

2CV HEADLIGHTS AND REAR LIGHTS IMPROVEMENT

Revision 8



Now, if I can find a spot to mount this...

Graeme Dennes

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Background

2CV owners will be aware that the factory-fitted front and rear lights are not the brightest at night. The article starts by considering replacement headlight globes to increase the light output to make night-time driving safer and more comfortable, and then considers replacement globes for the rear lights to remove a safety issue.

2CV P45t Headlight Globes



Fig. 1 P45t Base



Fig. 2 P45t Base



Fig. 3 P45t Base

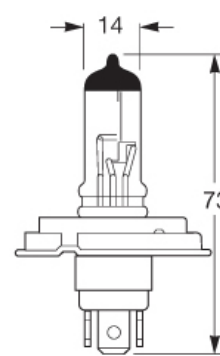


Fig. 4 P45t Base

2CV headlight reflectors are designed to use globes with the P45t mounting base, such as the globes shown in Figs. 1 and 2. Many other vehicles of the period also used P45t globes, so what follows also applies to those vehicles. Fig. 1 shows the original 45W/40W incandescent globe fitted to the 2CV, such as the Narva 49211. Fig. 2 shows the later 65W/60W H4 halogen globe which can be fitted to provide increased headlight brightness, an example being the Narva 48884. Figs. 3 and 4 show some basic dimensions of the P45t base and glass envelope. Other manufacturers may produce equivalent globes. Most 2CVs today will probably be using the Fig. 2 halogen globes.

P43t Headlight Globes



Fig. 5 P43t Base



Fig. 6 P43t Base

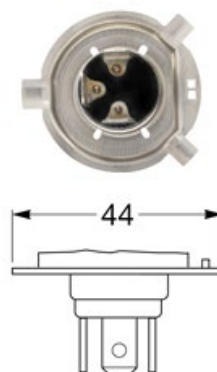


Fig. 7 P43t Base

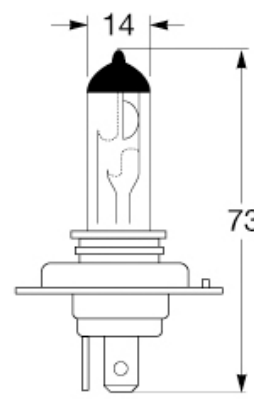


Fig. 8 P43t Base

There are two further headlight globes which may be of interest to 2CV owners, shown at Figs. 5 and 6. Fig. 5 shows the latest higher brightness 65W/60W H4 halogen globe, such as the Narva 48382. Fig. 6 shows the newest, state-of-the-art, much higher brightness LED globe from Narva, part number 18434, for which the brightness is specified as 5000 lumens per pair at a colour temperature of 5700K. The LED globe is the brightest globe for the 2CV known to the writer, and the low beam pattern shows the ideal well-defined Z-shape.

The Figs. 5 and 6 globes use the P43t mounting base. Figs. 7 and 8 show some basic dimensions of the P43t base and glass envelope. Again, other manufacturers may produce equivalent globes.

Well, what are we waitin' for? Plug 'em in, turn 'em on and let's go! Whoaaaaa, hold your horses. Not so fast...

And the problem Baldrick?

There is just a "minor" hiccup in using the Figs. 5 and 6 globes, m'lord. And the problem is Baldrick? Well, m'lord, the 2CV headlight reflectors are designed for P45t globes per Figs. 1 and 2, so unfortunately, the brighter P43t globes in Figs. 5 and 6 *cannot* be directly fitted to the 2CV headlight reflectors, no matter how hard we keep pushing!

And the solution Baldrick?

The solution is to use an adaptor which effectively converts a P43t globe to a P45t globe, allowing us to fit our choice of the higher brightness Fig. 5 or Fig. 6 globes to the 2CV.



Fig. 9 The adaptor fitted to a P43t globe

The writer previously described how to make a suitable metal adaptor for this task in earlier revisions of this article.

But today, **Eureka!** The writer recently located an off-the-shelf adaptor designed for this very purpose. The adaptor is shown fitted to a P43t globe at Fig. 9, converting the globe to a "P45t" type, ready for fitting in the 2CV's P45t reflector opening. A pair of the adaptors is shown at Fig. 10. Further, when the adaptors and our chosen P43t globes are fitted to the 2CV, there is no permanent modification made. The lights can be quickly reverted to the original type by replacing the P43t globes and adaptors with P45t globes.



Fig. 10 The adaptors. Two are required.

When the adaptors and the Fig. 6 globes are fitted to the headlights of your 2CV, you'll have the very best and brightest headlights for the 2CV known to the writer.

The adapters are available by online order from **Classic Car LEDs** in the UK and are labelled as: P45T R2 H5 HB12 410 to P43T H4 BULB ADAPTER, part number P45A. Two adapters are required. The adapter is shown at the following weblink:

<https://www.classiccarleds.co.uk/products/p45t-r2-h5-to-p43t-h4-bulb-adapter? pos=1& psq=adapter& ss=e& v=1.0>

Globe Retention Clips

When fitting the adapter and the selected globe to each headlight, ensure the two small over-centre spring retention clips on the reflector, which secure the globe and adapter in place, are doing their job. Just to be sure, the writer threaded a single loop of 1.2mm solid copper wire through the clips and around the central body of the globe, twisting the wire ends together and snipping off the excess. This ensures the clips remain locked in place. Should the globes ever need to be removed from the lights, snip the copper wire first.

Narva 18434 LED Globe Low Beam Z-Pattern



The photo at left shows the low-beam Z-pattern for the Fig. 6 Narva 18434 LED globe: a horizontal edge to the right of centre to minimise dazzling of oncoming drivers, and a rising edge to the left of centre to illuminate the road edge, street signs, etc. Text-book perfect! (The lines in the lower half of the photo are reference lines.)

WARNING NOTICE: HEAT DAMAGE

There are even brighter P43t LED globes available today for use with the 2CV, but these will run hotter than the LED globe discussed above. Why is this of concern? The 2CV headlight glass lenses and metal reflectors must be able to tolerate the heat produced by the chosen headlight globes without being damaged. If the heat produced is excessive, the glass lenses may crack and/or the silvering on the reflectors may be damaged/destroyed, rendering the headlights to the sad-history bin!

WARNING NOTICE: DIM-DIP HEADLIGHTS

If your 2CV was manufactured for the UK market during 1987 or 1988, it will have been manufactured with “dim-dip” headlights to meet UK vehicle regulations. (The UK was the only country to mandate a dim-dip system.)

Dim-dip headlighting was a feature to provide a night-time “town beam” with a light intensity somewhere above contemporary front parking lights and below low-beam intensity. Parking lights were commonly used around dusk in built-up areas but were considered to be of insufficient intensity in some conditions, while low-beam headlights were considered too glaring for safe use in built-up areas. For the 2CV “town beam”, Citroen chose to provide a reduced voltage to the low-beam headlights by inserting a 1 ohm resistor in series. It operates as follows. *Whenever the ignition switch is on and the light switch is in the “V” position*, then if low-beam is selected, the normal low-beam headlights are operated, while if “high-beam” is selected, the low-beam headlights are operated at a reduced intensity – the dimmed dip or “dim-dip” intensity.

In 1988, the European Commission successfully prosecuted the UK government in the European Court of Justice, arguing that the UK legislation requiring dim-dip headlights was illegal under EC directives prohibiting member states from enacting vehicle lighting requirements not contained in pan-European EC directives. As a result, the UK regulations mandating dim-dip headlights were quashed in 1989. (My thanks to Wikipedia.)

When the dim-dip function is operating in your 2CV, the reduced voltage supplied to the low-beam headlights has the following ramifications:

For standard incandescent headlight globes (Fig. 1): **No harm is done.**

For halogen headlight globes (Figs. 2 and 5): Under-voltage operation can impair the globes because it interrupts the halogen cycle. The lower voltage reduces the temperature of the glass envelope, preventing the tungsten silvering deposited on the inside of the glass from being returned to the filament. Thus the globes become **darkened beyond use.**

For LED headlight globes (Fig. 6): LED globes will often not tolerate under-voltage operation and **may end up destroyed.**

The safest solution? If your 2CV has dim-dip headlights, urgently disable the “dim-dip” function then fit the Fig. 6 LED globes and adapters described here.

Disabling the dim-dip function will also prevent premature failure of the 2CV light switch. Refer to the writer’s article, *2CV Dim-Dip Headlights* for full details.

Conclusion

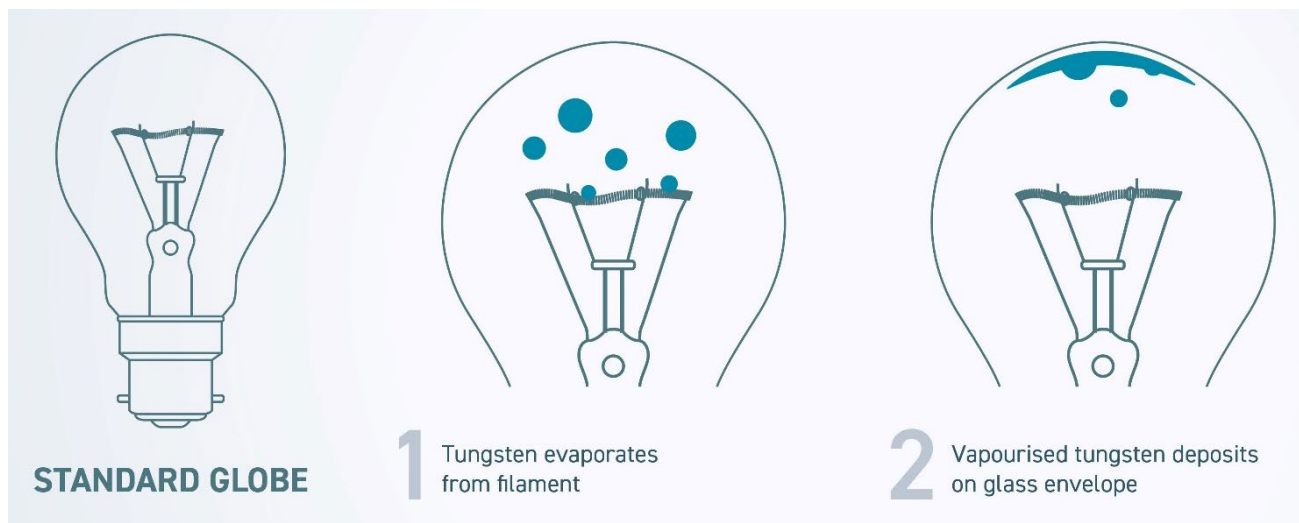
The adapters and the Fig. 6 LED globes form a non-permanent, perfect solution for the 2CV headlights.

ADDENDUM

How do halogen globes work?

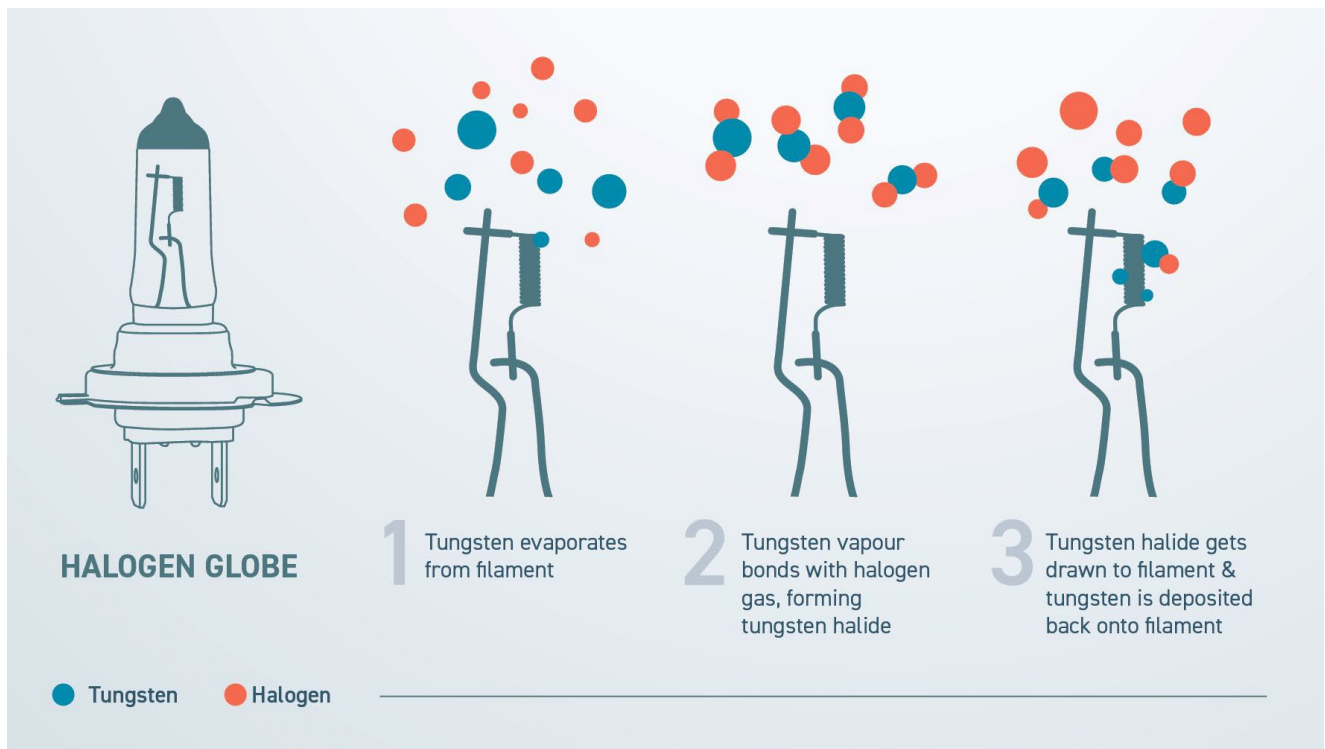
The halogen globe is the most widely used form of lighting in the automotive industry today. It has been the global standard since its introduction in 1962 with the “H1” style headlight. The enduring popularity of the halogen globe is due to its cost effectiveness and efficiency in power demand, and the fact that they are relative safe and easy to change.

A halogen globe is slightly different to the standard incandescent globe. An incandescent globe is made up of a tungsten filament surrounded by a gas such as argon and/or nitrogen inside a glass envelope. Just like any other metal, when heated, tungsten gets white hot and emits bright light.



The problem with standard high-brightness tungsten globes is that during operation, tungsten slowly evaporates from the hot filament and deposits itself on the inner surfaces of the glass globe, leaving a black mark. This results in a reduction (shielding) of the light output and reduces the life of the globe.

A halogen globe still uses a tungsten filament, but it is encased within a small glass envelope which is filled with gas from the halogen group, such as Bromine or Iodine. The interesting thing about halogen gases is that they effectively recycle the evaporated tungsten. When the globe is operating, the halogen gas combines with the tungsten molecules deposited on the glass envelope and deposits the tungsten molecules back onto the hot filament. This helps extend the life of the globe and means that the tungsten filament can run much hotter (with higher light output) without risk of burn-out. Thus, halogen globes can be much brighter, making them better for night driving.



High performance halogen globes such as the Narva 48382 add extra gases to extend the life of the globe. These gases include Xenon, Argon, Radon and other inert gases which protect the filament in two ways. Firstly, they make the halogen reaction more efficient, thus resulting in less tungsten being deposited onto the envelope. Secondly, they make the filament less likely to evaporate because they increase the pressure within the envelope.

Conclusion

While halogen globes have been the standard for many years and are well respected in their design, the advances in lighting technology over the past 10-15 years has resulted in some extraordinary developments in automotive headlights with the introduction of Xenon and LED technologies.

AND NOW TO THE REAR LIGHTS

Brighter Rear Lights for the 2CV:

Now, moving right along to the rear of the vehicle, we'll address the dullness of the incandescent globes used in the 2CV rear lighting assemblies – the tail (parking) lights, the brake lights and the turn indicator lights. (The number plate is illuminated by the tail lights.) According to the 2CV owner's manual, the tail light globes are rated at 5 watts, the brake light globes are rated at 21 watts, and the front and rear turn indicator globes are rated at 21 watts. So, opening up the Yellow Pages, er, Dr Google, the writer undertook a search for the latest in LED globes in the hope of finding suitable replacements for the standard BA15S single-filament incandescent globes fitted in the rear lighting assemblies. The BA15S globe standard has a single centre contact and bayonet base.



The writer located and trialled several types of LED globes in the search to replace the standard incandescent globes, and after testing them, settled on one type. Also, of great interest, is that the *same* LED globe type and wattage ended up being fitted to all *three* globe positions! Yes, the *same* wattage LED globe is used for the tail lights, the brake lights and the front and rear turn indicator lights!

Fitting the new globes has resulted in the visibility of the rear lighting being excellent at all times of the day and night.

Surprisingly, and contrary to the writer's expectations, the brightness of the tail lights is nowhere near excessive with respect to the brake lights and the rear turn indicator lights. In fact, the brightness of all three globes seems very balanced, normal and as expected in comparison to modern vehicles. Check out the rear lights on the writer's 2CVs next time you have a chance. Ask for a demonstration!

The selected LED globe (eight required) is available by on-line order from The LED Shop Australia, based in Melbourne. The telephone number is (03) 7068 9150. (These globes may also be available from other retailers.)

The LED globe used is listed as:

12V BA15S 1156 WHITE Canbus LED bulb 480lm (not the similar WARM WHITE globe).

Here's a link to the globe: <https://www.ledshoponline.com.au/product/ba15s/>

This globe is rated at 5W, so it draws 0.4 amps at 12V, less than the 1.75 amps drawn by standard 21W incandescent globes, putting a lighter load on the light switch.

The LED globe is a direct one-for-one replacement for the standard incandescent globe. There is no need to change the rear lighting assemblies or the vehicle wiring. This means the standard incandescent globes may be refitted to the vehicle at any time in the future should it become necessary.



The image at left shows the selected 5W LED globe with its BA15S base.

A total of eight globes is required for the 2CV. Six for the rear lighting assemblies and two for the front guard turn indicators.

Now, at long last, no more dull rear lights on the 2CV. The vehicle's rear lighting is now clearly visible at *all* times to other road users, adding to the safety and comfort of the 2CV occupants.

Disclaimer: The writer has no association with The LED Shop Australia. The LED globe discussed above is offered as an option for the reader because of its suitability for the 2CV, and because the writer has successfully fitted these globes to his 2CVs.

LIST OF ARTICLES BY THE WRITER

The articles written by the writer, listed below, may be freely downloaded from either of the following club websites by clicking on the adjacent links and locating the articles. Both websites maintain the latest revisions of the articles. Before using the articles, please ensure the latest revisions are being used, as the articles are updated on an as-required basis by the writer and given new revision numbers.

Citroen Classic Owners' Club of Australia: [Technical Articles](#)

Citroen Car Club of Victoria: [Tech Tips](#)

1. 2CV 40-Litre Fuel Tank
2. 2CV API GL-4 Gearbox Oil
3. 2CV Battery Charging Circuit
4. 2CV Battery Problems Solved
5. 2CV Brake Saga
6. 2CV Buyer's Questions
7. 2CV Carburettor Cover Screws
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15. 2CV Hard Luck Stories
16. 2CV Headlights and Rear Lights Improvement
17. 2CV Ignition Coil
18. 2CV Knife Edges Replacement
19. 2CV Low Oil Pressure Beeper and Lights On Beeper
20. 2CV Maintenance - Part 1 of 2
21. 2CV Maintenance - Part 2 of 2
22. 2CV Oil Breather
23. 2CV Oils and Maintenance Advice From Burton
24. 2CV Points Ignition Reinstallation
25. 2CV Roof Rack
26. 2CV Secondary Choke Butterfly Adjustment
27. 2CV Spare Parts to Carry
28. 2CV Valve Clearance Adjustment
29. 2CV Workshop
30. Better Fuel Hose Clamps – **applies to all vehicles**
31. Better UHF CB Car Radio Performance – **applies to all vehicles**
32. Ignition Coil Ballast Resistors – **applies to all vehicles**

FINAL STATEMENT

My acknowledgement and grateful appreciation is given to the web sites
from which photos/drawings/diagrams have been sourced.

My thanks to Brown & Watson International for the diagrams and text used in the Addendum.

The writer has no association with Brown & Watson International or The LED Shop Australia.

The LED globes recommended by the writer are offered in good faith as an option
for the reader because of their suitability to the 2CV, and because the writer
has successfully fitted the globes to his 2CV vehicles.

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