

**Chapter 1 : SU Carburetor Self-Check Owners Guide**

*SU Carburetors Tuning Tips and Techniques. Also covers all SU Fuel Pumps. Contains information on dismantling, inspection, reassembly & tuning SU carburetors.*

September 7, I spent most of my working life as owner and operator of a dyno tune-up and diagnostic shop in New Jersey. Happily, I discovered in my retirement years that there was an active British car club here in retirement heaven the Ozarks. The problem This season, our modified cc A-H Sprite engine in the Austin A40 would very occasionally backfire through the carburetor at highway speeds under light load. I know from experience that the symptoms indicate an excessively lean fuel mixture that means not enough gasoline in the air stream. Me and my wife Shirley in the Austin A40 Farina. Mechanically it was originally similar to a bugeye. After that they all got the Farina touch, for better or worse. Mine was a rust-free Canadian car with an amazing history that I imported in Background SU carburetors are marvelously simple devices that work wonderfully well, despite everything you have heard or even have experienced on old, worn-out British cars that are decades away from the condition they were in when they left the factory. Our cars were just as bad. But all that original goodness was created by many hours of testing in engine research labs and field testing by skilled technicians. When we go mucking about “ All of that careful factory calibration goes out the window when we start modifying sometimes improving! A lot of experimentation is needed to optimize a race engine and even more is needed for a modified street engine, because the latter must perform well under a wider variety of operating conditions “ not just mainly full throttle, as on a race track. How does a SU carb control the fuel mixture to meet the current need? The carburetor piston carries a tapered needle, hanging into a jet. The fuel in the jet is at a level controlled by the float. The piston is controlled by vacuum and, carrying the needle, rises and lowers in response to the engine load and, to a lesser extent, the speed of the engine. It means that the portion of the carburetor needle in the jet at that moment is too fat “ causing a borderline leanness. But the car runs smoothly and well at all other speeds and loads. Easy; we just connect a vacuum hose to the intake manifold, route the hose back into the car where a vacuum gauge can be seen and drive the car on a flat road at 3, rpm in fifth gear. The intake manifold vacuum, normally expressed in inches of mercury, is our precise indicator of load under those conditions. The exhaust gas analyzer will confirm our lean mixture suspicions. With the air filter off we can measure the exact piston height at that load. It is then easy to determine the exact needle position relative to the jet. I know “ the equipment needed is not readily available everywhere and a shop with that equipment and skilled technicians will deservedly charge a bundle for their time. Nevertheless, that is the best way to go and in the long run it may be the cheapest. After all, we are only talking about a half-hour of dyno time, or their minimum testing fee. You can perform the cure yourself. Summary so far At a now-determined distance the tapered needle it is too fat, causing an excessively lean fuel condition. We are going to think in terms of eighths of an inch. Doing it Remove the needle. Just as in a SU needle catalog, we first need to have accurate measurements of the needle needles, if a multi-carb engine before starting any mods. With a micrometer, measure exactly on those marks and record the diameters on a sketch of the needle. Remove material slowly and mic the diameter often. Reassemble and try it again! Is there a cheaper way to do this? Without a dyno, there are a few on-the-road methods that might work well enough to serve. Your video cam recorder “ or a rented camera, capable of short focal lengths and fitted with a long release cable “ could then be solidly mounted in the engine compartment facing the carburetor mouth. Hopefully, the camera would reveal the piston height with sufficient accuracy. Alternately, having removed the hood bonnet , perhaps a large mirror could be solidly mounted and angled to allow a riding mechanic to see the piston height. You watch the road, please! Or, with the dashpot plunger and oil removed, a calibrated, balsa stick could rest in the piston and readings taken above the top of the carb. A vacuum gauge is the best way to reproduce an exact load condition for a given engine speed and gear. A chassis dynamometer, of the proper type, is the best way to solve tuning problems or misfiring. A determined individual can cure fine-tuning glitches normally resolved at the factory. Water brake or eddy current electric dynos are needed. There is only one sequence to successful tuning and diagnosis:

*Fulfillment by Amazon (FBA) is a service we offer sellers that lets them store their products in Amazon's fulfillment centers, and we directly pack, ship, and provide customer service for these products.*

**First Things First** If your car is not running the way it should, and you suspect that your carburetors are to blame, be sure to check that your plugs, points, valve clearances, and particularly your ignition timing, are set correctly before you do anything else. Many problems blamed on the carbs are actually the result of ignition, or other engine issues. In fact, many of the carbs we receive, do not need rebuilding; the problems lay elsewhere. Before you even consider rebuilding your carbs, or having them rebuilt, please be sure to check everything else on the engine **FIRST!** If not, when you finish your own rebuild, or get them back from a rebuilder, the engine will almost certainly run just the same as it did before [Click Here](#) to download a DIY checklist that covers all the basic checks referred to above. Have a specific question? Maybe I can help. All of the information on this Web site, is provided in good faith to assist the enthusiast owner. Always refer to the appropriate workshop manual for your vehicle as necessary. Working on motor cars is inherently dangerous, and British Classic Motors accepts no responsibility for any damage, or injury, resulting from the use of this information. One of the most common problems is rough running at idle, and before it is assumed that a rebuild is required there are a couple of easy things to check, which may solve the problem. The most likely culprit is a vacuum leak, and these account for the majority of issues reported to us by owners. You need to check that all of the tubes and hoses connected to the carburetors and the inlet manifold are connected properly, and are not damaged, or perished. If everything looks OK, one more check is needed. With the engine running, take a can of starting fluid and carefully spray all of the hoses, their connections, and the inlet manifold gasket area. If the engine speeds up at any time, you have found a vacuum leak. Fix that leak, or leaks before you do anything else. You **MUST** still check the entire system after you find the first one; there almost certainly will be more than one! Check the condition of the hose, and each end for leaks. Spray along the whole length of this hose; they tend to perish, and develop cracks. Even the smallest leak in any of these areas will cause problems. If the engine is drawing air in from anywhere except through the carburetors, the mixture will be excessively weak; and you will **NOT** resolve it by adjusting the carburetors. Please remember that starting fluid is extremely flammable - and **ALWAYS** be extremely cautious when working around a running engine!! In response to a large number of inquiries about exactly how much oil should be used in the dashpots, I have added this image. Grasp the end of each shaft and try to move it back and forth. Test both ends of each shaft. If you find anything more than absolute minimal movement, they may need work. The next thing to check is the oil in the suction chamber. If the oil is either the incorrect grade, or the level is too low, you will experience a stumbling effect when you accelerate from idle. Everyone you talk to will give you a different opinion as to which oil you should use; everything from Marvel Mystery Oil, to EP 90 Grade gear oil. The grade of oil recommended by SU is, and always has been, is SAE 20, and this is the one we use, and the grade we supply in a small bottle with all rebuilt carbs. Is it absolutely critical? Not really, and if all you have on hand is 5w, it will do at a pinch. Do not go as high as 20w though, it is too thick, particularly when cold, and will give you an over-rich mix on acceleration. If you feel a distinct hesitation when you accelerate, it means the piston is rising too quickly; try a slightly heavier oil. Raise the jet adjusting nut, on one carburetor at a time, until the engine speed just begins to fall off. Raise or lower the jet by using the mixture screw on the side of the carb. Screw in for a richer mixture, out for a weaker mixture. If the engine speed increases and remains elevated, your mixture is a little rich. In this case raise the mixture adjusting nut by one flat at a time, and re-check the mixture. If the engine speed drops when the piston is lifted your mixture is too lean, and in this case lower the mixture adjusting nut, again, by one flat at a time. When the engine RPM initially raises as the piston is lifted, and then settles back to the original speed or a little higher, your mixture is right. Then, evenly adjust both idle speed screws to reach the desired idle speed. Re-check fuel mixture, and carburetor synchronization. Tighten all the screws on the interconnecting linkage, being careful not to move anything. Screw both the fast-idle screws in until they just touch the fast idle cam. Alternately turn each

fast-idle screw until the idle speed is increased to 1, RPM with the engine warm. Push the choke back in. Take a test drive, and enjoy the feel of a correctly set up pair of carburetors.

*Su Carburetters are The Worlds Sole Manufacturer of Genuine SU Carburetters, Fuel Pumps and Spares.*

The trick to tuning SU carbs is to understand that there are two things you need to get right: While they are interconnected, they are also independent, and need to be measured and adjusted independently. Special Tools You will probably need to arrange to buy or borrow a Unisyn flow meter. The Unisyn is the usual gauge for getting the air flow balanced between the two carbs. It consists of an adjustable opening same size circumference, but with a disc on a threaded rod that you can screw tighter or looser that you use to set the level of a little float that rises or falls in a glass tube at the side of the gauge. This is a spark plug with a crystal pressure- and heat-resistant window in it that lets you see into the combustion chamber while the motor is running. The color of the flame indicates the mixture richness. To tune SU carbs, first locate the following components: These set the idle speed for each carb, and are located typically behind the dashpot, on the same side of the carb to which the throttle linkage connects. This is the lower of the two nuts at the very bottom of the carburetor. Later SU carburetors of the HIF type have integral float chambers, on which the mixture is adjusted by turning a screw. These are little wobbly metal pins under the dashpot. When you push up on the pin, it raises the piston in the dashpot. This is the part inside the carburetor, where the gas jet opens into the airstream. The jet is the brass tube that sits in the center of the bridge, with a tapered needle poking down into it. The choke linkage nuts. Comparable to the throttle linkage nuts and usually the same size, but on the linkage that goes between the choke cable and the mixture adjustment mechanism. They make sure that both carbs are enriched when you pull on the choke.

**Balancing The Air Flow**

1. Start with the engine warmed up to operating temperature and perform your standard ignition tune-up points gap, timing, spark plug gap, new condenser, etc. Begin by balancing the air flow. To do this, first loosen the throttle linkage nuts. Leave them connected, just loosen them half a turn or so. Back out the throttle stop screws till you can see that they are just touching the throttle stop. Put the Unisyn over either carb and adjust the orifice in the Unisyn till the little float at the side rests at the middle of its graduated tube. Hold the Unisyn over the carb for only long enough to see the level of the float, then remove it. Place the Unisyn on each carburetor in turn to check its flow, adjusting the throttle stop screws until both carburetors register the same position on the graduated tube of the Unisyn. The float will probably move either up or down in the tube, which is why you want to center it in Step 4. When both carburetors flow the same amount of air, tighten the throttle linkage nuts, adjusting for the amount of free-play between the linkage and the throttle stops that your manual calls for probably about 0. Your goal should be to achieve the lowest possible idle with both carbs balanced and the engine running smoothly. Note that the idle speed will very probably rise as you get the mixture correct. Then adjust the mixture. This corresponds to the flat faces on the nut. Alternatively, you can "peer down the throat of the carb and turn the mixture screw while watching the top of the jet. Remember that moving the top of the jet up will lean out that carb, while moving the top of the jet down will richen it. Shut the car off and loosen the choke linkage nuts. Adjust the mixture nuts screws fully lean. For separate float-chamber cars, this means raising the mixture nut all the way up against the bottom of the carb or rather, against the spring. For HIF carbs, you can try turning the screw while looking down the throat to see which way the jet is moving. In either case, the idea is to zero out the jet: Then start the car. In the following step, you might want to consider adjusting the carburetors one-half a flat too lean, as the mixture will be enriched when you put the air filters which restrict air flow on at the end of the tuning process. If the exhaust note rises and stays high till you drop the piston, this carburetor is adjusted too rich. Turn the mixture nut one flat one-sixth of a turn up, moving the jet toward the bridge, then repeat Step 4. If the exhaust note falls and the car sounds as though it is going to stall, this carburetor is adjusted too lean. Turn the mixture nut one flat one-sixth of a turn down, moving the jet away from the bridge, then repeat Step 4. If the exhaust note rises briefly and then settles back down to something like the original RPM level, this carburetor is set correctly. When you have achieved this setting for both carburetors, continue with Step 5. Tighten the choke linkage nuts so that the choke cable will pull an equal amount on both mixture nuts when you pull the knob. At this time, I find I

usually have to adjust the idle again because getting the fuel mixture right usually changes the idle speed. Since you know you have the throttles synchronized, I normally just adjust the idle without loosening the throttle linkage. Replace the air filters and go for a test drive! Notes SU carburetors are most fuel-efficient when slightly lean, and provide the most power when they are slightly rich. You can use this knowledge to provide a certain amount of tuning for the kind of driving you do. The ColorTune will let you see the color of the flame. White flashes mean too lean; yellow flame means too rich. Blue like a Bunsen burner is correct, and blue with a faint orangish tinge is the best for power. If you modify your engine, you will probably need to modify your needles, as it is the needle profile that determines the mixture curve for different air-fuel loads. The most serious fault on most old SUs is wear in the throttle shaft area. To test for this, spray some carburetor cleaner on the outside of the throttle shaft; carburetor cleaner is non-combustible, and if the engine speed drops, it means some of this is getting into the air stream from outside the carburetor. You may also have leaks from the manifolds, from tubing such as the vacuum advance line to the distributor if fitted, or from other places; the carb cleaner trick works well for locating those leaks as well. Other problems that SU carbs experience involve dirt in the dashpot and occasionally in the float chamber. A little grit between the piston and the dashpot can make the car jerk and sputter. Take the dashpot off, wipe the insides down with carb cleaner and a lint-free, clean rag, then reinstall it, getting the screws down tight. Dirt in the float bowl basically shuts off that carburetor or can make it flood open, depending on whether the dirt is wedging the valve open or closed. You can try rapping on the float bowl with the handle of a screwdriver, but your best bet is to take the cover off, clean out the valve fittings, and reinstall everything, with a new fuel filter for good measure. Some older SU models also have adjustable floats, in which you need to set the float height which basically equals the fuel level in the float chamber by bending a brass rod. These carburetors were replaced in the mids with carburetors that had fixed, plastic floats which are basically trouble-free unless abused. The stop at the back of the floats can break if they are installed badly, and the brass pin that holds them in place can wear an oval hole in the float pivot. Grose-Jets are very popular with some people and a big pain for others. It appears " and this is just conjecture " that Grose-Jets work best in cars with adjustable floats, as they are longer than the stock SU float valves. The standard failure for Grose-Jets is to flood the carburetor. I have never had problems with the stock SU float valves or floats. Of course it always gets more interesting when you have more than one! There is a very good Haynes SU carb manual available, recommended reading. The carbs rarely need to be adjusted, once set. Of course, it helps if the carbs are in good mechanical condition as well. But you can consider a rebuild once you have gotten things working first! Make sure the needle is moving and seating properly. You can check for matching float settings, after setting the mixture, by removing the pistons, and peering down at the jets. The fuel level should be about the same on both carbs, a little below the top surface of the jet. After car has been run only step 3b- Go get a pint of ale, or something close, and set it nearby. Set the piston down on a clean wadded rag to prevent rolling. Clean the inside of the carb. Check operation of the throttle. The bushings and shafts can be replaced, but it requires some machining. Stare in awe at the odd carburetor design, simple and effective, constant velocity. Reassemble, check piston movement, raise it, then let go, it should fall freely. Do not stretch the spring. When all is operating properly, fill the damper with Marvel Mystery Oil for light damping, or use motor oil for heavier damping. Later Zenith-Strombergs have a thermostatic choke, not a cable. This is adjusted by loosening the set screws on the throttle shaft and matching the two sides. Both carbs should be about even, a little below the top surface of the jet. If not, readjust one or both floats to match the level. The Uni-Syn is much easier to use, and can result in better balance. The engine may now be running rough, just keep the idle speed high enough to keep running. Give the throttle a quick snap to make sure everything is settled, then check sync again. Periodically snap the throttle to make sure everything is seated. Turning the fitting raises and lowers the needle seat. Note where the engine runs better, idle speed should increase.

**Chapter 4 : SU Carburetors Tuning Tips and Techniques by R M Clarke (Paperback, ) | eBay**

*Book Summary: Note raise the groove mating with a petrol engine speed increases and impairing. Have new floats the interconnecting linkage. The ends of the radiator you can be put on stop.*

It needs a periodic check to see if it is in tune. Unlike other types of carburettor, which have fixed jets, the SU has only one jet, so the mixture setting affects the engine throughout its speed range. Some SUs also have exhaust emission-control devices to comply with anti-pollution laws. Adjustment of these is described in Adjusting an emission-control carburettor. Before tuning the carburettor, carry out all the checks in Checking and cleaning an SU carburettor, and bring the engine up to normal working temperature. Also check the level of oil in the dashpot - the domed piston chamber at the top of the carburettor. The oil is there to slow the movement of the piston. The delay enriches the mixture briefly when the throttle is opened suddenly. SAE 20 engine oil is the correct grade to use when you top up. On older SU carburetors, which have a vent hole in the screw-in plastic top of the dashpot, the oil level should be  $\frac{1}{2}$  in. On dustproof SUs, which have a hole in the dashpot neck instead of the top, the oil should be  $\frac{1}{4}$  in. If the engine is slow to respond to sudden throttle openings, or responds fluffily, correcting the dashpot oil level may cure the problem, so that you do not need to retune. Air cleaner The air cleaner in the front of the carburettor may have to be removed, but leave it on if possible. However, if correcting the oil level does not resolve the problem, you may need to clean the carburettor See Checking and cleaning an SU carburettor before tuning it. Whenever possible, make adjustments with the air cleaner in place removing it alters the partial vacuum inside the carburettor. On cars where the carburettor is not very accessible, you may have to remove the air cleaner to reach some parts, then carry out further fine adjustments to obtain correct engine running later on. Checking the mixture Hook a finger under the lifting pin to raise the piston. Use the piston lifting pin at the side of the carburettor to check the fuel-air mixture. If, while the piston is raised, the engine speed increases briefly then returns to normal, the mixture is correct. If it rises and stays high, the mixture is too rich. If it falls and the engine tends to die, the mixture is too weak. To correct the mixture, move the jet adjuster nut one hexagon flat at a time. Screwing it up - anti-clockwise as seen from above - makes the mixture weaker. Screwing it down - clockwise makes the mixture richer. Each time you move the adjuster, wait for about ten seconds, then check again with the lifting pin to see whether the mixture is now right. Take care that the engine temperature does not rise above normal - which it will if you take too long. Such a rise will result in a false, overweak mixture setting which will show when the temperature returns to normal. Before and after adjustment, check that the jet needle is central in the jet. Stop the engine, use the damper to lift the piston to the top of its travel and let it drop. It should fall smoothly with a sharp click. If it does not, the jet is out of line and you must centralise it. An off-centre jet may also score or bend the tapered needle. Do not attempt to clean up or straighten a badly scored or bent needle. It must be replaced See Checking and cleaning an SU carburettor. Centralising the jet With the air cleaner off, the piston can be lifted with a screwdriver. The jet should be screwed up as high as the bridge if possible. Remove the air cleaner and the dashpot screw-in top and damper. Use a screwdriver to raise the piston. Turn the jet adjuster nut up as far as it will go, or until the jet is level with the bridge inside the carburettor. Slacken the large locking nut above the adjuster nut on the jet where it enters the carburettor body. Hold the piston down with a pencil while you tighten the locking nut. Now use a pencil or soft metal rod, such as a stick of solder, to push the piston right down. Hold it down and tighten the locking nut. Check that the piston drops with a click - if it does not, repeat the centralising process. Screw the jet adjuster nut down two full turns, which should bring it near enough to the correct setting for the engine to be able to run. Refit the air cleaner and reset the mixture. Give the piston a final click check before you screw back the dashpot screw-in top and damper. Stop wasting time on YouTube and get serious! The Ultimate 20 hour car mechanics video course Learn everything about modern cars from our new video series. Clearly and easily explained. All modeled in 3D.

**Chapter 5 : How to tune SU Carburetors**

## DOWNLOAD PDF SU CARBURETTORS TUNING TIPS AND TECHNIQUES

*SU Carburetors Tuning Tips and Techniques. QTY: Add to Cart. Product Description. Looking for improved performance from your SU carburetor? This detailed manual.*

### Chapter 6 : SU Carburetors Tuning Tips and Techniques: R M Clarke: blog.quintoapp.com: Books

*PDF SU Carburetors Tuning Tips And Techniques: (Also Covers All SU Fuel Pumps) (Tips & Techniques. 3 years ago 1 views. Chun. Follow.*

### Chapter 7 : SU Midel | For All Your SU Carburetor Requirements - Catalogues, Manuals & Books

*THE IDIOT'S GUIDE TO TUNING SU CARBURETTORS Centering the jet First determine if your jet(s) need centering. To do this, remove the piston dampers and the air cleaners, so you can access the pistons.*

### Chapter 8 : SU Carb (very) Fine Tuning " Moss Motoring

*We work out the trending price by crunching the data on the product's sale price over the last 90 days. New refers to a brand-new, unused, unopened, undamaged item, while Used refers to an item that has been used previously.*

### Chapter 9 : Adjusting an SU carburetor | How a Car Works

*On older SU carburetors, which have a vent hole in the screw-in plastic top of the dashpot, the oil level should be 1 in. (13 mm) above the top of the piston tube. On dustproof SUs, which have a hole in the dashpot neck instead of the top, the oil should be 1 in. (13 mm) below the piston top.*