



AUSTRALIAN RAIL TRACK CORPORATION LTD

Discipline: Engineering (Track & Civil)

Category: Standard

# Thornley Type 45 Lever – Installation and Maintenance Procedures

## ETM-03-01

### Applicability

New South Wales	✓	CRIA (NSW CRN)	
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### Primary Source

ARTC NSW Standard LCP 02
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### Document Status

Version	Date Reviewed	Prepared by	Reviewed by	Endorsed	Approved
1.1	18 Jun 10	Standards	Manager Standards	Exec Manager SS&P 21/06/2010	CEO

### Amendment Record

Version	Date Reviewed	Clause	Description of Amendment
1.0	01 Dec 09		Implementation draft. Supersedes NSW Standard LCP 02 v1.1
1.1	18 Jun 10		Banner added regarding mandatory requirements in other documents and alternative interpretations.

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**Mandatory requirements also exist in other documents.**

**Where alternative interpretations occur, the Manager Standards shall be informed so the ambiguity can be removed. Pending removal of the ambiguity the interpretation with the safest outcome shall be adopted.**

## 1 Introduction

This specification details the installation and maintenance procedures for Thornley Type 45 point levers.

## 2 Manufacturer's Manual

Information for the installation and maintenance is provided in the Manufacturer's Manual attached as Appendix 1.

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*Note: The drag rod type used is 22D68. Appendix 1 also includes a parts listing.*

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## 3 Maintenance Tolerances

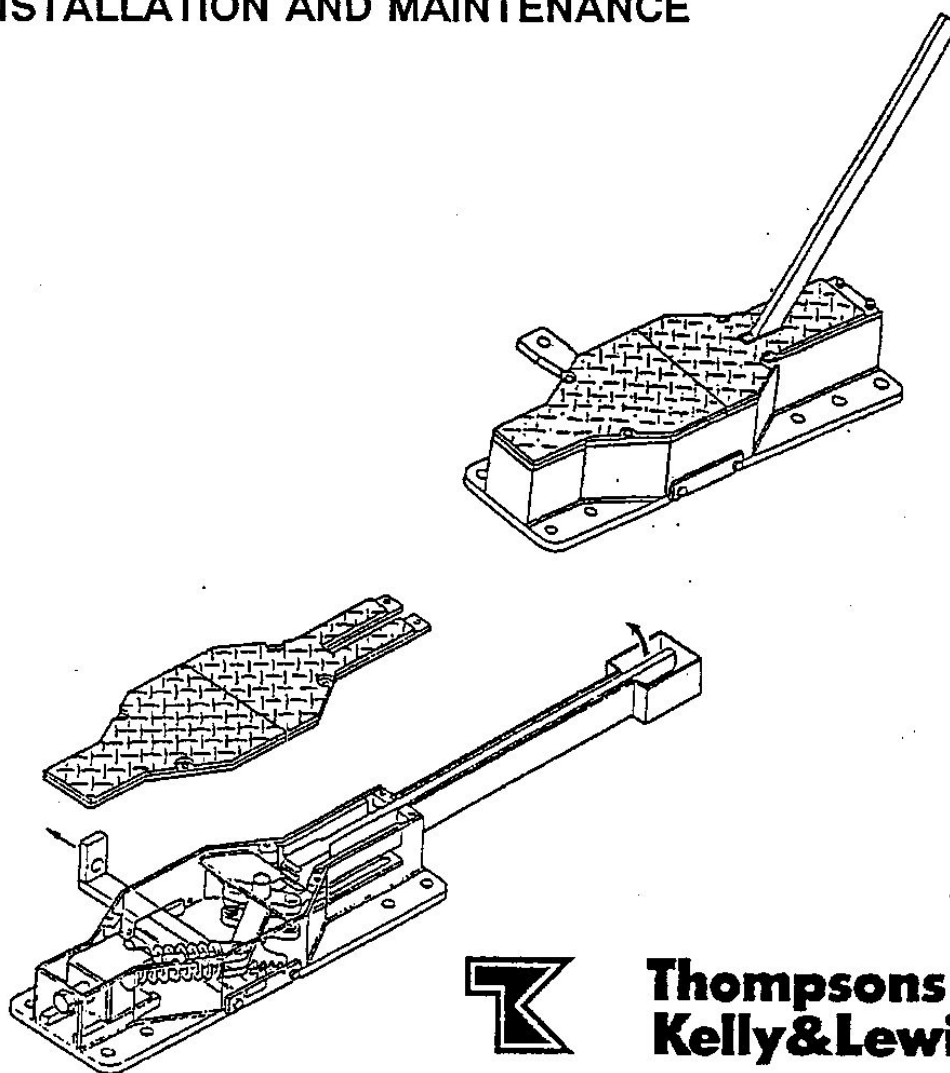
The switch opening must be maintained to a tolerance of 120mm + 2mm.

## 4 Appendix 1 - Thornley Lever Installation & Maintenance Manual



### TYPE 45 LEVER

### INSTALLATION AND MAINTENANCE



**Thompsons  
Kelly & Lewis**

**Railway Products  
Division**

Date of Issue: November 1993

**Thompsons, Kelly & Lewis Pty Ltd**  
**Installation & Maintenance**  
**Thornley Type 45 Lever**  
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During the installation of Thornley Type 45 levers, it is essential that certain conditions prevail to ensure satisfactory operation with minimum maintenance.

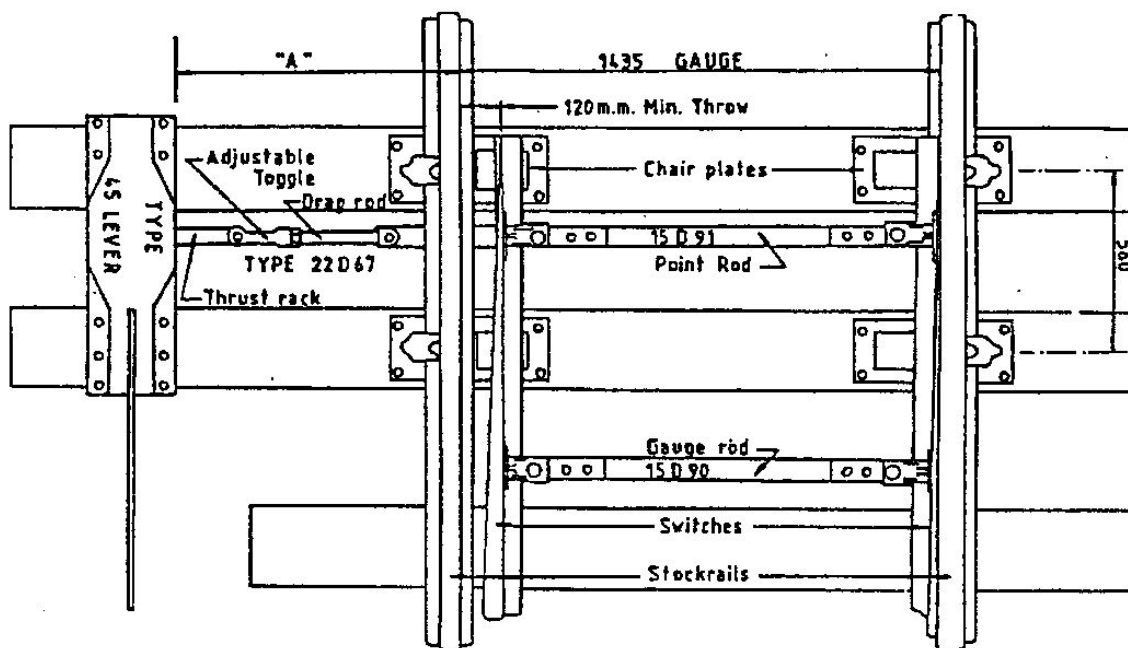
1. All trackwork in the switch area has to be maintained to a high degree of efficiency.
2. Chair plates have to be checked to ensure there is no movement between chairs and stockrail, also between chairs and sleepers.
3. Surveillance should be maintained at all heel joints to ensure all bolts are tight and the switchblade retains a free movement during operation.
4. Switchblades should bear evenly on all chair plates.
5. Switchblades should close firmly against each stockrail with no clearance at the point or at the end of head machining.
6. Chair plates should be kept greased at all times to ensure free sliding movement of the switchblades.
7. Obstructions such as blue metal pieces should be kept clear of the switchblade movement.
8. Point rod should be installed and adjusted to give a straight line through the point rod and a minimum throw at the switch points of 120mm.
9. Gauge rods should then be installed and adjusted so that there is no distortion at the switchblades.
10. It is imperative that switch bracket bolts be kept tight at all times.
11. When installing the Thornley Type 45 lever, it is most essential that the point rod, connecting drag rod and the thrust rack of the lever be kept in a straight line.

If this is not done a jack-knifing effect will occur and damage the mechanism of the lever.

12. The position of the lever is governed by the type of connecting drag rod used, as shown on our attached sketch, where the distance from the lever base to the running edge of the nearest stockrail is marked dimension 'A', which is:

For type 22D66	1140 mm
For type 22D67	1270 mm
For type 22D68	1400 mm

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FOR TYPE 22 D 66 "A" = 1140

FOR TYPE 22 D 67 "A" = 1270

FOR TYPE 22 D 68 "A" = 1400

13. The adjustable connecting drag rod is then adjusted so that when the operating lever thrust rack is in its central position, each switch has an opening of 60 mm.

This will give an even pressure on both switch blades when in their operating position.

14. When centralising the lever thrust rack, do not remove the lid through which the handle protrudes as this may disrupt the meshing of the handle quadrant with the lever rack. Removing the small lid is sufficient to observe the centralising of the thrust rack and also gives access to lubricating the internal mechanism of the lever box.

If the large lid has to be removed at any time, it is essential that it is replaced in the right position to give proper meshing of the handle and rack. It is usually placed approx 10 mm closer to the small lid and then pulled back against the tension of the lever rack return spring before bolting down. If this is not done, the lever box will not function properly.

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15. To maintain efficiency with the Thornley Type 45 lever, it is imperative that the internal mechanism is kept greased at all times.

Make sure the side plates of the box are kept tight, as any looseness in this area may allow the thrust rack guide to be displaced and cause a breakdown in the functioning of the lever.

Usually the spring tension in this type of lever box is pre-set, but if more tension is required, an adjusting screw is located at the back of the adjusting bracket. Do not over tighten this screw, as it will crowd the tension spring and impede the efficient operation of the lever.

There are drain holes in the bottom of the lever box to allow any water which may enter the box to escape.

During inspection and maintenance, ensure that no foreign matter has entered the box through these holes.

After inspection or maintenance always ensure that all screws are tightened.

The Thornley Type 45 lever is a very efficient machine, particularly in the area where trailing through operations occur, but remember at all times, it cannot overcome all the pitfalls of a badly maintained track.

If you want your switchblades to function properly, keep your lever maintained properly and, if you want your lever to function properly, keep your switchblades maintained properly. One cannot work efficiently without the other.

Heavy work will cause a strain on the best of equipment and any parts which may fail can be replaced immediate, as a comprehensive range of parts are kept in stock at all times.

To dismantle the Thornley Type 45 lever, the following procedure should be followed:

- . Remove the retaining split pin from the clevis pin attaching the connecting drag rod to the lever thrust rack.
- . Depress the lever handle to release the spring tension on the thrust rack and remove the drag rod clevis pin.
- . Remove the lid securing bolts (CS00599) from the small spring end lid (TH18306) and remove this lid.



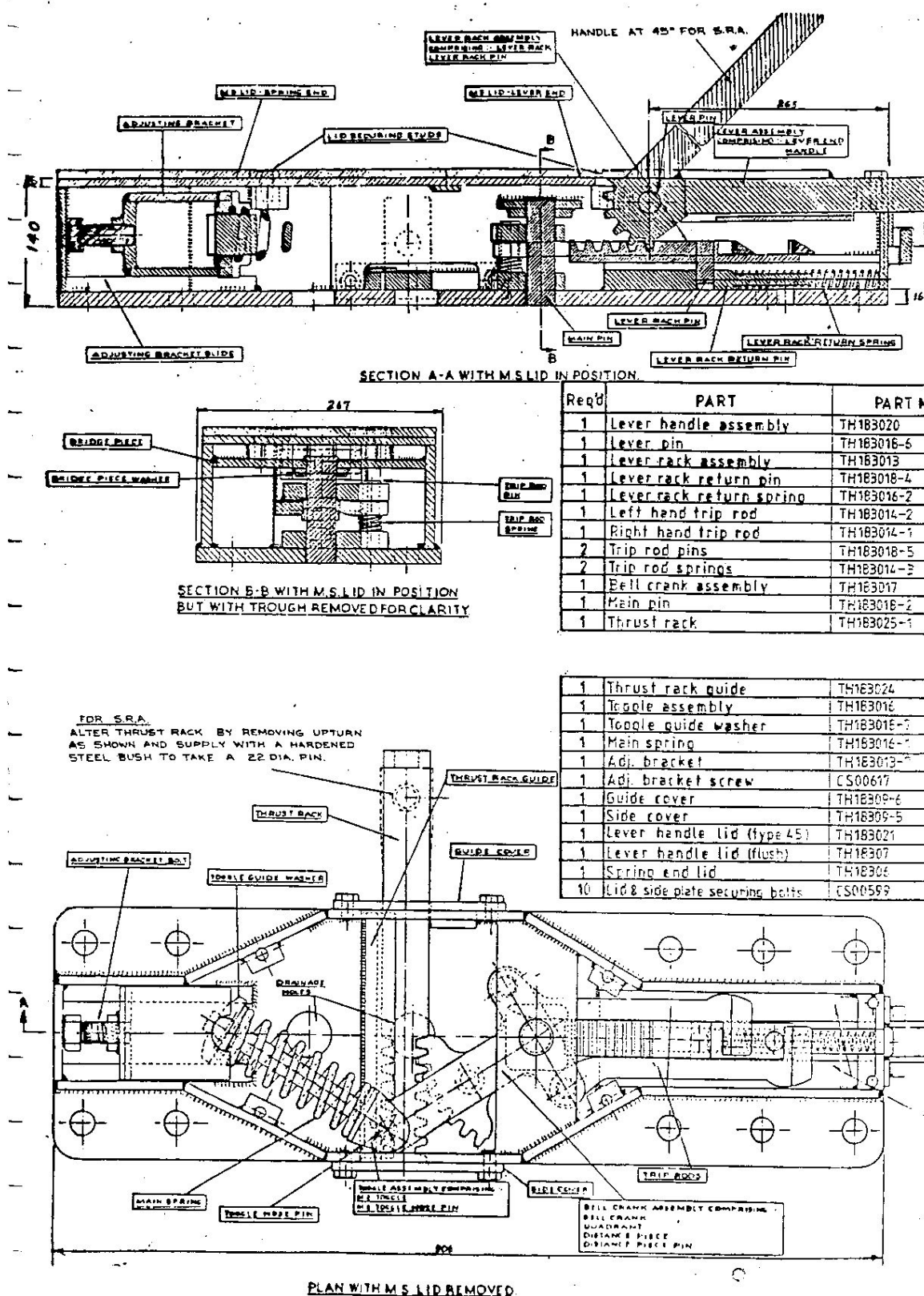
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- . Remove the securing bolts (CS00599) from the guide cover plate (TH18309-6) and side cover plate (TH18309-5) and remove these two plates.
- . Slide the thrust rack guide (TH183024) out through the side of the lever box and this will then allow the thrust rack (TH183025-1) to be removed.
- . With an M24 spanner screw the adjusting bracket screw (CS00617) clockwise into the adjusting bracket (TH183013-7) to release all tension off the main spring.
- . This will allow the removal of the adjusting bracket (TH183013-7), toggle guide washer (TH183018-7), toggle assembly (TH183016) and the main spring (TH183016-1).
- . Remove the securing bolts (CS00599) from the lever handle lid (TH18307 or TH183021) and the lid with the lever handle can then be removed.
- . Detach the lever handle assembly (TH183020) by removing the lever pin (TH183018-6) and this will leave the lever handle lid (TH18307 or TH183021) detached.
- . Extract the main pin (TH183018-2) with an upward pressure and the bell crank assembly with the trip rods attached can then be removed.
- . Extract the trip rod pins (TH183018-5) from this assembly and the trip rods (TH183014-1) and (TH183014-2) with the trip rod springs (TH1830A-3) can then be detached, noting that the trip rod springs are underneath the trip rods for reassembling.
- . The lever rack assembly (TH183013) can then be removed, which then allows the lever rack return spring (TH183016-2) together with the lever rack return pin (TH183018-4) to be removed.
- . All parts should then be thoroughly inspected and cleaned.
- . Any damaged parts should be replaced.
- . To reassemble, follow the reverse of the dismantling procedure, ensuring that plenty of grease is used on all moving parts.

Please note that the trip rods (TH183014-1) and (TH183014-2) are slightly concaved to ensure that the ends are bearing hard on the lever rack.

Do not straighten these rods.





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To assist in obtaining parts, the following is a list of all parts of the Thornley Type 45 lever, as shown on Drawing No. S-1-830.

Part No.	TH183020	Lever handle assembly
	TH183018-6	Lever pin
	TH183013	Lever rack assembly
	TH183018-4	Lever rack return pin
	TH183016-2	Lever rack return spring
	TH183014-2	Left hand trip rod
	TH183014-1	Right hand trip rod
	TH183018-5	Trip rod pins
	TH183014-3	Trip rod springs
	TH183017	Bell crank assembly
	TH183018-2	Main pin
	TH183025-1	Thrust rack
	TH183024	Thrust rack guide
	TH183016	Toggle assembly
	TH183018-7	Toggle guide washer
	TH183016-1	Main spring
	TH183013-7	Adj bracket
	CS00617	Adj bracket screw
	TH18309-6	Guide cover
	TH18309-5	Side cover
	TH183021	Lever handle lid (type 45)
	TH18307	Lever handle lid (flush)
	TH18306	Spring end lid
	CS00599	Lid and side plate securing bolts

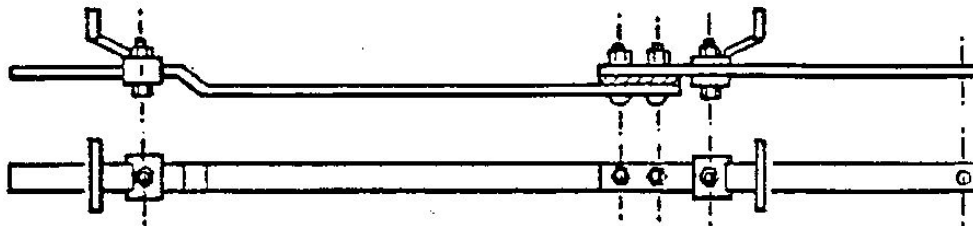
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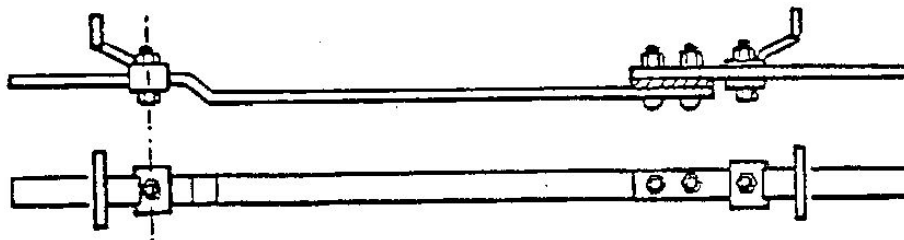
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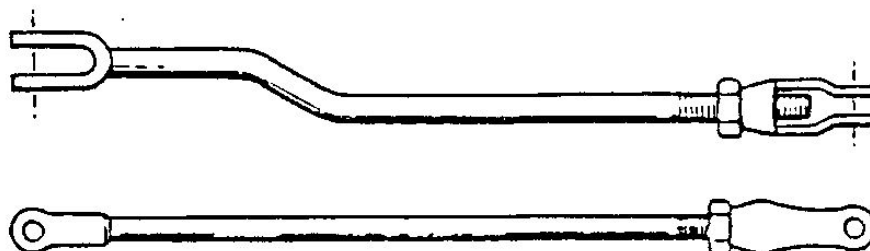
POINT ROD, GAUGE ROD AND DRAG ROD  
USED WITH TKL TYPE 45 LEVER



SRA Type 15D91 Point Rod



SRA Type 15D90 Gauge Rod



Type No. 22D67