Hodaka Performance Tuning Notes - 2006

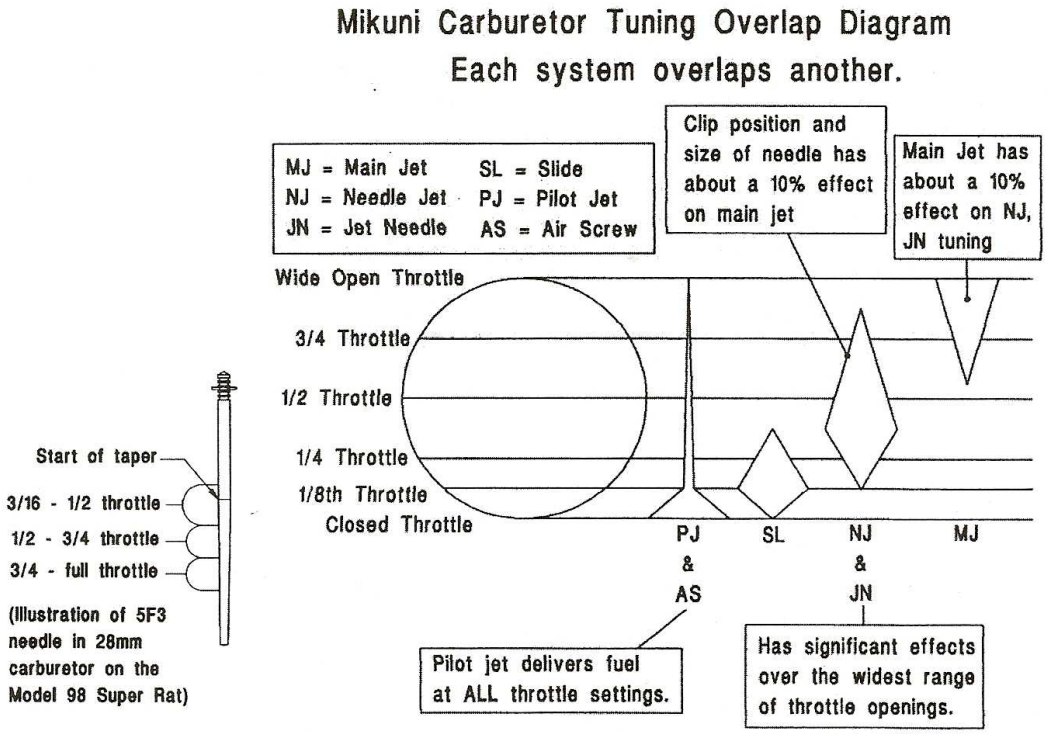
By: Harry Taylor – former PABATCO employee

Everyone has his own way of doing things and I am not saying that you should change, but the following items have worked for me over the last 50 years.

First and foremost, make sure all mechanical aspects of your engine and machine are good. Seals, compression, tire pressure, a clean carburetor and clean fuel, no engine air leaks, bolts tight, chain lubed and properly tensioned, etc. Over-oiling an air cleaner with some of the modern sticky oils can make the engine run rich until you have run it quite a lot.

Carburetion/jetting

Jetting effects of each component in the carburetor overlap with the jetting effects of other components. Read and understand the jetting diagram. There are no absolutes as there are so many variables – but there are principles to be followed to achieve success.



Carburetion/jetting continued -

Ideally, you should purchase an altimeter and barometer/humidity gauge. These items are not expensive and will save you the "guess and try" method of jetting and the problem of finding a place to test jetting when you go to a different area to race.

Take your altimeter to the weather department at your local airport and set it to the correct altitude and barometric pressure. "Highs" and "lows" of barometric pressure can change the altimeter readings 1,000 ft. from the highs to the lows, so referencing actual barometric pressure is important. This is a considerable amount when you consider that jetting changes are needed for every 1,500 -1,800 ft. of altitude change – "keep a record". Example: If you go to a race and your altimeter reading shows that you are 1,600 ft higher than your "home" track, you will know you need to drop 1 size on main jet and back out the pilot air screw ½ turn. If you go farther up – to 3,500 ft. higher than your "home" track – you'll need to go down 2 sizes of main jet (from the "home" jetting), possibly back out the pilot air screw 1 turn, reduce the needle jet by 1 size and possibly 1 notch leaner on the needle. You will also have lost 10 to 20 psi of compression!

In addition to altitude, air temperature affects jetting. Higher air temps will cause your engine to run richer and colder temps will cause the engine to run leaner. Temperature effects are like a pyramid, and as the air gets colder and colder, the jetting effects happen quicker. Examples: If you are properly jetted at 100 degrees, a temp. drop to 70 degrees will require 1 size richer main jet. From 70 to 50 degrees – another size richer on main jet. From 50 degrees to 30 – another 2 or more sizes richer. Under 30 degrees and you'll have to go richer by an additional size for each 10 degrees colder. Humidity also has an effect – higher humidity will cause the engine to run richer.

Another example of jetting changes: if you are jetted properly at 1,700 ft. (altimeter) at 65 degrees (F) air temp and 30% relative humidity and you travel down to a track at 1,000 ft – but it's hot and humid, 95 degrees and 95% humidity - you'll have to drop main jet size one or two sizes and you may have to drop the needle a notch, maybe adjust the pilot air screw out too! This is an example of temperature and humidity effects being larger than the effect from the altitude change.

A record of your altimeter, barometer, humidity and temperature readings and what you have done with the jetting at each event location will develop into an amazing jetting aid at future events in new locations.

Fuel and Lubrication

Changing from a 40:1 to a 26:1 gas/oil ratio demands re-jetting to provide more fuel. By the way, 26:1 pre-mix will out-lubricate a 40:1 mixture. The old engines will live longer and put out more horsepower @ 26:1. Added lubrication is the reason! (Yamalube "R" is my personal preference – 5 oz. to the gallon.) Everybody has his favorite oil.

Plug readings will vary with race gas and/or synthetic oil. Race gas burns darker than pump gas and most synthetic oils burn lighter or a different color.

Fuel & lubrication continued -

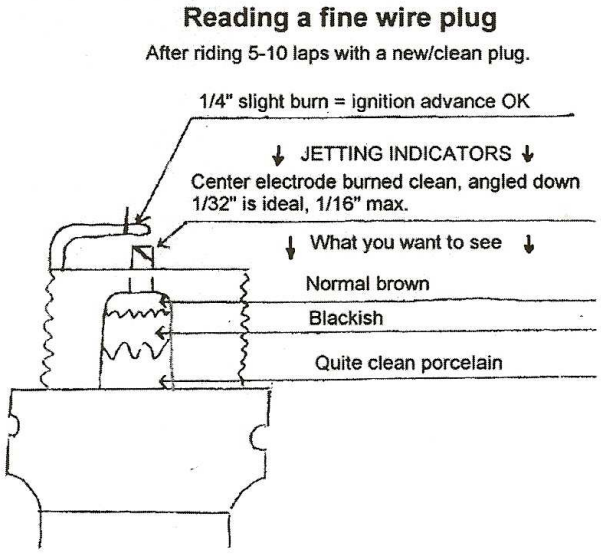
Race gas by itself does not make h/p, but it does let you run more compression, which does make more h/p. You can run race gas slightly leaner – more h/p – and it gives you some insurance when jetting "squeaky clean". If your engine has 150 psi compression, race gas is not needed (or recommended) – the race gas will be burning in the pipe, not in the engine. You can run the race gas a little leaner than pump gas which is a "little" plus.

Ignition and Spark Plugs

The leaner you run your engine, the colder the plug you'll need. Higher compression and more advanced ignition timing requires a colder plug. Normally a B9 – B10, and vary from there.

On a really hot day with humidity climbing up 30 to 40%, a fresh spark plug one size colder (say from a 9 to a 10) will help compensate for the hot air flowing over the cylinder.

Fine wire plugs are easier to read and take less voltage. A good spark is cheap after you spend all the money to get there!



Little specks on porcelain = Detonation, pre-ignition

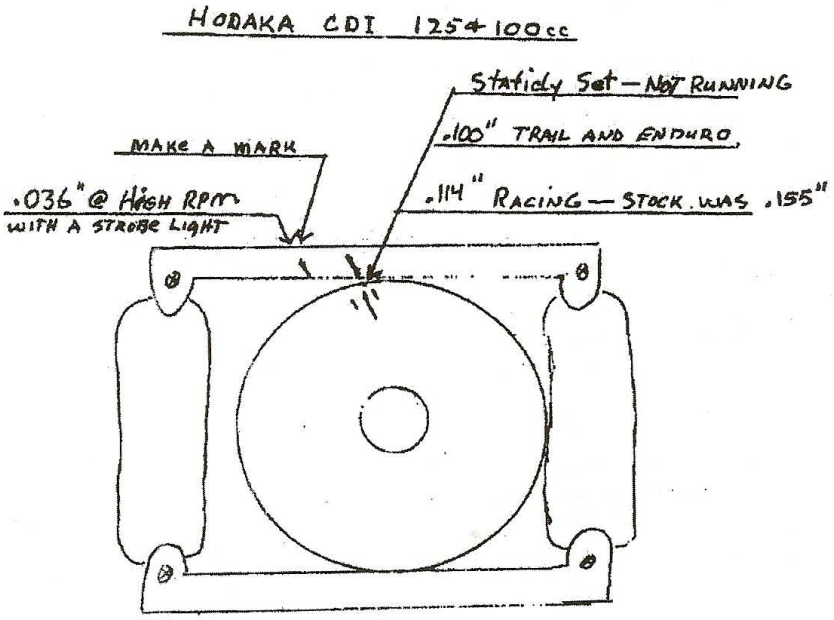
Shiny color on porcelain = too much heat (Jetting? Compression? Ignition advance?)

Particles on porcelain and electrodes = something coming through air cleaner -- inside carbon coming loose (from easy riding to hard riding)

Checking plug color will tell how things were in the engine AT THE THROTTLE SETTING YOU WERE HOLDING when you "buttoned" the engine. If you ride the bike easy back to the pits, then pull the plug for a plug reading, it won't tell you anything about your main jet or needle settings.

Ignition and spark plugs continued -

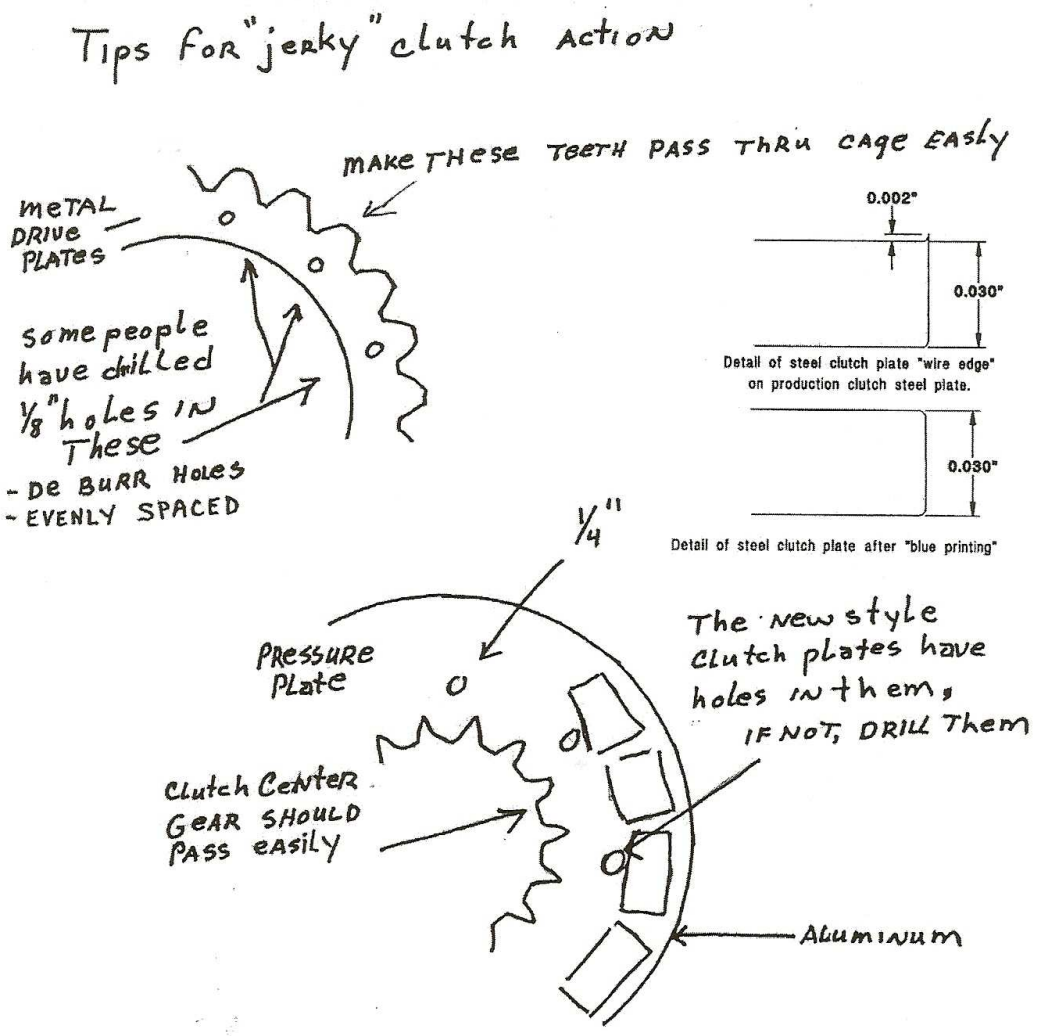
Current knowledge calls for a new ignition timing specification for the Super Combat (Model 97) and Super Rat (Model 98) engines with the internal rotor Capacitor Discharge Ignition (CDI) system.



The new PVL ignition systems should be set at .074" BTDC (static) on modified Hodaka engines.

You may use slightly more ignition advance on a stock Hodaka engine.

Clutch Details



Other Comments

If you make any change to the exhaust system, air cleaner or the opening to the air cleaner to let the engine breath better or advance the ignition timing – you will likely have to re-jet to provide more fuel.

The weight of the rider and "tall" gearing can demand more fuel. If you are using 2nd, 3rd and 4th gears and jetting seems fine, and then you go to a track where you start using 5th for a long stretch, you'll need more main jet.

Motocross jetting will not live with high speed top gear running – like road race or high speed street riding.

When changing from a street exhaust system to an expansion chamber, much jetting can be demanded.

A "squeaky clean" jetting set-up will run great the first lap, but when the engine gets heat saturated, it will have less h/p than if it were a skosh rich at the start. If you have an engine which does not back down after high speed, you probably have the idle speed set too high or are too lean at idle (pilot air screw and/or pilot jet).