Ref:	**NR/L2/TRK/001/mod04**
Issue:	**8**
Date:	05 June 2021
Compliance date:	05 June 2021

NR/L2/TRK/001

Module 04

Rail Joints

Emergency change

Issue date: 25 March 2020
Compliance date: 25 March 2020
Expiry date: TBC

Emergency change NR/BS/LI/440 is attached to this standard/control document.

This emergency change mitigates an urgent safety/asset/equipment risk that cannot await a full review of this standard/control document.

This standard/control document will be reviewed and reissued before the emergency change expires on TBC.



Tara Scott, Professional Head of Track

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 2021 Network Rail.

Uncontrolled copy once printed from its electronic source.

Published and Issued by Network Rail, 2nd Floor, One Eversholt Street, London, NW1 2DN.

--`,``,,,`,,`,,`,,,,`,```,,-`-`,,`,,`,`,,`---

Copyright Network Rail
Provided by S&P Global under license with Network Rail
No reproduction or networking permitted without license from S&P Global

Licensee=Intertrain (UK) Ltd/1121227010, User=Taylor, Garry
Not for Resale, 09/05/2022 01:52:05 MDT

Ref:	**NR/L2/TRK/001/mod04**
Issue:	**8**
Date:	05 June 2021
Compliance date:	05 June 2021

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

Copyright Network Rail
Provided by S&P Global under license with Network Rail
No reproduction or networking permitted without license from S&P Global

Licensee=Intertrain (UK) Ltd/1121227010, User=Taylor, Garry
Not for Resale, 09/05/2022 01:52:05 MDT

Ref:	**NR/L2/TRK/001/mod04**
Issue:	**8**
Date:	05 June 2021
Compliance date:	05 June 2021

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 13
10.4 Non-Glued insulated rail joints 14
10.5 Lipping at rail ends on insulated rail joints 14
11 Temporary rail joints 14
11.1 Fastenings 14
11.2 Temporary rail joints using rails 4.5 metres or longer 14
Table 7 – Temporary Rail Joints; 4.5m 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 17
Table 9 – Rail joints (fishplated and welded); minimum distances at underbridges 17
13 Rail joints in level crossings 17

Copyright Network Rail
Provided by S&P Global under license with Network Rail
No reproduction or networking permitted without license from S&P Global

Licensee=Intertrain (UK) Ltd/1121227010, User=Taylor, Garry
Not for Resale, 09/05/2022 01:52:05 MDT

Ref:	**NR/L2/TRK/001/mod04**
Issue:	**8**
Date:	05 June 2021
Compliance date:	05 June 2021

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 shall not be located in different bays without the approval of the Regional Track Engineer.

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

Joints shall not become located over sleepers or baseplates.

Copyright Network Rail
Provided by S&P Global under license with Network Rail
No reproduction or networking permitted without license from S&P Global

Licensee=Intertrain (UK) Ltd/1121227010, User=Taylor, Garry
Not for Resale, 09/05/2022 01:52:05 MDT

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.*

Do not allow flame-cut bolt holes in fishplates.

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
1⅛” (28mm) high tensile bolts	1020Nm (750ft lbs)	Insulated joint or tight joint in 110lb, CEN56E1 and CEN60 rail

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

3.5 Rail ends

Remove rail end defects or damage by:

a) cutting back the rail end; or

b) arc weld repair; or

***NOTE 1:** 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 clause 7.

Do not allow flame-cut bolt holes in rail ends.

Do not allow flame-cut rail ends at fishplated joints.

Only flame-cut rail is when:

d) cutting into stressed rail; or

e) the rail end in Normal Grade (220) and Standard Grade (260) rail is welded within 24 hours and no traffic passes.

***NOTE 2**: 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).*

Copyright Network Rail
Provided by S&P Global under license with Network Rail
No reproduction or networking permitted without license from S&P Global

Licensee=Intertrain (UK) Ltd/1121227010, User=Taylor, Garry
Not for Resale, 09/05/2022 01:52:05 MDT

4 Fishplated expansion joints

4.1 Lubrication

Fishplates, bolts and fishing surfaces on non-insulated expansion joints in running lines shall be lubricated.

Undertake lubrication during site assembly of a joint and as a routine annual maintenance task.
As a minimum, lubricate alternate pairs of joints in one year and the neighbouring pairs the next year. Continue this cycle.

Lubricate all joints annually where the distance between joints is greater than 60ft (18.3m).

If rail adjusting is required (see 4.3), undertake prior to (or at the same time) as lubrication.

4.2 Rail gaps

4.2.1 Rail gap dimensions

Install and reset rail gaps for fishplated expansion joints to the dimensions shown in Table 2.

Table 2 – Expansion gap settings

Rail temperature ºC	**Expansion gap** mm
below 10	10
11 to 13	9
14 to16	8
17 to19	7
20 to22	6
23 to25	5
26 to28	4
29 to31	3
32 to34	2
35 to37	1
38 or above	0

If expansion joints have been formed at a rail temperature lower than 0°C or greater than 45°C, undertake a rail gap survey (see section 4.2.2) when the rail temperature falls within the range of 10 to 37°C.

Copyright Network Rail
Provided by S&P Global under license with Network Rail
No reproduction or networking permitted without license from S&P Global

Licensee=Intertrain (UK) Ltd/1121227010, User=Taylor, Garry
Not for Resale, 09/05/2022 01:52:05 MDT

4.2.2 Rail gap surveys

Undertake an annual rail joint gap survey where any of the following apply:

a) known rail creep;

b) the gaps appear incorrect or joints are seized;

c) the distance between fishplated expansion joints exceeds 60ft (18.3m); or

d) tight radius curves.

Consider undertaking one for gradients.

Indicators of incorrect gaps or seized joints can be:

- irregular gap size;
- closed gaps at low rail temperatures;
- open gaps at high rail temperatures;
- gaps reducing towards one end of a section of jointed track.

Record rail gap surveys on TEF3206.

4.2.3 Rules to apply when measuring rail gaps

When measuring rail gaps:

a) Rail ends which are burred or lipped;
remove burr or lipping prior to measuring OR measure between the end of the burrs or lipping.

b) Tight joints and insulated block joints;
record with a gap of zero.

c) Seized or frozen joints;
record with a gap of zero (until the fishplates are freed and lubricated).

4.2.4 Calculation of Joint Closure Temperature (JCT)

Following the rail gap survey, calculate the Joint Closure Temperature (JCT) (see NR/L2/TRK/001/mod14).

4.3 Rail adjusting

4.3.1 Gaps too small

Complete rail adjusting prior to the onset of hot weather.

This is to minimise the risk of track buckling.

4.3.2 Gaps too wide

Complete rail adjusting prior to the onset of winter.

This is to minimise the risk of fishbolt, fishplate or rail end failure.

Copyright Network Rail
Provided by S&P Global under license with Network Rail
No reproduction or networking permitted without license from S&P Global

Licensee=Intertrain (UK) Ltd/1121227010, User=Taylor, Garry
Not for Resale, 09/05/2022 01:52:05 MDT

4.3.3 Rail anchors

Fit rail anchors in areas prone to rail creep.

4.4 Rail length between fishplated expansion joints

4.4.1 In tunnels

In tunnels subject to a limited temperature range, the maximum permitted rail length between fishplated expansion joints shall be 55 metres.

4.4.2 In plain line

Do not install or create rails longer than 30m (100ft) between fishplated expansion joints.

4.5 Damaged signalling and electrical bond wires

Report damaged or detached signalling bond wires to the person responsible for signalling maintenance as soon as reasonably practicable.

Report damaged or detached electrification bond wires to the person responsible for electrical equipment maintenance as soon as reasonably practicable.

5 Fishplated 'Tight' Joints

5.1 General

'Tight' joints are installed to create a fished rail joint that is considered as a piece of CWR.

Where it is not possible, due to physical constraints, to install a welded joint, a tight joint is permitted at line speeds up to 125 mph.

Tight joints installed where it is possible to install a welded joint shall be classified as a temporary joint and actioned in accordance with Table 7.

Do not lubricate tight joint fishplates.

5.2 Wide gaps at tight joints

A detailed examination of the tight joint shall be undertaken where:

a) the gap between the rail ends is greater than 6mm; or

b) there is evidence that the gap, between the rail ends, changes by more than 4mm due to temperature variation.

The cause of wide gaps will be due to incorrect fishplates, bolts or rail drilling. It might be necessary to dismantle the joint to identify the cause.

Where tight joints have gaps wider than 6mm, re-install the joint.

--`,``,,,`,`,,`,`,,,,`,`,```,,-`-`,,`,,`,`,,`---

Copyright Network Rail
Provided by S&P Global under license with Network Rail
No reproduction or networking permitted without license from S&P Global

Licensee=Intertrain (UK) Ltd/1121227010, User=Taylor, Garry
Not for Resale, 09/05/2022 01:52:05 MDT

5.3 Replacement of incorrect components in tight joints

Replace incorrect components in tight joints as specified in Table 3.

Table 3 - Replacement of incorrect components in tight joints

Component	Action	Timescale
One or more black bolts installed	Replace black bolts with 1⅛″ (28mm) diameter high tensile bolt(s).	Cat 1A, 1 & 2; 7 days Cat 3 to 6; 14 days
One or more 1” (25mm) diameter high tensile bolts have been installed	Replace with 1⅛″ (28mm) diameter high tensile bolt(s). (see note 1)	
Standard fishplates fitted	Replace with appropriate TJ4 fishplates	
Bolts too short (less than two threads showing beyond the nut)	Replace short bolts with 1⅛″ (28mm) diameter high tensile bolts(s) of the correct length. (see note 1)	
Fishplate(s) not fitted parallel to the rail	Attempt to tighten all bolts. If not corrected, dismantle the joint for a detailed inspection and replace both fishplates.	As soon as practicable
Drilled holes in rails have incorrect diameter or incorrect spacing	Replace rail(s).	As soon as practicable

Note:

1 Older 110A S&C layouts (and some early 113A layouts) tight joints are formed with 1″ (25 mm) diameter high tensile bolts. In these locations, 1″ (25 mm) bolts shall be used for the actions.

6 Welded joints

6.1 Forming the joint

Welded joints within CWR shall be formed using an approved flash-butt or aluminothermic welding process.

Undertake site welding of joints as detailed in NR/L2/TRK/0032 & RT/CE/S/130.

6.2 Rail end support

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

Welded joints shall be formed mid-way between sleepers.

They should not, due to stressing operations, become located over sleepers or baseplates.

Copyright Network Rail
Provided by S&P Global under license with Network Rail
No reproduction or networking permitted without license from S&P Global

Licensee=Intertrain (UK) Ltd/1121227010, User=Taylor, Garry
Not for Resale, 09/05/2022 01:52:05 MDT

7 Joining sideworn rails

Where rails with differential sidewear are joined together by a welded joint or a fishplated joint, the step in the running edge shall be blended in.

This requirement is to prevent wheel climb.

Blend in by:

a) grinding the blended length to extend to a minimum of 1.5m from the joint;

b) maintaining the sidewear angle of the more sideworn rail throughout the blended length;

c) creating a round gauge corner throughout the blended length without square edges; and

d) using a fully-supported grinder (i.e. mounted on both rails).

Manual support alone is not permitted.

8 Defective joints

8.1 Broken, cracked, incorrect or damaged fishplates

Where broken, cracked, incorrect or damaged fishplates are found, take action as specified in Table 4.

Apply Table 4 to all types of fishplates joining rails (expansion, tight and insulated joints).

The SM[T] shall establish the cause of broken fishplates and ‘same joint’ repetitive failures and implement remedial action to prevent further failures.

When replacing cracked or broken fishplates, replace other components in the affected joint/s at the same time.

Change damaged sleepers and eliminate any voiding by packing.

Copyright Network Rail
Provided by S&P Global under license with Network Rail
No reproduction or networking permitted without license from S&P Global

Licensee=Intertrain (UK) Ltd/1121227010, User=Taylor, Garry
Not for Resale, 09/05/2022 01:52:05 MDT

Ref:	**NR/L2/TRK/001/mod04**
Issue:	**8**
Date:	05 June 2021
Compliance date:	05 June 2021

Table 4 - Minimum action to be taken for broken, cracked, incorrect or damaged fishplates in a running line

Defect	Immediate action (Patroller)	Follow-up action (SM[T])
One or both fishplates cracked	None required	Replace ***both*** fishplates within 24 hours
One fishplate broken	Impose a 20 mph ESR	Replace ***both*** fishplates within 24 hours
Both fishplates broken (see note 1) **and** the sleepers will support and hold the rail ends in line and to gauge	(see note 2) Impose a 5 mph ESR and fit clamp plates to the joint when the clamps plates have been fitted, raise speed to a 20 or 50 mph ESR (see note 3)	Replace ***both*** fishplates within 24 hours Complete TEF3064
Both fishplates broken (see note 1) **but** the sleepers will not support and hold the rail ends in line and to gauge	Block the line Or (see note 2) Provide additional or alternative support to the rails and fit clamp plates. Open with a 20 mph ESR	Replace ***both*** fishplates within 24 hours replace sleepers. Complete TEF3064
Broken fishplates on the joints in both rails	Block the line	Replace ***all*** fishplates Complete TEF3064
Fishplate with flame cut holes	Impose 5 mph ESR	Replace ***both*** fishplates within 24 hours
Incorrect lift plates; Step > 2mm Step ≤ 2mm	Impose a 20 mph ESR None required	Replace ***both*** fishplates within 48 hours Replace ***both*** within 7 days
Incorrect fishplates (see note 4)	None required	Replace ***both*** fishplates within 7 days
Fishplate(s) deformed or damaged	None required	Replace ***both*** fishplates within 48 hours

Notes:

1 Where a joint is present in the opposite rail, it shall be complete, well supported and with intact fishplates.

2 If the gap between the rail ends at the rail joint is greater than 50mm, take action as for a broken rail.

3 The speed shall not exceed 20 mph unless ALL of the following apply:
   a) abutting rail heads are in line;
   b) there are no voids under the two sleepers each side of the joint (that is four sleepers in total);
   c) the clamping system is approved by Network Rail for use at 50 mph;
   d) the fishplates are correct in terms of rail section and lift.

4 'Incorrect fishplates' in this context describes the use of:
   a) fishplates for the wrong rail section;
   b) wrong or mismatched junction fishplates;
   c) a pair of incorrectly fitted fishplates (e.g. fitted the wrong way round).

Copyright Network Rail
Provided by S&P Global under license with Network Rail
No reproduction or networking permitted without license from S&P Global

Licensee=Intertrain (UK) Ltd/1121227010, User=Taylor, Garry
Not for Resale, 09/05/2022 01:52:05 MDT

8.2 Bolts missing from joints

The designed number of fishbolts, nuts and washers (or other approved fastener system) shall be present and correctly tightened.

Take action as detailed in Table 5 when fishbolts are missing from a rail joint.

Table 5 –Minimum action to be taken for joints with missing fishbolts

Defect	Immediate action	Follow-up action
One fishbolt missing	Confirm all other fishbolts are tight	Replace fishbolt; within 7 days if line speed greater than 60mph, within 14 days if line speed is 60mph or less
All bolts missing from both rail ends	Block the line	Fit new fishbolts
All bolts missing from one rail end (fly-fished joint)	See Table 6	

8.3 “Fly-fished” joints

Take action as detailed in Table 6 when all the bolts are missing from either rail end (a “fly-fished” joint).

Table 6 – Minimum action to be taken for rail joints with all the bolts missing from either rail end (‘fly-fished’ joint)

Gap between rail ends	Is a Watchman present? [1, 2]	Immediate action	Follow-up action
≤ 50mm	Yes	Impose a 20mph speed restriction. Confirm remaining bolts are tight	Fit new bolts within 48 hours [3, 4]
≤50mm	No	Impose a 5mph speed restriction. Confirm remaining bolts are tight	Inspect after 24 hours. Fit new bolts within 48 hours [3, 4]
51 to 75mm	Yes	Impose a 5mph speed restriction. Confirm remaining bolts are tight	Fit new bolts within 48 hours [3, 4]
51 to 75mm	No	Block the line (until rectified)	Fit new bolts
> 75mm	Not applicable	Block the line (until rectified)	Fit new bolts

Notes:

1 The watchman, if appointed, shall remain on site throughout the period when trains are running.

2 The watchman shall monitor for any deterioration in the joint (reduced support or gap widening) and action as advised by the SM[T].

3 If repairs are not completed within 48 hours, the line shall be blocked.

4 Repair may require rail replacement.

Copyright Network Rail
Provided by S&P Global under license with Network Rail
No reproduction or networking permitted without license from S&P Global

Licensee=Intertrain (UK) Ltd/1121227010, User=Taylor, Garry
Not for Resale, 09/05/2022 01:52:05 MDT

9 Rail joint straightening

Rail joints, both fishplated and welded, may be straightened to remove dips.

When rail joint straightening:

a) equipment and process shall be approved by the Network Technical Head Track;

b) do not undertake at rail temperatures below 0ºC;

c) do not undertake on AMS rail, SmW welds or insulated joints;

d) ultrasonically inspect the rail ends, and the rail within one metre of the joint, within 14 days *prior* to straightening and do not straighten joint if any defect is found;

e) do not treat dips at a *welded* joint by more than 3 mm (on a one metre straight edge); and

NOTE: *This is equivalent to a dip angle of approximately 12mrad;*

f) ultrasonically inspect the rail ends, and the rail within one metre of the joint, within 14 days *after* straightening.

Retain records of joint straightening until the rails are replaced.

10 Insulated Rail Joints

10.1 General requirements

Where there are design restrictions, 4-hole joints are permitted in S&C.

Use 6-hole shop-prepared glued units in Category 1A, 1 and 2 lines or where the cant deficiency exceeds 110mm. Do not use 6-hole glued joints where the radius is below 400 metres.

Glued insulated joints are recommended in CWR.

Assemble insulated joints in accordance with the manufacturer's instructions.

Do not replace an expansion joint with an insulated joint without providing additional expansion joints either side of the newly installed insulated joint.

10.2 Rail end support

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

Locate the centre of the joint mid-way between sleepers, with all rail fastenings correctly installed.

The choice of baseplates, sleeper spacing or bearer spacing should allow all rail fastenings to be installed.

10.3 Glued insulated rail joints

Provide glued insulated joints as factory made glued units. Do not undertake site gluing.

Where glued insulated rail joints are dismantled, replace with new glued joints.

Copyright Network Rail
Provided by S&P Global under license with Network Rail
No reproduction or networking permitted without license from S&P Global

Licensee=Intertrain (UK) Ltd/1121227010, User=Taylor, Garry
Not for Resale, 09/05/2022 01:52:05 MDT

10.4 Non-Glued insulated rail joints

Non-glued insulated joints (also known as “dry” joints) shall:

a) be made from the cut ends of the same rail (unless approved otherwise by the TME);

b) not be lubricated;

c) be fitted with an end-post of the correct type and thickness.

Replace all missing or damaged parts.

When installing a non-glued insulated joint at an existing joint, the condition of the rail ends and the holes shall be fit for purpose.

10.5 Lipping at rail ends on insulated rail joints

Remove any lipping on the rail ends at an insulated joint before it causes electric contact across the joint.

***NOTE**: This is likely to happen in warm weather when the insulated end post is compressed due to expansion of the rails.*

When trimming rail ends, take care to minimise damage to both the rail end and the end post.

Remove any metal swarf, created by trimming or drilling operations, from around the joint.

11 Temporary rail joints

11.1 Fastenings

Keep all fastenings on temporary joints tight, in accordance with component specification, at all times.

11.2 Temporary rail joints using rails 4.5 metres or longer

The maximum permitted speed for temporary rail joints is shown in **Table 7**, according to the type of joint and the rail end gap involved.

A register shall be kept of all temporary rail joints in service.

***NOTE 1:** When planning the replacement of CWR, welding is the preferred method of joining rail. Welding of different rail sections or rail wear should be prioritised first. Where welding is not possible, fishplated rail joints can be planned and installed as a temporary measure.*

***NOTE 2:** See Table 6 for requirements of “fly-fished” joints.*

Temporary clamped rail joints (Table 7: Type c and e) shall be inspected daily. The inspections shall include fitment of fishplates and rail clamps, rail end gap and any voiding.

***NOTE 3:**The performance of a temporary rail joint relies on the supporting conditions of the track system, trackbed and formation. Any concerns with deterioration of the supporting conditions, the inspection frequency and maximum permitted speed should be reviewed, and appropriate actions taken to mitigate.*

Copyright Network Rail
Provided by S&P Global under license with Network Rail
No reproduction or networking permitted without license from S&P Global

Licensee=Intertrain (UK) Ltd/1121227010, User=Taylor, Garry
Not for Resale, 09/05/2022 01:52:05 MDT

Ref:	**NR/L2/TRK/001/mod04**
Issue:	**8**
Date:	05 June 2021
Compliance date:	05 June 2021

Table 7 – Temporary Rail Joints; 4.5m or longer

Temporary Rail Joint type	Maximum Permitted Speed		Time limit
a) Fully bolted with high-tensile bolts	125 mph (if tight-jointed at both ends and in CWR) 90 mph (jointed track)		14 days, with extension to 28 days
b) 6 hole Temporary joint fishplates, back-hole bolted with high-tensile bolts, and centre clamps[1]	80 mph		7 days
c) 4 Clamp temporary rail joint system, with 1200mm long fishplates[1]	80mph		7 days (maximum speed reduced to 50mph if exceeds time limit)
d) Standard fishplate Back-hole bolted	50 mph		14 days with extension to 28 days
e) Clamped	50 mph	for gaps up to 10mm	7 days, with extension to 21 days
	20 mph	for gaps between 10mm and 50 mm	
	5 mph	for gaps between 50mm to 75mm	
	BLOCK THE LINE	for gaps exceeding **75mm**	

Notes:

1) For type **b** and **c**, the temporary rail jointing system (fishplates and clamps) shall be approved for operation at 80 mph. The joint shall be installed and inspected in accordance with the procedure for their use by personnel trained and authorised. TR52 is a prerequisite for the additional training required for these higher speed temporary rail joint types.

2) The speed for all joint types shall not exceed 20 mph unless all of the following apply:
a) both rail ends have been sawn, or disc cut;
b) no step up in the rail head, abutting rail heads are in line;
c) the gap between rail ends does not exceed 10 mm (if the rail temperature changes, it might be necessary to impose a more frequent inspection regime or, in CWR, to install temporary adjustment switches)
d) there are no voids under two sleepers each side of the joint (that is four sleepers in total)
e) the clamping system is approved by Network Rail for use at the relevant speed. (G-clamps shall only be used with emergency fishplates for the clamping of defective welds and rails); and
f) the fishplates are correct in terms of rail section and lift.

For the timescales in Table 7, any extension beyond 7 days (for type b, c, e) or 14 days (for type a and d) shall be subject to approval of the Regional Track Engineer, providing:

a) removal is planned and dated; additional controls are being implemented and documented (speed reduced to maximum of 50mph for type c);
or

speed is reduced to 20 mph for the duration of the extension period; and

Copyright Network Rail
Provided by S&P Global under license with Network Rail
No reproduction or networking permitted without license from S&P Global

Licensee=Intertrain (UK) Ltd/1121227010, User=Taylor, Garry
Not for Resale, 09/05/2022 01:52:05 MDT

b) prior to welding, rail ends are checked by welding team for cracks by magnetic particle testing (MPT) or liquid penetrant testing (LPT) after extended period of traffic, greater than the time limits in Table 7; and

c) any bolt holes that are planned to be retained in the rail follow the requirements in NR/L2/TRK/2102 sub-clause 13.2

11.3 Temporary rail joints using rails shorter than 4.5 metres in length

Temporary rail joints using rails less than 4.5 metres long are permitted.

If used, the requirements shown in Table 8 shall be applied.

Do not use rail less than 2 m long with a temporary joint. This rail shall be supported by a minimum of three sleepers.

Check these are sound and well packed.

Table 8 – Temporary rail joint requirements; rails shorter [1] than 4.5 metres

Joint type	Maximum permitted speed	Time limit
Back-hole bolted	20mph	48 hours [2]
Clamped	20mph for gaps up to 10mm; 5mph for gaps greater than 10mm and up to 50mm; BLOCK THE LINE for gaps exceeding 50mm	48 hours [2]
Fly-fished	NOT PERMITTED	n/a
Fully-bolted fishplated joint	50mph	48 hours [2]

Notes:

1 Rail shall be at least 2 metres long and supported by at least three sound and well-packed sleepers.

2 Inspection required after 24 hours.

Copyright Network Rail
Provided by S&P Global under license with Network Rail
No reproduction or networking permitted without license from S&P Global

Licensee=Intertrain (UK) Ltd/1121227010, User=Taylor, Garry
Not for Resale, 09/05/2022 01:52:05 MDT

Ref:	**NR/L2/TRK/001/mod04**
Issue:	**8**
Date:	05 June 2021
Compliance date:	05 June 2021

12 Rail joints on underbridges and structures

At underbridges, provide the minimum distance shown in Table 9 between a rail joint and the location shown (fishplated or welded joint).

Table 9 – Rail joints (fishplated and welded); minimum distances at underbridges

Location	Minimum distance (from location to joint)
End of ballasted bridge deck (see note 1 & 2)	2.5m (see note 3)
End of direct fastened bridge deck	4.5m (see note 3)
End of longitudinal timber (see note 4)	4.5m
End of longitudinal timber, where two timbers abut within the bridge (see note 4)	2m

Notes:

1 The requirement does not apply to welds or insulated joints over masonry arches with fully ballasted cross-sleepered track.

2 Do not, as far as is practicable, locate fishplated joints (excludes glued insulated rail joints) over structures.

3 In the case of a skew bridge the distance shall be taken along the centre of the four-foot.

4 Also applies where cross-sleepered track is seated directly onto longitudinal timbers.

13 Rail joints in level crossings

Do not install fishplated joints or aluminothermic welded joints within level crossings or road-rail vehicle access points.

Copyright Network Rail
Provided by S&P Global under license with Network Rail
No reproduction or networking permitted without license from S&P Global

Licensee=Intertrain (UK) Ltd/1121227010, User=Taylor, Garry
Not for Resale, 09/05/2022 01:52:05 MDT

Ref:	NR/BS/LI/440
Issue date:	25 March 2020
Compliance date:	25 March 2020
Expiry date:	10 July 2020

Emergency change: NR/BS/LI/440

Standard/control document affected: NR/L2/TRK/001 (Issue 15), *Inspection and Maintenance of Permanent Way*

The affected standard/control document will revert back after the 10th July 2020

For further information contact: Tara Scott, Professional Head of Track (Acting), 07825 259412

1 Reason for issue

This Emergency Change is being issued as a result of COVID-19 to allow limited and controlled changes to specific Track maintenance standards for a period of 3 months to allow the continuation of railway operations in the event of unavailability of maintenance staff.

2 Scope

This Emergency Change applies to the Route Asset Managers [Track] acting with the delegated authority of the Professional Head of Track to permit variations to red clauses in NR/L2/TRK/001 (Inspection and Maintenance of Permanent Way):

- Eric Thomson
- Chris Bibby
- Craig Green
- Dave Webb
- Darren Ellis
- Steve O'Brien
- Nigel Wilson
- Roger Griffiths
- Andrew Bartlett
- Steve Pearson
- Paul Meads
- Colum Cavanagh
- Phil Jeyes
- Andy Jones

The red requirements listed in clause 3 of this emergency change are changed to amber RAG status until the expiry date of this emergency change and variations can be made but only after suitable risk assessment and as documented in COVID-19 Contingency Plan, NR/L3/MTC/CP007 and NR/L2/CSG/STP001.

Copyright Network Rail
Provided by S&P Global under license with Network Rail
No reproduction or networking permitted without license from S&P Global

Licensee=Intertrain (UK) Ltd/1121227010, User=Taylor, Garry
Not for Resale, 09/05/2022 01:52:05 MDT

Ref:	**NR/BS/LI/440**
Issue date:	25 March 2020
Compliance date:	25 March 2020
Expiry date:	10 July 2020

3 Changes

The red RAG status of the requirements in the table of this clause is changed to amber for the duration of this emergency change. Variation is permitted if undertaken in accordance with NR/L3/MTC/CP007 and NR/L2/CSG/STP001.

Module	**Clause/sub-clause**	**Requirement**
NR/L2/TRK/001/mod02	3.3	Except where specifically permitted elsewhere in this standard, track inspections shall be undertaken on foot, walking within the length of the sleepers. A maximum of two tracks shall be inspected at one time.
NR/L2/TRK/001/mod02	6.6	A Section Manager track inspection which is being carried out as a substitute for a basic visual track inspection, shall be undertaken in accordance with the Track Patrolling Diagram.
NR/L2/TRK/001/mod04	6.1	Welded joints within CWR shall be formed using an approved flash-butt or aluminothermic welding process.
NR/L2/TRK/001/mod04	7	Where rails with differential sidewear are joined together by a welded joint or a fishplated joint, the step in the running edge shall be blended in.
NR/L2/TRK/001/mod13	10	The line shall remain blocked until the on-call Structures or Earthworks Engineer confirms that the track support has not been compromised and that the safety of the line is not affected.
NR/L2/TRK/001/mod13	11	The line shall remain blocked until the on-call Structures or Earthworks Engineer confirms that no further debris will fall and that the safety of the line is not affected.
NR/L2/TRK/001/mod16	5.2	The switch rail tip shall be adequately supported on the baseplate.

Copyright Network Rail
Provided by S&P Global under license with Network Rail
No reproduction or networking permitted without license from S&P Global

Licensee=Intertrain (UK) Ltd/1121227010, User=Taylor, Garry
Not for Resale, 09/05/2022 01:52:05 MDT

Ref:	**NR/BS/LI/440**
Issue date:	25 March 2020
Compliance date:	25 March 2020
Expiry date:	10 July 2020

Approval of Standard and Control Document Owner

Approved by:



Tara Scott, Professional Head of Track

Approval of Standards and Controls Management Team

Approved for publication by:



John Winnifrith, Senior Standards & Controls Specialist

Copyright Network Rail
Provided by S&P Global under license with Network Rail
No reproduction or networking permitted without license from S&P Global

Licensee=Intertrain (UK) Ltd/1121227010, User=Taylor, Garry
Not for Resale, 09/05/2022 01:52:05 MDT

Ref:	**NR/BS/LI/440**
Issue date:	25 March 2020
Compliance date:	25 March 2020
Expiry date:	10 July 2020

4 Recipients

Name	**Post**
Eric Thomson	Route Asset Manager [Track]
Chris Bibby	Route Asset Manager [Track]
Craig Green	Route Asset Manager [Track]
Dave Webb	Route Asset Manager [Track]
Darren Ellis	Route Asset Manager [Track]
Steve O'Brien	Route Asset Manager [Track]
Nigel Wilson	Route Asset Manager [Track]
Roger Griffiths	Route Asset Manager [Track]
Andrew Bartlett	Route Asset Manager [Track]
Steve Pearson	Route Asset Manager [Track]
Paul Meads	Route Asset Manager [Track]
Colum Cavanagh	Route Asset Manager [Track]
Phil Jeyes	Route Asset Manager [Track]
Andy Jones	Route Asset Manager [Track]

5 Details of briefing or cascade communication process

Route Asset Managers [Track] have already been briefed. Directors of Engineering & Asset Management will be briefed by the Professional Head of Track.

--`,,`,,`,`,,`,,`,,,,`,```,,```,,-`-`,,`,,`,`,,`---

Copyright Network Rail
Provided by S&P Global under license with Network Rail
No reproduction or networking permitted without license from S&P Global

Licensee=Intertrain (UK) Ltd/1121227010, User=Taylor, Garry
Not for Resale, 09/05/2022 01:52:05 MDT