

**LUCAS WORKSHOP INSTRUCTIONS****DRY-CHARGED BATTERIES**

'Dry-charged' batteries are supplied without electrolyte but with the plates in a charged condition. When they are required for service it is only necessary to fill each cell with sulphuric acid of the correct specific gravity. No initial charging is required. This procedure ensures that there is no deterioration of the efficiency of the battery during the storage period before the battery is required for use.

In these batteries porous rubber is used instead of wood for the separators between the plates, resulting in greater mechanical strength and the elimination of the possibility of short circuits between plates.

**PREPARATION FOR SERVICE****(a) Preparation of electrolyte.**

The electrolyte is prepared by mixing together distilled water and concentrated sulphuric acid, usually of S.G. 1.835. This mixing must be carried out in a lead-lined tank or a glass or earthenware vessel. The acid must be added slowly to the water while the mixture is stirred with a glass rod. **NEVER ADD THE WATER TO THE ACID**, as the resulting chemical reaction may cause violent and dangerous spurting of the concentrated acid.

The specific gravity of the filling electrolyte depends on the climate in which the battery is to be used. If the temperature of the battery and its surroundings will not normally rise above 90° F. (32° C.), electrolyte of S.G. 1.275 is required. Electrolyte of this specific gravity is prepared by adding 1 part (by volume) of 1.835 S.G. sulphuric acid to 2.8 parts of distilled water.

On the other hand, in tropical climates where the temperature may frequently rise above 90° F., the electrolyte should be of S.G. 1.215, and is prepared by adding 1 part of 1.835 acid to 4 parts of distilled water.

N.B.—All specific gravity figures are given for an electrolyte temperature of 60° F., which is adopted

as a reference temperature. Hydrometer readings taken at other temperatures can be corrected to this reference temperature as follows —

For every 5° F. **below** 60° F., **deduct** .002 from the observed reading to obtain true reading at 60° F. For every 5° F. **above** 60° F. **add** .002 to the observed reading to obtain true reading at 60° F.

Heat is produced by the mixture of acid and water, and the electrolyte should be allowed to cool before pouring it into the battery.

**(b) Filling the Cells**

Carefully break the seals in the cell filling holes and fill each cell with electrolyte to the top of the separators, **in one operation**. The temperature of the filling room, battery and electrolyte should be maintained between 60° F. and 100° F. If the battery has been stored in a cool place, it should be allowed to warm up to room temperature before filling.

**(c) Batteries filled in this way are 90 per cent charged**, and capable of giving a starting discharge one hour after filling. When time permits, however, a short freshening charge will ensure that the battery is fully charged. Such a freshening charge should last for no more than 4 hours, at the normal recharge rate of the battery.

During the charge the electrolyte must be kept level with the top edge of the separators by the addition of distilled water. Check the specific gravity of the acid at the end of the charge; if 1.275 acid was used to fill the battery, the specific gravity should now be between 1.280 and 1.300; if 1.215, between 1.220 and 1.240.

**MAINTENANCE IN SERVICE**

After filling, a dry-charged battery needs only the attention normally given to a battery—periodical topping up, cleaning, etc., as described in SECTION G-2.

