

PO/CL 549

From: Director, T & RS
Railfreight Distribution
Room 55, Trent House
Railway Technical Centre
London Road
Derby DE24 8UP

JUSTIFICATION - INSTRUCTION

Tel. 0332-2649890

O/r. RFD/FRS/BRA (PDA)

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BRAKE BLOCKS OF COMPOSITE MATERIAL - LIMITS OF ACCEPTABLE CRACKING

1. OBJECT

- 1.1 Define the acceptable limit of cracking allowed in service for brake blocks of composite material.

2. DEFINITIONS

2.1 Defective

Any fault or faults in a component or assembly; eg. structural fractures or weld fractures, which may prevent the component or assembly from fulfilling its designed purpose.

2.2 Renew

Scrap the original part and provide a new part in its place.

3. TYPES OF CRACKING

3.1 Through Crack

Cracks normally develop from the braking surface radially towards the mounting face (or back), being termed 'through cracks' once propagated through the full thickness of the block.

3.2 Open Crack

Crack width tends to increase in service from 'hairline' to 'open' in which latter condition the adjacent parts of the block are held together by the steel backing plate.

3.3 Crack along the Backing Plate

If a crack develops between the steel backing plate and the friction material of the block it can quickly lead to the block splitting from the backing plate.

3.4 Other Defects

Cracks may develop longitudinally along the brake block. A section of block may break free.

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4. TYPES OF BRAKE BLOCKS

4.1 Plain Blocks

Figure 1 illustrates a plain composite brake block.

4.2 Segmented Blocks

A segmented block has a reduced section of material in the centre of the block. The block may be :-

Fully Segmented with no material in at the reduced section (refer Fig 2), or

Partially Segmented where a thinner portion of friction material remains (ie a 'V' notch, refer Fig 3).

5. LIMITS OF ACCEPTABLE CRACKING

5.1 Plain Brake Blocks

The following are the limits of cracking which apply to plain brake blocks. Brake blocks found with cracks in excess of these limits are to be renewed.

- (a) The number of radial cracks permitted in service is limited to two. One or both cracks may be 'open cracks'.
- (b) Open cracks are permitted up to a maximum of 2mm at the widest point.
- (c) Blocks showing indications of splitting between the composite and steel backing plate are not permitted.
- (d) Longitudinal cracks are not permitted.
- (e) Broken or incomplete brake blocks are not permitted.

Figure 1 shows examples of defects not permitted.

5.2 Segmented Brake Blocks

5.2.1 Fully Segmented Blocks

No defects are permitted (refer Fig 2)

5.2.2 Partially Segmented Blocks

A single crack in the thinner section only is permitted. The crack may be open up to a maximum of 2mm (refer Fig 3).

No other defects are permitted.

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6. ACTION WHEN DEFECTS ARE FOUND

If a brake block exceeds any of the criteria in section 5 then it shall be renewed.

Additionally it is recommended that the following are undertaken:-

- 6.1 Check brake block carrier for defects (eg. loose, missing, worn, or damaged parts), paying particular attention to the secure fit between brake block, carrier and it's key.
- 6.2 Check brake rigging for defects (eg. loose, missing, worn, or damaged parts).
- 6.3 Check brake cylinder pressure in accordance with the specified limits (refer to appropriate Maintenance Strategy)

If any component/assembly is found to be defective then appropriate remedial action shall be taken.

Note: If brake blocks are found to exceed the limits of cracking, but no faults can be ascribed to 6.1 to 6.3 above, it may be necessary for the owner to investigate further the cause(s) of failure.

If brake blocks are found to be broken on a regular basis, on a particular working, wagon type/build or pool, then the Owner, or his repair agent, must advise the Private Owner Vehicle Engineer at the address above. A more stringent defect limit, based upon crack propagation rate details, may be placed on specific vehicles/workings until it is demonstrated that brake blocks will remain safe to operate.

D. J. Antcliff

for Director, Traction & Rolling Stock, Railfreight Distribution

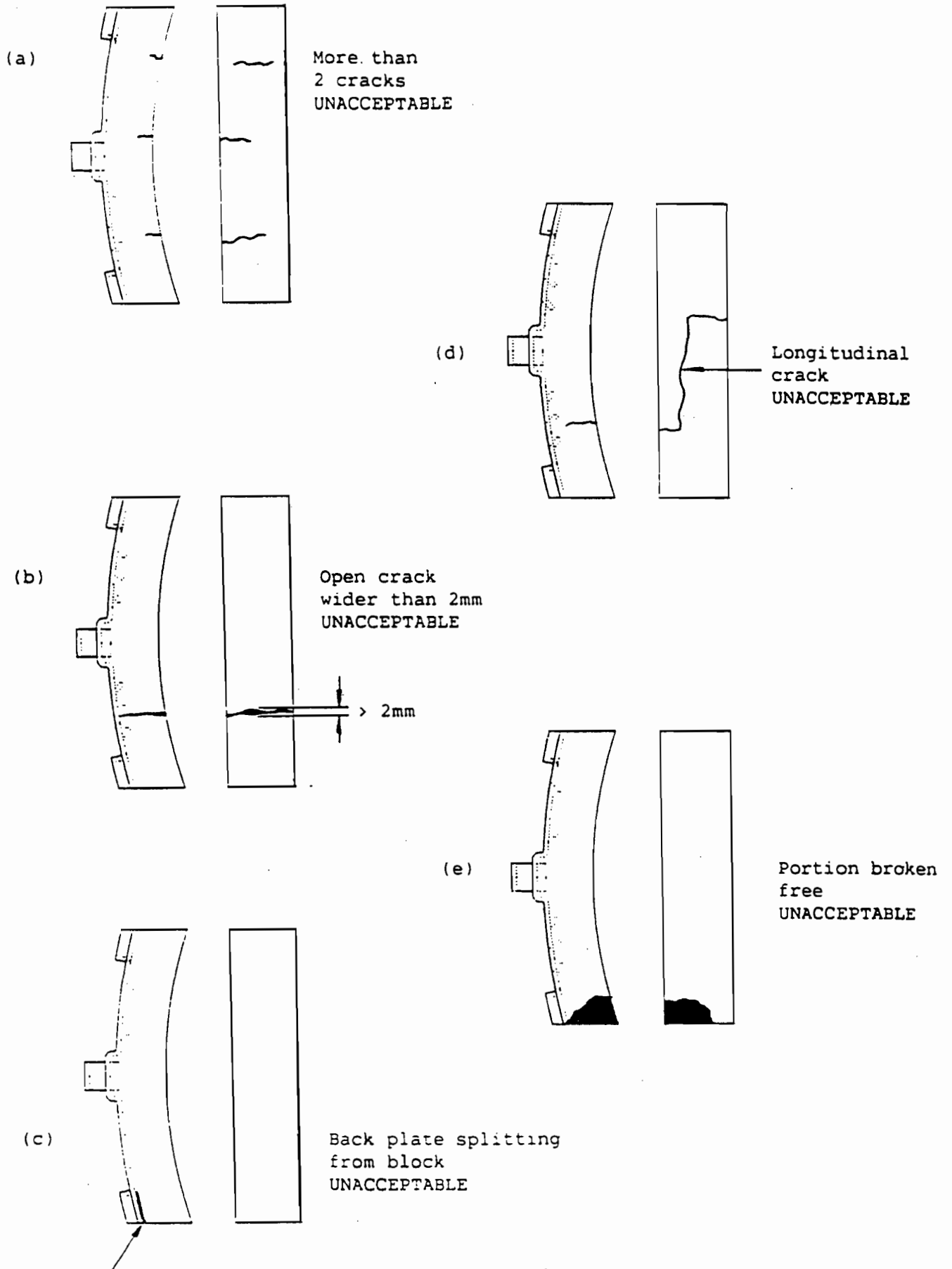
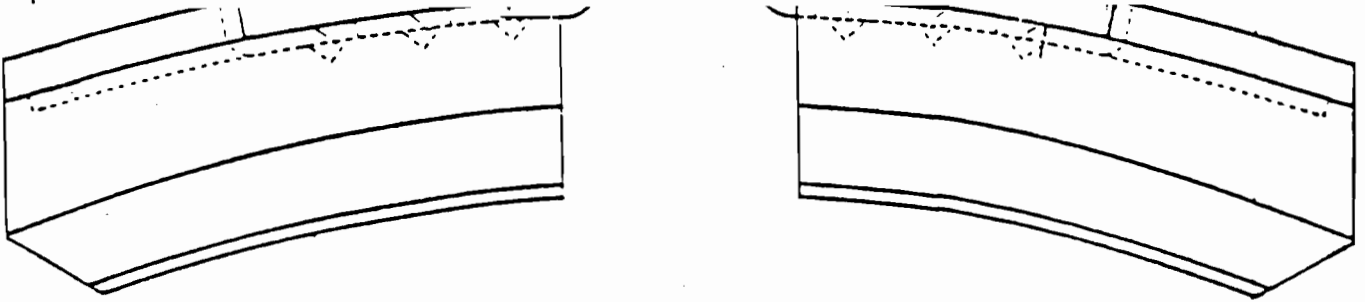


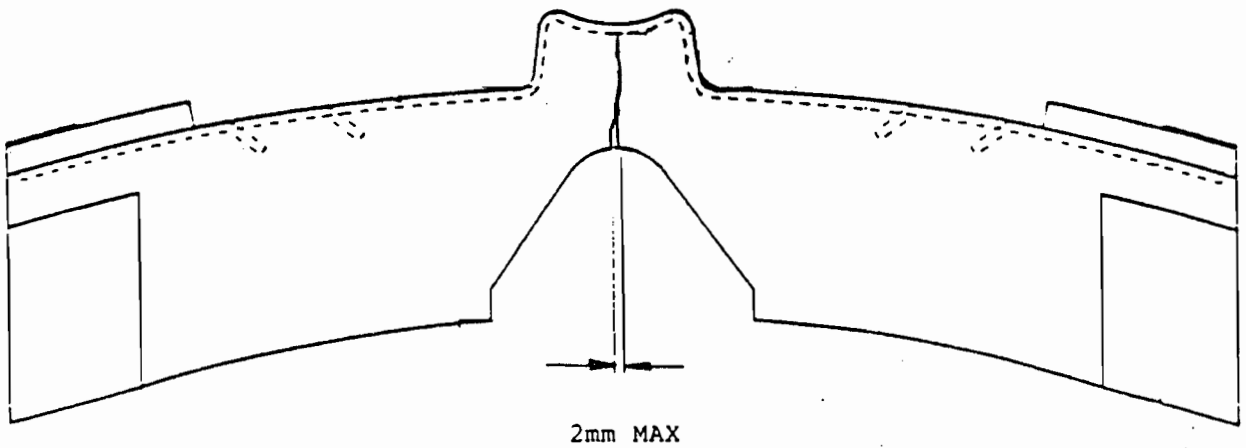
FIGURE 1



No cracks allowed

FIGURE 2

FULLY SEGMENTED COMPOSITE BLOCK



Maximum allowable defect - crack at centre max 2mm wide
No other cracking permitted

FIGURE 3

PARTIALLY SEGMENTED COMPOSITE BLOCK