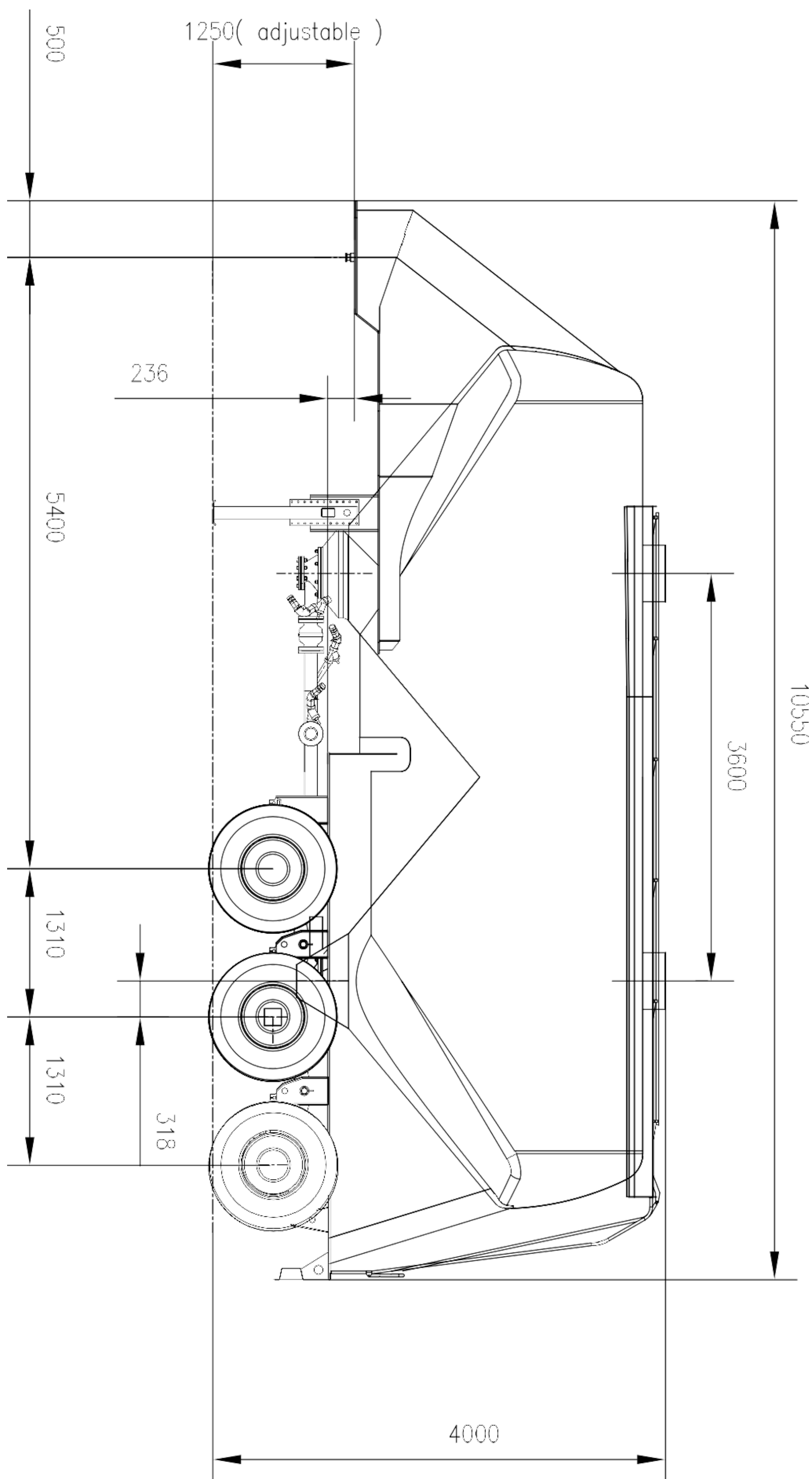




CEMENT BULK SEMI-TRAILER MANUALS

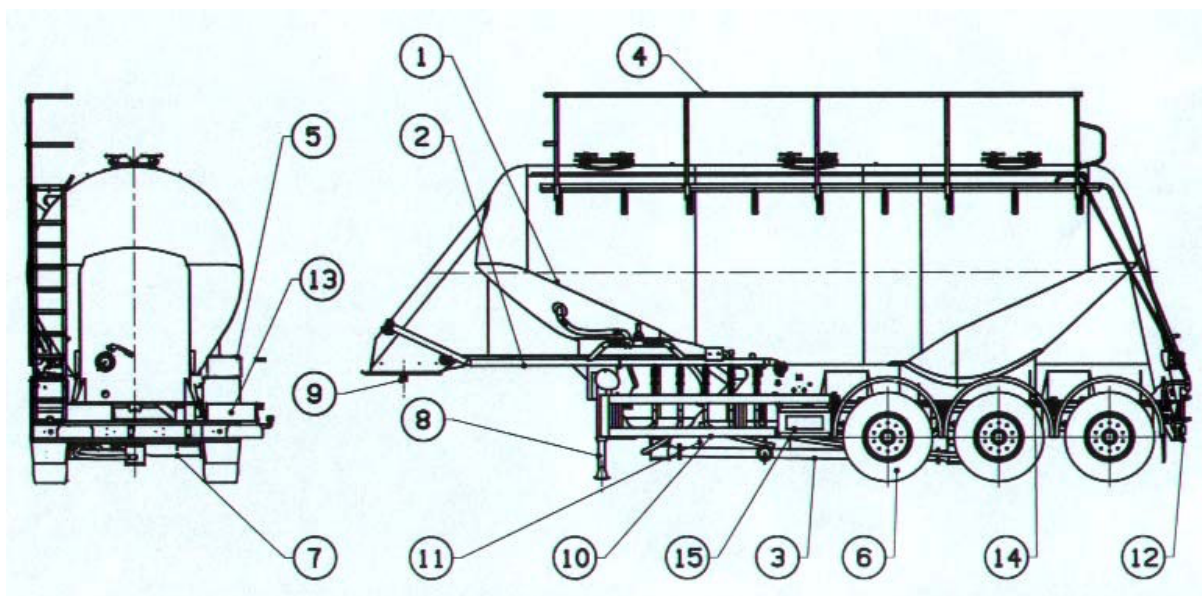
GENERAL INFORMATION

- 1. OPERATIONS MANUAL**
- 2. MAINTENANCE INSTRUCTIONS**
- 3. SAFETY RULES AND REGULATIONS**
- 4. DEFECTS AND REMEDIES**

GENERAL INFORMATION

Units of measurement: dimensions [mm]; weight [kg]; pressure [bar]

1 DEFINITIONS



1. Pressure vessel - tank
2. Air distribution system
3. Discharging device
4. Platform and ladder
5. Hose compartment
6. Axles and wheels
7. Brakes
8. Telescopic supports
9. Coupling head
10. Lateral protection
11. Spare wheel carrier
12. Rear protection
13. Electric wiring system
14. Mudguards

Fig. 1 Semitrailer main parts

2 INTRODUCTION

2.1 Description

2.1.1 The main part of the semitrailer is a self-supporting *tank*, i.e. a *pressure vessel* fitted with a front support used to carry the coupling head, the rear support and a frame designed to hold suspended axles and other parts. The vessel is made of mild steel plate. It consists of a central cylindrical section extended into two cone-shaped hoppers closed at the front. The vessel is provided with two DN 500 filling necks suitable to fill the tank with free-falling bulk material. Moreover, the vessel is equipped with a safety valve.

2.1.2 The *air distribution system* is installed to convey pressurized air from the relevant input connection (**designed to attach an external pressure-air source**) to the vessel's upper part; the air passes through an aeration baffle to the vessel bottom section, to the air pressure boosting pipe, and to the delivery pipe. The system is made of steel pipes and rubber hoses. It is rigged with all control & monitoring equipment needed.

2.1.3 The *discharging device* comprises aeration baffles mounted at the lower sections of hoppers and the downstream shutting flaps, cleaning pieces and delivery piping.

2.1.4 The *filling necks* can be accessed from a platform.

2.1.5 The *hose compartment* on the semitrailer right hand flank is used to accommodate hoses during transportation.

2.1.6 Three *fixed axles with mechanical suspensions* are fixed to the vessel frame.

2.1.7 The *telescopic supports* are needed to park the semitrailer. They may be raised or lowered with a crank handle operated from the semitrailer's right hand side.

2.1.8 The *coupling head* (with a king pin of 50 mm across) mounted on the semitrailer's front support serves as a link between the tractor and the trailer.

2.1.9 The *lateral protection* prevents the vulnerable road users from being caught by the semitrailer wheels.

2.1.10 The *spare wheel carrier* is intended to carry one spare wheel of the semitrailer. The carrier is mounted on the trailer's right hand side and covered by the lateral protection.

2.1.11 The *rear protection* is to prevent small cars from driving under and being wedged below the trailer from the back side.

2.1.12 The semitrailer *electrical wiring system* (24 V) is terminated in a seven-pole ISO-compliant socket mounted on the semitrailer nose.

2.1.14 Plastic *mudguards* used to cover the semitrailer rear wheels are fitted with mudguard flaps.

2.2. Use

2.2.1 The semitrailer is designed to carry bulk, dry, loose, powdered, finely granular or granular materials used in industry, construction, agriculture and food industry. The vehicle is particularly suited to transport power plant ashes, cement, ground limestone, lime, dry mortar mixtures, feed mixtures, granulated feed and plastics.

Its food stuff rated variant can carry bulk flour, sugar, cooking soda, and the like.

2.2.2 The semitrailer is not supposed to transport noxious, explosive or highly aggressive substances and materials excessively prone to heaping into a (*hard*) dome.

2.2.3 The possibility of moving new materials, not delivered pneumatically so far, has to be tested yet.

2.2.4 When making up an articulated vehicle train, the semitrailer may be attached only to a tractor with the permitted coupling load of 11 tons; at the same time the radius of a circle drawn around the coupling center and passing through the rearmost outline shall not exceed 2,300 mm. The coupling height shall be kept at 1,250 mm.

2.2.5 The semitrailer offers these ways of loading / unloading:

- a) Free fall loading;
- b) Power loading from a storage bin driven by overpressure exerted by an external source of pressurized air;
- c) Power unloading into a storage bin driven by an external pressure air source.

2.2.6 In case the powered loading and unloading relies on the external pressure source with the output of $450 \text{ m}^3 \cdot \text{h}^{-1}$ or more, the source shall be fitted with a condensate separator capable of removing air humidity; the air overpressure shall be reduced to 2 bars or less.

1. OPERATIONS MANUAL

This Operations Manual should be used by all owners of bulk semi trailer (hereinafter only semitrailer), particularly by the equipment operators. Only when this document is duly observed, the semitrailer may be operated in a reliable and safe way.

1.1 General

1.1.1 The person assigned by the semitrailer owner to operate the vehicle shall be duly familiarized with this Operation Manual and the relevant operation & safety regulations.

1.1.2 The driver shall keep the semitrailer in good technical condition; he/she shall not allow the vehicle to be loaded above the permitted overall weight.

1.2 Important!

1.2.1 When attaching the semitrailer to the tractor, it is necessary to check whether the tractor's braking system is able to build up the pressure of 6.5 bar in the trailer filling leg.

1.2.2 The parking brake must always be released manually. The force needed for the parking brake to be effective is exerted by strong springs inside brake cylinders acting on the 2nd and 3rd axles. The brake will be released by the counterpressure of air blown into the brake cylinder after the red release valve button is inserted. In case the braking system air pressure is not sufficient and still the trailer is needed to be driven short distances, the parking brake will have to be released mechanically. No other method how to make the vehicle move is available.

The mechanical release of the parking brake can be done with special-purpose pull-bars delivered together with the spring-loaded brake cylinders and included in the trailer accessory kit. Remove the plastic cover from the front of the brake cylinder, insert the pull-bar inside, and turn it clockwise until the tool engages with the internal dent. When you tighten the pull-bar nut, the spring will be overpowered and the wheel brake will be released. To mechanically release the parking brake as a whole, it will be necessary to repeat the procedure at all four spring-loaded brake cylinders of the 2nd and 3rd axles.

As soon as the brake couplings at the semitrailer nose are disconnected, the trailer will automatically be braked by the action of the service brake. The black button will assume the inserted position on its own. The efficiency of the self-acting service brake will peter out with the diminishing pressure inside the braking system.

To immobilize a parked semitrailer safely, you will have to use the parking brake. The brake will take effect as soon as the red button of the release valve is manually extended. This action will release air from the spring-loaded cylinders and their springs will exert the needed braking force without any time limitation.

 **WARNING! Peril of life & limb!** We strongly discourage you from making any attempts at dismounting the spring-loaded cylinders without the use of special tools. The springs are loaded up to 10,000 N.

1.2.3 When driving the vehicle train on public roads and motorways, follow the code valid in the relevant country.

1.2.4 The semitrailer may be driven only on hardened and well maintained roads.

1.2.5 When unloading the semitrailer into a storage bin, the vehicle should stand on level ground.

1.2.6 The vessel must be protected from the ingress of water or any humidity. That is why it has to be sheltered when being filled with free-falling substance, and with the filling completed (or possibly with discharging or internal check finished) all closing points have to be properly shut. A vessel wet inside shall not be filled with material.

1.2.7 The design and features of axles and axle suspensions are described in the axle manufacturer's Manual included in the semitrailer's attendant documentation.

1.2.9 The handling of telescopic supports (4) is depicted in the related operation manual enclosed with the attendant technical documentation of the semitrailer.

1.2.10 Before the vessel service platform may be accessed, the collapsible railing (7) has to be erected and the erected position arrested. Before the vehicle is driven, the railing will have to be collapsed and the collapsed position arrested.

1.3 Tractor / trailer attachment

1.3.1 Drive the tractor so that its rear part will roughly align with the coupling head (for the procedure of putting the tractor into operation see the "Tractor Manual"). A V-shaped cut in the coupling will take care of the coupling head accurate centering. With the coupling firmly pressed against the coupling head and the pull-bar arrested, the train will be safely connected. A slight elevation of the coupling upper surface above its seat is not detrimental.

1.3.2 Immobilize the train with the semitrailer parking brake.

1.3.3 Release the bundle of hoses and cables on the tractor and extend it towards the electrical wiring interface at the trailer nose; connect the interface heads and sockets between the vehicles in the usual way.

1.3.4 Using the crank handle raise the mechanical supports to the travelling position.

1.3.5 Take the semitrailer brake off.

1.3.6 Check the tractor and trailer electrical wiring for proper performance; the check shall include the brake lamps, tail lamps, standing (*position*) lamps and direction flash lamps.

1.4 Tractor / trailer detachment

1.4.1 Use the parking brake to immobilize the semitrailer.

1.4.2 Disconnect the couplings of the pressure air brake system; the trailer wheels will be automatically braked. Return the couplings and cables to their place on the tractor.

1.4.3 Lower the telescopic supports (4) and unload the tractor's springs by somewhat raising the trailer's front part.

1.4.4 Release the lever used to lock the coupling head and pull it to disengage the coupling. The train is detached now and the tractor is free to leave.

 **Notice!** Never disconnect the trailer when supported on surface lacking sufficient carrying capacity. Never disconnect the trailer unless the telescopic supports are properly extended.

1.5 Semitrailer loading

1.5.1 Free-fall loading (Fig. 1, Fig. 5)

To free-fall load the vessel, proceed as follows:

- Open the air-release valve of the vessel (13) to equalize the inside pressure to that of the outer space. Some pressure difference may arise from the changes in temperature throughout the day.
- Loosen the wing nuts (23) and knock out the treaded lugs; the lids (6) covering the vessel filling necks (1); swing the lids open.
- Make sure the vessel is empty; the aeration baffles (32) inside the vessel are not damaged or fouled with hardened material; and the neck sealings are in good shape.
- Let the material fill the vessel by free-falling through the filling necks.
- When the vessel is full, clean the mating surfaces of the nozzles and the lids (6), close the lids, and shut the air-release valve (13).
- Clean the outside surfaces of the trailer.

1.5.2 Overpressure loading from a storage bin using an external source of pressurized air (Fig.2, Fig 5)

To overpressure load the vessel, proceed as follows:

- Open the air-release valve of the vessel (13) to equalize the inside pressure to that of the outer space. Some pressure difference may arise from the changes in temperature throughout the day. When the pressures are the same, open the lids of filling necks.
- Make sure the vessel is empty and the aeration baffles (32) inside the vessel are not damaged or fouled with hardened material.
- Close the lids of filling necks.
- Remove the cap (20) from the filling pipe and take away one of the caps (18) pertaining to the air pipe. Using the (15) and (16) controls close the flaps in the delivery pipe. Close the pressure-booster valves (14). Open the filling pipe flap (21) and the air-release valve of the vessel (13).
- Using a delivery hose connect the neck of the trailer filling pipe with the storage bin discharge neck. Using an air hose connect the external pressure air source with the air distribution system on the bin.
- Prepare the storage bin for pressurization in compliance with the relevant operation regulations.
- When sufficient overpressure builds up in the air distribution system, use the overpressure to load the trailer vessel with material from the storage bin.
- When the process of filling is completed, stem the stream of material with either a flap installed on the bin, or the filling pipe flap (21) on the semitrailer; shut down the external source of pressurized air.

 **Notice!** In case the stream of material is stemmed with the semitrailer mounted flap (21), the entire material route will stay pressurized. Before you try to disconnect the hose, it is vital that the storage bin pressure

is released; only then the hose may be detached and the inside material knocked out of it. If you manage to empty the bin completely, you will enjoy the added advantage of being able to flush the entire filling route with expanding air.

j) With the bin free from pressure, remove the delivery and air hoses and store them in the relevant compartments (5). Return the caps (18 & 20) to the filling and air pipes.

Note: To extend the lifetime of filters in the pressure relief piping (in case the overpressure filling is used), we recommend to reduce the amount of pressurized air released from empty vessel through the filters by partial closing of the discharge valve or the flap (21); such closing should be done in good time.

1.6 Semitrailer unloading:

1.6.1 Overpressure unloading into a storage bin using an external source of pressurized air (Fig. 3, Fig. 5)

To overpressure unload the vessel, proceed as follows:

- a) Make sure the filling neck lids (6) are closed; the filling pipe is closed with flap (21) and cap (20); the discharge pipe is closed with flaps (15 & 16); the air-release valve of the vessel (13) is closed; and the pressure-booster valves are closed.
- b) Using an air hose connect the external pressure air source to one of the two connection points of the semitrailer air-distribution system. The other shall be kept capped (18).
- c) Remove cap (19) and using the delivery hose connect the semitrailer discharge pipe with the relevant storage bin pipe - use an adapter piece, if need.
- d) Open the upper air valve (11) and aeration valves (10) and (12).
- e) Activate the external pressure source and pressurize the semitrailer vessel.
- f) When the vessel (1) internal overpressure reaches 1.8 bar, open the pressure-booster valve (14) and the rear flap of the discharge pipe. This action will initiate the unloading proper. The working overpressure will automatically adjust to the filling height of the bin; to the properties of the discharged material; and to the current operational conditions. Optimal discharging conditions may be adjusted with an optimal degree of opening the pressure-booster valve (14), found by trial and error. When the rear section of the vessel is empty, the overpressure will drop down to almost 0 bar. If so, close the rear flap of the discharge pipe (15) and the pressure-booster valve (14). When the vessel pressure recovers to 1.8 bar, re-open the pressure-booster valve (14) and then the front flap of the discharge pipe (16). This action will initiate the unloading of the vessel front section.
- g) If needed, the material discharge may be suspended (for a short period of time) by closing the delivery pipe flaps (15 and 16) and the pressure-booster valve (14); the discharge may be resumed without releasing pressure from the vessel and without stopping the external pressure source. Any attempt at connecting the external source so that it is loaded with pressure from the outlet should be avoided.
- h) The vessel emptying is indicated by a steep fall of overpressure inside the vessel (1), down to almost 0 bar and by the hissing sound of air escaping from the vessel.
- j) If needed, the vessel may be flushed clean by short-time closing/opening of flaps (15 & 16) and valves (10 & 12).
- k) When the vessel is empty, depressurized and checked to be empty, disconnect the air and delivery hoses and place them to the relevant compartment (5). Close the pipes with caps (18 and 19).



Notice! Any handling of the lids (6) and caps (18 & 20), and any attempts at disconnecting the air and delivery hoses with valve (13) without prior depressurization are prohibited.

2. MAINTENANCE INSTRUCTIONS

2.1 The axles, brakes and axle air suspensions shall be maintained, lubricated and checked in conformity to the manufacturer's instructions included in the technical documentation attendant to the semitrailer.

2.2 The air handling equipment shall be maintained and inspected so as to meet the requirements and deadlines applicable to the operation of pressure vessels (tank trailers) in the owner's country.

2.3 Maintenance & operation of the brake system

2.3.1 Reliability and long life of the brake system components depend primarily on the quality of compressed air run through the system (i.e. on the volume of mechanical impurities and water).

A major factor influencing the compressed air quality is proper performance of the pressure air external source installed on the tractor. In case the tractor is equipped with air dryer, whose cartridge is replaced always in good time, just like the filter cartridge upstream of the compressor, the quality of pressurized air may be expected to be appropriate. Nevertheless the air quality may also be impacted by the level of the compressor wear & tear; a higher level of wear will entail an increased ingress of lubricating oil above the piston. The air above the piston may be compression heated up to 220 °C; the hot air will partly burn the oil and produce carbon. The carbon will gradually foul the air pipes and instruments. Tractors not equipped with the air dryer are prone to condensation of humidity contained in the incoming air; the water thus created enters the brake system. Such water needs to be frequently dumped by lifting the cones of drain valves placed at the lowest perimeter points of the compressed air drum. In winter the water could freeze inside the brake system and cause its failure. Consequently, the tractors without air dryers are equipped with anti-freeze pumps. Still, the injected anti-freeze agent may wash grease out of the brake system components and shorten their life. In consideration of the above-mentioned facts we recommend to use tractors with air dryers. The importance of dry air becomes most obvious in winter. In case the trailer is connected to a tractor equipped with the air dryer, the entire system dry-up (provided the system is tight) may take up approx. 14 days of operation.

2.3.2 To prevent impurities from entering the semitrailer's brake system, take the following steps:

- with the trailer disconnected always place the coupling connections onto the holder racks;
- use each service inspection as an occasion to clean or, if needed, to replace the filters;
- make sure the entire brake system is tight; leaks, if any, remedy immediately;
- in case a PE pipe is to be re-connected, always use a new binding ring.

2.3.3 To make sure the brake system is reliable, take the following steps:

- once a half year use pressure gages attached to check points to make sure the pressure values correspond with the values stated on the AZR label; if needed, adjust in compliance with the relevant manual;

- do not try to repair faulty instrumentation, always install new replacements;
- take care whenever using heat sources close to PE piping. The PE pipes can withstand no more than 160 °C for 60 minutes, provided they are free from pressure!

2.3.4 A good braking effect depends not only on the air pressure, but also on a good mechanical condition of the brakes!

None of the brake system components requires special maintenance, apart from common cleaning.

2.4 Maintenance & checks of air-handling equipment

2.4.1 After travelling the first 300 to 500 km, check the wheel disk nuts and all threaded connections for tightness (particularly the bolts and screws used to attach the chassis, the coupling head and the mechanical supports to the brackets and the truck frame).

2.4.2 Check on a continuous basis:

- a) Sealings of filling necks and those of pipe connection necks. Damaged sealings replace with new ones.
- b) Cleanliness of the mating surfaces of filling neck lids.
- c) Function of pressure gages; any fault is a reason for immediate replacement.
- d) Proper performance of control members and closing elements.
- e) Tightness of bolts used to attach the tank truck chassis to the axle brackets.
- f) Condition of aeration baffles. Clogged, oily or loosened baffles shall be replaced.

2.4.3 Check daily, after each shift:

- a) Cleanliness of the trailer and its machinery components; wash with water, if needed.
- b) Proper performance of the chassis instrumentation, with special attention paid to the brake system and illumination system.

2.4.4 Check weekly:

- a) Condition and clearance of the safety valve; lift the valve several times with the working overpressure present.
- b) Condition and function of control members and closing elements.

2.4.5 Check quarterly:

- a) Tightness of the air distribution system and the pressure vessel rigging. Pressurize the vessel up to 2 bars, switch the compressor plant off, keep the outlets closed and watch the overpressure diminishing. In 10 minutes the overpressure should not drop by more than 0.2 bar.
- b) Zero setting of pressure gages. With the pressure vessel and the air distribution system depressurized, the pressure gauges shall read zero; otherwise replace with new ones.
- c) Tightness of wheel disk nuts and all threaded connections, particularly the tightness of bolts and screws used to attach the chassis, couplings and mechanical supports to the brackets and to the truck frame.

2.4.6 The user is obliged to have the Pressure Vessel Inspection done as required by regulations applicable in the equipment owner's country. The Inspection results shall be entered into Inspection Logs enclosed as an annex with the Equipment Certificate.

Inspections: a) Service Inspection - once a year or oftener

b) Internal Inspection (the tightness test included) - once every two years of oftener

2.4.7 At least once every 2 years use a standard pressure gage to test the accuracy of the service gages.

2.4.8 At least after 9 years (*of operation*) have the pressure vessel tested in compliance with European Standard 97/23/ES or with the relevant regulations applicable in the owner's country; the vessel shall be pressurized with water up to the gage pressure of 2.86 bar as measured at the vessel top. Before the test can be performed, dismount the aeration baffles. Remove 4 blinding caps from the skids. The discharge of water must be accompanied with the intake of air, otherwise the vessel could be damaged by internal underpressure. The residual water trapped under the skids shall be drained through the pair of pipes located at the vessel bottom, next to the discharge flange. When all water is drained, make the vessel completely dry. Take care to return plugs into the pair of pipes, to seal the plugs properly and take steps to prevent their

loosening. When completed, the water pressure test performance shall be recorded in the Equipment Certificate.



Notice! Whenever the semitrailer is repaired with arc welding, disconnect all cables from the EBS control unit located under the truck. With the repair finished, re-connect the cables in conformity to their color coding.

2.5 Maintenance & checks of other semitrailer parts

2.5.1 Coupling head

After travelling 5,000 km, lubricate the coupling plate with DZ grease. After each traveled distance of 10,000 km check the coupling head for wear & tear. The $\varnothing$ 50 mm king pin shall be replaced when reduced to $\varnothing$ 48,8 mm. Any attempts at restoring the pin's condition are prohibited.

2.5.2 Spare wheel carrier

After each traveled distance of 10,000 oil the threads of lock nuts.

2.5.3 Mechanical supports

The supports shall be maintained according to the Handling Manual of Telescopic Supports included in the technical documentation attendant to the semitrailer.

2.5.4 For other semitrailer component checks and the related deadlines see the relevant regulations applicable in the equipment owner's country.

2.5.5 The air filters of the brake piping are installed in the front support to the tank. They can be accessed after dismounting the metal sheet caps on the tank nose.

3. SAFETY RULES & REGULATIONS

3.1 The person assigned to operate the semitrailer shall be provably familiarized with regulations introduced to govern the operation of pressure vessels in the trailer owner's country, and, if applicable, with safety rules & regulations included herein; he/she shall be obliged to adhere to them.

3.2 The vessel operation (the tank itself) shall be governed by regulations applicable in the owner's country.

The most important operation rules include:

- a) The vessel shall not be filled with material so that the trailer's effective weight is exceeded.
- b) The vessel shall not be filled with material warmer than +70 °C.
- c) The vessel shall not be pressurized with an external pressure source, whose output gage pressure is not reduced to 2 bars or below.
- d) Before the vessel is closed, make sure it does not contain inappropriate objects or substances.
- e) All fittings shall be tested and appropriately positioned. Before pressurizing commences, the gages shall read 0 bar.
- f) The bolts and screws of lids and flanges shall be checked for completeness and proper closing and tightening, respectively.
- g) When in use, the vessel and its accessories shall be continuously monitored. Any defect shall be a reason for putting the vessel out of operation.
- h) Such defects may comprise: a crack; a leak in a disconnection point or in the delivery piping; clogging of the safety valve; a failure making further operation a health hazard; any unusual operational phenomena impossible to be investigated while the vessel is in use; and a deformation of the pressure boundary.
- i) Before a person enters the vessel, make sure the internal temperature does not exceed +60 °C and the inner atmosphere is good for breathing. The person shall stay inside only as long as his/her health condition allows. The person working inside shall be monitored by another person positioned on the platform and equipped with suitable rescue means (a rope, a protective belt); the monitoring person shall be trained to give First Aid.
- j) The electrical devices used inside the vessel for lighting, cleaning, ventilation or any other purposed shall be powered with safe voltage (24 V).
- k) Any repairs of the pressure vessel shall be done solely by the manufacturing plant or an authorized firm.

3.3 Before opening the filling necks and removing the caps from the pipe couplings, the vessel shall be depressurized.

3.4 In case the semitrailer is under an electrical overhead line or close to it, no one shall be allowed to climb onto the operator's platform of the vessel.

3.5 No one shall be allowed to climb onto or stay on the operator's platform when the vessel is pressurized.

3.6 No one shall be allowed to walk or dwell on the vessel top, away from the platform protected with erected railing.

3.7 Since the vessel's center of gravity is relatively high and the train is long, take care when turning.

3.8 Check the thickness of brake lining and the amount of king pin wear and replace them in good time.

3.9 When driving the vehicle, observe the Traffic Code valid in the truck owner's country.

3.11 It is not recommended to discharge the semitrailer contents through an unfixed delivery hose onto an open space or into a small internal space not fitted with a pressure-relief filter. Unless proper safety measures are introduced, even a slight discharging overpressure may cause the hose to move; moving hose may hit somebody or the content may hit someone's eyes.

3.12 When pressurized, the vessel (the tank truck) shall not be driven, no matter how short the distance may be.

3.13 The truck shall not be driven with the platform railing erected.

4. DEFECTS AND REMEDIES

4.1 The semitrailer cannot be emptied:

The vessel may be pressurized to sufficient gage pressure; with the pressure-booster valve closed the safety valve leaks; with the pressure-booster valve open the safety valve does not leak.	The discharging device at the vessel bottom is clogged with foreign bodies - dismount the blinding flange on the discharging device body and remove the obstacles. The vessel is filled with wet material - empty the vessel mechanically and dry it. The material heaped to form a (<i>hard</i>) dome - using a rod break the dome through a filling neck.
The vessel may be pressurized to sufficient gage pressure; with the pressure-booster valve both closed and open the safety valve leaks.	Clogged delivery pipe - flush the pipe with clean air or use any other means to clean it .
The vessel cannot be pressurized, the safety valve leaks.	The valves at the air inlet to the vessel are closed - open the valves. The safety valve adjustment is faulty - replace it with a properly adjusted valve.
The vessel cannot be pressurized; the safety valve does not leak.	The second cap of the air distribution piping is not closed. A lid of a filling neck is open, or the pressure-relief valve, or the pressure-booster valve - close the lids or valves
The vessel cannot be pressurized; the safety valve does not leak; the valves at the inlet of air into the vessel are open, both the pressure-booster valve and the pressure-relief valve are closed.	The external pressure air source is faulty - replace it or repair it.
The flap in the delivery pipe cannot be opened.	The flap is obstructed with a foreign body - disassemble the flap and remove the obstacle.

4.2 Large leftover of material:

The vessel is damp inside or the material being filled is wet.	Empty the vessel, clean it and dry it.
The aeration baffle is loosened, clogged with hardened material or greasy.	Replace the baffle; make sure no air-entrained oil may penetrate into the air distribution system of the trailer.
The vessel is filled with inappropriate material.	Fill the vessel only with dry and loose material devoid of lumps and impurities.

4.3 Poor filling / discharging performance of the semitrailer:

The time needed to empty the vessel is too long or increasingly long.	Insufficient or faulty source of pressurized air. Use another.
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The air pressure escapes through a leaky lid of the filling neck or through the air-release valve. Loosened connections in the air distribution system.	Remedy the leaks. Replace faulty parts.
The pressure-booster valve in the trailer air distribution system is open too much.	Close the valve partially - search for the best position by trial & error.
The aeration baffle is damaged with hardened material, greasy or clogged.	Replace the aeration baffle.
Excessive vertical difference in levels, or the delivery course is too winding.	Streamline the course. For excessive difference in levels boost the pressure with additional source of compressed air.
The vessel is filled with inappropriate material.	Fill the vessel only with dry and loose material devoid of lumps and impurities

4.4 Defects experienced in overpressure filling:

The air-release nozzle of the vessel discharges excessive amounts of dust.	The filter hose is damaged or the filter related piping is leaky. Replace the hose, make the piping good.
The vessel cannot be filled pneumatically, the filling pipe keeps clogging. The vessel internal pressure rises.	Someone has failed to open the air-release valve of the vessel - open it.
The vessel cannot be filled pneumatically, the filling pipe keeps clogging, the air-release valve is open. The vessel is not pressurized.	Someone has failed to open the filling pipe flap - open it.

4.5 Other defects:

The pressure gages either do not indicate pressure rise or do not return to the zero position.	Blow the incoming tube clean with air; compare the pressure gage against pressure standard; replace the gage if faulty.
The pressure vessel became wet due to an open lid.	Clean the vessel and dry it.