

APPENDIX 10

to the GCU

Wagons

Corrective and

Preventive Maintenance

Applicable with effect from 16 June 2009

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INTRODUCTION

Appendix 10 is intended for use by staff in workshops and details the minimum condition for parts (in accordance with the criteria set at international level) on leaving the workshop.

It comprises four chapters.

Chapter A (Corrective Maintenance) is structured in the same way as Annex 1 of Appendix 9 (Catalogue of Irregularities).

This structure is as follows:

- Minimum condition and limit values for dimensions
- Indications for corrective maintenance operations – Acceptable and prohibited practices

Chapter B sets out provisions for dealing with wagons after specific incidents.

Chapter C contains provisions on the subject of preventive maintenance.

Chapter D contains provisions for the storage and transport of spare and replacement parts in the workshop area before being fitted to and after being removed from the wagon.

The markings and signs that wagons must carry are given in Appendix 11. Appendix 10 only covers those markings that can lead to a wagon being withdrawn from service under the terms of Appendix 9.

A – CORRECTIVE MAINTENANCE

0. PRINCIPLE

Wagon keepers, customers of repair work and workshops must all ensure that wagons are free from defects that are liable to lead to the vehicle being removed from service again, based on the provisions of Appendix 9 on the instructions issued for repairs to be carried out and Appendix 10, Chapter A (and where appropriate also Chapter B) on the actual execution of repair work.

Chapter A of Appendix 10 contains criteria and guidance to be applied by workshops to remove irregularities as understood by Appendix 9.

It is not necessary to apply the whole of Chapter A of Appendix 10 each time a wagon is sent to a workshop, only those provisions relating to the damage that is to be repaired.

Irrespective of the reason for a wagon's withdrawal from service, compliance with those provisions that are marked with an asterisk (*) is required systematically whenever a wagon is sent to the workshop.

If the workshop is not in a position to restore the wagon to the minimum specified condition, the vehicle must be handled in accordance with the keeper's instructions (procedure as per Appendix 9).

1. RUNNING GEAR

Minimum condition and limit values for dimensions

Wheelsets

- 1.1. The following four conditions concern the distance between the wheels, measured close to rail level, with the wagon empty or loaded, and the thickness of the flanges. They must all be met concurrently:
- 1.1.1 Distance between the active faces of the wheels, measured 10 mm down from the measuring circles :
- maximum 1426 mm
 - for wheels with a minimum diameter of 840 mm¹⁾:
 - at least 1418 mm for the wheelsets of 2-axle wagons with double-link suspension, suitable for running at 100 km/h with a 22.5t axle-load and a wheelbase of 8 m or more;
 - 1410 mm for the wheelsets of other wagons;
 - at least 1415 mm for wheels with a diameter of less than 840 mm;
- 1.1.2 Distance between the inner faces of tyres or rims of monobloc wheels:
- maximum 1363 mm¹⁾
 - minimum 1357 mm for wheels with a diameter of 840 mm or more ¹⁾
 - minimum 1359 mm for wheels with a diameter of less than 840 mm;
- 1.1.3 Wheels must show no signs of displacement along the axle;
- 1.1.4 Thickness of the flange of one wheel, measured 10 mm below the running circle:
- minimum 22 mm for wheels of diameter up to 840 mm,
 - minimum 27.5 mm for wheels of diameter less than 840 mm but at least 630 mm.
- 1.2 The diameter of the wheel running circle must not be less than:
- 840 mm for a nominal diameter of 920 to 1000 mm when new;
 - 760 mm for a nominal diameter of 840 mm when new;
 - 680 mm for a nominal diameter of 760 mm when new;
 - 630 mm for a nominal diameter of 680 mm when new.
- 1.3 The width of the tyre or rim of monobloc wheels must be:
- maximum 140 mm²⁾,
 - minimum 133 mm.
- 1.4. The height of the wheel flanges in relation to the measuring circle must be no more than 36 mm.
- 1.5. The wheel flange, measured with a gauge, must have a qR value that is always greater than 6.5 mm, with no sharp edges or burrs on the outside profile of the flange, at a distance of more than 2 mm from the upper edge (Appendix 9, Annex 4).
- 1.6 The wheel tread must not
- be partly crushed,
 - **have wheel flats of more than 60 mm in length for a wheel diameter \geq 630 mm,**

¹⁾ These rules also apply to the intermediate axles of wagons with a 3-axle articulated underframe, but not to the intermediate axles of vehicles other than bogie wagons, nor to the intermediate axles of the bogies themselves.

²⁾ Including the projection formed by the outer edge of the running tread.

- have wheel flats of more than 30 mm in length for a wheel diameter < 630 mm,
 - display metal build-up of more than 60 mm in length or 1 mm thickness for a wheel diameter ≥ 630 mm,
 - display metal build-up of more than 30 mm in length or 1 mm thickness for a wheel diameter < 630 mm,
 - have cracks at the edge of the tread.
 - Tread surface defects (shelling, cavities, exfoliation) must be no more than 60 mm long.
- 1.7 The lateral face of the wheel and the inner part of the rim or tyre (active face) must not be gouged or marked with sharp-angled notches.
- 1.8 For monobloc wheels, the wear limit of the tyres must be indicated by the bottom of a circular groove concentric with the wheel and traced on the outside surface¹⁾ This groove must always remain fully visible. It may however be partially obscured by dirt providing this does not detract from the possibility of assessing the wear state of the wheel.
- 1.9 The thickness of the wheel tyre measured in the plane of the running circle – defined as the circle where a vertical plane 70 mm from the inner surface of the tyre intersects the wheel tread – must be at least:
- for wagons authorised to run at 120 km/h
(wagons marked SS or "****") ... 35 mm
 - for other wagons²⁾ 30 mm
- 1.10 On a wheel with tyre:
- 1.10.1 the tyre must not be loose.
A tyre is considered loose if at least one of the following conditions is met:
- the tyre has been displaced by rotation on the rim in the plane of the running circle (visible from the fact that the check marks on the tyre and those on the wheel rim are not longer aligned);
 - dull sound when struck;
 - loose tyre clip;
 - presence of rust between the tyre and the rim over more than 1/3 of the circumference;
- 1.10.2 the tyre must show no signs of sideways movement (a tyre can only move sideways if the tyre clip is missing or has become loose, broken or clearly deformed);
- 1.10.3 the tyre clip must not be cracked. When the tyre clip is held in place with a wedge, the wedge must not be missing;
- 1.10.4 tyres must not be cracked or fissured in the transverse or longitudinal directions.
- 1.11 The wheel hub must not be cracked.
- 1.12 The rim of a spoked wheel must not be broken across.
- 1.13 None of the spokes of a wheel may be broken or cracked.
- 1.14 A solid or monobloc wheel must not show:
- any defects repaired by welding,
 - any cracks.
- Minor defects in the wheel body resulting from the casting process are acceptable.
- 1.15 Axles must not:
- show any cracks or any defects repaired by welding;
 - be warped;
 - have any part worn by friction showing sharp edges (sharp-edged notches);

¹⁾ If exceptionally there are two grooves on a wheel, the outer groove shall indicate the minimum thickness.

²⁾ Including wagons suitable for 120 km/h only when empty.

- show any kind of wear by friction exceeding 1 mm in depth.
Brake rods or other parts must not rub on the axles.
- 1.16* Each time the wagon is in the maintenance centre, the wheel+tyre assembly of all wagons fitted with tyres must be checked. The dates on which this verification and the one before it take place are entered in the maintenance plate specified in Appendix 11, point 7.5 against the initials of the RU and establishments that conducted the check in question.
- 1.17 **If a check is required on the distance between the inner faces of the tyres or rims of monobloc wheels, then this distance shall be measured with a gauge at rail level in at least three points on the wheel, at 120° intervals.**
- 1.18 If a monobloc wheel is suspected to have sustained a thermal overload from braking, as characterised by:
- a paint burn of 50 mm or more at the connection between the rim and wheel centre or recent traces of rust or
 - fusion of brake blocks or
 - deterioration of wheel tread with build-up of metal,
- the distance between the inner faces of the tyres of axles must be measured as indicated in points 1.1.2 and 1.17.
If this distance is within the specified tolerances, the air brake must be isolated and the vehicle fitted with labels R1 and K (Appendix 9, annex 11) marked "Brake and bearing surface to be verified for thermal overload".
These checks are not to be carried out on wheels that are able to withstand high thermal stresses and which are marked on the axle-box casing with a solid vertical white line (Appendix 11, point 6.1).
- 1.19 Wheels shall be tested for out-of-roundness when
- at least two signs of out-of-roundness and wheel tread defects as defined in Appendix 10, annex 1 are detected on a wagon wheel or its immediate environment,
 - on the wheels of the axle in question, if there are no signs on the second axle,
 - on the wheels of both axles, if there is at least one sign on the second axle,
 - they are indicated "Substantial irregular crushing on the edge of the tyre", as defined in Appendix 10, annex 1, Figure 9 (indication of a particular flat point), irrespective of the presence of any other indication.

In this respect a bogie is to be considered as an axle wagon.
The degree of wheel out-of-roundness must not exceed 0.6 mm.

Axle-boxes

- 1.20 Axle-boxes must not be damaged to the point of no longer being able to hold their lubricant or of allowing dust and water infiltration.
- 1.21 The sides of the axle-box must cover the guiding surface of the axle guard or of the corresponding bogie parts in all positions of the box, with an overlap of at least 5 mm.

Indications – Accepted and prohibited practices

- 1.22 Axles must not be repaired by welding.
- 1.23 The side faces of the tyres or rims of monobloc wheels must not be painted or covered over with oily or greasy substances, with the exception of the four painted control markings at 90° intervals used to identify tyred wheels (Appendix 11, point 6.2.).

- 1.24 Brake rods and other parts must not rub against the axles. If this fault cannot be corrected, the parts in question must be removed or suspended so as to prevent contact. The brake must then be isolated and fitted with labels R1 and K (as per Appendix 9).
- 1.25 Sharp edges on a flange may be removed on the lathe or by grinding.
Any flats or build-up of metal on the running tread may be removed on the lathe with the keeper's agreement.
- 1.26 When an axle is replaced, a wheelset or wheelsets with tyred wheels may not be fitted to a wagon equipped with monobloc wheels.
Tank wagons and wagons loaded with tank containers for the carriage of Class 2 RID products must be fitted with monobloc wheels.
- 1.27 To position the wheelsets on a lathe, the workshop of the user RU may only remove the axle-box covers if they are not fitted with centring holes. All other work on axle-boxes is reserved for the keeper alone.
- 1.28 [When reprofiling monobloc wheels with the authorisation of the keeper:^{1\)}](#)
– identify any cracks along the edge of the wheel tread and any sharp-edged dents on the flange and remove by reprofiling,
– remove any severe radial marks left by the lathe clamping jaws.
[Wheels with an out-of-roundness of \$\geq 0.6\$ mm \(see point 1.19\) may not be reprofiled. They must be removed and returned to the keeper, suitably marked.](#)
- 1.29 Existing wheelsets fitted with monobloc wheels of steel grades R2, R3, R8 and R9 must be tested by the keeper to check for the absence of cracking and lathe clamp jaw marks. After the test a triangular metal plate embossed with the steel grade is fixed to one of the bolts of the axle-box cover.
- 1.30 Wagons with load-proportional tread brakes for running under SS conditions may not be fitted with monobloc wheels of steel grades R2, R3, R8 or R9.
If thermal overloading is suspected, the provisions of point 1.18 shall apply.
- 1.31 Oil seepage between the axle and wheel hub does not constitute absolute proof of loosening. Displacement must be shown to have occurred.
- 1.32 If there is any sign or suspicion of a hot axle-box, the axle must be replaced.
- 1.33 Axle-boxes may only be lubricated by the keeper.
- 1.34 No repairs may be carried out on axle-boxes.
- 1.35 If a replacement axle is requested using Form H^R (see Appendix 7), the form shall include an indication of the diameter of the previous axle's running circle (bogie or axle wagon) so that the keeper can supply an axle with a running circle whose diameter is within the difference range permitted by the applicable regulations.
If an axle is replaced without making use of the Form H^R procedure and with no specific indication from the keeper, the difference in the diameters of the running circles must not be greater than:
– 10 mm between the two axles of a bogie
– 20 mm for axle wagons.

¹⁾ This autorisation may be permanent or issued on a case-by-case basis

2. SUSPENSION

Minimum condition and limit values for dimensions

- 2.1 The leaves of a suspension spring must not become longitudinally displaced by more than 10 mm in relation to the buckle.
- 2.2 None of the leaves must be missing, broken or cracked. This provision applies both to parabolic springs and trapezoidal springs.
- 2.3 No spiral or coil spring forming part of the main suspension must be broken.
- 2.4 None of the parts necessary for fastening the springs must be missing or broken. None of the spring buckles must be loose.
- 2.5 On wagons fitted with leaf spring suspensions, the distance between the buckle of the suspension spring and any parts of the vehicle body, underframe or bogie frame which may be liable to come into contact with it must be at least 15 mm.
- 2.6 There must be no recent traces of contact between:
- the spring buckle or other parts of the suspension and the wagon underframe or bogie;
 - the wheels and the body or underframe.
- Once the causes have been remedied, the traces of contact shall be painted over.
- 2.7 The boss of the leaf spring buckle must be properly engaged in its housing (axle-box case or plug). The axle-box case must not be in an abnormal position (twist) as a result.
- 2.8 The component parts of the elastic suspension (rings, rods, intermediate bearings, suspension pins) must not be displaced, missing or broken. The suspension pins must be properly secured.

Indications – Acceptable and prohibited practices

- 2.9 The minimum distance may not be restored by:
- placing sheet metal shims between the suspension brackets or bearings and the links, even if these sheets are welded;
 - building up the suspension brackets or bearings by welding.
- 2.10 In the event of damage to the suspension spring of a wagon with a rigid underframe (marked as shown in Appendix 11, point 7.4), both springs of the same axle must be replaced by two others with equivalent deflections. The request for spare parts using Form H (see Appendix 7) must therefore specify that the springs are to be used on a wagon with a rigid underframe.
- For springs with progressive stiffness, it is not necessary to replace both springs. When requesting springs of this kind, the type of spring must be mentioned specifically on Form H.
- 2.11 Repairing suspension springs by welding is prohibited.
- 2.12 Standard parabolic suspension springs for 22 or 22.5 tonne axle-loads can be freely interchanged in the event of damage.

3. BRAKE

Minimum condition and limit values for dimensions

Compressed air brakes

- 3.1 On wagons with compressed-air brakes, the handle of the brake isolating valve must be turned vertically downwards when the brake is operational. It must be possible to isolate the brake by a 90° turn on the handle at the most. This handle must satisfy the conditions set out in Appendix 9, annex 10.
- 3.2 The function of the brake position changeover controls must be easily identifiable in accordance with the stipulations of Appendix 11, point 4.3.
- 3.3 The main brake pipe must be in proper working order, to ensure a continuous air supply along the train.

Brake blocks, shoes, disc brakes and brake rigging

- 3.4 The disc brake indicator device must clearly display the "brake on" and "brake released" positions.
- 3.5 None of the brake rigging safety stirrups must be broken, loose or missing.
- 3.6 Wagons with protruding brake blocks must be dealt with in accordance with Appendix 9. A brake block shall be considered protruding if its outer face is level with the outer edge of the tyred wheel. This check shall be carried out with the brakes applied.
- 3.7* Cast-iron brake blocks that are worn, broken or missing must be replaced. The minimum thickness of brake blocks, measured at the thinnest point as seen from the outside, must be 10 mm.
Brake blocks
- with an incipient crack shall not be considered as broken,
 - shall be considered broken if they are only held in place by their metal reinforcement layer.
- 3.8* When brake blocks made from composite materials
- are missing,
 - are broken radially from the friction surface to the edge of the plate (except at the level of the expansion joint),
 - show visible signs of crumbling of the friction material over more than ¼ of the length of the block or metal inclusions,
 - are less than 10 mm thick in the area near the block holder,
- the workshop of the user RU must:
- either replace the blocks if it has spares in stock;
 - or isolate and drain the brake in the absence of spare blocks.
- The wagon must then be handled in accordance with Appendix 9.

Brake hose couplings

- 3.9 All wagons must be fitted with brake hose semi-couplings. Wagons with two brake coupling connections at each end for the same main brake pipe must also have two brake semi-couplings at each end.

- 3.10 Brake semi-couplings must not be defective (not airtight).
- 3.11 No part of the brake coupling system (whether connected or disconnected) must hang down within 140 mm of the top of the rails.
- 3.12 The stop cocks must be operable and function correctly. Each air stop cock must be fitted with a stop device in its extreme position that functions correctly.

Indications – Acceptable and prohibited practices

- 3.13 Damaged or loose brake parts that could constitute a safety hazard or cause other damage must be removed or securely fastened. Damage of this kind should be examined in conjunction with point 1.19. In this case, the compressed air brake must be isolated and the wagon fitted with labels R1 and K.
- 3.14 Work on the pneumatic parts of the brake system (distributors, relay valves, load-weight valves, brake cylinders) and their replacement by workshops shall not be authorised without the agreement of the wagon keeper.
- 3.15 Wagons with platform-operated or ground-operated hand brakes / parking brakes that are inoperable must be repaired. Otherwise they must be dealt with in accordance with Appendix 9.
- 3.16 Disc brake pads may be replaced exclusively by the keeper, who shall ensure that the brake is in correct working order without needing to be monitored by the user RU.
- 3.17 Missing or damaged brake semi-couplings must be replaced.
- 3.18 Safety stirrups may not be repaired by welding.
- 3.19 All brake tests in application of Appendix 12 of the GCU shall be carried out in accordance with UIC Leaflet 543-1.

4. Wagon underframe and bogies

Minimum condition and limit values for dimensions

Underframe

- 4.1 The underframe must not be visibly deformed or warped.
- 4.2 The flanges of solebars, headstocks and intermediate cross-bars subject to stress from the coupler must not have cracks (transverse cracks) starting at the edge of the flange and extending over more than half the flange width. Longitudinal cracks up to 150 mm are acceptable, except at the points where the suspension brackets are fixed to the solebars. At these points, longitudinal cracks between the flange and the web of the solebar must not exceed 100 mm in length.
- 4.3 Welded joints on underframe crossbars and solebars, and on axle guards and solebars, must not have cracks, nor must any cracks in these parts originate in the joints.
- 4.4 Two handrails for use by shunting staff (during coupling) must be fitted below each headstock.
- 4.5 Steps and handles must be fit for use. Steps and their brackets must not have cracks.
- 4.6 Wagons with wooden or inflammable floors, even if lined with a metal sheet underneath, must be fitted with spark arrestors above the braked wheels. Spark arrestor plates mounted directly beneath the floor are not acceptable.
This stipulation also applies to flat wagons that have no floor or with a skeletal floor, intended for carrying containers or semi-trailers.
The spark arrestor plates must not be dislodged or pierced through by rust.
- 4.7 Axle wagons carrying the sign specified in Appendix 11, point 2.10 must be fitted with special spark arrestors.
- 4.8 Axle guards must not be dislodged or broken. They may not have cracks over more than ¼ of their cross-section or that are extending towards or close to a fastening point.
- 4.9 No guide-pieces (wear liners) must be missing from the axle guards.
- 4.10 Axle-guard ties must not be missing or broken.
- 4.11 Suspension spring brackets must not be loose, broken, cracked or visibly deformed.

Bogies of all types

- 4.12 Welded joints on bogie frame crossbars and solebars must not be cracked, nor must any cracks in these parts originate in the welded joints. Solebars, crossbars and bolster swing-links must not have any cracks.
- 4.13 The friction surfaces of damping systems acting on the axle-box or bolster guides must not be lubricated.
- 4.14 No side bearers, side bearer parts or springs must be missing or broken.
- 4.15 The bogie must not be lying in an abnormal position in relation to the frame.

- 4.16 The centre casting must not be broken or loose.
- 4.17 The centre casting kingpin must not be missing, broken or loose.
- 4.18 No guide pieces (wear liners) may be missing.
The total length of cracks in the weld beads of the wear liners may not exceed 50% of the total length of the welds.
- 4.19 Missing earth connections (straps or cables) must be replaced. It must however be possible to see that an earth connection existed before.

Y 25 bogies and their derivatives (see Annex 2)

- 4.20 No tare springs must be cracked or broken. Damage of this kind should be examined in conjunction with point 1.19.
- 4.21 No load springs must be displaced or broken. Damage of this kind should be examined in conjunction with point 1.19.
- 4.22 All the tare springs of the bogie must coil in the same direction.
- 4.23 All the pairs of helical springs on a bogie (tare spring/load spring) must coil in opposite directions.
- 4.24 No outer or inner damper ring may be missing, broken or loose.
- 4.25 No damper cover may come into contact with the bogie frame (faulty damper).
- 4.26 No lifting T must be missing or loose. Damage of this kind should be examined in conjunction with point 1.19.

Indications – Acceptable and prohibited practices

- 4.27 Cracked steps must be replaced by the workshop of the user RU. Repairs involving welding are not permitted.
- 4.28 When the spark arrestor plates of a wagon are missing or damaged without the possibility of proper repairs being carried out, the brake must be isolated and the wagon dealt with in accordance with Appendix 9 (labelling).
- 4.29 Breakages, damage and cracks on solebars, intermediate crossbars, underframe headstocks (wagon or bogie) and welded joints must only be repaired by welding at a workshop selected by the keeper. However, the workshop of the user RU may, exceptionally, be authorised to carry out welding work for the sole purpose of repairing cracks or breakages on underframe profiles, to make it possible for an empty wagon to be returned home.
- 4.30 Wagons whose underframe is warped or deformed and which are not fit to run must be specially treated, in agreement with their keeper.
- 4.31 [Damaged axle guards and suspension spring brackets can be straightened or replaced by the workshops.](#)
- 4.32 [If the rivets or bolts used to fix the axle guards in place are loose or missing, they shall be replaced by the workshops with self-locking screw bolts or bolts locked by split pins.](#)
- 4.33 The friction surfaces of damping systems acting on the guides of the axle-boxes or swivelling bolster must not be lubricated. Any grease must be removed insofar as possible without demounting. In this case the wagon must be fitted with a Label M.

- 4.34 Welding of wear liners on bogies is only authorised after the axles have been demounted and following instructions from the keeper. Re-welding of cracks on wear liners is not allowed.

5. Buffing and draw gear

Minimum condition and limit values for dimensions

Buffing gear

- 5.1 The height of the centre of the buffing gear, measured vertically from rail level and at rest, must be:
- for empty wagons maximum 1 065 mm
 - under maximum load.....minimum 940 mm.

5.2 In abeyance.

- 5.3* No buffer or buffer fixing bolt must be missing. All fixing bolts must be tight. This also applies to permanent couplings.
- 5.4 The locking or fastening devices holding the buffer plungers in place must not be missing or damaged.
- 5.5 The buffer spring and the other parts of the buffer must not have cracks or damage liable to impede the proper working of the buffer. It is acceptable for one buffer at each end of the wagon to be compressible by hand by a maximum of 15 mm.
- 5.6 Buffer casings must not be damaged to the extent that their fastenings are no longer sufficiently robust or that buffer plunger guidance is no longer sufficiently guaranteed.
The buffer casings and plungers must not be cracked.
- 5.7* There must be no missing or loose rivets or fixing bolts on the buffer heads. This also applies to permanent couplings.
- 5.8* The contact surfaces of the buffer heads must be sufficiently lubricated. This also applies to permanent couplings.
- 5.9* The steel contact surfaces of buffer heads must not have sharp-edged grooves that could prevent the heads from sliding. This also applies to permanent couplings.
- 5.10 On wagons fitted with anti-crash devices, these devices must not show signs of having been triggered, nor any trace of deformation.
The anti-crash devices have been triggered if
- the arrow marker is not fully visible,
 - the deformation marker is missing or deformed,
 - the length of the buffer is visibly shortened,
 - the buffer casing is deformed or destroyed.

Draw gear

- 5.11 No part of the screw coupling gear (coupled or uncoupled) must hang down within 140 mm of the top of the rails.
- 5.12 The length of the screw coupler must be such that the buffers can at least be brought into contact.
- 5.13 The screw couplers and draw hooks must not be missing.
- 5.14 The screw couplers and draw hooks must not be cracked. Nor must they have sustained any damage liable to prevent the vehicle from being coupled to another vehicle or to stop them performing properly.
- 5.15 Draw bars must not be broken or cracked. Sleeves, bolts or cotter pins must not be broken or missing.

- 5.16 Draw hook rods and guides must not be worn to such an extent that the draw hook is able to rotate on its axis within the guides.
- 5.17 **If non-continuous draw gear is used, none of the following types of damage may occur:**
- fracture or defect on a volute or ring spring;
 - deterioration of a rubber or elastomer spring.
- 5.18 If continuous draw gear is used, none of the springs must not be fractured or damaged. The draw gear guides must not have cracks that are liable to prevent the draw gear from functioning properly.
- 5.19 The draw hook pin on the screw coupler must be at least 50 mm in diameter.
- 5.20 When the suspension device on the screw coupler is inoperable or missing, it must be repaired or replaced.

Indications – Acceptable or prohibited practices

- 5.21 Use of welding to repair draw gear is prohibited. However, electric welding may be used for temporary repairs to broken or cracked draw bars. The wagons concerned must be handled in accordance with Appendix 9 and transported at the rear of the train.
- 5.22 Wagons fitted with long-stroke shock absorbers whose sliding part is visibly not in the middle position must be dealt with in accordance with Appendix 9.
- 5.23 When a buffer at one end of the wagon is damaged, both buffers must be replaced. The replacement buffers must be identical. In the case of buffers with a stroke of 105 mm, 130 mm or 150 mm, the replacement buffers must however belong to the same category as the buffers removed. Also, for buffers with a stroke of 130 and 150 mm, the replacement parts must have the same design characteristics as the buffers removed.
When replacing buffers with wear inserts in the buffer heads, attention should be paid to their diagonal arrangement. The replacement operation must only take place in accordance with the keeper's instructions.
- 5.24 Missing buffer head fastening rivets may be replaced using appropriate screw fasteners. Any sharp edges on the buffer head contact surfaces shall be removed by grinding.
- 5.25 It is forbidden to carry out welding or blowtorch work on or near buffers marked on the casing with a yellow dot (see Appendix 11, point 7.9.4).
- 5.26 **Damaged or deformed anti-crash devices shall be dealt with in accordance with the keeper's instructions.** Buffers fitted with anti-crash devices must, in principle, be replaced by identical buffers. If anti-crash devices are not available, standard buffers may, exceptionally, be fitted to enable the wagon to continue its journey to be unloaded or sent to the workshop for repairs. In this case, a K Label as shown in Appendix 9, annex 11 shall be affixed, together with the sign shown in Appendix 11, points 5.4 or 5.5.

6. Vehicle body

Minimum condition and limit values for dimensions

Provisions applicable to all wagons:

- 6.1 The wagon body, superstructures and all additional devices must not be damaged in a way that could lead to deterioration or loss of the load or constitute a safety hazard for railway operations and/or a risk for persons or the environment.
- 6.2 The wagon body and its parts must not foul the loading gauge.
- 6.3 No part of the heating coupling and other coupling devices (coupled or uncoupled) must hang down within 140 mm of the top of the rails.
- 6.4 Moving parts of the wagon and the devices used to control them must not have visible damage that prevents them from functioning normally.
- 6.5 None of the wall or floor boards must be missing, broken, split or damaged to the point where the load might be lost or damaged as a result of damp.
- 6.6 The sliding doors must be mounted in such a way that they cannot come off their runners. Drop sides must be secured so they cannot part from their hinges or fastenings.
- 6.7 It must be possible to close and lock all doors and sliding walls completely and securely. They must not be missing or have come out of their runners.
- 6.8 The doors must have no deformation or holes that could lead to loss of the load.
- 6.9 No guiding or locking systems (door frames, hinges, bolts, latch hooks or handles) must be missing or be dislodged, broken or deformed.
- 6.10 All steps, handrails, ladders and walkways must be safe to use and free from cracks. This provision also applies to their fastenings and supporting structures.
- 6.11 Steps may be twisted, deformed or tilted to a maximum of 40 mm.
- 6.12 The clearance between handrails and the nearest part of the wagon must be at least 60 mm.
- 6.13 Plates carrying markings, folding panels and label-holders must not be missing and must be properly secured.
- 6.14 The following markings as specified in Appendix 11 must be fully present and legible:
 - wagon number (including country code and details of the keeper);
 - RIV sign or derogation plate (for wagons marked with exchange codes 41, 43, 45, 81, 83 or 85);
 - tare;
 - braked weight of the hand brake;
 - load limits;
 - capacity of tank wagons;
 - goods for which tank wagons are used;
 - length over buffers of wagon;
 - the high voltage warning sign "Caution – Electrical hazard" on wagons fitted with steps or ladders placed at a height of more than 2 m;
 - maintenance (overhaul) plate;
 - signs indicating the presence of anti-crash devices;
 - diagonal stripes for wagons with long-stroke shock absorbers.

Additional provisions for covered wagons:

- 6.15 Ventilation flaps must not be missing or damaged.
- 6.16 Control gear, shutters and retaining brackets must not be unhooked, dislodged or deformed.
- 6.17 The roof cover and weatherboard must not be raised or deformed.
- 6.18 It must be possible to close and lock opening roofs to prevent them from coming open unexpectedly. None of the controls must be missing, deformed or inoperable. The roofs must lie in their runners.
- 6.19 It must be possible to use roof hatches correctly.

Additional provisions for open wagons:

- 6.20 It must be possible to close and lock the side walls to prevent them from opening unexpectedly.
- 6.21 It must be possible to close and lock the end flaps to prevent them from opening unexpectedly.
- 6.22 The locking systems for the end flaps (pins, camshafts, rings, shafts) must not be missing, broken or cracked. They must be fit for use.
- 6.23 The cantrails must not be deformed, broken or cracked so as to foul the gauge.

Additional provisions for flat wagons:

- 6.24 It must be possible to lift and secure the drop sides.
- 6.25 The hinges, pins and securing devices of the drop sides must not be missing or broken. They must be fit for use.
- 6.26 Detachable, swivelling and retractable stanchions must not be missing, broken or cracked. They must not be deformed, broken or torn to the extent of fouling the loading gauge. This provision also applies to the stanchion mountings and securing devices. The stanchion fastenings must be effective.
- 6.27 Folding bolsters must not be loose.

Additional provisions for tank wagons²:

- 6.28 Tanks must not have sharp-edged deformations (even if there is no loss of the goods carried).
- 6.29 Cracks in tank cradles are not accepted. If the tank is fastened to the underframe using bolts or rivets, none of these must be missing.
- 6.30 The welded joints on the tank and the underframe must not be cracked.
- 6.31 Ladders, platforms and guard rails must be safe to use and must not be loose.
- 6.32 Tank cladding, sun-roofs and insulation must not have come loose.

² Tank wagons are wagons used for transporting liquids, gases, powdered or granular goods

- 6.33 The tanks and their filling and emptying devices must not leak. It must be possible to seal them hermetically, with the exception of the automatic ventilation devices (Appendix 11, point 6.3).
- 6.34 Screw caps must not be missing.
- 6.35 The blind flanges must not be missing or loose. All the fastening screws must be in place.
- 6.36 The emergency control screw for the emptying valve must be unscrewed.
- 6.37 The indicator on the emptying valve must be functioning correctly.
- 6.38 The dome hatch must be present. It must be possible to close it hermetically.

Additional provisions for mechanically sheeted wagons:

- 6.39 It must be possible to close and lock the mechanical sheeting correctly (indicator visible). This requirement also applies to the locking system for the end hoops.

Additional provisions for wagons with telescopic hood:

- 6.40 It must be possible to close and lock the hoods correctly, keeping them in the guide rails provided.

Additional provisions for flat bogie wagons for carrying road and rail vehicles:

- 6.41 The moving headstocks at each end must not be damaged. It must be possible to lock them from both sides.
- 6.42 The sealing plates, plate bolts, securing chains and chain eyes must be fit for use.

Additional provisions for ACTS carrier wagons:

- 6.43 The swivel frames must not be damaged to the extent that they cannot be properly fastened and locked.
- 6.44 The snap locks must function properly.
- 6.45 The central lock must function and clearly show the "locked" position.
- 6.46 It must be possible to erect the stanchions correctly.

Additional provisions for car-carrying wagons:

- 6.47 It must be possible to raise and secure the end boards and crossing gangways.
- 6.48 The upper loading deck must rest on the supporting brackets and be properly secured. The indicator device must function.
- 6.49 None of the accessories must be loose (scotches, wheel scotch guide-pieces, crank handles, lifting or lowering device, end boards, crossing gangways).

Additional provisions for self-discharging wagons:

- 6.50 It must be possible to close and lock all valves and hatches.
- 6.51 No part of the locking and discharging system must be loose.

Indications – Acceptable and prohibited practices

- 6.52 When deformation has occurred and the vehicle gauge profile must be verified, the provisions of point 4, Section 1 of the Loading Guidelines shall be applied.
 - Exception: for wagons built in accordance with UIC Leaflet 505 and whose width exceeds that obtained by application of point 4, Section 1 of the Loading Guidelines (these wagons are not specially marked), the wagon keeper should be contacted to find out the permitted width of the wagon.
Failing a reply from the keeper, point 4 of Section 1 of the Loading Guidelines shall be applied for safety reasons.
- 6.53 Parts made from plastic or plywood (e.g. roof covers and side wall panels) must not be repaired with nails. These wagons carry the sign specified in Appendix 11, point 2.14.
- 6.54 Rivets used for fastening the tanks of tank wagons may be replaced by bolts when missing.
- 6.55 Welding work on tanks may only be carried out by approved workshops with the keeper's agreement.

B – HANDLING OF WAGONS AFTER SPECIFIC INCIDENTS

0 Principle

After specific incidents, the user RU must ensure that any damage or presumed damage that the wagon has suffered will not give rise to consequential damage. To this end, this chapter sets out a number of additional provisions to be complied with when returning the wagon to running order. These additional tests are designed to ensure that damage such as deformation of the bogie and/or underframe or cracking, which can jeopardise the wagon's fitness for use, has not occurred. If workshops are unable to restore the wagon to the minimum condition specified, the vehicle shall be referred to the keeper for a decision on what action to take (in accordance with Appendix 9).

1 Derailment

When a wagon has derailed, the distance between the inner faces of the tyres (or rims for monobloc wheels) must be measured on the wheelsets that derailed, as specified in Chapter A, point 1.17. If the difference in the dimensions is greater than 2 mm, the wheelset must be replaced.

Derailed wheelsets that have been replaced must be clearly marked before being sent back so that the keeper or the keeper's workshop can recognise that the wheelset has derailed (Model H^R).

2 Exceptional impacts

When a wagon has suffered an exceptional impact, it is assumed that the speed of impact was greater than 12 km/h. In this case, the following tests shall be carried out:

- measure buffer height and check for visible damage to the buffers,
- ensure buffer longitudinal clearance is less than 15 mm,
- ensure twist clearance is less than 5 mm (only for non-rotating buffers),
- visual inspection of headstock compression in the buffer area and the underframe members immediately behind it.

3 Overloading (recommendation only)

When a wagon is brought in because it has been overloaded (whole wagon, bogie or wheelset), the vehicle should first be unloaded and the following inspections and measurements carried out:

- visual inspection of suspension springs for ruptures, cracks and deformation,
- visual check for traces of contact on the springs and parts of the underframe or bogie,
- inspection of the wheelset(s) for excessive thermal stressing or other damage.

In case of doubt, the wheelset(s) should be replaced and marked as having been subject to overloading (Model H^R) before being sent back to the wagon keeper.

4 Flooding (recommendation only)

The following inspections and measures shall be performed on wagons that have stood with all or part of their underframe under water in order to return them to running order, where appropriate after cleaning:

- replacement of all wheelsets,
- before they are sent back, all the wheelsets that have been subject to flooding must be clearly marked so they are recognisable to the wagon keeper or his workshop as having suffered potential damage from water (Model H^R),
- visual inspection of suspension springs to check for corrosion that could lead to a rupture of the spring,
- replacement of any buffers that were below the waterline,
- draining of water from the main brake pipe. The wagon should be handled with the brake isolated in accordance with Appendix 9.

5 Contact with energised catenary

When parts of the wagon body have come into contact with energised catenary wires, the axle-boxes are likely to have sustained damage from the passage of electric current.

In cases such as these, the following measures shall be taken:

- replacement of all wheelsets on the wagon,
- before they are sent back, all the wheelsets that have been affected by the electric current must be clearly marked so they are recognisable to the wagon keeper or his workshop as having suffered potential damage from electric current (Model H^R),
- inspection of the vehicle body to check for other damage with potential consequences for the wagon's fitness to run.

C – PREVENTIVE MAINTENANCE

0 Principle

When overhauls are carried out, the keeper must ensure that wagons are restored to a condition making them fit for normal service, in terms of load safety and conservation, until the next scheduled overhaul.

This overhaul must form an integral part of a time-based or performance-based maintenance system.

1 Overhaul periodicity

- 1.1 In a time-based maintenance system, overhauls are carried out after a set period defined in UIC Leaflet 579-1. With this system, the period between overhauls corresponds to the validity period indicated on the maintenance plate. The maximum validity period on the maintenance plate must not exceed the value indicated in point 1.3.
- 1.2 In a performance-based maintenance system, overhauls are carried out when the wagon reaches a performance limit expressed in tonne-kilometres and defined in UIC Leaflet 579-1. The validity period on the maintenance plate must not exceed the value indicated in point 1.3.
- 1.3 The maximum validity period on the maintenance plate (Appendix 11, point 2.3) is as follows:
 - 1.3.1 6 years, with a possible 3 month extension, for wagons meeting the following conditions:
 - distributor type Bd, Ch, O, KE, WE, DK, WU or WA;
 - automatic brake-rigging adjustment facility;
 - double-link suspension for axle wagons;
 - bogies with leaf springs and link suspensions (by derogation, also the modernised "Niesky" bogies on DB wagons);
 - bogies with helical springs and UIC damper or equivalent;
 - buffers conforming to UIC Leaflets 526-1 or 526-2.
 - 1.3.2 4 years, with a possible 3 month extension, for wagons that do not meet the conditions in point 1.3.1.
 - 1.3.3 To be eligible for this 3 month extension, wagons must carry the marking "+3M" (Appendix 11, point 2.3). Wagons that are not marked "+3M" may obtain the marking at the keeper's request if the condition of the wagon permits.
- 1.4 However, the keeper must set a shorter validity period when necessitated by the type of wagon and the conditions of its operation.
Additionally, for SS¹⁾ braked wagons with a maintenance plate validity period of more than 3 years, the keeper shall organise an intermediate inspection.
This inspection may be confined to a random check if the results obtained are satisfactory.
- 1.5 Tank wagons for which the date (end of month) of the next tank test has become due (Appendix 11, point 6.4) shall be handled in accordance with Appendix 9.

¹⁾ In accordance with UIC Leaflet 543

D – TRANSPORT AND STORAGE OF PARTS

0 Principle

When wagon parts are transported, transhipped and stored before they are fitted to wagons, after their removal and in preparation for being sent back to the wagon keeper, particular care must be taken to ensure that their inner components remain undamaged and their surfaces and anti-corrosion coatings intact.

1 Wheelsets

Storage

- When stored side-by-side on the track, there must be no contact in the wheel profile area. Flange-to-flange contact is permissible.
- When stored in staggered formation (with double rail) there must be no contact between axle-box / flange or flange / axle shaft.
- When storing wheelsets in loading cradles, similar precautions must be taken.
- Storage on flat surfaces is permissible if the wheelsets are resting on suitable materials (wood, rubber, plastic) so that the surfaces in contact are not damaged.
- The wheelsets must be placed and moved in such a way that no damage can occur to the wheelset or its component parts.
- Wheelsets shall be secured against rolling away using wheel scotches, scotch blocks or hollow seats in the track.
- Stacking of wheelsets is permissible, if the above-mentioned provisions are applied for storage. Any axle-to-axle contact is forbidden.

Transport

- During transport by fork-lift truck, the tines of the fork and their ends must be fitted with protective padding. Damage resulting from wheelsets rolling off the forks should be prevented.
- If load handling attachments are used, the wheelsets must not be damaged as a result.
- Wheelsets should be transported between workshops and spare parts centres in loading cradles wherever possible. The wheelsets must be loaded and secured in such a way that there is no possible contact between them during transit. Axle-boxes must be secured against rotation.

2 Other parts

- Buffers shall be stored in such a way that no water is able to penetrate between the buffer casing and the plunger.
- If parabolic springs are transported directly by fork-lift truck, the tines of the fork and their ends must be fitted with protective padding (rubber inserts) to avoid damaging the anti-corrosion coating.

Appendix 10 – Annex 1
Signs indicating out-of-roundness on wheels

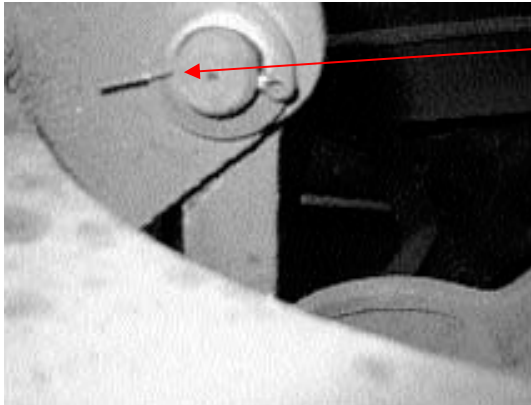


Fig. 1
● Sheared-off pin

Fig. 2
Broken safety stirrup

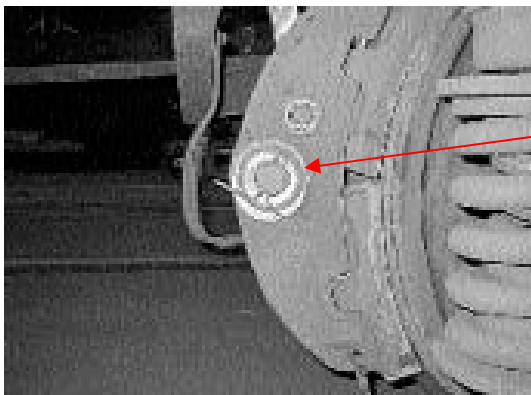
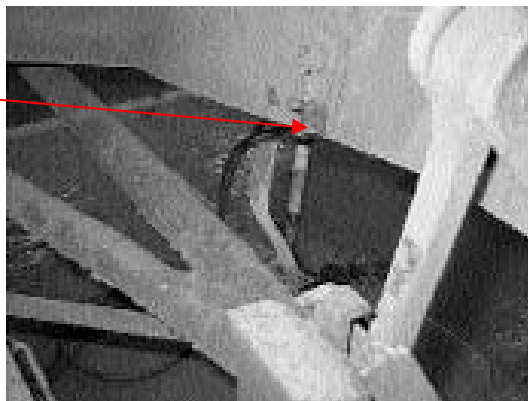
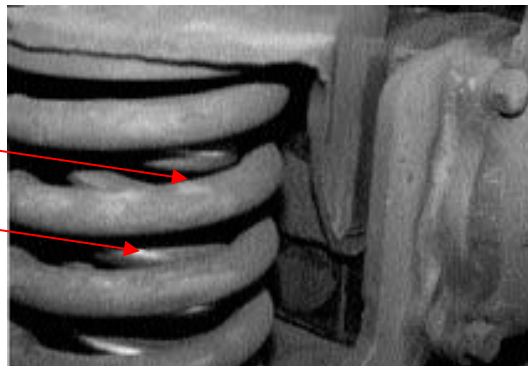


Fig. 3
Shiny traces on the brake triangle end washer

Fig. 4
Shiny traces on the load spring



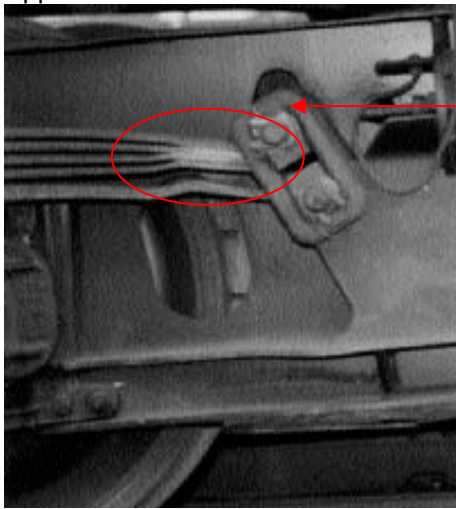


Fig. 5
Areas shiny with wear, visible from the outside, on the friction points of the spring leaves of parabolic spring suspensions

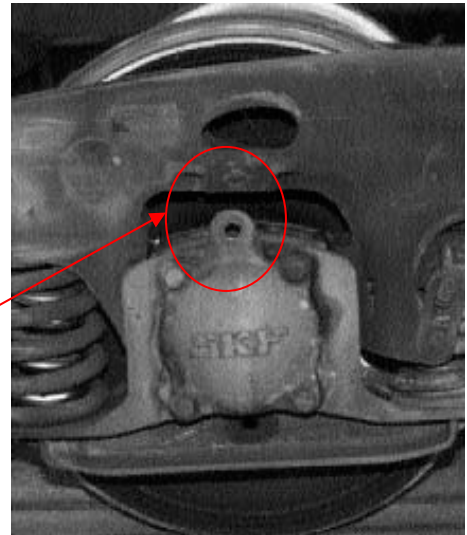


Fig. 6
Lifting safety catch missing or loose

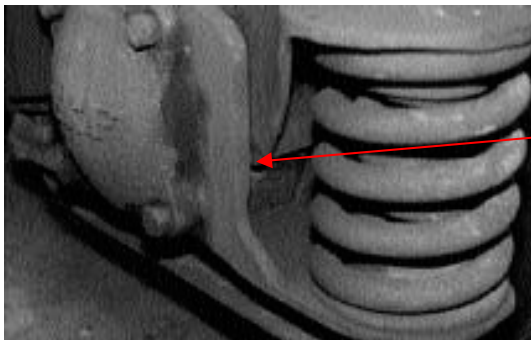


Fig. 7
Manganese wear plates on bogies and axle-boxes detached



Major irregular crushing of the edge of the wheel rim

Fig. 8
Irregular contact surface on the edge of tired wheel rim

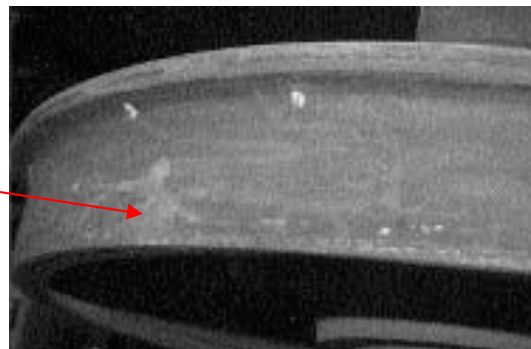
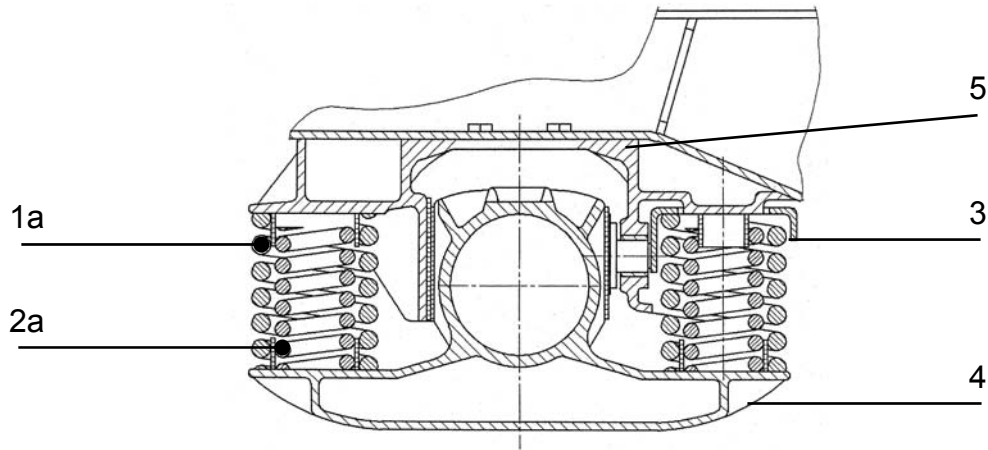


Fig. 9
tired

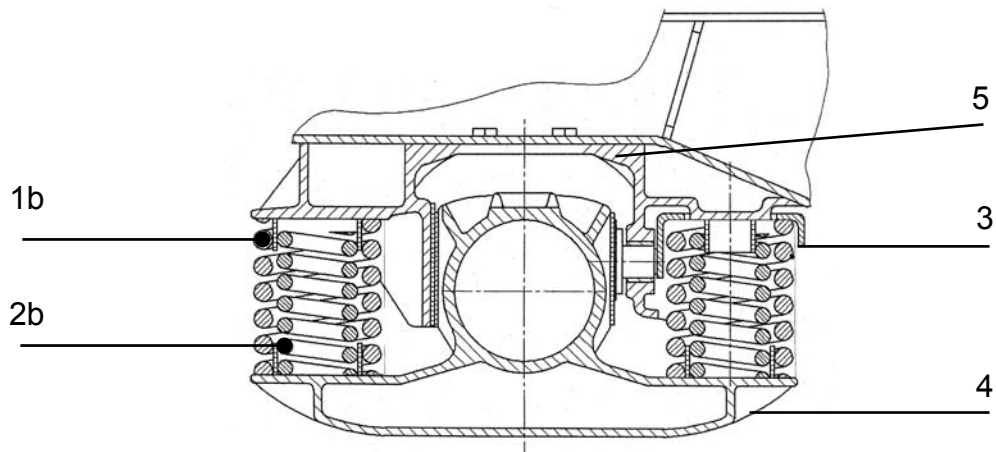
Diagram of the Y25 bogie suspension

Figure 1 – Bogie with springs for axle-load of 20 tonnes



- 1a tare spring for 20 t axle-load, right-wound
- 2a load spring for 20 t axle-load, left-wound
- 3 spring cap
- 4 axle-box
- 5 axle-box guide piece

Figure 2 – Bogie with springs for axle-load of 22.5 tonnes



- 1b tare spring for 22.5 t axle-load, left-wound
- 2b load spring for 22.5 t axle-load, right-wound
- 3 spring cap
- 4 axle-box
- 5 axle-box guide piece