

Specification for

Railway turnouts for private users —

**Part 2: Light grade turnouts over which
British Railways locomotives do not
operate, for axle loads not
exceeding 10 tons, using flat bottom
rails**

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Foreword

This British Standard has been prepared under the authority of the Mechanical Engineering Industry Standards Committee. It is one of a series of specifications, of which the full list is as follows:

BS 4521, *Railway turnouts for private users.*

— *Part 1: Turnouts over which British Railways locomotives operate;*

— *Section 1.1: Turnouts using bull head rails;*

— *Section 1.2: Turnouts using flat bottom rails;*

— *Part 2: Light grade turnouts over which British Railways locomotives do not operate, for axle loads not exceeding 10 tons, using flat bottom rails;*

— *Part 3: Medium grade turnouts over which British Railways locomotives do not operate, for axle loads not exceeding 25 tons;*

— *Section 3.1: Turnouts using bull head rails;*

— *Section 3.2: Turnouts using flat bottom rails;*

— *Part 4: Heavy grade turnouts over which British Railways locomotives do not operate, for axle loads which may exceed 25 tons, using flat bottom rails.*

This Part of this standard relates exclusively to turnouts constructed from new rails complying with the requirements of BS 11 “*Flat bottom railway rails*”, Section 75A. It is recognized that second-hand, partly worn rails and rails complying with BS 11:1936, Section 75R are used for the manufacture of turnouts but it should be clearly understood that their use is subject to agreement between the purchaser and the supplier. The recommended minimum acceptance requirements for partly worn rail are given in Appendix A.

Turnouts from curved track have been omitted from this standard as they would complicate the tables and diagrams, but when they are used the minimum radius should be maintained, although the crossing angles obtained may be outside the range shown.

Special requirements such as insulation for track circuiting have not been included.

Nomenclature is given in Table 1 with cross references to layout and component diagrams for identification of parts for standard turnouts.

Materials and dimensions are specified.

A British Standard does not purport to include all the necessary provisions of a contract. Users of British Standards are responsible for their correct application.

Compliance with a British Standard does not of itself confer immunity from legal obligations.

Summary of pages

This document comprises a front cover, an inside front cover, pages i and ii, pages 1 to 24, an inside back cover and a back cover.

This standard has been updated (see copyright date) and may have had amendments incorporated. This will be indicated in the amendment table on the inside front cover.

1 Scope

Part 2 of this British Standard specifies requirements for light grade turnouts over which British Railways locomotives do not operate, for axle loads not exceeding 10 tons, from straight track 4 ft 8½ in gauge manufactured from new flat bottom rails as specified in BS 11-75A.

The angles of crossing are 1 in 4½, 1 in 5, 1 in 5½, 1 in 6, 1 in 6½, 1 in 7, 1 in 7½ and 1 in 8.

NOTE The titles of the British Standards referred to in this standard are listed on the inside back cover.

2 Definitions

For the purposes of this British Standard the following definitions apply.

railway turnout

a complete unit consisting of curved track diverging from straight track as illustrated in the layout diagrams of this standard

hand of turnout

the direction in which the curved track leaves the straight track

3 Inspection

The purchaser or his representative shall have access at all reasonable times to those parts of the works engaged on the contract or order. He shall be at liberty to witness the manufacture at any stage.

4 Identification marking

Each complete turnout shall be marked by stamping with 1 in high letters and figures on the web of the wing rails at the check ends with the number of this British Standard followed by a stroke and a number indicating the Part of this standard, i.e. BS 4521-2.

When rail components are supplied separately they shall be stamped on the end of the rail with the number of this British Standard and the item number as shown in the nomenclature table.

All castings shall be marked with identification letters, rail sections and the manufacturer's initials.

5 General requirements

The design of light grade turnouts is based on the centre line radius. The minimum radius shall be 190 ft 8½ in measured to the centre line of the track.

The switches shall be heel type straight cut with jogged stock rails and operated by a weighted type lever box.

The shaping of the rails shall be carried out by machining, sawing and pressing. The holes shall be drilled. The turnouts shall be supported on timbers of cross section 12 in × 6 in. As an acceptable alternative to timbers, rolled steel supports may be used, subject to agreement between the purchaser and the manufacturer. Bolts shall be threaded BSW (complying with BS 84) free class, with nut threads normal class, except where otherwise stated.

6 Nomenclature

The nomenclature and numerical reference numbers for components are given in Table 1 which refers to item numbers shown in Figure 1 to Figure 3 and Figure 5 to Figure 15.

Component details are given in Figure 5 to Figure 15 as a further aid to identification.

7 Materials

Materials shall be in accordance with the requirements shown in Table 2.

8 Dimensions

The leading dimensions shall be in accordance with Figure 1 and Figure 4 and with Table 3.

The rail shall comply with the requirements of BS 11, Section 75A.

The fishplates shall comply with the requirements of BS 47 and the fishbolts and nuts shall comply with BS 64.

Appendix A Partly worn rail

Partly worn flat bottom rail used for the construction of turnouts should have a minimum depth, measured on the vertical axis, of $4\frac{7}{8}$ in and have a minimum weight of 70 lb/yd.

It should be free from excessive side wear, chair gall and corrosion.

As a guide to the purchaser, it is recommended that flat bottom rail should be renewed when the depth reaches $4\frac{9}{16}$ in. The precise figure will depend on the following conditions:

- conditions of sleepers and timbers
- spacing of sleepers and timbers
- conditions of ballast
- presence of side cutting.

Table 1 — Nomenclature for components

Item no.	Description	Figure no.
201	Stock rail, L.H. for L.H. turnout	Figure 1, Figure 2
202	Stock rail, R.H. for L.H. turnout	Figure 1, Figure 2
203	Stock rail, L.H. for R.H. turnout	Figure 1, Figure 2
204	Stock rail, R.H. for R.H. turnout	Figure 1, Figure 2
205	Switch tongue rail, L.H. for L.H. turnout	Figure 1, Figure 2
206	Switch tongue rail, R.H. for L.H. turnout	Figure 1, Figure 2
207	Switch tongue rail, L.H. for R.H. turnout	Figure 1, Figure 2
208	Switch tongue rail, R.H. for R.H. turnout	Figure 1, Figure 2
209	Straight running rail	Figure 1, Figure 2, Figure 3
210	Straight closure rail	Figure 1, Figure 2, Figure 3
211	Curved running rail	Figure 1, Figure 2, Figure 3
212	Curved closure rail	Figure 1, Figure 2, Figure 3
213	Wing rail, R.H.	Figure 1, Figure 3
214	Wing rail, L.H.	Figure 1, Figure 3
215	Check rail	Figure 1, Figure 3, Figure 7, Figure 8
216	Point rail	Figure 1, Figure 3
217	Splice rail	Figure 1, Figure 3
218	Common baseplates	Figure 1, Figure 2, Figure 3, Figure 12
219	Switch baseplates	Figure 1, Figure 2, Figure 11
220	Crossing baseplates	Figure 1, Figure 3, Figure 12
221	Check baseplates	Figure 1, Figure 3, Figure 12
222	Back heel baseplates	Figure 1, Figure 2, Figure 12
223	Switch soleplate	Figure 1, Figure 2, Figure 13
224	Switch stud bolts	Figure 15
225	Switch heel blocks	Figure 1, Figure 2, Figure 14
226	Crossing blocks	Figure 1, Figure 3, Figure 14
227	Check blocks	Figure 1, Figure 3, Figure 14
228	Back heel blocks	Figure 1, Figure 2, Figure 14
229	Joint (fishplated)	Figure 1, Figure 9
230	Fishplate	Figure 9
231	Fishbolt, nut and washer	Figure 9
232	Stretch bar	Figure 1, Figure 2, Figure 13
233	Connecting rod	Figure 1, Figure 2
234	Lever box (weighted)	Figure 1, Figure 2
235	Spring washers	Figure 15
37	Timbers	Figure 1, Figure 2, Figure 3
38	Coach screws	Figure 10
239	Switch and crossing bolts	Figure 15
240	Rail spikes	Figure 2, Figure 3, Figure 10
541	M.O.W. clips	Figure 10
243	9 ft heel switches	Figure 5
244	12 ft heel switches	Figure 6
245	Crossing 1 in $4\frac{1}{2}$	Figure 7
246	Crossing 1 in 5	Figure 7
247	Crossing 1 in $5\frac{1}{2}$	Figure 7
248	Crossing 1 in 6	Figure 7
249	Crossing 1 in $6\frac{1}{2}$	Figure 7
250	Crossing 1 in 7	Figure 7
251	Crossing 1 in $7\frac{1}{2}$	Figure 7
252	Crossing 1 in 8	Figure 8
253	Ferrule	Figure 15

Table 2 — Materials for components

Part	Material
Rails	BS 11
Stretcher bar	BS 24-3A:Grade 8
Stretcher bar brackets	BS 24-6:Grade 621
Connecting rod	BS 24-6:Grade 621
Baseplates	BS 24-6:Grade 621
Coachscrews	BS 970-1, steel 080M40, galvanized to BS 729-1
Fishbolts and nuts	BS 64
Switch, crossing and check bolts and nuts	BS 916
Plain washers	BS 3410
Spring washers	BS 1802
Fishplates	BS 47:Class B
Switch, crossing and check blocks	BS 1452:Grade 12
M.O.W. clips	Mild steel
Rail spikes	Mild steel
Resilient rail spikes	BS 970-5, steel 250A61
Timbers	Douglas Fir or of similar approved quality incised and pressure creosoted to BS 913 where possible

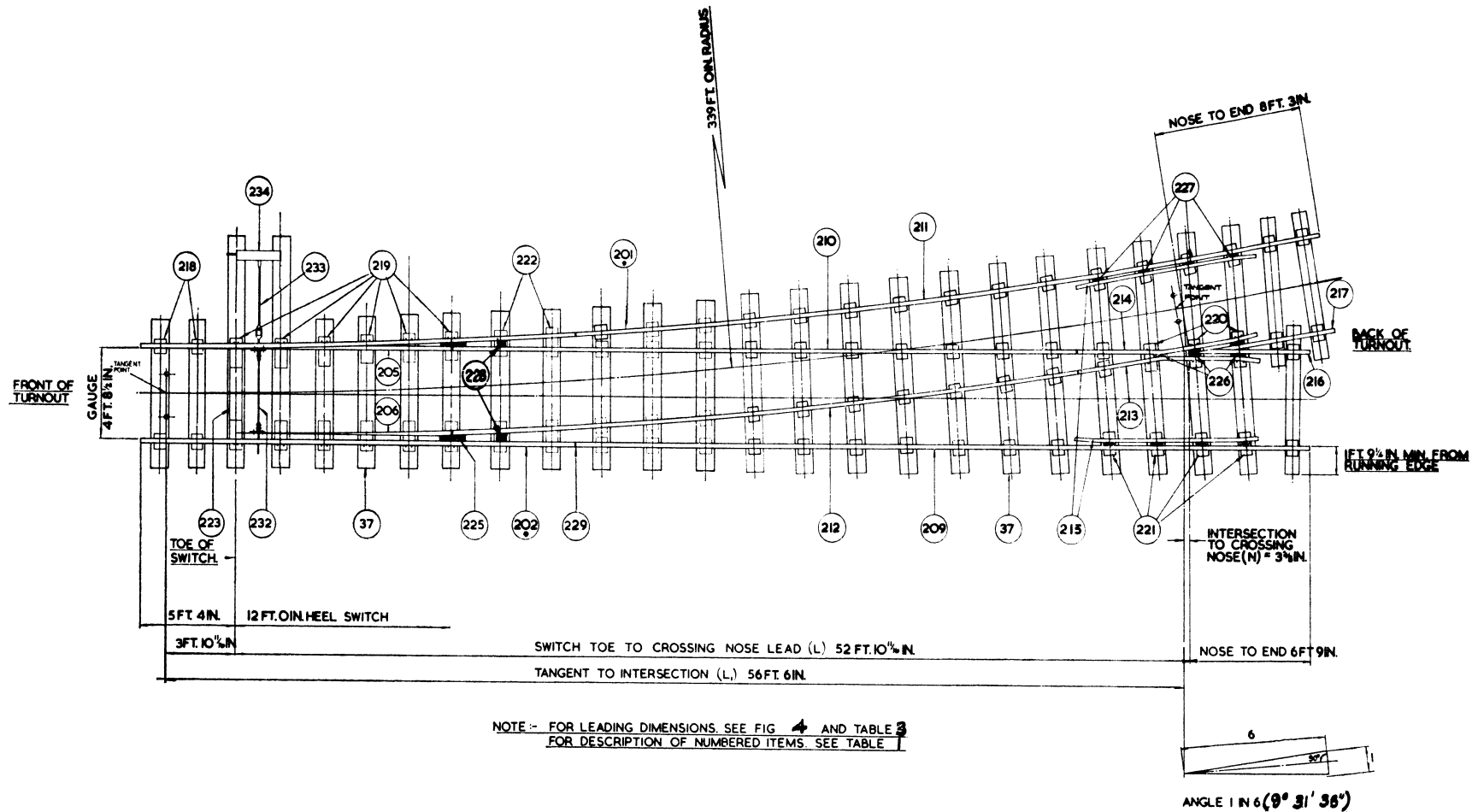


Figure 1 — Layout diagram for heel switch turnouts

BS 11-75A flat bottom rail
(1 in 6 left-hand turnout shown)

*For right-hand turnout items no. 201 to read 203
202 to read 204
205 to read 207
206 to read 208