

Category 1 Standard

S1163 Conductor rail - Inspection and Maintenance



Please read the Written Notices
attached to this standard

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1 Purpose

- 1.1 The purpose of this standard is to define the requirements for the inspection and maintenance of conductor rail.

2 Scope

- 2.1 This standard applies to all conductor rail systems in plain line and junctionwork.
- 2.2 The requirements of this standard are applicable to all approved systems of conductor rail.
- 2.3 This standard does not cover completed works and maintenance tolerances for the conductor rail system, which are the subject of 1-164.
- 2.4 Where it is mandatory that any of the supporting information in Section 5 of this standard is to be applied, the appropriate requirement is set in Section 3.

3 Requirements

3.1 General

- 3.1.1 The conductor rail system shall be subject to an inspection and maintenance regime which ensures that:
- a) it provides for the power requirements of the scheduled train service at all times;
 - b) the risks of service disruption, fire hazard and accidental contact with the conductor rail system by railway personnel or the general public are minimised.

3.2 Inspection

- 3.2.1 Detailed monitoring of the conductor rail system shall be undertaken at regular intervals and any sub-standard conditions detected shall be rectified. In particular an inspection shall be programmed to enable any necessary preventive remedial work to be completed before the onset of hot weather. Particular attention shall be given to the following items:
- a) rails shall be able to expand and contract freely at both ends;
 - b) bonds between rails and out-of-gauge rails shall be in positions which allow for expansion;
 - c) anchors shall be in good condition and securely fastened;
 - d) sleepers and bearers carrying the anchors shall be well packed ; timber sleepers shall be securely strutted;
 - e) surface defects on conductor rail ramps;
 - f) safety blocks shall be in good condition and securely fastened;
 - g) uneven wear and surface defects at positive and negative splays;
 - h) positioning of conductor rail ramps (height and offset);
 - i) condition of conductor rail insulators and evidence of arcing.
- 3.2.2 Over a distance of 65m in rear of station platform stop markers (i.e. the track occupied by the leading 65m of a train at the station), at 2m intervals, the vertical gauge of both conductor rails shall be inspected for compliance with the Maintenance Limit threshold

(as defined in standard 1-164). The inspection shall be carried out as part of PM3 inspections unless automatic or semi-automatic measuring systems are in use. Any exceedence beyond the Maintenance Limit shall be rectified within one week.

3.3 Maintenance

3.3.1 Preventative maintenance

Preventative maintenance shall be carried out to ensure that the conductor rail system is kept in a good state of adjustment and repair and to optimise its performance and whole-life costs

3.3.2 Minimum response to faults

Following inspection of the conductor rail system, the appropriate minimum actions as detailed in the tables given in 1-164 and Section 5 shall be applied. In the event of any conflict, 1-164 shall prevail.

3.3.3 Cutting of conductor rail

Composite conductor rail shall not be flame cut.

3.3.4 Re-use of conductor rail components

Components proposed for re-use shall be inspected and confirmed serviceable. They shall not reduce the performance of the conductor rail system.

3.4 Provision of lineside spares

Consideration shall be given to minimising disruption by the provision of lineside spares at strategic locations.

3.5 Records

Appropriate records shall be developed to cover major events and inspection and maintenance activities throughout the asset life cycle. All records shall conform with 1-691 unless otherwise stated

3.6 Evidence of compliance

Evidence of compliance with the requirements of this standard shall be demonstrated to LU by each party contracted to LU. Additionally LU may audit compliance as part of its surveillance regime.

4 Responsibilities

4.1 **The Professional Head of Track Engineering** is responsible for the technical content of this standard. Any concessions in relation to this standard shall be directed to the Professional Head of Track Engineering who has overall accountability for compliance with this standard. The Professional Head of Track Engineering may request support from the other technical authorities when reviewing concessions or queries arising from the application of this standard.

4.2 **LU and LU Suppliers** shall be responsible for compliance with the requirements of this standard.



5 Supporting information

5.1 Safety considerations

The failure to adequately monitor and maintain the conductor rail system rectify sub-standard conditions may cause:

- a) detrimental movement of the conductor rail resulting in distortion and in extreme cases derailment;
- b) arcing leading to fires;
- c) track circuit failures;
- d) defects in the track system;
- e) loss of traction current supply and service disruption;
- f) injury to or death of people.

5.2 Other supporting information

5.2.1 Minimum maintenance action for all conductor rail systems

Where the conductor rail is the composite type, the following tables shall be read in conjunction with those in clause 5.2.2.

**Table 1 - Rails, ramps and negative splays**

Item	Defect	Action
Conductor rail	Broken, cracked or defective	Rerail (existing upside-down BH rail may be replaced like-for like only if the supports are in serviceable condition)
	Headwear in excess of that specified in 1-164 (not applicable to OOG rail)	Rerail
	Rail surface defects (not applicable to OOG rail)	Grind out defects where appropriate. If after grinding the required relative rail heights as specified in 1-164 are not attainable, the defective rails shall be renewed
Surface condition	Burn marks	Inspect for vertical gauge at next planned measured inspection (PM3 or equivalent) (burn marks may be an indication that the rail is out of vertical gauge).
Ramps	Cracked or damaged	Repair weld or replace
	Loose	Re-position weld and renew insulators as required and fasten to sleepers
	Missing	Replace
	Surface defects	Grind out defect or replace
	Cracked or damaged welds	Re-weld ramp to rail
	Insufficient insulators supporting ramp	Add or remove insulators as necessary
	Ramp end longitudinal position incorrect	Re-position ramp
	Vertical or horizontal movement under traffic	Replace missing or damaged components. Adjust packings and shims. Tighten insulator clips. Pack sleepers.
Negative splays	Relative rail heights not as specified in 1-164	Adjust relative rail heights
	Loose or defective bolts	Tighten loose bolts. Replace defective bolts.
	Surface defects	Grind out defect, or replace if relative rail heights specified in 1-164 are not attainable
	Filler pieces not as specified in the relevant design drawings	Replace filler pieces to meet the requirements of the design drawings
Negative splay holding-down devices (Central line)	Broken, fatigued (over 10 years old) or missing	Replace
	Loose	Tighten