SECTION H-4
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LUCAS

Quality

EQUIPMENT

WORKSHOP INSTRUCTIONS

HEADLAMPS INCORPORATING LUCAS SEALED BEAM LIGHT UNITS

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1. GENERAL

(a) THE SEALED BEAM LIGHT UNIT

(*i*) The construction of a typical 'all-glass' sealed beam light unit is shown in Fig. 1. Such a unit can be regarded as a large gas-filled bulb. It has an internally aluminised glass reflector which is fused to the periphery of the front lens to form a completely sealed unit. The reflecting surface, being completely protected, maintains its reflective efficiency throughout the life of the unit. This life is normally longer than that of the conventional bulb, the filament assemblies being of sturdier construction. These assemblies (either single or twin-filament) are positioned with extreme accuracy with respect to the focal point of the reflector and to the setting plane of three Beam Aimer setting projections (or 'pads') moulded on the outer surface of the lens. Except for these three glass projections the outer surface of the front lens is smooth to facilitate cleaning, but the inner surface consists of flutes and prisms to obtain the correct, scientifically arranged, distribution of light—different patterns being used according to lamp application.

(*ii*) Light units that incorporate twin filaments have a bulb shield to reduce 'top light', thus giving a better performance in wet or misty conditions.

(*iii*) At present, the sealed beam light units that are either in production or will shortly be so are as follows :—

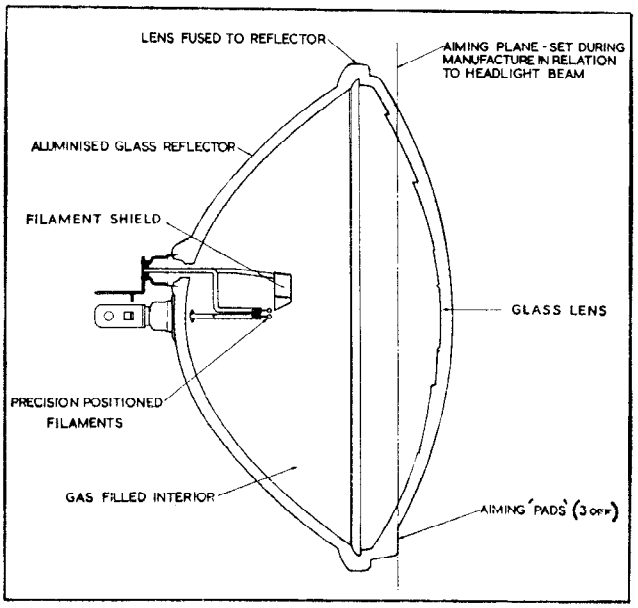

Fig. 1
Typical sealed beam light unit, sectioned

British Sealed Beams Ltd. Part No.	*Lens dia.*	*Nominal Voltage*	*Wattage*	*Application**
60–5700†	5¾″ (146 mm.)	12	37.5	1A (R.H.D.)
60–5701 (SAE 4001)†	5¾″ (146 mm.)	12	37.5	1 (L.H.D.)
60–5702†	5¾″ (146 mm.)	12	37.5/50	2A (R.H.D.)
60–5703 (SAE 4002)†	5¾″ (146 mm.)	12	37.5/50	2 (L.H.D.)
60–7002†	7″ (178 mm.)	12	60/45	2A (R.H.D.)
60–7005 (SAE 6012)†	7″ (178 mm.)	12	50/40	2 (L.H.D.)

*The symbols used in this column are explained, under 'Four-Headlamp Systems', in para. 1 (c) (i) and (vii). In addition, please note that sealed beam light unit 60–7002 is also fitted in headlamp model F700 Mk. X, described in para. 1 (b) (i) and (ii), when used in territories observing the left-hand rule of the road.
†Lamp markings.

Note : To meet the requirements of four-headlamp systems in certain territories, and as a temporary measure until the appropriate sealed beam units become available, some headlamp light units are fitted with special accurately soldered-in flangeless bulbs while others have loose bulbs. Details of these interim measures will be found under para. 1 (d).

(b) TWO-HEADLAMP SYSTEMS

(*i*) When supplied as initial equipment, headlamps containing 7″ (178 mm.) diameter sealed beam light units are known as model F700 Mk. X. This lamp is illustrated in Fig. 2. The chief difference from the earlier Mk. VI lamps, which had light units fitted with replaceable bulbs (see Workshop Manual SECTION H–2 ISSUE 2), is that only two adjustments screws are now provided. One adjustment screw controls horizontal aiming of the beam and the other controls the vertical aim—an arrangement which conforms to S.A.E. requirements.

(*ii*) Sealed beam light units fitted in model F700 Mk. X headlamps can be used to replace the replaceable bulb type light units as fitted in model F700 Mk. VI headlamps. It should be noted, however, that since the springs used to load the beam adjustment screws in Mk. VI headlamps are weaker than those used in Mk. X lamps, the 'Lev-L-Lite' mechanical Beam Aimer is not suitable for setting sealed beam light units when these are used as replacements in Mk. VI lamp bodies. When fitted thus, the standard Lucas Beamsetter or suitably marked aiming boards must be employed.

(*iii*) Model F700 Mk. X headlamps are also used in certain territories together with a pair of $5\frac{3}{4}$″ (146 mm.) diameter lamps, model F575, to constitute the 'mixed' four-headlamp system described below in para. 1 (c) (v).

(c) FOUR-HEADLAMP SYSTEMS

(*i*) In the Lucas Four-Headlamp System (sometimes referred to as the 'Quad Beam System') two headlamps containing sealed beam light units are recessed on each side of the vehicle and are positioned either side by side, one above the other or diagonally. Each pair consists of (in countries observing the left-hand rule of the road) one No. 1A unit and one No. 2A unit, the latter being mounted as the outer or upper unit of the pair. A pair of these lamps is shown in Fig. 3.

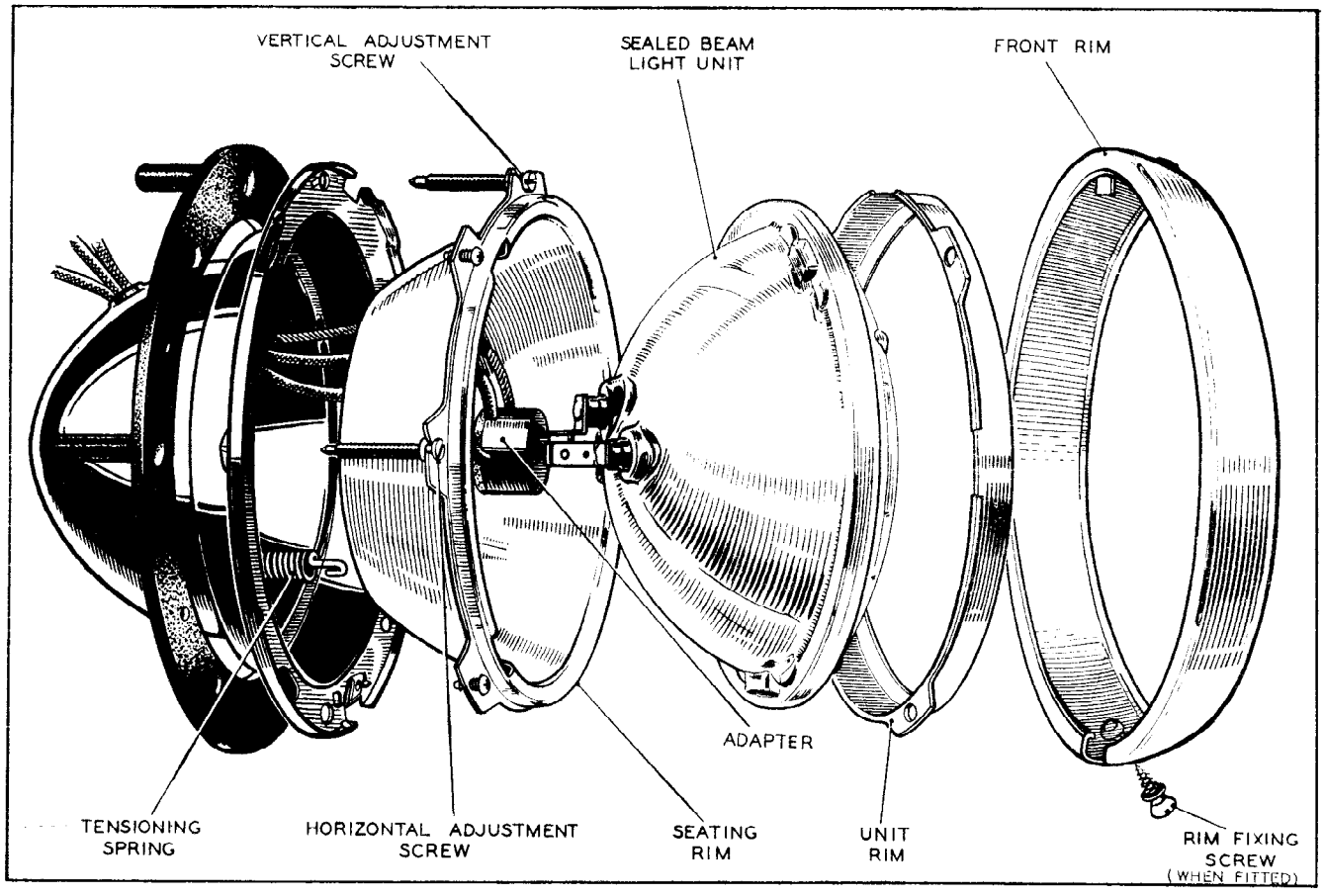

Fig. 2
Sealed beam headlamp, model F700 Mk. X, dismantled

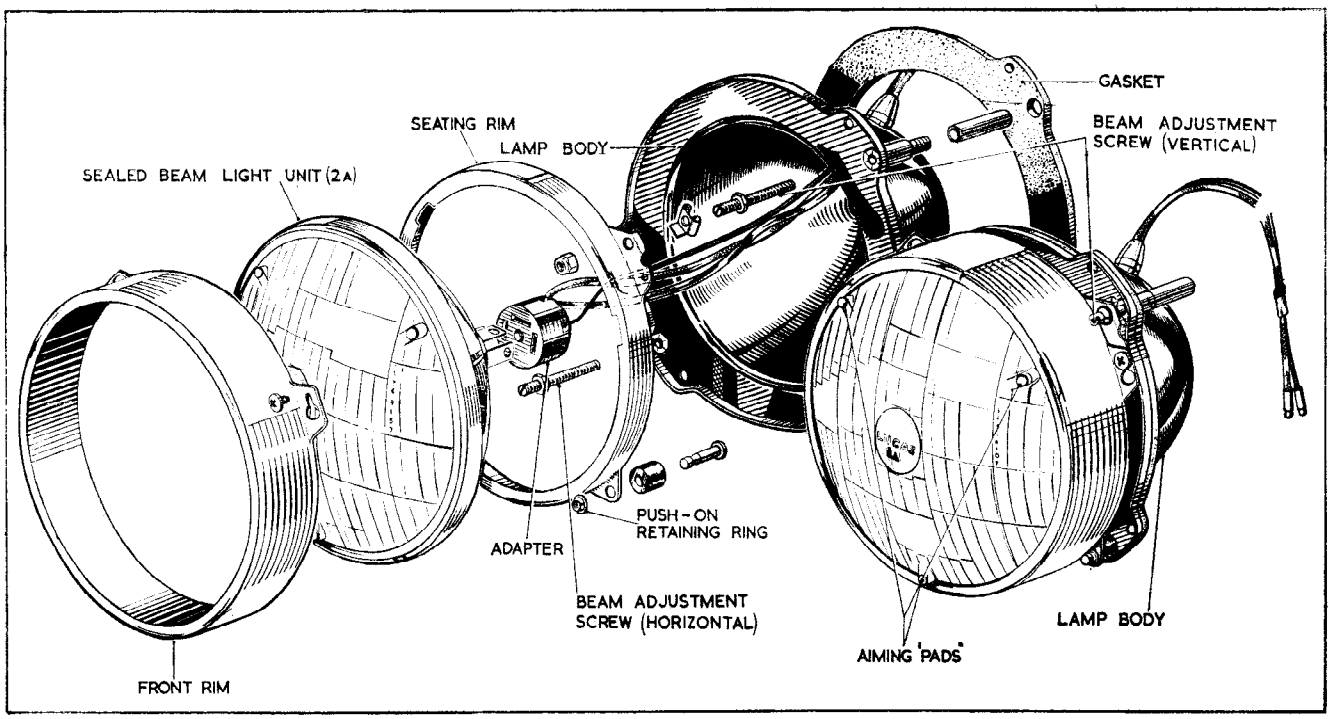

Fig. 3
Sealed beam headlamps, model F575, assembled and dismantled, as used in four-headlamp system

(*ii*) Unit No. 1A contains a single filament of 37½ watts, and the unit is designed exclusively to give the major portion of the Main beam.

(*iii*) Unit No. 2A is a double filament unit. The primary filament (which, in standard units, has a power of 50 watts) is positioned at the focal point of the reflector, and the optical system is designed to give the best practical Meeting beam from this filament. In addition, a secondary filament (normally of 37½ watts) is positioned below the Meeting beam filament and is operative only when the main beams are on. This latter filament provides supplementary light to illuminate the nearer section of road, for which the requirements are far less critical than those for the major portion of the Main beam produced by the No. 1A units.

(*iv*) Thus, for Main beam operation four lamps are in use, but two only are used in the Meeting or dipped condition.

(*v*) While, as originally designed, the four-headlamp system consisted only of model F575 lamps, model F700 Mk. X lamps are now being fitted as Meeting beam (2A) units to certain high performance cars and, since the light flux collection of these lamps is considerably higher for the same wattage filaments, this practice is expected to increase. Such an installation is referred to as a 'Mixed' Four-Headlamp System.

(*vi*) When designed to produce the European Asymmetric Meeting Beam Pattern, outer lamps are termed No. 2E units and are used in conjunction with No. 1A inner units.

(*vii*) The light units fitted to vehicles used in all territories (other than European) which observe the right-hand rule of the road are termed No. 1 and No. 2 units.

(d) SOME TEMPORARY EXPEDIENTS

(*i*) Until "all-glass" light units become generally available or, in some territories, permissible, some vehicles with four-headlamp systems are initially fitted with metal-backed units having either loose replaceable bulbs or soldered-in bulbs. These temporary units are used for F700 2E lamps and for F575 1A, 2A and 2E lamps fitted in certain European territories. In the case of 2E units, the

metal-backed construction is made further necessary due to the requirement for replaceable Duplo type bulbs. (At present, it is visualised that where these 'temporary' arrangements are due to statutory requirements they may continue to be used for several years, and even indefinitely.)

(*ii*) The 60/45 watt F700 Mk. X sealed beam light unit is serving satisfactorily as a 2A unit in the 'mixed' system until the 60/50 watt filament assembly becomes available.

(*iii*) Some 1A units for France, and all 1A units for Italy, are fitted with double filament replaceable bulbs, but, in these lamps, only the Main beam filament is used.

(*iv*) The following replaceable bulbs are used in metal-backed light units until the appropriate 'all-glass' units become available :

Bulb No. 410. 12-volt 45/40 watts (Unified European cap with Duplo internal construction and clear envelope). Fitted in all 2E lamps, excepting French, and in Italian 1A lamps (but with the 40-watt filament left disconnected).
Bulb No. 411 : (as No. 410 but has a cadmium yellow envelope). Fitted in all French 2E lamps, and in some French 1A lamps (but with the 40-watt filament left disconnected).

(*v*) The following bulbs are permanently held in focus by soldering ; these are flangeless and not replaceable or offered as spares, due to the very special equipment required to ensure accurate soldering-in—this operation being carried out before the reflector is rolled-over to secure the front lens.

Bulb No. 420 : 12.8 volts 50/37.5 watts (flangeless 3-terminal cap with shielded dipping filament, for left-hand rule of the road, and clear envelope). Fitted in 2A F575 lamps.
Bulb No. 426 : 12.8 volts 37.5 watts (flangeless 2-terminal cap with axial filament and clear envelope). Fitted in all 1A lamps (excepting French, Italian and North American).
Bulb No. 430 : 12.8 volts 37.5 watts (flangeless 2-terminal cap with axial filament and cadmium yellow envelope). Fitted in French 1A lamps when Bulb No. 411 is not used.

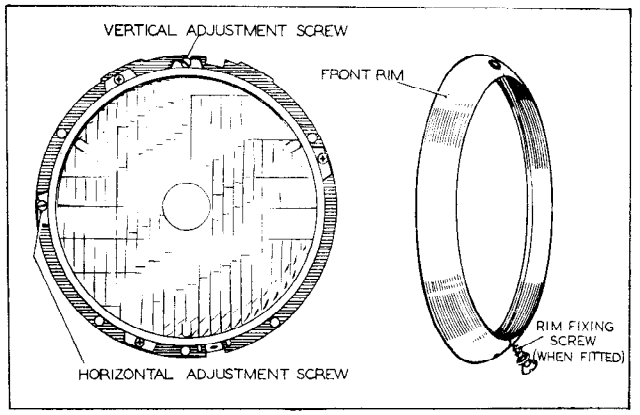

Fig. 4
Headlamp, model F700 Mk. X, with front rim removed to show beam adjustment screws

2. SETTING

(a) PIVOTING ARRANGEMENTS

(*i*) In model F700 Mk. X headlamps, light units are carried in a ribbed seating pan shaped to form a ball-and-socket type assembly with the lamp body, in which it is retained by a spring and two adjustment screws. This lamp is illustrated in Fig. 4 with the front rim removed to show the beam adjustment screws.

(*ii*) In model F575 headlamps, light units are carried on a seating rim attached at three points to the lamp body pressing, two of these three points being adjustable spring-loaded assemblies, while the third takes the form of a hard rubber pivot.

(*iii*) The object of these arrangements is to provide for the independent movement of a light unit in the horizontal and vertical planes by the adjustment of two screws only, thus complying with the S.A.E. requirements and making for simplicity of setting.

(*iv*) In most vehicles, access to the adjustment screws is gained by removing the front rim—the latter being either of a snap-on design or single-screw secured. In some applications, however, beam adjustment is effected from the rear of the lamps, when two knobs are provided instead of screwdriver slots.

(b) ALTERNATIVE METHODS OF SETTING LAMPS

(*i*) The three Beam Aimer locating projections enable setting to be carried out accurately and easily by means of the Lucas 'Lev-L-Lite' Beam Aimer.
N.B. An exception to this statement is given in para. 1 (b) (ii).

(*ii*) Alternatively, inner and outer units can be individually set using the Lucas Special Beam Tester, 571 119. This unit can be adjusted to obtain differing settings in the horizontal and vertical planes and must not be confused with the standard Lucas Beamsetter which, superficially, it resembles. No. 1A units are set to $\frac{1}{2}$° down 0° lateral. No. 2A units are set (on the Meeting beam) to 2° down 2° left.

Note : A method of adapting the standard Lucas Beamsetter, enabling 2A lamp adjustments to be made using a 9″ x 5″ (229 x 127 mm.) screen is given in Service Bulletin Publication SB/LP/54.

(*iii*) Large suitably marked aiming boards or screens, as shown in Fig. 5, can also be used, but it is important to observe that No. 2A units must be aimed on the Meeting Beam (not on the Main Beam portion, which only provides supplementary light to that of the No. 1A units). Further, No. 2A units must be set using the top and right-hand edges of the high intensity portion of the Meeting Beam and not the centres or 'hot spot'. The actual setting limits for Nos. 1A and 2A units at 25′ (7.62 m.) are as follows :—

Vertical Limits

No. 1A units : Centre of high intensity zone 2″ (50.8 mm.) below horizontal centre line of lamps (Tol. ±2″ ; 50.8 mm.).

No. 2A units : Top edge of high intensity zone of Meeting Beam on horizontal centre line of lamps (Tol. ±2″ ; 50.8 mm.).

Horizontal Limits

No. 1A units : Centre of high intensity zone on vertical centre line of lamps (Tol. ±6″ ; 152.4 mm.).

No. 2A units : Right-hand edge of high intensity zone of Meeting Beam 2″ (50.8 mm.) to left of vertical centre line of lamps (Tol. 2″ ; 50.8 mm. right : 4″ ; 101.6 mm. left).

Note : In early production F575 lamps, the two beam adjustment screws carried push-on clawed rings for retaining the seating rim. Later, this device was superseded by the use of self-locking nuts. It is important, when adjusting these lamps, to use a suitably narrow bladed screwdriver in the screw slots and not a spanner on the nuts.

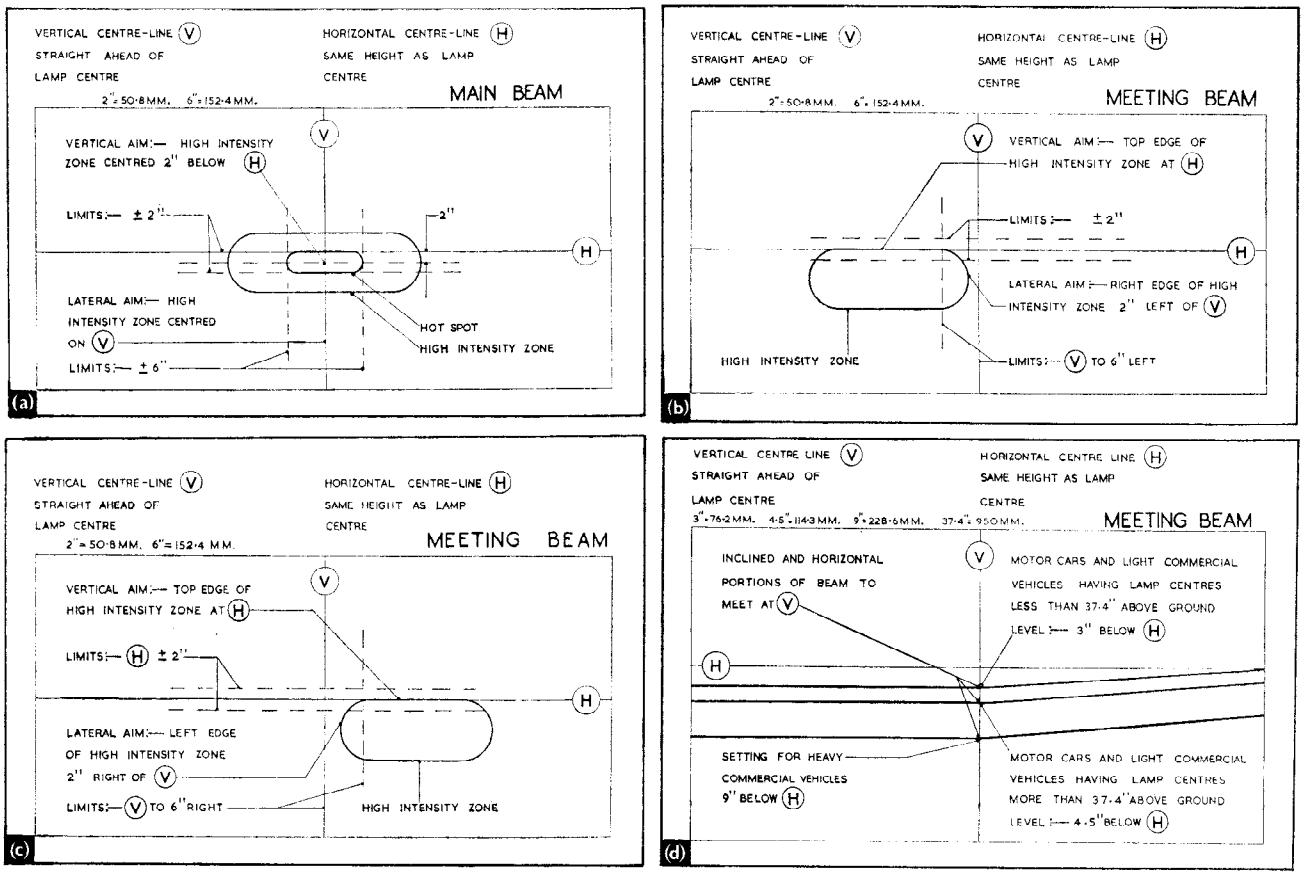

Fig. 5 Lamp setting diagrams :

(a) Main Beam, all territories
(b) Meeting Beam, dip left
(c) Meeting Beam, dip right
(d) Meeting Beam, vertical dip