

Supplement Notice

Information for users

The attached standard:

RT/CE/S/051

Issue 1

has essential supplementary information

Instructions for use

It is essential that you first read and understand the supplement pertaining to the standard before proceeding to the standard. You must then apply the requirements of the supplement to the standard.

Proceed to supplement ►**I have read & understand the supplement.
Proceed to standard ►**

Ref	NR/SP/TRK/05 I
Issue	I
Date	January 1996

Process for Cold-Expanding Existing Fishbolt Holes by the Split Sleeve Method (formerly RT/CE/S/05 I)

This temporary front sheet facilitates change to the new Network Rail Standards referencing nomenclature.

The Ref above will be formally allocated to this standard when it is next changed in the meantime the contents, date and issue number of this Network Rail Standard are UNCHANGED and with immediate effect it should be referred to as “(new ref) formerly (old ref)”.

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 the Standard Owner.

© Copyright 2004 Network Rail

Uncontrolled copy once printed from its electronic source.

Published & Issued by: Network Rail; 40 Melton Street, London NW1 2EE



RAILTRACK LINE

SPECIFICATION

PROCESS FOR COLD-EXPANDING EXISTING FISHBOLT HOLES BY THE SPLIT SLEEVE METHOD USING FTI TOOLING AND CONSUMABLES

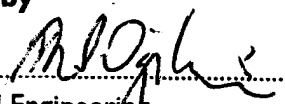
© Copyright 1996 Railtrack PLC

All rights reserved. No part of this publication may be reproduced, stored in a retrieval system, or transmitted, in any form or by any means, electronic, mechanical, photocopying, recording or otherwise, without the prior written permission of Railtrack PLC.

Endorsed by


.....
Chairman, Railtrack Line Civ Eng Stds Cttee

Authorised by


.....
Director Civil Engineering

Published by
Director Civil Engineering
Railtrack HQ
East Side offices
King's Cross Station
London
NI 9AP



Documents

Document Sharing Hub

PROCESS FOR COLD-EXPANDING EXISTING FISHBOLT HOLES BY THE SPLIT SLEEVE METHOD USING FTI TOOLING AND CONSUMABLES

Summary

This specification gives the method to be used for the cold-expansion of existing fishbolt holes in railway rails by the split sleeve process, using FTI tooling and consumables.

Issue record

This specification will be updated when necessary by distribution of a complete replacement. Amended or additional parts of revised pages will be marked by a vertical black line in the margin.

Issue: 1 **Date:** January 1996 **Comments:** Supersedes BR1224 Part B

Responsibilities

This specification shall be complied with by all suppliers of serviceable rails and serviceable switch and crossing work to Railtrack, and by contractors, where they are undertaking the cold-expansion of existing fish-bolt holes by the split sleeve process and they are using FTI tooling and consumables.

Persons using this specification shall ensure that they use the latest version of any document to which reference is made.

Implementation

The provisions of this specification are mandatory and apply from two months after the issue date shown at the top of this page unless a temporary non-compliance has been authorised by Director, Civil Engineering.

Disclaimer

Railtrack PLC has used its best endeavours to ensure that the content, layout and text of this document are accurate, complete and suitable for its stated purpose. It makes no warranties, express or implied, that compliance with the contents of this document shall be sufficient to ensure safe systems of work or operation. Railtrack PLC will not be liable to pay compensation in respect of the content or subsequent use of this document for any purpose other than its stated purpose or for any purpose other than that for which it was prepared except where it can be shown to have acted in bad faith or there has been wilful default.

Supply

Persons requiring controlled copies of this specification shall obtain them from their Directorate's Document Control Point.

PROCESS FOR COLD-EXPANDING EXISTING FISHBOLT HOLES BY THE SPLIT SLEEVE METHOD USING FTI TOOLING AND CONSUMABLES

CONTENTS

Section	Description	Page
	Foreword	4
1	Purpose	5
2	Scope	5
3	Definition	5
4	Method Statement	5
5	Staff training and certification	5
6	Welding	6
7	Preparation of rail ends	6
7.1	Ultrasonic inspection	6
7.2	Dismantling and re-assembling rail joints	
6		
7.3	Measurement and re-cutting of holes	6
8	Tooling and consumables required for cold-expansion	7
9	Mandrel wear check	7
10	Mandrel selection	7
11	Mandrel preparation	8
12	Pulling mandrels	8
13	Actions to be taken in the event of malfunctions of the sleeves or equipment	9
14	Recording of fishbolt holes treated in track	9
	Figure 1: Split sleeve on a mandrel and its position in a rail bolt hole	10
	Figure 2: Positions of puller gun control handle	11
	Appendix A: Criteria for determining competence of people to undertake cold expansion	12
	Appendix B: Advice on further action to be taken if sleeves pull through or are damaged and if mandrels jam	13
	Appendix C: Additional advice and information	14
	References	15

PROCESS FOR COLD-EXPANDING EXISTING FISHBOLT HOLES BY THE SPLIT SLEEVE METHOD USING FTI TOOLING AND CONSUMABLES

FOREWORD

Cold expansion is a process which, if correctly applied, reduces substantially the risk of cracking at fishbolt holes. In the process described here, cold expansion is achieved by pulling a tapered mandrel through the hole, which is separated from the mandrel by a thin, dry-lubricated, stainless steel split sleeve. The split sleeve is a vital part of the process because it ensures that the metal around the hole is forced radially outwards by the mandrel, rather than pulled through with it, so that the material around the hole is placed in compression when the mandrel is removed.

Cold expansion is successful in improving the fatigue resistance of bolt holes in all pearlitic rail steels such as the BS 11 normal and wear-resistant grades, and in austenitic manganese steel (AMS).

To obtain the required level of compressive residual stress around bolt holes a minimum expansion in hole diameter of 2.3% must be applied. It is also important that too great an expansion is not attempted as the mandrel may become jammed in the rail and there is also a risk of older rails splitting horizontally as the mandrel forces the head and foot apart. Successful cold expansion therefore requires both the hole size and the degree of expansion to be controlled to within close limits.

Notwithstanding the potential benefits, this specification does not apply to existing fishbolt holes in AMS rails and crossings as it is generally impractical to re-cut these within the tolerances required.

The existence of this specification does not preclude the cold expansion of fishbolt holes using other methods or the products of other suppliers subject to the approval of Railtrack.



PROCESS FOR COLD-EXPANDING EXISTING FISHBOLT HOLES BY THE SPLIT SLEEVE METHOD USING FTI TOOLING AND CONSUMABLES

1 PURPOSE

To ensure that the correct procedure is used for the cold expansion of fishbolt holes and thereby that the benefits of the process are realised.

2 SCOPE

This specification describes the method to be used for the cold expansion of existing fishbolt holes in rails by the split sleeve process using FTI tooling and consumables. It applies to both bull-head and flat-bottomed rails in the following grades:

- BS 11 Normal Grade
- BS 11 and UIC Grades 'A' and 'B'
- Wear-resisting Chromium Grades
- Heat-treated Pearlitic Grades, including head-hardened rails.

3 DEFINITIONS AND ABBREVIATIONS

Agent A person procuring materials for installation in Railtrack's infrastructure.

FTI Fatigue Technology Inc, 100 Andover Park West, Seattle, WA 98188-2868, USA

or that company's products or subsidiaries, including

Fatigue Technology Ltd, PO Box 601, Sutton Coldfield, B72 1FT, UK

4 METHOD STATEMENT

A method statement shall be produced for the safe execution of the work for approval by Railtrack prior to commencement. It shall include the method to be used for the disposal of used sleeves. It shall be freely accessible to all staff undertaking the process and shall be made available on request to a representative or agent of Railtrack.

5 STAFF TRAINING AND CERTIFICATION

Only staff specifically trained to undertake the process and certified as competent by those responsible for the training shall undertake the cold expansion of fishbolt holes.

A person shall be deemed competent if he/she fulfils the criteria given in Appendix A, demonstrated by a practical test.

The certificate of competence shall be dated and be valid for two years. The test paper shall be retained for the same period.

A representative or agent of Railtrack may require to see a person's certification at any time.