

Ref:	NR/L2/TRK/001/mod04
Issue:	6
Date:	01 December 2012
Compliance date:	02 February 2013

Rail Joints

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 2012 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/TRK/001/mod04
Issue:	6
Date:	01 December 2012
Compliance date:	02 February 2013

Contents

1 Scope	4
2 Definitions	4
3 Fishplated rail joints	4
3.1 Forming the joint	4
3.2 Rail end support	4
3.3 Fishplates	5
3.4 Fishplate bolts	5
Table 1 – Tightening fishbolts	5
3.5 Rail ends	5
4 Fishplated expansion joints	6
4.1 Lubrication	6
4.2 Rail gaps	6
Table 2 – Expansion gap settings	6
4.3 Rail adjusting	7
4.4 Rail length between fishplated expansion joints	8
4.5 Damaged signalling and electrical bond wires	8
5 Fishplated ‘Tight’ Joints	8
5.1 General	8
5.2 Wide gaps at tight joints	8
5.3 Replacement of incorrect components in tight joints	9
Table 3 - Replacement of incorrect components in tight joints	9
6 Welded joints	9
6.1 Forming the joint	9
6.2 Rail end support	9
7 Joining sideworn rails	10
8 Defective joints	10
8.1 Broken, cracked, incorrect or damaged fishplates	10
Table 4 - Minimum action to be taken for broken, cracked, incorrect or damaged fishplates in a running line	11
8.2 Bolts missing from joints	12
Table 5 –Minimum action to be taken for joints with missing fishbolts	12
8.3 “Fly-fished” joints	12
Table 6 – Minimum action to be taken for rail joints with all the bolts missing from either rail end (‘fly-fished’ joint)	12

Ref:	NR/L2/TRK/001/mod04
Issue:	6
Date:	01 December 2012
Compliance date:	02 February 2013

9 Rail joint straightening	13
10 Insulated Rail Joints	13
10.1 General requirements	13
10.2 Rail end support	13
10.3 Glued insulated rail joints	14
10.4 Non-Glued insulated rail joints	14
10.5 Lipping at rail ends on insulated rail joints	14
11 Temporary rail joints	15
11.1 Fastenings	15
11.2 Temporary rail joints using rails 4.5 metres or longer	15
Table 7 – Temporary rail joint requirements; rails 4.5 m or longer	15
11.3 Temporary rail joints using rails shorter than 4.5 metres in length	16
Table 8 – Temporary rail joint requirements; rails shorter ¹ than 4.5 metres	16
12 Rail joints on underbridges and structures	16
Table 9 – Rail joints (fishplated and welded); minimum distances at underbridges	16
13 Rail joints in level crossings	16

Ref:	NR/L2/TRK/001/mod04
Issue:	6
Date:	01 December 2012
Compliance date:	02 February 2013

1 Scope

This module of NR/L2/TRK/001 applies to joints in plain line and S&C and covers:

- a) fishplated expansion joints;
- b) rail gap measurement and rail adjusting;
- c) fishplated tight joints;
- d) welded joints;
- e) joining sideworn rails;
- f) defective joints;
- g) rail joint straightening;
- h) insulated rail joints;
- i) temporary joints;
- j) rail joints on underbridges.

This module does not cover:

- k) the management of dip angles (see NR/L2/TRK/001/mod11);
- l) ultrasonic testing of joints (see NR/L2/TRK/001/mod06);
- m) broken rails at joints (see NR/L2/TRK/001/mod08).

2 Definitions

See Glossary (NR/L2/TRK/001/mod01).

3 Fishplated rail joints

3.1 Forming the joint

Install and maintain fishplated rail joints so that the running surface and gauge face of the rails are in line.

3.2 Rail end support

The two sleepers on each side of a fishplated joint (four in total) shall be of the same material and depth.

Locate joints opposite each other in the same bay, mid-way between sleepers. They may be located in different bays only with the approval of the RAM [Track].

Joints are kept nominally central between the sleepers so that all rail fastenings may be correctly applied.

Joints should not become located over sleepers or baseplates.

Ref:	NR/L2/TRK/001/mod04
Issue:	6
Date:	01 December 2012
Compliance date:	02 February 2013

3.3 Fishplates

Use appropriate fishplates for the rail sections being joined.

Accommodate different rail profiles and rail depths by the use of junction fishplates and/or lift fishplates.

NOTE shims are not appropriate for this task.

Flame-cut bolt holes in fishplates are not permitted.

3.4 Fishplate bolts

Tighten fishplate bolts to the torque settings detailed in Table 1.

Table 1 – Tightening fishbolts		
Bolt type	Torque to be applied	Typical use
Black bolts	475Nm (350ft lbs)	Expansion joint
1" (25mm) high tensile bolts	880Nm (650ft lbs)	Insulated joint or tight joint in 98lb and 109lb rail
1½" (28mm) high tensile bolts	1020Nm (750ft lbs)	Insulated joint or tight joint in 110lb, CEN56E1 and CEN60 rail

See Section 8 for action required for missing or broken fishbolts.

3.5 Rail ends

Remove rail end defects or damage using one of the following methods:

- a) cutting back the rail end;
- b) arc weld repair;

NOTE arc weld repairs are permitted for the repair of wheelburns and squats within fishplate limits provided that there is no associated vertical defect greater than 15mm deep present. Arc weld repairs are also permitted to repair rail end batter in Track Categories 4, 5 and 6.

- c) replacing the rail.

Manage differential sidewear of the two rail ends as detailed in Section 7.

Flame-cut bolt holes in rail ends are not permitted.

Flame-cut rail ends at fishplated joints are prohibited.

Flame-cutting of rail is only permissible when:

- a) cutting into stressed rail;
- b) the rail end in Normal Grade (220) and Standard Grade (260) rail is to be welded within 24 hours and no traffic is to pass.

NOTE in an emergency traffic may pass at a maximum speed of 20 mph, for up to seven days, if the rail end is fitted with emergency clamped fishplates (complete with four clamps or equivalent).