

2CV MAINTENANCE
PART 2 OF 2
Revision 18



An unusual place to carry a star picket... Raid Arnhem 2016

By Graeme Dennes

2CV MAINTENANCE - PART 2 OF 2

Revision 18

Before using the information in this article, ensure the latest revision is being used.

This article is accompanied by a separate article: 2CV MAINTENANCE - PART 1 OF 2.

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1. EXHAUST

Removing and Refitting the Heat Exchangers

When removing the heat exchangers, firstly disconnect the two heater control cables from the heat exchangers, then loosen (but don't remove) the two 11mm bolts on the sides of the gearbox which support and secure the crossbox and its mounting hooks. This will provide a small amount of movement of the crossbox to facilitate its removal and refitting if required. *Remove all five exhaust clamps* – four 49mm clamps on the heat exchangers and one 47mm clamp on the outlet fitting of the crossbox. The heat exchangers may now be removed from the engine.

When refitting the heat exchangers, commence with the *front* fitting of one heat exchanger. Match its inlet fitting with the exhaust manifold fitting, then fit a 49mm exhaust clamp so it's seated but not tightened. Using a little copper grease on the clamp bolt threads will make it easier. Allow the heat exchanger to "self-support" itself. Repeat for the other heat exchanger. Now move/rotate the crossbox so the two outlet fittings on the heat exchangers closely align with the two inlet fittings on the crossbox, ensuring the crossbox does not jump off its mounting bolts. Fit the 49mm clamps to the rear heat exchanger flanges but don't tighten.

At this moment, the two heat exchangers and the crossbox are a "loose" fit. The aim now is to take up all the slack in the flange fittings to achieve an airtight seal at the four flanges when the clamps are tightened. Let's do it. Jiggle the crossbox and heat exchangers by hand to ensure the four clamped coupling points are drawn together *as closely as possible*. With the heat exchangers and crossbox supported in this close-fit arrangement, firstly, hold/press the *front* flanges closely together and tighten the *two front clamps in turn*, then secondly, hold/press the *rear* flanges closely together and tighten the *two rear clamps in turn*, checking that the crossbox hooks remain correctly seated on the mounting bolts between the large washers in accordance with the diagram following. Now tighten the two 11mm bolts supporting the crossbox.

At this point, both heat exchangers and the crossbox should be a single rigid entity attached to the engine and gearbox, *with no movement present*.

The next step is to fit the crossbox outlet pipe to the exhaust system pipe. If necessary, loosen the torpedo exhaust pipe fittings and mounting components to allow the exhaust pipe to provide a close-fitting connection with the crossbox pipe. Once a close fit is achieved, fit and tighten the 47mm clamp while holding the flanges in close contact.

Next, loosen all the rear exhaust fittings and fixtures, ensuring all components are optimally positioned and supported as a complete assembly, then tighten all fittings. Ensure the angled tailpipe section near the rear wheel doesn't contact the body, chassis or suspension arm when the left rear wheel is off the ground.

Why do we go to such lengths with the assembly of these components? To ensure exhaust gas leakage does not occur. Leaking exhaust gasses can cause excessive noise, affect emissions and can enter the cabin of the vehicle, risking the safety of the occupants. The fitting procedure above is the writer's attempt to minimise the risk of exhaust leaks occurring. Take your time. Be thorough. Do it once.

Fitting the Crossbox

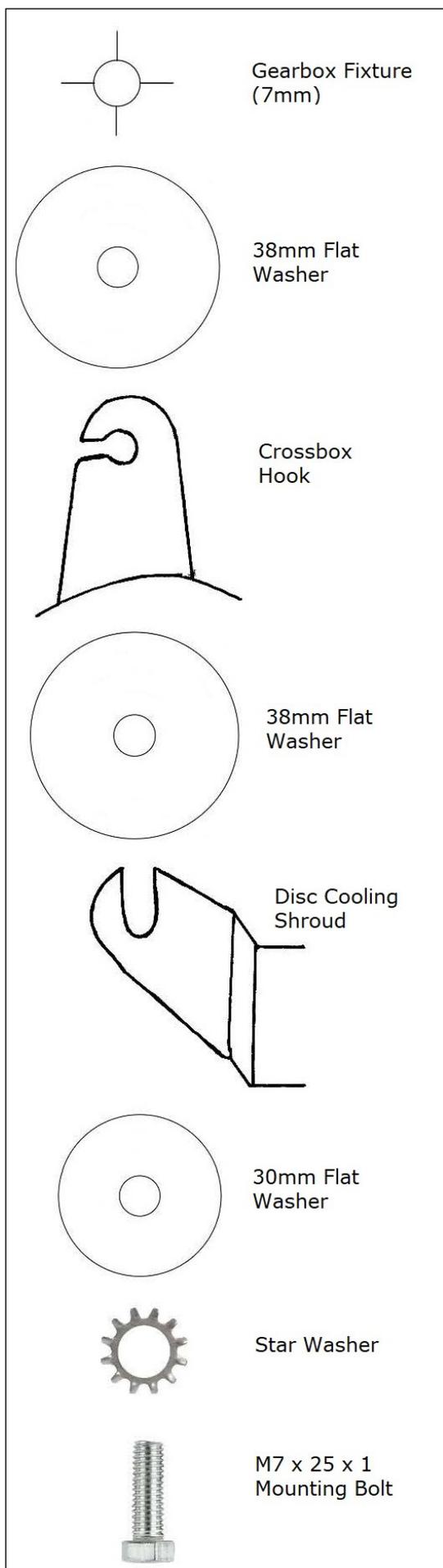


Fig. 6-1

Fig. 6-1 at left shows the parts needed and their order of fitment for mounting and securing the crossbox to the two 7mm fixing sockets on the sides of the gearbox.

Although the diagram shows an M7 x 25 x 1 bolt being used on each side, check when tightening that the bolt is not bottoming in the gearbox fittings before the bolt is properly tightened. If it is found to be bottoming, grind off 1mm at a time from the bolt length and retry.

The aim is to maximise the depth of engaged threads with the gearbox without the bolts bottoming.

When refitting the crossbox, fit the crossbox hooks *between* the 38mm washers and over the fixing bolts, then later, tighten the bolts *as the final assembly step* after the heat exchangers and clamps have been fitted per *Fitting the Heat Exchangers* above. Once the crossbox has been secured in place, fit and adjust the rear exhaust pipe and muffler components also per *Fitting the Heat Exchangers*.

If the crossbox has to be removed from the vehicle, loosen the two bolts sufficiently to allow the crossbox mounting hooks to be “unhooked” from the bolts. *The bolts don't have to be removed.*

Note: If the 2CV has drum brakes at the front, the disc cooling shrouds will not be present, so the M7 bolts *may* need to be shortened accordingly, but *don't* delete the 30mm washers!

Note: M7 x 20 x 1 bolts could be used as Citroën used, but this is less-than-ideal as these have less engaged threads and require more care when tightening to prevent damage to the gearbox threads! The secret? Maximise thread engagement as shown here!

2. FUEL

Idle mixture adjustment screw:

The idle mixture screw may have a small plastic removable cover over it. Never overtighten the idle mixture adjustment screw (on the front face of the carburettor). See Fig. 7-1 below. In fact, it should never be screwed in clockwise to where it becomes tight. Doing so can result in either damage to the needle point and the seat, or else cause the tip of the needle to break off, leaving it in the bottom of the seat.



Fig. 7-1

Apply the *smallest* rotational force to the screwdriver blade with two fingers to alter the idle mixture adjustment screw, just in case it does reach the seat so it will only *just touch* the seat and you will feel it without causing damage.

A suggestion. Prior to making any adjustment to the idle mixture screw, it may assist to know how many turns it is *currently* screwed out (counter-clockwise) from its seat, so you can always return it to its present position!

To do this, record the number of *clockwise* turns required to position the idle mixture screw to where it *just* contacts its seat. It may be, for example, three and one half turns. Record this number. Then turn the idle mixture screw *counter-clockwise* by this same number of turns to return it back to its start setting. If all becomes lost, very gently, screw the idle mixture screw fully in to seat it, then unscrew it four turns. This will be close to the ideal position and sufficient to allow the engine to start and idle.

You may also wish to unscrew and completely remove the idle mixture screw to examine the needle point for damage. Be aware of the small spring, fibre washer and metal washer accompanying it.

Removal and Replacement of Fuel Pump:

If the fuel pump is removed, check the flatness of the two faces of the thick fibre spacer block beneath the pump by rubbing the faces on a flat piece of light sanding paper. We want the pump to be drawn down tight without cracking the fibre spacer and we achieve this by ensuring both faces of the fibre block are dead flat. Refit the spacer block with a gasket on each side.

When refitting the fuel pump, firstly rotate the crankshaft to where the fuel pump **pushrod** is **at its lowest point**, minimising its exposed length. This is to prevent the pushrod being bent when the fuel pump bolts are later tightened. Should the pushrod be bent during tightening of the fuel pump, you may find it impossible to withdraw the damaged pushrod, in which case, it will require an engine disassembly to remove it from *inside* the crankcase. *Ouch!!!!*

Carburettor Cover Screws:

When removing the top cover of your carburettor, don't mix up the positions of the six securing screws. *They may not necessarily be all of the same thread standard!* They could be either 0.75mm pitch Japanese Industrial Standard (JIS) threads, or 0.8mm pitch ISO (metric) threads. Citroën used both standards! If you make an error and fit a screw with the incorrect thread into a socket, *keep using that screw in that socket!*

Should a second error be made for that socket, i.e., fitting a screw of the *original* thread, it will usually require a helicoil repair! You might be lucky with one error but rarely with two!

Further, the thread depths (socket depths) of the six sockets aren't all the same. Ensure the screws are long enough to use all the available thread depth, but no longer! Refer to the writer's article, 2CV Carburettor Cover Screws.

Note that the top cover securing screw which does double duty to hold the choke cable mounting bracket is too short by about 7mm. As a result, the thread in this socket is prone to being stripped when the screw is tightened. This screw needs to be approximately 22mm long, the longest of the six screws!

New Dual Choke Carburetors:



Fig. 7-2

The writer purchased two brand new Burton-branded “Solex 26-35 CSIC” dual-choke carburetors with 18mm/26mm chokes. These are manufactured by Burton as engineering-perfect, copy-perfect replicas of the genuine Solex. (These are not refurbished Solex carburetors.) An extraordinary manufacturing effort! See Fig. 7-2 at left, courtesy of Burton Car Company. Following their manufacture, assembly and adjustment, each carburettor is fitted to a 2CV engine test bed driving a dynamometer and cycled through the full range of throttle openings, engine RPMs and engine loadings to confirm the carburettor is performing correctly.

The new Burton carburetors are operating *perfectly* in the writer's 2CVs. A highly recommended solution for a worn 30+ year-old 2CV carburettor. Even better, your old carburettor doesn't have to be surrendered for return of a deposit. The new carburetors have the Burton part number A1.1151.

Primary Choke Main Jet:

The primary choke main jet, Fig. 7-3 below, fitted by Citroën to the final production Solex 26-35 CSIC carburetors (18mm/26mm choke sizes and metal tag number 225) is of size 1.025. This is a little undersized for the task but was a concession made by Citroën in meeting the emerging global emission standards at the time. Some years ago the writer replaced the original 1.025 jets in both 2CVs with 1.05 size, which successfully removed most if not all of the slight hesitation and surging often encountered with small throttle openings on light loads with the standard 1.025 jet.

After receiving the new Burton carburetors, the writer changed the primary choke main jets to 1.05 to achieve these beneficial results.

The penalty for changing the jet size from 1.025 to 1.05 is around five percent increase in fuel consumption or a five percent reduction in fuel tank range. A thoroughly recommended change which greatly improves the driving comfort and flexibility of the 2CV at low RPMs.

Fig. 7-4 below shows the brass cap and copper washer which provide screwdriver access to the primary choke main jet. Fig. 7-5 below shows the tip of a screwdriver inserted inside the orifice which holds the jet (after the brass cap and washer were removed). Figs. 7-4 and 7-5 are of the new Burton-branded carburetors.



Fig. 7-3



Fig. 7-4

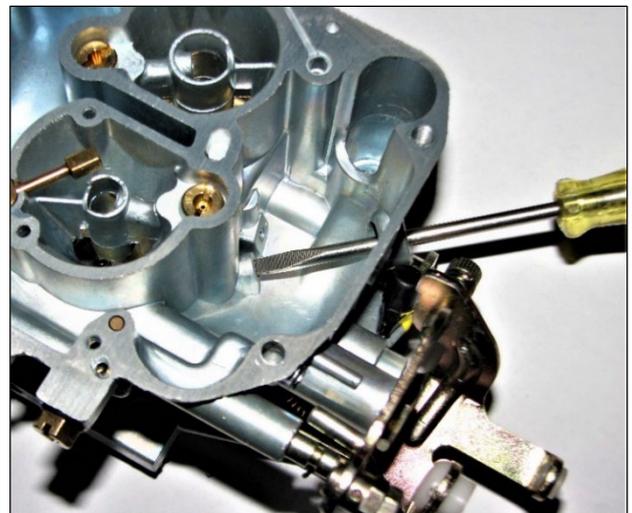


Fig. 7-5

Special Screwdriver:

The primary choke main jet, Fig. 7-3, is physically small at around 7mm long and 4mm in diameter. It's easy to damage if a standard screwdriver is used to remove and replace it. The writer recommends using a screwdriver which has been specially prepared for the job. It has a tip thickness which completely fills the slot in the jet, with vertical (i.e. parallel) faces, per the profile shown in Fig. 7-6 below, and with a tip width which is just a smidgeon less than the width of the orifice holding the jet.

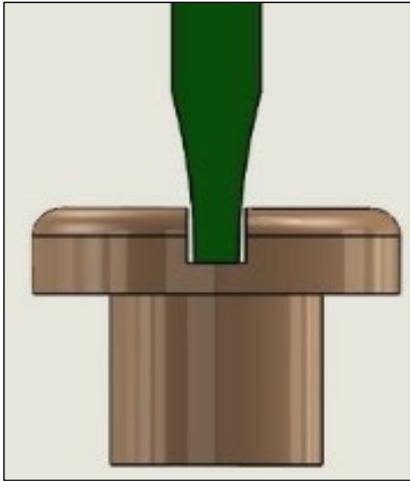


Fig. 7-6

In other words, the screwdriver tip should provide a wall-to-wall, end-to-end fit in the slot of the jet, with its sides parallel, with next to zero side or end clearance.

The goal is to remove *any* looseness of the screwdriver tip in the slot by *completely filling the space in the slot*. No looseness means the turning forces are spread evenly over the side faces of the slot in the jet to the maximum extent possible, and the screwdriver tip won't be forced out of the slot by the forces/action at the tapered faces of a standard screwdriver. (In a similar vein, the standard Phillips head screwdriver is also subject to this action because of cam action at the flutes of the blade.)

The standard (i.e., unmodified) screwdriver is *a destructive tool when applied to carburettor jets*. Using a tool as discussed above means no surprises and no marred, damaged jets. A much better tool for the job!

The writer's special screwdriver started life as the common Stanley yellow-handle flat (plain) type with a shaft length of 115mm and a tip width of 4mm. The tip thickness was ground to achieve parallel faces, matching the profile shown in Fig. 7-6, but with even less side clearance than that shown. Yes, a sliding fit only!

Then, the width of the tip was ground down until it just fits inside the carburettor orifice holding the jet. The aim is to have both faces of the screwdriver parallel and of a thickness which results in a snug fit in the jet slot. *Set the screwdriver aside for this task only.*

Carburettor Float Heights:



Fig. 7-7

Check/set the positions of the floats in the Solex 26/35 CSIC (18/26mm chokes) carburettor with metal plate number 225 so they do not bind on the side walls of the float chambers. Refer to Fig. 7-7 at left. Only one float is shown, but it applies similarly to each float.

Firstly, a warning: Don't apply *any force whatsoever* between the plastic floats and their attached metal arms, as doing so can result in the floats being broken off the arms. As any repair is likely to be problematic at best, the float assembly will need to be replaced!

Set each float as follows:

Firstly, ensure each float is nominally centred left-to-right over the cut-out in the gasket below the float. From the camera angle in Fig. 7-7, you will (just) see small clearances between the sides of the black float and the grey edges of the gasket cut-out, i.e., the white strips on each side of the float.

(The white strips are reflections from the flash.) The metal mounting arm needs to be adjusted a little so the float is moved to the left to equalise the white space on the sides.

Secondly, the flat side of the float should be parallel to the edge of the gasket cut-out. In the figure, the metal mounting arm needs to be adjusted a little until the flat face of the float (on the left) is parallel to the left edge of the gasket cut-out. It's currently at a small counter-clockwise angle to it.

Thirdly, the float should be rising up vertically out of the page, i.e. its flat side in the figure should be vertical to the gasket. In the figure, it appears to be correct.

The next step is to check/set the float heights.

Setting the Float Heights:

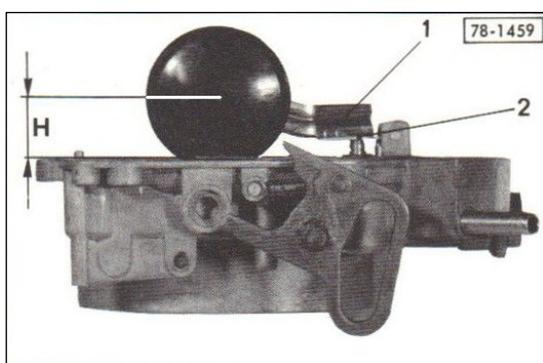


Fig. 7-8

After the floats are optimally positioned per the previous steps, the last step is to check/set the float heights. Per Citroën's specifications, the centre of each float, usually marked with a dot or dimple in the centre of the curved outer face, is required to be 18mm *above the gasket surface*, shown as measurement H in Fig. 7-8 at left, with the carburettor top cover inverted (i.e., with the floats uppermost) and the gasket in place.

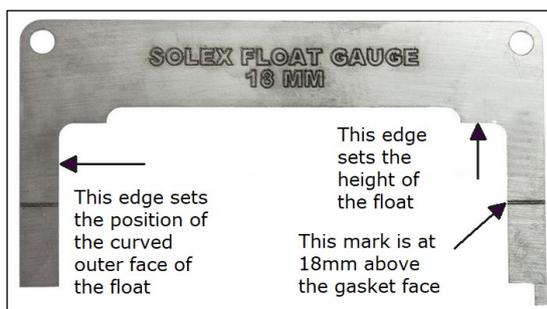


Fig. 7-9

Not all floats are marked with a central dot or dimple, and for these, a float height gauge, per Fig. 7-9 at left, may be used. (This particular float height gauge also includes height markers at 18mm for setting the float height H in Fig. 7-8 for floats which have the central dot or dimple.)

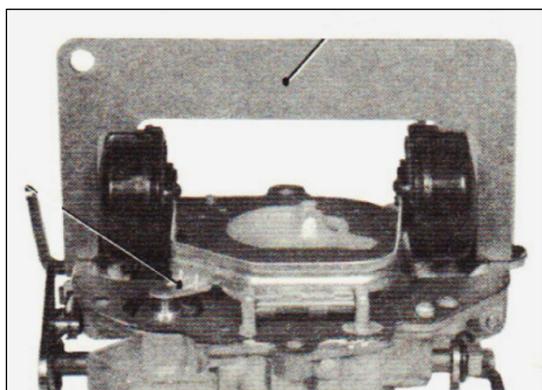


Fig. 7-10

Fig. 7-10 at left demonstrates the float height gauge in use, looking square on at the left float. The gauge is useful in setting the sideways positioning of the floats, i.e., for their correct positioning in the fuel bowls, as well as setting the height of the floats, all with the one gauge.

Carburettor Choke Vacuum Actuator Adjustment:

This information is sourced from the website maintained by **Norbert Heinz** with full acknowledgement and grateful appreciation. It's used here with permission.

The website is located at: http://www.entmontage.de/vergaser_e.htm

At the website, click on the *Subject Index* button for the list of available articles.

The writer encourages the reader to visit this site. It's freely accessible and is a large resource of information for 2CV owners. Thank you Norbert.

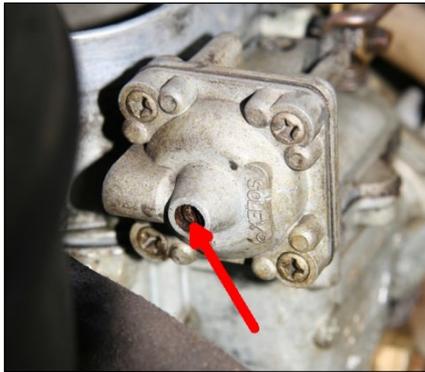


Fig. 7-11

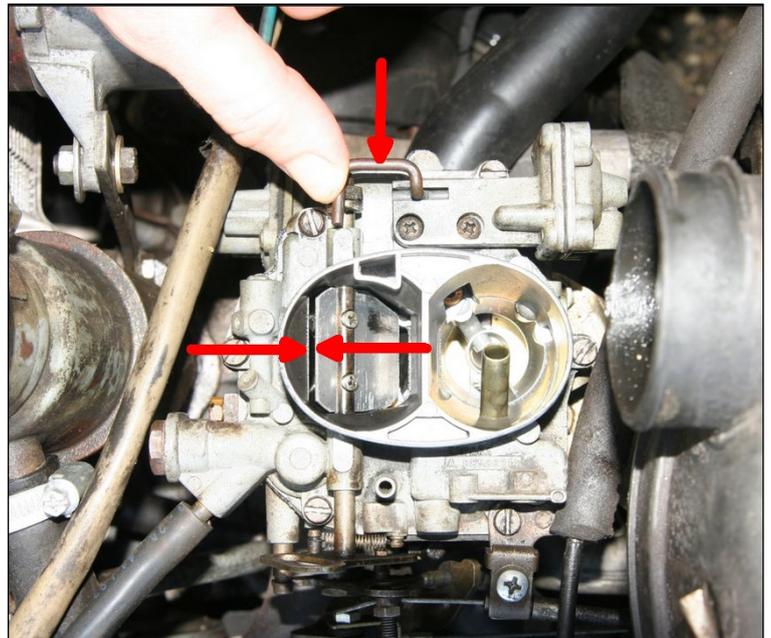


Fig. 7-12

The Choke Vacuum Actuator:

The choke vacuum actuator assembly on the twin-choke carburettor is shown in Fig. 7-11 above, its diaphragm cover secured by four screws. The central screw (arrowed) is the vacuum actuator adjusting screw. The purpose of the actuator is to open the choke plate slightly to lean the mixture once the engine starts from a cold start with a full choke, assisting in a smooth idle with the choke full on. This occurs by the engine inlet manifold vacuum acting on the diaphragm, which moves the choke plate via the hook shown at the upper red arrow in Fig. 7-12. The actuator assembly is shown at upper right in Fig. 7-12.

Adjustment of the Choke Vacuum Actuator:

1. With the engine off, pull the choke fully on.
2. Push the hook fitting from the vacuum actuator, shown in Fig. 7-12 at the upper red arrow, fully to the right (rearwards) and hold it there.
3. Measure the width of the opening between the tips of the two lower red arrows, i.e., the distance between the top edge of the choke plate and the adjacent fixed section of the choke wall. The width of the opening should be 1.5 to 2.0 mm. A small steel rule placed across the top of the carburettor when looking directly downwards from above will assist. As the measurement is relatively small and the ruler is sitting a little above the gap being measured, be mindful of parallax error. If the opening width is not correct, adjust the vacuum actuator adjusting screw and repeat steps 2 and 3 until correct.

Some Parts used by the writer:

These are offered as suggestions only. Available from various suppliers.

Burton branded “Solex” 26/35 CSIC carburettor. Burton PN A1.1151. The perfect solution to fixing carburettor wear problems.

Carburettor 1.05 primary choke main jet. Burton PN A1.1221. (Replaces the standard 1.025 jet).

Carburettor thick spacer. Burton PN A1.1133 or Der Franzose PN 10022.

2 x carburettor spacer gaskets. Der Franzose PN 10026 or Burton A1.1176. Fit one on each side of thick spacer. Ensure correctly orientated (note the right-angle corner). Rubber fuel hoses and hose clamps between the carburettor and the fuel pump, the fuel pump and the fuel filter, and the fuel filter and the end of the plastic fuel line from the tank.

Rubber fuel hose and hose clamps between the fuel tank outlet spigot and the start of the plastic fuel line. I used two hose clamps at each end of this hose section. – just to be sure!

Fuel hose is Burton PN A1.1125. Buy by the metre.

Fuel sender. Burton PN A1.1145 or Der Franzose PN 14346.

Fuel sender rubber gasket. Burton PN A1.1144 or Der Franzose PN 14135.

Accelerator cable RHD. Burton PN A1.3304 or Der Franzose PN 10155.

Throttle return spring. Burton PN A1.1159 or Der Franzose PN 10477.

Fuel hose clamps. ABA Mini 12/9W4 (11.5-13.0 mm). Pack of 15. These don't damage the rubber hose like every other hose clamp does! (One of my articles.) Local suppliers.

Fuel filler rubber joiner. Burton PN A1.1128 or Der Franzose PN 16104. Joins filler pipe to tank.

Fuel pump. Burton PN A1.1104 or Der Franzose PN 10172. *Turn the crankshaft to make sure the pushrod is fully recessed before fitting bolts to prevent bending pushrod.*

Fuel pump thick spacer. Der Franzose PN 10108 or Burton PN A1.1106.

2 x fuel pump spacer gaskets. Der Franzose PN 10616. One on each side of thick spacer.

Fuel filter as required.

3. GEARBOX AND DRIVE SHAFTS

Gear Lever Adjustment:

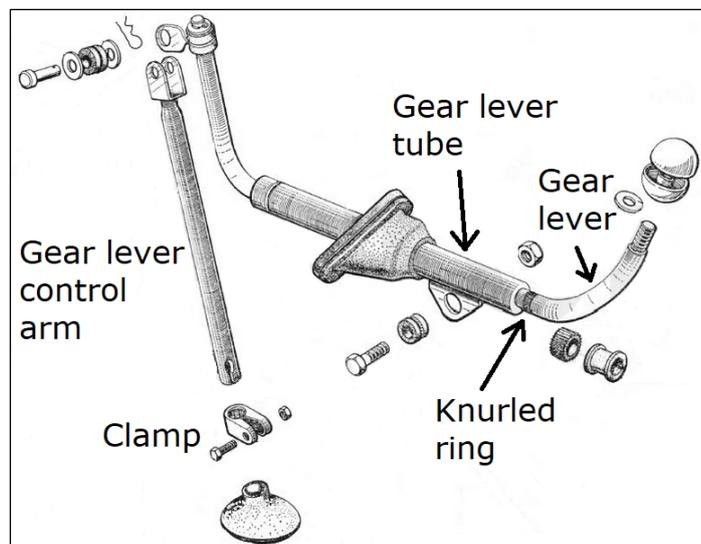


Fig. 8-1 Gear Lever Arrangement

If you find your 2CV gear changes aren't as smooth, positive and clean as they were once, it's very likely due to unintended slippage between the gear lever control arm, shown in Fig. 8-1 at left, and the gearbox selector stub, shown in Fig. 8-2 below. The selector stub fits inside the bottom of the control arm, and both items are intended to be firmly locked together by the clamp, nut and bolt shown in Fig. 8-1. Any slippage or looseness at this connection point will result in the symptoms reported above.



Fig. 8-2

Any error in their relative positioning can be readily checked/corrected by firstly placing the gearbox in **neutral**, then loosening the nut and bolt on the clamp. Adjust the position of the gear lever so that the knurled ring on the gear lever shaft, shown in Fig. 8-1, is **just fully visible** at the opening of the gear lever tube as shown. Then, while ensuring the gear lever does not move, tighten the nut and bolt on the clamp.

The knurled ring in that position is also quick confirmation that the gearbox is in neutral.

Adding Oil to the 2CV Gearbox:

Before adding oil to the 2CV gearbox, it is important that the vehicle is sitting on level ground. Add oil to the oil filler port until it *just* overflows, then allow it to stand long enough so *all excess oil* can drain/drip out of the filler port to the very last drop before fitting the oil filler plug. Too much oil in the gearbox can cause difficulties in engaging gears because the synchromesh may be rendered inoperative. (Haynes Manual, page 76).

Fitting a Reversing Light Switch to the Gearbox:

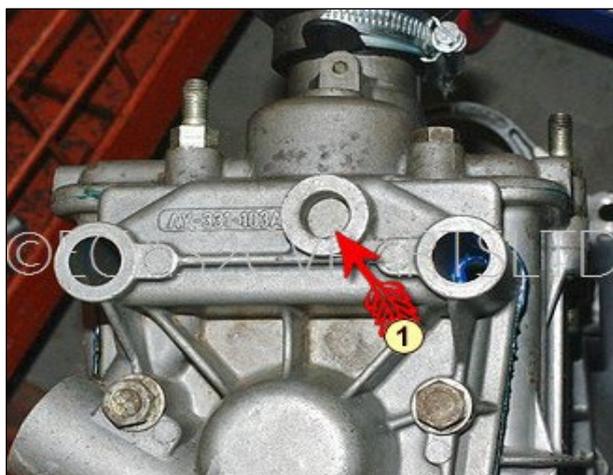


Fig. 8-3

The ideal mounting location to fit a switch to activate the reversing light when reverse gear is selected is the gearbox backplate, as intended by Citroën. Citroën supplied two types of backplates. If you have the later backplate, shown in Fig. 8-3 at left, it has a moulded round boss shown by the red arrow. This can be drilled and tapped with an M14 x 1.5 thread to take the reversing switch. More below. This mounting location provides foolproof, problem-free operation of the reversing switch because the switch is activated by the end of a gearbox selector shaft whenever the gearbox is put into reverse.

If you have the earlier backplate, it will not have the moulded boss and is unable to be tapped to fit the switch. The backplate will need to be replaced with a later backplate.

Fig. 8-4 below shows the later backplate with the reversing switch and spacer fitted. Fig. 8-5 below shows a closeup of the boss, spacer and switch. Fig. 8-6 below shows the reversing switch, metal spacer and copper washer, ready to be fitted. Don't forget the spacer!

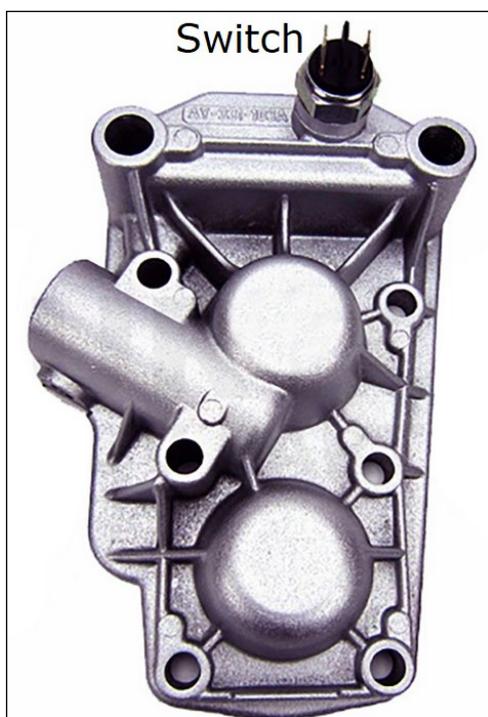


Fig. 8-4

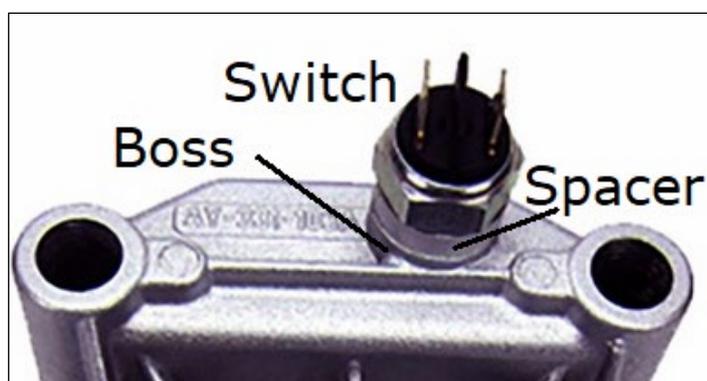


Fig. 8-5



Fig. 8-6 Reversing Light Switch

Some Parts used by the writer:

These are offered as suggestions only. Available from various suppliers.

Gearbox mount. Burton PN A1.5917.

Gear linkage joint set. Burton PN A1.5930.

Gearbox drain plug with magnet. Burton PN A1.4346.

Gearbox filling plug. Burton PN A1.4345. Don't overtighten!

2 x drain/filling plug copper gasket. Burton PN A1.4347 or Der Franzose PN 10001.

6 x neoprene driveshaft boots and metal clamps set. Burton PN A1.0118. These are very well made. (Buy some extra metal clamps of each size!) The original clamps were Ligarex straps. Some people use cable ties in place of the metal clamps or Ligarex straps.

4. IGNITION

Burned or Damaged Points:

If your 2CV suffers from burned and damaged points, it's highly likely the points capacitor (a.k.a. condenser) has failed and needs to be replaced. The capacitor is heavily stressed in points ignition systems. Always fit a new capacitor when new points are fitted.

Easier still? Fit an electronic ignition system then promptly forget all about it for a very long time!

Electronic Ignition for the 2CV:

Disclaimer: This information is provided for the reader's understanding of the purpose and benefits of electronic ignition systems in general, and why electronic ignition systems offer benefits over the points ignition system which is standard in the 2CV. Electronic ignition systems for the 2CV are available from a range of manufacturers, as an internet search will confirm. This is not intended as an infomercial for the family of products manufactured by the company **123 Ignition**.

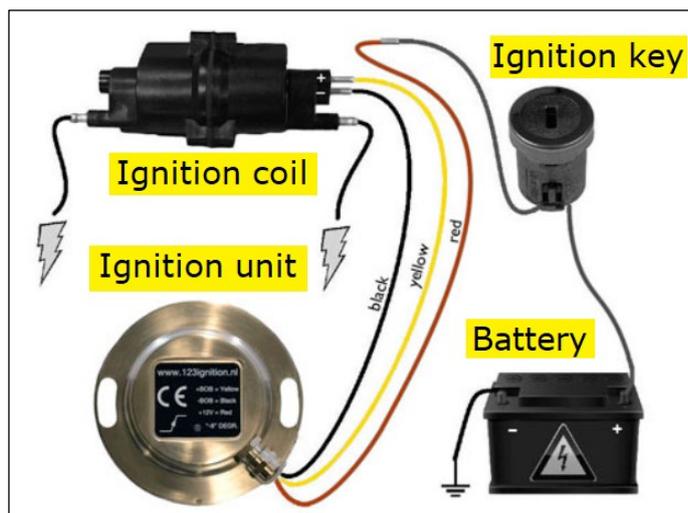


Fig. 9-1 Example of an electronic ignition system for the 2CV

Electronic ignition systems are a popular choice for classic car owners looking to improve the performance and reliability of their engines. They offer a number of benefits over traditional points ignition systems, including a longer life and little to no maintenance.

Points Ignition vs Electronic ignition:

An electronic ignition system is a modern alternative to the traditional points ignition system which was used in internal combustion engines for many decades.

One key difference between the two is the use of electronic parts to control the ignition process, rather than mechanical parts such as contact points, springs and cams.

The key advantages of electronic ignition is the increased reliability and the maintenance-free operation. With no mechanical parts to wear out or become out of adjustment, an electronic ignition system can provide consistent ignition timing for the life of the vehicle. This can result in improved fuel efficiency and overall engine performance. The fully electronic ignition design also allows for precise control of the ignition timing and spark strength, resulting in a smooth-running engine and improved performance.

In contrast, a points ignition system relies on physical components which do wear out or become out of adjustment over time. These parts require regular maintenance and adjustment to ensure proper ignition timing is achieved during the life of the vehicle. In addition, points ignition systems are more prone to failure or malfunction due to the mechanical nature of their components.

Some electronic ignition systems feature adaptive coil current, which maintains constant ignition coil current at all engine speeds. This ensures that the spark remains strong and consistent from low to high RPMs. The adaptive coil current technology helps to improve engine performance by ensuring that the spark is always of optimal strength.

Some electronic ignition systems feature spark balancing, which guarantees consistent timing for each cylinder, with a deviation of less than perhaps 0.5° of crankshaft rotation. This means that the spark plugs will ignite the fuel at precisely the same time in each cylinder, resulting in a smoother running engine with maximum power being delivered, an important benefit for 2CV owners!

Waterproofing the 123 Ignition:

If your 2CV is fitted with a **123 Ignition** unit, its manufacturer advises the unit can be made completely waterproof by applying silicon sealant around the inner and outer edges of the circuit board, the edges of the LED and around the wires where they exit from the unit. With this done, you'll be able to drive your 2CV through those six feet deep RAID water crossings. Um, well, maybe not quite that deep...!

2CV Ignition Timing Mechanical Advance Characteristics:

Part 2 of this article includes the ignition timing mechanical advance characteristics for the 2CV engine in the Citroën Data section, per pages 53-54 of the Citroën Repair Manual Part 1 for the M28/1 engine with camshaft Advance Curve C and initial (static) advance of 8° BTDC (Before Top Dead Centre). This shows the plots of the camshaft RPM vs mechanical advance in degrees for the ignition timing.

For the engine type M28/1, at the maximum throw-out RPM (1500 camshaft RPM), when the points cam is rotated anti-clockwise (advanced) by 12.5° with respect to the *camshaft*, the engine ignition timing with respect to the *crankshaft* has been advanced by 25° at 3000 crankshaft RPM, for a total ignition timing advance of $8^\circ + 25^\circ = 33^\circ$ BTDC at 3000 crankshaft RPM.

As background, the camshaft turns at half the crankshaft speed, so 12.5° of advance with respect to the camshaft translates to 25° of advance with respect to the crankshaft. Because the engine static timing at the crankshaft is set to 8° BTDC, which is also the idle RPM, the total (effective) ignition timing advance being applied with respect to the crankshaft at the maximum throw-out position of the centrifugal weights is therefore $8^\circ + 25^\circ = 33^\circ$. Thus, the spark plugs fire when the crankshaft is positioned at 33° BTDC at the RPM of maximum timing advance, which is 1500 camshaft RPM or 3000 crankshaft RPM. At crankshaft RPM greater than 3000, the maximum mechanical (centrifugal weight) advance remains at 25° , set (limited) by limit stop tabs.

When electronic ignition is fitted to the 2CV, the engine mechanical advance timing characteristics are often incorporated into the design of the electronic ignition unit, doing away with the need for the mechanical springs and weights, which are removed from the vehicle.

5. STEERING, SUSPENSION AND WHEEL HUBS

Shock Absorber Mounting Nuts:

At all times, before tightening up the shock absorber mounting nuts, position the vehicle on flat level ground with the mounting nuts backed off. Then, after checking the vehicle height settings are correct, tighten the shock absorber nuts. Tightening the nuts with the vehicle lifted off the ground may result in the shock absorber inner metal mounting bushes being ripped away from the rubber bushes during vehicle operation. \$\$Ouch!!

Wheel Bearings:

If wheel bearings are replaced, don't use Locktite on the threads of the bearing retainers and don't peen the bearing retainers into the hub assemblies! You may have great difficulty removing them next time, often necessitating them needing to be cut out!

2CV Height Adjustment:

Citroën provides specifications for the vehicle height. The height of the 2CV chassis from ground is adjusted by rotating the suspension tie-rods in their suspension tie-rod eyes. The suspension tie-rods have a flat section which will take a 9mm spanner. However, the tie-rods are usually *very* tight in the eye fittings, and it's *very* easy to round off and destroy the flat sections on the tie-rods as you try to turn them with a standard 9mm spanner.

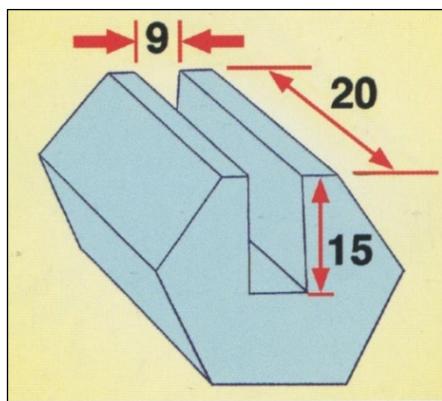


Fig. 10-1

The safest way to adjust the suspension tie-rods is to use a tool designed for the job such as the one shown in Fig. 10-1 at left. The writer used hex steel section of 25mm across the flats. Ensure the sides of the 9mm slot are **perfectly** parallel and the slot is **exactly** 9mm wide. You don't want any looseness in the fitting. Fit the tool over the 9mm flat section on the suspension tie-rod and rotate the tool with a spanner. A further advantage of this tool is that it doesn't matter where you decide to stop the adjustment because you'll always be able to remove the spanner and the tool from the suspension tie-rod.

Burton also has a similar tool available as part number A1.2719, made from hex steel section of size 22mm across the flats.

(Fig. 10-1 was sourced from page 112 of the book *How to Restore Citroën 2CV* by Lindsay Porter from Veloce Publishing, with acknowledgement and grateful appreciation.)

Track-Rod-End Ball Joints:



Fig. 10-2 (Courtesy of Norbert Heinz)

Fig. 10-2 on left shows the parts which make up the track-rod-end ball joints at the front wheels. *Missing from the figure is the split pin.* As noted above, replace the grease in the ball joints every five years with a high-shock-loading grease such as Castrol Spheerol LMM.

When replacing the rubber boots, fitting the boot is much easier if the track-rod end (in white) is held in a vice with the ball upright, the ball lubricated with a smear of rubber grease and the boot pushed over the ball via the opening in the bottom of the boot. It feels a little tight but it will pass over the ball.

With the boot on the track-rod end, push an open end of boot onto the outer end of the track-rod end, stretching the rubber gently but sufficiently to allow the ball to be positioned below the track-rod end housing and then allow the ball to move upwards into the opening in the bottom of the housing. Position the rubber boot fully on the housing.

6. OPERATION

Closing off unwanted hot air:

When the heater temperature control lever is in the Cold position, hot air may still make its way into the cabin through the ducted air vents in the firewall. This happens because of poor sealing of the metal flapper valves inside the heat exchangers on the engine exhaust pipes. This can make for very uncomfortable travel in the summer period. You may wish to seal off the floor ducts during summer to keep the hot air leakage away from feet and legs. An old foam rubber car wash sponge can be sacrificed to make two rubber bungs to insert in the vents to close them off. Job done. Store in the boot when not used.

WARNING: If you do fit the rubber bungs, **NEVER move the temperature control lever away from the full Cold position** while the engine is operating. *Doing so will reduce the air flow through the engine cowling, heads and barrels, leading to engine overheating and potentially its destruction.* In fact, at the full Hot position, when all the engine air flow would normally be directed into the cabin, then if the rubber bungs are in place, there will be no air flow into the cabin, meaning there will be **NO** air flowing over the barrels and heads to cool the engine. It will only be a short time before the engine seriously overheats and very likely seizes.

The writer's hugely technical solution? Tie a small loop of string around the temperature control lever and the heater panel to ensure the temperature control lever remains on full Cold, acting as a reminder not to move it off Cold until the bungs are removed!

The rule: Fit the bungs? Fit the string. Remove the bungs? Remove the string.

Illumination of Oil Pressure Warning Light:

If the oil pressure warning light illuminates while driving, the engine should be turned off **immediately** to prevent damage. **Every second** of engine operation after the light illuminates *rapidly propels the engine towards its demise*. By the time you experience a possible loss of engine power or notice any engine noises or smells, it may already be too late for the engine to recover. Of course, the 2CV engine is not unique in this regard.

Refer to the writer's article: 2CV LOW OIL PRESSURE BEEPER AND LIGHTS ON BEEPER.

Fitting a Roof-Mounted Tent to the 2CV:

The writer received an email from a 2CV owner interested in fitting a roof-mounted tent to a 2CV. The owner provided links to two possible tent options and sought the writer's advice on their suitability for fitting to the 2CV. He was interested in the weight and load-bearing parameters and the suitability of the tent being carried on a 2CV roof.

Here's one example of a small **Roof-Mounted Tent**. A web search shows many options.

The writer's advice was as follows:

The tent manufacturer has presumably done the necessary engineering analysis and design to establish and manage the parameters of weight, strength, attachment mechanisms, loads, forces, limits, risks, safety margins, liabilities and relevant Australian standards. The tent must also comply with Australian consumer law.

Further, there should be no impact on the vehicle's comprehensive insurance policy or compulsory third party insurance policy by fitting the selected tent to the vehicle.

Before any selection of a product is decided on, the writer suggests the first step should be to seek advice from the tent manufacturer to confirm the suitability of the product's fit with the 2CV. The onus for that rests solely with the Australian manufacturer (or the importer/distributor for products manufactured overseas), and if confirmatory advice is not forthcoming, suggest you search for another product. All other advice is personal opinion or anecdotal, neither of which can be relied upon for legal liability, insurance and statutory purposes! Also, because an item is being sold in the market does not guarantee its compliance.

Similar considerations would apply if wishing to purchase a trailer and towing fitting for the 2CV.

Speedometer Needle Fluctuations:

If the speedometer needle tends to show an oscillation or "wobble" during driving, the most likely cause is a worn speedo cable. Replace the cable with one of the same length.

7. SOME SPECIFICATIONS

Two fundamental conversion constants:

These are drawn from: [https://en.wikipedia.org/wiki/Pound_\(mass\)](https://en.wikipedia.org/wiki/Pound_(mass)):

In 1959, international agreement was reached for **exact** conversions between imperial and metric units of length and weight. **These are not approximations!**

Length: 1 yard = 0.9144 m **exactly** (The genesis of 1 in = 25.4 mm)

Weight: 1 pound = 0.45359237 Kg **exactly** (The genesis of 1 oz = 28.349523125 g!)

Common Terms for Common Torque Units:

Kg-m is the commonly used term for Kgf-m (f = force)

ft-lb is the commonly used term for ft-lbf (f = force)

Torque Conversions: 1 Kg-m = 9.81 N-m = 7.23 ft-lb

The Citroën repair manual also uses **da Nm** = Deca Newton-metre = daN-m, where 1 daN-m = 10 N-m.

Citroën 2CV Torque Settings:

The torque settings and page references below are from the Citroën repair manual:

2CV Repair Manual 8161 Volume 1 – Characteristics Adjustments Checks – OCT 1983

Page references are the sequential PDF page numbers, not the repair manual sectional page numbers.

Gearbox Output Hub Nut x 6: 27.4 – 30.3 ft-lb

(for vehicles fitted with the gear lever on the upper cover – the later gearbox): (page 77)



Differential Shaft Lock Nut: 72.2 – 144.4 ft-lb

(for vehicles fitted with the gear lever on the upper cover – the later gearbox): (page 77)

(This figure is stated as 86.64 – 91.08 ft.lb on page 115, but as that is in the Brakes section, 90 ft.lb would be a safe figure to use either way!)



Gearbox Output Hub Ring Nut: 43.2 – 72.2 ft-lb

(for vehicles fitted with the gear lever on the upper cover – the later gearbox): (page 77)



Brake Disc Securing Bolt x 6: 32.4 – 36.1 ft-lb

(page 119)



Some Other Torque Settings:

Brake Line Nuts:	5.8 – 6.5 ft-lb (page 16)
Flywheel to Crankshaft Securing Bolt x 5:	28.8 – 32.5 ft-lb (page 32)
Engine oil drain plug:	25.27 – 32.49 ft-lb (page 32)
Cylinder Head Nut x 3:	14.4 – 16.6 ft-lb (page 33)
Intake-Exhaust Manifold Bolts and Nuts:	13.7 ft-lb (page 33)
Rocker adjusting nuts x 2:	10 – 13.7 ft-lb (page 35)
Fan Bolt:	36 – 43 ft-lb (page 36)
Oil Cooler union x 2:	7.2 – 10 ft-lb (page 36)
Clutch Mounting Bolt x 6:	7.2 – 9.4 ft-lb (page 68)
Gearbox oil <i>drain</i> plug:	25.27 – 32.49 ft-lb (page 77)
Gearbox oil <i>filler</i> plug:	7.22 – 10.83 ft.lb (page 77)
Front Wheel Hub Bearing Ring Nut:	252 – 288 ft-lb (page 89)
Front Wheel Hub Castle Lock Nut:	252 – 288 ft-lb (page 89)
Wheel Nuts:	28.8 – 43.3 ft-lb (page 89)
Rear Wheel Hub Bearing Ring Nut:	252 – 288 ft-lb (page 95)
Rear Wheel Hub Nut:	252 – 288 ft-lb (page 95)
Brake Caliper Mounting Bolt x 2:	32.4 – 36.1 ft-lb (page 119)
Brake Caliper Eccentric x 2:	28.8 ft-lb (page 119)
Oil union (Banjo) bolts x 3:	1.2 – 1.3 Kg-m (8.67 – 9.4 ft-lb) (Vol. 2 page 20)

Engine Oil Pressure:

Engine oil pressure for M 28 and M 28/1 engines at 80°C is 5.5 – 6.5 bar (79.7 – 94.2 psi)
(Citroën manual page 35).

Oil Pressure Switch Operation:

The oil pressure switch operates in the range of 0.5 – 0.8 bar (7.2 – 11.6 psi)
(Citroën manual page 35).

Crankcase Vacuum (using water manometer):

Minimum of 50 mm at idle.

The vacuum should never fall to zero at any engine speed.

(Citroën manual page 62).

(For reference, the vacuum was 250mm for the writer's two new engines with new oil breathers.)

Brake Pedal Free Play:

Adjust for 5mm of free play at the pedal rubber.

(Citroën manual page 115: G = 5mm)

8. CITROËN DATA

Identification of "A" Vehicles	-	1 page
Vehicle Data	-	3 pages
Engine Data	-	2 pages
Carburettor Data	-	2 pages
Ignition Data	-	2 pages

IDENTIFICATION OF « A » VEHICLES, ALL TYPES

(Vehicles as of 1963)

Usual name	Official symbol	Factory guarantee symbol *	Commercial symbol	Engine plate identification mark	Engine type
2 CV	AZ (series A and AM) 3/63→2/70	AZZ	2 CV AZL and 2 CV AZAM 2 CV 4 2 CV 4 2 CV Spécial 2 CV 6 2 CV 6 2 CV 6 Spécial, Club 2 CV Spécial or Club or Spécial E or Charleston	AZ	A 53 (425 cc)
	AZ (series A 2) 2/70→9/75	AZA		AYA 2	A 79/1 (435 cc)
	AZ (series KB) 9/75→9/78	KB		AYA 2	A 79/1 (435 cc)
	AZ (series KB) 9/78→9/79	KB		AYA 2	A 79/1 (435 cc)
	AZ (series KA) 2/70→9/78	KA		AK 2	M 28/1 (602 cc)
	AZ (series KA) 9/78→7/79	KA		A 06/635	M 28/1 (602 cc)
	AZ (series KA) 7/79→7/81	KA		A 06/635	M 28/1 (602 cc)
AZ (series KA) 7/81→	KA	A 06/635	M 28/1 (602 cc)		
DYANE	AYA (series A and AM) 8/67→3/78	AZZ	Dyane 4 Dyane 6 Dyane 6	AYA	A 79/0 (425 cc)
	AYA 2 (series A and AM) 3/68→2/70			AYA 2	A 79/1 (435 cc)
	AYA3 (series A and AM) 1/68→10/68	AM		M 4 (602 cc)	
	AYB (series A and AM) 10/68→2/70	AK 2		M 28/1 (602 cc)	
	AYA2 (series A and AM) 2/70→9/75	AYA 2		A 79/1 (435 cc)	
AY (series CB) 2/70→	CB	AM 2	M 28 (602 cc)		
MEHARI	AY (series CA) 10/68→7/78	CA	Méhari	AK 2	M 28/1 (602 cc)
	AY (series CA) 7/78→	CA	Méhari	A 06/635	M 28/1 (602 cc)
2 CV Van	AZU (series A) 3/63→8/72	AZZ	AZU 1/63→8/67 AZU 8/67→8/72 Citroën 250 Citroën 250	AZ	A 53 (425 cc)
	AZU (series B) 8/72→9/75	AZU		AYA	A 79/0 (425 cc)
	AK series AP (AZU) 9/75→2/78	AZU		AYA 2	A 79/1 (435 cc)
3 CV Van	AK 1/63→5/68	AZZ	AK AK Citroën 400 Acadiane Acadiane L.P.G.	AM	M 4
	AK (series B) 5/68→8/70			AK 2	M 28/1 (602 cc)
	AK (series AK) 8/70→2/78	AK		M 28/1	
	AY (series CD) 2/78→	CD		AM 2 A	M 28/1 (602 cc)
	AY (series CD modified) 8/80→	CD		AM 2 A L.P.G.	M 28/1 (602 cc)
3 CV Saloon and Estate	AM → 5/68	AZZ	AMI 6 AMI 6 Estate AMI 6 AMI 6 Estate AMI 8 AMI 8 AMI 8 Estate/Commer. AMI 8 Service Estate	AM	M 4
	AMB - AMC - AMF			AM	M 4
	AM 2 - AMC - AMF 5/68→3/69			AM 2	M 28
	AMB 2 5/68→7/69			AM 2	M 28
	AM 3 3/69→7/69	AM 2		M 28	
	AM (series JA)	JA		M 28	
	AM (series JB)	JB		M 28	
	AM (series JC)	JC		M 28	

* All vehicles produced before the 1972 motor show have the factory guarantee symbol : AZZ.

Vehicles which are no longer commercialized.

SALOONS

	All 2 CV Saloons	All Dyane Saloons	All 3 CV Saloons
Number of seats	4	4	4
Tyres : Type : { (tubeless) (export with inner tube)	125 - 380 X 135 - 380 X	125 - 380 X	125 - 380 X
Pressure in bars : { Front Rear	See Owner's Manual		
General dimensions :			
Wheel base	2.400 m (7 ft 10.4 in)	2.400 m (7 ft 10.4 in)	2.400 m (7 ft 10.4 in)
Front track	1.260 m (4 ft 1.6 in)	1.260 m (4 ft 2.6 in)	1.260 m (4 ft 2.6 in)
Rear track	1.260 m (4 ft 1.6 in)	1.260 m (13 ft 1.1 in)	1.220 m (4.00 ft)
Overall length	3.830 m (12 ft 8.3 in)	3.870 m (5 ft)	3.991 m (13 ft 1.1 in)
Overall width	1.480 m (4 ft 11 in)	1.500 m (4 ft 10.4 in)	1.524 m (5 ft)
Overall height (empty)	1.600 m (5 ft 0.6 in)	1.540 m (4 ft 10.8 in)	AMI 6 : 1.485 m (4 ft 10.4 in) AMI 8 : 1.494 m (4 ft 10.8 in)
Ground clearance (loaded)	0.150 m (5 in)	0.155 m (5.08 in)	AMI 6 : 0.160 m (5.25 in) AMI 8 : 0.130 m (4.26 in)
Turning circle	10.700 m (35 ft 1.2 in)	10.700 m (35 ft 1.2 in)	11.400 m (35 ft 4.8 in)
Kerb weight	2 CV → 2/1970 535 kg (1180 lbs) 2 CV 2/1970 → 560 kg (1235 lbs) 2 CV → 2/1970 870 kg (1918 lbs) 2 CV 2/1970 → 895 kg (1973 lbs)	See table page four	AMI 6 : 670 kg (1477 lbs) AMI 8 : 725 kg (1598 lbs)
Gross vehicle weight		See table page four	AMI 6 : 980 kg (2160 lbs) AMI 8 : 1050 kg (2315 lbs)
Towing :			
Maximum weight on tow bar	2 CV AZL : 20 kg (44 lbs) 2 CV 4 and 6 : 35 kg (77 lbs)	Dyane → 3/1968 20 kg (44 lbs) Dyane 3/1968 → 35 kg (77 lbs)	35 kg (77 lbs)
Maximum weight without brakes	2 CV AZL : 200 kg (441 lbs) 2 CV 4 and 6 : 270 kg (595 lbs)	Dyane → 3/1968 200 kg (441 lbs) Dyane 3/1968 → 270 kg (595 lbs)	AMI 6 : 340 kg (750 lbs) AMI 8 : 360 kg (794 lbs)
Maximum weight with inertia brakes	400 kg (882 lbs)	400 kg (882 lbs)	500 kg (1102 lbs)
Maximum gradient with a trailer	2 CV → 2/1970 11 % (1 in 9) 2 CV 2/1970 → 12 % (1 in 8)	12 % (1 in 8)	11 % (1 in 9)
Maximum weight on roof rack	30 kg (66 lbs)	30 kg (66 lbs)	30 kg (66 lbs)
Capacities :			
Petrol tank	2 CV AZL } 20 litres 2 CV 4 } (4.40 Imp.gal) 2 CV 6 25 litres (5.50 Imp.gal.)	Dyane 4 : 20 litres Dyane 6 : 25 litres	AMI 6 : 25 litres (5.50 Imp.gal) AMI 8 : 30 litres (6.60 Imp.gal)
Engine :			
Engine casing after draining	2 CV 4 2.3 litres (4 Imp.pts) 2 CV 6 2.4 litres (4.2 Imp.pts)	Dyane 4 : 2.3 litres (4 Imp.pts) Dyane 6 : 2.4 litres (4.2 Imp.pts)	2.4 litres (4.2 Imp. pts)
Gearbox	0.9 litres (1.6 Imp.pts)	0.9 litres (1.6 imp.pts)	0.9 litres (1.6 Imp.pts)

ESTATES and VANS

	3 CV Estate	« Mehari »	2 CV Van	3 CV Van	Acadiane 3 CV Van
Number of seats : Without rear bench-seat With rear bench-seat	Commercial Estate 2/3 « Familial » Estate 4/5	2 4	2 4	2 4	2
Tyres : Type { tubeless with inner tube	125 - 380 or 135 - 380 X	135 - 380 X 135 - 380 XM + S	135 - 380 X authorized fitting 135 - 380 X	135 - 380 X	135 SR 15 ZX For authorized fittings see owner's manual
Pressure in bars (psi) { front rear	See owner's manual				
General dimensions : Wheelbase Front track Rear track Overall length Overall height (empty)	2.400 m (7 ft-10.4 in) 1.260 m (4 ft-1.6 in) 1.220 m (4 ft) 3.991 m (13 ft-1.1 in) 1.520 m (4 ft-11 in)	2.400 m (7 ft-10.4 in) 1.260 m (4 ft-1.6 in) 1.260 m (4 ft-1.6 in) 3.520 m (11 ft-6.5 in) 1.530 m (5.00 ft)	2.400 m (7 ft-10.4 in) 1.260 m (4 ft-1.6 in) 1.260 m (4 ft-1.6 in) 3.605 m (11 ft-9.9 in) 1.723 m (5 ft-7.8 in)	2.400 m (7 ft-10.4 in) 1.260 m (4 ft-1.6 in) 1.260 m (4 ft-1.6 in) 3.805 m (12 ft-5.8 in) AK and AKB :: 1.723 m (5 ft-7.8 in) AK series AK : 1.840 m (6 ft-0.4 in)	2.535 m (8 ft-3.8 in) 1.260 m (4 ft-1.6 in) 1.260 m (4 ft-1.6 in) 4.030 m (13 ft-2.6 in) 1.825 m (5 ft-11.8 in)
Overall width Ground clearance (loaded) Turning circle Kerb weight	1.524 m (5.00 ft) 0.130 m (5.11 in) 11.400 m (37 ft-4.8 in) AMI 6 : 690 kg (1521 lbs) AMI 8 : 725 kg (1598 lbs)	1.530 m (5.00 ft) 0.177 m (6.96 in) 10.700 m (35 ft-1.2 in) 555 kg (1224 lbs)	1.500 m (4 ft-11 in) 0.180 m (7.08 in) 10.700 m (35 ft-1.2 in) See table page 4	1.500 m (4 ft-11 in) 0.160 m (6.29 in) 10.700 m (35 ft-1.2 in) See table page 4	1.500 m (4 ft-11 in) 0.140 m (5.51 in) 11.44 m (37 ft-6.3 in) 680 kg (1499 lbs)
Gross vehicle weight	AMI 6 : 1065 kg (2348 lbs) AMI 8 : 1100 kg (2425 lbs)	935 kg (2061 lbs)	See table page 4	See table page 4	1155 kg (2546 lbs)
Towing : Maximum weight on towbar Maximum weight without brakes Maximum weight with inertia brakes Maximum gradient with a trailer Maximum weight on roof rack	35 kg (77 lbs) AMI 6 : 340 kg (750 lbs) AMI 8 : 360 kg (794 lbs) 500 kg (1102 lbs) 11 % (1 in 9) 30 kg (66 lbs)	35 kg (77 lbs) 270 kg (595 lbs) 400 kg (882 lbs) 11 % (1 in 9) 30 kg (66 lbs)	35 kg (77 lbs) AZU → 2/1972 → : 200 kg (441 lbs) AZU 2/1972 → : 270 kg (595 lbs) 400 kg (882 lbs) AZU → 2/1972 : 11 % (1 in 9) AZU 2/1972 → : 12 % (1 in 8) 30 kg (66 lbs)	35 kg (77 lbs) AK → 5/1968 : 200 kg (441 lbs) AK 5/1968 → : 270 kg (595 lbs) 500 kg (1102 lbs) 12 % (1 in 8) 30 kg (66 lbs)	35 kg (77 lbs) 335 kg (738 lbs) 500 kg (1102 lbs) 12 % (1 in 8) 40 kg (88 lbs)
Capacities : Petrol tank	AMI 6 : 25 litres (5.50 Imp.gal.) AMI 8 : 30 litres (6.60 Imp.gal.)	25 litres (5.50 Imp. gal.) 25 litres 7/1971 → (5.50 Imp.gal.)	20 litres → 7/1971 (4.40 Imp.gal.) 25 litres 7/1971 → (5.50 Imp.gal.)	25 litres (5.50 Imp.gal.)	25 litres (5.50 Imp. gal.)
Engine : Engine casing after draining Gearbox	2.4 litres (4.2 Imp.gal.) 0.9 litre (1.6 Imp.gal.)	2.4 litres (4.2 Imp.gal.) 0.9 litre (1.6 Imp.gal.)	2.3 litres (4 Imp.gal.) 0.9 litre (1.6 Imp.gal.)	2.4 litres (4.2 Imp.gal.) 0.9 litre (1.6 Imp.gal.)	2.4 litres (4.2 Imp.gal.) 0.9 litre (1.6 Imp.gal.)

« DYANE »

(Vehicles produced until February 1970)

	AYA (Series A and AM) Dyane 8/1967 → 3/1968	AYA 2 (Series A and AM) Dyane 4 3/1968 → 2/1970	AYA 3 (Series A and AM) AYB (Series A and AM) Dyane 6 AYA 3 1/1968 → 10/1968 AYB 10/1968 → 2/1970
Kerb weight	<ul style="list-style-type: none"> { AYA series A Saloon = 570 kg (1257 lbs) Commercial = 585 kg (1290 lbs) { AYA series AM Saloon = 575 kg (1268 lbs) Commercial = 590 kg (1300 lbs) 	<ul style="list-style-type: none"> { AYA 2 series A and AM Saloon = 590 kg (1300 lbs) Commercial = 605 kg (1333 lbs) 	<ul style="list-style-type: none"> { AYA 3 series A Saloon = 585 kg (1290 lbs) Commercial = 600 kg (1323 lbs) { AYA series AM Saloon = 590 kg (1300 lbs) Commercial = 605 kg (1333 lbs) { AYB series A and AM Saloon = 600 kg (1323 lbs) Commercial = 605 kg (1333 lbs) AYA 3 = 925 kg (2039 lbs) AYB = 930 kg (2050 lbs)
Gross vehicle weight	910 kg (2006 lbs)	925 kg (2039 lbs)	

« DYANE »

(Vehicles produced since February 1970)

	AYA 2 (Series A and AM) Dyane 2/1970 → 9/1975	AY (Series CB) Dyane 6 2/1970 →
Kerb weight	590 kg (1300 lbs)	600 kg (1323 lbs)
Gross vehicle weight	925 kg (2039 lbs)	930 kg (2050 lbs)

« 2CV and 3 CV VANS »

	AZU (Series A) AZU (Series B) AZU (Series A) 1/1963 → 2/1972 CITROEN 250 2/1972 → 2/1978	AK AK (Series B) AK (Series AK) AK 1/1963 → 5/1968 AK (Series B) 5/1968 → 8/1970 CITROEN 400 8/1970 → 2/1978
Kerb weight	530 kg → 2/1972 (1168 lbs) 560 kg 2/1972 → (1235 lbs)	AK and AKB = 620 kg (1366 lbs) AK (Series AK) = 640 kg (1410 lbs)
Gross vehicle weight	880 kg → 2/1972 (1940 lbs) 910 kg 2/1972 → (2006 lbs)	AK and AKB = 1055 kg (2325 lbs) AK (Series AK) = 1115 kg (2458 lbs)

ENGINE

OPERATION No. A. 100-00 : Characteristics and special features of the engines.

Op. A. 100-00 ♦ 1

I. GENERAL CHARACTERISTICS.

TYPE OF ENGINE	VEHICLES
A 53 (425 cc)	AZ (Series A and AM) 3/1963 → 2/1970 AZU 3/1963 → 8/1967
A 79/0 (425 cc)	AZU 8/1967 → 8/1972 AYA (series A and AM) 8/1967 → 3/1968
A 79/1 (435 cc)	AZ (series A 2) 2/1970 → 9/1975 AZ (serie KB) 9/1975 → 9/1979 AYA 2 (series A and AM) 3/1968 → 9/1975 AZU (series B) 8/1972 → 9/1975 AK (series AP) 9/1975 → 2/1978
M 4 (602 cc)	AYA 3 (series A and AM) 1/1968 → 10/1968 AK → 5/1968 AM 10/1963 → 5/1968 AMB 10/1963 → 5/1968
M 28/1 (602 cc)	AYB (series A and AM) 10/1968 → 2/1970 AZ (series KA) 2/1970 → AY (series CA) 10/1968 → AK (Série B) 5/1968 → 8/1970 AK (series AK) 8/1970 → 2/1978 AY (series CD) 2/1978 → AY (series CD modified) 8/1980 →
M 28 (602 cc)	AY (series CB) 2/1970 → AM 2 5/1968 → 3/1969 AMB 2 5/1968 → 7/1969 AM 3 3/1969 → 9/1969 AM (series JA) 9/1969 → 9/1978 AM (series JB and JC) 9/1969 → 9/1978

Supplement No. 1 to Manual 816-1 (CORR)

Type of engine	A 53	A 79/0	A 79/1	M 4	
				AYA 3	AK - AM
Number of cylinders:		2 CV	2 (flat twin)		3 CV
Fiscal rating :					602 cc
Cylinder capacity :	425 cc		435 cc		74 mm
Bore :	66 mm		68.5 mm		70 mm
Stroke:	62 mm		59 mm		7.75 : 1
Compression ratio :	7.5 : 1	7.75 : 1	8.5 : 1		
Effective power :					
ISO :	13.2 kW (18 CV SAE) at 5000 rpm	15.5 kW (21 CV SAE) at 5450 rpm	17.7 kW (24 CV DIN) at 6750 rpm	20.6 kW (28 CV SAE) at 5000 rpm	19.1 kW (26 CV SAE) at 4500 rpm
Maximum torque					
ISO :	2.9 m.daN (2.9 m.kg SAE) at 3500 rpm	3.1 m.daN (3 m.kg SAE) at 3500 rpm	2.9 m.daN (2.9 m.kg DIN) at 4500 rpm	4.5 m.daN (4.4 m.kg SAE) at 3500 rpm	4.1 m.daN (4 m.kg SAE) at 3500 rpm

Engine type	M 28	M 28/1			
Engine plate	AM 2	AK 2	A 06/635	AM 2 A	AM 2 L.P.G.
Number of cylinders			2 (flat twin)		
Fiscal rating			3 CV		
Cylinder capacity			602 cc		
Bore			74 mm		
Stroke			70 mm		
Compression ratio	9 : 1			8.5 : 1	
Effective power					
ISO	21.5 kW (30 CV DIN) at 5750 rpm	19.1 kW (26 CV DIN) at 5500 rpm	21 kW (29 CV DIN) at 5750 rpm		18 kW (25 CV DIN) at 5000 rpm
Maximum torque					
ISO	4.1 m.daN (4.2 m.kg DIN) at 4000 rpm	4.1 m.daN (4 m.kg DIN) at 3500 rpm	3.8 m.daN (4 m.kg DIN) at 3500 rpm		3.6 m.daN (3.7 m.kg DIN) at 2500 rpm

Cooling : Forced air.

Lubrication : pressurized system supplied by an oil pump of the « EATON » type, mounted on the end of the camshaft.

- Built-in filter cartridge on M 28/1 and M 28 engines 11/1969 → 11/1970.
- External filter cartridge on M 28/1 and M 28 engines 11/1970 →

Carburation : (See table of Operation A. 142-00).

- Intake silencer : with dry interchangeable element.
- Fuel used } Super grade for M 28 engine
 } Ordinary grade for all other types of engines.

Ignition :

- Distributor on camshaft end, at the front of engine.
- Manufacturer : DUCELLIER.
- Sparking plugs : See *appropriate Technical Bulletins*.
- Firing order : 1 - 2.

Distribution :

- Camshaft below crankshaft (timing gear with self adjusting device for wear).
- Maximum run-out of the spindle for distributor = 0.02 mm (.0008 in).

**CARBURETTOR TO VEHICLE REFERENCE
TABLE**

Type of engine	Type of vehicle	Dates of production	Type of carburettor	Reference on carburettor	
				Conventional clutch	Centrifugal clutch
A 53 (425 cc)	AZ (series A and AM)	3/1963 → 2/1970	SOLEX 28 IBC * SOLEX 28 CBI or ZENITH 28 IN * ZENITH 28 IN 4	32 ¹	30 ¹
	AZU (series A)	3/1963 → 8/1967		Z 32	Z 30
A 79/0 (425 cc)	AZU (series A)	8/1967 → 8/1972	SOLEX 32 PICS *	38	39
	AYA (series A and AM)	8/1967 → 3/1968	SOLEX 32 PCIS	38	
	AYA 2 (series A and AM)	3/1968 → 2/1970	SOLEX 34 PICS 4 * SOLEX 34 PCIS 4	101	102
	AYA 2 (series A and AM)	2/1970 → 8/1972	SOLEX 34 PICS 5 * SOLEX 34 PCIS 5	101 ¹	102 ¹
	AZ (series A 2)				
	AYA 2 (series A and AM)	8/1972 → 10/1975	SOLEX 34 PICS 6 *	121	122
A 79/1 (435 cc)	AZ (series A 2)			121	
	AZU (series B)	10/1975 → 7/1976	SOLEX 34 PCIS 6	173	174
	AK (series AP) (AZU)			173	
	AZ (series KB)	7/1976 → 7/1978	SOLEX 34 PICS 10	191	
	AK (series AP) (AZU)	7/1976 → 9/1979	SOLEX 34 PCIS 10	191	192
	AZ (series KB)	1/1968 → 10/1968	SOLEX 40 PICS 3 * SOLEX 40 PCIS 3	44 ³	46 ³
M 4 (602 cc)	AYA 3 (series A and AM)		SOLEX 30 PICS		
	AK	9/1963 → 4/1964	SOLEX 40 PICS * SOLEX 40 PCIS	44	45
	AM (AMI 6)	4/1964 → 4/1967	SOLEX 40 PICS 2 * SOLEX 40 PCIS 2	44 ¹	45 ¹
		4/1967 → 5/1968	SOLEX 40 PICS 3 * SOLEX 40 PCIS 3	44 ²	45 ²
	AYB (series A and AM)	10/1968 → 1/1970	SOLEX 34 PICS 4 *	103	104
	AY (series CA)	5/1968 → 1/1970	SOLEX 34 PCIS 4	103	104
M 28/1 (602 cc)	AK (series B)			103	
	AYB (series A and AM)	1/1970 → 2/1970	SOLEX 34 PICS 5 * SOLEX 34 PCIS 5	103 ¹	104 ¹
	AY (series CA)	1/1970 → 8/1972		103 ¹	104 ¹
	AK (series B)	1/1970 → 7/1970		103 ¹	
	AK (series AK)	7/1970 → 8/1972		103 ¹	
	AZ (series KA)	2/1970 → 8/1972		103 ¹	104 ¹

Supplement No. 1 to Manual 816-1 (COHR)

Type of engine	Type of vehicle ^a	Dates of production	Type of carburettor	Reference on carburettor	
				Conventional clutch	Centrifugal clutch
M 28/1 (602 cc) (continued)	AY (series CA)	8/1972 → 2/1975		123	124
	AK (series AK)			123	
	AZ (series KA)			123	124
	AY (series CA)	2/1975 → 10/1975	SOLEX 36 PICS 6 *		164
	AK (series AK)				164
	AZ (series KA)				164
M 28 (602 cc)	AY (series CA)	10/1975 → 7/1976	SOLEX 34 PCIS 6	175	176
	AK (series AK)			175	
	AZ (series KA)			175	176
	AY (series CA)	7/1976 → 7/1978	SOLEX 34 PICS 10 * SOLEX 34 PCIS 10	193	194
	AK (series AK)			193	
	AZ (series KA)			193	194
M 28 (602 cc)	AZ (series KA)	7/1978 → 7/1980	SOLEX 26/35 CSIC *	197	198
	AZ (series KA)	7/1980 →		225	226
	AY (series CA)	7/1978 → 7/1980	SOLEX 26/35 SCIC	197	198
	AY (series CA)	7/1980 →		225	226
	AY (series CB)	2/1970 → 6/1970		110 ²	111 ²
	AY (series CB)	6/1970 → 8/1972		113 ¹	114 ¹
	AY (series CB)	8/1972 → 10/1975		127	128
	AY (series CB)	10/1975 → 7/1976		179	180
	AY (series CB)	7/1976 → 7/1977		195	196
	AY (series CB)	7/1977 → 7/1980	SOLEX 26/35 CSIC *	197	198
	AY (series CB)	7/1980 →		225	226
	AY (series CD)	2/1978 → 7/1980		197	
M 28/1 (602 cc)	AY (series CD)	7/1980 →		225	
	AM (AMI 6)	5/1968 → 11/1968	SOLEX 26/35 SCIC	110	111
	AM 3 (AMI 8)	11/1968 → 3/1969		110 ¹	111 ¹
	AM 3 (AMI 8)	3/1969 → 7/1969		110 ¹	111 ¹
	AM (AMI 8)	7/1969 → 8/1972		110 ¹	111 ¹
	AM (AMI 8) (Series JA - JB - JC)	8/1972 → 10/1975 10/1975 → 7/1976		125	126
	7/1976 → 9/1978		177	178	
			197	198	

^a Carburettor without throttle closing dashpot (conventional clutch);

CARBURETTORS	28 IBC (32 ¹) SOLEX 28 CBI (30 ¹)	28 IN (Z 32) ZENITH 29 IN 4 (Z 30)	SOLEX CARBURETTORS	30 PICS	32 PICS (38) 32 PCIS (39)	40 PICS (44) 40 PCIS (45)	40 PICS 2 (44 ¹) 40 PCIS 2 (45 ¹) 40 PICS 3 (44 ^{2,3}) 40 PCIS 3 (45 ^{2,3})
Venturi bore	22	22	Venturi bore	26	28	32	32
Main jet	125	132	Main jet	140	150	165	170
Air correction jet	EI		Air correction jet	AB	215	AB	AC
Choke jet	80		Idling jet	475	55	55	50
Idling jet	42.5	45	Pump injector		40	40	40
Idling speed air jet		160	Needle valve seat	1.3	1.3	1.6	1.3
Needle valve seat	1.2	1.25	Float	5.7 g	5.7 g	5.7 g	5.7 g

SOLEX CARBURETTORS	34 PICS 4 (101) 34 PCIS 4 (102) 34 PICS 5 (101 ¹) 34 PCIS 5 (102 ¹)	34 PICS 4 (103) 34 PCIS 4 (104) 34 PICS 5 (103 ¹) 34 PCIS 5 (104 ¹)	34 PICS 6 (121) 34 PCIS 6 (122)	34 PICS 6 (123) 34 PCIS 6 (124) 34 PICS 6 (164) 34 PCIS 6 (165)	34 PICS 6 (173) 34 PCIS 6 (174) 34 PICS 10 (191) 34 PCIS 10 (192)	34 PICS 6 (175) 34 PCIS 6 (176) 34 PICS 10 (193) 34 PCIS 10 (194)
Venturi bore	28	28	28	28	28	28
Main jet	155	160	155	165	155	165
Air correction jet	AB	AB	AB	AC	AB	AC
Idling jet	40	42.5	40	42.5	35	40
Progression jet	55	55	50	52.5	48	45
Pump injector	35	40	35	40	37.5	40
Needle valve seat	1.3	1.3	1.3	1.3	1.3	1.3
Float	5.7 g	5.7 g	5.7 g	5.7 g	5.7 g	5.7 g

TWIN CHOKE SOLEX CARBURETTORS	Identification 110 * - 111		110 ¹ * - 111 ¹ Identification 110 ² * - 111 ² 113 ¹ * - 114 ¹		125 * - 126 Identification 127 * - 128		177 * - 178 179 * - 180 197 * - 198 195 * - 196		Identification 225 * - 226	
	1st choke	2nd choke	1st choke	2nd choke	1st choke	2nd choke	1st choke	2nd choke	1st choke	2nd choke
26/35 CSIC * and SCIC										
Venturi bore	21	24	21	24	21	24	21	24	18	26
Main jet	120	60	125	75	** 125 (1/73 →) 40	82.5	120	70	102.5	87.5
Idling jet	50		50		40		40		39	
Air correction jet	1 F 1	2 H 1	1 F 1	2 AA	1 F 1	2 AA	1 F 2	2 AA	1 F 2	2 AA
Pump injector	40		40		40		40		35	
Needle valve seat (springs)	1.7	1.7	1.7	1.7	** 1.7 11/5 1/73	1.7	1.7 (ball type)		1.7 (ball type)	

* Carburettor without throttle closing dashpot (conventional clutch).

CHARACTERISTICS

DISTRIBUTOR.

Make : DUCELLIER or FEMSA.

Type of engine	Type of vehicle	Date produced	Initial advance	Advance curve	Maximum centrifugal advance	Centrifugal advance check with device 1692-T Needle in ZONE
A 53 (425 cc)	AZ (series A and AM)	3.1963 → 2.1970	12°	A	6° to 8°	« AZB »
	AZU	3.1963 → 8.1967				
A 79/0 (425 cc)	AZU	8.1967 → 3.1972	12°	B	7°30' to 12°30'	Between « AZB » and « AZP »
	AYA (series A and AM)	8.1967 → 3.1968				
A 79/1 (435 cc)	AYA2 (series A and AM)	3.1968 → 2.1970	12°	C	10° to 15°	« AZP »
	AZ (series A2 and KB)	2.1970 → 9.1978				
	AZU	8.1972 → 2.1978				
M 4 (602 cc)	AYA3 (series A and AM)	1.1968 → 10.1968	12°	A	6° to 8°	« AZB »
	AK and AMI 6	→ 5.1968				
M 28/1 (602 cc)	AYB (series A and AM)	10.1968 → 2.1970	8°	C	10° to 15°	« AZP »
	AZ (series KA)	2.1970 →				
	AY (series CA)	10.1968 →				
	AK (series B)	5.1968 → 7.1970				
	AK (series AK)	7.1970 → 2.1978				
	AY (series CD)	2.1978 →				
M 28 (602 cc)	AMI 6	5.1968 → 3.1969	8°	C	10° to 15°	« AZP »
	AY (series CB)	2.1970 →				
	AMI 8 All types	3.1969 →				

Contact breaker gap : 0.35 to 0.45 mm (.014 to .018 in).

Dwell angle :

- Distributors fitted up to February 1970 : 144° ± 2° (Dwell ratio : 80 % ± 2 %)

- Distributors fitted since February 1970 : 109° ± 3° (Dwell ratio : 60 % ± 2 %)

COILS :

Make : DUCELLIER

- 6 Volt circuit : Reference 2768 - 12 Volt circuit : Reference 2769

Make : FEMSA

- 12 Volt circuit : Reference BC 12-4.

SPARKING PLUGS.

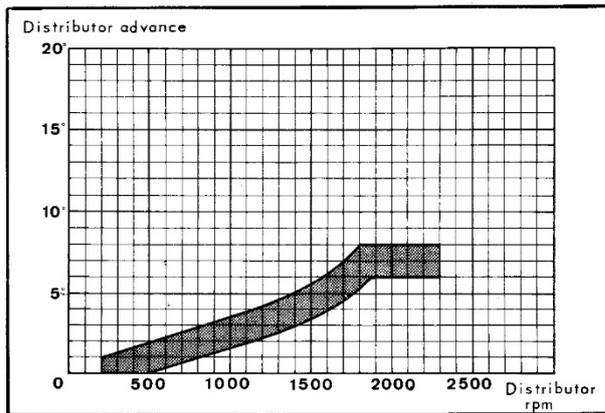
Refer to the Technical Bulletins, appearing periodically, for recommendations as to the type and make of sparking plugs to be used.

CONDENSER.

Capacity : 0.18 to 0.28 μ F.

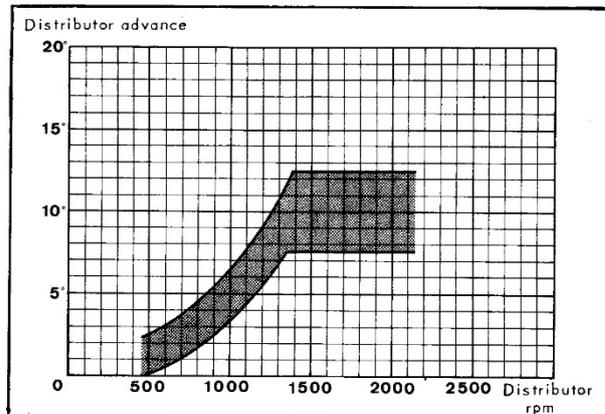
CENTRIFUGAL ADVANCE CURVES.

A. 21-54



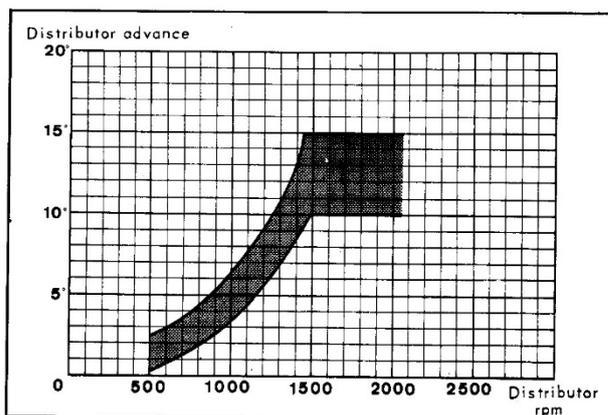
CURVE A

A. 21-52



CURVE B

A. 21-53



CURVE C

9. LIST OF ARTICLES BY THE WRITER

1. 2CV 40-Litre Fuel Tank
2. 2CV API GL-4 Gearbox Oil (Revision 2)
3. 2CV Battery Charging Circuitry (Revision 2)
4. 2CV Battery Problems Solved (Revision 6)
5. 2CV Brake Saga (Revision 1)
6. 2CV Buyer's Questions (Revision 2)
7. 2CV Carburettor Cover Screws (Revision 1)
8. 2CV Carburettor Jets and Adjustments (Revision 1)
9. 2CV Engine Problems (Revision 6)
10. 2CV Fuel Filter (Revision 1)
11. 2CV Fuel Gauge and Battery Meter (Revision 1)
12. 2CV Gearbox Output Hubs (Revision 2)
13. 2CV Gearbox Unwinding Debacle
14. 2CV Hard Luck Stories (Revision 2)
15. 2CV Headlights Improvement (Revision 4)
16. 2CV Ignition Coil (Revision 6)
17. 2CV Knife Edges Replacement (Revision 3)
18. 2CV Low Oil Pressure Beeper and Lights On Beeper (Revision 1)
19. 2CV Maintenance - Part 1 of 2 (Revision 18)
20. 2CV Maintenance - Part 2 of 2 (Revision 18)
21. 2CV Oil Breather (Revision 5)
22. 2CV Oils and Maintenance Advice From Burton (Revision 3)
23. 2CV Points Ignition Reinstallation (Revision 1)
24. 2CV Roof Rack (Revision 3)
25. 2CV Secondary Choke Butterfly Adjustment (Revision 4)
26. 2CV Spare Parts to Carry (Revision 5)
27. 2CV Valve Clearance Adjustment (Revision 2)
28. Better Fuel Hose Clamps (Revision 1) – **applies to all vehicle brands**
29. Better UHF CB Car Radio Performance (Revision 6) – **applies to all vehicle brands**
30. Ignition Coil Ballast Resistors (Revision 5) – **applies to all vehicle brands**
31. The Workshop (Revision 2) – **applies to all workshops and vehicle brands**

10. PHOTOS



Fig. 10-1 2CV at Mont Saint-Michel in 1959



Fig. 10-2 Mont Saint-Michel at low tide



Fig. 10-3 1938 Citroën TPV (Toute Petite Voiture or “Very Small Car”) aka 2CV prototype



Fig. 10-4 1938 TPV

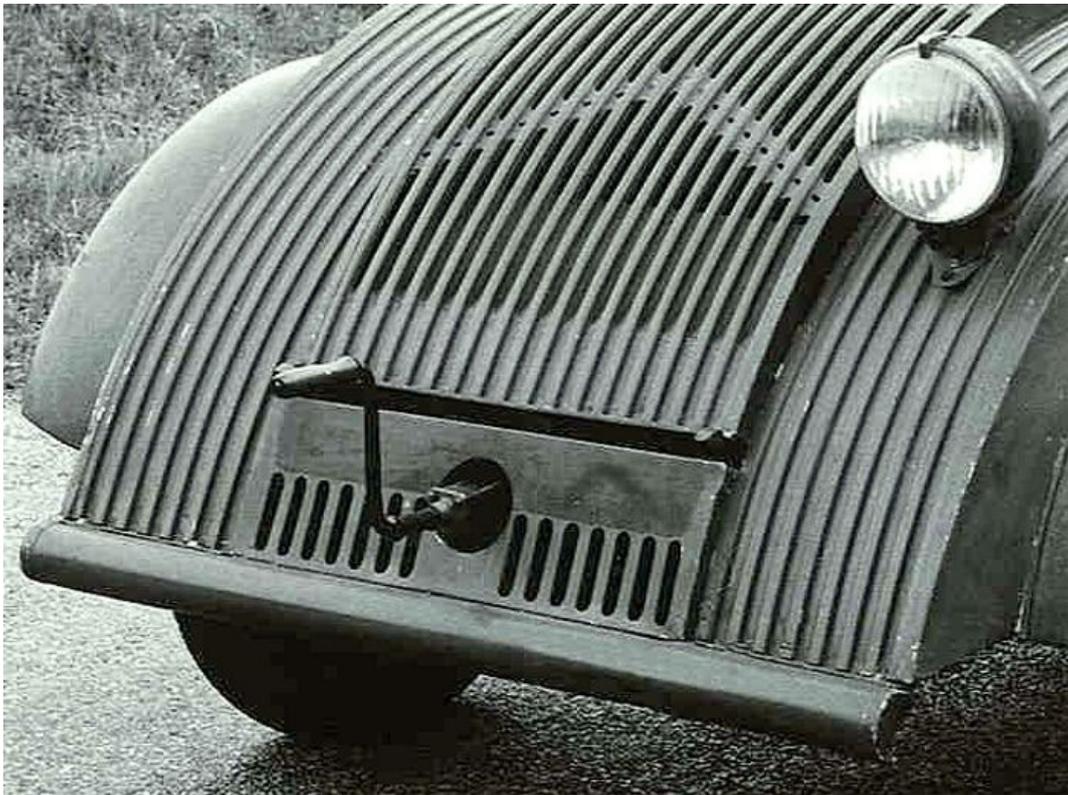


Fig. 10-5 1938 TPV

“Turns out it was a marble in the ashtray”





Fig. 10-6

FINAL STATEMENT

My acknowledgement and grateful appreciation is given to Automobiles Citroën for the use of the 2CV data tables included herein.

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

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