

NOTE

This leaflet is part of a set which also includes :

- Leaflet 520 : Wagons, coaches and vans - Draw gear
- Leaflet 583 : Wagons - Application of a special mark on interchangeable parts

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1 - PURPOSE

1.1 - Nature of parts

This specification governs the supply of draw hooks with nominal loads equal to 250 kN, 600 kN or 1000 kN, their nuts or muff couplings and draw bars (see Appendix) for rolling stock. The 1000 kN draw hooks for rolling stock with reinforced coupling must also satisfy the provisions of UIC Leaflet 520.

All the details necessary for implementation of the contract, especially those concerning the application of §§ 2.1.2, 2.2.2, 7.1 and 7.2, must be indicated in the order or its appended documents.

1.2 - List of reference documents

Reference is made to the following documents in this technical specification :

UIC Leaflets 520, 583

ISO Standards and Recommendations :

- ISO 82, ISO 83, ISO R/85, ISO/R/377, ISO R/630, ISO R/683 (1-11), ISO 6506.

2 - CHARACTERISTICS

2.1 - Materials

2.1.1 - Preparation of materials

The steel used for the manufacture of hooks, nuts or muff couplings shall emanate from killed casts produced by the electric or open hearth process, or by a top-blown pure oxygen process.

Subject to the purchasing railway's approval, the continuous casting process shall be allowed.

2.1.2 - Characteristics of the steel

The steel used shall be one of the steels defined in Table 1 hereinafter, and shall be specified, together with its metallurgical state and the hardening medium if required, in the order or its appended documents.

The muff couplings however must be made either of forged or die-forged steel. The tensile strength in the normalized state may then equal or exceed 480 N/mm².

TABLE 1

metallurgical state	Comparable ISO steel grades	NUMBERS	Analysis on product in % (1)							Re in N/mm ²	R _m in N/mm ²	A % on 5d	K _{Ic} ⁽²⁾ in joules	Bending at 180°	
			C	Mn	Si	Cr	Mo	S	P						
Normalized N	C 40 ISO R 683 (I)	I	0.38/	0.50	0.15/	-	-	-	0.050	0.050	345	590/ 710	19	20	3 e
			0.45	0.80	0.40	-	-	-	-	-	-	-	-	-	-
(3)	50 MnSi4	II	≤0.60	≤1.20	≤1.00	-	-	-	0.050	0.050	430	750/ 860	12	10	3.5 e
Hardened and tempered T	C 55 ISO R 683 (I)	III	0.52/	0.60/	0.15/	-	-	-	0.045	0.045	430	710/ 860	15	25	-
			0.60	0.90	0.40	-	-	-	-	-	-	-	-	-	-
T	42 CrMo4 ISO R 683 (II) No. 3	IV	0.38/	0.50/	0.15/	0.90/	0.15/	0.035	0.035	550	800/	800/	14	25	-
			0.45	1.00	0.40	1.20	0.30	-	-	-	-	-	-	-	-

(1) The amount of alloy in the steel must not exceed the following values in relation to the product :

- Nickel : 0.30%
- Chromium : 0.30% (does not concern Grade 42 Cr Mo4 with 0.90 to 1.20% Cr)
- Molybdenum : 0.10% (does not concern Grade 42 Cr Mo 4 with 0.15 to 0.30% Mo)
- Vanadium : 0.05%
- Copper : 0.30%
- Cr + Mo + Ni + Cu ≤ 0.70%

(2) Verified on a series of two test pieces, neither of which must give a result lower than the value prescribed.
Test carried out at 20° C.

(3) Normalization treatment in this context shall consist of :

- either, after having left the part to cool sufficiently slowly after forging or die-forging down to ambient temperature away from draughts, preferably in a covered pit or beneath a frame, bringing it uniformly to a temperature above the heat-affected zone, maintaining it at that temperature for a sufficient length of time, then allowing it to cool slowly away from draughts, preferably in a covered pit or beneath a frame.
 - or, after having left the part to cool after forging or die-forging down to a temperature between 540° C and 250° C, bringing it uniformly to a temperature above the heat-affected zone, maintaining it at that temperature for a sufficient period of time, then allowing it to cool slowly away from draughts, preferably in a covered pit or beneath a frame.
- With the purchasing railway's agreement, the slow cooling need not be carried out when the steel has been effectively dephosphated, the object of the operation being to avoid the formation of scaling.

2.2 - Component parts

2.2.1 - Physical characteristics

2.2.1.1 - Appearance

The parts or sections of parts rough forged or die-forged must have smooth, carefully trimmed surfaces completely free of oxides.

The surface condition of sections for which machining is prescribed must comply with the conditions laid down in the order or its appended documents, or demonstrated by the specimens or standards previously acceptance-tested by the purchasing railway. There must be no deficiencies, sharp angles or accidental tool marks on the materials used.

Rough or machined connecting radii must be well formed and free from scoring.

2.2.1.2 - Soundness

The parts must be sound throughout and show no defect such as folds, flaws, or cracks of any kind.

2.2.1.2.1 - Macroscopic examination

The macroscopic examination carried out after a cross-section as defined in § 4.2.5.2.2 has been polished must not reveal any cavity or gap.

2.2.1.2.2 - Macrographic examination

After treatment, the macrographic image taken on the section indicated in § 4.2.5.2.2 must be of uniform colour and free from any pronounced trace of segregation.

2.2.2 - Geometrical characteristics

The shapes, dimensions and their tolerances must be those stipulated in the order or its appended documents.

2.2.3 - Mechanical characteristics

2.2.3.1 - Tensile test on test piece

The values of the elastic limit, tensile strength and elongation measured on a test piece taken from the hook, in delivery condition, must not be less than those stipulated in Table 1 of § 2.1.2.

If stipulated in the order or its appended documents, a second test piece intended to undergo normalization heat treatment may be taken. The values to be obtained must be specified by the purchasing railway.

2.2.3.2 - Resilience

The fracture energy of each of the resilience test pieces taken from the hooks must not be less than the value stipulated in Table 1 of § 2.1.2.

2.2.3.3 - Hardness

Hardness figures recorded on the hooks, nuts or muff couplings, in delivery condition, must be within the limits stipulated in Table 2 below :

TABLE 2

Metallurgical state	Steel grade Nos.	HBS - HBW Brinell hardness
Normalized N	I	160 to 190
	II	210 to 250
Hardened and tempered T	III	210 to 260
	IV	235 to 305

2.2.3.4 - Tensile test on hook

2.2.3.4.1 - Test under half-load

After being subjected to a tractive effort corresponding to half the nominal load, the head of the hook must not show any permanent distortion greater than 0.5 mm (dimension L, Figure 2).

2.2.3.4.2 - Test under nominal load

The hooks, and where applicable, their muff couplings, must be able to withstand a tractive effort corresponding to the nominal load for 3 minutes without fracture and without cracking or flaw.

2.2.4 - Manufacturer's brand marks

The hooks, and where relevant their muff couplings, must be stamped with the type of marks and in the position specified in the order or its appended documents.

In the absence of any stipulations, each part must be stamped with the following marks :

- manufacturer's mark,
- the last two figures of the year of manufacture,
- mark of ownership,
- characteristic interchangeability marks defined in UIC Leaflet 583,
- symbol of the steel grade,
- delivery condition (N or T).

The position of the marking must not affect the safety of the hook.

The marks shall be embossed by hot-working during the forging or die-forging operation.

3 - MANUFACTURE

The hooks may only be manufactured by suppliers approved by the purchasing railway.

3.1 - Forging and die-forging

The hooks shall be manufactured by forging, without welding. In certain special cases, however, flash butt welding may be allowed by the purchasing railway.

The nuts shall be either forged, or cut from forged or rolled hexagonal bars.

The muff couplings shall be obtained by forging or die-forging, according to the instructions in the standards or drawings.

The forging grade, particularly for products obtained from continuous casting, must be high enough to ensure that the finished products have the mechanical and soundness characteristics stipulated. The purchasing railway can specify the forging grade to be observed during manufacture.

Any forging or die-forging operation giving rise to distortion of the metal in the cold state and, in particular, any cold upsetting or straightening operation shall be forbidden.

3.2 - Machining

Machining of the external and internal threads must be carried out so that the threads are perfectly shaped, with no distortion.

The sharp parts formed at the beginning and end of the external and internal threads must be removed.

3.3 - Heat treatment

The hooks, nuts or muff couplings must undergo the heat treatment for normalization or hardening and tempering, stipulated in the order or its appended documents.

The heat treatment operations must be conducted to ensure uniformity of the characteristics throughout each part, also on all parts in the same batch.

Heating of the parts must not give rise to their oxidation. It must always be carried out fairly slowly, until the parts have reached a temperature of at least 400° C.

The temperature of the furnaces shall be checked by means of correctly-calibrated recording pyrometers arranged so that all zones of these furnaces can be checked and regulated accordingly.

It must be possible for the readings of the calibrated recording pyrometers to be made available to the inspector in charge of acceptance testing.

The quenching baths must be of sufficient capacity and equipped with a temperature regulation system.

3.4 - Rectification of defects, if any

No alterations or repairs may be undertaken without the prior agreement of the purchasing railway.

The elimination of surface defects by removal of metal in the cold state (chiselling, filing, grinding or any other approved process) may be authorised subject to observing the dimensional tolerances and providing adequate transition curves with the places where metal has been removed, to avoid any stress concentration and destruction (even partial) of the effects of heat treatment.

Any weld, resurfacing and, generally speaking, any repair intended to hide a defect, shall be strictly forbidden and shall cause the batch to be rejected.

4 - INSPECTION

Characteristics shall be checked on the parts. However, the materials intended for the manufacture of draw hooks can be inspected and their characteristics checked before use.

4.1 - Manufacturing control

It must be possible for the purchasing railway's representative to ascertain, by any checks he may consider necessary, that the conditions of manufacture prescribed in this UIC leaflet with regard to the steels and the parts themselves, have been fully observed.

For this purpose, the manufacturing and inspection drawings must be submitted to him and he must be kept advised of any modifications made, also of any incidents occurring during manufacture.

4.2 - Inspection of the hooks

4.2.1 - Submission for acceptance

4.2.1.1 - Condition of the materials and parts

4.2.1.1.1 - Materials

Should a special agreement exist to this effect, the rolled products shall be submitted as forged in the delivery condition stipulated by the manufacturer of the hooks in agreement with the purchasing railway.

4.2.1.1.2 - Parts

The parts shall be submitted for acceptance after machining and heat treatment and before any application of a protective product against oxidation.

4.2.2 - Grouping into batches

4.2.2.1 - Materials

Each batch shall comprise a maximum of 20 tonnes of products of the same section from the same cast.

4.2.2.2 - Parts

Each batch shall comprise a maximum of 200 hooks, fitted where applicable, with their nuts or muff couplings, produced during the same casting operation and from the same manufacture. The hooks, nuts and muff couplings must have respectively undergone the same heat treatment.

4.2.3 - Advice of presentation

The date of presentation shall be advised to the purchasing railway's representative in writing. This advice must indicate the number of parts presented, the composition of the batches and their identification marks, also the references of the order involved.

At the time of presentation, the manufacturer shall provide the purchasing railway's representative with a certificate, signed by the Director of the factory or his authorised representative, confirming that all the conditions of manufacture have been observed, that the hardness tests and the checks on appearance, soundness and dimensions have been carried out and that their results are in compliance with the provisions of this UIC leaflet.

At the time of presentation, a record of the results of the individual hardness tests carried out on component parts shall also be provided.

4.2.4 - Nature and extent of checks and tests

4.2.4.1 - Materials

Each batch of steel produced under the conditions prescribed in § 4.2.2.1 shall, on submission for acceptance, be subjected to the checks and tests the nature and extent of which are stipulated in Table 3 hereinafter.

4.2.4.2 - Parts

Each batch of hooks shall, on submission for acceptance, be subjected to the checks and tests the nature and extent of which are stipulated in Table 3 hereinafter.

TABLE 3

Nature of the checks and tests	Extent of the checks and tests	
<u>Materials</u> checks on the characteristics stipulated in Table 1 of § 2.1(1)	1 series of tests per batch	
<u>Parts</u> - Chemical composition - Appearance, dimensions, marking - Macroscopic and macrographic test (1) - Tensile test on a test piece - in delivery condition - having undergone heat treatment for normalization (1) - Resilience on a series of 2 U-notched test pieces - Hardness (2) - Tensile test on parts	1 to 200	for each additional batch
	1 per cast as indicated by the purchasing railway's representative	
	1	1
	1	1
	1	1
	individual	
(1) If stipulated in the order or its appended documents. (2) The supplier must have checked the hardness of each of the parts and provide the purchasing railway's representative with the record of the results of this test.		

4.2.5 - Sampling and preparation of the samples and test pieces

4.2.5.1 - Sampling

The purchasing railway's representative shall designate from each of the batches presented, those parts on which he wishes to carry out the checks and tests prescribed. He shall mark them indelibly.

The macrographic examinations, the chemical analyses as well as the resilience and tensile tests may be carried out on parts which have undergone the tensile test.

The marks and stamps of the purchasing railway's representative must remain on these samples and test pieces. They may only be removed in his presence.

4.2.5.2 - Preparation of the samples and test pieces

The preparation of the samples and test pieces shall be carried out in accordance with the provisions of ISO Recommendation R/377.

4.2.5.2.1 - Materials

The tensile strength, resilience and bending characteristics shall be checked on test pieces taken parallel to the rolling direction, cut up and treated as follows :

The sample shall consist of a section of the original semi-manufactured product stretched by forging along its longitudinal centre-line. The forging grade between the sample and the semi-manufactured product shall be equal to 3.

The sample shall undergo either normalization treatment in the case of normalized parts, or hardening and tempering in the case of hardened and tempered parts.

The test pieces shall be extracted by machining from the sample treated. Irrespective of the section of the product, the longitudinal centre-line of the test pieces shall be situated 12,5 mm from the surface of the sample in rough-finished condition.

4.2.5.2.2 - Component parts

4.2.5.2.2.1 - Chemical composition

The sample for checking the chemical composition shall consist of a full section plate, cut parallel to the section intended for the macrographic examination (see Figure 1) or of shavings representing the full section and weighing at least 50 grammes.

4.2.5.2.2.2 - Macroscopic and macrographic examinations

The position of the section to be examined shall be situated in cross-section AA for the 600 kN and 1000 kN hooks and in cross-section DD for the 250 kN hooks (see Figure 1). The surface of this section shall be carefully machined, polished and degreased.

4.2.5.2.2.3 - Tensile test on test pieces

The tensile test piece(s) shall be cut from the positions defined in Figure 1. For the 250 kN and 600 kN hooks, a single test piece in delivery condition shall be taken along the centre line of the draw bar.

Machining of the test pieces shall be carried out in accordance with the instructions in ISO Standard 62.

4.2.5.2.2.4 - Resilience

Two resilience test pieces with U-shaped notches shall be cut from the positions defined in Figure 1. The direction of the notch of each of the test pieces shall be that shown in the same figure.

For 250 kN hooks the resilience test pieces (dotted test piece in Figure 1) must be taken side by side in the longitudinal direction of the head of the hook. The longitudinal centre line of each test piece must be situated 1/4 and 3/4 through the thickness of the head of the hook respectively, the symmetrical plane of the test pieces being situated in the plane of section AA.

Machining of the test pieces shall be carried out in accordance with the instructions in ISO Standard 83.

4.2.5.2.2.5 - Hardness

The test pieces shall consist of the parts themselves, which shall have the oxide removed by milling or grinding to a depth of about 2 mm in the position designated by the purchasing railway's representative or, in the absence of any indication, in the position indicated in Figure 2.

4.2.5.2.3 - Tensile test on hook

The hooks shall be marked as is shown in Figure 2 hereinafter. One mark shall be placed in a diametral plane of the hook-eye bore, and the other in a plane passing through the centre-line of the coupling-screw housing.

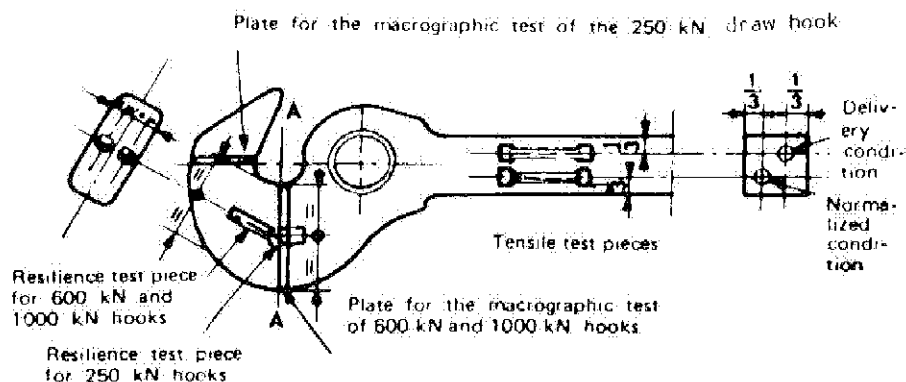


Figure 1

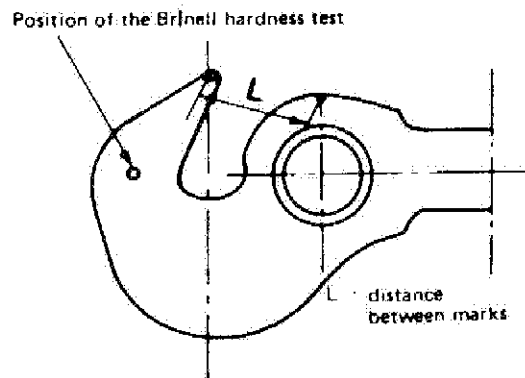


Figure 2

The hooks shall be tested either with their nut screwed-in by a distance equal to its own height plus about 2 pitches, or with their muff coupling, or with their joint pin.

4.2.6 - Organisation of checks and tests

4.2.6.1 - Materials

The tests shall be carried out in accordance with the provisions of the following standards :

- Steel-Tensile test : ISO Standard 82 - 1974
- Steel-Charpy resilience test : ISO Standard 63 - 1976 (U-shape notch)
- Bend test for steel : ISO Recommendation R/85 - 1959

The provisions of § 2.1.2 must be observed.

4.2.6.2 - Component parts

4.2.6.2.1 - Chemical composition

The methods for determining the amounts of the various components shall be those defined for each of them in the ISO standards. Except in cases of disagreement, spectrographic analysis can be used.

The instructions in § 2.1.2 must be observed.

4.2.6.2.2 - Appearance and soundness of the parts

The surface conditions, in particular those of the transition curves between rough-finished and machined parts, shall be examined.

If there is any doubt, the purchasing railway's representative may resort to additional methods of investigation : dye penetrant, magnetic particle examination, etc.

The provisions of § 2.2.1.1 and 2.2.1.2 must be observed.

4.2.6.2.3 - Macroscopic examination

The surface of the section prepared as indicated in § 4.2.5.2.2.2 shall be checked with the naked eye under normal visual conditions or with a magnification ≤ 3 .

The provisions in § 2.2.1.2.1 must be observed.

4.2.6.2.4 - Macrographic examination

After the macroscopic examination a sheet of silver bromide paper, saturated with a solution of water and 2% pure sulphuric acid shall be applied for 3 minutes to the surface, after the latter has been carefully degreased beforehand.

The provisions of § 2.2.1.2.2 must be observed.

4.2.6.2.5 - Checking the geometrical characteristics

Checks to verify the dimension of parts shall be carried out by any suitable means, in particular using calibrated gauges supplied by the manufacturer.

The external and internal threads shall be checked by means of limit-gauges approved by the purchasing railway.

The provisions of § 2.2.2 must be observed.

4.2.6.2.6 - tensile test

The tensile test shall be carried out in accordance with the provisions of ISO Standard 82 : Steel - Tensile test.

The provisions of § 2.2.3.1 must be observed.

4.2.6.2.7 - Resilience test

The resilience test on U-notched test pieces shall be carried out in accordance with the instructions in ISO Standard 83. The test shall be carried out at a temperature of 20° C.

The instructions in § 2.2.3.2 must be observed.

4.2.6.2.8 - Hardness test

The hardness test shall be conducted in accordance with the provisions of ISO Standard 6506 : Brinell hardness test.

The test shall be carried out with a 10 mm ball under a load of 29.42 kN.

The provisions of § 2.2.3.3 must be observed.

4.2.6.3 - Tensile test on hook or component parts

4.2.6.3.1 - Preparation of hook

The hook or the component parts, prepared as indicated in § 4.2.5.2.3, shall be placed on a tractive unit by means of a securing device so that the force is applied to the parts under conditions identical to those of use.

The hook shall be subjected to an initial tensile force of 25 kN for the 250 kN hook, or of 50 kN for 600 kN and 1000 kN hooks. The distance between marks, determined under the effect of these forces shall be taken as the initial length.

4.2.6.3.2 - Test under half load

The tensile load shall gradually be increased up to a load equal to or as little as possible above half the nominal load, maintained for at least 1 minute before the force is reduced to its initial value of 25 kN or 50 kN.

The distance between marks shall then be recorded, and any permanent distortion must not be greater than that indicated in § 2.2.3.4.1.

4.2.6.3.3 - Test under nominal load

The tensile load shall again be gradually increased up to a load equal to or as little as possible above the nominal load, maintained for 3 minutes and released. The parts shall then be examined.

The provisions of § 2.2.3.4.2 must be observed.

4.3 - Conclusion of the inspections

Any characteristic not conforming to the provisions of this UIC leaflet shall lead to rejection of the corresponding batch.

If rejection has been decided because of unsatisfactory test results, further tests may only be carried out, at the written request of the manufacturer, with or without any heat treatment for improvement, with the purchasing railway's prior agreement.

5 - DELIVERY

5.1 - Protection against oxidation

After the parts have been inspected and stamped by the purchasing railway's representative and before they are stored or despatched, the machined parts shall be coated with an anti-rust product approved by the purchasing railway.

5.2 - Packaging

The parts must be effectively protected by suitable packaging in order to avoid any deterioration, particularly of the machined parts, or deformation during handling or transit.

6 - GUARANTEE

The parts, hooks, nuts or muff couplings shall be guaranteed for a period of two years against any defect attributable to the material and to manufacture. This period shall start from the end of the year marked on the parts.

If the hooks are intended for fitting to new stock, the date of delivery of the vehicles to which these parts are fitted shall be regarded as the beginning of the guarantee period.

Parts which, during the guarantee period, reveal defects which make them unsuitable for use or which are likely to reduce their service life, shall be rejected.

Before being finally rejected, the defective parts may, however, be subjected to a check test between the purchasing railway and the manufacturer, if the latter so requests.

When the check test confirms that the defects are definitely attributable either to the material, or to manufacture, or to inadequate packaging or protection from impact, the defective parts shall definitively be rejected.

Should the results of the check test not enable an agreement to be reached between the purchasing railway and the manufacturer, the matter shall be referred to experts approved by both parties to settle the dispute. The costs arising from obtaining an expert opinion shall be borne by the party found to be responsible.

When more than 5% of hooks, nuts or muff couplings in the same delivery are found to have defects giving rise to rejection, the purchasing railway may reject the entire delivery.

Rejected parts shall be made available to the manufacturer with a view to their replacement or reimbursement at their value, in new condition, at the time of withdrawal.

CHARACTERISTICS, MANUFACTURE AND INSPECTION
OF DRAW BARS

This appendix governs the supply of draw bars with a test load of 450 kN for rolling stock, both tractive and trailing.

7 - CHARACTERISTICS

7.1 - Materials.

7.1.1 - Preparation of materials

The steels used for the manufacture of draw bars shall be from killed casts prepared by the electric or open-hearth process, or by a top blown pure oxygen process.

Subject to the purchasing railway's approval, the continuous casting process shall be allowed.

7.1.2 - Characteristics of the steel

The steel used shall be one of the steels defined in Table 4 given hereinafter and shall be specified, together with its metallurgical state and the hardening medium, if required, in the order or its appended documents.

If so stipulated in the order, the Fe 510 D steel grade defined by ISO Standard 630 may be used.

TABLE 4

Metallurgical state	Analysis on product in % (1)					Re in N/mm ²	Rm in N/mm ²	A% on 5d	KV(2) in joules
	C	Mn	Si	S	P				
Normalized N (3)	≤ 0.50	0.40/0.80	≤ 0.40	≤ 0.045	≤ 0.045	350	600/720	18	20
Hardened and tempered T	0.57/0.65	0.60/0.90	0.15/0.40	0.045	0.045	460	750/900	14	20

(1) The amount of alloy in the steel must not exceed the following values in relation to the product :

Nickel : 0.30 %
Chromium : 0.30 %
Molybdenum : 0.10 %
Vanadium : 0.05 %
Copper : 0.30 %
Cr + Mo + Ni + Cu ≤ 0.70 %

(2) Checked on a series of two test pieces neither of which must give a result less than the value prescribed. Test carried out at 20° C.

(3) See Footnote (3) in Table 1.

7.2 - Parts

The provisions of §§ 2.2.1 and 2.2.2 shall apply to the draw bars. In respect of macroscopic and macrographic examinations, sampling shall be carried out in accordance with the provisions of § 9.2.

7.2.1 - Mechanical characteristics

7.2.1.1 - Tensile test on test piece

The characteristics of the tensile test pieces taken from the draw bars having undergone the prescribed heat treatment, must not be less than the values stipulated in Table 4 of § 7.1.

7.2.1.2 - Resilience

The fracture energy of each of the resilience test pieces taken from the draw bars in delivery condition must not be less than the value prescribed in Table 4 of § 7.1.

7.2.1.3 - Hardness

The hardness figures recorded on the draw bars in delivery condition must be within the limits prescribed in Table 5 below :

TABLE 5

Metallurgical state	HBS - HBW Brinell hardness
Normalized N	170 to 220
Hardened and tempered T	225 to 275

7.2.1.4 - Tensile strength of draw bars

Test under a load of 450 kN.

After having been subjected to a tensile load of 450 kN, the draw bars must not show any permanent distortion greater than 0,2% of the basic length.

7.2.2 - Manufacturer's brand marks

The provisions of § 2.2.4 shall apply to the draw bars.

8 - MANUFACTURE

The provisions of Section 3 shall apply to draw bars. Draw bars shall be manufactured by forging or die-forging without welding. However, the bar head may be welded to the body by flash butt welding with the agreement of the purchasing railway.

The formation of the heads by upsetting may be authorized by the purchasing railway.

9 - INSPECTION

Characteristics shall be checked on the finished parts. However, the materials intended for manufacturing the draw bars can be inspected and their characteristics checked before use.

9.1 - Nature and extent of checks and tests

9.1.1 - Materials

Each batch of steel shall be formed, on submission for acceptance, under the conditions prescribed in § 4.2.2.1. The characteristics stipulated in § 7.1 shall be checked. The range of checks and tests shall be that stipulated in Table 3 of § 4.2.4.2.

9.1.2 - Draw bars

Each batch shall comprise a maximum of 200 draw bars. The characteristics stipulated in § 7.1, 7.2.1 and 7.2.2 shall be checked. The range of checks and tests shall be that stipulated in Table 3 of § 4.2.4.2.

9.2 - Sampling and preparation of samples and test pieces

The provisions of § 4.2.5 shall apply to draw bars. The test pieces shall be taken from the external 1/3 of the radius or half-diagonal of the bar.

Test pieces shall be cut at the positions defined in Figure 3 below. The draw bars intended for the tensile test shall be marked in accordance with the provisions of Figure 3.

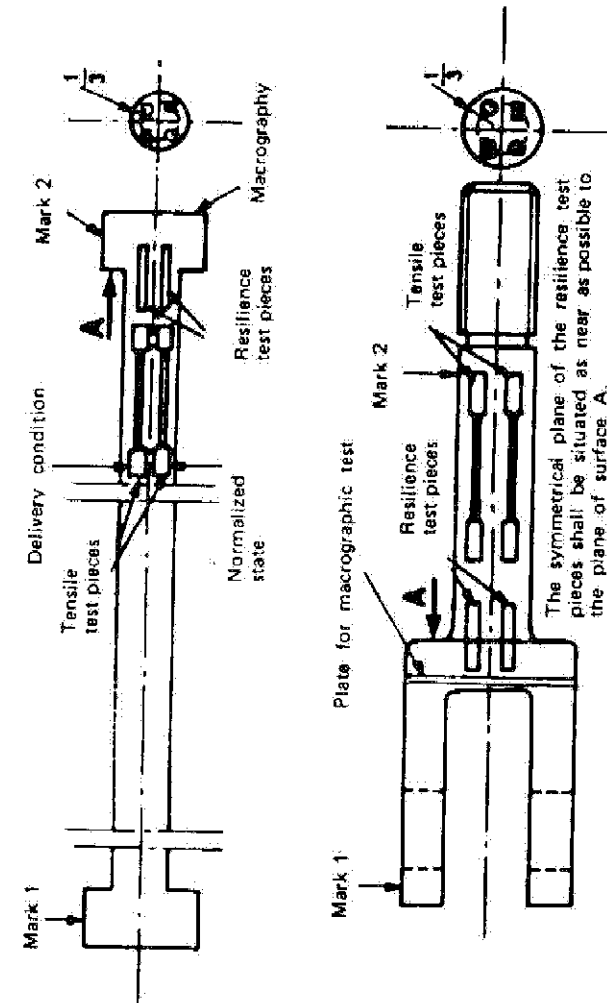


Figure 3

9.3 - Organisation of checks and tests

The provisions of §§ 4.2.6.1 and 4.2.6.2 shall apply to the draw bars, the values to be observed being those defined in §§ 7.1, 7.2.1 and 7.2.2.

9.3.1 - Tensile test on draw bars.

9.3.1.1 - Preparation of draw bars.

The draw bar prepared as indicated in § 9.2 shall be placed on a tractive unit using a securing device so that the load is applied under conditions identical to those of use.

The draw bar shall be subjected to an initial tensile load of 45 kN. The distance between marks, determined under the effect of this load, shall be taken as the initial length.

9.3.1.2 - Test under 450 kN load

The tensile load shall gradually be increased up to a load equal to or as little as possible above 450 kN, maintained for at least 1 minute before it is reduced to its initial value of 45 kN.

The distance between marks shall then be recorded and any permanent distortion must not be greater than that specified in § 7.2.1.4.

9.4 - Conclusion of the inspections

The provisions of § 4.3 shall apply to draw bars.

10 - DELIVERY

The provisions of Section 5 shall apply to draw bars.

11 - GUARANTEE

The provisions of Section 6 shall apply to draw bars.

APPLICATION

With effect from 1 July 1984.

All Railways in the Union.

RECORD REFERENCES

Headings under which the question has been dealt with :

- Preparation of standard specifications for :

- coupling gear;
- buffer, draw and suspension springs;
- wheel centres for trailing stock;
- solid wheels for trailing stock;
- wheel sets for trailing stock;
- brake shoes,
(5th Committee - RS ; Hamburg, July 1954).

- Preparation of standard specifications :

- a) b) c) draw bars
- d) e) f) g) h) i) j) k)
- l)

(5th Committee - RS : Copenhagen, May-June 1956)

- Possible amendment, prior to publication, of Appendix 1 to Leaflet 825. Conditions of manufacture and acceptance of draw bars in connection with the tensile test and the coefficient of quality.

(5th Committee - RS : Paris, June 1957)

- Preparation of technical specifications relating to the supply of steel parts, in connection with the manufacturing process of the steel and in particular the possibility of using oxygen-blast steel.

(5th Committee - J.O., Stockholm, May 1967)

- Revision of existing specifications.

a) Running gear, suspension components, connections for brake-hose couplings, and couplings.

b) Harmonization of the guarantee clauses.
(Sub-Committee for Specifications, Paris, January 1975)

- Question 5/S/8 - Revision of existing specifications : running gear, suspension components, connections for brake-hose couplings, and couplings.

(Sub-Committee for Specifications, Paris, January 1976)

- Question 5/Sa/FIC - Finalisation of revised UIC Leaflet 825 : "Draw hooks".

(Sub-Committee for Specifications, Paris, January 1983)

- Question 5/Sa/FIC - Revision of Leaflet 825 : "Draw hooks for tractive and trailing stock".

(Sub-Committee for Specifications, Paris, January 1984)

- Revision of Leaflet 825 : Technical specification for the supply of draw hooks for tractive and trailing stock.

(Sub-Committee for Specifications, Paris, January 1985)