

**WOSS 510/3**

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**British Railways Board**

**Director of Mechanical and Electrical Engineering**

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**Battery Boxes**

**WORKSHOP OVERHAUL STANDARD SPECIFICATION**

REVISION RECORD

This Specification will be updated when necessary by the issue of amended pages accompanied by revision letters. The amended or additional part of re-issued pages will be marked with a vertical black line.

If you consider that an amendment is necessary, complete BR Form 14298 and pass it to the local BRB Resident Engineer or Area Quality Engineer. Submission of a form does not authorise the proposed amendments.

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Should any query arise regarding the contents of this document telephone 0332 42442 Ext. 3516, BR Code is 056 3516, or write to the above address.

This Specification applies to equipment fitted to the vehicles indicated 'X' below, but it is only to be implemented when authorised by an appropriate maintenance/overhaul document.

LOCOMOTIVES

03	X
08	X
09	X
20	X
25	X
26	X
27	X
31	X
33	X
37	X
43	X
45	X
47	X
50	X
56	X
58	X

73	X
81	X
85	X
86	X
87	X
88	X
89	X
91	X

DMU's

101	X
104	X
107	X
108	X
110	X
111	X
114	X
115	X
116	X
117	X
119	X
121	X
122	X
123	X
140	X
141	X
142	X
143	X
150	X
151	X
210	X

EMU's

302	X
303	X
304	X
305	X
307	X
308	X
309	X
310	X
311	X
312	X
313	X
314	X
315	X
317	X
318	X
319	X
504	X
507	X
508	X

411	X
412	X
413	X
414	X
415	X
416	X
419	X
421	X
422	X
423	X
432	X
455	X
485	X
486	X
487	X
488	X
489	X
491	X

DEMU's

201	X
202	X
203	X
204	X
205	X
207	X

COACHING STOCK

Mk 1	X
Mk 2, 2a-c	X
Mk 2d-e	X
Mk 2f	X
Mk 2 DBSO	X
Mk 3a	X
Mk 3b	X
Mk 3 (HST)	X
Mk 3 SLE and SLEP	X
Non Passenger	X

WORKSHOP OVERHAUL STANDARD SPECIFICATION 510/3

BATTERY BOXES

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REFERENCE DOCUMENTS

BR2 'Maintenance Painting Schedule, Passenger Rolling Stock'  
BR6 'Maintenance Painting Schedule, Diesel & Electric Locos'  
WOSS 510/1 'Batteries Nickel Alkaline'  
WOSS 510/2 'Batteries Lead Acid'  
WOSS 560/3 'Cable Repairs'  
WOSS 560/4 'Crimped Joints for Cables'  
WOSS 562/2 'Sockets & Plugs'  
C-A1-24260 'Arrangement of Cables to Batteries on Mk 3 Sleeping Cars  
B3-AO-8500030 'WN7 Battery Arrangement'

TOOLS AND MATERIALS

BR Cat No

Petroleum jelly	27/27000
Anti-corrosive jointing compound	28/36805
Oil	27/23000
Grease	27/1350
Boric acid	7/510
Sodium bicarbonate (3Kg)	7/154795
Bristle brush	5/3500
Face plate	18/13377
Split pin 2.5 x 16 mm	29/125168
Sealing tape 600 mm wide, Densopol grade VN	7/120574
Sealing tape 50 mm wide, Densopol	7/120556
Paint, Vinyl, golden yellow	28/44260
Wax (28kg)	7/75925
Identification plate "+"	52/1848

SECTION 1 REPAIR PROCEDURE

Note: see WOSS 510/1 or 510/2 for protective clothing and insulated spanners

1. Disconnect and remove the battery. See WOSS 510/1, 510/2 or 510/4 for battery overhaul procedure.
2. Remove all packing pieces, wedges, separators and cramping bars. Renew any item that is fractured or corroded by more than half its original thickness. Remove any corrosion deposits with a scraper.
3. Remove any corrosion deposits from inside the box and the inner faces of detachable doors with a scraper.
4. Clean the interior of the box, all packing pieces, wedges, separators, cramping bars and the inner faces of detachable doors with a bristle brush and the following mixture.
  - 4.1 Lead acid battery boxes: approx 4% sodium bicarbonate to 96% water (1 cup to 1 gallon).
  - 4.2 Alkaline battery boxes: approx 1% boric acid to 99% water (1/4 cup to 1 gallon).
5. Metal and GRP Boxes
  - 5.1 Renew any section of the box that is corroded by more than half its original thickness. Butt welding is to be ground flush both inside and outside. Any steel surface in contact with aluminium is to be treated with anti-corrosive jointing compound.
  - 5.2 Renew any fractured frame members or supports.
  - 5.3 Renew any fractured or missing suspension studs or bolts. Ensure all bolts and nuts are tight and fitted with a locking device.
  - 5.4 Mk 3 Coach Modules
    - 5.4.1 Renew the base panel if holes larger than 25 mm  $\emptyset$  have developed, or if drain holes have become enlarged to more than 75 mm  $\emptyset$
    - 5.4.2 Renew any damaged or missing drain tubes.
    - 5.4.3 Check that the winding mechanism operates freely. Renew/repair defective items.
    - 5.4.4 Renew any damaged cables.
    - 5.4.5 Reterminate any termination not in accordance with WOSS 560/3.

- 5.4.6 Renew any defective or missing cable clips.
- 5.4.7 Remove the fusebox cover and wipe the interior with a dry cloth. Renew any fuses with 'blown' indicators. Renew the cover seal if defective. Refit the cover. Renew any wing nuts, trunnions or split pins that are defective or missing.
- 5.4.8 See WOSS 562/2 for attention to socket.
- 5.4.9 Check that the inspection doors open and close easily, the eight budget locks operate and that none of eight hinges are fractured. Rectify any defects.
- 5.4.10 Check that the winding mechanism moves freely and that a winding handle can be fitted to the drive pin. Rectify any defects. Renew the trunnion if fractured.
- 5.4.11 Renew any of the two securing pins and chains if missing or defective.
- 5.4.12 Renew either of the two dirt excluders if it has missing bristle tufts.
- 5.4.13 Renew any slide that is fractured or damaged. Remove any burrs from the sliding surfaces.
- 5.4.14 Renew the sealing tape on the box packing pads or the front securing bars if damaged.
- 5.4.15 TRUB's: Check the plate and angle section bridging the gap between the battery module and the refrigerator compressor module. If loose, damaged or missing fabricate a new angle sheet and fit as shown in Figure 4.
- 5.5 Check the operation of any lid safety catches. Renew/repair if the catch does not fall into position.
- 5.6 Repaint any safety catch that has chipped or faded paintwork with golden yellow identification paint.
- 5.7 Class 56
  - 5.7.1 If the tray is fitted with a lip, the lip is to be removed and the recut edge deburred.
- 6. Timber Boxes
  - 6.1 Renew/repair the cradle if fractured or bent.

- 6.2 Measure the insulation resistance between the cradle and the sole bar with a 50 V megger. Clean/renew insulators if the value is less than 50 K ohm. New insulators on BRA1 and BRA2 cradles are to be fitted using face plates.
  - 6.3 Examine the base, sides, back, tops, main cover and inspection cover for corrosion. Probe for spongy areas with a sharp implement. Renew any defective components. Renew any damaged cover handles.
  - 6.4 Renew the base sealing tape if torn, punctured or corroded. New sealing tape is to be fitted with turn-ups of approx 10 mm at each side and 75 mm at the back. Approx 20 mm is to be folded down at the front.
  - 6.5 Renew the base packing strips if damaged. Ensure that each strip is screwed to the base. Fit any missing screws.
  - 6.6 Renew the battery connection box (1.1) base and/or cover if fractured or missing. Tighten or reterminate any defective connections.
  - 6.7 Renew the battery fuse box (1.7) base and/or cover if fractured or missing. Change the fuse if open-circuit. Tighten or reterminate any defective connections.
  - 6.8 Renew or refit any missing or loose rubber strips (1.8).
7. When thoroughly dry, paint the box interior, exterior, separators, packing pieces, wedges and the inner faces of detachable doors and inspection covers in accordance with the vehicle painting schedule. Do not apply paint to any timbers which have been wax impregnated, ebonite packing pieces, worm drives, vent holes, vent gauzes or sliding faces of runners.
  8. Soak any timbers which have previously been wax impregnated as follows:
    - Soak in a bath of paraffin wax at 85°C (185°F) minimum for at least 30 minutes.
  9. Clear any obstructions from vents and drain holes. Where gauzes are fitted, renew any that are damaged or blocked.
  10. Renew any missing or defective cable cleats.

11. See WOSS 560/3 for attention to connecting cables. Renew any defective termination.

Where available, lead acid battery terminals should be lead plated and nickel alkaline battery terminals should be nickel plated. These terminals are normally supplied by the battery manufacturer.

12. Insulate the battery connecting terminals with PVC tape until required for connection.
13. Lubricate all hinges and catches with oil and ensure that they move freely.
14. Lubricate worms and runners with grease.
15. Renew any missing or defective door seals.
16. Mk 1, Mk 2, 101-128: check that a +ve identification plate is fitted inside the battery box in the position given in Section 3 Table 1. Renew if missing or illegible.
17. Fit the overhauled battery and separators (where applicable). Secure all cells firmly by positioning of packing/wedges. Fit securing bars and tighten clamp screws.
18. CCT & GUV
  - 17.1 If the battery has parallel bolt terminals, ensure that the battery cables are fitted with 7/8" lugs. Vehicles already fitted with 7/8" lugs are not to have batteries with tapered terminals installed.
19. Connect the cells as shown on the appropriate drawing. Note that Mk 3 Sleeping cars are connected differently from other Mk 3 vehicles.
20. Apply petroleum jelly to all terminations, nuts, studs and links.
21. Fit the battery box covers (where applicable).
22. Ensure any bolt/stud with a drilled hole is fitted with a split pin.



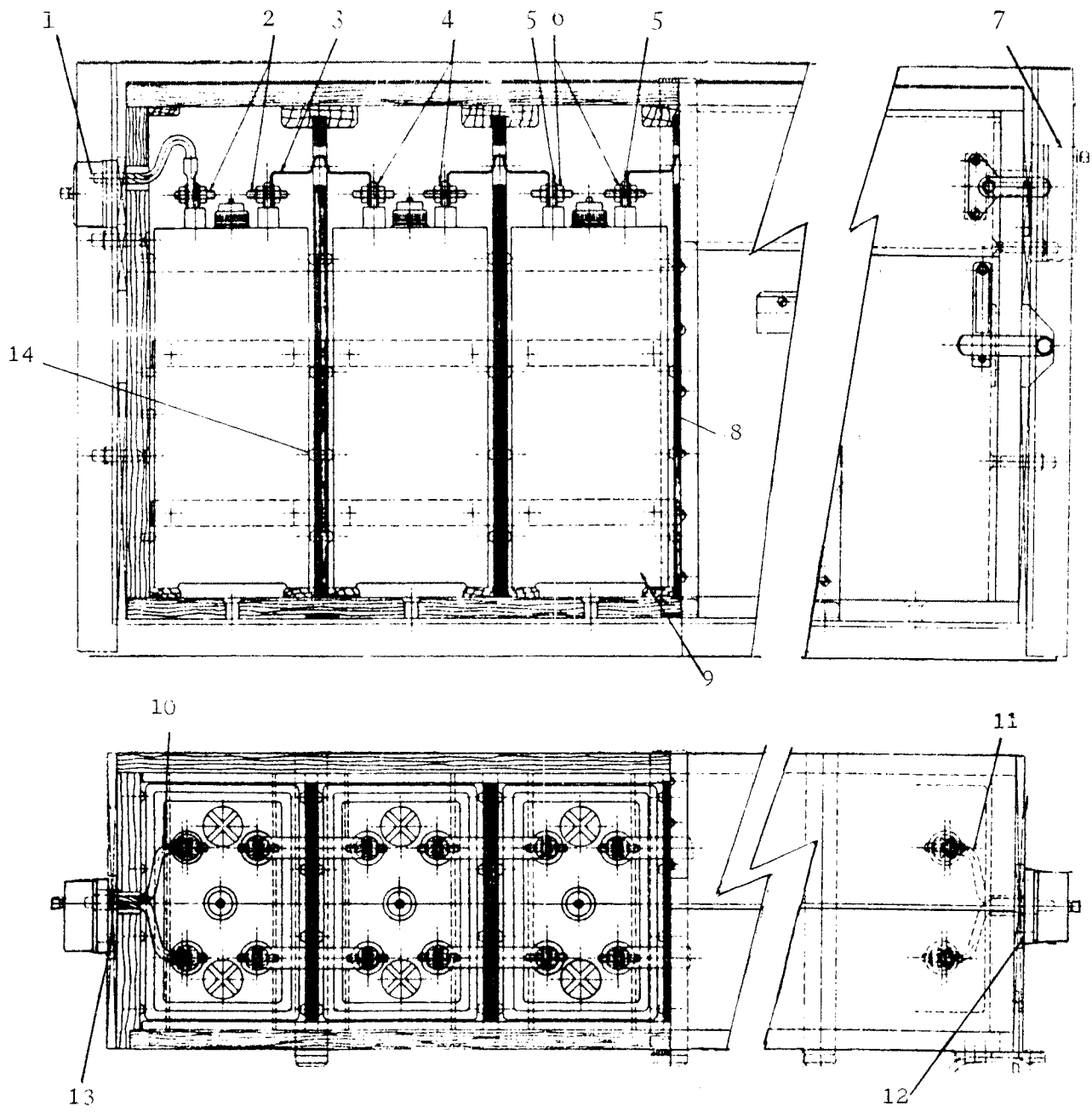


Figure 1 Part Section of BRA2M Battery and Box Assembly

Items List for Figure 1

<u>Item</u>	<u>Description</u>	<u>BR Cat. No.</u>
1.1	Battery Connection Box BRJ1 47	
1.2	Studs	52/461
1.3	Intercell connector	52/462
1.4	Washer	52/41740
1.5	Cell insert	
1.6	Nut	52/24736
1.7	Battery fuse box BRF1 for 440A/H 15/32" entry	52/4341
1.7	Battery fuse box BRF1 for 440A/H 11/16 entry	52/4348
1.8	Rubber strip	52/15721
1.9	Cell BRA2M	52/8447
1.10	Cell end connector	52/460
1.11	Cell end connector	52/459
1.12	End packing	18/21239
1.13	End packing	18/21240
1.14	Grommet	52/15721

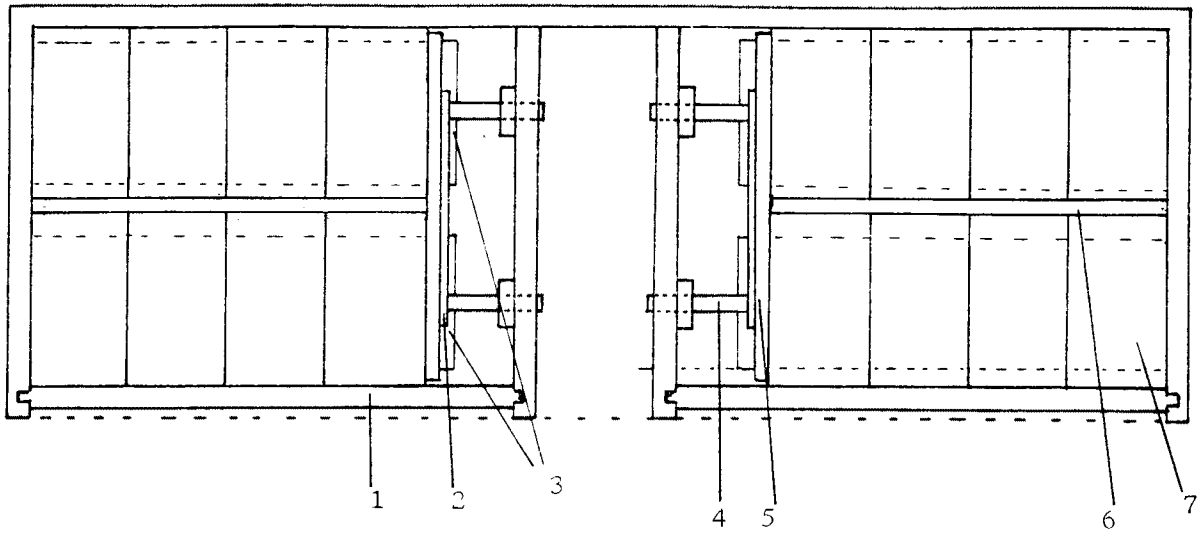


Figure 2 Mk 3 Coach Wind -out Module

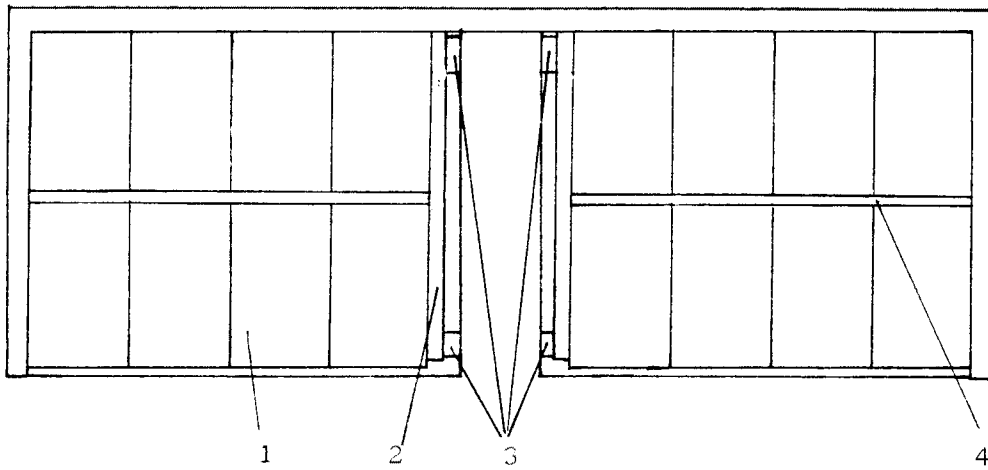


Figure 3 Mk 3 Coach Wind-out Tray

Items List for Figure 2

<u>Item</u>	<u>Description</u>	<u>BR Cat. No.</u>
2.1	Front securing bar	
2.2	Side securing bar	
2.3	Floor packing	
2.4	Clamp screw	
2.5	Wood packing	840/000601
2.6	Packing PVC	64/4283
2.7	Monobloc WN6	63/7703
2.7	Monobloc WN7	850/003002

Items List for Figure 3

<u>Item</u>	<u>Description</u>	<u>BR Cat. No.</u>
3.1	Monobloc WN6	63/7703
3.1	Monobloc WN7	850/003002
3.2	Wood packing	840/000701
3.3	Hardwood wedges (part of 3.2)	
3.4	Packing PVC	64/4283

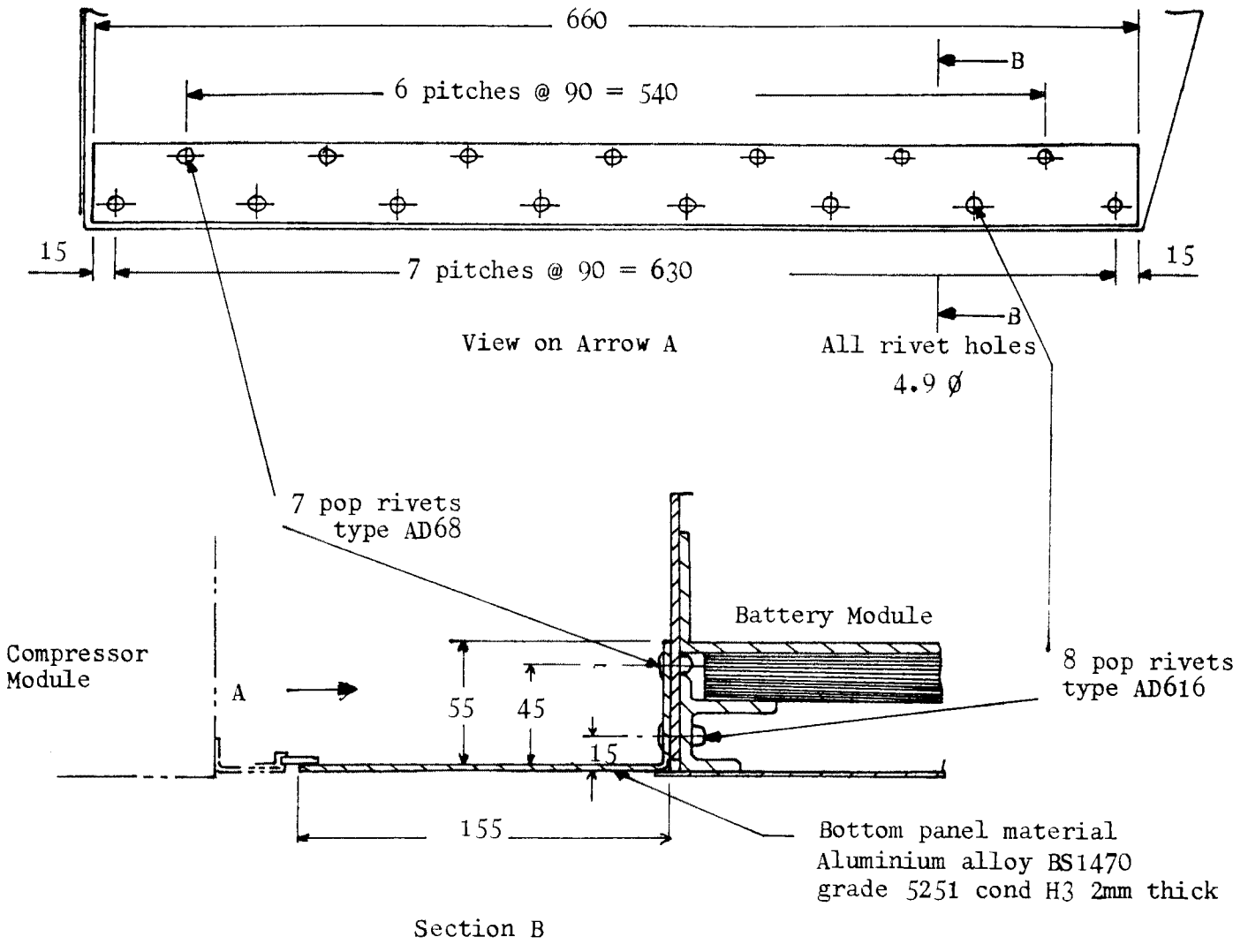


Figure 4 TRUB Bridge Piece Repair

SECTION 3 TECHNICAL DATA

Table 1 Vehicle Classes and Battery Orientation

Class	Battery Position	
	Power Car	Trailer Car
101	+ to right	+ to right
104	+ to cab end	+ to right
105 107	+ to right	+ to right
110	+ to cab end	+ to right
114	+ to left	+ to left
115 116	+ to right	+ to right
118 119 122 131	+ to cab end	+ to right
Mk2a-c	-	+ to right
Mk2d-f M/a set side	-	+ to left
Mk2d-f non-M/a set side	-	+ to right