

Bulletin Number 5049	Issue 1	Date 21.6.49	Sheet 1 of 3 Sheets
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MODELS AFFECTED LAND-ROVER	UNIT AFFECTED BODY
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COMPLAINT

SUBJECT
REPAIR OF BODY PANELS BY GAS WELDING

Although it is preferable to repair damage to Land-Rover body panels by rivetting or spot-welding, lack of the specialised equipment to carry out these operations will make it necessary, on occasions, to resort to gas welding when undertaking panel repairs.

The light alloy material used in the manufacture of the Land-Rover body unit demands a special welding technique, but the information contained in this bulletin should enable an experienced operator, provided with the correct welding rods and fluxes, to produce sound welds with little difficulty.

Material.

The material used for all Land-Rover panels is known as Birmabright 2.

Annealing.

Birmabright 2 can be readily softened for general working by heating for a very short time (one to five minutes) to a temperature of 360°C—380°C. In circumstances where proper temperature control is not available, one side of the panel should be marked by rubbing with ordinary soap. If the panel is then heated from the other side, the soap mark will begin to clear at this temperature.

Equipment required for welding.

Assuming oxygen and dissolved acetylene to be the means of obtaining the welding heat, the following equipment, supplied by the British Oxygen Company, is considered to be the most reliable.

- Type OR 12. Two stage oxygen regulator.
- Type AR 9. Two stage acetylene regulator.
- Type D.H. Oxy-acetylene high pressure blow pipe complete with nozzles and spanners.
- Type TR 3. Outdoor trolley.
- Type TR 3a. Tool box.
- Type EC 3. Dual gas economiser with set of keys.
- Type FG 2. Goggles.

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6 JUN 1949

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Issue 1

Date 21.6.49

Sheet 2 of 3 Sheets

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Welding Rod.

The recommended welding rod for use on Birmabright 2 is a 1/8 in. (3 or 4 mm.) diameter rod made from the parent material and supplied by Birmabright Ltd., Woodgate Works, Quinton, Birmingham 32, England.

The best alternative is to shear a narrow strip of parent material from a discarded sheet or damaged panel.

For emergency use only, two further alternatives are available from the British Oxygen Company; they are pure aluminium or Alda 5% silicon aluminium welding rods. The pure aluminium rod would give a weak weld but one reasonably free from corrosion, while the 5% silicon material would give a stronger weld but with more likelihood of corrosion unless the weld is coated with primer after cleaning.

Welding flux.

A suitable flux is most important and it must be sufficiently acidic to dissolve away the oxides on the surface of the panel prior to welding.

The flux recommended is "Hari-Kari" Aluminium Welding Flux, Red Label, obtainable from the Midland Welding Supply Co., Lakey Lane, Hall Green, Birmingham 28, England, though a suitable alternative should be available from local sources.

Preparation of material for welding.

The area to be welded should first be scratch-brushed with a fine wire steel brush or emery cloth, to remove as much surface oxide as possible and the remaining oxide dissolved by applying a suitable flux.

Welding technique.

The acetylene used should be completely free from impurities; dissolved acetylene must be used wherever possible.

A neutral flame is necessary for aluminium welding, and the cone must be directed towards the bottom of the seam.

The actual weld should be made by using the "Leftward" technique as illustrated at Fig. 1.

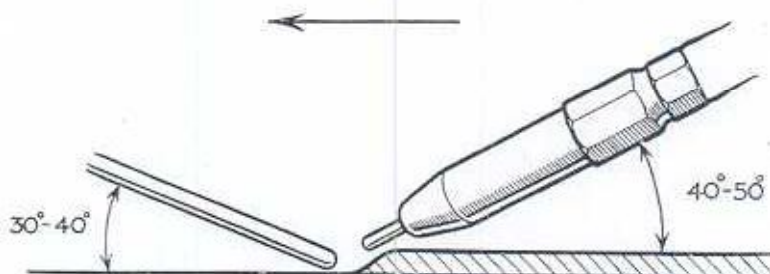


Fig. 1. Leftward method of welding.

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Sheet 3 of 3 Sheets

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The blowpipe must be held in the right hand, at an angle of 40°—50° and moved steadily to the left without any lateral motion; the welding rod is held in the left hand at an angle of 30°—40° and must be given a progressive circular movement.

Cleaning and cold working the completed weld.

To avoid subsequent corrosion, all traces of flux must be removed from the finished weld. The panel should be washed in warm water and thoroughly scrubbed, using a fine steel wire brush. Wherever possible, the weld should then be dipped in a warm 5% nitric acid solution and immediately rinsed in cold water.

As the welding temperature is far in excess of the annealing temperature, it is most important that the original properties of the weld and adjacent metal are now regained by cold working, i.e., hammering. The deposited metal has a coarse-grained cast structure and thorough cold working tends to restore the mechanical properties and refine the grain size, apart from relieving contractional stresses, removing surface porosity and consolidating the surface of the weld.

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