

Ref:	NR/L2/SIG/11201 – Mod B13
Issue:	4
Date:	04/06/2011
Compliance date:	03/09/2011

Level 2

Signalling Design: Module B13 -

Points - General

Endorsement and Authorisation

For endorsement and authorisation, please refer to
NR/L2/SIG/11201

This document is the property of Network Rail. It shall not be reproduced in whole or part nor disclosed to a third party without the written permission of Network Rail.

© Copyright 2011 Network Rail.

Uncontrolled copy once printed from its electronic source.

Published and Issued by Network Rail, Kings Place, 90 York Way, London. N1 9AG.



Ref:	NR/L2/SIG/11201 – Mod B13
Issue:	4
Date:	04/06/2011
Compliance date:	03/09/2011

Issue record

Issue	Date	Comments
4	June 2011	Modularisation of handbook and guidance notes, contains content of former NR/GN/SIG/11600, Part P.

Compliance

This Module is mandatory and shall be complied with by Network Rail and its contractors if applicable from 03/09/2011.

When this standard is implemented, it is permissible for all projects that have formally completed GRIP Stage 3 (Option Selection) to continue to comply with the issue of any relevant Network Rail standards current when GRIP Stage 3 was completed and not to comply with requirements contained herein, unless stipulated otherwise in the scope of this standard.

Disclaimer

In issuing this document for its stated purpose, Network Rail makes no warranties, express or implied, that compliance with all or any documents it issues is sufficient on its own to confirm safe systems of work or operation. Users are reminded of their own duties under health and safety legislation.

Supply

Copies of documents are available electronically, within Network Rail's organisation. Hard copies of this document may be available to Network Rail people on request to the relevant controlled publication distributor. Other organisations may obtain copies of this document from IHS. Tel: 01344 328039.

Copyright Network Rail

Ref:	NR/L2/SIG/11201 – Mod B13
Issue:	4
Date:	04/06/2011
Compliance date:	03/09/2011

Contents

1 INTRODUCTION	4
2 DESIGN PRINCIPLES	4
3 POINT OPERATION	8
4 POINT DETECTION	12
5 POINT SWITCH HEATERS	17

Ref:	NR/L2/SIG/11201 – Mod B13
Issue:	4
Date:	04/06/2011
Compliance date:	03/09/2011

1 INTRODUCTION

1.1

This Code of Practice applies, in support of [GC/RT5021](#), to all technologies of on-track equipment used for the operation and proving of:

- a) facing and trailing points (combining to form crossovers, tandem points, single and double slips, etc.);
- b) swing nose crossings;
- c) switch diamond crossings (effectively two point ends);
- d) trap points and catch points;
- e) train operated points (including spring points);
- f) hand points;
- g) derailleurs; and
- h) scotch blocks.

1.2

Where it entirely addresses the situation under consideration, the use of this module is an alternative to an approved risk-based assessment. However, where the particular application or intended environment for the system introduces additional risks, these should be subject to separate assessment.

The Design Principles in Section 2 give the minimum requirements that need to be addressed, even when a risk-based approach is used. These principles are mandated in [NR/L2/SIG/11201](#).

1.3

The following guidelines should satisfy the principles encompassed within the standard:

- a) guidelines on rail clamp point locks (clamp locks) in [NR/GN/SIG/11774](#);
- b) guidelines on the use of track circuits in point layouts in [NR/L2/SIG/11752](#);
- c) the standard drawings for point layouts, fittings and detectors listed in [NR/LS/CAT003](#);
- d) supplementary mechanical information on points and fittings in [NR/L2/SIG/11201, Module B14](#);
- e) the typical circuits for point operation and detection listed in [NR/GN/SIG/CAT005](#), which are described in [NR/L2/SIG/11201, Module B15](#); and
- f) guidelines for SSI installations in [NR/L2/SIG/11201, Module B16](#).

2 DESIGN PRINCIPLES

These principles are mandated in [NR/L2/SIG/11201](#).

Ref:	NR/L2/SIG/11201 – Mod B13
Issue:	4
Date:	04/06/2011
Compliance date:	03/09/2011

2.1

For interlocking, route locking, track locking and other controls listed in the control tables, see [NR/L2/SIG/11201, Module B7](#).

2.2

The toes of the points should be physically locked in either the normal or reverse position before a passenger move can be signalled over them in the facing direction, thus preventing the switches from being forcibly moved.

Such locking should be proved effective in the aspect level at the interlocking.

This section should also be applied to non-passenger movements, except where omission can be justified by documented risk assessment.

Train operated points are not considered here (see [GC/RT5021](#)).

2.3

Both switches should be detected to be in their correct position, corresponding to the position in which the points are locked, before a passenger move can be signalled over them in the facing direction.

Such correspondence should be proved in the aspect level at the interlocking.

This section should also be applied to non-passenger movements where Section 2.2 has been omitted.

Points that are temporarily secured out of use do not require to be detected. However, the detection of facing points that have been out of use for more than six months should be subject to risk assessment, considering the method of securing, the inspection regime and the likely time before removal or commissioning.

2.4

Locking and detection requirements for movements through points in the trailing direction should generally comply with Sections 2.2 and 2.3, except where a risk assessment demonstrates that a proposed relaxation introduces no additional risk.

A trailing direction run-through of points lying in the wrong position should not result in a derailment, but should result in loss of detection, where provided.

2.5

In the case of power operation of points, the following features should be provided to enhance safety and dependability:

- a means of securely fixing the operating mechanism to the track, so as to prevent its movement relative to the stock rail;
- measures to prevent false operation of the points or a false indication being given to the interlocking arising from cable damage, microswitch failure, power supply polarity reversal at an intermediate lineside location, earth faults, or other electrical interference, such as traction current;
- a means of disconnecting the operating feed to the points when their movement is complete, and reconnecting it should the detection be lost (the latter feature may be omitted where no additional risk is thereby created);

Ref:	NR/L2/SIG/11201 – Mod B13
Issue:	4
Date:	04/06/2011
Compliance date:	03/09/2011

- d) dynamic braking to bring the mechanism to rest at the end of a complete movement, where appropriate to increase reliability;
- e) a means of allowing the points to complete their movement, should the track locking become effective whilst the points are in mid stroke;
- f) a means of preventing the mechanism being overloaded by an obstruction restricting movement of the switch rails;
- g) any overload cut-out provided should immediately reset and allow the point movement to be reversed at any time during the cycle;
- h) a means of preventing moisture or ice affecting the operating characteristics of the point operating or detection mechanism;
- i) where necessary to confirm adequate availability, secure power supplies for point operation;
- j) a means of securing the points out of use with the point lock in the locked position and the points in either the normal or reverse position; and
- k) a means of hand operation under failure conditions that isolates the power supply from the mechanism and does not reconnect it until manually reset, in accordance with [GC/RT5021](#).

2.6

In the event of a failure of the safety-critical system controlling the point operation, the safe state to which the system should revert is "locked as last set".

2.7

A means of confirming that the running rails are maintained to gauge at all times should be provided.

Where switches are sufficiently long to require it, a means of providing a supplementary drive on one or more stretcher bars along the switch rail should be provided, so that each switch rail when closed is held against its respective stock rail for the whole of its planed length and the minimum flangeway clearance is maintained for the length of the open switch.

Supplementary detection should similarly be provided, as necessary, to prove the correct operation of the supplementary drive.

2.8

Where necessary, a means of preventing point movement being obstructed by ice and snow should be provided.

2.9

Adequate precautions should be taken to protect staff working on point fittings and mechanisms from danger due to an electrical fault, in accordance with the Electricity at Work Regulations 1989.

In electrified areas, measures should be taken to prevent dangerous touch potentials and other danger arising from point mechanisms, apparatus housings, lever frames, or running rails being connected to different earth systems.