

Standard Category **1**

S1169

Train arrestors – Performance, design and configuration

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1 Purpose

The purpose of this standard is to define the performance and design requirements for new or modified train arrestors, and their basic configurations.

2 Scope

This standard covers fixed and friction train arrestors on running lines and in depots and sidings.

3 Requirements

3.1 General

3.1.1 The type of train arrestor provided at a specific track location shall be determined by:

- a) the operational characteristics of the location;
- b) the requirement for compatibility with existing and prospective rolling stock using the track and with signalling and power systems.

3.1.2 The selection of train arrestors shall be against the following criteria:

- a) except at trap points or sand drags, where the track configuration is specifically designed to derail a train making an unauthorised movement before it obstructs other lines, a train arrestor shall be used at the end of tracks;
- b) friction train arrestors shall be used at the ends of tracks in terminal platforms;
- c) where it is not possible to use a friction train arrestor at the end of a track in a terminal platform, the use of other types of train arrestor shall be subject to risk assessment, and measures taken where necessary to reduce the speed of approaching trains;
- d) the use of fixed train arrestors is permitted at locations other than terminal platforms;
- e) hydraulic and drag types of train arrestor are not permitted for new or fully renewed installations.

3.1.3 The principal dimensions for train arrestor installations shall be as shown in Attachment 1 (clause 11.1). Alternatively, where it can be shown through quantified risk assessment that the risk of injury to passengers, staff and other persons can be maintained ALARP taking account of likely impact speed, train mass, deceleration rate and nearby infrastructure, other configurations may be adopted.

3.1.4 Only approved train arrestors shall be used.

3.1.5 Train arrestor buffing faces shall present a diagonal pattern of 75mm-wide alternating red and white stripes.

3.1.6 Interface with rolling stock

3.1.6.1 Train mass – fixed train arrestors

The train mass to be assumed in the design of fixed train arrestors shall be based on the maximum expected value.

3.1.6.2 Train mass – friction train arrestors

The train mass to be assumed in the design of friction train arrestors shall be based on passenger stock only. It shall reflect the maximum expected value (tare plus passenger loading). However, account shall be taken of variation in this value (e.g. where the site has a mix of surface and tube stock, and/or widely varying passenger loadings) so as to minimise the overall risk from impact.

3.1.6.3 Buffing configuration

The buffing face on the train arrestor shall be of a height and shape to be compatible with the buffing face and the coupling and any anti-climb devices on the rolling stock.

3.1.7 Interface with signal and control

3.1.7.1 Where a train arrestor system includes fixed red lights, the lights shall be positioned in conformity with the Signal and Control Engineer (LU)'s standards.

3.1.7.2 The train arrestor shall be electrically insulated if this is necessary to ensure compliance with signalling requirements.

Note: Interface with power

Current limiting devices, where fitted, are the responsibility of the LU Power Engineer. These devices limit the power to trains approaching train arrestors at terminal stations.

3.2 Fixed train arrestors

3.2.1 The design of a fixed train arrestor shall minimise the risk of damage to the train and the train arrestor, by taking into account:

- a) the mass of each train approaching the train arrestor (see clause 3.1.6.1);
- b) the likely impact speed of a train approaching the train arrestor;
- c) the possibility of the train arrestor being located at the end of curved track.

3.2.2 Material and construction details for fixed arrestors shall be as specified in Attachment 2 (clause 11.2).

3.3 Friction train arrestors

3.3.1 A friction train arrestor shall be designed to bring a train (of mass according to clause 3.1.6.2) to a halt in a controlled manner at a retardation rate not exceeding 15%g (1.47 m/sec²).

Note: At this retardation rate the stopping distance will be approximately 10m at an impact speed of 20km/h and approximately 15m at an impact speed of 24km/h.