# 2CV FUEL FILTER

By Graeme Dennes

Revision 1

Please note:
Although this article applies directly to the 2CV, it applies in principle to all classic and earlier vehicles!

2CV owners usually change fuel filters during the vehicle's annual service. If the owner fits a preferred type of filter, then usually, that filter type will continue to be used. This may be how many of us manage our 2CV's fuel filter, but there's more to know as filters ain't filters!

The life of an internal combustion engine is substantially influenced by the cleanliness of the fuel burnt in the engine. The majority of today's modern vehicles use fuel filters which filter particles down to the 10-20 micron range, while some vehicles use 5-micron filters. (A micron is one millionth of a metre or one thousandth of a millimetre.) As well as protecting the engine in this manner, the fuel distribution system in modern vehicles is also protected. The question is: What can we do to help the 2CV engine and fuel system? After all, dirty fuel is dirty fuel and engine life is engine life. And the answer? *Use a 10-micron fuel filter in the 2CV.* Well, that should be easy enough to arrange…

Citroën fitted a small inline plastic fuel filter to the 2CV, specified as a Champion L101 (Haynes manual, page 49). An internet search found several overseas suppliers selling this filter, with their web sites stating it filters to 10 microns. Ah, that's looking good! Contact was made with the suppliers to seek a link or reference to a Champion document which states the particle size specification for this filter. Although the suppliers responded quickly, *none were able to provide a reference to a Champion document*. (I chose not to ask where their stated 10-micron figures originated.) The next contact was to an overseas Champion filter distributor, who kindly sent me a link to a Champion filter document containing the specifications for the L101. It also included a link to the specifications for the L101's replacement, the Champion CFF100101. Unfortunately, the particle sizes for both these filters was not specified. After seeking further advice on the L101's particle size, the writer was advised that *this information is only for internal use by their engineering department!* It astounds me that particle size information is not formally available from the manufacturer, given that it is *the most critically important property of a fuel filter!* (More follows).

Ah, take a deep breath! Ok, let's try outside the box! What type of fuel filter should we be searching for? As our 2CVs are usually travelling only a few thousand kilometres between annual services, the surface area of the filtering element should not be of concern. Also, as the 2CV fuel pump pressure is just under 3 PSI, the maximum flow rate and maximum working (negative) pressure should also not be of concern.

This shortlisted the search criteria to four items: (1) the fuel filter **must have** 6 mm (1/4 inch) fuel spigots to match the 5.5 mm inside diameter of the rubber fuel hose used in the 2CV; (2) it needs to be an in-line, standalone filter; (3) it must be relatively small and lightweight so it can be self-supporting if necessary, and (4) it should filter particles down to **10 microns**, in line with modern day vehicle fuel filters.

Ok. Let's check locally. An internet search on Australian web sites was done in the hope of finding a suitable filter from a local supplier. While numerous fuel filters were found which match the first three criteria, *none of them provided particle size data.* One of the sellers was contacted in the hope of obtaining the data, and although very helpful, *the seller advised they didn't have that information and felt it may not be obtainable!*

One could ask: why is such critically important information being withheld from the consumer?

Mmmm. Although pure supposition, the writer believes it could benefit filter manufacturers, distributors and retailers for these reasons. All other things being equal, a 10-micron filter has to cost more to manufacture than a 40-micron filter because it is more restrictive to the fuel flow and therefore needs more surface area, increasing the manufacturing cost and thus the cost to the consumer. By deduction, perhaps a way to attract a customer to buy a filter is to keep the cost down by selling lower-cost (read: larger particle size) filters. These will be priced much more in line with the customer's expectations and buying history, along with the advice that "this fuel filter fits your car". The customer may not mention particle size or may not even be aware of the term particle size or that it is a *critical* filter parameter. In a nutshell, excluding the particle size specification from the manufacturer's product data sheet certainly is a way to keep it out of sight and out of mind of the consumer. If you don't know about, you'll never go looking for it!

*The bottom line?* Why hide a critical filter specification? To repeat, who is benefiting from this action? As a consumer, the writer certainly is not! Hence this article! However, as already noted, this is all pure supposition by the writer, and there may well be justifiable reasons for why the particle size is not formally stated or made available on request. The writer just can't think of any.

Ok, moving right along. The fuel filters provided by popular local filter brands were also considered. A small range of fuel filters from Repco and Ryco were identified which match the first three criteria. Some of those filters stated the particle size while some did not. The respective product managers were contacted in the hope of obtaining particle size data, and fortunately, the data was provided for all the filters requested by the writer. Thank you Repco and Ryco! The results? The popular Repco filters RPF1003, RPF1005, RPF1022, RPF1415 and RPF9192 are specified at 40 microns, whilst the popular Ryco filters Z4, Z14, Z750 and MF1-12 are specified at 17 microns. Regrettably, in view of the writer's search criteria, none of these filters is a match. Keep searching!

As an aside, it's now understood why there has always been plenty of sediment lying on the bottom of the fuel bowls of the writer's 2CV carburettors when serviced, even though the vehicles usually travel less than 5000 Km each year. The writer has been using the Repco RPF1415 filter for 14 years (well, not the same one!). At 40-micron particle filtering, any dirt particles in the fuel which are smaller than this figure will pass through the filter. (This is not a criticism of Repco's RPF1415 fuel filter, but rather, is a statement of self-criticism by the writer for not identifying the filter's properties sooner!)

Alright, let's go global. A grand total of **one, yes, one,** fuel filter matching the four search criteria was located – the Oregon 07-124. This filter is sold by Amazon.com.au, eBay and many North American retailers. A local supplier has not been found.

The photo at right shows the Oregon 07-124 fuel filter. The Oregon filter and specifications are shown on the manufacturer's web site at: Oregon 10-Micron Fuel Filter.
It also shows information on USA/Canadian retailers. A link to the Oregon filter on Amazon.com.au is shown here: Oregon Fuel Filter

There may be other fuel filters which match the writer's search criteria. *Should the reader come to know of any, the writer wishes to receive the details from you.* Your information will be added to the next revision of this article for the benefit of all readers.

*Please note:*
*This article is not intended as an advertisement for the Oregon filter, but rather, is offered as information on the only 10-micron fuel filter known to the writer which suits the 2CV.*

**Filter Testing Standards**
There are filter test standards shown here which describe the methods used to test and specify the filtering performance of fuel filters. In the strictest sense, the micron figure alone does not completely describe the filtering performance of a filter. Given historical filter industry developments and today's vehicle industry norms and specifications, the micron figures will, in part, carry some useful information.

If a filter has a rating of "10 microns", it has some ability to capture particles as small as 10 microns; however, because there is no single accepted way to measure and describe the size of particles that a filter can capture and the total amount of particles that a filter can hold, more information is needed. For a micron rating to be truly useful, we must know the filter's removal efficiency for the specified particle size. When you see a filter marked "10 microns", you will not know exactly what that means unless you also have a description of the test method and standards used to determine the micron rating.

The most recognized and utilised test methods are prepared under the banners of the Society Of Automotive Engineers (SAE) for North America and the International Standards Organisation (ISO) for the rest of the world. Specifically, the key standards are SAE J905, SAE J1488, SAE J1839 and ISO 4020. All of these test methods require complex and sophisticated test equipment.

Filter micron ratings are often based on one of the following three testing methods, but many variations are possible:

a. **Nominal Micron Rating** (NMR) Expresses the ability of the filter to capture particles of the specified size at an efficiency between 50% and 90%. For example, a nominal filter rating of 90% at 10 microns means the filter captures 90% of the particles at the 10 micron size. NMR usually means the filter can capture a given percentage of particles of the stated particle size.

b. **Absolute Micron Rating** (AMR). Means that the filter is capable of removing at least 98.7% of the particles of the specified size. This rating is determined through a single-pass or multi-pass test in which fluid containing measurable particles is passed through a flat sheet of filter material. Particles that pass through are measured and counted. This rating is more informative than the NMR.

c. **Multi-Pass Beta Rating** (MPBR)
The MPBR has been accepted by many filter manufacturers, **but is not used in a public manner by most of them to identify or specify their filters.** (Emphasis by the writer.)

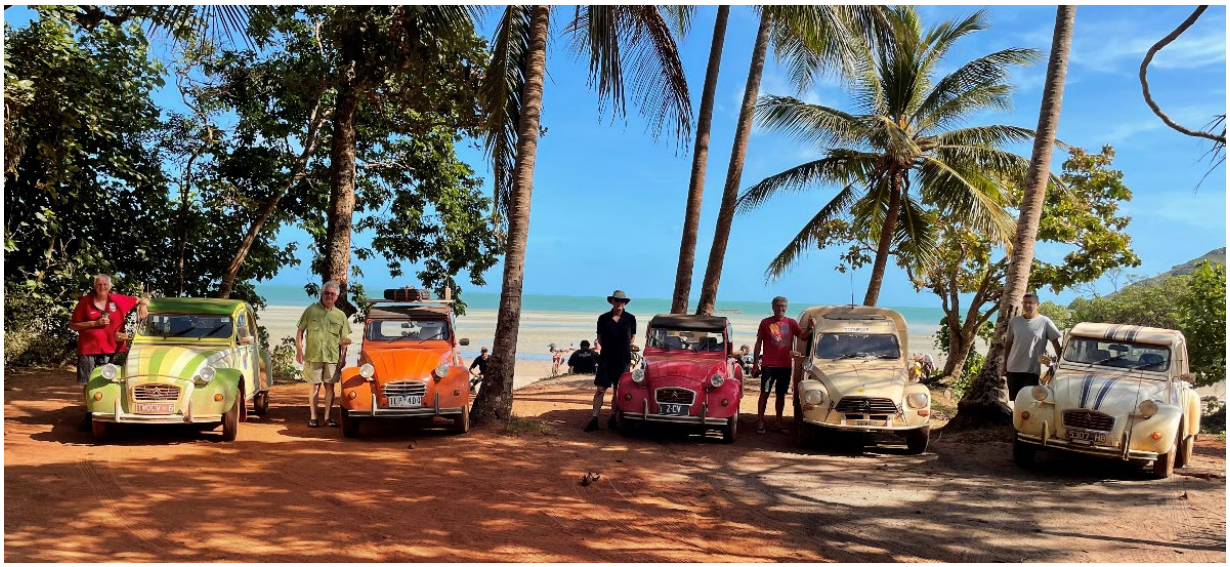
Most filter manufacturers follow these test methods, but several use test methods of their own design.

Writer's Suspicions Confirmed
In line with the writer's earlier suspicions, the third test method above **confirms that many filter manufacturers are deliberately withholding filter specifications from the consumer.** So there we have it!


The photo above shows the writer's 2CV alongside wheat sowing machinery operated on Burrangong Station near Young, NSW. (Lee's home town and home of the best cherries in Australia I'm told on very good advice!) The overall length of the sowing machinery is 55 metres, and up to 30 acres per hour can be sown (yes, that's one acre every two minutes!), with all steps done in one pass, including the fertiliser. The machinery operation and the sowing rates are computer controlled by the operator in the cabin. The all-up cost of this rig would buy *several dozen* very good condition 2CVs!

The three fuel filters used in the 12.5 litre diesel engine in the John Deere tractor above remove particles down to 10 microns. Yes, that's probably a good enough filtering standard for the 2CV as well!


The writer took the above photo at the service station in Seisia at the top of Cape York Peninsula. This is red dust country, as depicted in the photo. The need for a 10-micron fuel filter is paramount at the Top End, given the greater propensity for dust and dirt to gain entry to the engine via the fuel line.



Five of the Raid 2CVs at the northern-most tip of Cape York Peninsula. Again, plenty of red dust to make its way to the engine.

FINAL STATEMENT

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

The section on filter testing standards is drawn from the linked Parker Hannifin document
with grateful appreciation and acknowledgement.

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