

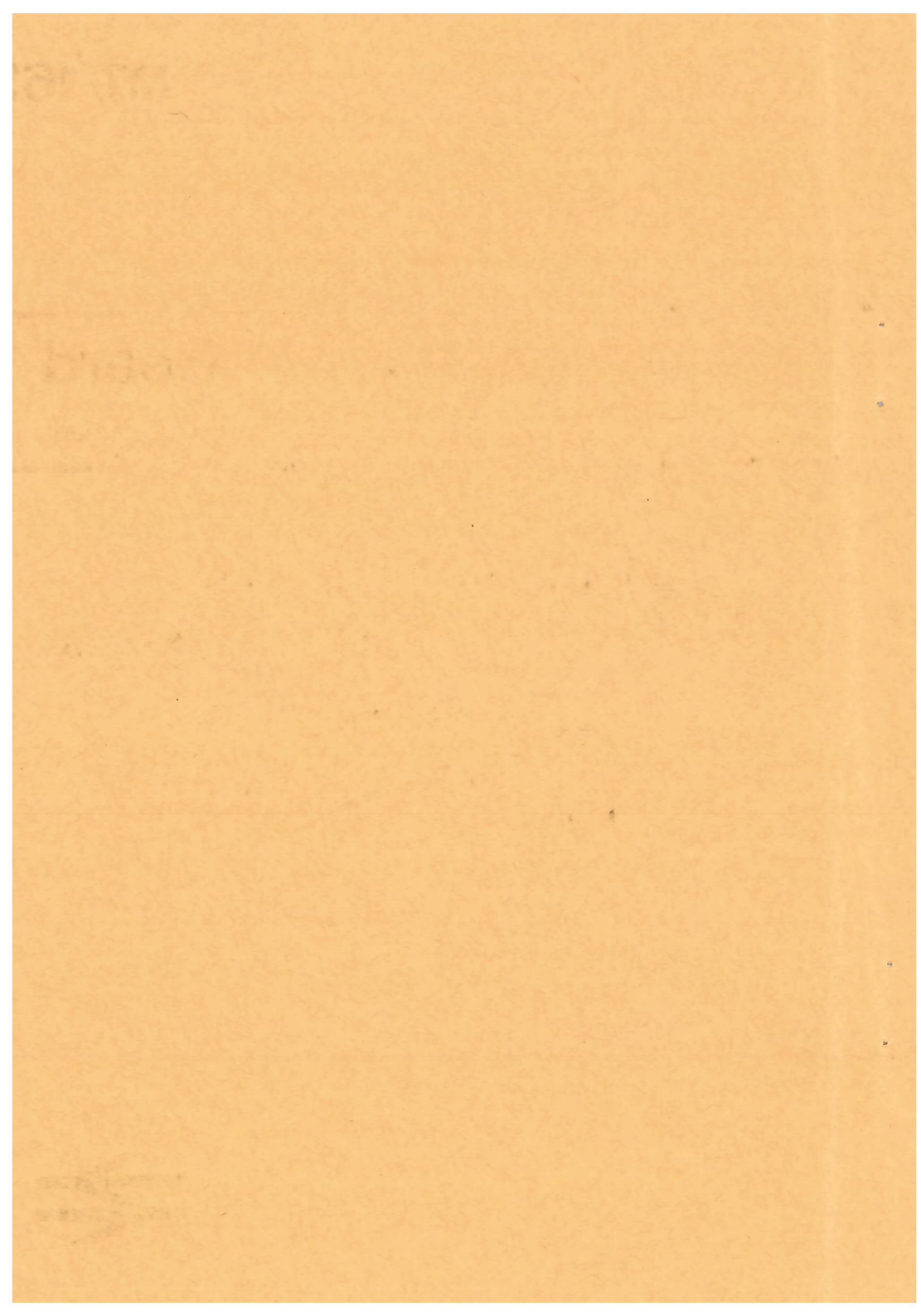
MT/162

British Railways Board

Chief Mechanical & Electrical Engineer's Department

IDENTIFICATION OF WHEEL & TYRE TREAD DAMAGE REQUIRING REMEDIAL ACTION





1. INTRODUCTION

- 1.1 This booklet establishes a standard for the recognition of tread damage requiring remedial action on all rail mounted vehicles. It applies equally to tread damage on monobloc wheels and on tyres.
- 1.2 It should result in benefits both from the safety aspect, and in preventing the withdrawal of vehicles with tread damage that does not require immediate attention.
- 1.3 The various types of damage likely to be encountered have been classified under four headings : Flats, Cracks, Cavities and Other Damage.
- 1.4 To assist in the identification of the various types of damage, photographs are included.
- 1.5 Examination of tread condition should be carried out at the intervals specified in the appropriate, "Regulations for Maintenance/Examination Schedule", unless a more frequent examination is specifically called for on a particular vehicle.
- 1.6 R.I.V. registered vehicles are subject to separate instructions in accordance with para 35 of chapter VII of those regulations.

2. DEFINITION OF TERMS

- 2.1 Length of a crack refers to a dimension measured end to end across the tread.
- 2.2 Length of a damaged area, such as one containing cavities, refers to a dimension measured circumferentially around the tread.

3. ACTION

- 3.1 When the damage exceeds the level laid down in the relevant part of section 4, then the appropriate action specified for the particular type of damage, must be taken.
- 3.2 Where movement of a vehicle withdrawn for wheel/tyre damage is necessary to enable remedial action to be carried out, then the matter should be referred to the appropriate AM & EE, unless specifically covered in Section 4.
- 3.3 Where an instance of damage not specifically covered by this instruction is found, then this should be reported to the AM & EE.
- 3.4 Where a vehicle undergoing maintenance is found to have defects that would require its immediate withdrawal from service, then the vehicle shall not be released to traffic until remedial action has been taken.
- 3.5 When detected, the location of damaged areas should be indicated by a broad line marked onto the side of the tyre/wheel for the length of the damaged tread.

4. CLASSIFICATION OF TYRE DAMAGE

4.1 FLATS AND HIGH SPEED WHEELSLIDE DAMAGE

4.1.1 Where flats of an isolated nature are found as shown in Fig. 1, then these are to be measured as shown, and remedial action taken in accordance with table 1.

4.1.2 A form of damage frequently found to occur on disc-braked vehicles is that resulting from high speed wheelslide, as shown in Fig. 2. Individual flats within the damaged zone are to be measured as shown in Fig. 1 and remedial action taken in accordance with table 1.

4.1.3 Where the action specified in the appropriate part of the table requires the vehicle to be stopped immediately, and it is necessary to move the vehicle to a repair point, the maximum permitted speed for locomotives and coaching stock is to be as follows :-

Flat length above that specified in column C of table 1 and up to 70 mm, 60 mile/h.

Flat length above 70 mm, 35 mile h.

For freight vehicles with flats above the length given in column C of the table, the maximum speed is to be 35 mile/h.

4.1.4 A vehicle having a flat length greater than 100 mm must not be moved, except where necessary to clear running lines, without the approval of the AM & EE.

TABLE 1

VEHICLE TYPE	ACTION TO BE TAKEN		
	A	B	C
Mk. 3 Sleepers All locomotives. DMU's, DEMU's and HST Power Cars.	Up to 20 mm	21 to 50 mm	Above 50 mm
EMU's with maximum speeds less than 90 mile/h. All non passenger carrying coaching stock, except Post Office and newspaper sorting vehicles.	Up to 40 mm	40 to 60 mm	Above 60 mm
Loco hauled coaching stock including Class 253 Trailer Cars, Post Office and newspaper sorting vehicles.	Up to 30 mm	30 to 50 mm	Above 50 mm
EMU's with a maximum speed of 90 mile/h and and above.			
2 axle wagons with GLW below 35 tons (35 500 kg). Bogie wagons with GLW below 70 tons (71 000 kg).	Up to 60 mm	60 to 80 mm	Above 80 mm
2 axle wagons with GLW at or over 35 tons (35 500 kg) Bogie wagons with GLW at or over 70 tons (71 000 kg).	Up to 50 mm	50 to 70 mm	Above 70 mm
A-No action			
B-To be taken out of service for remedial action on completion of journey (locomotives and freight stock) or no later than the end of the day. (Passenger Vehicles).			
C-To be taken out of service immediately for remedial action (see also sections 3 and 4.1.4).			

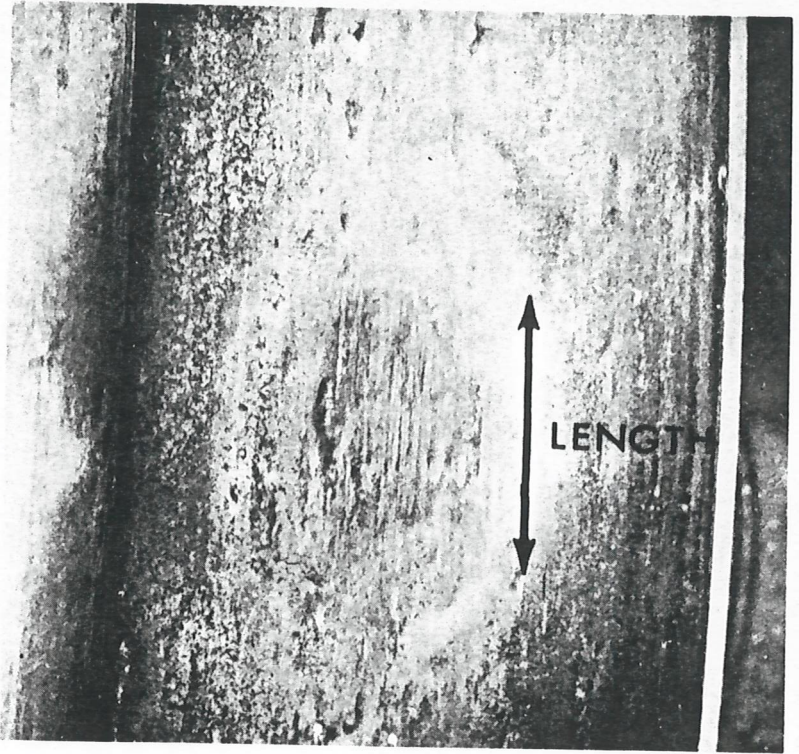


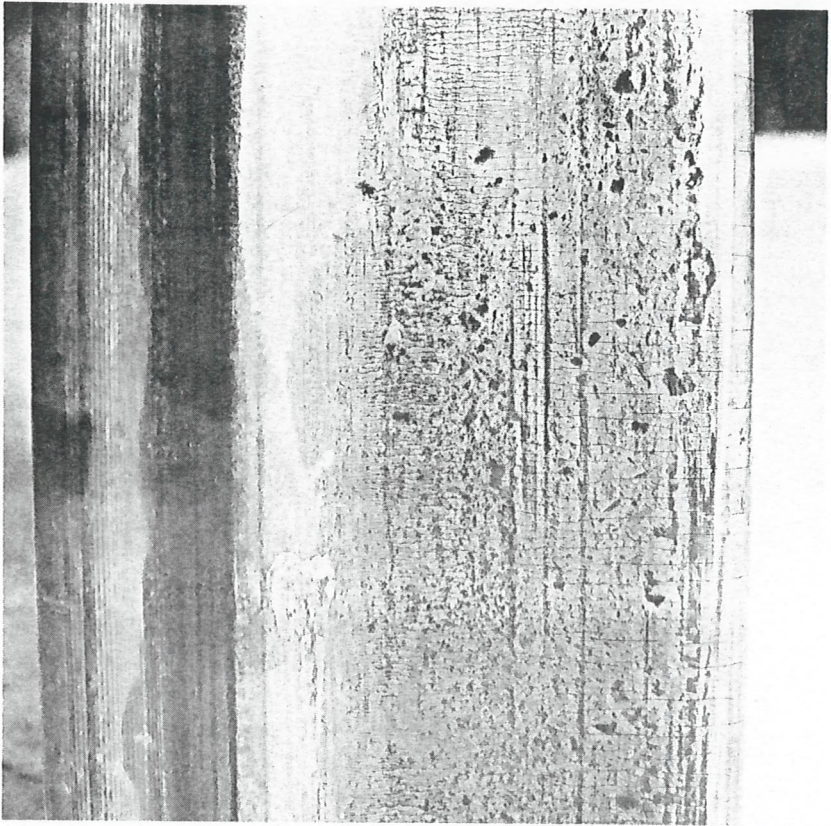
FIG. 1 Isolated Flat



FIG. 2. High Speed Wheelslide Damage.

4.2 CRACKS

- 4.2.1 Where cracks are found to occur on the chamfer, on the outer face or on the flange, the vehicle shall be immediately withdrawn from service for repair. See Figs. 3 & 4. There shall be no cracks in the area of the chamfer where it has become rounded due to wear, or within any 'roll-over' at the edge of the flange. The vehicle shall be immediately withdrawn for repair. Movement to a repair point shall be at a maximum speed of 45 mile/h.
- 4.2.2 Fine cracking in the tread area is permissible as shown in Fig. 5.
- 4.2.3 If multiple coarse cracking is present in the tread area, as shown in Fig. 6, then where individual cracks are more than 40 mm in length the vehicle is to be withdrawn from service for remedial action on completion of the journey (locomotives and freight stock), or no later than the end of the day (passenger vehicles).
- 4.2.4 Where isolated coarse cracks are present in the tread area as shown in Fig. 7, and exceed 30 mm in length, the vehicle is to be immediately withdrawn from service for remedial action.



FLANGE

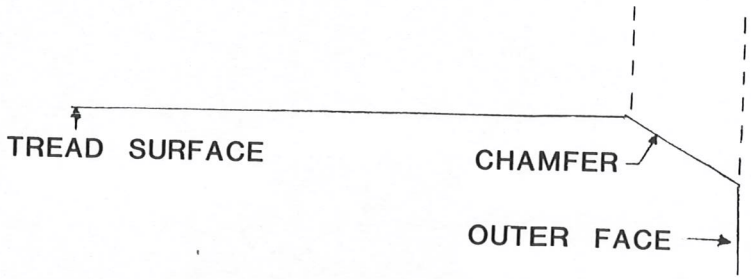
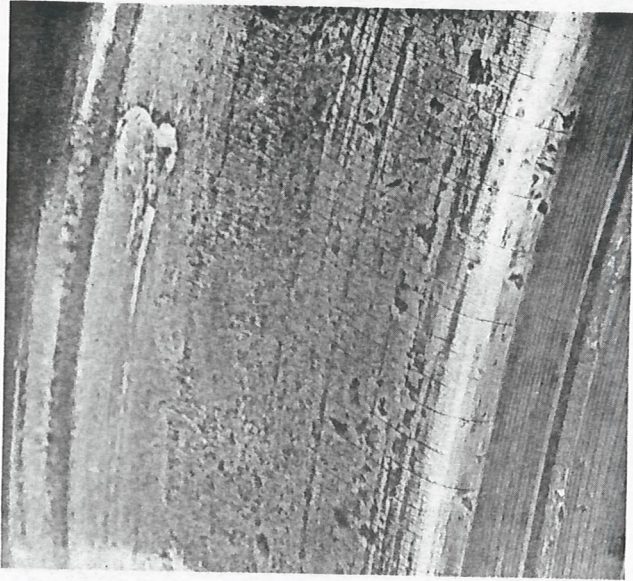


FIG 3 Cracks over Chamfer of Profile

8A



FLANGE SIDE



LAST TURNING GROOVE

FIG 3a Cracks over chamfer of Profile

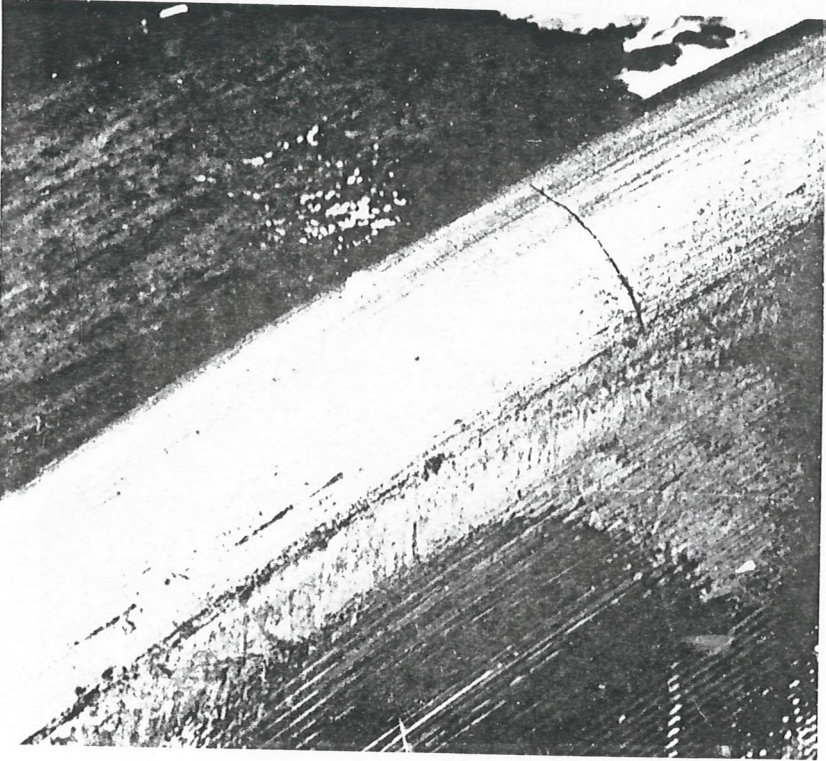


FIG 4. Cracks on Flange

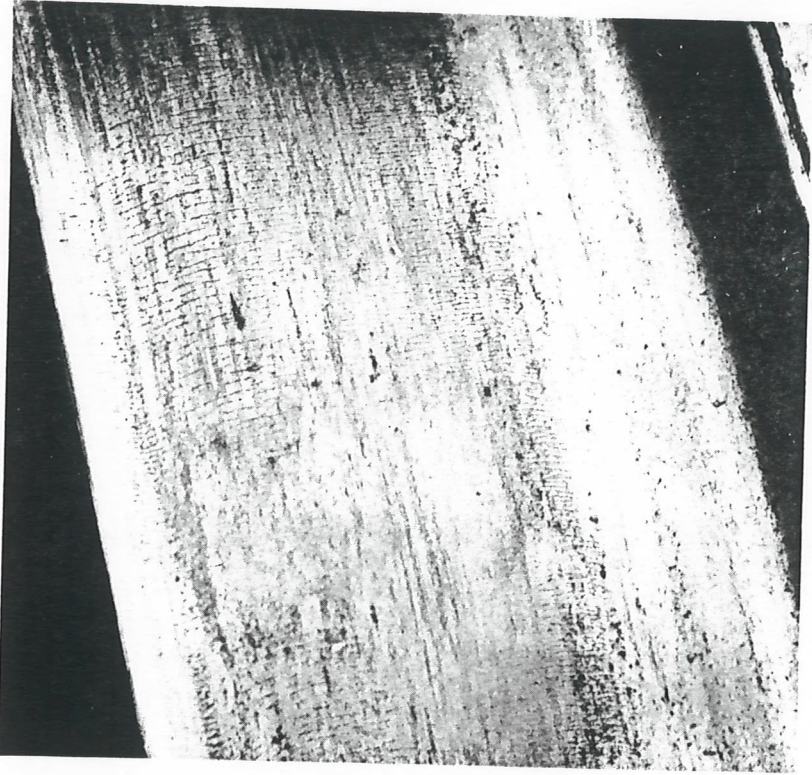


Fig.5 Fine Cracking in Centre of Tread



FIG. 6. Multiple Coarse Cracking in Centre of Tread

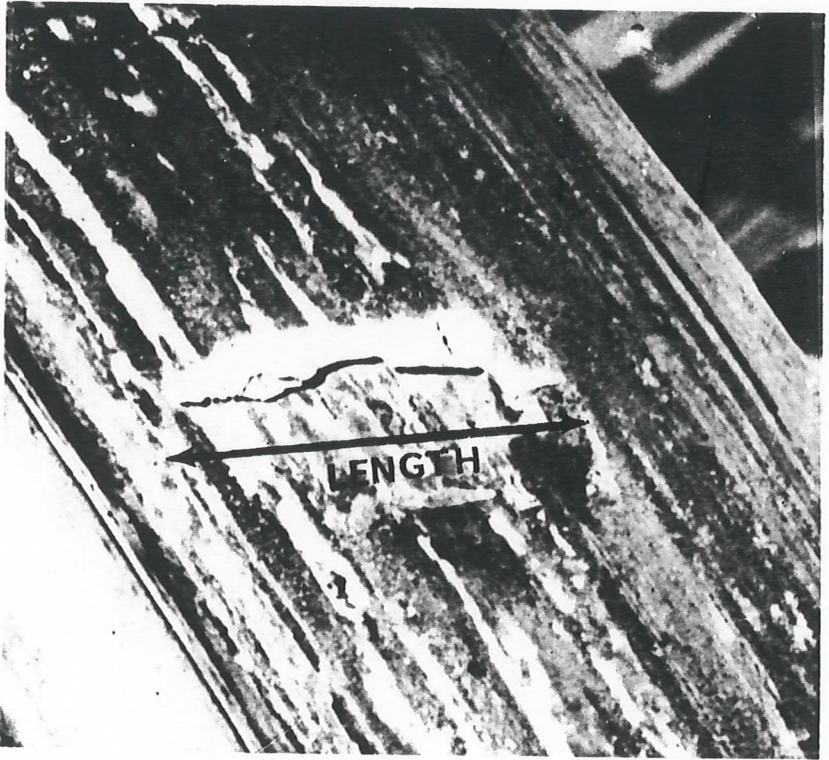


FIG. 7. Isolated Cracks in Tread Area.

4.3 CAVITIES

(see Fig 8)

- 4.3.1 Where a tread cavity exceeds 15 mm continuous length, then the vehicle must be taken out of service for remedial action on completion of journey (locomotives and freight stock) or no later than the end of the day (passenger vehicles).
- 4.3.2 When tread cavities exceed 10 mm continuous length, and occur less than 50 mm apart, then the vehicle must be taken out of service for remedial action, on completion of journey (locomotives and freight stock) or no later than the end of the day (passenger vehicles).

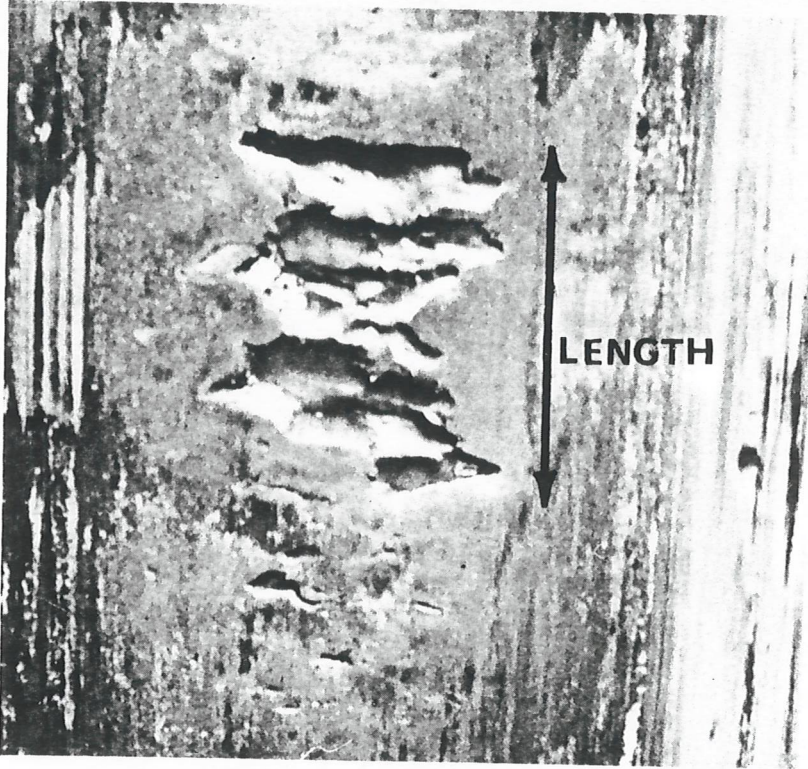


FIG. 8. Cavities.

4.4 OTHER DAMAGE

4.4.1 Metal Build-up (Fig. 9)

4.4.1.1 Where metal build-up is found on the tread and is less than 1 mm in height, no action is required.

4.4.1.2 Where metal build-up is found on the tread and is 1 mm in height or above, then the vehicle should be immediately withdrawn from service for remedial action.

4.4.1.3 If it is necessary to move a vehicle with metal pick-up in excess of 1 mm to a repair point then the maximum permitted speed is 35 mile/h.

4.4.1.4 Where possible, excessive amounts of metal build-up shall be removed by hand tools. If the area involved extends for less than 50 mm round the tread and there are no other defects, such as flats, which are above the limits quoted in the appropriate section of this document, then the vehicle may be returned to traffic without further attention to the wheel. If the area involved extends for 50 mm or more around the tread, then the vehicle must be withdrawn from traffic for remedial attention. If it is necessary to move the vehicle for this purpose then the maximum permitted speed is 35 mile/h.

4.4.2 Scoring and Grooving

Two types of damage, usually only associated with tread braking using composition brakeblocks, are scoring as shown in Fig. 10, or grooving as shown in Fig. 11. In either case the vehicle concerned must be withdrawn from service for remedial action, on completion of the journey (for locomotives and freight stock) or no later than the end of the day (passenger vehicles), and the AM & EE informed.

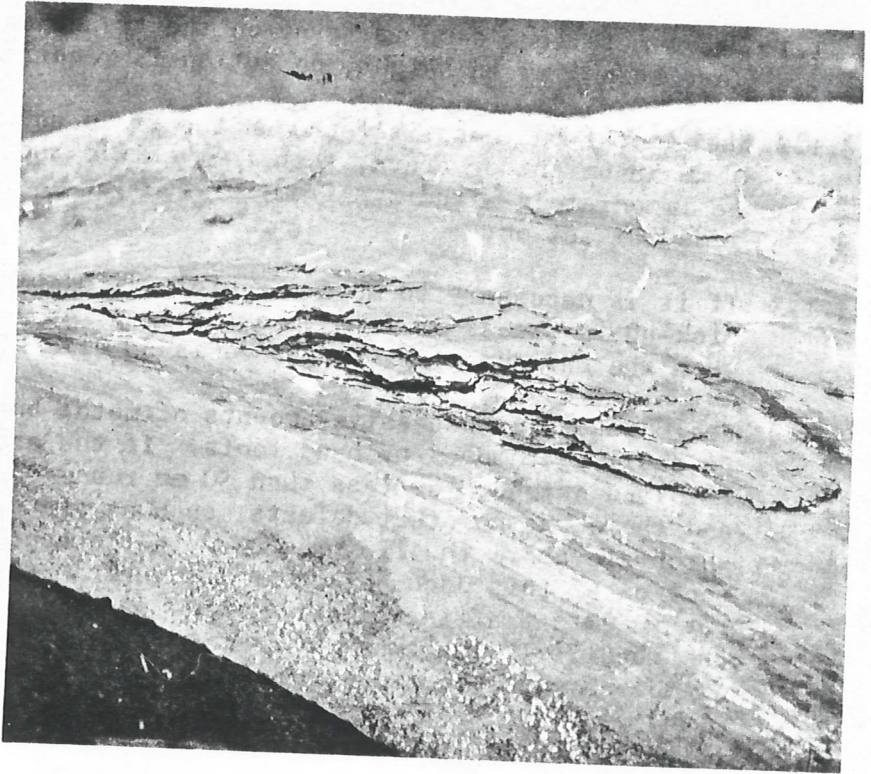


FIG. 9 Metal Build-up

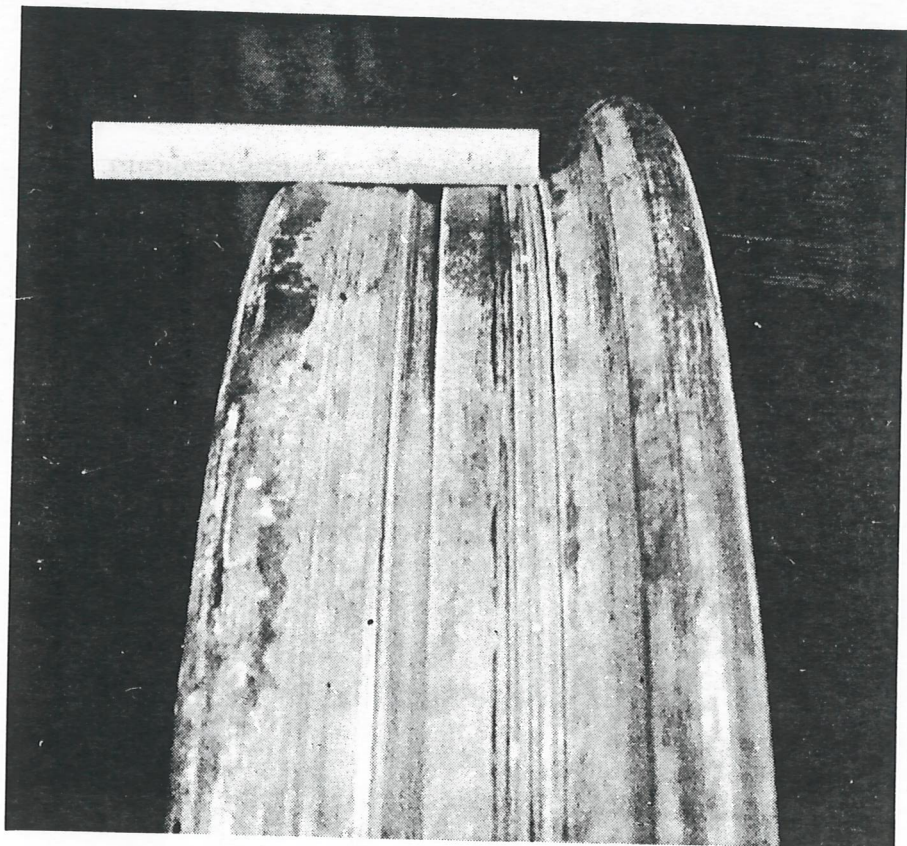


FIG. 10. Scoring

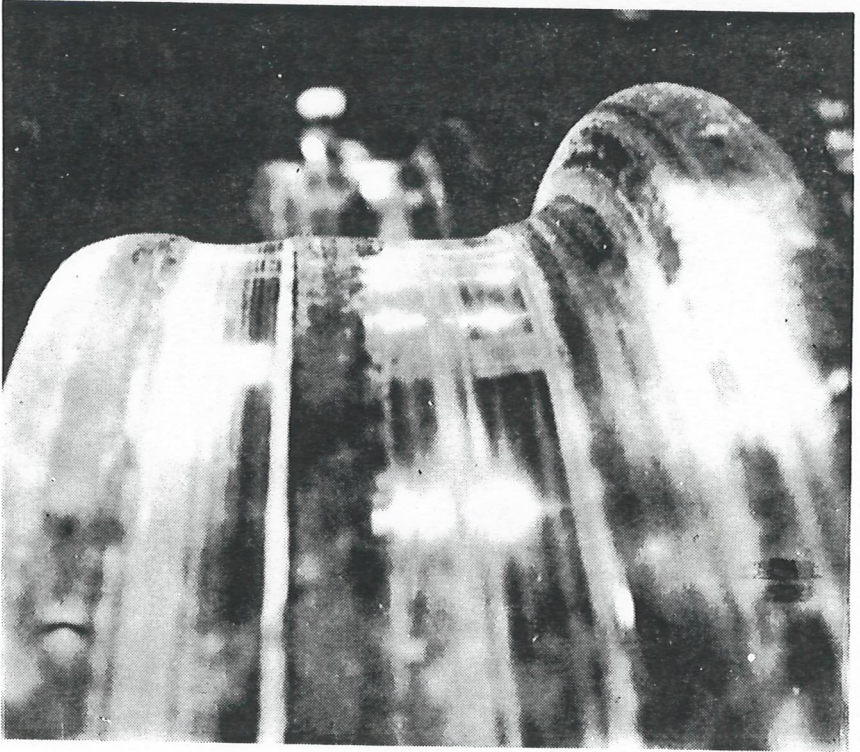


Fig 11 Grooving

IDENTIFICATION OF
WHEEL & TYRE TREAD DAMAGE REQUIRING
REMEDIAL ACTION

B.R. PUBLICATION NO. M1/162

REVISION LETTER NO. 1

<u>LOCATION</u>	<u>ACTION</u>	<u>REASON FOR CHANGE</u>
Pages 1, 2, 3, 4, 8, 7 and 15	Replace with Issue 2 of these pages)))
Page 8A	Insert this page)))

After incorporating the above, endorse the "Revision Record" at the front of the manual accordingly.

When this Revision letter has been actioned, it is to be stored at the back of the publication (capacity permitting), for easy future reference.

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