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TRANSPORT OF DANGEROUS GOODS IDENTIFICATION OF DEFECTS IN RAIL TANK CARS

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PREFACE

Rail transport is very closely connected with accessibility of seaports and industry and is therefore very important for our economy.

During the last years, several serious rail accidents have happened in Europe involving the transport of dangerous chemical goods. Notwithstanding that statistically the likelihood of an accident related to the transport of dangerous goods is very low compared to other railway accidents, the potential consequences of these accidents are significant.

Rail Undertakings and Chemical Companies carry out systematic inspections of Rail Tank Cars (RTCs) during which technical defects are observed; some of these defects have the potential of resulting in serious accidents.

In this context, VNCI (the Association of the Dutch Chemical Industry) presents this translation of the well-known Dutch guideline "Identification of Defects in Rail Tank Cars". The initiators of this new edition are convinced that through education and the use of existing knowledge in the chemical industry and the rail sector, incidents such as drip leaks and small product spills can be reduced to a minimum. Because an incident, even a small one, can easily lead to major social inconvenience, such as shut down of rail traffic and evacuation of stations, the benefit for residents, emergency services and the business is evident.

Despite the high degree of care during establishing this guideline, it does not pretend to be complete. Additions or suggestions are therefore more than welcome. This fits perfectly in the tradition of the chemical industry and the railway sector where continuous improvement is very important as is a responsible care attitude towards the community.

Colette Alma, director VNCI
Leidschendam – April 2018



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INDEX

Introduction	6
Reporting procedure in case detection of defects	8
Not included in this edition	8
RID dangerous goods classes	9
Orange identification plates (RID 5.3.2.)	10
Dangerous goods labels and characteristics (RID 5.2/5.3)	11
Orange band for class 2 (RID 5.3.5)	12
White, blue and red placarding and codes of RTC's	12
Explanation Identification of defects in RTC's	14
Orange plates	15
Dangerous goods labels	16
Product identification plates	17
RTC's (general)	18
RTC's for liquids	20
Tank inspection time interval and other references	21
Construction of tank and chassis	22
Equipment for loading and unloading	23
Equipment on top of the tank	25
Loading and unloading devices on top of tank	26
Rail hook cable and eye for fixing rail hook for loading/unloading	27
Equipment for loading and unloading of gas RTC's	28
Hydraulic bottom valve for gas RTC's	29
Bottom valve (type hydraulic P 160) for gas RTC's	30
Bottom valve type hydraulic for gas RTC's	31
Bottom valve type hydraulic	33
Bottom valve type GESTRA (mechanic) (HWV 36)	34
Bottom valve type GESTRA (part 2)	35
Hydraulic bottom valve type GESTRA (HV 205)	36
Securing of valve	37
Dry-break systems (valves/closing devices)	38
Earthing connections between tank and chassis	39
Additional information	40
White belt for automatic ventilation for liquid RTC's	41
RTC's without automatic ventilation	42
Brake Pads	45
Adjustment of the brakes in relation to the weight of the wagon	47
Loading / unloading - do not use the handbrake	48
Axle boxes and blade suspension	49
Crash buffers (TE 22) and buffer protection (TE 25)	50
Nitrogen as a rinsing agent	51
Yellow tape with black letters	52
Earthing connections	53
Graffiti	54
"Dogstar" plug	54



INTRODUCTION

The booklet 'Identification of defects' was published for the first time in 1997 by NS Cargo in cooperation with DSM. Early 2000 the booklet was reviewed and updated by Railion.

This new edition was initiated in august 2012 by VNCI in cooperation with all partners who are involved in the transport of dangerous goods in Rail Tank Cars (RTC's).

The actual content of the booklet has been established after several sessions of the VNCI Working Group Logistics Safety.

It was decided to make this booklet available as a digital file to interested people, who can add specific working instructions and use the booklet for internal use.

This booklet is a reference guide and can be used during inspections of rail tank cars loaded with hazardous goods. Although the formal name of a tank wagon according to RID is "tank vehicle", we will use the name rail tank car (RTC) in this booklet.

The primary target group of this reference guide are certified wagon inspectors of rail companies and operators of loading / unloading sites. Also representatives of emergency response team inspectors and surveyors can make use of this information.

Unlike previous versions, administrative aspects, such as preparation of waybills, are NOT addressed in this booklet. The trend is that these administrative issues are carried out electronically more and more.

Given the fact that the RID is revised every two years, possible changes in the regulations shall be considered. If necessary, the next issue of this booklet will be adjusted accordingly.

Regarding loading / unloading of RTC's it is recommended to use the CEFIC checklists for preventing leaks when filling or discharging rail tank wagons".

Basically manufacturers / suppliers of RTC's also have guidelines with instructions for correct and safe use. These guidelines shall always be consulted in case of dissolving defects.

It is not allowed to use this booklet for commercial reasons, neither in printed form, nor in digital or any other form.

Suggestions for clarification / correction of these booklets can be submitted to the VNCI - for the contact address see colophon on the back page.

REPORTING PROCEDURE IN CASE OF DETECTION OF DEFECTS

In case of incidents and detection of defects on public rail infrastructure that might compromise (public) safety **you shall alert the infrastructure manager immediately** and inform him/her as fully as possible:

- Who are you?
- Where did the incident occur?
- Which rail track?
- Which dangerous goods/UN code?
- What is happening and what do you observe?
- Do you have information about train or wagon numbers?

Then take care of your own safety by leaving the incident area against the wind, beware other trains. Then proceed as directed by internal emergency procedures and try to remain available to assist

emergency services. Incidents that occur on not-public rail infrastructure (company sites) shall be reported and treated according to internal company and (if present) national procedures.

Please respect the obligation to report the authorities serious defects in accordance with dangerous goods legislation, e.g. RID 1.8.5.

In case of leakages not on public rail infrastructure, sender/shipper or receiver/consignee also have to report these incidents to national / local authorities, if applicable.

In all cases the consignor of the RTC shall also be informed.

NOT INCLUDED IN THIS EDITION

This edition includes all dangerous goods classes of the RID except classes 1, 6.2 and 7; these classes require specific attention.

Issues that are related to intermodal transport (tank containers) are not addressed in this edition as loading and unloading of this type of transport equipment is quite different.

Although the use of (GPS-) transmitters, to determine the exact location of RTC's (so called track and trace systems) is increasing rapidly, this subject is not addressed in this booklet because of the diversity of these systems.



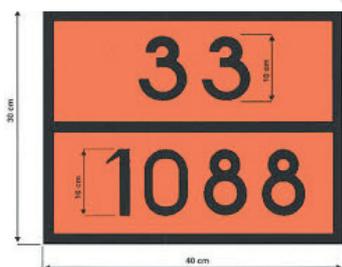
RID DANGEROUS GOODS CLASSES

Substances are classified in certain RID classes depending on their properties:

Class 1	Explosive substances and articles (not included)	Class 5.1	Oxidising substances
Class 2	Gases	Class 5.2	Organic peroxides
Class 3	Flammable liquids	Class 6.1	Toxic substances
Class 4.1	Flammable solids	Class 6.2	Infectious substances (not included)
Class 4.2	Substances liable to spontaneous combustion	Class 7	Radioactive material (not included)
Class 4.3	Substance which emits flammable gas in contact with water	Class 8	Corrosive substances
		Class 9	Miscellaneous dangerous substances and articles



ORANGE IDENTIFICATION PLATES (RID 5.3.2.)



Orange identification plates shall be attached on both sides of RTC's during transport of dangerous goods (both

for loaded as well as for empty, uncleaned RTC's). The sizes of

these plates shall be at least 40 by 30 cm and adhesive labels are allowed.

On these orange plates there are 2 numbers:

- On top the hazard identification number, this number identifies the type of hazard of the relevant substance
- At the bottom the UN number, with this number the substance can be identified

The hazard identification number for substances of the classes 2 till 9 consists of 2 or 3 digits. Generally those digits refer to the following hazards:

- 2 Emission of gas due to pressure or to chemical reaction
- 3 Flammability of liquids (vapours) and gases or self-heating liquids
- 4 Flammability of solids or self-heating solid
- 5 Oxidizing (fire-intensifying) effect
- 6 Toxicity or risk of infection
- 7 Radioactivity
- 8 Corrosivity
- 9 As 1st digit: other hazards, f. e. environmentally hazardous substance. As 2nd or 3rd digit: risk of spontaneous violent reaction

Remark: The risk of a spontaneous violent reaction in the sense of digit 9, includes the hazard of a substance and the coherent possibility of an explosion, decomposition or polymerization reaction, resulting in the release of considerable heat or flammable and / or toxic gases'.

Doubling of a figure indicates an intensification of that particular hazard.

If a hazard identification number is preceded by

the letter "X", this indicates that the substance will react dangerously with water. For such substances, water may only be used when approved by experts.

Where the hazard associated with a substance can be adequately indicated by a single figure, this is followed by zero (0).

However, the following combinations have a special meaning: 22, 323, 333, 362, 382, 423, 44, 446, 462, 482, 539, 606, 623, 642, 823, 842, 90 and 99 [see RID 5.3.2.3.2].

Some examples:

- 22 refrigerated liquefied gas, asphyxiant
 - X323 flammable liquid which reacts dangerously with water, emitting flammable gases
 - X333 pyrophoric liquid which reacts dangerously with water
 - X423 solid which reacts dangerously with water, emitting flammable gases, or flammable solid which reacts dangerously with water, emitting flammable gases
 - 44 flammable solid, in the molten state at an elevated temperature
 - 539 flammable organic peroxide
 - 90 environmentally hazardous substance; miscellaneous hazardous substances
- Note: UN 3077 and UN 3082 always indicate an environmentally hazardous substance
- 99 miscellaneous dangerous substance carried at an elevated temperature

DANGEROUS GOODS LABELS AND CHARACTERISTICS (RID 5.2/5.3)

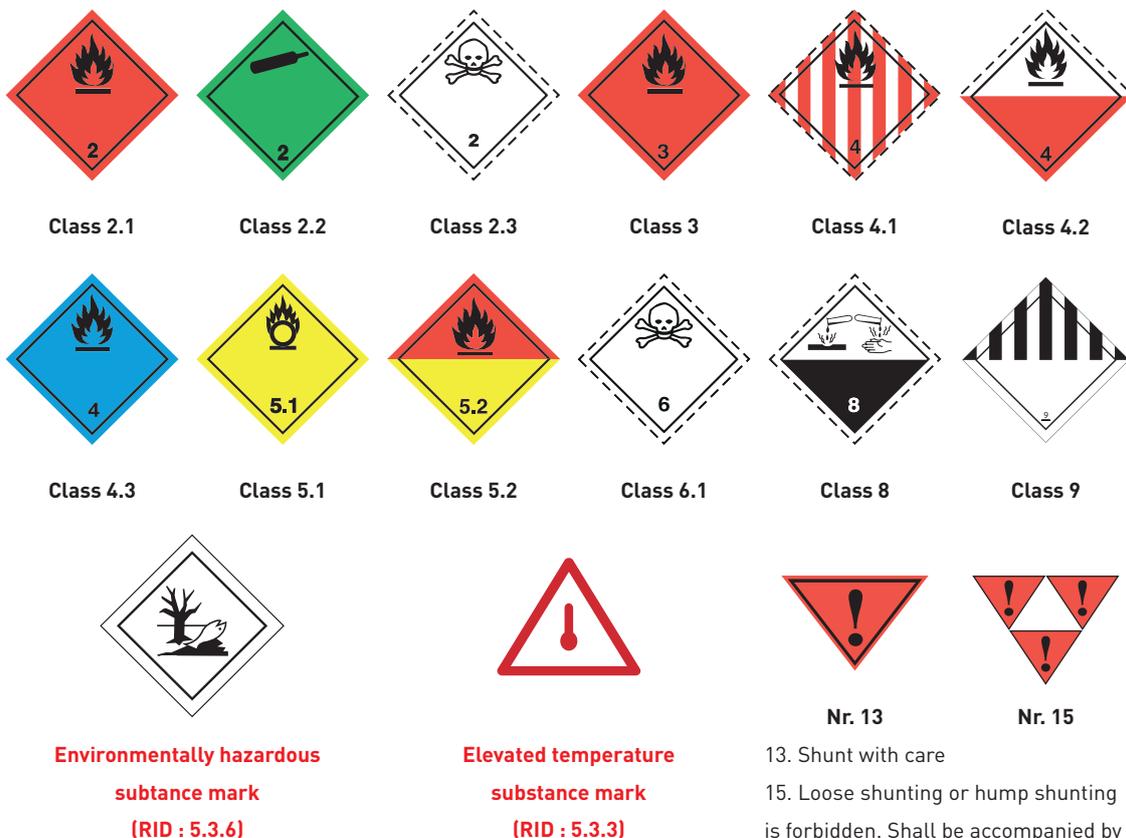
RTC's in which dangerous goods are transported should be equipped on both sides with one or more dangerous goods placards (stickers or plates). The dimensions are usually 250x250 mm, but may be reduced 150x150 mm, when the available space is insufficient (RID 5.3.1.7.4).

Each dangerous goods placard has a number that corresponds to the hazard class (nature of the danger).

Regarding the use of adhesive stickers it shall be considered that the quality of the glue can be very different.

The blow off of stickers during transport is a known issue.

It is strongly recommended to use fixed dangerous goods placards/plates or otherwise to attach the stickers with a special glue.



The pictograms in the dangerous goods placards of the classes 2.1, 2.2, 3, 4.3 and 5.2 may also be white instead of black.

13. Shunt with care

15. Loose shunting or hump shunting is forbidden. Shall be accompanied by a motive power unit. Shall not bump, or be bumped by, other wagons. (RID 5.3.4.2)



ORANGE BAND FOR CLASS 2 (RID 5.3.5)

RTC's for liquefied, refrigerated liquefied or dissolved gases shall be marked by an unbroken, 30 cm wide non-retro-reflective orange band, encircling the shell at mid-height.

WHITE, BLUE AND RED PLACARDING AND CODES OF RTC'S

In case of defects the RTC shall be equipped with white, blue or red placards, depending on the severity of the defect.

White:

indicates the defect that needs to be repaired at the first opportunity (repair, maintenance or inspection).

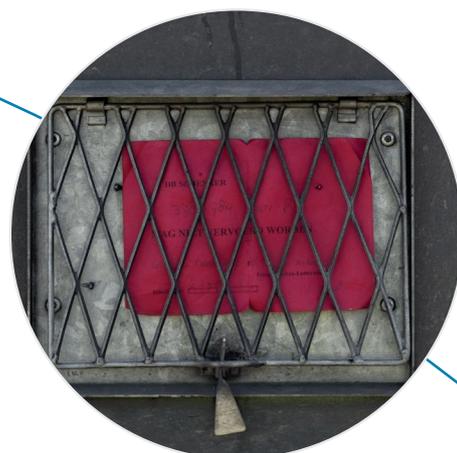
Blue:

is a defect that needs to be repaired before the rail tank car (RTC) can be reloaded (model K). The RTC can still continue to the destination for unloading.

Red:

is a defect that needs to be repaired immediately, before further operations of the RTC. Without supplementary restrictive measures, which are guaranteeing a safe onward movement of the RTC it is not allowed to transport the equipment any further.

The designation for defects and placards are documented in Appendix 9 of the guideline "conditions for the technical transfer inspection of wagons." This appendix does not specifically address dangerous substances, but general issues subjects from CGU (General Contract of Use for Wagons) (see: <http://bit.ly/1yiElkx>). To verify the correct application, appendix E of UIC-fiche 471-3 may be used.





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ORANGE PLATES

Standard/requirements

Orange plates with hazard identification/UN number shall be identical and readable and mounted on both sides of the wagon.

NB. Empty and uncleaned RTC's shall be equipped with the same labels and identifications as loaded RTC's.

In case RTC's are empty and clean, then RID labels and identifications are not allowed. It is allowed that the product name remains visible.

Orange plates and dangerous goods identification/UN number refer to the product name.

Measures in case of deviation of the standard

Staff with competence of wagon inspector

In case of defects in train or shunting part:

- Reporting according to local procedures

In case of collection of RTC at sender/shipper:

- Wagon to be rejected and sender to be contacted
- Correct dangerous goods identification/UN number with the product name on both sides of the wagon

Staff of sender/shipper

- Correct dangerous goods identification/UN number with the product name on both sides of the wagon



DANGEROUS GOODS LABELS

Standard/requirements

Danger labels (minimum size 15x15 cm) shall be identical and readable and mounted on both sides of the wagon.

NB

Empty and uncleaned RTC's shall be equipped with the same labels as loaded RTC's.

In case RTC's are empty and clean, then RID labels and identifications are not allowed. It is allowed that the product name remains visible.

Measures in case of deviation of the standard

Staff with competence of wagon inspector

In case of defects in train or shunting part:

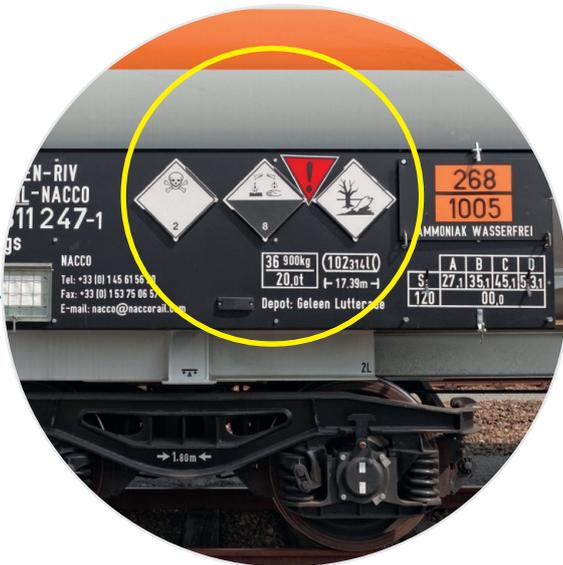
- Reporting according to local procedures

In case of collection of RTC at sender/shipper:

- Wagon to be rejected and sender to be contacted

Staff of sender/shipper

- Attach missing danger labels clearly visible on both sides of the wagon
- Before wagons leave the site, danger labels will be checked again; this can also be outsourced to a service provider.



PRODUCT IDENTIFICATION PLATES

Standard/requirements

The plates, showing information about loading and tare weight shall be undamaged. Reversible plates if, present shall be fixed and the eyes of the plates shall be undamaged. The product name should preferably be on the same plate as the ABCD table. The product name and the allowed weight shall be identical and clearly visible at both sides of the wagon. The correct product name should also be checked with the transport document.

NB tare weight can also be indicated on the chassis of the wagon.

Measures in case of deviation of the standard

Staff with competence of wagon inspector

In case of defects in train or shunting part:

- Reporting according to local procedures

In case of collection of RTC at sender/shipper:

- Wagon to be rejected and sender to be contacted

Staff of sender/shipper

- Identification plates and /or reversible plates shall be repaired
- Attach product name and/or allowed weight clearly readable in cooperation with owner of RTC



RTC (GENERAL)

Standard/requirements

The tank is undamaged and closed (no visible, smelling or audible leakage) no deformation with sharp corners; see also "insulation" (see item 2 on next page).

Measures in case of deviation of the standard

Staff with competence of wagon inspector

In case of next inspection date is exceeded:

- Reporting according to local procedures

In case of collection of RTC at sender/shipper:

- Wagon to be rejected and sender/shipper to be contacted

Staff of sender/shipper

- Tank to be cleaned and degassed and ship to workshop for repair

Explanation of photo

1. Gas RTC without sunroof
2. Gas RTC with sunroof
Attention! Roof might be loose which may cause danger for rail catenary. This can be visually checked from the ground.
3. Gas RTC without insulation
4. Isolated carbon dioxide RTC with relief valve. Gas RTC's (orange belt) for transport of liquefied, refrigerated gases could be equipped with a pressure relief valve which can be operated from outside the cabinet. Potential risks are suffocation and burns caused by extremely cold products and surface.

1



2



4



3



Standard/requirements

Insulation and cladding cover shall be undamaged.

Visible holes at the outside of the insulation and/ or cladding is not allowed. Small dents need to be checked by loading site/shipper.

Attention! When isolation is damaged, moisture or condensation may cause corrosion and subsequent leakage. In this case it is difficult to check the tank on possible damages.

Measures in case of deviation of the standard**Staff with competence of wagon inspector**

- Fix or remove loose parts
- Attach placard model K

Staff of sender/shipper

- Do not load RTC

Leakage or condensation?

In case of possible leakage always be aware for the possible presence of condensed water. Loading of liquefied gasses can be done from (semi-)cooled storage. Depending weather conditions this can cause (harmless) condensation on the tank shell. In case of any doubt always contact the loading site. Leakages can be easier identified by smell, local ice and/or whirling of gas.

Standard/requirements (Liquids)

Tank shell /cladding is free of product residues (loading /unloading spills).

Measures in case of deviation of the standard**Staff with competence of wagon inspector**

In case of defects on train or shunting part:

- Reporting according to local procedures

In case of collection of RTC at sender/shipper:

- Wagon to be rejected and sender to be contacted

Staff of sender/shipper

- Remove product residues

Standard/requirements (Gases)

Orange band around the tank, without damages interruptions and clearly visible.

Measures in case of deviation of the standard**Staff with competence of wagon inspector**

In case of defects in train or shunting part:

- Detach wagon and remove from train

In case of collection of RTC at sender/shipper:

- Wagon to be rejected and sender to be contacted

Staff of sender/shipper

- Do not load RTC



RTC FOR LIQUIDS

RTC's for liquids can be constructed as top loading/unloading tanks or bottom loading/unloading. There are also RTC's constructed for both. These wagons can also be provided with insulation.

1



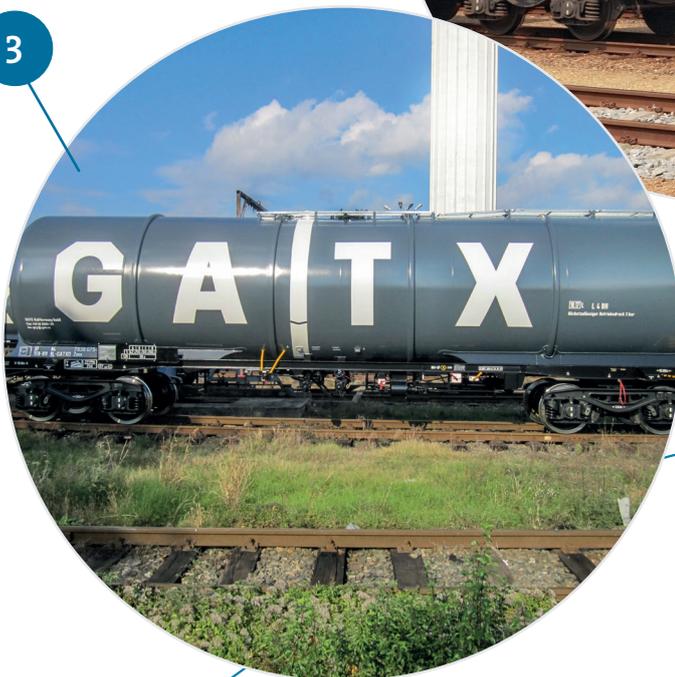
Photo explanation:

1. RTC top loader, not insulated
2. RTC top loader insulated
3. RTC bottom unloader not insulated

2



3



TANK INSPECTION TIME INTERVAL AND OTHER REFERENCES

Standard/requirements

Prescribed term of tank test is not to be exceeded.

Attention! It is permitted to ship empty uncleaned wagons for inspection after the approval date has expired.

Measures in case of deviation of the standard

Staff with competence of wagon inspector

In case of next inspection date is exceeded:

- Detach wagon and remove from train

In case of collection of RTC at sender/shipper:

- Wagon to be rejected and to sender/shipper to be contacted

Staff of sender

- Loading of wagon is not allowed.

Explanation of photo:

1. Pictogram of gasket/seal shows type of gasket material
2. Date of next test and test code "L" (Density test)
3. Tank code
4. TE22 and TE25 : measures to prevent or limit damage caused by overriding of buffers
5. Examples TE 25



CONSTRUCTION OF TANK AND CHASSIS

Standard/requirements

The connection between tank and chassis shall be undamaged (No cracks or rips larger than 1/4 of the cross-section of saddle, mounted straps / tires). The welds that connect the tank with the chassis may not show cracks or rips. Bolts or nails shall be present.

Measures in case of deviation of the standard

Staff with competence of wagon inspector

In case of defects on train or shunting part:

- Attach "blue" placard model K
- Detach wagon and remove from train

In case of collection of RTC at sender/shipper:

- Wagon to be rejected and to sender to be contacted

Staff of sender/shipper

- Do not load RTC

Photo explanation:

1. Mounting of strap/tyre
2. Connection of saddle



EQUIPMENT FOR LOADING AND UNLOADING

Standard/requirements

Valves shall be closed and secured; sealing is optional.

Attention! Although sealing is not required by RID, sealing is strongly recommended for safety and security aspects.

Measures in case of deviation of the standard

Staff with competence of wagon inspector

In case of defects in train or shunting part:

- Close and secure valves
- If closing is not possible:
- Reporting according to local procedures

In case of collection of RTC at sender/shipper:

- Wagon to be rejected and sender to be contacted

Staff of sender/shipper

- Close and secure valves
- If closing is not possible:

RTC to be unloaded

Possible leaks shall be repaired

Standard/requirements

Cap (screwed) or blind flange shall be mounted

Attention! The cap (screwed) or blind flange shall be tightened straight and firmly and the condition of the gasket shall be checked. The cap (screwed) shall be visually checked even when not used, to see if it is closed correctly and not damaged. A blind flange shall be equipped and firmly tightened. There shall be no visible smell or audible leakages on both seals.

Measures in case of deviation of the standard

Staff with competence of wagon inspector

In case of defects in train or shunting part:

- In case of not RID classified products attach the screw cap
- In case of RID classified products, reporting according to local procedures

In case of collection of RTC at sender/shipper:

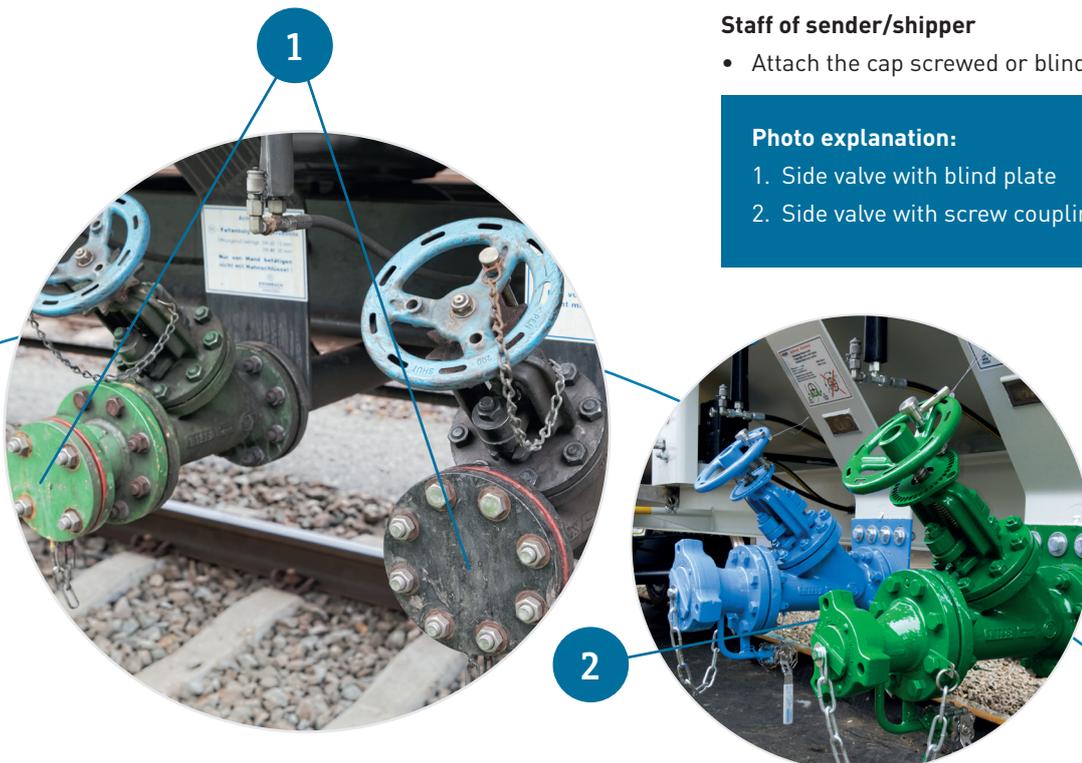
- Wagon to be rejected and contact the sender/shipper

Staff of sender/shipper

- Attach the cap screwed or blind flange

Photo explanation:

1. Side valve with blind plate
2. Side valve with screw coupling



EQUIPMENT FOR LOADING AND UNLOADING

Standard/requirements

The blind flange or cap (screwed) coupling shall be present and closed. All bolts are present and physically checked. There shall not be visible, smelling or audible leaks. Each bolt should have a proper length. For gas RTC's (f. e. ammonia) cold - proof bolts shall be used. Loading and unloading devices at the bottom shall not show any leakage.

Measures in case of deviation of the standard

Staff with competence of wagon inspector

In case of defects in train or shunting part:

- In case of leakage-reporting according to local procedures
- Attach cap of WECO coupling; when under safe conditions without protection
- Put missing screws in the blind flange
In case this is not possible or blind flange is missing:
- Wagon to be rejected and sender to be contacted

In case of collection of RTC at sender/shipper:

- Wagon to be rejected and sender to be contacted

Staff of sender/shipper

- Attach blind flange and/or bolts
- Attach the cap (screwed)

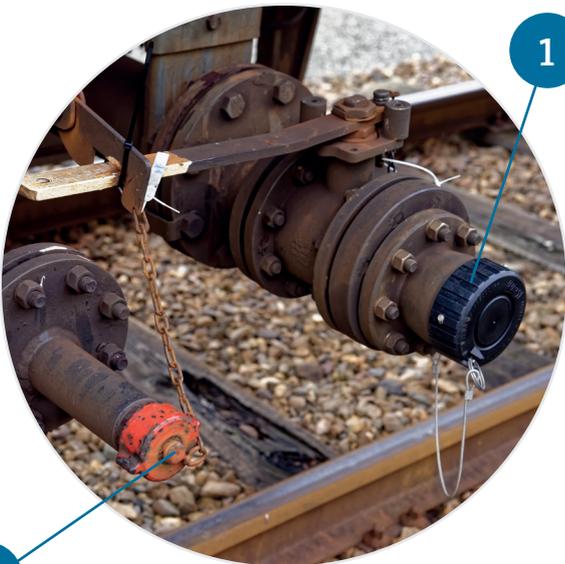
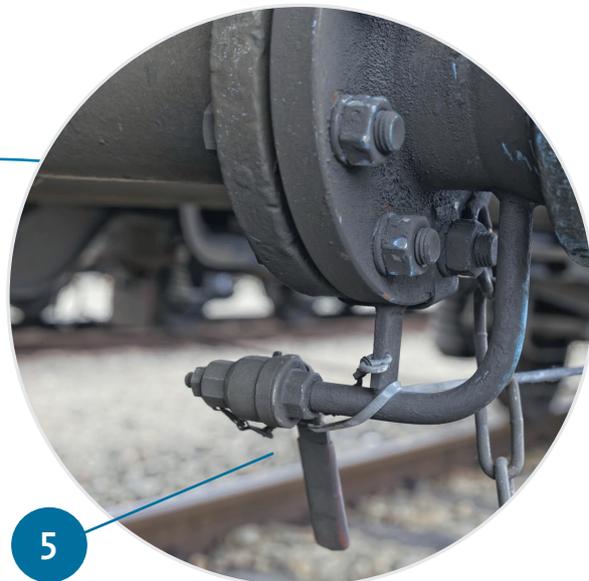


Photo explanation:

1. Dust cap
2. Vent cap
3. and 4: Nut should be fixed completely; photo is WRONG
5. Degassing tab between side valve and screw coupling



EQUIPMENT ON TOP OF THE TANK

Standard/requirements

Manhole covers shall be closed and secured and eventually sealed.

Attention! Although sealing is not required by RID, sealing is strongly recommended for safety and security aspects.

Attention! For wagon inspector as far is visible from the ground.

Measures in case of deviation of the standard

Staff with competence of wagon inspector

In case of defects on train or shunting part:

- Reporting according to local procedures

In case of collection of RTC at sender/shipper:

- Wagon to be rejected and sender to be contacted

Staff of sender/shipper

- Close and secure the manhole cover; sealing is preferred but not mandatory

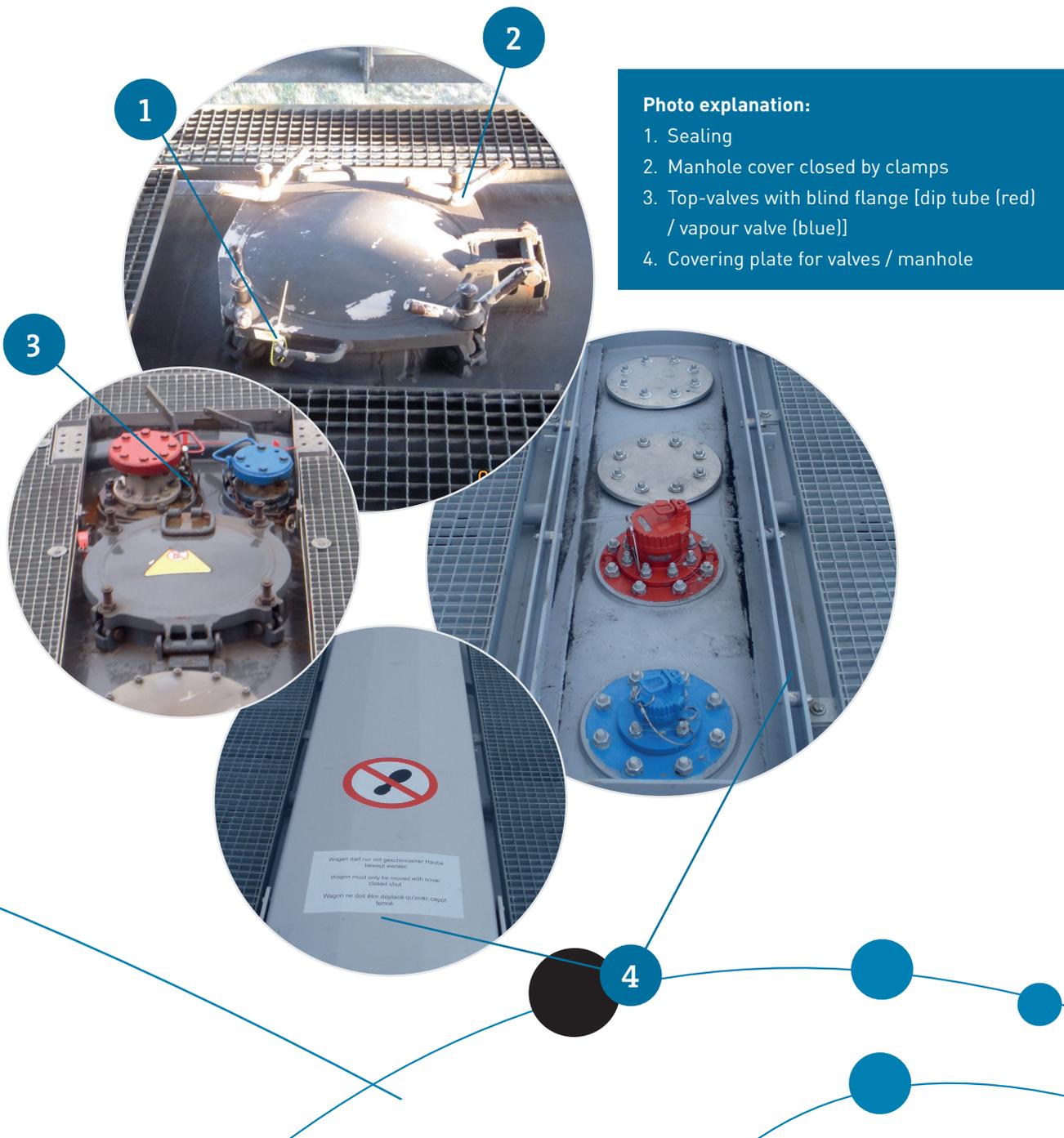


Photo explanation:

1. Sealing
2. Manhole cover closed by clamps
3. Top-valves with blind flange [dip tube (red) / vapour valve (blue)]
4. Covering plate for valves / manhole

LOADING AND UNLOADING DEVICES ON TOP OF TANK

Standard/requirements

- Loading and unloading devices on top of the tank shall be closed and secured.
- Manhole covers shall be closed and secured.
- From the ground there shall be no smell or visible product residues

Attention! For wagon inspector only as far is visible from the ground.

Measures in case of deviation of the standard

Staff with competence of wagon inspector

In case of defects in train or shunting part:

- Report according to local procedures

In case of collection of RTC at sender/shipper:

- Wagon to be rejected and sender to be contacted

Staff of sender/shipper

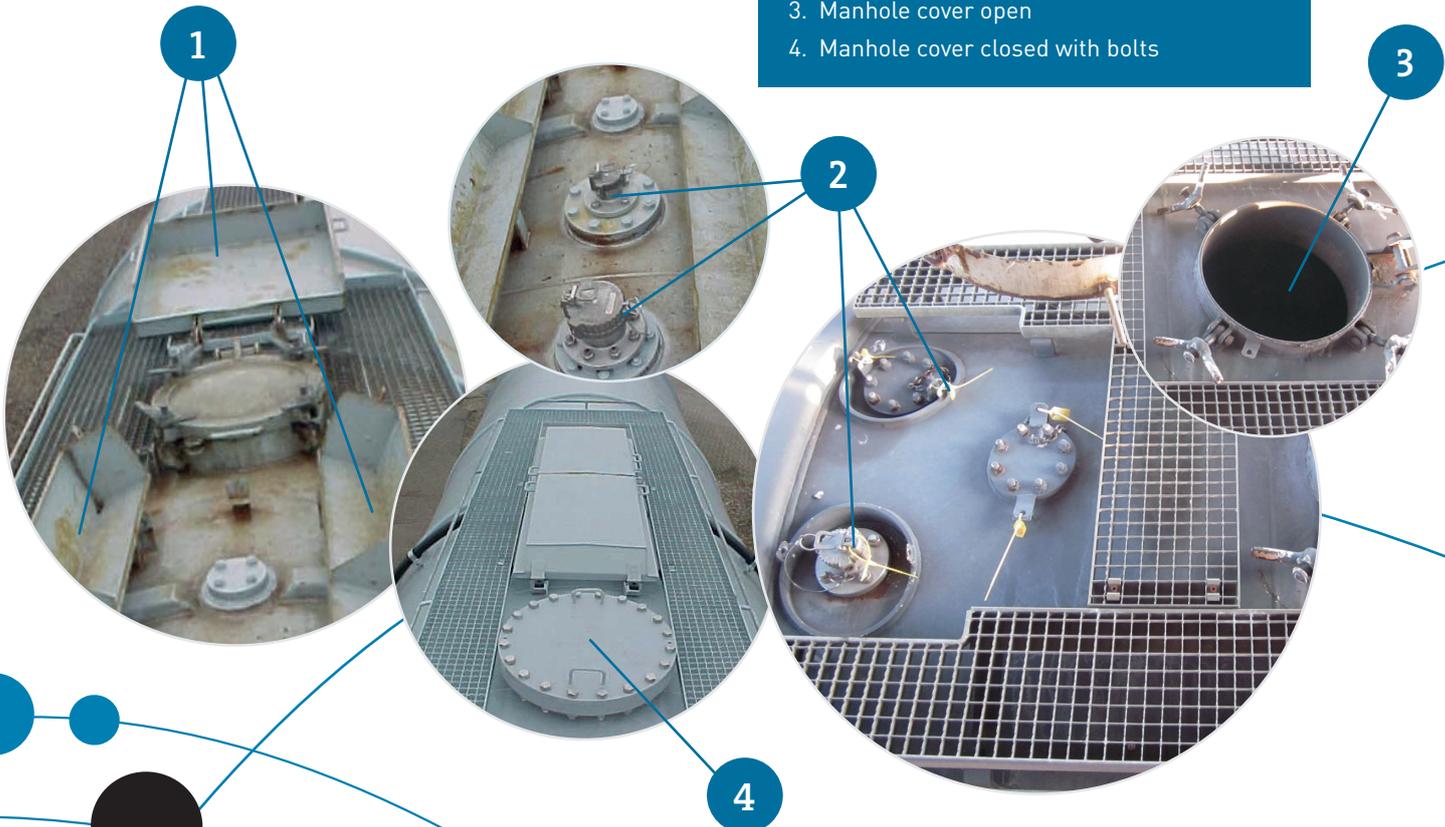
- Close loading unloading devices (valves closed, blind flanges mounted and all bolts/clamps tightened); close and secure the manhole covers and eventually sealed

Beware of overpressure.

In case of a little overpressure in the RTC, the pressure to the manhole is already very high and therefore very dangerous. Before opening the manhole please ensure that the RTC is depressurized. Do not simply trust a pressure gauge, when the pressure gauge is fitted behind a bursting disc than the gauge does not show the pressure of the tank. The key message is: open the gas phase first.

Photo explanation:

1. Manhole cover and covering loading devices are opened
2. Loading and unloading devices on top of tank are closed and sealed
3. Manhole cover open
4. Manhole cover closed with bolts





RAIL HOOK CABLE AND EYE FOR FIXING RAIL HOOK FOR LOADING/UNLOADING

Standard/requirements

Only for gas RTC's: the traction cable to open the bottom valve shall be present and can be operated normally. Examples are the "tellurite" clamp and steel rope with clamp.

Measures in case of deviation of the standard

Staff with competence of wagon inspector

In case of defects in train or shunting part:

- Repair rail hook cable

In case of collection of RTC at sender/shipper:

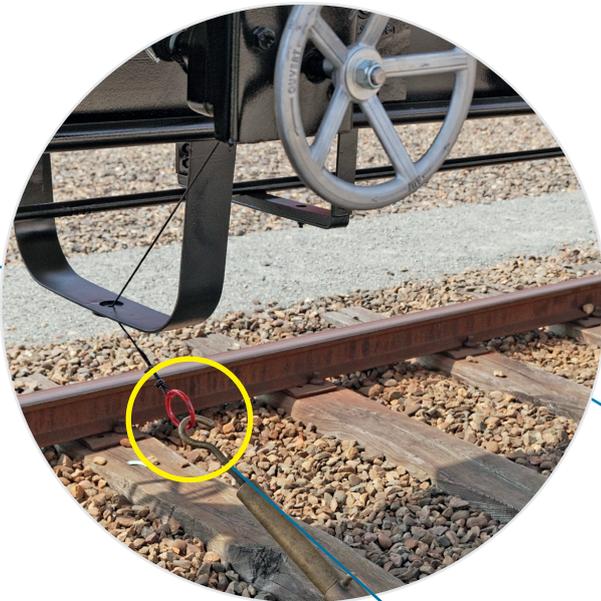
- Wagon to be rejected and sender to be contacted

Staff of sender/shipper

- Attach rail hook cable
- Repair rail hook cable

Photo explanation:

1. Rail hook cable for gas RTC's



1



EQUIPMENT FOR LOADING AND UNLOADING OF GAS RTC'S

1. Hydraulic system
2. Mechanical system

Remark: there are also pneumatic systems, however these are not common; in this booklet these systems are not addressed in this paragraph mainly loading and unloading facilities of gas RTC's are treated.

Standard/requirements

Bottom valves shall be closed and secured; sealing is optional (hand wheel or hydraulic control).

Attention! Although sealing is not required by RID, sealing is strongly recommended for safety and security aspects.

Measures in case of deviation of the standard

• Staff with competence of wagon inspector

In case of defects on train or shunting part:

- Close and secure bottom valves

If closing is not possible:

- Report according to local procedures

In case of collection of RTC at sender/shipper:

- Wagon to be rejected and sender to be contacted

Staff of sender/shipper

- Close and secure bottom valves

If closing is not possible:

- RTC to be unloaded

Photo explanation:

1. Bottom valve, hydraulically operated



HYDRAULIC BOTTOM VALVE FOR GAS RTC'S

Standard/requirements

Position of indicator/detector is DOWN.

The system is closed if the indicator is pointing downwards.

Measures in case of deviation of the standard

Push the indicator softly to check whether this is not blocked (caused by for instance corrosion or air in hydraulic system). Check also if the small lever behind the pump house is not blocked by a foreign object. Then check if the bottom valves can still be closed, if not, start procedures for dealing with an open bottom valve.

Staff with competence of wagon inspector

In case of defects in train or shunting part:

- Detach wagon and remove from train

In case of collection of RTC at sender/shipper:

- Wagon to be rejected and sender to be contacted

Staff of sender/shipper

- Close valve and indicator shall point downwards. If after closing the valve the indicator is still in open position the hydraulic system shall be repaired.

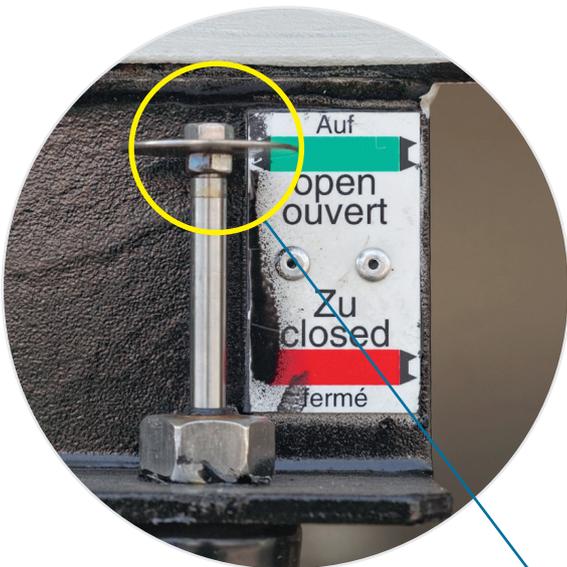
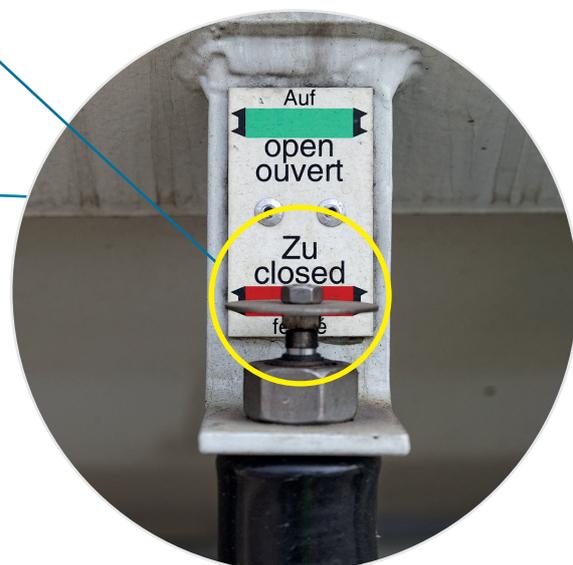
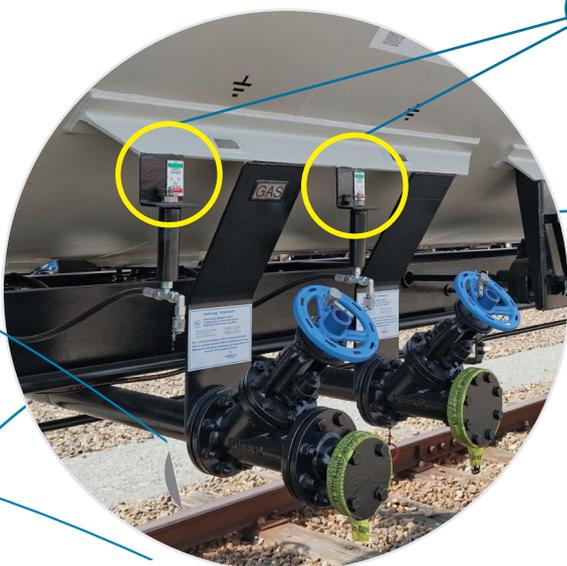


Photo explanation:

1. Indicators



BOTTOM VALVE TYPE HYDRAULIC (P 160) FOR GAS RTC'S

Standard/requirements

The lever behind the pump house shall be freely movable (there shall be no objects between lever and top of pump house).

Measures in case of deviation of the standard

Staff with competence of wagon inspector

In case of defects in train or shunting part:

- Remove object between lever and lug
- If this is not possible
- Detach wagon and remove from train

In case of collection of RTC at sender/shipper:

- Wagon to be rejected and sender to be contacted

Staff of sender/shipper

- Remove object between locking device and lug
- Remove rest product from the discharge line



Photo explanation:

1. WRONG: foreign object present, pump house is not secured
2. GOOD

BOTTOM VALVE TYPE HYDRAULIC FOR GAS RTC'S

Standard/requirements

The venting bolts (two bolts with a large head) shall be present in the pump house. These bolts may only be used in case of an emergency discharge.

Measures in case of deviation of the standard

Staff with competence of wagon inspector

In case of defects in train or shunting part:

- When bolts with a large head are installed (these are the venting bolts from the pump house) in the bottom valves then these shall be removed by authorised staff of emergency services (in this case bottom valves are opened)

In case of collection of RTC at sender/shipper:

- Wagon to be rejected and sender to be contacted

Staff of sender/shipper

- Contact the wagon owner
- Do not load the wagon
- Unloading in consultation with wagon owner

Photo explanation:

1. Venting bolts
2. Gauge glass, if present, oil level shall be visible





BOTTOM VALVE TYPE HYDRAULIC FOR GAS RTC'S

Standard/requirements

The hand wheel of the oil pump shall be locked with devices suitable for this purpose.

Measures in case of deviation of the standard

Staff with competence of wagon inspector

In case of collection of RTC at sender/shipper:

- Secure the hand wheel

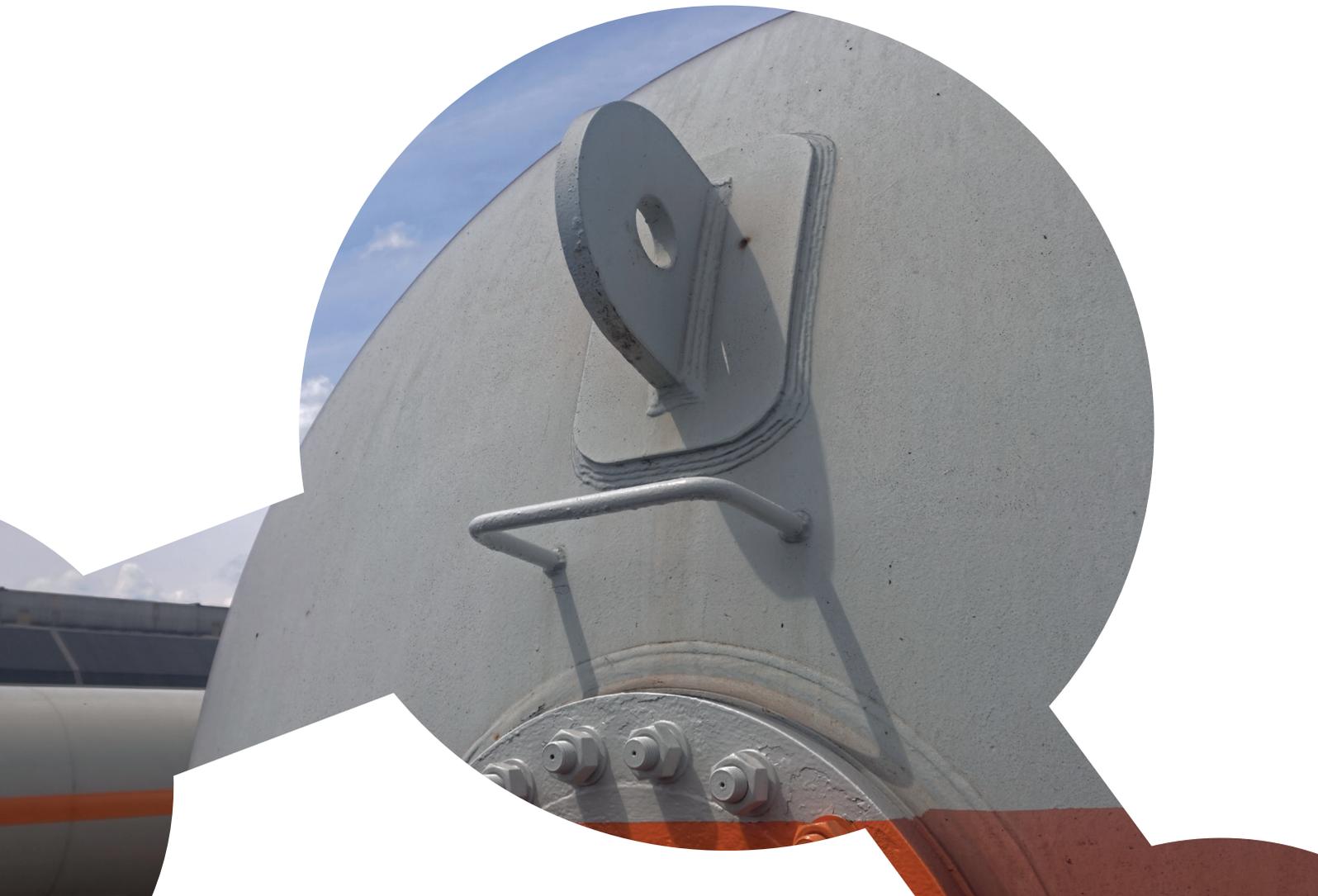
In case of collection of RTC at sender/shipper:

- Wagon to be rejected and sender to be contacted

Staff of sender/shipper

- Secure and seal the hand wheel

Attention! Although sealing is not required by RID, sealing is strongly recommended for safety and security aspects.



BOTTOM VALVE TYPE HYDRAULIC

Standard/requirements

Position of oil level indicators shall be in lowest position.

Attention! When both indicators are in the highest position then execute check as described on page 27.

Attention! Besides the indicators as illustrated there are also glass gauges.

Measures in case of deviation of the standard

Staff with competence of wagon inspector

In case of defects in train or shunting part:

- Check oil detector (push detector softly downwards, detector shall remain in this position)

If one of the detectors stays in upper position:

- Contact sender/shipper to vent the system
- If this is not possible:
 - Detach wagon and remove from train and attach "red" placard

In case of collection of RTC at sender/shipper:

- Wagon to be rejected and sender to be contacted

Staff of sender/shipper

- Check the hydraulic system and repair if necessary

If the oil detector remains in upper position:

- Do not load or unload the wagon.

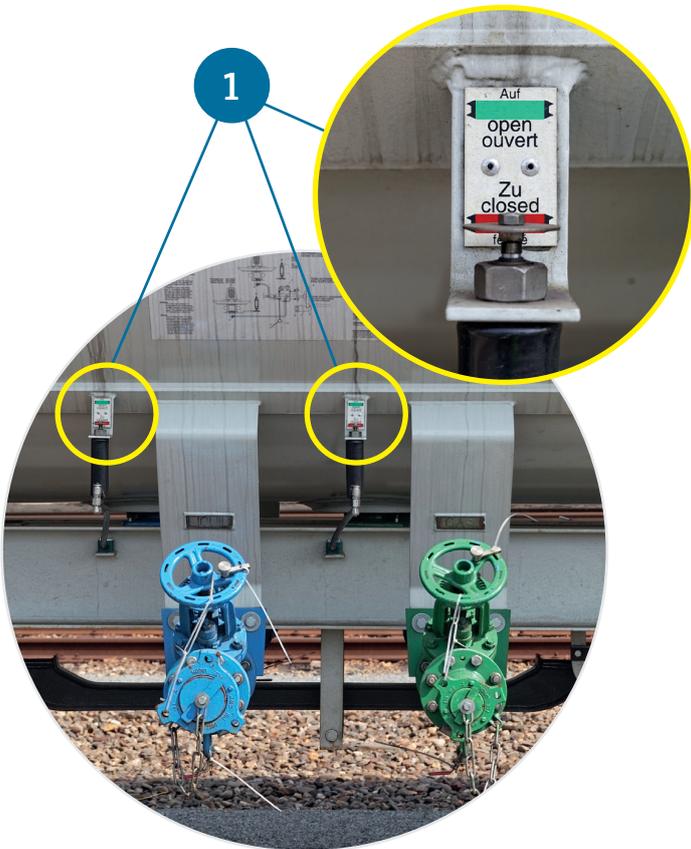


Photo explanation:

1. Bottom valve indicators

BOTTOM VALVE TYPE GESTRA (MECHANICAL) (HWV 36)

Standard/requirements

The levers are in horizontal position (no objects between lever and tank shell). The ridge shall be in locked position.

Measures in case of deviation of the standard

Staff with competence of wagon inspector

In case of defects in train or shunting part:

- Remove blockade of the lever

In case of collection of RTC at sender/shipper:

- Wagon to be rejected and sender to be contacted

Staff of sender/shipper

- Remove blockade of the lever and check proper functioning and operation
- Remove gas residues from the discharge pipe

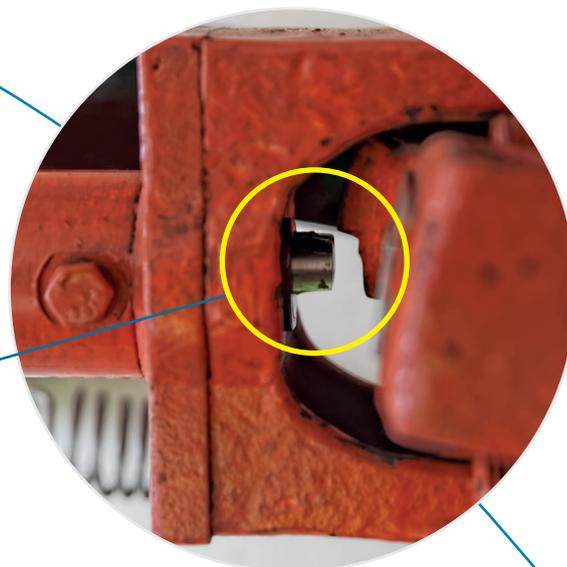
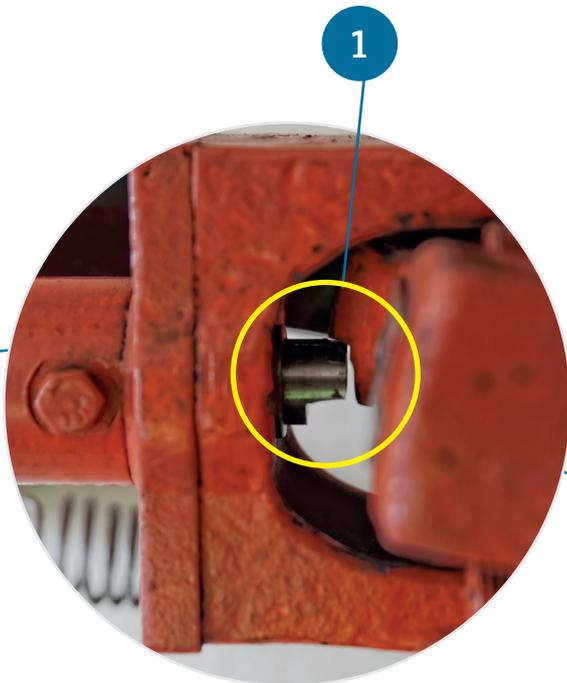


Photo explanation:

1. GOOD: bottom valve closed
2. WRONG: bottom valve open

BOTTOM VALVE TYPE GESTRA CONTINUED (MECHANICAL) (HWV 36)

Standard/requirements

The emergency bolt shall be in turned out position and secured by a cap or a similar device.

Measures in case of deviation of the standard

Staff with competence of wagon inspector

In case of defects in train or shunting part:

- Attach locking device when present.

If the emergency bolt is not turned out:

- Report according to local procedure

In case of collection of RTC at sender/shipper:

- Wagon to be rejected and sender to be contacted

Staff of sender/shipper

- Attach locking device when present.

If the emergency bolt is not turned out:

- Turn out emergency bolt. (Please note that interior part (in which the emergency bolt is screwed) cannot rotate (see inscription / instructions emergency bolt on tank))
- Remove gas residues from the loading and unloading pipes



Photo explanation:

1. GOOD cap is placed
2. WRONG cap is loose; when cap cannot be placed the emergency bolt is (partly or completely) screwed in



HYDRAULIC BOTTOM VALVE TYPE GESTRA (HV 205)

Description how to operate the bottom valve

The position of the bottom valve is indicated by one indicators per bottom valve on each side. After loosening the rail hook the oil pressure below the bottom valve will drop and the bottom valves will automatically close. The drop of oil pressure brings the indicators back in the lowest position. Only then the control cabin can be closed. Finally the loading-or unloading installation will be disconnected.

Standard/requirements

The door of the control cabin is closed.
When box is open : check indicators (push oil level indicators softly downwards) these shall remain in this position.

Attention! If indicators are in upper position (open box) then cabin cannot be closed

Measures in case of deviation of the standard

In case of defects in train or shunting part:

If one of the indicators remains in upside position

- Contact sender/shipper to vent the system
- If this is not possible:
- Detach wagon and remove from train and attach "red" placard

In case of collection of RTC at sender/shipper:

- Wagon to be rejected and contact the sender/shipper

Staff of sender/shipper

- Check the hydraulic system and repair if necessary

If the oil level indicator remains in upper position:

- Do not load the wagon.

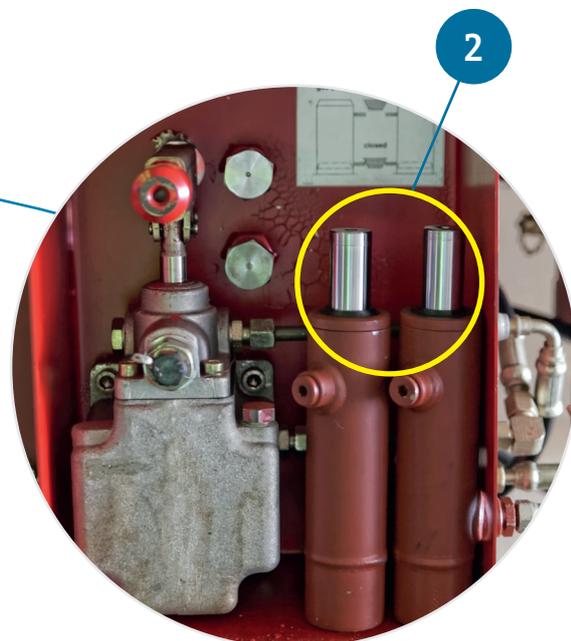
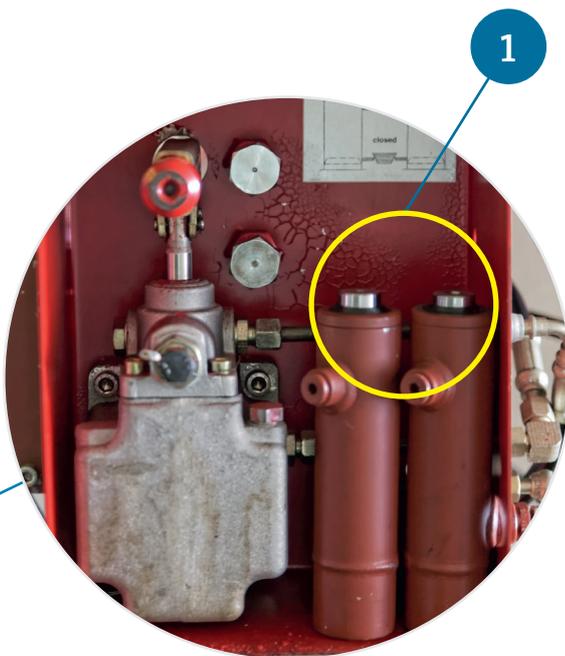


Photo explanation:

1. GOOD bottom valve closed
2. WRONG bottom valve open

SECURING OF VALVE

Standard/requirements

All valves shall be secured to prevent untimely opening. Securing shall be done by using locking pins or other devices recommended by the manufacturer. In some cases the use of qualified seals (or tie wraps) is allowed.

Attention! A "seal" to ensure that a valve was not open after discharge is insufficient to be considered as a secure lock.

Measures in case of deviation of the standard

Staff with competence of wagon inspector

In case of defects in train or shunting part:

- Attach locking pin or secure by a proper tie wrap

In case of collection of RTC at sender/shipper:

- Wagon to be rejected and sender to be contacted

Staff of sender/shipper

- Attach original locking device of manufacturer or another proper securing device

1

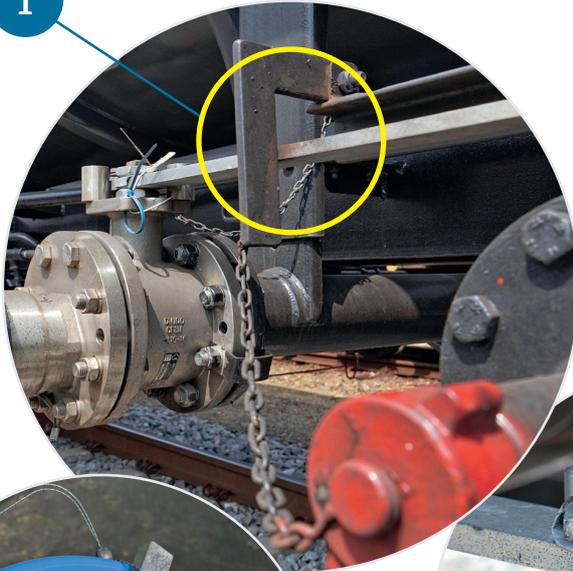


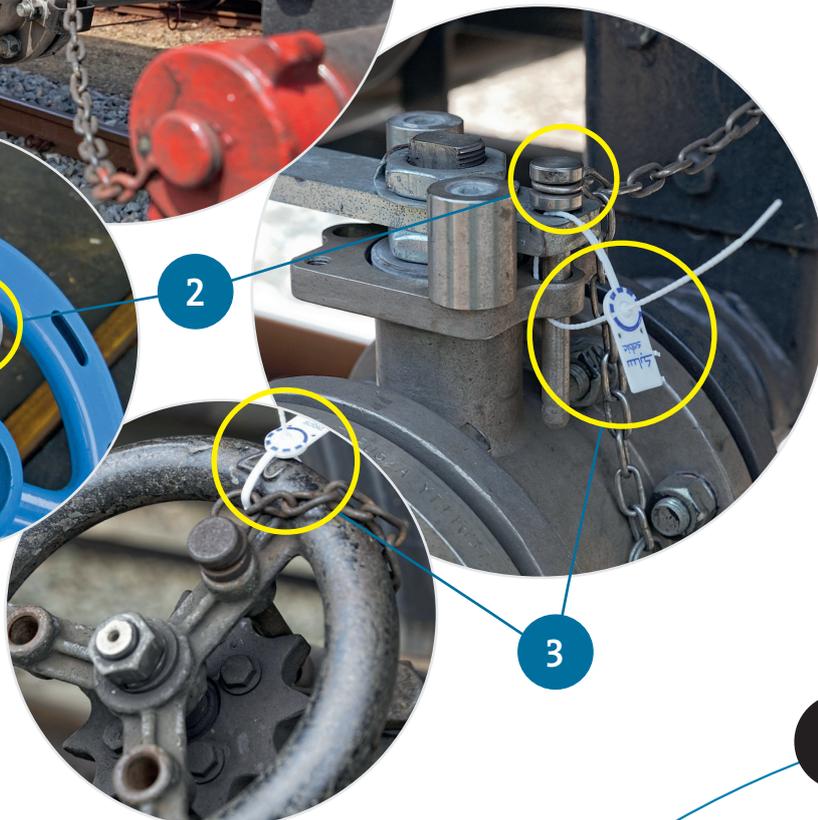
Photo explanation:

1. Securing by means of a bracket
2. Locking pin
3. Tie wrap as securing device

2



3



DRY-BREAK SYSTEMS (VALVES/CLOSING DEVICES)

Standard/requirements

Corresponding dust/pressure cap shall be attached.
Remark: a dust cap is intended to prevent the valve from dirt or dust.

Formally the pressure cap is a closing device which can be mounted with an indicator that indicates possible pressure under the cap. Dust cap and pressure cap shall be free of leaks/or products residues.

Only for sender/shipper:

- System shall be closed
- if present: pressure indicator at pressure cap shall be downwards

Measures in case of deviation of the standard

Staff with competence of wagon inspector

In case of defects in train or shunting part:

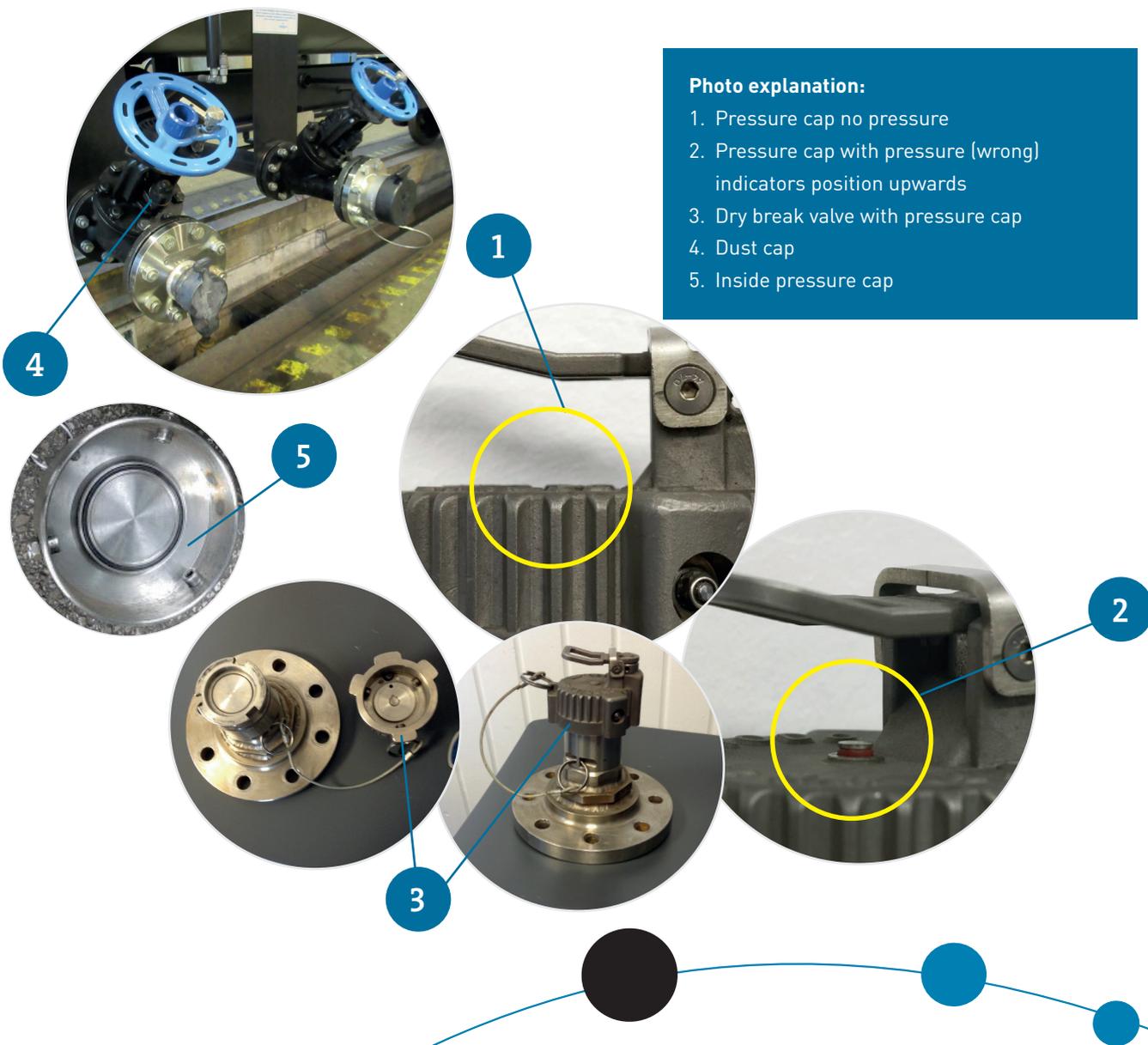
- Report according to local procedure

In case of collection of RTC at sender/shipper:

- Wagon to be rejected and sender to be contacted

Staff of sender/shipper

- If required and possible repair and or clean
- If not possible do not load or unload the wagon; clean and degas the wagon and ship to workshop for repair





EARTHING CONNECTIONS BETWEEN TANK AND CHASSIS

Standard/requirements

Earthing connections shall be present and attached.

Attention! Only applicable in case of visible earthing connections.

Measures in case of deviation of the standard

Staff with competence of wagon inspector

In case of defects on train or shunting part:

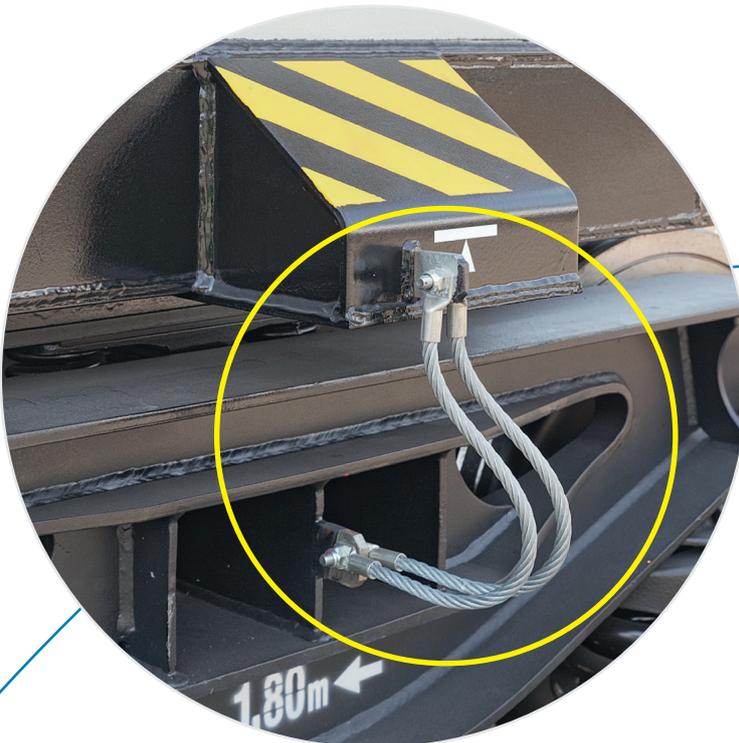
- In case one or more (not all) earthing connections are missing, attach "blue" placard (model K)
- In case all earthing connections are missing, detach wagon and remove from train

In case of collection of RTC at sender/shipper:

- Wagon to be rejected and sender to be contacted

Staff of sender/shipper

- Do not load the wagon; repair it preferably on the spot, otherwise clean and degas the wagon and transport to workshop for repair





ADDITIONAL INFORMATION

Identification of defects and other deviations as discussed in this section are not specifically for RTC's with dangerous goods, but for all RTC's.



WHITE BELT FOR AUTOMATIC VENTILATION FOR LIQUID RTC'S

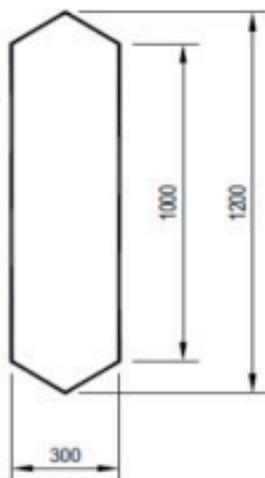
See also the following UIP website:

<http://bit.ly/2D0b3Rd>

Liquid RTC's which are provided with a white vertical belt show that the RTC is equipped with a tool that when opening the bottom valve the air valve on top of the wagon is opened at the same time and the tank will be ventilated automatically. During loading or unloading the air pipeline (venting line bottom) should be opened so that there is a flow to avoid over pressure (implosion) or underpressure causing slower loading/unloading.

On behalf of European harmonisation, the UIP (International union of private wagons) has advised to replace the white belt on RTC's by a vertical white arrow on both sides of the RTC (see picture on top of this page). This arrow indicates that the

RTC is provided with a device to avoid vacuum incidents (implosion). Existing white belts do not have to be removed with immediate effect, only in case of possible paint-refurbishment of an RTC.



RTC's WITHOUT AUTOMATIC VENTILATION.

See also the following UIP website:

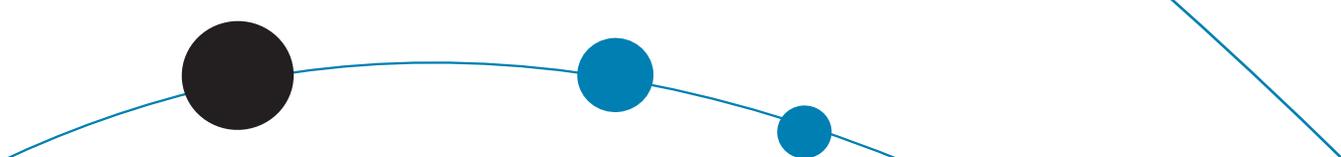
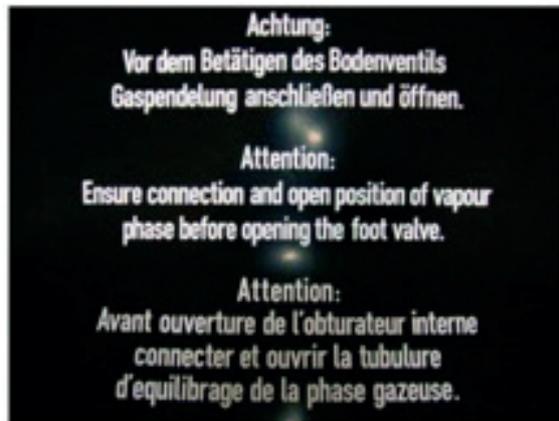
<http://bit.ly/2D0b3Rd>

Liquid RTC's which have a vapour return line that is not active, e.g. the ventilation valve is missing, should be equipped with the following indication

nicht aktive Gaspindelung
non active vapour return system
récupération des vapeurs inactive

(see box on the leftside) on both sites of the RTC at the middle of the tank (vertical), and within 3000 mm left or right of the manhole and close to the not-active vapour return line connection.

RTC's with active vapour return line, but without automatic vacuum in the vapour return system, should be equipped with a marking on both sides close to the vapour return line connection, which indicates that the vapour return line shall be opened before opening the bottom valve (see box below).







33 84 7932 372-1

B

Höchstzulässiger Betriebsdruck 3 bar

T RIV L100H TE22 02.16 L

Gewährleistung: WS
Stoffe und Bau b. 17.02.14
Anstrich HP b. 01.03.14

→ 10.46m ←

G1

6 REV WS 17.02.12

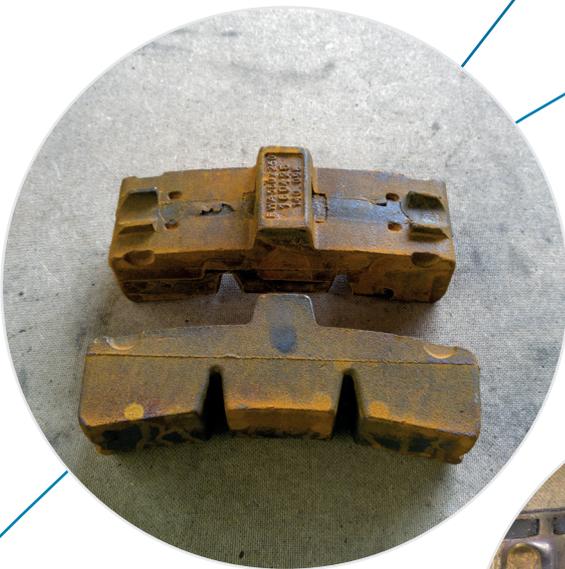
← 1.80m →

BRAKE PADS

For RTC's various types of brake pads can be used. The difference between cast iron brake shoes (GG-Grauguss) and composite brake shoes (K and LL) is the weight and noise production of the brake shoe. Cast iron brake shoes can be replaced by LL brake shoes (composite), but both types may not be used at the same time on the same wagon. Composite brake shoes are not interchangeable. The type of material used (K and LL) shall be indicated on the wagon. In 2020, 100% of the rail wagons in Germany and 80% of the rail wagons in the Netherlands should be equipped with low noise brake shoes.

Photo explanation:

1. Cast iron brake shoes
2. LL brake shoes
3. K brake shoes



BRAKE PADS



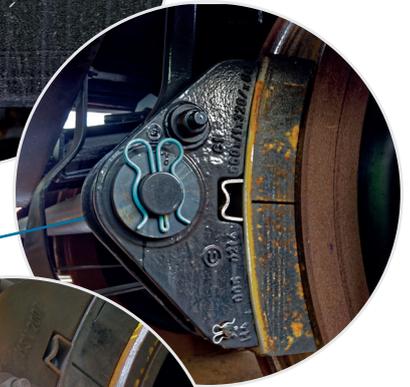
1

Whether K-or LL-brake shoes are used is indicated by an indication on the chassis of the wagon.

Damaged brake shoes can be identified by cracks and shall be replaced. Composite brake shoes are less heavy and generate less noise, but have problems with heat dissipation and shall be replaced earlier. Picture 5 shows an LL-brake shoes after about 20 km with a blocked brake



2

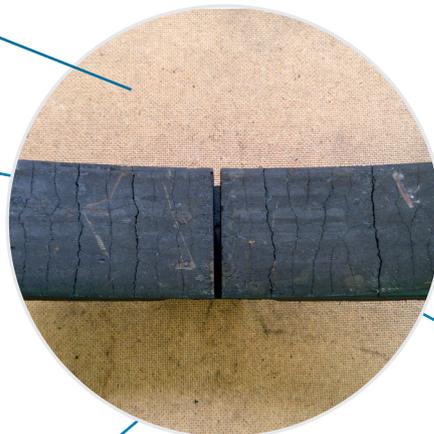


3

Photo explanation:

1. Indication K- and LL-brake shoe on the chassis
2. K-brake shoe and holder
3. LL-brake shoe and holder
4. Broken brake shoe normal wear and tear
5. LL-brake shoe with blocked brake

4



5



ADJUSTMENT OF THE BRAKES IN RELATION TO THE WEIGHT OF THE WAGON

Standard/requirements

The position of the weight indicator (in this case 48 tons) shall be in the correct position for unloaded (empty or empty/unclean = approx. 27 tons) or loaded (approx. 60 tons). Above 48 tons the reversing lever should be put in position loaded.

Measures in case of deviation of the standard

Staff with competence of wagon inspector

In case of defects in train or shunting part:

- In case loaded volume is higher than the weight indicator than put the lever in higher position.

In case of collection of RTC at sender/shipper:

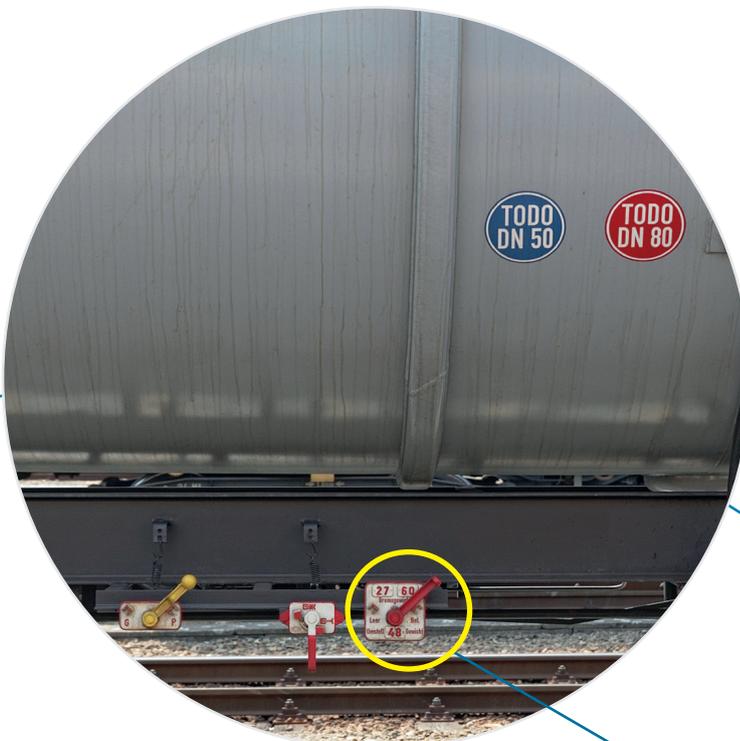
- Wagon to be rejected and sender to be contacted

Staff of sender/shipper

- Put the weight lever in correct position accorded to loaded weight.

Photo explanation:

1. Reversing lever



1



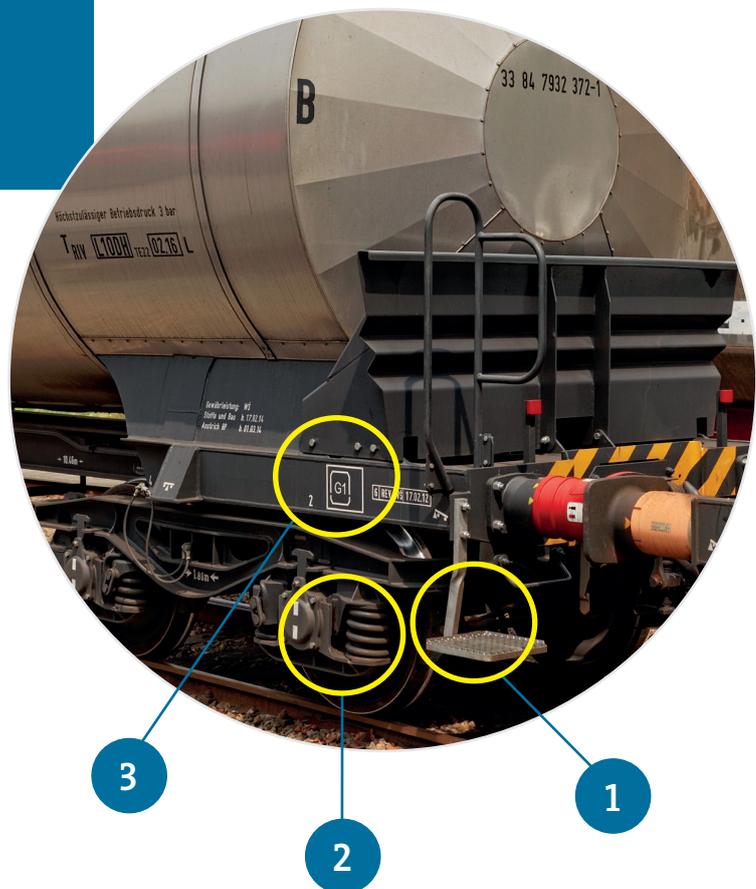
LOADING / UNLOADING - DO NOT USE THE HANDBRAKE

Loading / unloading of RTC's is documented in Cefic guidelines and/or procedures of producers, receivers and/or shippers. Special attention is required to not use the manual handbrake of RTC's during loading or unloading. The brake shoe holders are fixed to the chassis of the RTC. When during loading or unloading the handbrake is used, the suspension coil springs cannot operate as intended.

In that case the RTC cannot get in or out of its suspension until the force on the brake shoes is such that the coil springs will come in or out their suspension with a blow, causing possible damage to the brake shoes or unloading devices (such as unloading arm). During loading and unloading only use the wheel chocks or similar effective means to prevent unexpected movements of the RTC.

Photo explanation:

1. Brake shoes
2. Suspension coil springs
3. Chassis of RTC



AXLE BOXES AND BLADE SUSPENSION

Standard/requirements

Axle boxes shall be undamaged; rust may indicate damage or overheating.

No wet (grease) spots.

The blade suspension shall not be broken.

Measures in case of deviation of the standard

Staff with competence of wagon inspector

In case of defects in train or shunting part:

- Detach wagon and remove from train

In case of collection of RTC at sender/shipper:

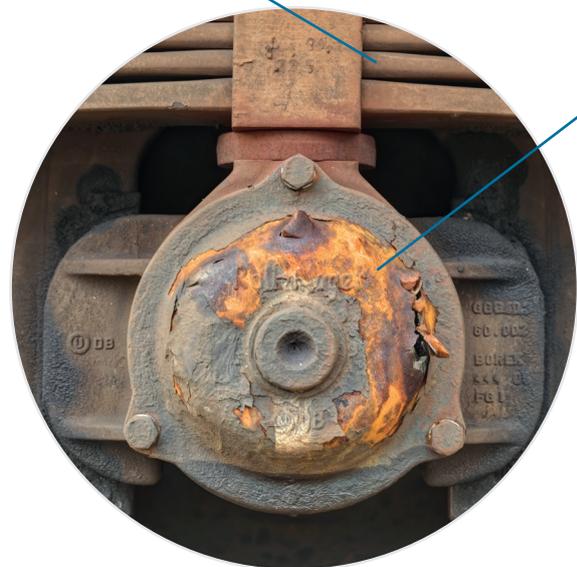
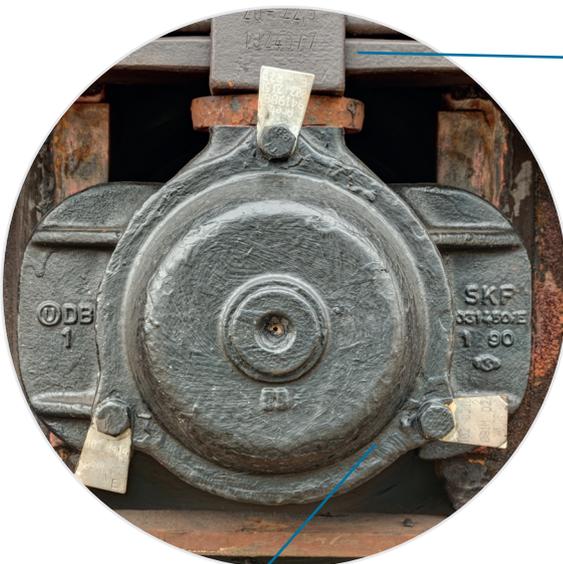
- Wagon to be rejected and sender to be contacted

Staff of sender/shipper

- Do not load empty wagon
- Unload loaded wagon
- Contact the wagon owner/lessor

Photo explanation:

1. Laminated spring
2. WRONG
3. GOOD



CRASH BUFFERS (TE 22) OVERRIDING PROTECTION (TE 25)

Standard/requirements

Crash buffers are mandatory for a number of products (TE 22), and this requirement may also be dependent on the age of the RTC. The yellow triangles shall be visible on a functioning crash buffer.

For some products buffer overriding protection (TE 25) is also required (RID 6.8.4).

Crash buffers are frequently installed in combination with overriding protection (protection against climbing on the wagon or protection plate) as additional safety measures.

Measures in case of deviation of the standard

Staff with competence of wagon inspector

In case of defects in train or shunting part:

- Reporting according to local procedures.

In case of collection of RTC at sender/shipper:

- Wagon to be rejected and sender to be contacted

Staff of sender/shipper

- Do not load empty wagon
- Unload loaded wagon
- Contact the wagon owner/lessor

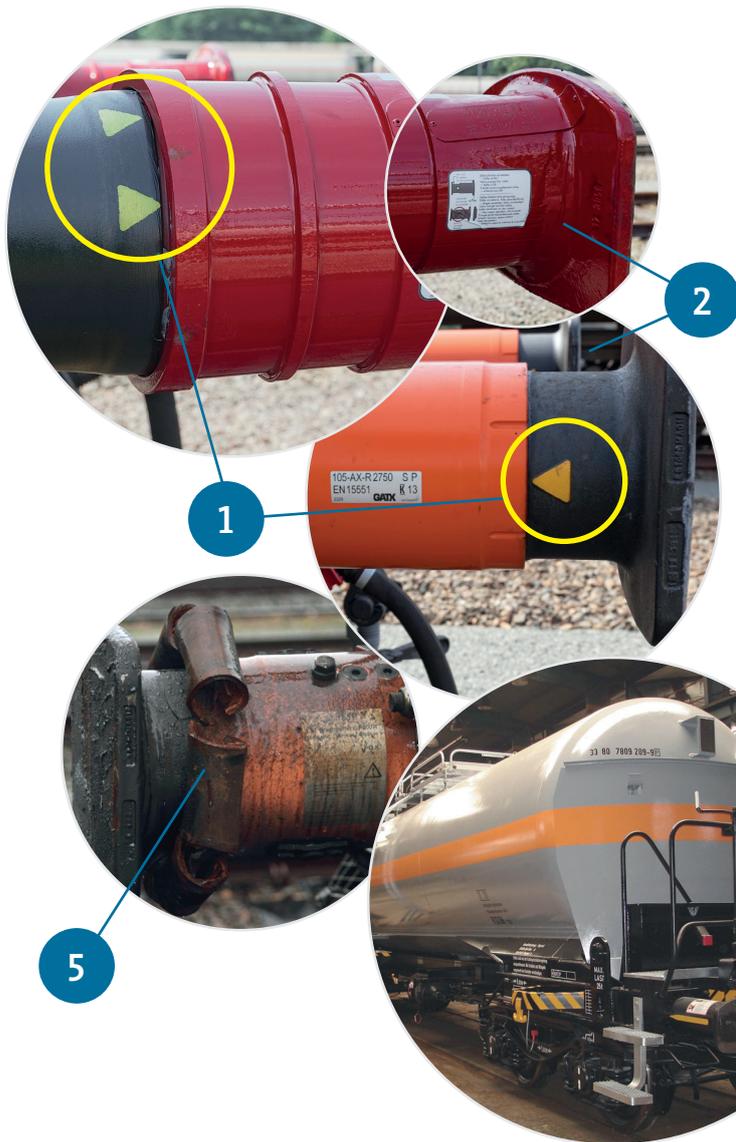


Photo explanation:

1. Yellow triangle
2. Crash buffer
3. Overriding protection
4. Protection plate
5. Unusable or damaged buffer after collision



NITROGEN AS A RINSING AGENT

Sometimes RTC's (loaded or empty) are provided under a nitrogen atmosphere. For quality reasons, with some products the ullage space is filled with a nitrogen blanket. Unloaded RTC's can be rinsed with nitrogen to remove the oxygen on behalf of other products or for transport to a workshop for inspection or repair.

The warning for nitrogen take place in different ways with both text and pictograms.

THE TANK OF AN RTC IS A CONFINED SPACE, DO NEVER ENTER THE TANK WITHOUT INDEPENDENT BREATHING PROTECTION AND MEASURE THE INNER ATMOSPHERE FREQUENTLY FOR OXYGEN AND EXPLOSION!

For empty, cleaned RTC's under a nitrogen atmosphere (up to 2 bar), the usual labelling such as danger and UN code and labels is not necessarily required.



YELLOW TAPE WITH BLACK LETTERS

See also the following UIP website:

<https://bit.ly/2l2Ee9e>

With regard to European harmonisation, the UIP (International Union of Private wagons) has advised to use yellow tape with black letter with the following text:

N₂ N₂ N₂ N₂ N₂ N₂

Or written in one of the CEN-languages:
Nitrogen / Stickstoff or Azote

N₂ - Nitrogen - N₂ - Nitrogen - N

The tape shall be fixed to all manholes, product- and vapour return connections as indicated in below pictures.

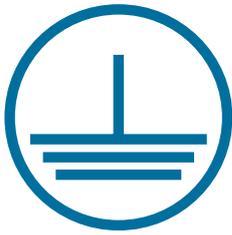
Identification on the reversible plate (see picture below)



Identification as in below pictures is also allowed and often used



EARTHING CONNECTIONS



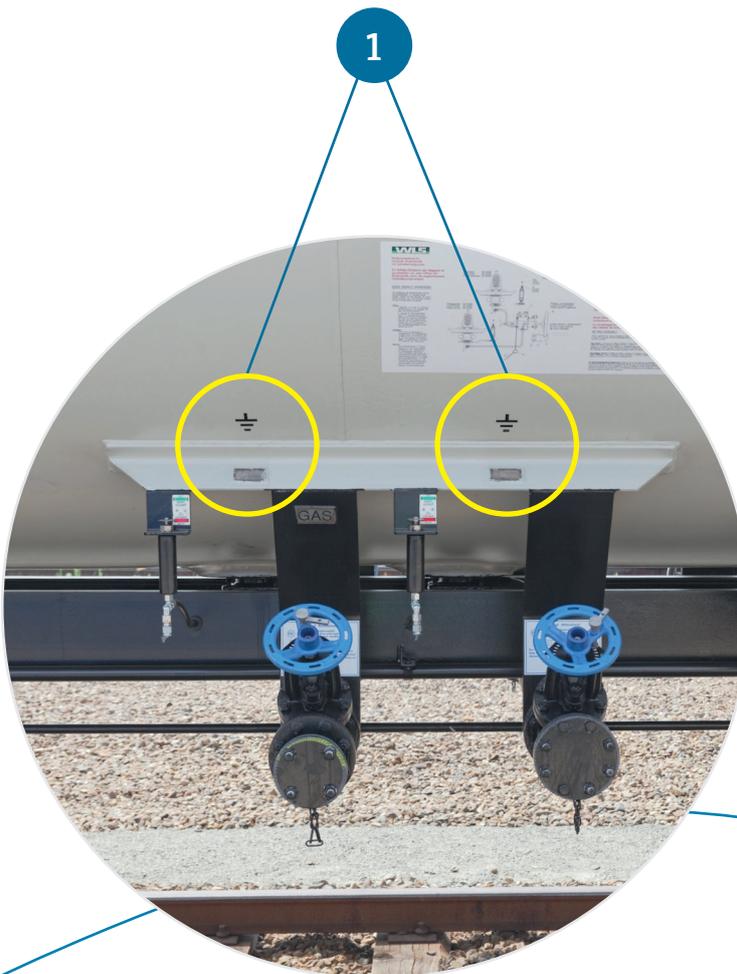
For certain products it is required that for loading and unloading an earthing connection is made between the RTC and the fixed installation of the filler/receiver.

For this purpose special earthing lugs are to be used.

To ensure proper operation, the earthing connection often shall be made blank otherwise the contact cannot always be achieved, for instance because of rust or dirt.

Photo explanation:

1. Earthing lugs



GRAFFITI



In case RTC's are contaminated with graffiti it shall be verified whether inscription plates, danger labels and the orange belt are clearly visible. Beside that it is required that the wagon number and other markings are readable.

1

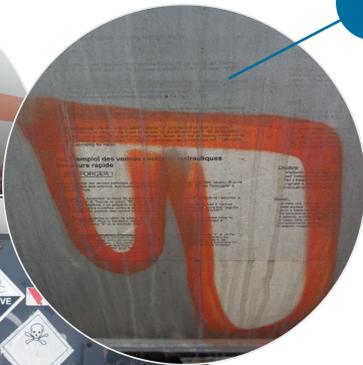


Photo explanation:

1. Operating instructions, the readability of the operating instructions is not a legal requirement
2. Picture shows a reversible plate on which the danger / UN code (eventually on a Kemmler plate) shall be visible.

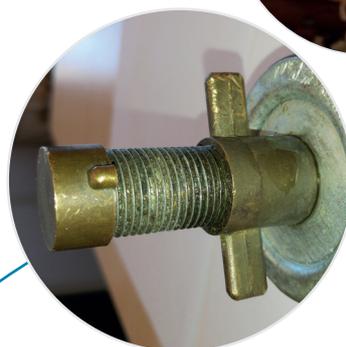
2



DOGSTAR PLUG

In case of a drip-leakage, the leakage can be eliminated by putting a so-called 'dogstar plug' in the loading / unloading-line at the bottom of the RTC as a temporary solution.

When a 'dogstar plug' is fitted, this shall be clearly identified by using a label or red-white ribbon on the loading / unloading lines (both sides), this is to prevent that the wagon will be used accidentally in the normal transport process. Prior re-using the RTC repair is needed.



COLOPHON

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Editing: VNCI

Pictures: ILT, Wiel Vrolings (DB Cargo), wagon will be used accidentally in the normal transport process. Prior re-using the RTC repair is needed.

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APPENDIX

For international legislation reference is made to the OTIF website:

<http://www.otif.org/en/dangerous-goods.html>

