

Specification for

Brake hose couplings for locomotives and rolling stock

Co-operating organizations

The Mechanical Engineering Industry Standards Committee, under whose supervision this British Standard was prepared, consists of representatives from the following Government departments and scientific and industrial organizations:

Admiralty*	Gas Council
Air Ministry	High Commission of India
Associated Offices' Technical Committee	Institute of Marine Engineers
Association of Consulting Engineers (Incorporated)	Institute of Petroleum
Association of Mining Electrical and Mechanical Engineers*	Institution of Civil Engineers
British Chemical Plant Manufacturers' Association	Institution of Gas Engineers
British Compressed Air Society*	Institution of Heating and Ventilating Engineers
British Electrical and Allied Manufacturers' Association	Institution of Mechanical Engineers*
British Gear Manufacturers' Association	Institution of Mechanical Engineers (Automobile Division)
British Internal Combustion Engine Manufacturers' Association	Institution of Production Engineers
British Iron and Steel Federation*	Locomotive and Allied Manufacturers' Association of Great Britain*
British Mechanical Engineering Federation*	Machine Tool Trades Association
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Crown Agents for Oversea Governments and Administrations	Ministry of Power*
D.S.I.R. National Engineering Laboratory	Ministry of Public Building and Works*
Electricity Council, the Generating Board and the Area Boards in England and Wales	Ministry of Transport*
Engineering Equipment Users' Association	National Coal Board*
	National Physical Laboratory (D.S.I.R.)
	Radio Industry Council
	War Office

The Government departments and scientific and industrial organizations marked with an asterisk in the above list, together with the following were directly represented on the Committee entrusted with the preparation of this standard:

Association of British Railway Carriage and Wagon Manufacturers	Federation of Manufacturers of Construction Equipment
British Hose Manufacturers' Association.	Federation of Painting Contractors
British Mechanical Engineering Federation	Institution of Municipal Engineers
British Moulded Rubber Hose Manufacturers Association	Institution of Water Engineers
Federation of British Rubber and Allied Manufacturers	Ministry of Aviation
Federation of Civil Engineering Contractors	National Association of Colliery Managers
	Individual manufacturers

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Foreword

This standard makes reference to the following British Standards:

BS 21, *Pipe threads.*

BS 218, *Leaded brass (58 per cent copper, 2 per cent lead) forging stock and forgings.*

BS 250, *Wrought high tensile brass rods and sections (other than forging stock).*

BS 251, *Naval brass rods, sections, forging stock and forgings.*

BS 309, *Whiteheart malleable iron castings.*

BS 310, *Blackheart malleable iron castings.*

BS 384, *Phosphor bronze (copper-tin-phosphorus) wire.*

BS 443, *Galvanized coatings on wire.*

BS 590, *Mild steel chain Grade 30, short link and pitched or calibrated for lifting purposes.*

BS 916, *Black bolts, screws and nuts.*

BS 970, *Wrought steel in the form of bars, billets, and forgings, up to 6 in ruling section, for automobile and engineering purposes. En series.*

BS 1052, *Mild steel wire for general engineering purposes.*

BS 1154, *Vulcanized natural rubber compounds.*

BS 1400, *Schedule of copper alloy ingots and copper and copper alloy castings.*

BS 1408, *Hard-drawn steel wire for springs.*

BS 1490, *Aluminium and aluminium alloy ingots and castings for general engineering purposes.*

BS 2032, *9 % Aluminium bronze (copper-aluminium) rods, sections, forging stock and forgings.*

BS 2056, *Rust, acid and heat-resisting steel wire for springs.*

BS 2779, *Fastening threads of BSP. sizes (formerly in BS 84:1940).*

BS 2789, *Iron castings with spheroidal or nodular graphite.*

BS 3628, *Hose clips (worm-drive type) for general purpose use.*

BS 3682, *Railway brake coupling hose.*

This British Standard, prepared under the authority of the Mechanical Engineering and Rubber Industry Standards Committee, forms one of a series now under preparation for railway rolling stock components. The object of this standard is to lay down the leading requirements for brake hose couplings fitted to locomotives and rolling stock.

NOTE Where metric equivalents are stated, the figures in British units are to be regarded as the standard. The metric conversions in Appendix B are approximate. More accurate conversions should be based on tables in BS 350, "Conversion factors and tables".

A British Standard does not purport to include all the necessary provisions of a contract. Users of British Standards are responsible for their correct application.

Compliance with a British Standard does not of itself confer immunity from legal obligations.

Summary of pages

This document comprises a front cover, an inside front cover, pages i to iv, pages 1 to 18, an inside back cover and a back cover.

This standard has been updated (see copyright date) and may have had amendments incorporated. This will be indicated in the amendment table on the inside front cover.

1 Scope

This British Standard specifies the leading requirements for brake hose couplings between all types of railway rolling stock. The purpose of these couplings is to convey compressed air or vacuum for braking.

The standard is divided into two parts:

- *Part 1: Couplings for compressed air braking;*
- *Part 2: Couplings for vacuum braking.*

Part 1. Couplings for compressed air braking

2 General design

Each coupling assembly shall consist of a straight or bent nipple connected by a length of flexible hose to a coupling head (see Figure 1).

Dummy couplings (see Figure 11 and Figure 12) may be provided to close off the coupling head when not in use to prevent damage, deterioration and ingress of dirt and moisture.

The angle of the hose nipple should be such that the hose cannot become kinked either when it is coupled to another vehicle or attached to the dummy coupling.

3 Materials

The component parts of the coupling assembly shall be made from one of the following materials:

Nipples

- a) Malleable iron to BS 310¹⁾, Grade B 20/10, or BS 309²⁾, Grade W 24/8.
- b) Spheroidal graphite cast iron to BS 2789³⁾, Grade SNG 27/12, or SNG 24/17.
- c) Steel to BS 970⁴⁾, En 3A or equivalent.
- d) Aluminium bronze to BS 1400⁵⁾, AB1-C, or BS 2032⁶⁾.

Coupling head

- a) Malleable iron to BS 310¹⁾, Grade B 20/10, or BS 309²⁾, Grade W 24/8.
- b) Spheroidal graphite cast iron to BS 2789³⁾, Grade SNG 27/12 or SNG 24/17.
- c) Aluminium bronze to BS 1400⁵⁾, AB1-C, or BS 2032⁶⁾.

Sealing washers. Natural rubber to BS 1154⁷⁾, Compound Z14. Synthetic rubber may be used if it meets the physical properties of BS 1154⁷⁾, Compound Z14.

Valves and caps (where fitted)

- a) Gunmetal to BS 1400⁵⁾, LG-2-C.
- b) Brass to BS 250⁸⁾, BS 251⁹⁾ or BS 218¹⁰⁾.

Spring (where fitted)

- a) Steel wire to BS 1408¹¹⁾, En 49B or C or equivalent, with anti-corrosive metal plated finish.
- b) Stainless steel wire to BS 2056¹²⁾, En 58 or equivalent.
- c) Phosphor-bronze wire to BS 384¹³⁾ or equivalent.

¹⁾ BS 310, "Blackheart malleable iron castings".

²⁾ BS 309, "Whiteheart malleable iron castings".

³⁾ BS 2789, "Iron castings with spheroidal or nodular graphite".

⁴⁾ BS 970, "Wrought steels in the form of bars, billets, and forgings, up to 6 in ruling section, for automobile and general engineering purposes. En series".

⁵⁾ BS 1400, "Schedule of copper alloy ingots and copper and copper alloy castings".

⁶⁾ BS 2032, "9 % Aluminium bronze (copper-aluminium) rods, sections, forging stock and forgings".

⁷⁾ BS 1154, "Vulcanized natural rubber compounds".

⁸⁾ BS 250, "Wrought high tensile brass rods and sections (other than forging stock)".

⁹⁾ BS 251, "Naval brass rods, sections, forging stock and forgings".

¹⁰⁾ BS 218, "Leaded brass (58 per cent copper, 2 per cent lead) forging stock and forgings".

¹¹⁾ BS 1408, "Hard-drawn steel wire for springs".

¹²⁾ BS 2056, "Rust, acid and heat-resisting steel wire for springs".

¹³⁾ BS 384, "Phosphor bronze (copper-tin-phosphorus) wire".

Hose clips

- a) Malleable iron to BS 310¹⁴⁾, Grade B 20/10, or BS 309¹⁵⁾, Grade W 24/8.
- b) Spheroidal graphite cast iron to BS 2789¹⁶⁾, Grade SNG 27/12 or SNG 24/17.
- c) Steel to BS 970¹⁷⁾, En 3A or equivalent.
- d) Hot brass pressings to BS 218¹⁸⁾.
- e) Gunmetal to BS 1400¹⁹⁾, LG-2-C.

Hose. To comply with BS 3682²⁰⁾.

Dummy couplings.

- a) Malleable iron to BS 310¹⁴⁾, Grade B 20/10, or BS 309¹⁵⁾, Grade W 24/8.
- b) Spheroidal graphite cast iron to BS 2789¹⁶⁾, Grade SNG 27/12 or SNG 24/17.
- c) Steel to BS 970¹⁷⁾, En 3A or equivalent.
- d) Aluminium bronze to BS 1400¹⁹⁾, AB1-C, or BS 2032²¹⁾.

4 Length of coupling

The nominal length of the coupling shall be as specified by the purchaser and shall be measured as dimension *H* in Figure 1, which is the length of the hose.

5 Nipple

The nipple shall be one of four types as follows:

- a) Male type — straight or bent
 - b) Female type — straight or bent
- } See Figure 2.

In each case the thread shall be to BS 21²²⁾.

The portion of the nipple on which the hose is fitted shall be smooth cast or machined and all fins and rough edges which would tend to damage the hose, shall be removed. The hexagons shall be smooth and regular.

6 Hose clips

Hose clips shall be of robust construction to ensure that the hose is securely held to the nipple and coupling head when under pressure and also to avoid damage through impact. They shall be provided with a tongue or slip which will prevent nipping of the hose at the clip joint (see Figure 3).

A worm-drive or other proprietary type of clip may be used subject to the purchaser's approval. When a worm-drive type of clip is required by the purchaser, it shall conform to BS 3628²³⁾ and shall be of the serrated band type.

7 Coupling head

Coupling heads shall be of two types:

- a) With valve, for main reservoir and non-automatic brake pipes.
- b) Without valve, for automatic brake pipe.

Sizes which relate to the nominal diameter of the hoses are:

For Type a), $\frac{1}{2}$ in, $\frac{3}{4}$ in and 1 in (see Figure 4).

For Type b), $\frac{1}{2}$ in, $\frac{3}{4}$ in, 1 in and $1\frac{1}{4}$ in (see Figure 5).

¹⁴⁾ BS 310, "Blackheart malleable iron castings".

¹⁵⁾ BS 309, "Whiteheart malleable iron castings".

¹⁶⁾ BS 2789, "Iron castings with spheroidal or nodular graphite".

¹⁷⁾ BS 970, "Wrought steels in the form of bars, billets, and forgings, up to 6 in ruling section, for automobile and general engineering purposes. En series".

¹⁸⁾ BS 218, "Leaded brass (58 per cent copper, 2 per cent lead) forging stock and forgings".

¹⁹⁾ BS 1400, "Schedule of copper alloy ingots and copper and copper alloy castings".

²⁰⁾ BS 3682, "Railway brake coupling hose".

²¹⁾ BS 2032, "9 % Aluminium bronze (copper-aluminium) rods, sections, forging stock and forgings".

²²⁾ BS 21, "Pipe threads".

²³⁾ BS 3628, "Hose clips (worm-drive type) for general purpose use".