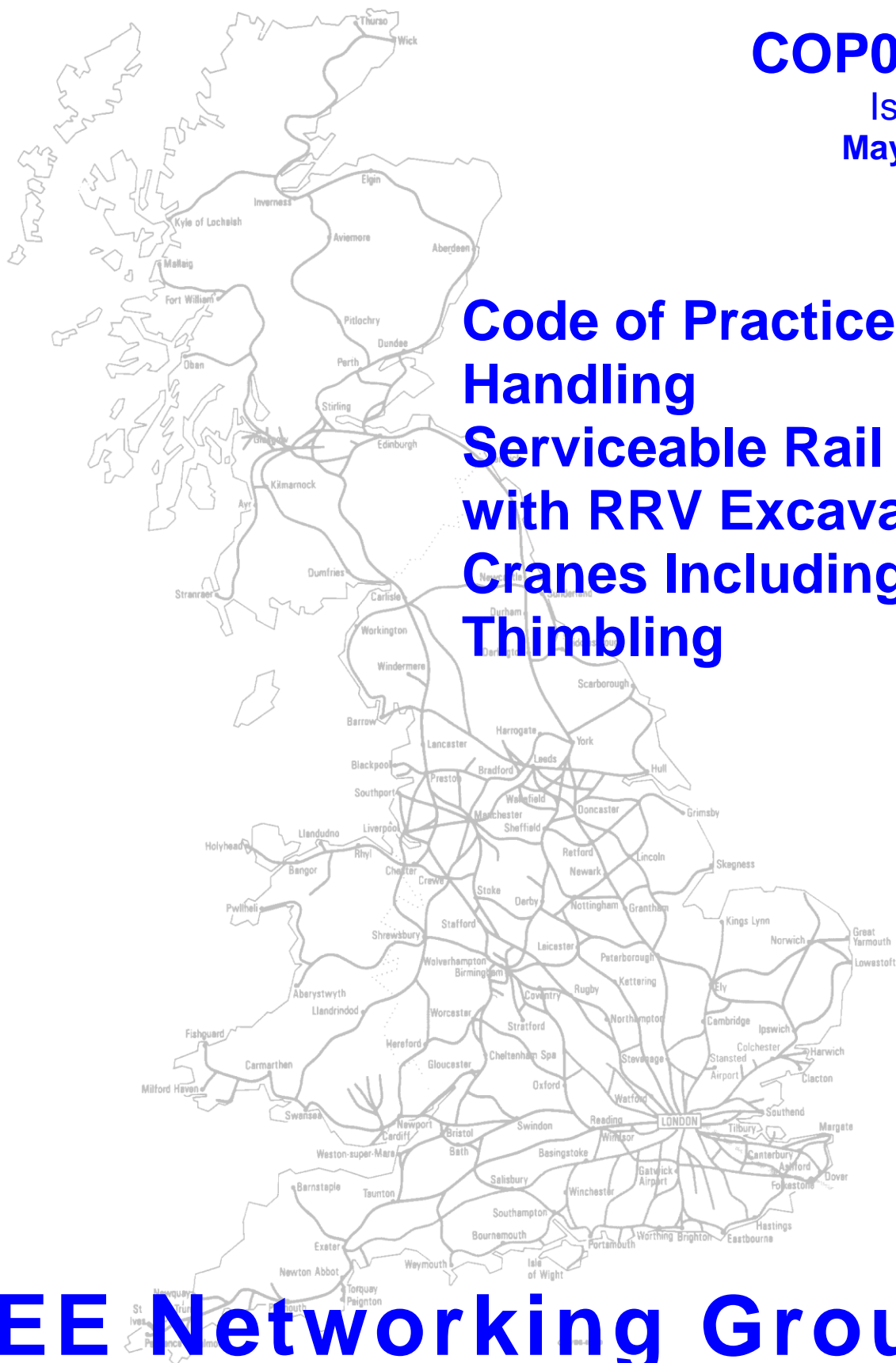


COP0005

Issue 5
May 2015



**Code of Practice for
Handling
Serviceable Rail
with RRV Excavator
Cranes Including
Thimbling**

M&EE Networking Group

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Handling Serviceable Rail with
RRV Excavator Cranes including Thimbling

Document revision history

Issue	Date	Reason for change
1		First issue (now withdrawn)
2	Nov 05	Revised and updated (now withdrawn)
3	Sep 10	Reviewed and updated (now withdrawn).
4	May 12	Addition of separate competence for lift planner, restricted area, sample thimble lift plan, lifting of conductor rail, and a general review of COP (now withdrawn).
5	May 15	General review of COP, Imperial measurements removed, Table 1 changed to remove manufacturers' names. 1.13 added for rail on its side.

Background

A sub-group of the M&EE Networking Group have looked at various published standards and reviewed current industry practice, for the lifting operations for iron men; and have made recommendations for consistent processes across the industry. The M&EE Networking Group recommend this COP as good practice for the industry.

M&EE COPs are produced for the benefit of any industry partner who wishes to follow the good practice on any railway infrastructure. Where an infrastructure manager has mandated their own comparable requirements, the more onerous requirements should be followed as a minimum for work on their managed infrastructure.

The M&EE Networking Group makes no warranties, express or implied, that compliance with this document 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.

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Sign off

The M&EE Networking Group agreed and signed off this Code of Practice on 13th May 2015 and published on 5th September 2015

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Purpose

This Code of Practice details the equipment and working practices for handling rail to minimise risk to personnel and damage to the rail.

Scope

This Code of Practice concerns the handling and thimbling of serviceable rail using RRV excavator cranes.

This Code of Practice does not deal with tandem lifting of rail, which is covered in COP0008. This Code of Practice deals with the longitudinal movement for up to 20 m of rail, and lateral movement of any length of rail.

Note: These recommendations can also be used for handling scrap rail where the risk to personnel is the same as handling serviceable rail but the damage to the rail is not so critical.

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Definitions

Pick & Carry

A process of lifting and transporting rail with a suitably rated RRV excavator crane and accessories (designed to prevent the rail slipping through or turning) whilst suspended from the RRV excavator crane when moving along the track.

Pick & Lift

A process of lifting and moving rail with a suitably rated RRV excavator crane and accessories (designed to prevent the rail slipping through or turning - unless a sufficient length of the rail remains in contact with the ground to act as a restraint), whilst suspended from the RRV excavator crane with the RRV excavator crane remaining static during the entire operation.

Rail

Individual serviceable rail released from fastenings and free of all loose material.

Thimbling

A process of laterally moving long welded flat bottomed rail with an RRV excavator crane and lifting accessory fitted with guidance rollers suspended from the RRV excavator crane. Minimum length of rail suitable for this process is 90 m.

1 General requirements

- 1.1 The person planning the handling of rail using RRV excavator crane should be suitably competent as a lift planner.
- 1.2 Ensure lifting accessory to be used has approval (Product Acceptance) from the infrastructure manager concerned, the approval should also state:
- a) the intended rail section to be moved.
 - b) rail-head condition concerned (badly side cut rail may not be adequately retained by the lifting accessory).
 - c) method of lifting.
 - d) proposed further use of the rail.
- 1.3 The lifting of conductor rail should only be carried out using methods and lifting accessories that have approval from the Electrification Engineer of the infrastructure manager concerned.
- 1.4 Ensure lifting accessories to be used have sufficient capacity for the intended use.
- 1.5 Ensure RRV excavator crane to be used has the capacity for the intended use.
- 1.6 The person in control of operation and the machine operator should hold competency for the 'Road Rail Excavator Crane' and the rail handling operation to be undertaken e.g. thimbling.
- NOTE Competency e.g. Sentinel requirements on UK managed infrastructures
- 1.7 The person specifying the RRV excavator crane to be used should be familiar with COP0002 and COP0011.
- 1.8 The following parameters should be determined at the planning stage:
- a) Maximum cant & gradient to be operated over (for the RRV excavator crane).
 - b) Overhead limitations and track obstructions.
 - c) Site tail-swing restrictions.

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- d) Length of rail to be lifted.
- e) Positions of rail to be moved from/to.
- f) Electrical isolations.
- g) Restrictions due to passing traffic.
- h) Location of restricted areas.

1.9 From site parameters the person planning the work will select a suitable process from Table 1. Although tandem lifting is more commonly used for track sections, lengths of rail could also be moved using two RRV excavator cranes (tandem lifting), this method is explained in COP0008.

Rail Length	Pick-&-Lift	Pick-&-Carry	Thimbling	Lifting Accessory	Method
Up to 6m	Yes	Yes	No	Chains, Camlocks, Web slings Approved rail lifting beams	May be single point lift
6m to 20m	Yes	Yes	No	Beams required with 2 Camlocks or Web-slings, Approved rail lifting beams	Minimum 2 point lift
20m to 90m <i>Not Bullhead</i>	Yes Laterally only	No	No	Suitable thimble, with a minimum of 2 tonne capacity	Pick and lift only (Max. height of lift 500mm)
Above 90m <i>Not Bullhead</i>	Yes Laterally only	No	Yes	Suitable thimble, with a minimum of 2 tonne capacity	Thimbling (Max. height of lift 500mm)

Table 1 Handling method for lengths of rail

1.10 From the site parameters and process the person planning the work should select a suitable RRV excavator crane taking into consideration the potential need for height and slew limiters.

1.11 At no time should any person be under or carry out work on a suspended load. If work is required, the rail should be landed onto suitable blocks.

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- 1.12 Consideration should be given, when landing the rail, to ensure its stability, safe release of the lifting accessory, and avoidance of damage to existing track components.
- 1.13 Consideration should be given to rail which is on its side. In these circumstances an approved rail turning attachment should be used in accordance with the manufacturer's instructions. For manual rail turning this should be undertaken with an approved device and safe system of work.

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2 Pick-and-lift

- 2.1 The RRV excavator crane selected must be fitted with a Rated Capacity Indicator (RCI).
- 2.2 For rail lengths up to 20 m the rail should be balanced and suitably restrained (either controlled handling device or 'tag' lines). An initial lift should be made to check balance and correct attachment of the lifting accessory(s), re-adjusting if necessary.
- 2.3 When laterally moving rail lengths of over 20 m, sufficient length should remain on the ground to act as a restraint. All ground personnel should be at least 3 m from the rail and at least 5m from the end of the rail when the free end is being raised off the ground due to the risk of rail "whipping".
- 2.4 If using a thimble to pick and lift then the person in control of operation and the machine operator should have thimbling competence.

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3 Pick-and-carry

- 3.1 The RRV excavator crane should have an RCI with “Lift & Carry” duty. An assessment of the cant encountered over the distance to be travelled with the load should be carried out and the RRV excavator crane selected should have the capacity for the most adverse cant identified.
- 3.2 For rail up to 20 m the rail should be gripped and balanced and suitably restrained (either controlled handling device or ‘tag’ lines). An initial lift should be made to check balance and correct attachment of the lifting accessory, re-adjusting if necessary. Lengths greater than 20 m should not be pick-and-carried.
- 3.3 Where practical, the rail should be kept parallel to the running line and as low as practicable.

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4 Thimbling

4.1 Planning for Thimbling

- 4.1.1 Type, section and size of rail to be thimbled should be identified. If rail-head is badly lipped or side cut, thimbling should not be considered where the thimble locates under the rail head (ie it is permissible to use a thimble that locates under the foot of the rail).
- 4.1.2 The planner should decide the nominal radius at which the load is to be lifted. The nominal radius should always be the furthest point the rail is to be moved from or to. The planner should always note that thimbling is accomplished at an angle from the track therefore the nominal radius is greater than the perpendicular distance from the centre of the track to the rail to be moved. Further assistance is given in Appendix A.
- 4.1.3 With many designs of thimbles it is necessary to have the rail raised and placed on blocks to allow the thimble to be correctly closed around the rail. The lifting of the rail to place it on blocks can be carried out in a number of ways, one of which is to use the thimble located only under the head of the rail. The suitability of the thimble for this duty should be determined and if not suitable other means of lifting the rail should be planned and allowed for.
- 4.1.4 An example of a simple lift plan for use when thimbling only is shown in Appendix B.

4.2 RRV Excavator Crane Capacity & Selection

- 4.2.1 The RRV excavator crane should be selected for use on the most onerous cant on the site. The rated limit for cant is detailed on the Engineering Acceptance Certificate (and shown on a data panel on the side of some RRV excavator cranes).
- 4.2.2 For use when thimbling the RRV excavator crane should have an RCI with "Lift & Carry" duty. An assessment of the cant encountered over the distance to be travelled with the load should be carried out and the RRV excavator crane selected should have the capacity for the most adverse cant identified.

4.2.3 When the RRV excavator crane is ordered the person requesting it should specify that the RRV excavator crane should be fitted with an RCI and with a minimum capacity of 2 tonne for lifting rail sections up to 113 lbs/yd / UIC60, at radius as defined in the lifting plan. Adjustments will be necessary when lifting heavier rail sections (such as conductor rail) and guidance should be sought.

4.2.4 The 2 tonne capacity given in 4.2.3 is only for the weight of the rail and thimble. It does not make an allowance for any other lifting accessory such as a quick-hitch which will also need to be included as part of the total load being lifted if the quick hitch is not part of the lifting equipment.

4.3 Thimble

4.3.1 Thimbles are a lifting accessory with a minimum lift capacity of 2 tonnes and capable of securely locating the rail in the vertical position and have the capability of securely gripping the rail under the rail head (Pick & Lift capability) and/or under the foot of the rail.

4.3.2 The thimble should be designed such that the rail cannot be accidentally released, eg integrity of the opening / closing circuits on a hydraulically operated thimble should be protected to avoid accidental opening under load (ie hose failure).

4.3.3 Thimbles should be suspended from an approved lifting point and should be able to swivel freely.

4.4 Site Preparation

4.4.1 All rail welds and other obstructions that cannot be removed should be clearly marked, briefed and indicated to the RRV excavator crane operator by the person in control of operation before the thimbling operation progresses.

4.4.2 Pads, bonds, fishplates, creep adjusters and other loose material should be removed from rail or clearly marked.

4.4.3 Sufficient blocks should be available where necessary for:

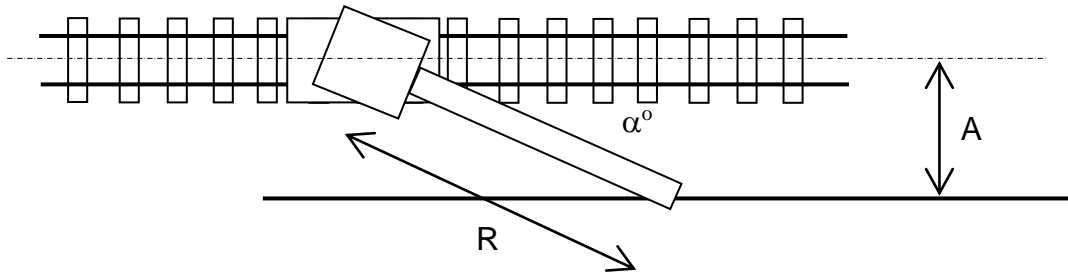
- landing rail.
- passing obstructions.
- use when attaching/detaching the thimble.

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4.5 Use

- 4.5.1 When thimbling a restricted area should be set up. All personnel must be at least 3 m from rail and 5 m from the free end of the rail when the thimble approaches due to possibility of the rail “whipping”.
- 4.5.2 The person in control of operation should be satisfied that the thimble is correctly closed on the rail before commencing every lift during the thimbling operation.
- 4.5.3 When an obstruction is reached the rail should be lowered onto blocks (where necessary), the thimble opened and moved past before continuing with the operation.
- 4.5.4 The RRV excavator crane operator should monitor the RCI throughout the thimbling operation. If the indication of load on hook increases this may indicate that an obstruction has been encountered (eg weld, pads, etc), or that the rail is fixed in position, or snagged in some other way. In this event travel should be stopped, the load lowered and the cause identified and rectified.
- 4.5.5 The height of the rail being thimbled (normally a maximum of 500 mm as detailed in Table 1) will also have an effect on the load on the RRV excavator crane (the higher the rail is lifted the heavier the load), therefore rail height should be kept to the minimum. The minimum height is that required to avoid unnecessary contact with other track components which could be impacted by the thimble itself or the rail being thimbled.
- 4.5.6 The operator should orientate the RRV excavator crane to give themselves maximum vision in the direction of travel and of the rail being handled.
- 4.5.7 The load should be carried in the lifting duty which has sufficient lift capacity (this could be limited to the fixed axle end). This should be taken into consideration when on-tracking the RRV excavator crane so that the thimbling operation is undertaken within this duty.
- 4.5.8 Overhead restrictions (e.g. OLE) should be considered as this may influence the load/radius capacity of the RRV excavator crane.
- 4.5.9 Speed of travel should be such that the person in control of operation can closely observe and control the operation, stopping should the thimble snag on any obstructions (eg pads, welds, creep adjusters) that have inadvertently not been previously removed or marked, or when personnel encroach within the 3 m and 5 m parameters described in 4.5.1.

Appendix A Determination of nominal radius



Perpendicular distance from track to rail to be moved from or to A m	Angle machine used from track α°	Nominal radius of machine to be used for planning R m
1	20	2.9
2		5.8
3		8.8
4		11.7
2	40	3.1
3		4.7
4		6.2
5		7.8
6		9.3
7		10.9
8	12.5	
3	60	3.5
4		4.6
5		5.8
6		6.9
7		8.1
8		9.2
9		10.4
10		11.6

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Appendix B Example of thimbling lift plan

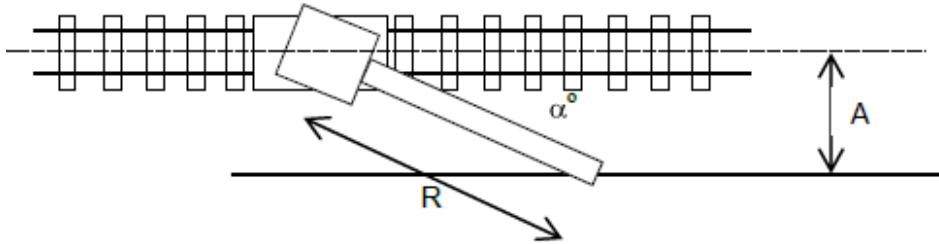
Job Location:

Date of lift

Prepared by Name:

Signature:

Minimum length to be thimbled 90m	
Type of Rail to be thimbled	
Track obstructions that may increase radius	
Are welds/obstructions marked on the rail	
Weight of thimble	
Weight of other accessories including quick hitch (where not part of machine)	
Maximum load on hook	2 tonne max
Cant	
Maximum perpendicular start/finish distance (A)	
Angle at which maximum radius was calculated	
Nominal Radius (R)	
capacity of machine at selected radius (R)	(must be greater than 2 t)



Machine Details

Lifting machine/s	Make/Type	
Capacity of machine - At required radius/height		
Any deratings used		

Thimble Details

Make/Type	
Weight of Thimble	
Suitability for rail section	
Blocks required for passing obstruction (where required)	

Site details

Lifting eye Height of machine (if applicable)	
Exclusion zone details	
Maximum Gradient - Is protection needed	
Lifting points to be used - are they of adequate strength	
Specific risks (excavations, Structures, Ground conditions, P/Way, underground services, National grid lines/pylons)	*
Overheads present - are they isolated	*
Clearances - Risks of trapping, walk ways etc.	*

*Any of the above that are highlighted must have additional control measures detailed.