

BRITISH RAILWAYS - WESTERN REGION

STANDARD INSTRUCTION FOR THE REPAIR OR

MAINTENANCE OF DIESEL LOCOMOTIVES AND MULTIPLE UNITS

Incorporates B.R. Engineering Instruction No. LG/52 Issue 4 (parts thereof which apply using W.R. Tyre gauges).	W.R. Standing Order No. <b>1/F/100</b>
<u>SUPERSEDES:</u> W.R. Standing Order No. 1/F/100 dated 15.3.72	Date: 9 March, 1973
<u>Units Applicable:-</u>  All Locomotives	<u>Vehicle Serial Nos.:-</u>  Various

LOCOMOTIVE TYRES & PROFILES

This instruction has been prepared with the object of supplying particulars of tyre profiles fitted to all classes of locomotives, excluding those fitted experimentally.

The tyre reprofiling last turning thicknesses for depots and Main Workshops are listed, together with acceptable variations of diameter when matching wheel sets in the bogies for a particular locomotive type.

This information, which is relevant to W.R. current practice, has been extracted from B.R.B. Engineering Instruction No. LG/52 Issue 4, the remaining data of the instruction has been discarded.

Limits of max flange height & thickness will be found in W.R. Standing Order 1/F/103, MUSP 8.

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FOR CHIEF MECHANICAL & ELECTRICAL ENGINEER  
 PADDINGTON.

PROFILE TYPES FOR LOCOMOTIVES

<u>PROFILE NO.</u>	<u>DESCRIPTION</u>	<u>DRAWING NO.</u>
P1	Profile with 1 in 20 tread incline originally Profiles 'A' or 'P'	F-A2-1
P6	Tyre Profile. R.D.5 This profile is in Metric dimensions	F-A2-0
P9	Profile with 1 in 20 tread incline Originally Profile 'K' as used on Eastern Region. similar to Profile 'E', B.S. 276	L-A2-1840

IDENTIFICATION OF TYRE PROFILE

When the wheel pair is separated from the locomotive or bogie the undermentioned stamping particulars to be provided for identification purposes.

TYRE/WHEEL STAMPING LOCATION

The profile identification letter and number to be stamped in  $\frac{1}{2}$ " (13 mm) scroll letters in accordance with Drg. No. E776 & located as follows :-

a) BUILT-UP WHEELS

On the outside of the tyre adjacent to the cast number etc.

b) SOLID WHEELS

On the inner side of the boss following the "B.R." stamp.

TABLE 1

DIESEL SHUNTER TYRE PROFILES

ELECTRIC TRANSMISSION

<u>CLASS</u>	<u>TYRE THICKNESS ON TREAD (NEW)</u>		<u>PROFILES</u>
	<u>INCHES</u>	<u>M.M.</u>	
13 *	3	76	P1-P9-P1 : P1-P9-P1
∅ 07, 08, 09, 10, 11, 12, ∅	3	76	P1-P9-P1

HYDRAULIC TRANSMISSION

02	3	76	P1 all wheels
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MECHANICAL TRANSMISSION

01	3	76	P1 all wheels
03, 04, 05	3	76	P1 all wheels
06	3	76	P1 all wheels

\*For use with retarders,  $\frac{1}{4}$ " (6 mm) wide flat to be turned on tip of all flanges (letter dated 7.9.66 Ref. D85/10/GEN/D2).

∅ The above note also applies to Locomotives allocated to "Bescot" Marshalling Yard.

TABLE 2DIESEL ELECTRIC MAIN LINE LOCOMOTIVE  
TYRE PROFILE

<u>CLASS</u>	<u>TYRE THICKNESS ON</u> <u>TREAD (NEW)</u>		<u>PROFILES</u>
	<u>INCHES</u>	<u>M.M.</u>	
15	3	76	P1 all wheels
17	3	76	P1 all wheels
20	3	76	P1 all wheels
24	3	76	P1 all wheels
25	3	76	P1 all wheels
26	3	76	P1 all wheels
27	3	76	P1 all wheels
29	3	76	P1 all wheels
31	3	76	P1-P9-P1 : P1-P9-P1
33	3	76	P1 all wheels
37	3	76	P1 all wheels
40	3	76	P1 all wheels
44	3	76	P1 all wheels
45	3	76	P1 all wheels
46	3	76	P1 all wheels
47	3	76	P1 all wheels
50	3	76	P6 all wheels
53	3	76	P1 all wheels
55	3	76	P1 all wheels

TABLE 3DIESEL HYDRAULIC MAIN LINE LOCOMOTIVE  
TYRE PROFILES

<u>CLASS</u>	<u>TYRE THICKNESS ON</u> <u>TREAD (NEW)</u>		<u>PROFILES</u>
	<u>INCHES</u>	<u>M.M.</u>	
35	3	76	P1 all wheels
52	3	76	P1 all wheels.

TABLE 4ELECTRIC & ELECTRO-DIESEL MAIN LINE  
TYRE PROFILES

<u>CLASS</u>	<u>TYRE THICKNESS ON</u> <u>TREAD (NEW)</u>		<u>PROFILES</u>
	<u>INCHES</u>	<u>M.M.</u>	
71	3	76	P1 all wheels
73	2½	64	P1 all wheels
74	3	76	P1 all wheels
76	3	76	P1 all wheels
81	3	76	P1 all wheels
82	3	76	P1 all wheels
83	3	76	P1 all wheels
84	3	76	P1 all wheels
85	3	76	P1 all wheels
86	3	76	P6 all wheels

DISTANCE BETWEEN FLANGE BACKS OF WHEEL PAIR

The distance between the flange backs between wheels of a wheel pair is 4'-5 $\frac{5}{8}$ " (1362 mm) minimum and 4'-5 $\frac{5}{8}$ " + .050" (1362 + 1.25 mm) maximum.

NOTE : These limits are applicable only when the wheel pair is unloaded, the axle being subject to deflection when assembled in a locomotive.

INSTRUCTIONS RELATING TO MINIMUM TYRE THICKNESS AND VARIATION IN WHEEL DIAMETERS

A. FOR LOCOMOTIVES AT CLASSIFIED REPAIRS

1. To enable locomotives to run between classified repairs without unscheduled bogie or wheel set changes, tyres must be renewed at a classified repair if the tyre thickness would be less than that shown in Tables 5, 6 and 7.

2. (a) MAIN LINE ELECTRIC, ELECTRO-DIESEL & DIESEL ELECTRIC LOCOMOTIVES

Maximum permitted variation of diameter between any pair of newly turned wheels on motored axles throughout the locomotive when turned out from Workshops at Classified Repairs is  $\frac{1}{4}$ " (6 mm).

(b) DIESEL HYDRAULIC LOCOMOTIVES CLASS 52.

Maximum permitted variation of diameter between any pair of newly turned wheels on the same bogie is .010" (.25 mm). There is no limit imposed on the variation of diameters between bogie and bogie.

(c) DIESEL HYDRAULIC LOCOMOTIVES CLASS 35 AND SHUNTING LOCOMOTIVES WITH COUPLED WHEELS

Maximum permitted variation of diameter between any pair of newly turned wheels throughout the locomotive is .010" (.25 mm).

3. The tread diameter of re-profiled wheels on the same axle to be within 0.010" (.25 mm) of each other subject to the conditions for shunting and diesel hydraulic locomotives contained in paragraphs 2(b) and 2(c) above.
4. Pony Truck wheels on lcc1 locomotives must be turned such that the tyre thickness is within the range of thickness of the driving wheel tyres.

**B. FOR LOCOMOTIVES SERVICED AT MAINTENANCE DEPOTS**

1. The last turning and scrapping thickness for locomotive tyres to be in accordance with Tables 5, 6 and 7.

2. (a) **MAIN LINE ELECTRIC, ELECTRO-DIESEL & DIESEL ELECTRIC LOCOMOTIVES**

A  $\frac{1}{2}$ " (13 mm) maximum variation of diameter between any pair of newly turned wheels on motored axles throughout the locomotive is allowed when individual wheel pairs are reprofiled at Depots, except on Class 74 locomotives where the variation of diameter on any wheel pair must not be greater than  $\frac{1}{4}$ " (6 mm)

(b) **DIESEL HYDRAULIC LOCOMOTIVES CLASSE 52**

Maximum permitted variation of diameter between any pair of newly turned wheels on the same bogie is .010" (.25 mm). There is no limit imposed on the variation of diameters between bogie and bogie.

(c) **DIESEL HYDRAULIC LOCOMOTIVES CLASSE 35 AND SHUNTING LOCOMOTIVES WITH COUPLED WHEELS**

Maximum permitted variation of diameter between any pair of newly turned wheels throughout the locomotive is .010" (.25 mm).

**NOTE :** No Diesel Hydraulic Locomotive must be allowed to travel with wheels of unequal diameter, except within the above limits and within differences caused by normal wear when such wheels are coupled by cardan shafts to the same transmission, unless cardan shafts connecting such wheels are uncoupled.

3. The tread diameters of re-profiled wheels on the same axle to be within 0.010" (.25 mm) of each other subject to the conditions for shunting and diesel hydraulic locomotives contained in paragraphs 2(b) and 2(c) above.

4. There are special conditions of permitted wear on pony truck wheels of Classes 40, 44, 45 & 46 Locomotives with 1C Bogies and reference should be made to Sheet No.10 for this information which is based upon Eastern Region Standing Order LD.158 dated 8 May 1969.

DIESEL ELECTRIC MAIN LINE & DIESEL SHUNTING LOCOMOTIVESTABLE 5

<u>LOCOMOTIVE CLASS</u>	<u>MIN TYRE THICKNESS FOLLOWING CLASSIFIED REPAIRS</u>		<u>LAST TURNING THICKNESS</u>		<u>SCRAPPING THICKNESS</u>	
	<u>INCH</u>	<u>M.M.</u>	<u>INCH</u>	<u>M.M.</u>	<u>INCH</u>	<u>M.M.</u>
All shunters (except S.R.)	$1\frac{7}{8}$	48	$1\frac{1}{2}$	38	1.5/16	33
S.R. shunters	$2\frac{1}{2}$	64	$1\frac{1}{2}$	38	1.5/16	33
15	$1\frac{7}{8}$	48	$1\frac{1}{2}$	38	1.5/16	33
17	$1\frac{7}{8}$	48	$1\frac{1}{2}$	38	1.5/16	33
20	2.5/16	59	$1\frac{5}{8}$	41	1.7/16	37
24	2	51	$1\frac{5}{8}$	41	1.7/16	37
25	2	51	$1\frac{5}{8}$	41	1.7/16	37
26	2	51	$1\frac{5}{8}$	41	1.7/16	37
27	2	51	$1\frac{5}{8}$	41	1.7/16	37
29	2	51	$1\frac{5}{8}$	41	1.7/16	37
31	$2\frac{1}{4}$	57	$1\frac{5}{8}$	41	1.7/16	37
33	$2\frac{1}{2}$	64	$1\frac{5}{8}$	41	1.3/8	35
37	$2\frac{1}{2}$	64	$1\frac{7}{8}$	48	1.11/16	43
+ 37	$2\frac{3}{4}$	70	$1\frac{7}{8}$	48	1.11/16	43
* 40	$2\frac{3}{8}$	60	$1\frac{7}{8}$	48	1.11/16	43
* 44	$2\frac{1}{2}$	64	$1\frac{7}{8}$	48	1.11/16	43
* 45	$2\frac{1}{2}$	64	$1\frac{7}{8}$	48	1.11/16	43
* 46	$2\frac{1}{2}$	64	$1\frac{7}{8}$	48	1.11/16	43
47	2.13/16	71	2.3/16	56	2	51
50	$2\frac{1}{2}$	64	$1\frac{7}{8}$	48	$1\frac{5}{8}$	41
53	2.13/16	71	2.3/16	56	2	51
55	$2\frac{1}{4}$	57	$1\frac{7}{8}$	48	1.11/16	43

\* For Pony Truck Tyres on LCCL Locomotives the last turning size is  $1\frac{1}{2}$ " (38 mm). The decision to scrap depends upon condition but minimum thickness is 1.5/16" (33 mm).

+ Western Region Operating locomotives only.



DIESEL HYDRAULIC LOCOMOTIVES

TABLE 6

<u>LOCOMOTIVE CLASS</u>	<u>MIN. TYRE THICKNESS FOLLOWING CLASSIFIED REPAIRS</u>		<u>LAST TURNING THICKNESS</u>		<u>SCRAPPING THICKNESS</u>	
	<u>INCH</u>	<u>M.M.</u>	<u>INCH</u>	<u>M.M.</u>	<u>INCH</u>	<u>M.M.</u>
	35	$2\frac{1}{4}$	57	2	51	$1\frac{3}{16}$
52	$2\frac{1}{4}$	57	2	51	$1\frac{3}{16}$	46

ELECTRIC & ELECTRO DIESEL LOCOMOTIVES

TABLE 7

* 71	3	76	$1\frac{7}{8}$	48	$1.11/16$	43
* 73	$2\frac{1}{2}$	64	$1\frac{5}{8}$	41	$1.7/16$	37
* 74	3	76	$1\frac{7}{8}$	48	$1.11/16$	43
76	$2\frac{1}{2}$	64	$1\frac{5}{8}$	41	$1.7/16$	37
81	$2\frac{1}{4}$	57	$1\frac{7}{8}$	48	$1.11/16$	43
82	$2\frac{1}{4}$	57	$1\frac{7}{8}$	48	$1.11/16$	43
83	$2\frac{1}{4}$	57	$1\frac{7}{8}$	48	$1.11/16$	43
84	$2\frac{1}{4}$	57	$1\frac{7}{8}$	48	$1.11/16$	43
85	$2\frac{1}{4}$	57	$1\frac{7}{8}$	48	$1.11/16$	43
86	$2\frac{1}{4}$	57	$1\frac{7}{8}$	48	$1\frac{5}{8}$	41

\* Tyres for Classes 71, 73 and 74 to be renewed at every Classified Repair.

Pony Truck wheel tyres on 1.Co-Co.1 Diesel Main Line Locomotives.

(i) The tyre must not be more than  $\frac{1}{4}$ " (6 mm) thinner than the thinnest driving wheel tyre, unless packings can be fitted under the pony truck bearing spring buckles. Where such packings can be fitted, the tyre thickness difference can exceed  $\frac{1}{4}$ " (6 mm) subject to last turning limits and provided that packing is inserted in accordance with the following instructions for spring adjustment:-

a. A locomotive which is suitable for the addition of packing under the bearing spring buckles can be recognised by the existence of 4" (102 mm) diameter distance pieces  $\frac{5}{16}$ " (8 mm) thick for the driving wheels & 1" (25 mm) thick for the pony trucks which are fitted in the spring seats above the axleboxes.

The selection of packing to retain acceptable weight distribution is carried out as under:-

b. Where no packing other than a standard  $\frac{5}{16}$ " (8 mm) thick distance piece is already fitted under the driving wheel bearing spring buckle, the necessary packing is to be fitted as tabulated below:-

Amount by which pony tyres are thinner than the thinnest driving tyre.	Thickness of Packing to be added under pony truck bearing spring buckles.	B.R. Catalogue No. of Packing
$\frac{1}{4}$ " - $\frac{1}{2}$ " (6-13 mm)	$\frac{1}{2}$ " (13 mm)	9/61/3318
$\frac{1}{2}$ " - $\frac{3}{4}$ " (13-19 mm)	$\frac{3}{4}$ " (19 mm)	9/61/3319
$\frac{3}{4}$ " - 1" (19-25 mm)	1" (25 mm)	9/61/3317

Refer to Drawing SL/DE/22910 for procedural details.

c. Where as a result of previous buffer height adjustment carried out before the issue of this instruction, a locomotive has packings under the driving wheel bearing spring buckles, the size of any pony truck packing necessary in accordance with the above table must be increased by the amount of the packing under the driving wheel bearing springs.

(ii) If it will be necessary to exceed the  $\frac{1}{4}$ " limit to restore the profile, and the locomotive has not been modified to take packing, the regional C.M.& E.E. must be informed before any action is taken.

(iii) Where it is necessary to change a pony truck wheel set, the tyre thickness of the replacement set must be within the range of the driving wheel tyre thickness.