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DKP

DIRECTOR OF MECHANICAL & ELECTRICAL ENGINEERING

DERBY

# Engineering Instruction

No. MD /375  
ISSUE 2

**TITLE**  
REPAIR OF FRACTURED ALUMINIUM ALLOY LONGITUDINALS AND SOLEBARS,  
CLASS 108 DMU POWER CAR UNDERFRAMES.

**LOCOMOTIVES, VEHICLES OR EQUIPMENT**

Description	Serial Nos.	Lot Nos.
CLASS 108 DMU POWER CARS	SEE ATTACHED LIST	

**LOCOMOTIVE, VEHICLE OR EQUIPMENT CODES**  
DMU 108

**COMPONENT CODES**  
0610

**INSTRUCTION** **WORKS**

This Instruction supersedes Engineering Instruction MD/375 Issue 1 dated 24 Sept 81 which shall be destroyed.

1.0 The aluminium alloy channel section longitudinals in the underframe of Derby Lightweight power cars are prone to fracturing in the vicinity of the engine front and rear mountings. Where longitudinals have fractured additional load is transferred to the solebars through cross-members and trimmers. This in turn can lead to fractures in the solebars, trimmers, and connecting knees.

Figure 1 shows the areas of the underframe affected and Figures 2, 3 and 4 show typical cracks in longitudinals and solebars.

2.0 During Main Works overhauls the critical areas shown in these Figures shall be crack detected using the dye-penetrant method. The examination is only to be carried out by operators approved by the Director of Mechanical & Electrical Engineering, BR HQ, Quality Assurance Division (refer to District Metallurgist).

cont...

Signed Allison Date 15<sup>th</sup> Nov. 1983 Corres. Ref. TSU/177-300-312(CGW)

Countersigned M.V. Casey D. of M & E.E. Telephone No. 056-3525

For B.R.E.L. HQ. USE ONLY

B.R.E.L. Eng. Inst. No.	Type of Instruction		Estimates of unit cost change are /are not required	
	Recurring	Non-Recurring	Recurring	Non-Recurring

Redistribution  
Paper

To :-

- \* Divisional / Works Manager -----
- \* Works / Depot -----

Please acknowledge receipt of this Engineering Instruction

Signed \_\_\_\_\_ Corres. Ref. \_\_\_\_\_ Date \_\_\_\_\_  
for D.M. & E.E. / MD, B.R.E.L.

\* Delete whichever is not applicable

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- 3.0 Where such fractures are found the following methods of repair shall be adopted.
- 3.1 Fractured aluminium alloy longitudinals shall be replaced by a steel channel of the same section over a length that includes the positions of both front and rear mountings for the engine. BR Drawing B1-A0-9008221 shows the repair, specifies the replacement steel section, and gives the position, design, and fastening of the joints to be used to join the new steel section to the remaining aluminium alloy sections. The drawing gives only the important design requirements for the repair. The remaining details are left to the discretion of Workshop staff working to the guidelines given on the drawing and in association with the Resident Engineer, Q.A. Division, M & EE Department, BRB HQ.
- 3.2 Fractured solebars shall be repaired by drilling the ends of the cracks and fastening a reinforcing steel plate onto the outside of the solebar over the area of the fractures. The repair is fully specified on BR Drawing TBS-A0-9023769.

## LIST OF VEHICLES

<u>Vehicle Numbers</u>	<u>Lot Numbers</u>
50599 - 50624	30406
50625 - 50629	30407
50924 - 50935	30460
50938 - 50987	30465
51416 - 51424	30498
51901 - 51950	30601
50630 - 50646	30408
51561 - 51572	30461
52037 - 52065	30660

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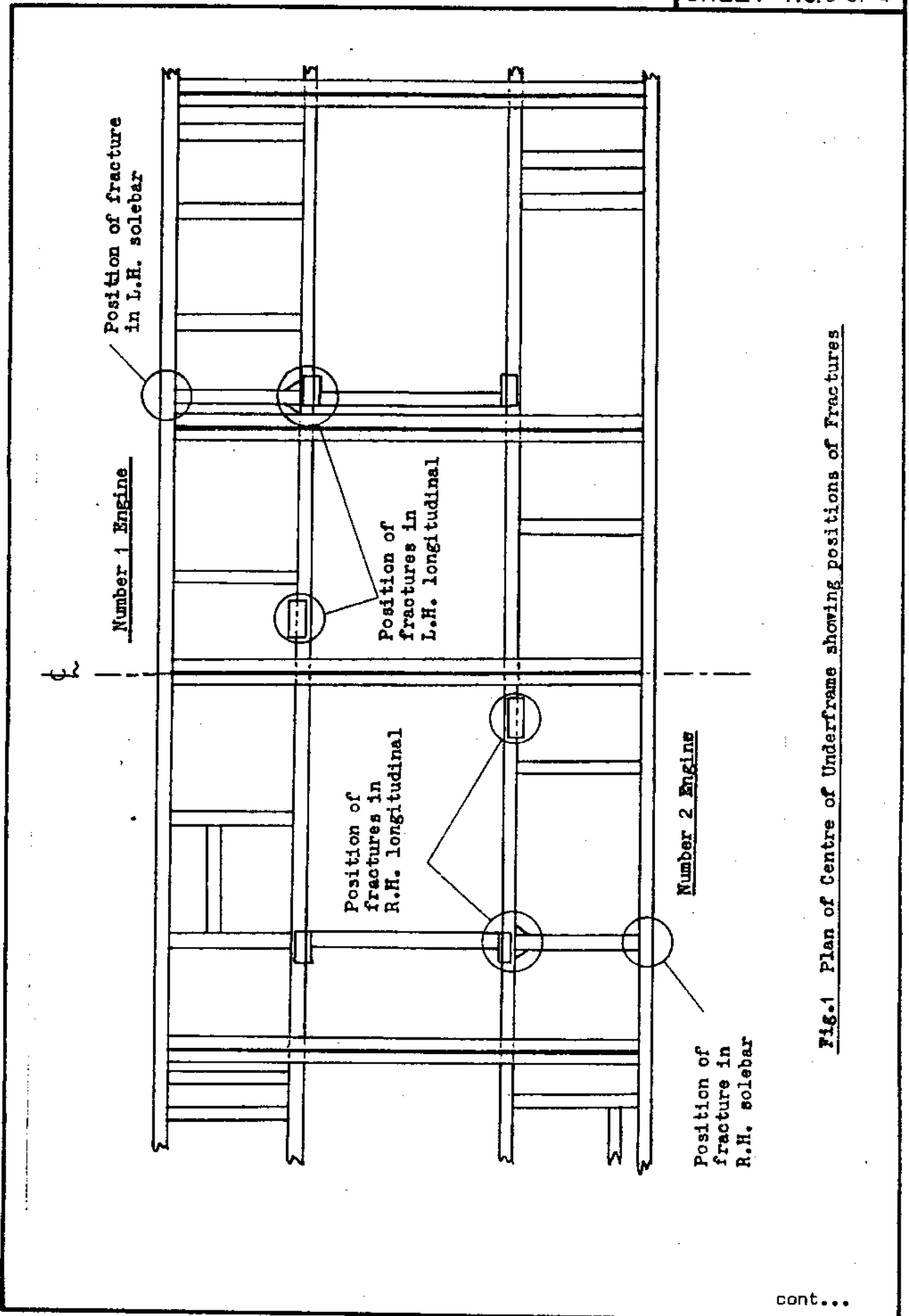


Fig.1 Plan of Centre of Underframe showing positions of Fractures

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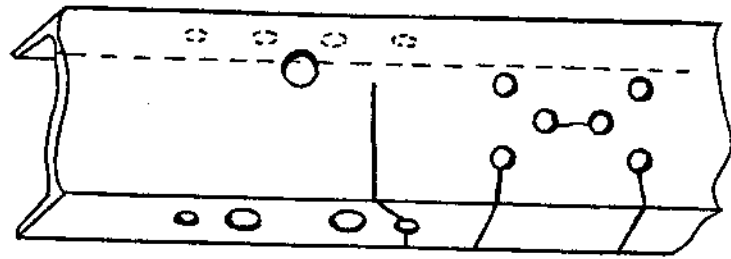


Fig. 2. Typical fractures in Inner Longitudinal;  
Position of Front Engine Mounting

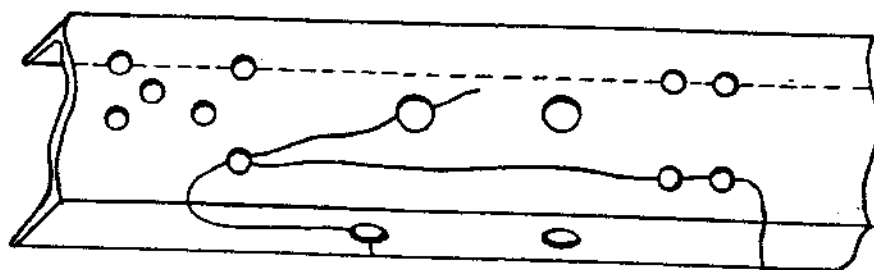


Fig. 3. Typical fractures in Inner Longitudinal;  
Position of Rear Engine Mountings

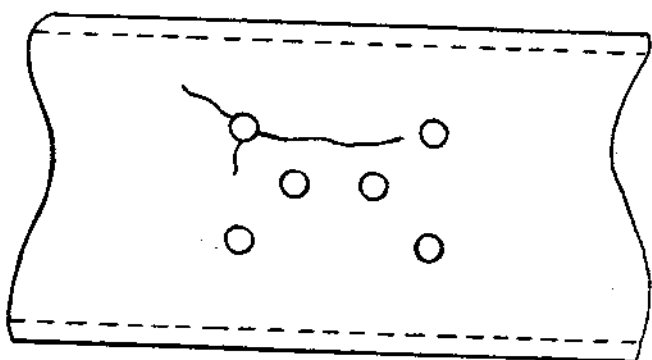


Fig. 4. Typical fracture in Solebar at position of connection  
with Engine Mounting Trimmer