

Ref:	NR/L3/SIG/11303/2F10
Issue:	2
Date:	4 September 2010
Compliance date:	4 December 2010



Level 3 Module

Signalling Installation – Signal Boxes: Lever Locks and Contacts

Endorsement and Authorisation

For endorsement and authorisation, please refer to
NR/L3/SIG/11303.

This module is a reformatted version of the previous Signalling Installation Handbook with no change to the content other than correction of terminology.

It represents historic best practice which may no longer be relevant.

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 2010 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/L3/SIG/11303/2F10
Issue:	2
Date:	4 September 2010
Compliance date:	4 December 2010

Issue record

Issue	Date	Comments
2	September 2010	Reformatted version of previous document incorporating the text of the installation handbook.
1	August 2000	First issue.

Compliance

This Network Rail standard is mandatory and shall be complied with by Network Rail and its contractors if applicable from 4 December 2010.

When this standard is implemented, it is permissible for all projects that have formally completed GRIP Stage 4 to continue to comply with the Issue of any relevant Network Rail Standards current when GRIP Stage 4 was reached and not to comply with requirements contained herein, unless the designated Standard Owner has stipulated otherwise in the accompanying Briefing Note.

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 ensure 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.

Ref:	NR/L3/SIG/11303/2F10
Issue:	2
Date:	4 September 2010
Compliance date:	4 December 2010

Contents

1 Introduction	4
2 Lever Lock Construction.....	4
3 Contact Box Construction.....	4
4 Economiser Contacts	5
5 Lock Proving Contacts	5
6 Westinghouse Lever Lock And Circuit Controller	5
7 SGE Lock & Circuit Controller	7
8 Installation - General Arrangement.....	7
9 Installation – Electrical.....	8

Copyright Network Rail

Ref:	NR/L3/SIG/11303/2F10
Issue:	2
Date:	4 September 2010
Compliance date:	4 December 2010

1 Introduction

Signal box and ground frame levers are provided with mechanical locking between levers in the same frame, but they frequently need to be interlocked with electrical controls or other systems. To allow this, a lever is fitted with an electric lock and a set of electrical contacts.

The electric lock allows the lever to be moved from particular positions only when the lock is energised, and the electrical contacts can be chosen so that they only make when the lever is in certain positions.

2 Lever Lock Construction

The lock consists of an electromagnet that operates an armature connected to a piece of shaped metal known as the "lock dog". Running through the lock body is a slotted metal slide that carries a lug or pin to enable it to be connected to the lever.

As the lever is moved, the slide moves within the fixed lock body. The lock dog fits into the slot, and they are so shaped that at certain positions of the slide the electromagnet has to be energised to lift the dog before the slide (and hence the lever) can be moved further.

The lock dog is returned to its non-energised position by spring or gravity (or both) depending on the lock design and mounting position. In some designs, the slide is fitted with "force-down" dogs or pins which push the lock dog back to the locked position as the slide is moved from one lock position to the next. This means that a sticking lock dog does not provide a false release for the next lock position.

Figure 1 shows a typical lever lock.

Lock slides are obtainable with the slot already cut in a few standard patterns that provide the more common lever position locks. Sometimes these can be adapted to provide additional lock positions, otherwise, the workshops or service centre will specially cut a slide to what is required.

3 Contact Box Construction

A contact box contains a number of movable oilite segments that rub against fixed spring contacts. The segments are carried on an insulating plate or drum linked to the lever, so that as it is moved the segments move also, and open or close circuits wired through the contact springs. Some designs use sliding segments and in others they rotate. By altering the segment length and position, the contacts can be made to make and break according to any desired lever position. Figure 2 shows a typical contact box design.