

An Introduction to The ColourTune Plug

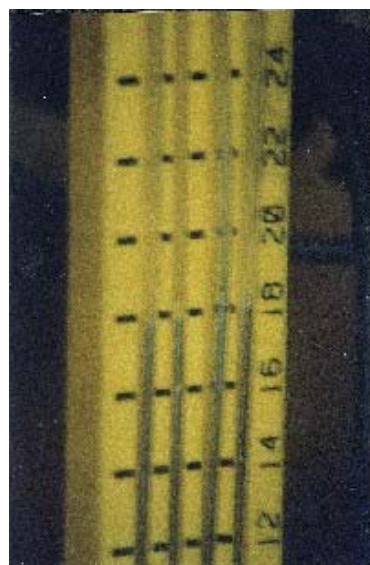
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The pilot screws fine tune mixture at idle and up to about 1/8 throttle. They have a great effect on part throttle acceleration and an influence on the mid-range. Pre-mixed air and fuel are metered into the air stream in the carb throat through the pilot circuit. These should be properly adjusted as part of the annual spring tune-up and any time the carbs are disassembled.

It is almost impossible to adjust them properly by 'ear'. The dealer uses an expensive Exhaust Gas Analyzer to set the mixture by the emissions. The Gunson's Colourtune Plug is a more affordable solution for the average owner.

First of all, the engine should be at normal operating temperature (set up a fan to blow on the engine and prevent overheating if it's a warm day), a temporary fuel supply set up, and the carbs must be [synchronized](#) to each other.



Mercury carb sticks. One tube is connected to each manifold, and the synchronizing screws are adjusted to achieve equal vacuum on each cylinder. Low vacuum on one cylinder means it's working harder than the others -- back off the synchronizing screw to close the throttle on that carb. High vacuum means it's being carried by the others -- turn the screw clockwise to open the throttle.



Rich mixture. The flame inside the cylinder is yellow to orange in colour.



Normal mixture. The flame is a nice bright 'Bunsen blue'.



Lean mixture. The flame is a whiteish or electric blue, very hard to see and may disappear completely as the engine "misses".

The principle behind the colourtune is the same as adjusting an acetylene torch or Bunsen burner. The chemical compounds produced during the various stages of combustion change the colour of the flame. Rich mixtures do not burn completely and produce a lot of carbon monoxide, which turns the flame yellow. Lean mixtures produce a hard to see bluish white colour, or don't burn at all. What we want to see is a nice bright 'Bunsen blue' colour -- named after, you guessed it, the Bunsen burner.

Follow the directions that come with the tool, but basically, the procedure is to set the idle speed to approximately 1050 rpm and install your YICS tool (if required). Back out the screw until the flame turns yellow, then slowly wind it in to get that nice blue with no yellow tinges. If you're tuning for best power and acceleration, then leave it there. If you're tuning for best economy, then mark the position of the screw before continuing to turn the screw in, counting the turns to the lean point. Back the screw out to a point 1/2 way between rich and lean.

For example, if it takes 1-3/4 turns to go from the first steady blue to the lean condition, then back the screw out 7/8 of a turn from lean.

Reset the idle speed if necessary. Check the position by 'blipping' the throttle. The flame should turn yellow momentarily. If it doesn't, open the pilot screw 1/8 turn at a time and try again. Slowly rev the engine up to 3,000 rpm or so. It should remain blue all the way. If it doesn't, close the screw 1/8 turn at a time. When you are satisfied, move on to the next cylinder, resetting the idle again if necessary.

Keep an eye on the synchronization between adjusting each screw too. As you fine tune the mixtures the synchronization may wander. Don't let the difference between highest and lowest become more than 2 cm of mercury. If you have to make substantial corrections while adjusting the mixture on all four cylinders, then you should go back over them again. The pilot mixture affects the synchronization and vice-versa.