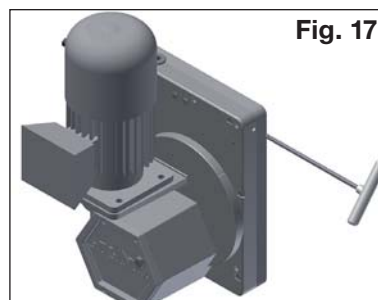


Fig. 17

Appendix B: Inspection report and report of defects

Location							Turbine no.:	
Oper. respons.								
Traction hoist	Type:		Load capacity:		Equipm. no.:			
Electrical control box			Wiring chart no.:		Serial no.:			
Safety brake	Type:						Equipm. no.:	
Wire	Certificate no.:							
Date of testing:								
Oper. hours counter:								
For each position check "○ = OK" or "□ = Defect". All defects must be described in the Defects Report!								
1. Traction hoist	OK	Defect	OK	Defect	OK	Defect	OK	Defect
1.1 Visual inspection	○	□	○	□	○	□	○	□
1.2 EMERGENCY lowering	○	□	○	□	○	□	○	□
2. Safety brake	OK	Defect	OK	Defect	OK	Defect	OK	Defect
2.1 EMERG. STOP switch	○	□	○	□	○	□	○	□
2.2 EMERG. STOP reset	○	□	○	□	○	□	○	□
2.3 Wire acceleration test (hand)	○	□	○	□	○	□	○	□
3. Suspension/Wires/Cable	OK	Defect	OK	Defect	OK	Defect	OK	Defect
3.1 Suspension	○	□	○	□	○	□	○	□
3.2 Drive wire	○	□	○	□	○	□	○	□
3.3 Safety wire	○	□	○	□	○	□	○	□
3.4 Guide wire and	○	□	○	□	○	□	○	□
3.5 Attachment	○	□	○	□	○	□	○	□
3.6 Power/Control cable	○	□	○	□	○	□	○	□
4. Control/limit stop switch	OK	Defect	OK	Defect	OK	Defect	OK	Defect
4.1 EMERG. L. STOP reset	○	□	○	□	○	□	○	□
4.2 UP-/DOWN travel	○	□	○	□	○	□	○	□
4.3 Oper./Emerg. limit stop	○	□	○	□	○	□	○	□
4.4 Bottom stop	○	□	○	□	○	□	○	□
4.5 Override bottom stop	○	□	○	□	○	□	○	□
4.6 Door stop switch	○	□	○	□	○	□	○	□
4.7 Overload test (Buzzer!)	○	□	○	□	○	□	○	□
4.8 Overload limiter adjusted	NO	YES	NO	YES	NO	YES	NO	YES
Tested by								
Signature								
Observations								

