For queries regarding this document
standards@transport.nsw.gov.au
www.asa.transport.nsw.gov.au

# Technical Note - TN 041: 2016

Issued date: 17 October 2016

Effective date: 17 October 2016

**Subject: Withdrawal of legacy RailCorp signalling maintenance manuals**

This technical note is issued by the Asset Standards Authority (ASA) to notify that the following legacy RailCorp signalling maintenance manuals have been withdrawn:

- TMG E1083 *Lamp Proving Module Maintenance Manual*, version 1.1
- TMG E1340 *The Claw Lock Mechanism Description and Operation*, version 2.2
- TMG E1341 *Claw Lock Mechanism – Safety and Functional Tests – Routine Maintenance*, version 2.3
- TMG E1342 *The Claw Lock Mechanism – Overhaul*, version 3.0
- TMG E1360 *Jeumont Schneider Track Circuits*, version 1.1
- TMG E1400 *Electro-pneumatic Points – Style 'S' Control Valve*, version 1.2
- TMG E1401 *Pneumatic Points Control Valve Style 'A'*, version 1.4
- TMG E1402 *Pneumatic Points Control Valve Style 'N'*, version 1.3
- TMG E1403 *Pneumatic Points Control Valve Style 'T'*, version 1.4
- TMG E1580 *Electric Points Machine – Westinghouse 84M Mechanism*, version 1.1
- TMG E1585 *HLM Point Lock Detectors Maintenance Manual*, version 1.0
- TMG E1590 *Signal Structures – Examination and Maintenance*, version 1.2
- TMG E1630 *Signalling Compressed Air System*, version 1.0
- TMG E1632 *Pulsating Indications*, version 1.0

*Note: All enquiries regarding the technical content of the manuals listed in this technical note should be directed to SydneyTrainsstandards@transport.nsw.gov.au*

WITHDRAWN

© State of NSW through Transport for NSW

# Authorisation:

| | Technical content prepared by | Checked and approved by | Interdisciplinary coordination checked by | Authorised for release |
|---|---|---|---|---|
| **Signature** | | | | |
| **Date** | | | | |
| **Name** | Russell Freeman | Peter McGregor | Andrea Parker | Graham Bradshaw |
| **Position** | Principal Engineer Mechanical | Lead Signals and Control Systems Engineer | Chief Engineer | Director Network Standards and Services |

WITHDRAWN

Withdrawn - for reference only

WITHDRAWN

# TMG E1340

# THE CLAW LOCK MECHANISM DESCRIPTION AND OPERATION

**Version 2.2**

**Issued April 2010**

Engineering Manual

| | | | |
|---|---|---|---|
| Owner: | Chief Engineer Signals & Control Systems | | |
| Approved by: | Warwick Allison<br>Chief Engineer<br>Signals and Control Systems | Authorised by: | Paul Szacsvay<br>Principle Engineer<br>Signalling Technology |

**Disclaimer**

This document was prepared for use on the RailCorp Network only.

RailCorp makes no warranties, express or implied, that compliance with the contents of this document shall be sufficient to ensure safe systems or work or operation. It is the document user's sole responsibility to ensure that the copy of the document it is viewing is the current version of the document as in use by RailCorp.

RailCorp accepts no liability whatsoever in relation to the use of this document by any party, and RailCorp excludes any liability which arises in any manner by the use of this document.

**Copyright**

The information in this document is protected by Copyright and no part of this document may be reproduced, altered, stored or transmitted by any person without the prior consent of RailCorp.

Withdrawn - for reference only

## Document control

| Revision | Date | Summary of change |
|---|---|---|
| 2.0 | 08/2003 | Inclusion of installation and maintenance procedures for Claw Lock Mechanisms on swing nose v-crossings. |
| 2.1 | 20/09/2004 | Formatting |
| 2.2 | 23/04/2010 | Updated document format to comply with current RailCorp template. Removed the reference to Part 6 – SC07370006EQ 'Switch Rollers' in Section 1.2 and removed Fig 2.3 'Single slip, claw pinned directly to switch flange'. |
| | | |

## Summary of changes from previous version

| Summary of change | Section |
|---|---|
| *Document format updated to comply with TMA 400 Engineering Publications Manual.* | All |
| | |
| | |

## Contents

**1 General ..... 3**
1.1 Purpose ..... 3
1.2 References ..... 3
1.3 Terminology ..... 5
**2 Claw Lock Description ..... 5**
**3 Claw Lock Operation ..... 7**
3.1 On Points ..... 7
3.2 On Swing Nose V Crossings ..... 8

WITHDRAWN

Withdrawn - for reference only

# 1 General

## 1.1 Purpose

This manual describes the operation of claw locks on turnouts and swing nose crossings and details the procedures to be followed to install, test and maintain the claw locks and their operating mechanisms.

## 1.2 References

There are 5 parts to the manual:

| | | |
|---|---|---|
| Part 1 | TMG E1340 | The Claw Lock Mechanism - Description and Operation |
| Part 2 | TMG E1341 | The Claw Lock Mechanism – Safety and Functional Tests / Routine Maintenance |
| Part 3 | TMG E1342 | The Claw Lock Mechanism – Overhaul |
| Part 4 | TMG E1343 | The Claw Lock Mechanism - Installation on Turnouts |
| Part 5 | TMG E1344 | The Claw Lock Mechanism - Installation on Swing Nose Crossings |

WITHDRAWN

Withdrawn - for reference only

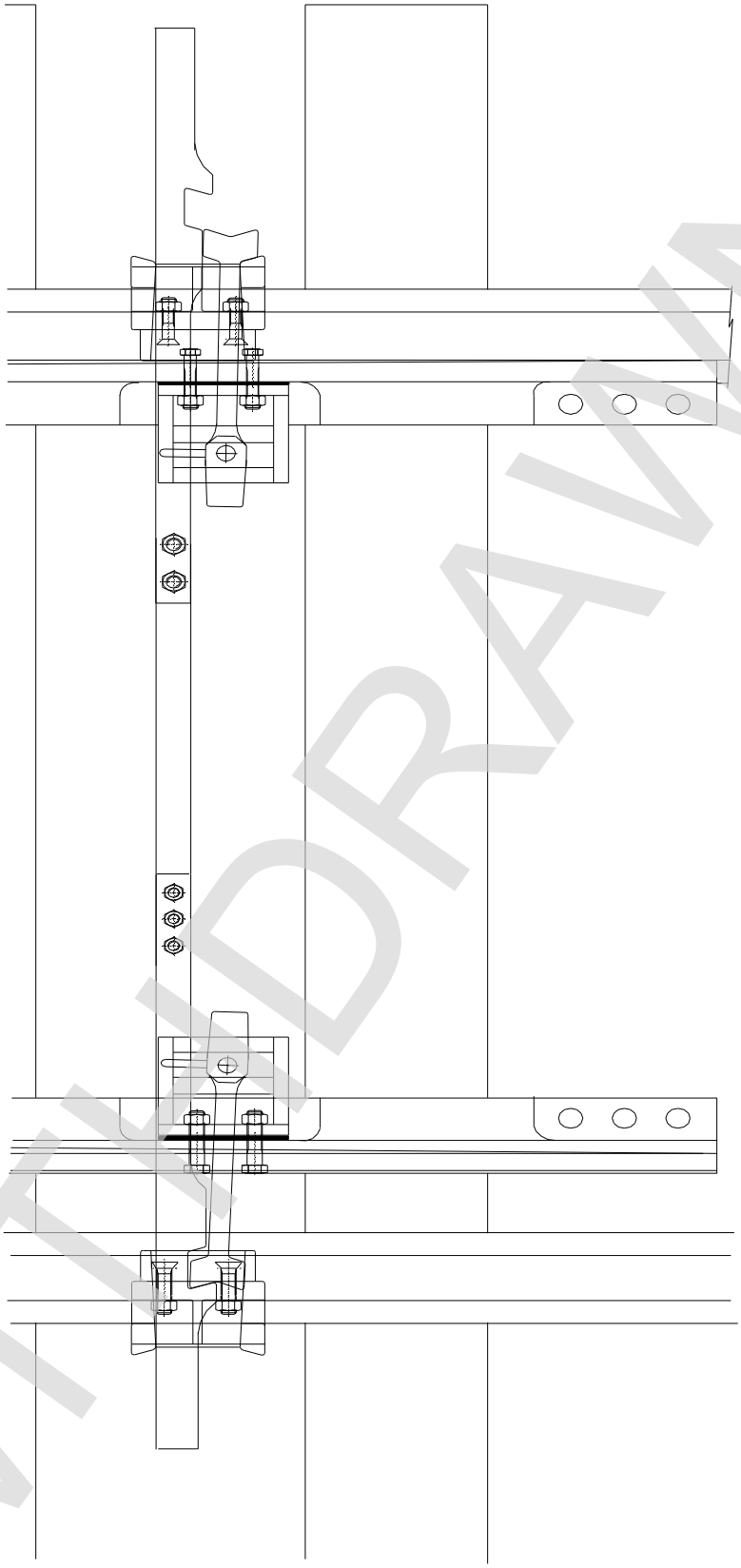

***Figure 1.1***
***Claw Lock Assembly on Turnout***

WITHDRAWN

Withdrawn - for reference only

## 1.3 Terminology

| Name Used in this Manual | Name Which May Be Used in Other Publications |
|---|---|
| Coupling bar | Operating bar |
| Drive rod | Throw rod |
| Jaw | Clevis |
| Crossing base frame | Crossing base plate |
| Point Machine Throw bar | Point machine operating bar |

# 2 Claw Lock Description

The claw lock type of mechanism was introduced into railways in Europe more than 50 years ago and is currently in common usage in a number of forms. The mechanism was first introduced into NSW at Glenfield where it was used to drive and lock the swing nose V-crossings on the 1 in 21 medium speed turnouts.

The Claw lock is a device in which the drive and facing point lock for the points are combined into a single mechanism. It provides direct locking between each switch and stockrail and any form of manual, electrical, pneumatic or hydraulic mechanism that can provide the required drive travel, may power it.

It is suitable for 60kg conventional turnouts and 60kg tangential turnouts in main line applications and 53 and 47kg turnouts in sidings and yards. Depending on the drive mechanism used, the claw lock may be trailable or non-trailable.

There are no fixed gauge rods (stretchers, front rods, backs rods) connecting the switches since the switches must be able to move independently of one another at each end of the drive stroke to allow the claws to unlock and lock. Conventional 60, 53 and 47 kg turnouts do, however, require a slotted “anti-roll” stretcher to be fitted to prevent excessive switch roll caused by the claw rolling the foot of the switch in towards the stockrail.

The mechanism itself consists of cast steel claw locks bolted to each of the stockrails between the “A” and “B” timbers and, if a backdrive is required, to each of the stockrails at the point of backdrive.

A claw bracket is bolted to each switch blade and this supports a locking claw pinned or bolted to the bracket such that the claw can swing in the horizontal plane.

An operating bar connects the locking claws on each side but is not physically fastened to claw, switch or stockrail.

Figure 1.1 shows an assembled claw lock installation on a tangential turnout.

WITHDRAWN

Withdrawn - for reference only

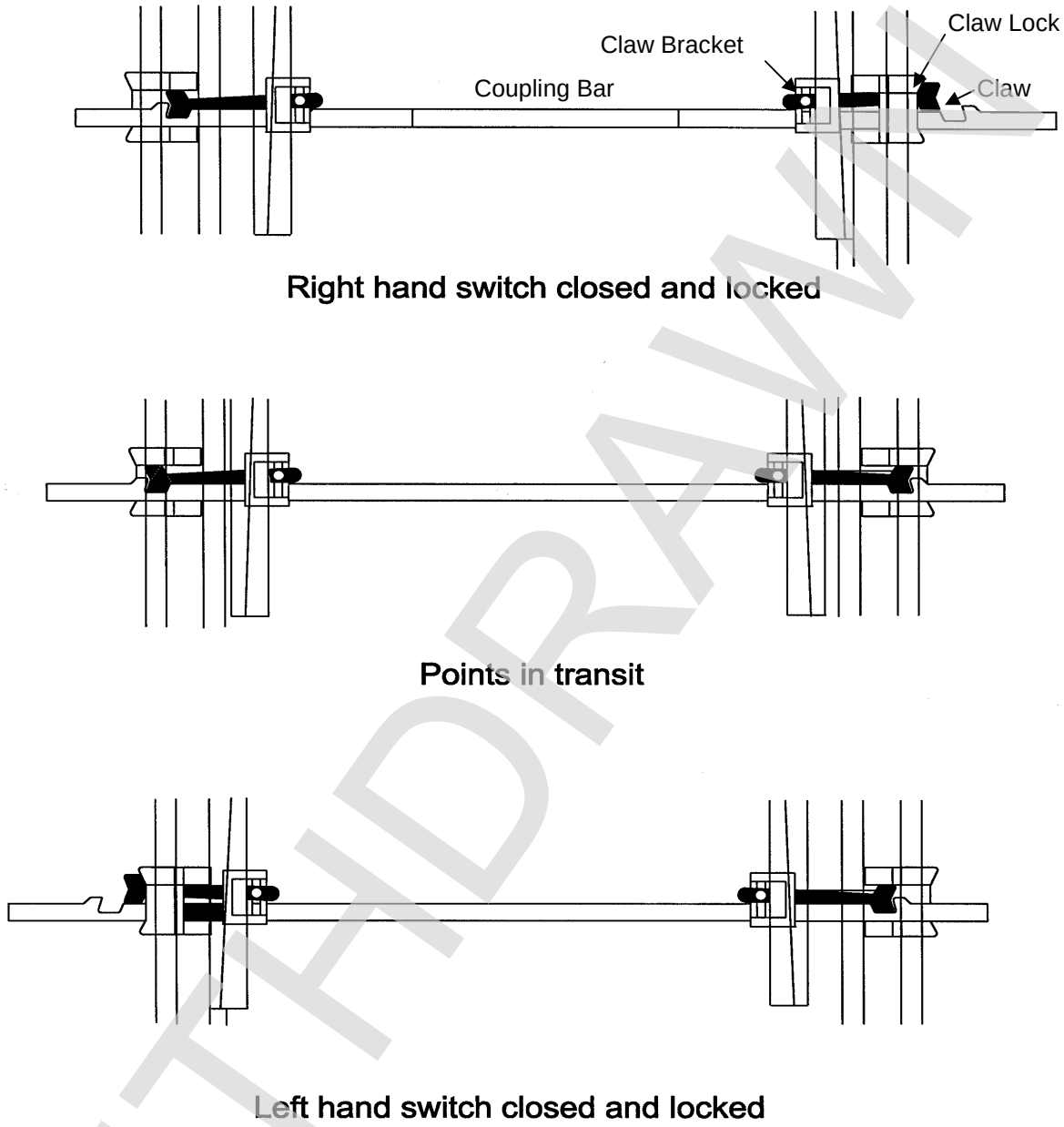


***Figure 2.1***
***Claw Lock Operation***

WITHDRAWN

Withdrawn - for reference only

# 3 Claw Lock Operation

## 3.1 On Points

Providing a driving force to one end of the coupling bar actuates the mechanism. This may be done with an electric mechanism, a pneumatic cylinder, a hydraulic cylinder or a mechanical lever.

Using Figure 2.1 for reference.

The top drawing shows the switch at the right of the diagram in the closed and locked position. The tail of the locking claw is hooked around the locking face of the claw lock and is held in this position by the coupling bar.

The switch at the left of the diagram is held in the open position by the tail of the claw being constrained within the notch in the coupling bar and being still within the claw lock.

To move the points, force is applied to move the coupling bar to the left. The open switch will immediately commence to move towards the closed position.

When the notch in the top of the coupling bar is opposite the tail of the claw of the closed switch, the claw will release from behind the claw lock into the notch and free the switch.

Continued movement of the coupling bar will move both switches until the switch at the left of the diagram is closed and its claw hooks behind the locking face of the claw lock.

The operating bar then travels past the claw and locks it behind the claw lock, at the same time completing the open switch travel.

When a trailable mechanism is attached to the coupling bar, the claw lock can be trailed without damage and operation is as follows:

As the train wheel rolls towards the tip of the switch from the “V”-crossing, it tries to force the open switch towards the closed position. When the force on this switch reaches a pre-determined level it will release a clutch or similar in the drive mechanism which frees the coupling bar to move.

As the wheel forces the open switch towards the closed position it will move the coupling bar through its locking claw, which is engaged in the notch in the bar.

Once the switch and bar have moved approximately 45 - 50 mm, the locking claw on the closed switch will be freed from behind the claw lock, and will allow the closed switch to open.

Generally points which have been trailed will be neither normal nor reverse after the trailing movement. It will be necessary for the signaller to re-stroke the points unless automatic normalising has been provided.

The claw lock mechanism may also be used on single blade catchpoints. A claw lock is fixed to the stockrail opposite the switch and this acts as a guide for the coupling bar. On the switch side, the assembly is identical to that of a full set of points.

It is also possible to use the claw lock mechanism on single and double slips. However, this does require some modifications to the standard assembly. For example, it is necessary to dispense with the claw bracket on the switch or switches in the “V” of the slip and pin the claw directly to the flange of the switch. To maintain commonality of parts the opposite switch is treated in the same manner.

WITHDRAWN

Withdrawn - for reference only

***Fig 3.1***
***Single Slip Fitted with Claw Locks***

## 3.2 On Swing Nose V Crossings

Again, providing a driving force to one end of the coupling bar actuates the mechanism.

The swing nose is held closed against the right hand wing rail by the right hand claw being driven out behind the claw lock by the coupling bar. The claw lock may be attached directly to the wing rails but is more commonly attached to a bracket fixed to the rail plates supporting the wing rail.

Note also that the slots in the coupling bar into which the claws fit are longer than those in the coupling bar for points. As both claws are fixed to the swing nose (In effect a single double sided switch), the coupling bar must be able to move to clear the locked claw before contacting the unlocked claw.

WITHDRAWN

Withdrawn - for reference only

Force applied to the coupling bar moves the bar to the left and allows the locked claw to fall into the slot in the bar. The bar then contacts the back of the unlocked claw and moves it and the swing nose across to the left hand wing rail.

When the swing nose contacts the wing rail, the coupling bar continues to move forcing the claw out behind the claw lock and locking it in place.

Claw lock installations on swing nose crossings are always non-trailable since pressure on the swing nose cannot move the coupling bar. In fact pressure will tend to increase the friction between claw and claw lock and will prevent release.

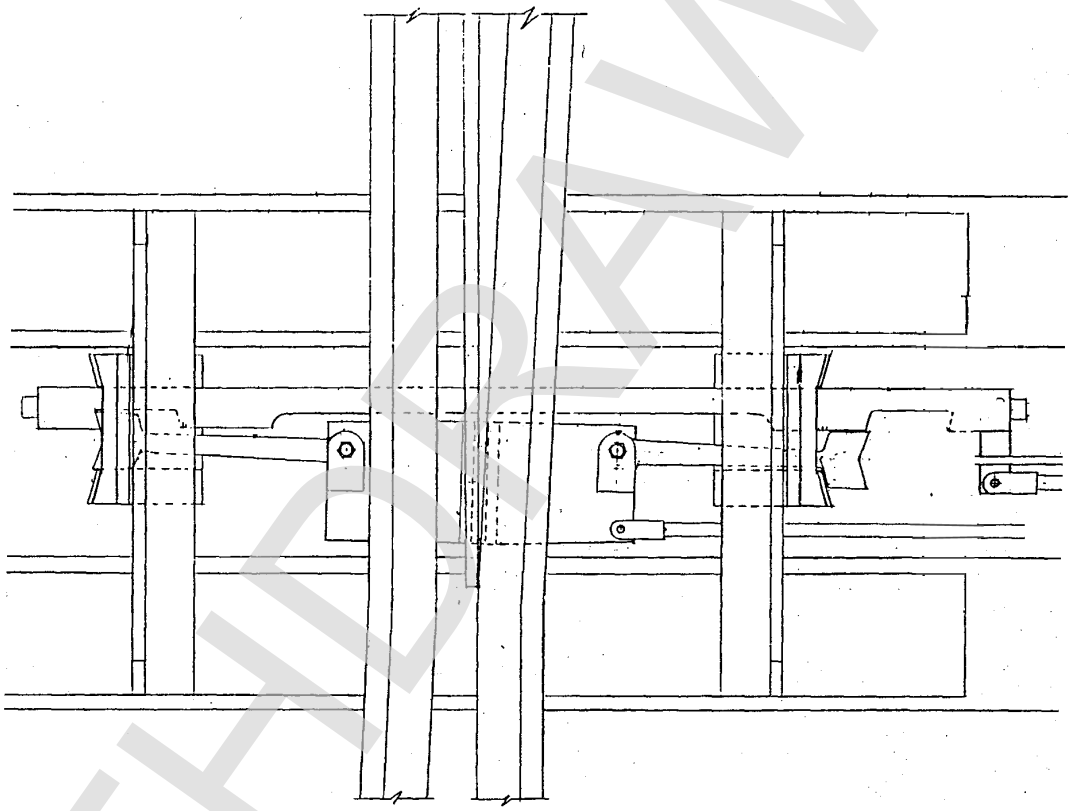

Figure 3.2
Claw Lock on Swing Nose Crossing

WITHDRAWN

Withdrawn - for reference only

Figure 3.3
VAE Swing Nose Equipped with Claw Locks

Figure 3.4
PRE 1 in 24 Swing Nose V Crossing Equipped with Claw Locks

Figure 3.5
PRE 1 in 12 to 15 Swing Nose Crossing Equipped with Claw Locks

WITHDRAWN