

P700 Lucas Headlamp - General [Part 1]

The 700 series of semi sealed headlamps were produced by Lucas Electric LTD. Lucas at that time was the major supplier to British car industry. This 7-inch headlamp of the 50's and 60's came in at least three categories i.e.:

- [1] 700 Type - Fitted to family cars (eg Morris Oxford and Austin A40)
- [2] P700 Type - Fitted as standard to more expensive cars (eg MG Z types & Rover 90)
- [3] PL700 Type - Fitted as standard to upmarket and sporting cars (eg Later Rover cars)

All three used the standard 700 type body but the:

P700 in addition, has a second reflector mounted on a three-legged pod and a modified glass Lenz added to aid efficiency.

PL700 is the same as the P700 except the glass Lenz is modified

To appreciate the construction of a P700 Headlight the following diagrams and comments are provided

Vertical Cross Section [fig. 1]

- Note - Globe placement and filaments [high and low]
- Focusing shields relative placement [support arms not shown]
 - Glass Lenz [Lenz with clear portion]
 - Parabolic shape for light collection

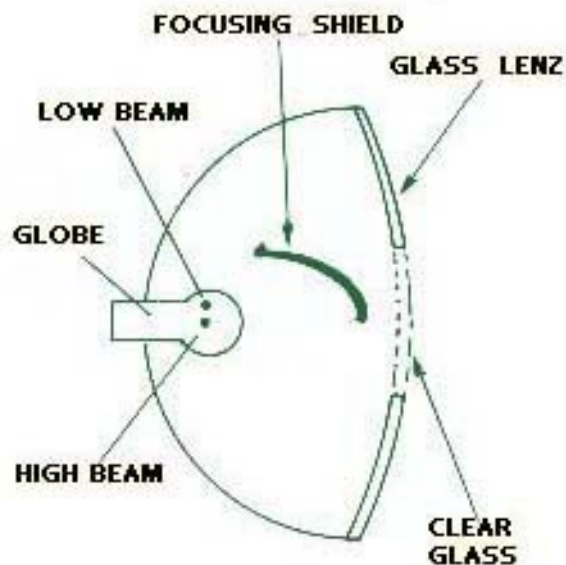


Fig 1 Vertical Cross Section

Front View [fig.2][Next Page]

- Note - Tripod Support
- Placement of focusing shield
 - Band of clear glass [Not just for show] “ but looks good “

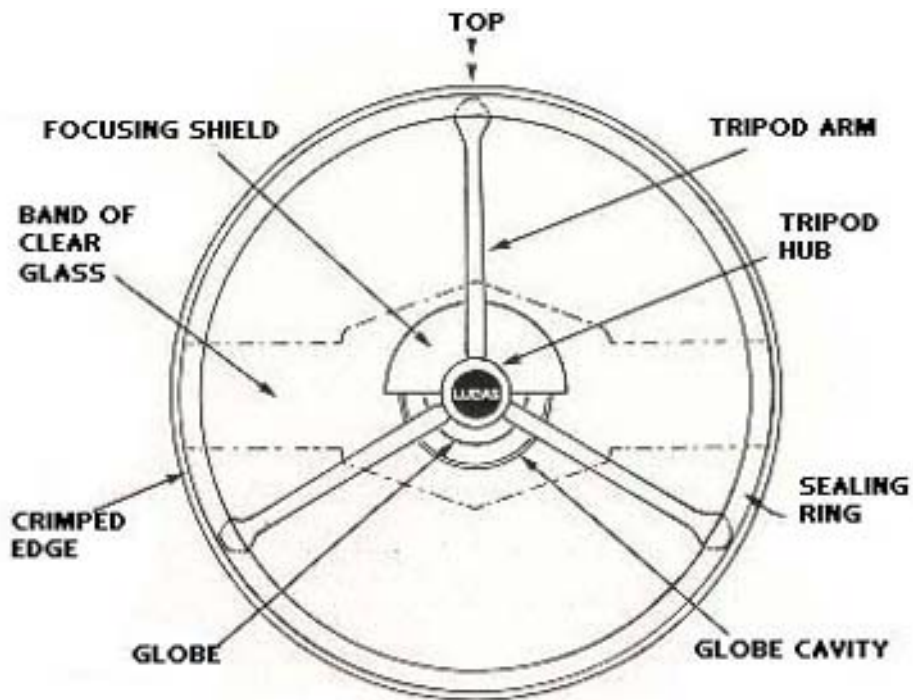


Fig 2 Front View

Detailed Cross Section [fig.3 below]

Note - Tripod Hub / focusing shield assembly

- Globe cavity [designed to locate pre focused globes correctly]
- Sealing ring [locks Tripod arm & seals out weather]

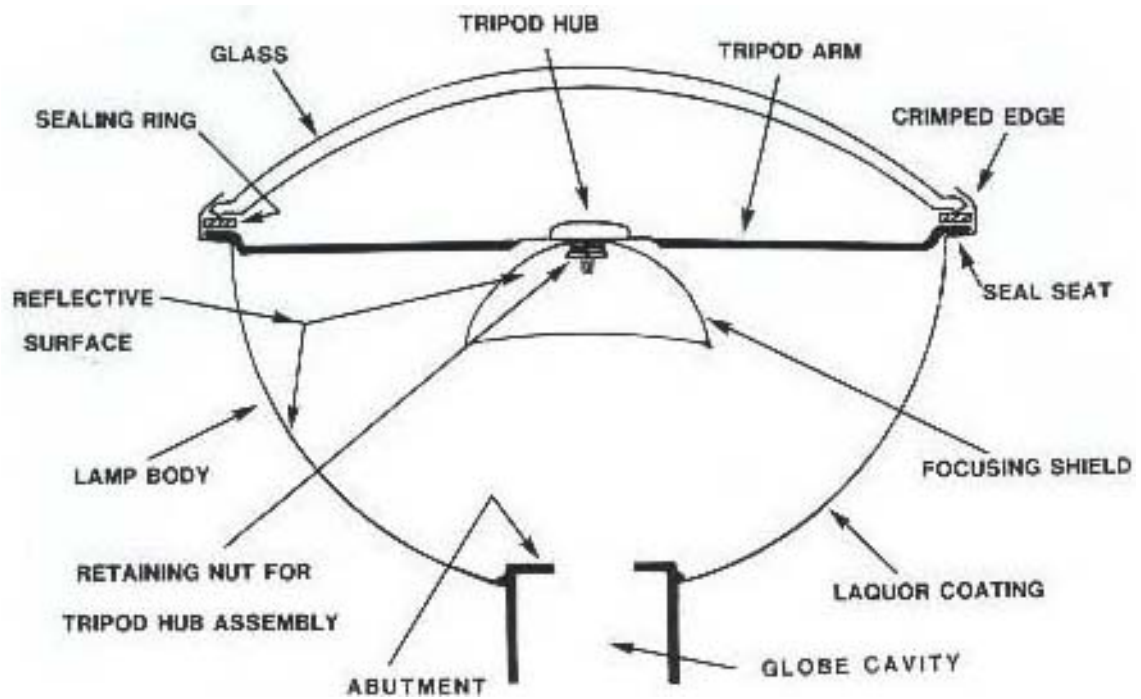


Fig3. Detailed Cross Section

P700 Headlamp - How It Works [Part 2]

As they say in the trade, location is everything. For the globe filaments their location is critical if light, from an active (glowing) filament, is to bounce its rays off the lamp body's reflective surface and out via the Lenz as a useful beam.

Technical Comment

Lamp body is formed as a parabolic shape { $Y = X$ squared}

Globe is placed at focus point of parabola so light is forced into a beam

High Beam [fig's 4a & 4b]

With the high beam filament switched on, being placed on the centre axis of the lamp body, light is collected evenly and projected straight out. This is our high beam.

Note - Fig 4a. Shows the relativity of the beam to the road.

Fig 4b. Action of the emitted light in producing a beam containing both reflected and unreflected light

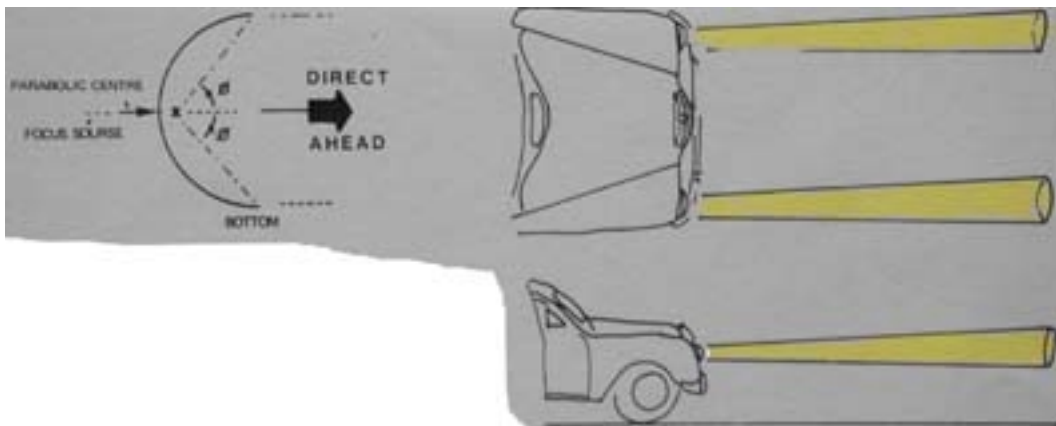


Fig 4a - High Beam - Relativity Of Beam

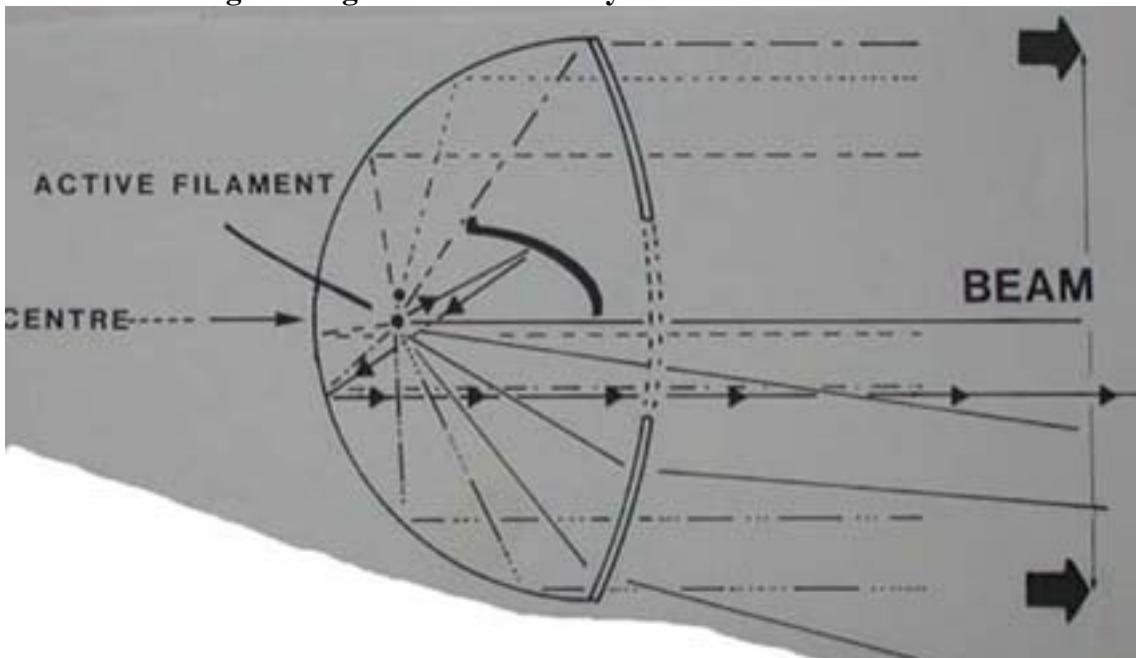


Fig 4b - High Beam P700 Detail

Low Beam [fig's 5a, 5b & 5c]

With the low beam filament switched on, being placed above and to the right of the high beam filament, the direction of light reflected from the headlight body is placed into a beam directed down and to the left [for right hand drive cars]. This innovation is a nice trick that allowed earlier complex Electro / Mechanical dipping systems to be scrapped.

Note - Fig 5a & b. Relativity of the beam to the road. Looking from both the drivers view and side view.

Fig 5c. Action of the emitted light in producing a beam containing both reflected and unreflected light.

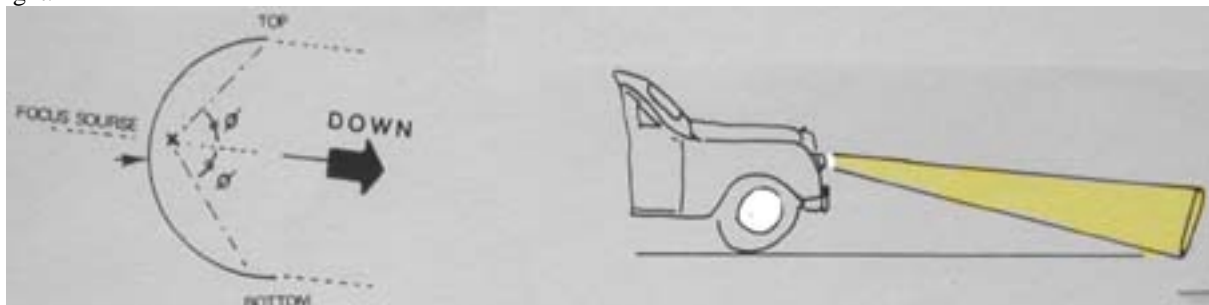


Fig 5a - Low Beam - Relativity Of Beam [Down]

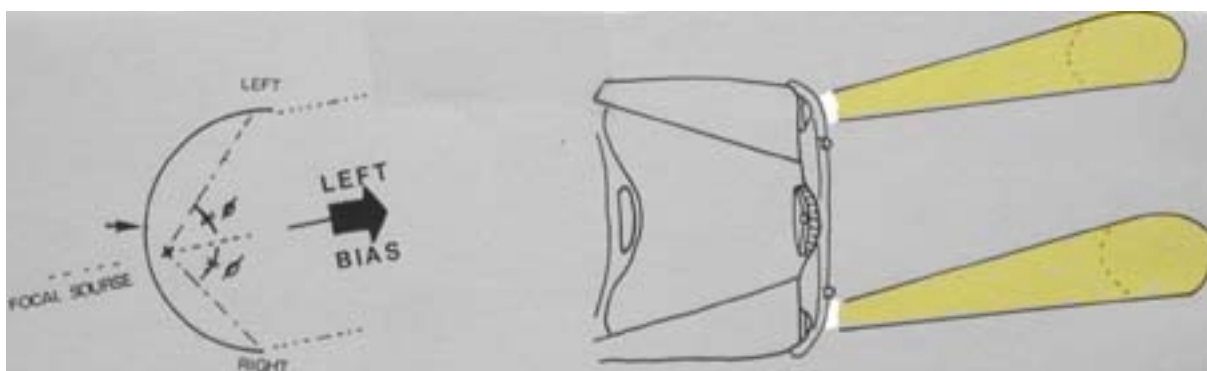


Fig 5b - Low Beam - Relativity Of Beam [To left]

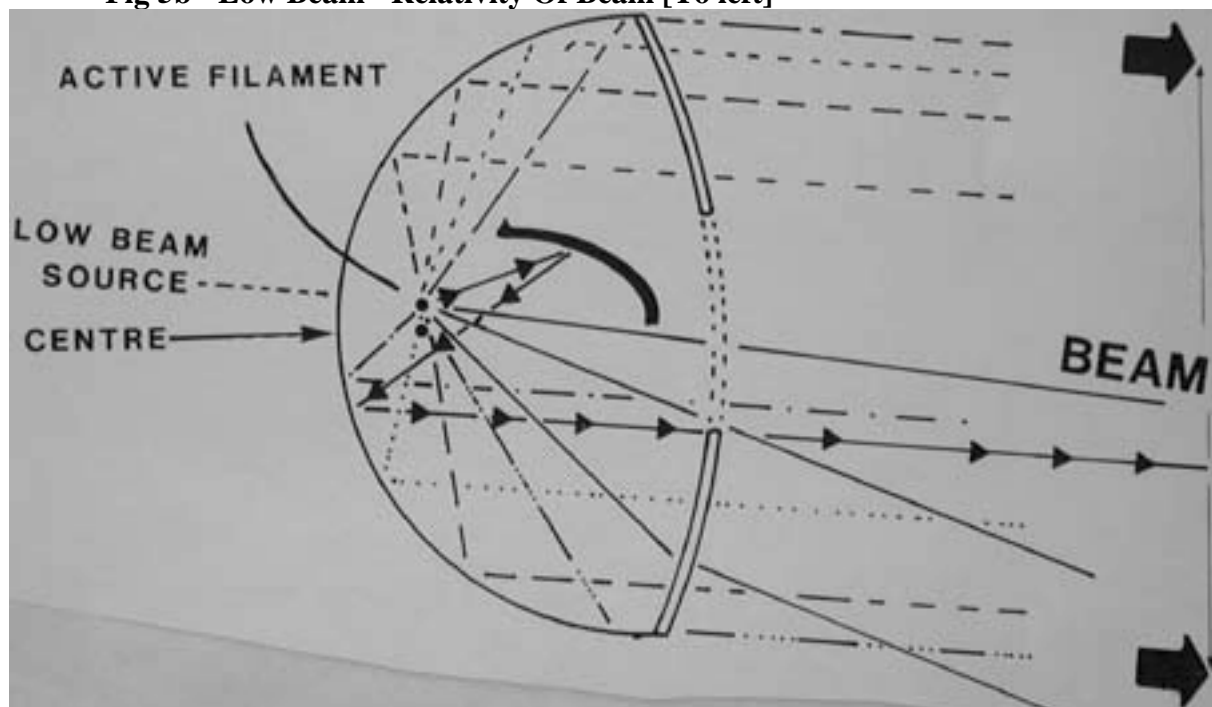


Fig 5c - Low Beam P700 Detail

P700 Headlamp - Maintenance & Comments [Part 3]

If for some reason there is a need to pull your Headlight apart. Perhaps to:

- Repair part of the tripod unit or
- Rejuvenate the existing P700 Unit [Rusted or failed reflective coating] by replacing its body with a new/newer one taken from a less expensive Standard 700 Unit.

NB IF EXISTING BODY IS TO BE REUSED MARK TOP OF BODY ACCURATELY TO AID LATER REASSEMBLY.

P700 Disassembly - Preferably read through a few times before commencing

Step 1 Remove all rims and locating plates from Headlamp.

Step 2 Obtain a plastic strip (cut from a soft drink bottle) and a couple of medium sized screwdrivers.

Step 3 See fig 6a. Place the plastic strip to the glass and fit the screwdriver between the plastic and lip. Now gently rotate the screwdriver, so the lip is kinked out [not too far] .Now move the screwdriver, just forward of the kink and repeat.



Fig 6a Kinking out lip

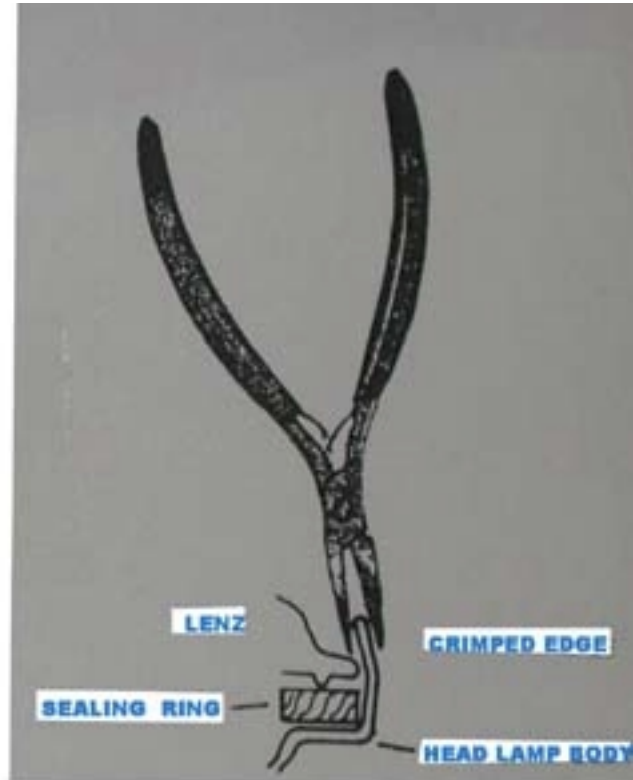


Fig 6b Straightening & widening

Step 4 Continue around the headlight rim until the start point is reached. **Step 5** Observe how far out the rim is pushed. If not out far enough to allow the Lenz to pass repeat step 4 until this condition is met. Be gentle and patient.

Step 6 Once the metal lip is out sufficiently, apply (fig 6b) flat nosed pliers to even out the kinks and accelerate the process. Stop when you think the lip is out just far enough to allow the glass Lenz to pass. Now use a flat domestic knife to free the glass from its rubber seal and seat. **Step 7** Gently place the complete headlamp with its glass front resting on something soft and raise the body so the glass is left behind. Repeat step 6 if not successful.

Comments

-Recovered glass Lenz should be checked for excessive chipping {stone blasting} and cracks. New Lenz's have been available in past

-Sealing rings need to be made from suitable strip or sheet rubber/synthetic

-Silicon [Dow Corning Roof and Gutter- 'Neutral Cure. Clear Drying'] was used to seal lip. See section reassembly. Wear gloves to protect your skin when applying silicon.

-Focusing shield is held together with a nut and can be disassembled. There are two types of shield; { 1 } earlier open type that blackens very easily and (2) the later elongated type that does not seem to blacken with use.

- Replating the headlight interior [its thin steel] is not considered economic. Its better to substitute a new body from a cheaper 700 headlight
- Plating, I'm told was originally Aluminium and can be done in Silver or Rhodium; really only consider if you have earlier 30/40,s brass type [Javco Engineering of Melbourne used to advertise Rhodium plating]

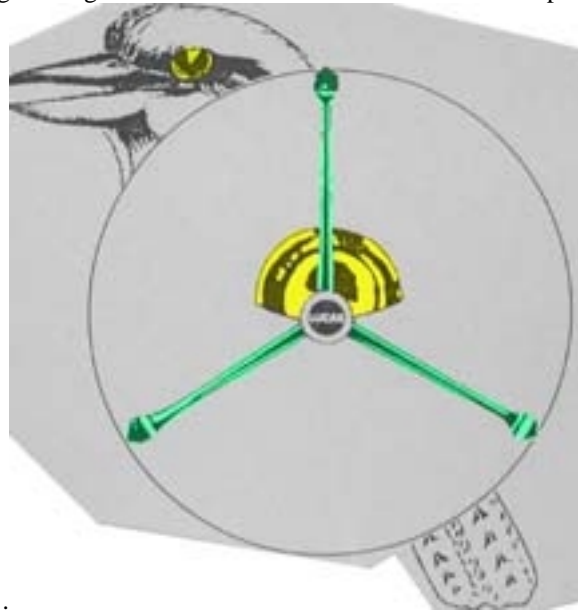


Fig. 7 Tripod Unit

P700 Re assembly

Step 1 Place tripod unit on seating flange such that [1] middle support points to top reference mark, [2] shield is in upper half of body and [3] **Lucas** name is horizontal. See fig 7. *Ignoring the Kookaburra.*

Step 2 Coat new seal with a thin layer of silicon on both sides. Lay this in the seating flange and over the Tripod's feet. Next place a bead of silicon on seal in preparation for glass installation.

Step 3. Align glass Lenz {it's indicated} to your mark on headlamp body and place on top of seal. Ensure references of glass /body /middle tripod arm are all in alignment before leaving this step.

Step 4 Use Visegrip as indicated to bend lip back, See Fig. 8, onto periphery of glass Lenz. Note this is a gradual process where the lip is bent a little then Vice-grip shifted, lip bent again and so on until returning to start point.

Step 5 Repeat step 4 until lip is just touching glass. Now fill and kinks and gaps with silicon to fully seal. Allow silicon to set before installing in vehicle

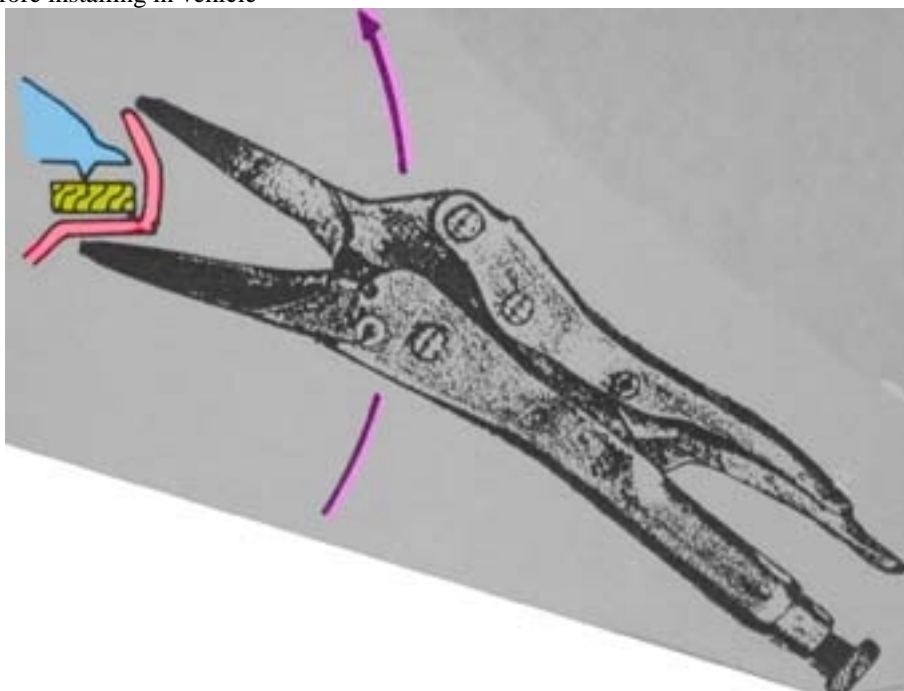


Fig 8 Re crimping

Laurie [Loz] Scott - MG Z type Enthusiast
MG Car Club Geelong. Australia

P700 Headlamp - Maintenance & Comments [Attachment/1]

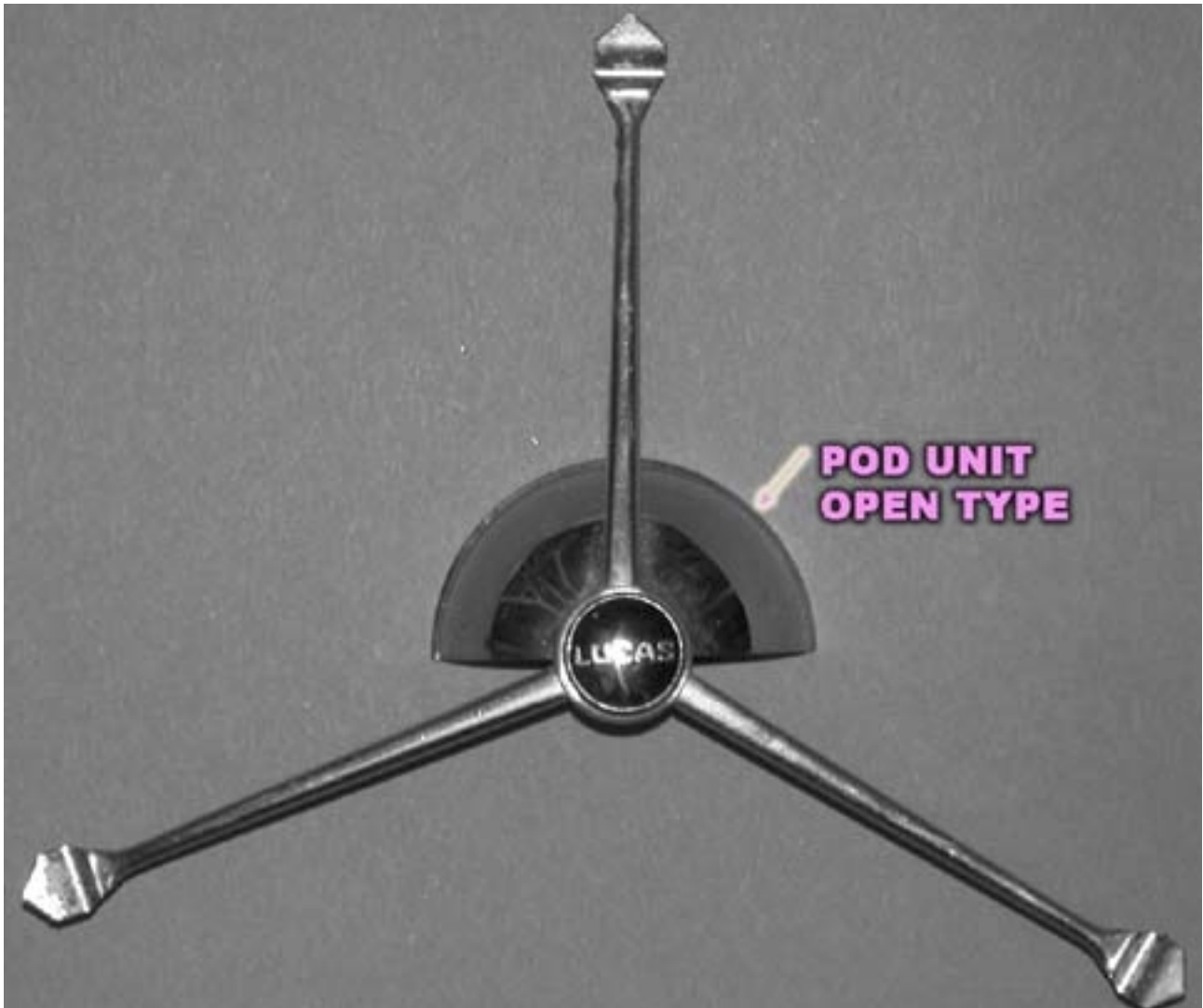
Tripod Attachments:

Attachment 1 P700 Pod Unit – Open Type [front view]

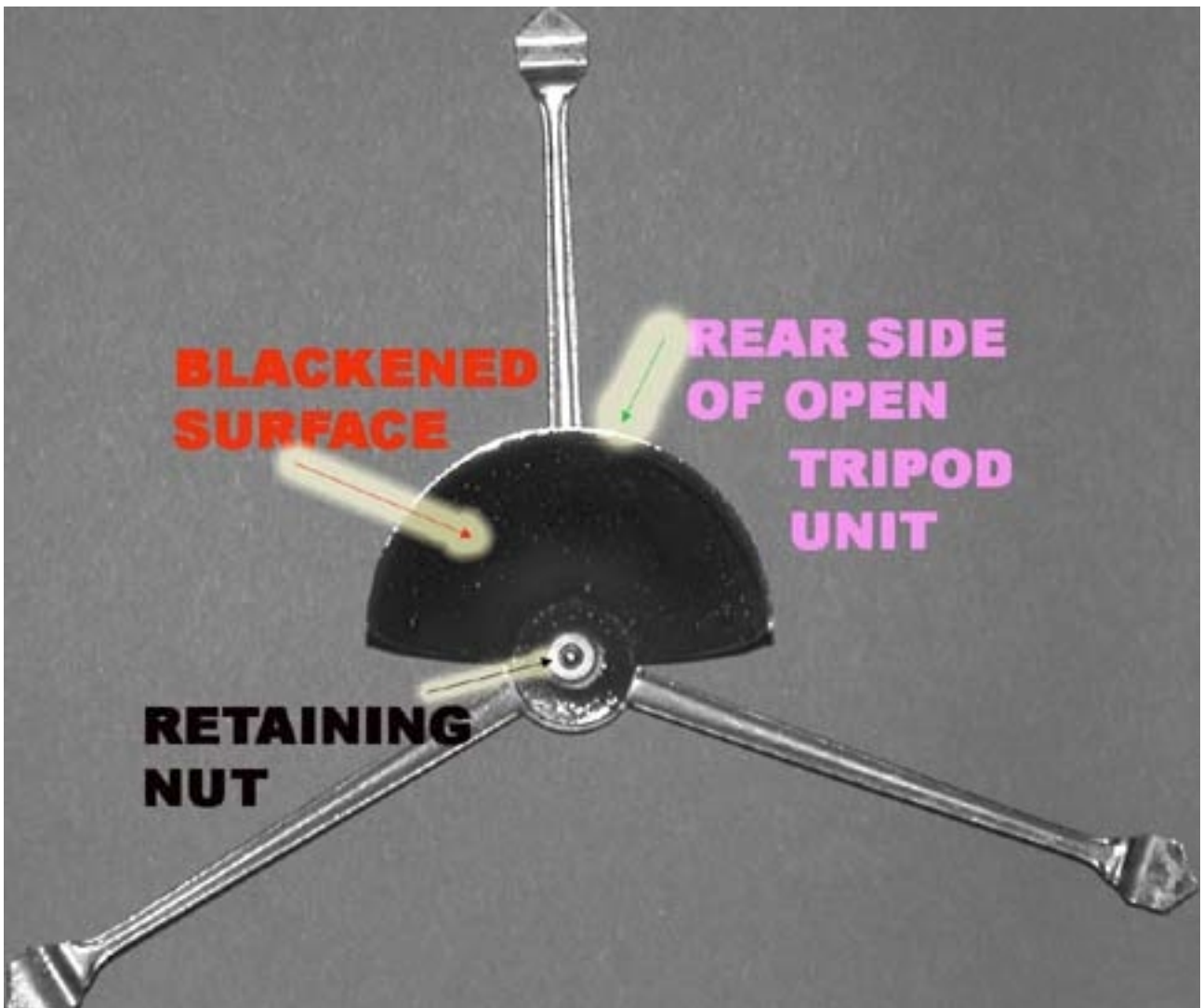
Attachment 2 P700 Pod Unit – Open Type [rear view]

Attachment 3 P700 Pod Unit – Elongated Type [front view]

Attachment 4 P700 Pod Unit – Elongated Type [rear view]



Attachment 1 P700 Pod Unit – Open Type [front view]



Attachment 2 P700 Pod Unit – Open Type [rear view]

Note – Open Type Reflector Tripod Unit – Blacking as indicated must make the unit less efficient than the standard 700 Lucas semi sealed beam headlight [7 inch unit]

Further Detailed Information

<http://www.classicandvintagebulbs.com/page2.html>

<http://www.dimebank.com/Light-up.html>



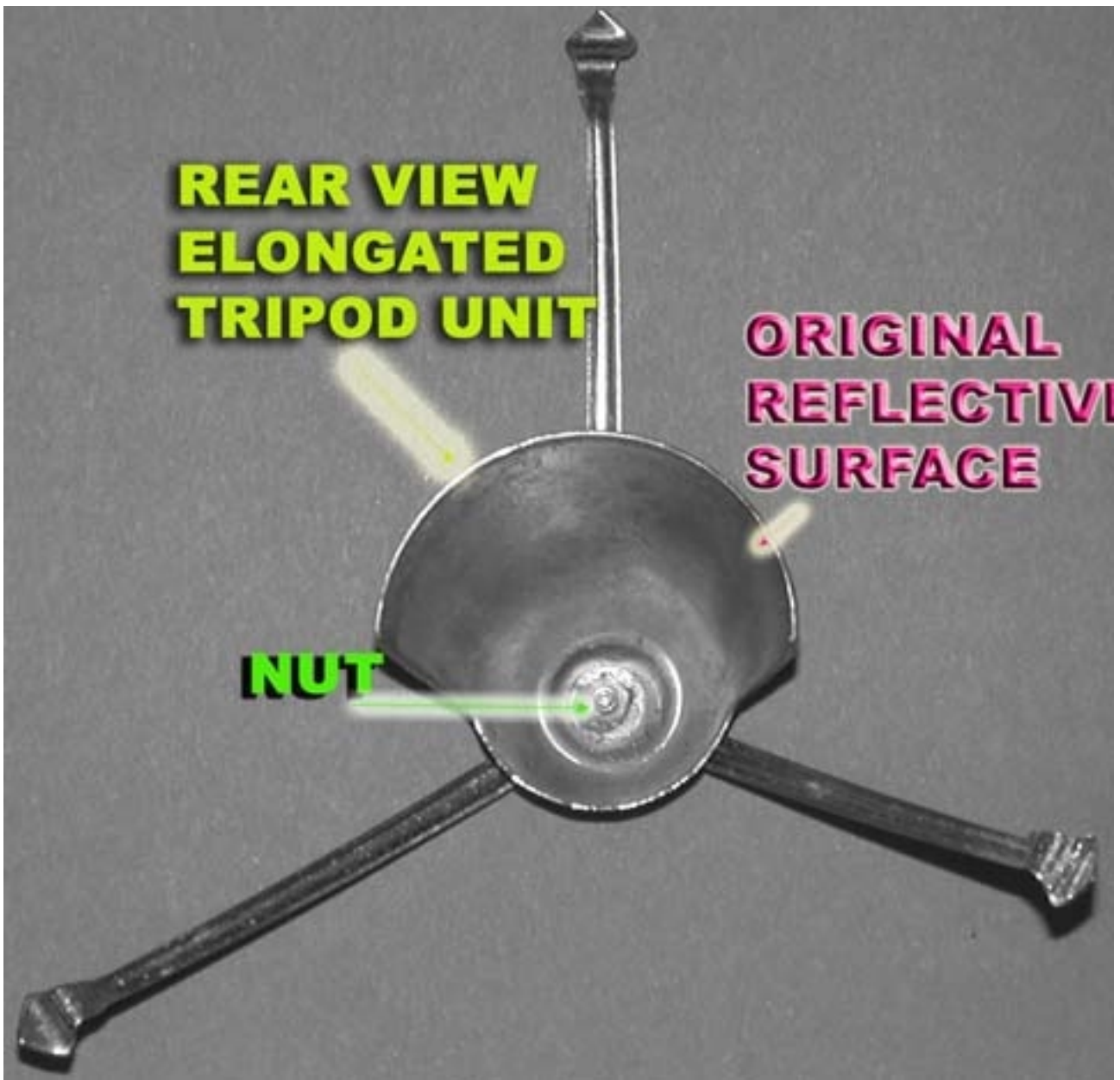
Attachment 3. P700 Pod Unit – Elongated Type [front view]

Note – Elongated type sits much closer to the inside of the glass Lenz

- Attachment 4 below shows a very clear inside reflective surface, being typical of the small number looked at over time. Assume this to be a function of elongated shield/reflector design.

Comment – The P700 headlight looks very attractive with its prominent banded glass Lenz and visually prominent Tripod unit, although:

- Output light is disappointing compared with modern lights. Better globes will help.
- Be mindful of current/supply if employing higher wattage globes
- Copies (of P700s) may look perfect but, if the physics of focal point and reflective shield are not correct, could prove in practice very disappointing.
- The physics of correct operation apply to the Lucas units as well. Check open type reflective shield for correct placement and reflectivity of inside surface. Further head light glass is moulded specifically for either left or right hand drive vehicles



Attachment 4 P700 Pod Unit – Elongated Type [rear view]

[Sept 2002]
Loz Scott
Geelong MG Car Club. Australia