

J.B.M. INDUSTRIES

3761 MORLEY DR.
KENT, OHIO 44240

DON JAMES

(216) 678-9537

PRICE LIST 1, JULY 1982

1. Sphere Recharge (All Sizes and types)-----	\$6.00 ea.
2. Sphere Rebuild (All Rebuildable types)-----	22.00 ea.
3. Hydraulic Pump Rebuild (Aluminum Body if not cracked)-----	48.00 ea.
4. Hydraulic Pump Rebuild (With new Steel Body)-----	93.00 ea.
5. "French Connection Tool" in 1/4" or 3/16" size-----	27.50 ea.
6. Set of two "French Connection Tools"-----	50.00 ea.
7. Relocation Bracket Kit-----	10.00 ea.
8. Power Steering Rack Alignment Tool-----	10.00 ea.
9. Motor Mounts-----	13.00 ea.
10. Motor Mounts installed in can (Exchange)-----	18.00 ea.
11. Rear Suspension Cylinder Boot (Teapot)-----	16.00 ea.
12. Rear Suspension Cylinder Boot for S. Wagon-----	18.00 ea.
13. Oil Pressure Switch Kit-----	16.00 ea.
14. Cross-over gage set-----	68.00 ea.
15. Teflon Seals for Rotating Union-----	20.00 set
16. Teflon Seals for Piston Ends-----	10.00 set
17. Tool to remove cross dowel pin-----	17.00 ea.
18. Installation Cone for union seals-----	16.00 ea.
19. Installation Cone for Piston End Seals-----	8.00 ea.
20. Teflon Seals for Suspension Cylinders-----	6.00 ea.
21. Rubber Mounts for Radiator Expansion Tank and Muffler-----	1.00 ea.
22. Power Steering Block-off Plate-----	3.50 ea.
23. Sphere Static Pressure Tester and Test Bench-----	68.00 ea.
24. 2 1/4" Hole Saw Kit-----	33.00 ea.
25. Oil Spray Gun (Requires an air compressor)-----	19.00 ea.
26. Pressure Tank Oil Spray Kit-----	48.00 ea.
27. Penetrol (Gallon Can)-----	22.00 ea.
28. 8mm Nut Driver Important Citroen Service Tool-----	7.50 ea.
29. Special Tap for Hydraulic Fittings 9mm-----	12.00 ea.
30. Metric Tap and Die Set will work for any car-----	19.00 set
31. Genuine Wood Handle Screwdriver Set with square shanks, 11pc-----	9.00 set
32. Super Sticky Electrical Tape 60ft roll-----	.75 ea.
33. Pop-Rivet Tool with ass. rivits, Long Snout for tight spots.-----	18.00 ea.
34. Box of 500 Pop-Rivets 5/32" dia.-----	16.00 bx.
35. Box of 500 Pop-Rivets 1/8" dia.-----	11.00 bx.
36. Pack of 100 Nylon Cable Ties for wire and hydraulic lines-----	7.00 ea.
37. Outside rear view mirrors DS-23 type of good quality (R or L)-----	37.00 ea.

All Prices are POST PAID with a \$20 order. C.O.D. \$3 extra

Shipping Info: Spheres sent to J.B.M. should be clean & have the threads protected with tape.

Pumps should include pulley & special attention should be given to protect the pulley and mounting ears in shipment.

NEW EARS ARE AVAILABLE for \$2.50 each.

New customers should include payment with order. Dealers will be billed.

SPHERES WILL BE MODIFIED FOR SOFTER RIDE FOR \$2 EXTRA EACH.

Removable shock spheres should be sent WITHOUT the shocks unless you wish the damping rate changed or checked. DO NOT SWITCH FRONT & REAR.

You may ship by mail, but UPS is faster. All Canadian shipments will be marked: 1954 CAR PARTS.

J.B.M. INDUSTRIES

3781 MORLEY DR.
KENT, OHIO 44240

EXPLANATION OF PARTS AND SERVICES

Note: Please keep in mind that our prices include shipping and the heavier an item is, the more we must charge. We will try to keep prices low. If we are sold out of an item, and can not deliver it in a reasonable time, we will send a refund check.

DON JAMES

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Fellow Enthusiasts,

I would like to thank you all for your support of our small "cottage industry". We appreciate your ideas and suggestions. I am sorry that we can't put all of your suggestions into production. We need to get the same suggestion from several people to get an idea of where the trouble spots are. We are not mechanics, working on Citroens every-day, so we need your help.

I am operating a small "basement machine shop" on a part-time basis, and you may have trouble getting in touch with me. If you call and get no answer, try later. We do not have an answering machine, so you will not be charged for a long-distance call. You may call in the evening, when rates are cheap if you wish.

This letter is printed at my own expense, and is intended to explain our tools, parts, and services to you. It should also help you watch for possible trouble spots on you DS or SM. I have sent this information to other club newsletters, but they have never published it to my knowledge. I know that my typing and spelling is not so hot, but I think that most people will be able to get some pointers from it.

I have been asked many times why we don't exchange pumps, spheres, etc. The reason for this is that many people send me old, brake-fluid components that they must have found in a field. They get a good component, and I get JUNK. If people know that they will get back what they send me, this is less likely to happen.----- Also, I do not have a lot of cash tied-up in cores.

Cores are getting harder to find all of the time. Many Citroen owners are foolish enough to throw their rebuildable type spheres away. Some let their service agent keep them and he installs the new "welded" type of sphere at a high cost. Many parts are replaced on an uninformed owner's car for no reason. Some service agents are ignorant about component replacement, or are looking for the greatest mark-up.

Our objective is to make reproduction parts that are cheaper, or that eliminate a point of failure on original equipment. Points of failure are only discovered with your help.

Please keep this newsletter. Many people call me and tell me to send another because they "LOST" theirs. If you have a friend that wants this info, have him send a stamp. I include fresh information with your order when I ship it.

Shipping costs are figured into my prices by weight for simplification. Packing costs are not. If your order is for less than \$20, PLEASE include \$2 extra. Give me a break.


Please place written instructions in the box with any components that you send to me. I may not remember your name from a telephone conversation. Please try to clean the components also, as this helps me keep the prices down. Place leaky spheres in a plastic bag.

If you have a friend that owns a Citroen, please tell him of our services. If you wish to experiment with components on your car, let me know. If you have a hint or a tip, ditto. Let me know how you heard about my services.

Our cars are increasing in value, so lets all do what we can to keep them running.

Don ^

Page 3

- Item #
- 1.&2. We can recharge the new "CX" spheres, and ROLLS ROYCE spheres. We have diaphragms for the small brake accumulator spheres, and can rebuild for LHM or Brake Fluid. Rebuilds have a 1 YEAR guarantee against diaphragm rupture or nitrogen permeation out of tolerance. "O" RINGS for under the sphere can be lost or dropped. Spares are available for LHM or B.F. for \$1.00 ea.
 - 3.&4. Hydraulic Pumps with aluminum valve block body are guaranteed for 10 days. All pumps came with aluminum bodys, but they get "punky" with age and tend to crack. Pumps rebuilt with STEEL bodys are guaranteed for 1 year. We doubt that the J.B.M. steel body will ever crack. The only place they can leak is the shaft seal. A new shaft seal is installed in all pumps.
 - 5.&6. "French Connection Tool" makes an end on "AMERICAN" size brake line identical to Citroen original. We have heard that it will work on the original lines also if you wrap them with foil before using the tool. With instructions and wrenches.
 7. Rubber mounted relocation bracket will not conduct noise to the frame of the car. With instructions.
 8. Alignment tool helps you get your steering rack in line with the steering wheel shaft. Just like the one in the manual.
 - 9.&10. Motor Mounts can be installed in can yourself, or a heating and sheetmetal shop will make short work of it. J.B.M. will install them on an exchange basis. With instructions.
 13. Oil pressure switch can fail suddenly with NO WARNING. This kit solves the problem and even makes it easy to attach an oil gage.
 14. Cross-over gage set is used in the car just like in the manual. Quality gages measure in lbs. and bars on a dual scale.
 - 15&16. Teflon seals replace the high pressure wear surface that covers the "O" rings. The "O" Rings do not wear and are not included.
 - 18&19. Installation cones are the best way to install steering seals.
 21. Mounts are a block of rubber with a 1/4-20 stud on each end. 
 22. Block-off Plate allows you to check for an internal leak in the steering rack before you tear it apart to replace seals that you may not need. It can be used to shut off fluid to steering leaks.
 23. Tester can save you time and \$ by telling you the exact amount of gas in your spheres. Also allows you to test components, valves.
 24. Hole saw will cut a hole in the center of your wheels so that tire may be changed on common tire change machine. No more tire irons or added expense to change tires. REQUIRES 1/2" HEAVY DUTY DRILL.
 25. Compressor type Spray Gun blows oil or paint thru doors and fraze. 1qt. capacity, easiest to use. Fits standard tire chuck.
 26. Pressure tank type is rated to 200psi. Includes oil canister, pump, 30" long wand, and spray nozzle. Sprays 90 deg. to wand.
 28. Nut Driver is THE tool for the Cit. mechanic. Once you use this tool you will never be without it. A real timesaver.
 30. Tap & Die set is a timesaver. Use it on other cars too. Cleans out those rusty threads. 40pcs. Metal case. Good price.
 36. Cable Ties are needed to keep things neat in your engine compartment. Can also be used to hold on rubber boots, keep hydraulic lines in bundles so they don't rub.

PLEASE DO NOT SHIP IN EXCESSIVELY HEAVY CONTAINERS. We pay return shipping and will not return them.



PRODUCT INFORMATION

TEXACO INC., 2000 Westchester Ave., White Plains, N. Y. 10650

J.B.M. INDUSTRIES

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KENT, OHIO 44240

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(216) 678-8837

SPHERES; THEIR CARE and FEEDING

1. Make sure when you replace your spheres, that you have the "O" Ring seated in the cylinder.
2. Tighten the sphere HAND TIGHT only. It won't come loose when there is pressure on it, and hand tightening makes it easy to take off the next time.
3. Be very careful about dirt getting into the suspension cylinders.
4. Clean as much rust and dirt from around the rear suspension cylinder mounting bracket as you can. Squirt oil around the space between the bracket and the cylinder. This area is famous for corrosion.
5. Spheres should be checked for static pressure a minimum of once every 2 years. Once every 2 or 3 months you should bounce each corner of the car, and it should give easily under your weight.

IMPORTANT: Low pressure is what ruins the diaphragm in your spheres. KEEP YOUR SPHERES CHARGED.

IMPORTANT: Don't leave your car in the "Jacking" Position for long periods of time. Use this only for an emergency.

The "Jacking" Position blocks the height corrector valve open and allows the full system pressure into the suspension cylinders. This pressure is around 2400psi, and it bends the diaphragm back against the gas in the sphere. The rear of a "D" model Citroen has only around 400psi in it's spheres, so it will compress this gas into one sixth of the total volume of the sphere. This is what bends the rubber diaphragm "inside out" and force the gas thru the rubber. Most people do not notice a deterioration in the ride quality until the static pressure in their spheres is less than half of what it is supposed to be.

6. When traveling in your Citroen, it is a wise idea to carry an "EMERGENCY" sphere. This sphere should be a removable shock type if you have relocated your pressure regulator, so that you can use it for a main accumulator. This sphere should be about 700psi static.

>> IMPORTANT: Driving on a flat sphere can damage the suspension arms or dislocate the rear suspension brackets. If you do blow a sphere, drive slow and avoid the bumps.

7. Low static pressure in the main accumulator will cause the pump to cycle often and is likely to damage the pump or the regulator. Internal leaks could cause the same effect also.
8. The best way to know if you should recharge or rebuild your spheres, is to know when the last time they were rebuilt was. If it was less than 5 years ago, the proper fluids have been used, and the sphere has not been run clear flat, (You can feel some spring on that wheel) it is best to just recharge. Brake fluid diaphragms last almost forever so a recharge is usually best for them unless they are very old.

Welded type spheres can be recharged if they have not been run flat. If they have been run flat, then the diaphragm punctures itself on a sharp edge inside the sphere. They are very good spheres, if they are kept charged.

9. If you use ATF for fluid, or if you seem to feel that your car doesn't ride as soft as it should, the pressures in your spheres can be increased as much as 30%. This has the effect of putting taller springs on your car. The small expansion cracks that you feel can be softened by changing your shock absorber rate. I can modify your RIVITED in shocks too.

I will change your static pressure and modify your rivited in shocks for \$6.00 each ppd.

BE SURE TO TELL ME WHAT TYPE OF CAR AND IF THEY ARE FRONT OR REAR SPHERES.

AIRCRAFT HYDRAULIC OIL

CODE NO. 1537 AIRCRAFT HYDRAULIC OIL 15

Typical Characteristics

Appearance	Red (dyed)
Gravity, °API	32.3
Flash, COC, °F	210
Pour, °F	-75
Neutralization No.	0.03
Viscosity cSt at -65°F	2070
cSt at -40°C	450
cSt at 40°C	13.5
cSt at 100°C	5.0
SUS at 100°F	74.3
SUS at 210°F	43.0
Viscosity Index	372

NOTE:

The use of this fluid will not improve your ride if your spheres are low on nitrogen.

AIRCRAFT HYDRAULIC OIL 15

Manufactured from specially selected ingredients, Aircraft Hydraulic Oil 15 provides the user with the utmost in low temperature performance as well as the corrosion resistance, oxidation stability and anti-wear properties so necessary in today's hydraulic systems. This mineral oil product is widely used in many of today's aircraft hydraulic systems and shock absorbers. It is compatible with all seal materials normally found in such systems that are designed for use with petroleum oils, and is dyed red for ease of identification.

Aircraft Hydraulic Oil 15 meets the requirements of superseded U. S. Military Specification MIL-H-5606A and the Canadian and British equivalents 3-GP-26B Amend. 3 and DTD 585. NATO symbol H-515 applies. This oil is for use in hydraulic systems and other locations of aircraft, missiles as well as non-aircraft uses where an oil meeting MIL-H-5606A is required.

Note: I will try to stock this HYDRAULIC #15 in one gallon cans. As I have written before, it should also be available at airports that handle jet aircraft. Price at an airport should be around \$12 gal.

Since it is heavy, (shipping weight is about 10 lb per gal.) I will be happy to send you some for \$15.00 per gallon post paid. This fluid performs better than LHM and costs less. LHM is now up to \$8.00 per liter. If you have used DEXRON, you will notice a big improvement rightaway. Advantages over LHM will show up in cold weather operation.

If you get this fluid from a large airport, take a clean container with you, as they may only have it in a drum. It will be even less expensive this way.



Some Brief Notes of Interest

Teflon seals are used on post 1967 "DS" suspension cylinders. Cars with over 100,000 miles on them could have extremely worn Teflon seals. Cars that sink rapidly may need them. Check steering first.

Herb Webb of Webb Engineering reports that a Repco Timing chain #2372 is a perfect replacement for your "D" model. Chain has a master-link in it so that it can be opened, and can be purchased from local autoparts store. Remove 2 links before installing.---- Tensioner from a Ford Courier #D27Z-6K 254-A will replace the original. Rotate pusher 180 degrees and file teeth in the opposite side. Drill a small hole in the large dowel that locates it for oil flow.

Eric Locker reports that a knock in his front suspension was found after much trial and error. One of the small ball joints in the linkage between the suspension arm and the anti-roll bar had a broken spring. The spring looks like an I.U.D., and takes up play in the ball joint. Joint is easily taken apart.

Battery acid that gets on speedometer cable can cause it to lock-up. This will make the speedo drive gear unscrew and put a hole in the front cover on the trans.---- A hard downshift can cause the front bearing to put a much larger hole in this same cover. A push start in first gear can cause this too. Lots of pressure on the front cover due to pinion gear end-thrust.

Low or flat main accumulator spheres can cause cracked pumps and regulators. Easiest way to remove it is from the bottom of the car. Bleed pressure from system and strike edge of sphere with chisel to loosen. Place a jack under the engine sump and lift slightly. Sphere should come out passed the brake discs, but it is a fight with fuel line and rubber hoses in the way.---- Check sphere with engine off after car has been run up to driving height. Sit on the edge of the trunk. Car should be able to lift your weight after a 30 to 60 second delay.---- This is a good demonstration to impress the local gas jockey that thinks it has "AIR SHOCKS".

Door bottoms, splash pans, stainless mufflers are available from:

PETER FYFE
6130 Allen Street
Halifax, N.S. CANADA B3L 1G6

Parts are of excellent quality
and Peter deserves our support.
SEND FOR HIS PARTS LIST.

"A" model owners with a sticky gear-change lever caused by oil on natural rubber bushings can fix them easily. Remove the lever and slide it thru the tube as far as it will go. Heat the rod with a torch, and then draw it back thru the tube quickly. This will melt a small amount of rubber that will stick to the heated rod. Remove the rubber with steel wool or scotch-brite. Repeat if needed. Baby powder makes the best lube for rubber.

LHS-2 O-rings that no longer have the proper fit or are worn can be swollen by placing them in LHM or motor oil. They will swell quickly so keep an eye on them. They will stay swollen for years because the rubber absorbs the oil.---- The same will work in reverse for LHM. This is considered cheating in a rubber molding shop, but it does work and is used quite often to fix undersize parts. If you can't get hold of a proper size O-ring, give this method a try. Do not use gas or kerosene to swell rubber. It swells fast, but won't last.

Remove stuck brake pistons from your calipers by fitting a piece of steel line to the caliper. (Use French Connection Tool) Attach a grease fitting to the line and use pressure from your grease gun to force out the offending piston. A loose piston can be held in with a "C" clamp until the stuck one is free. Fill caliper with oil from an oil can first to conserve grease.

This method will also work to free an engine that is "stuck" from sitting for a long period of time without being run. Remove the valve train to close the valves.

Some people are confused about what cars can use TEXACO HYDRAULIC#15. Use it in LHM cars ONLY. LHM cars have a green hydraulic tank.

Be sure to check anti-freeze content for summer driving. It can be run as high as 70% .---- It will raise the boiling point of your coolant by quite a bit. Lubricates the water pump seal too. --- Remember, coolant that boils away does you no good, so keep an eye on it.--- Don't let a gas jockey put a high pressure radiator cap on your car. The hoses won't take it.

Piston "end seals" come in two different sizes. Pre and post 67 . If you are not sure which you need, better wait until you take your steering apart to see.--- Steering seals have been working well and have solved a lot of peoples problems.

Have you checked on the price of new cars ? ---- Your old Citroen is worth fixing. You can't buy a car like it now. \$3000 will buy a lot of repairs and body work. You can't even buy any kind of new car for \$3000 .

I have heard of some people using kerosene to thin DEXRON. This will probably give the same results as LHM as far as ride and steering go, but kerosene will vaporize at a much lower temperature. I sure would hate to find out about this fact when I was sailing down some mountain.

New owners of "DS" cars should be sure their hood is down and latched before operating the car. More than one owner has had the hood suddenly fly up and wrap over his roof. The safety catch will NOT hold at speed.

An engine that is missing on one or more cylinders may have oil in the spark plug wells. The seals under the valve cover get hard with age and tend to let oil pass. Replace the seals. Available from Red Burwell

Citromatic owners should check their carburetors to be sure BOTH barrels are opening all the way. The flex joint to the clutch reengagement control may be out of synchronization.

Grease fittings should be installed in the aluminum bearing block for the front suspension arms. Drill and tap at an upward angle so that chips will fall away. Also drill a small relief hole to allow air and excess grease to escape. Squirt a few shots of oil in before you install fitting in the hole. This will help soften old grease.--- Fill with grease until it flows from the relief hole. The bearings in these blocks seem to get worn in one spot due to the limited suspension travel. Packing the cavity full of grease helps keep water out too.

Watch for wires that pass by the alternator. Be sure they are up and out of the way of the fan on the front of the alt. Wires, speedo cable, or hoses can be cut by this fan easily. This is a crowded area.

Do NOT oil the pegs that the fenders slip on to. Oil will attack the rubber bushings in the fender. Silicone spray works better and will make them easy to remove next time.

More NOTES

Owners of DS cars that use IHS-2 or Brake fluid should check for leakage from the brake control valve. Fluid will run down the bulkhead and rust the floor of your car. Fluid will also enter the "BOX" of the frame beneath your feet. Fix this leak as fast as possible. Your car is eating itself alive. --- Fix may only take a few min. The low pressure return line from the valve may have come loose. Fluid in the sponge rubber that is under the carpet can be removed by a strong spray from a hose. (garden)

LHM owners can consider a leak here to be an automatic frame oiling device.

Rear suspension cylinders on sedans can be replaced easily if they are corroded. Remove the sphere and strike the cylinder with a heavy hammer, (Cover the end of the cylinder with a solid piece of wood.) Strike with blows aimed at an angle. Alternate the angle of the blows to loosen the cylinder.---- Remove the 8mm retaining screw before you start any of this.

Cylinder can be replaced with one from the front of another car. Fronts are always in perfect condition as far as corrosion goes. You will have to put a flat on it for the retainer because the fronts don't have it. You may use the old rod and piston. This is a good time to replace the boot and seal in the cylinder.

WAY

Windows that will not wind up all of the way to the top may have a broken tooth on the winder quadrant. Remove the "U" shaped clamp from the glass the easy way. --- Drill and tap a hole for a spreader screw. It is spring steel and is tough, but you can drill and tap it. --- Makes it much easier to install and remove the glass next time.

I have noted that many newcomers to the hobby are driving around on flat spheres.----- Good way to kill a car. Pumps are thrashed to death because the main accumulator is flat. Pumps and regulators crack. A new pump will only solve the problem for a time. The real problem is the main accumulator. Internal leaks will also overwork the pump. Pump will get hot and fail. Small type main and brake accumulators CAN be rebuilt.

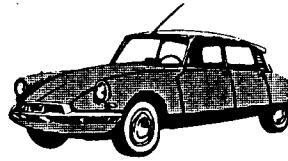
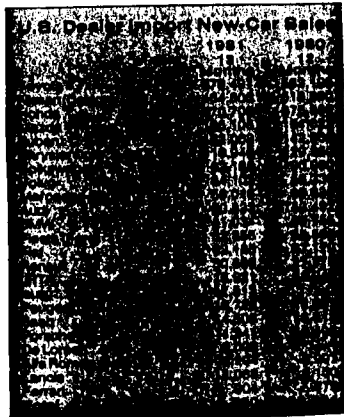
HARD TO FIND PART ???

Good results have been reported from;

Andre Pol
Oude Bredase Postbaan 10
4741 SM HOEVEN
Holland

I have purchased the moving lights from Andre, and have been well satisfied with his service. He can get Traction and 2 CV parts too.

P.S. I did not have to pay any duty or taxes on any of the packages that he has sent to me so far.



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(216) 678-9537

MOTOR MOUNTS

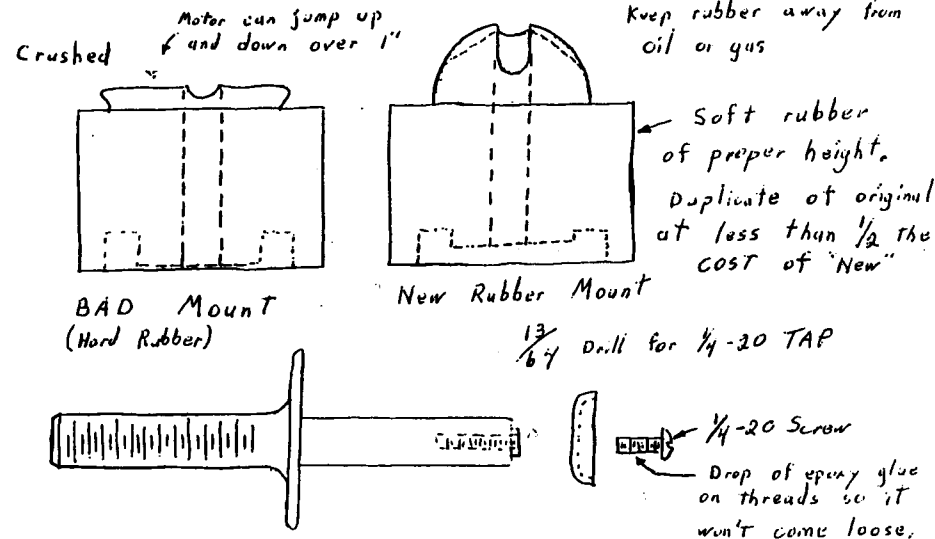
It will probably be noticed by a lot of Citroën owners, that their car is much noisier than new and has more vibration. Also it may be noticed that the car shudders when releasing the clutch or when applying the brakes. A knock or clunk when starting out or turning a sharp corner and applying the brakes could also occur if your car is old and noisy.

All of the above faults may be due to bad REAR MOTOR MOUNTS. Age, heat, and the weight of the engine may have compressed and hardened the rubber over the years and the symptoms may have slowly crept up on you.

The motor mounts on a front wheel drive car are very important. They must not only control engine torque, but the entire drive-train torque as well. Also a " Citroën " has an additional torque from the brakes, which are mounted to the drive-train also.

The rubber mounts fit in a metal can that has been spot-welded together at 3 places on each end. The spot-welds can be drilled out with a 1/4 inch drill, new rubber installed, and reassembled with pop rivets. The end of the threaded metal shaft has a crimped on metal washer on it that can be drilled out, then tapped for 1/4-20 screw.

JBM can supply new motor mount rubbers for \$13.00 each, a considerable savings over the cost of mounts from Citroën. These mounts should outlast the originals by far, as they are made out of a special rubber compound that can take heat much better and absorb energy better. They are of the exact same durometer as original.



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WATER PUMPS

Water pumps fail for several reasons on "D" model cars. One of the most common is when the car sits for a long time without being run. The carbon shaft seal gets rusted to the cast iron seal face. This can also happen from a lack of sufficient anti-freeze to lubricate these surfaces.

When the car is started, the shaft spins inside the rubber boot that attaches the shaft to the carbon seal. This wears out the boot and it no longer will drive the carbon seal. In addition, the worn hole in the boot allows water to pass. The water can then get into the bearings.

The seal is a good design in that it takes up it's own wear. If the car is not running and the seal face has a scratch in it, some moisture may get past. The area just past the seal is bound to be damp.

Citroen has provided for this dampness by allowing a space between the seal face and the bearings. This "space" is provided with a drain at the bottom that is attached to the tube you see coming from beneath the pump. This tube keeps this moisture from getting on the "V" belts beneath the pump.

The problem is, the moisture causes the pump shaft to rust and flecks of rust and dust from the wear of the carbon seal plug the drain hole. Water backs up, and then flows into the bearings. It is only a matter of time until the bearings fail. The rust particles mixed with the water are abrasive and will even wear the rubber on a "sealed bearing".

The problem is, how to keep the drain hole open???

The designers of the pump have provided for this also. There is a small "vent" hole at the top of the "space". This hole can be used to inject kerosene or a light oil to "wash" out the "space" and keep the drain open. This should be done at every oil change. Kerosene has a better washing action, so it would be best to use for the first time. Oil will prevent rust, so should be used thereafter. You should see an oil spot on the floor after doing this. No oil spot? Don't take a long trip without a spare pump.

In an emergency, drill and tap for a grease fitting about one inch forward of the "vent" hole. Fill with grease, and you can go again for awhile.

The ball bearings in the pump are not huge. They don't need to be, because of the double sheeve pulleys. Two belts don't need to be as tight as one. DO NOT OVER TIGHTEN THE BELTS.

If you have a standard shift car, oil the bellcrank on the clutch release mechanism when you oil the water pump.

DO NOT ATTEMPT TO REMOVE THE PULLEY FROM THE PUMP. This takes special equipment. The pulley is a very tight press on the shaft.

J.B.M. will rebuild your water pump for \$55.00 ppd.

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HYDRAULIC PUMPS

One of the components that is the least likely to completely fail on your hydro-pneumatic marvel is the hydraulic pump. The pumps do have a habit of leaking fluid after they get to be a ripe old age. Soon you will grow tired of the puddle on the garage floor.

The pumps leak from only two places. The first and least expensive to fix is the shaft seal. This is very common on LHM pumps, but LHS-2 pumps can leak here also. The usual cause is a rubber "O" ring that gets hard with age and allows the brass shaft seal to spin inside it, right along with the large ball bearing. The rubber wears into the brass and actually cuts a groove in it. Then even a brand new "O" ring will fit too loose to keep the brass from spinning.

Fluid leaking past this shaft seal will wash all of the grease out of the large ball bearing. On LHS-2 pumps this spells destruction for the bearing for sure. These bearings can be replaced, but new ones are expensive.

The other place that the pumps leak from is the joint between the steel forged mounting plate and the aluminum valve body. You can barely see the aluminum body because the sheetmetal "can" is pressed on over it. You can try to tighten the 7 bolts on this mounting plate, but it probably won't do any good. The aluminum valve block is cracked.

These aluminum blocks can not be repaired. They must be replaced. The problem with aluminum is that it is not quite strong enough to take the extreme pressures involved. Also age tends to crystallize the aluminum and make it "punky". Brake fluid (LHS-2) pumps are affected by this in particular.

The manufacturer's choice of aluminum for this purpose was probably due to production machining considerations because these parts look like a piece of swiss cheese. Since they have so many holes, they need all of the strength they can get. That is why a steel valve body is better.

To decide if you need a new body, look to see where the pump is leaking from. You will need a strong light and a mirror to help. Wipe the pump as clean as you can. An old tooth brush is a dandy parts washer.

Run the engine with the bleed screw on the pressure regulator open just a crack. This "internal leak" will make the pump cycle often and cause more leakage. Watch carefully.

If the pump is leaking from the shaft seal, it may only leak when the car is shut off. Traces of fluid will be seen around the pulley. A leaking shaft seal will also allow air into the system, possibly into the brakes.

Should you remove the pump pulley for any reason, be very careful of the small key when you replace the pulley. A check for grease in the ball bearing is another good check for a leaking shaft seal.

Be sure all of the bolts that mount the pump are tight when you replace it. Pack the pump carefully when shipping. Cast iron pulleys break easily. Don't try to repair the pump yourself because unless you have special tools and equipment, you don't stand a chance.

There is a terrific amount of end force on the shaft when the pump is running. A small amount of wear on the ball bearing will allow the shaft to run at a different place and reduce slightly the efficiency of the pump. This does not harm anything, but makes your car slightly slower to raise up.

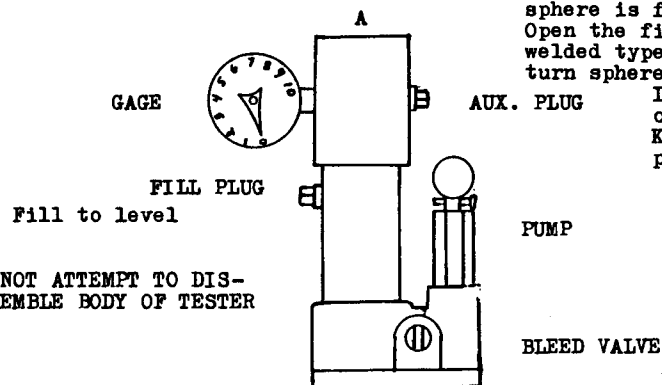
J.B.M. INDUSTRIES

3761 MORLEY DR.
KENT, OHIO 44240

DON JAMES

(216) 878-9827

SPHERE TESTER



Needle will not rise if sphere is flat. Open the fill plug on the welded type spheres and turn sphere upside down. If fluid comes out, it is shot. Keep it as a paper weight.

Tester is shipped dry. Open fill plug, and fill as far as possible with fluid. Replace fill plug. Continue filling at "A" to the top of the tester.

With "O" ring in place, screw sphere on tester at "A". Place handle on bleed valve and be sure it is closed tight. Use handle to operate pump slowly.

Watch needle on the gage. It will eventually rise very rapidly and then stop at the static pressure reading. Continued pumping will not show a very rapid rise in pressure because fluid is filling the sphere. Holes may be drilled in the base to mount it to your work bench.

To test other equipment, use the 1/4" pipe tap at the aux. plug. Run steel lines using brass compression fittings and "French Connection" tool. If you require a larger reservoir, install at the fill plug. A main accumulator can be installed at "A". You may also install a plug made from an old sphere with the hole welded shut. If you use it as a test bench often, install a valve at the aux. plug.

J.B.M. can also supply gages in pounds and bars at extra cost. Cross-over gage set can also be used on this tester. 0 to 3000psi gages are available.

REMEMBER TO OPEN THE BLEED SCREW BEFORE YOU REMOVE SPHERES OR OTHER EQUIPMENT. Otherwise you will make a mess.

This tester is intended for use on IHM equipment, but as the seals are made of nylon, Brake Fluid will work fine. We recommend that you do NOT leave brake fluid in the tester. Flush with alcohol after use and refill with ATF or mineral oil. (Thin) Brake fluid will rust your tester and remove paint.

This tester will save you money by telling you exactly the pressure in your spheres. Saves needless rebuilding and pressurizing.

Questions and Answers

- Q. The red hydraulic pressure warning light flashes when I step on the brakes. Whats wrong?
- A. Your brake accumulator is low on pressure or flat.
- Q. Why does my car's clutch "judder" when I start out fast? My brakes also "judder" when I stop.
- A. You need rear motor mounts. Almost all cars need these now because the rubber is old, and it gets smashed by the weight of the engine and the cooking it gets from the engine heat. The large washer on the bottom of the rubber mount can hit the frame and cause a "clunk".
- Q. Why does my pressure regulator make a "Put_Put" noise like a machinegun?
- A. Your main accumulator is flat. This should be fixed as soon as possible because damage to your pump or regulator can result.
- Q. My rear brakes grab first, and as I push harder on the pedal, the front brakes come on too hard.
- A. Sounds like you may have sticking front pistons in your calipers. Disassemble your calipers and remove the pistons. Polish the caliper bores and the pistons. Put "Never-Seez" on the felt dust seal.
- Q. Why can't I bleed all of the air out of my brakes?
- A. A ruptured diaphragm in your brake accumulator can cause this. A leaking shaft seal in your hydraulic pump is another source of air. Bleed your brakes slowly.
- Q. What do I need to relocate my pressure regulator the easiest way?
- A. Relocation Bracket Kit, 1/4" & 3/16" French Connection Tools, a length of rubber fuel line for a return hose, and some American steel brake line from an auto parts store. Opinions vary as to the best location, but I like the area just behind the air horns because you need only open your hood to remove the sphere or get to your bleed screw. No need to remove your spare tire. With the above mentioned parts, you could mount it in the trunk if you want. You can replace any steel line that is on the car.
- Q. I want to eliminate my power steering as a temporary fix for a leaking seal. Will your block-off plate work for this?
- A. Yes. Just remove the fender and battery tray, then remove the lines to the steering unit. Work the steering back and forth to eliminate the fluid, and install the block-off plate. Drive carefully.
- Q. I need my spheres rebuilt. Do you install new rubber parts?
- A. Yes. A new diaphragm and "O" ring under the fill plug are included.
- Q. I need to rebuild my power steering seals. Can I replace them myself?
- A. If you are a fair mechanic, yes. You must have the proper tools. Installation Cones, Cross-over pressure gages, Alignment tool, and a tool to remove the cross dowel can be purchased for less than a rebuilt steering rack. Tools can be used again or sold.

- Q. My heater blower seems weak. Do I need a new motor?
 A. No. The heater must be disassembled and the motor removed. The brushes are usually stuck. Remove them and sand down the sides of the brushes on a flat piece of sandpaper and spray them with WD-40.
- Q. My car will not raise up unless I move the lever inside the car. Why?
 A. The linkage to the height correctors is probably stuck. Remove the left side fenders and the gravel guards. Oil the linkage and pay special attention to the bushing at the base of the lever that actuates the height corrector.
- Q. I put a new battery in my car, but it still turns over very slowly and the starter seems weak.
 A. Try changing the battery cables. Put on nice fat "American" type cables. The original cables were too small in diameter. Don't forget the ground cable.
- Q. I need to constantly add refrigerant to my A.C. system. How can I find the leak?
 A. If you have not had any hoses off on your car, the chances are that the shaft seal on your compressor is leaking. Go to the drugstore and get some kid's "Bubble Stuff" and brush it on all joints and around the shaft.
 If the shaft seal is leaking, you can get another at an autoparts store. I use NAPA #207243 seal kit for most York compressors. Count the number of bolts on the plate of your compressor to be sure you get the proper part. Seals come with instructions. Evacuate, purge and refill system.
- Q. Why can't I keep my tail lights working on my car?
 A. They are a weak point. Clean the sockets and bulbs and then spray with WD-40. Drill a small hole in the bottom of the lens to allow water to drain.
- Q. I have a "parts car" that I need to move, but the engine won't start. How can I get ground clearance?
 A. Remove the radiator and hydraulic pump belts. A socket and a speeder wrench will allow you to crank the pump by hand. A socket on an electric drill will work too. If no hydraulics, then jack the car and place wooden blocks on the suspension stops.
- Q. My car overheats. Should I have the radiator taken apart and rods run through the core?
 A. Try getting some "Muratic Acid" from the local hardware store. Remove the radiator and pour the acid in straight. Wear gloves and eye protections. Slosh about 1 qt. of the acid back and forth through the core for 15 min. Flush completely with water from a garden hose for 30 min. You will be surprised at the transparent flakes of stuff that come out. You should also be sure to check the thermostat in a pan of water on the stove to be sure it opens completely.
- Q. I can't get my spheres back on my car because of damaged threads. What can I do?
 A. A three corner file can be used to correct smashed threads if you should drop a sphere by accident.

- Q. Can I use the small cans of refrigerant to fill my air conditioner? I have seen them sold as a charging kit in discount stores.
 A. Yes. Check to see if you are low on refrigerant by looking in the sight glass on top of the receiver dehydrator canister. Run the engine at 2000 rpm on a warm day with the A.C. on full blast. If you see any bubbles in the glass, you are low on refrigerant.
 Follow the instructions that come with the charging kit. Before you attach the charging hose, be sure to purge it by allowing some refrigerant to spray out of the hose.
 Hold the can upright and charge with gas only. Do not put "liquid" refrigerant into your system with the can inverted. The trick that they don't tell you is, that when charging begins, the can will begin to get very cold. This lowers the pressure in the can and charging slows to a stop.
 To force the refrigerant out of the can, place the can in a pail of warm (not hot) water. Run the engine at 2000 rpm while charging.
 Fill until the bubbles disappear in the sight glass. Do not over charge. No more than 1/2 can after the bubbles disappear.
- NOTE:
 Don't try to recharge if your system has been opened. Push in the valve on the charging fitting mounted on the compressor head with a screwdriver. If gas comes out, system still has pressure in it and it is safe to charge. It is easy to recharge and only takes a few minutes to do.
 The refrigerant won't burn, and the gas won't hurt you. The liquid refrigerant can give you frostbite if you get it in your eyes or on your skin for very long. It won't stay on your skin easily because it boils at - 21 degrees F.
 If you are industrious and need to evacuate your system, you can use the intake on your air compressor. Be sure to evacuate then partially fill and then evacuate again. This will purge the system and eliminate any air. If the system has been open for very long, replace the receiver dehydrator canister. If you don't, it won't work for long.
- Q. I bought a pair of your motor mounts, but had a lot of trouble getting them into their cans. Why can't I use oil to lubricate it?
 A. Oil will attack the natural rubber in the mount. Place the rubber on the shaft and then put the whole works in your freezer. Baby powder will work fine as a lubricant. You will be able to assemble easily.
- Q. I get a loud cracking noise from the rear suspension when the car comes up in the back. I checked the end of the piston rod for lube, and it looks fine. What's wrong?
 A. The end of the piston rod gets worn in the spot that it rides all of the time. Rework the end of the rod with a small hand grinder. You will need to remove the rod and boot and hold it in a vice. Take care not to get grit into the boot. Smooth the groove that the ball rides in. Use a mounted grinding wheel with a radius that is close to that of the ball. It doesn't have to be ground perfect because it will "wear in" anyway.
 Check this joint for lube on any Citroen you buy as soon as you get it home. Many people neglect to lube this spot and soon the piston rod snaps off. The socket can be removed on newer cars, but older cars are all one piece.
- Q. Where can I get Texaco Hydraulic # 15 ?
 A. Any airport that handles jet aircraft should have it, or be able to get it for you. They may only have a 55gal drum, so take a container. If you have been using A.T.F. you will probably notice a big difference in ride and steering.

- Q. I was driving on a flat front sphere until I replaced it with a set of J.B.M. rebuilds. Now the car leans to the side that had the flat sphere. Switching the spheres doesn't help and I checked the anti-roll bar adjustment.
- A. You damaged your top front suspension arm. With a flat sphere on your car, it had no "spring" to absorb road shocks on that wheel. All of the weight for each front wheel is carried by the top suspension arm only. The bottom arm is an idler and does not carry the weight of the car. Drive slowly if you have a blown sphere.
- Q. Why does my car have a "delay" in the brakes?
- A. Air in the braking system. Bleed the brakes.
- Q. I dropped a small nut down into the engine compartment. I can't see it. How can I get it back?
- A. You can't without doing some work to remove the bottom engine pan. Treat your car as if you are working on a time bomb. One slip and it's all over. Place rags to catch things should you slip. If the rags don't catch it, drop to the floor and cover your head.
- Q. I want to rebuild my spheres myself. Will you sell me just the diaphragms?
- A. Yes. Contact me for prices and quantity discounts. *1/2.00 ea.*
- Q. I have a leaking oil pressure switch on my car. Citroen wants over \$45 for a new one. What can I do?
- A. J.B.M. has an adapter kit for this problem. The original switch failures are a common problem. Dangerous too. The oil from the leaking switch diaphragm gets on the contacts, then the diaphragm ruptures and all of the engine's oil is lost within a mile. The J.B.M. kit comes with a common American pressure switch.
- Q. I have an SM and need a hydraulic pump. Can you rebuild mine.
- A. Yes, and we may be able to help with other SM parts on an experimental basis.
- Q. Why can't I spray used motor oil in my doors and frame?
- A. You can, but used oil contains acids and water so I don't think it does as good a job of protecting against rust. Oil is not too expensive, and two quarts is plenty to do your entire car. Any oil that runs off is wasted. Doing anything is better than doing nothing and watching your car rust. *USE NON-DETERGENT*
- Q. I need my power steering rebuilt, but I don't want to do it myself. Can I send it to J.B.M. to be rebuilt?
- A. No. We do not have as nice a set up as Rod Burwell. Rod has gone to a lot of trouble to make a steering test bench so that he can adjust the steering out of the car. Rod uses J.B.M. parts.

Send to: Rod Burwell
Burwell Hill
West Haven, CT. 06516

USE A PROPANE TORCH, TO HEAT THE ALUMINUM CYLINDER, TO REMOVE REAR SPHERES
(order new "O" rings from J.B.M.)

T-shirts are now available. State model, size, and sex. \$8.50 ea. ppd.

Toutes les teintes de carrosserie de la gamme "D" 1955-1975.

COLORIS DES "DS"

REF	COULEUR	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75
AC 200	Noir	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
AC 505	Vert cru	*																			
AC 406	Aubergine	*																			
AC 136	Gris rose	*	*	*	*																
AC 134	Champagne	*	*	*	*																
AC 305	Jonquille	*	*	*																	
AC 604	Bleu nuage	*																			
AC 603	Bleu delphinium	*	*																		
AC 306	Ecaille blonde	*	*																		
AC 143	Marron glace	*	*	*																	
AC 307	Jaune Panama	*																			
AC 507	Vert mezeze	*	*																		
AC 408	Rouge Esterel	*	*	*																	
AC 605	Bleu Monte-Carlo	*	*	*																	
AC 146	Gris mouette	*																			
AC 147	Gris typhon	*																			
AC 308	Ambre dore	*																			
AC 607	Bleu Pacifique	*	*																		
AC 309	Beige antillais	*																			
AC 409	Brun palissandre	*																			
AC 510	Vert olive	*																			
AC 101	Gris anthracite	*	*	*	*																
AC 102	Blanc paros	*	*	*	*																
AC	Brun auroch	*																			
AC 104	Gris sable	*																			
AC 612	Bleu Provence	*																			
AC 105	Gris ardoise	*																			
AC 411	Rouge carmin	*	*	*																	
AC	Vert tilleul	*																			
AC 106	Gris ete	*	*																		
AC 414	Brun isard	*	*																		
AC 616	Bleu d'Orient	*	*																		
AC 518	Vert hereda	*																			
AC 108	Gris palladium	*	*	*	*																
AC 144	Blanc carrare	*	*	*	*	*	*														
AC 421	Bordeaux	*	*	*	*	*	*														
AC 509	Vert Jura	*																			
AC 119	Gris cyclone	*	*																		
AC 419	Rouge coralline	*	*	*																	
AC 133	Gris Kandahar	*	*	*	*																
AC 099	Gris nocturne	*	*																		
AC 623	Vert icinee	*	*																		
AC 403	Rouge corsaire	*	*																		
AC 097	Blanc stellaire	*	*	*	*																
AC 522	Vert charmille	*	*	*	*	*	*														
AC 096	Blanc albatre	*	*	*	*	*	*														
AC 401	Brun ecorce	*	*	*	*	*	*														
AC 095	Gris nacre	*	*	*	*	*	*	*	*												
AC 623	Bleu andalous	*	*	*	*	*	*														
AC 093	Blanc cygne	*	*	*	*	*	*														
AC 095	Gris brumaire	*	*	*	*	*	*														
AC 091	Beige agate	*	*	*	*	*	*														
AC 318	Sable metallise	*	*	*	*	*	*														
AC 524	Vert muscinee	*	*	*	*	*	*														
AC 630	Bleu Danube	*	*	*	*	*	*														
AC 632	Bleu platine	*	*	*	*	*	*														
AC 088	Blanc Meije	*	*	*	*	*	*	*	*												
AC 086	Gris d'Anjou	*	*	*	*	*	*														
AC 320	Bronze	*	*	*	*	*	*														
AC 087	Beige albatros	*	*	*	*	*	*														
AC 424	Rouge de Rio	*	*	*	*	*	*														
AC 423	Rouge Massena	*	*	*	*	*	*														
AC 426	Rouge de Grenade	*	*	*	*	*	*														
AC 527	Vert argente	*	*	*	*	*	*														
AC 635	Bleu Camargue	*	*	*	*	*	*														
AC 084	Ivoire borely	*	*	*	*	*	*														
AC 085	Beige Tholonet	*	*	*	*	*	*														
AC 427	Brun scarabee	*	*	*	*	*	*														
AC 083	Beige Vanneau	*	*	*	*	*	*														
AC 639	Bleu lagune	*	*	*	*	*	*														
AC 640	Bleu delta	*	*	*	*	*	*														

Les coloris des DS de 1957 n'ont pu être retrouvés.

Page suivante 1984 Pour la grande exposition consacrée aux "Cent ans de l'automobile française" qui se tenait au Grand-Palais. Citroën prête quelques-uns des jouvaux de sa collection automobile.

COLORIS DES "ID" ET DERIVES

REF	COULEUR	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	
AC 200	Noir	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
AC 303	Capucine	*	*																		
AC 138	Bleu turquoise	*	*																		
AC 142	Gris mirage	*	*																		
AC 604	Bleu nuage	*	*																		
AC 601	Bleu nuit	*	*																		
AC 306	Ecaille blonde	*	*																		
AC 143	Marron glace	*	*	*	*																
AC 145	Gris palombe	*	*																		
AC 605	Bleu Monte-Carlo	*	*	*	*																
AC 507	Vert mezeze	*	*	*	*																
AC 147	Gris typhon	*	*																		
AC 607	Bleu Pacifique	*	*	*	*																
AC 309	Beige antillais	*	*	*	*																
AC 512	Absinthe	*	*	*	*																
AC 510	Vert olive	*	*	*	*																
AC 101	Gris anthracite	*	*	*	*	*	*														
AC 102	Blanc paros	*	*	*	*	*	*														
AC	Brun auroch	*	*	*	*	*	*														
AC 104	Gris sable	*	*	*	*	*	*														
AC 612	Bleu de Provence	*	*	*	*	*	*														
AC	Vert tilleul	*	*	*	*	*	*														
AC 106	Gris ete	*	*	*	*	*	*														
AC 414	Brun isard	*	*	*	*	*	*														
AC 518	Vert hereda	*	*	*	*	*	*														
AC 616	Bleu Orient	*	*	*	*	*	*														
AC 120	Gris ciel lourd	*	*	*	*	*	*														
AC 420	Brun sardone	*	*	*	*	*	*														
AC 119	Gris cyclone	*	*	*	*	*	*														
AC 421	Bordeaux	*	*	*	*	*	*														
AC 133	Gris Kandahar	*	*	*	*	*	*														
AC 509	Vert Jura	*	*	*	*	*	*														
AC 97	Blanc stellaire	*	*	*	*	*	*														
AC 522	Vert charmille	*	*	*	*	*	*														
AC 401	Brun ecorce	*	*	*	*	*	*														
AC 096	Blanc albatre	*	*	*	*	*	*														
AC 093	Blanc cygne	*	*	*	*	*	*														
AC 095	Gris brumaire	*	*	*	*	*	*														
AC 524	Vert muscinee	*	*	*	*	*	*														
AC 630	Bleu Danube	*	*	*	*	*	*														
AC 088	Blanc Meije	*	*	*	*	*	*	*	*												
AC 086	Gris d'Anjou	*	*	*	*	*	*														