

Mikuni HSR42/45/48 Carburetors (General Tuning Procedures)

General Tuning Procedures

Your Mikuni HSR42 is fitted with the tuning parts we found to work with a majority of engine tuning combinations. However, the tremendous number of differing exhaust systems and cams available for Harley engines make it impossible to accommodate all possible combinations with one carburetor set-up. You will probably find that the HSR42 will run perfectly on your engine without exchanging any parts. But if it doesn't you may alter its tuning to suit your engines needs by following this guide.

There are many more replaceable parts that affect tuning in the HSR42 than in the stock Harley carburetor. With these parts you will be able to precisely tailor the HSR42 to your engines requirements throughout its rpm and throttle setting range. Each tuning system is easy to modify and diagnose, but only when you understand what each system does and how it works. Before making any alterations to the HSR42, if any are needed at all, read the section of this manual describing the various tuning components and their functional range.

There is simply no point in attempting to tune any carburetor unless the engine is completely sound. Valves and rings must seal properly, the ignition timing must be correct and the spark plugs clean and gapped. Some exhaust systems may also make carburetor tuning difficult. For instance, it is very difficult to get smooth responsive carburetion with straight and open pipes. If you have any doubts about the condition of your engine, tune and test it before beginning what could be a frustration and unproductive effort to fix another problem with the carburetor.

Pilot System - Tuning the Pilot Circuit

The first step in tuning this carburetor is to get the idle circuit correctly adjusted. And the first step in this procedure is to adjust the air screw for the best idle. Mikuni sets the air screw two turns out during assembly. This is the position we have found to be right most of the time. If the screw position had been altered, gently bottom it and reopen it to two turns out from the fully closed position.

Next, ride the bike until the engine is at its normal operating temperature. This may require several miles at highway speeds. If you have an oil temperature gauge, ride until the oil temperature is at or near 150.

With the machine vertical and the engine idling near 1,000 rpm, adjust the air screw out until the engine again slows or becomes irregular, then begin turning the screw out until the engine again slows or begins an irregular idle. Count the number of turns between the too rich and too lean positions.

Set the air screw mid-way between the too rich and too lean positions. You may further refine the air screw position with further riding experience, but this will be very close to the perfect idle mixture setting.

If you allow the engine to get too hot during the air screw adjustment procedure, the resulting adjustment will probably be on the lean side of correct. If you have a large fan, use it while adjusting the mixture. If you do not have one, you may need to take him out for a short ride to cool the engine back to normal temperature.

NOTE: IF the best idle is achieved with the air screw less than 1/4 turn out, the pilot jet is too small and will need to be changed.

On the other hand, if the air screw must be more than three turns out for best idle, the pilot jet is too large and will need to be changed. Once you have a good idle with the air screw within its range, you may proceed to the next stage: Tuning the Jet Needle.

Main System - Tuning the Jet Needle

(Initial straight portion)

It is unlikely that you will need to change the jet needle from the one supplied in your HSR42. However, in case you do, you should be aware of how it works and how to tell if the one you have is too large (leaner) or too small for your particular engine set up.

The initial straight portion of the jet needle affects the mixture from the idle to approximately 1/4 throttle, at which point the needle's tapered portion takes over.

Lean Condition

If the jet needle is too lean (large), part throttle acceleration will be flat. There may also be some detonation during part throttle acceleration, although this can be caused by other factors. A lean jet needle will also result in a slow warm-up.

If part throttle acceleration is flat, install one size smaller jet needle and compare the performance. If acceleration is improved, leave the smaller jet needle in and take a fairly long ride at steady speeds to give the spark plugs time to color evenly.

Take a spark plug wrench with you and after a few miles at steady speeds, stop and remove a plug for inspection. Be careful as you stop not to operate the throttle. The extra fuel from the accelerator pump can cause a false plug reading. The body of a spark plug can be from light gray to brown to dark gray. If the plug body is black and has a sooty appearance the jet needle is probably too rich and a larger one will need to be fitted.

Rich Condition

While a black sooty spark plug is a sure sign of richness, there are others that are a bit more subtle. If your engine responds crisply at low throttle when it is cold, chances are the jet needle is one size smaller than it needs to be. Assuming, of course, that the idle circuit is correctly tuned.

Poor fuel mileage is another sign of richness and because of the way most of us ride our Harleys, the richness is usually the result of a jet needle that is too small. The color of the end of the exhausts is a sign of free gasoline. If the exhaust color is black, chances are you can enlarge the size of the jet needle.

It may be that you prefer a jet needle that is slightly on the rich side of the correct range. A slightly over-rich condition lets a Harley accelerate better at very low rpm's and from very low throttle settings. Be aware that you will lose some fuel economy if you choose to do this.

Tuning the Jet Needle (Tapered portion)

Like the idle circuit of the jet needle, the tapered portion has its range of operation. The tapered portion has an increasing effect on fuel mixture from about 1/4 throttle opening as the tapered section leaves the opening of the needle jet. Between 1/2 and 3/4 throttle the jet needles influence is the greatest and it controls most of the fuel flow.

All jet needle and main jet testing should be done with the engine near the middle of its rpm range. Start acceleration tests at about 50 mph. The best jet needle position will give the strongest acceleration.

With the engine at operating temperature, accelerate at 1/2 to 3/4 throttle, in top gear from 50mph or so. If acceleration seems soft or flat and the engine is slow to respond when the throttle is quickly opened from 1/2 to 3/4 throttle position, the mixture is too lean. Raise the jet needle one notch and repeat the test.