At the beginning I tried to keep these proportions by replacing the #195 mains with #170 and using #27.5 RD350 idle jets as power jets. This did not work for several reasons. One of them was that the RD350 idle jets have not the same diameter as the Mikuni power jets (Part No.: N100606 + size from #30 to #150). Compared to the Mikunis the #27.5 idle jets were about #60 in Mikuni size! The second thing was that the fuel flow of my stock #195 jets equalled about #165 in current Mikuni scale. These two deviations resulted in a far too rich mixture and I think I don't have to tell how the bike ran? You never heard me cursing so much, but read on to the next chapter ... .

The jet size problem

A small problem in finding a setup for my RD500 following a reed conversion led me to a fundamental carburettor problem.

After re-jetting from stock #195 main jets (stock YAMAHA with Mikuni marking) to #180 (Götz) with #22.5 power jets (using RD/RZ 350 idle jets with 4 mm thread) the engine was running very poorly. The mixture was far too fat in mid-range and top-end and I was wondering why, because the conversion would have required a slightly fatter jetting. Then I changed main jets to #170 (Mikuni) and it made no difference at all.
Just before going nuts I had the idea of measuring my jet store – with some amazing results - .

The Mikuni jet number should indicate the fuel flow which is not the same scale for all measured jets.
Mikuni claims to deliver lots with a maximum variation of ± #10. This means if you buy a main jet labelled #180 it's just sized in the range from #170 to #190.
The jet number is linear dependent on the fuel flow which means a #120 main jet has 20% more fuel flow compared to a #100 jet. Do not mistake fuel flow with jet bore diameter! This dependency is not linear!
I saw in an older jet chart that Mikuni also claims the jet number to represent the fuel flow in ccm per minute. This is only true for a special test combination of fuel, pressure and jet-type. As far as I know nowadays the jets are measured with air and the difference in pressure (before and after the jet venturi) leads to the jet number.
Obviously the method changed about one decade ago.

I found that some of my jets had differences between label and fuel flow of #30 numbers and more.

The stock RD500 #195 jets had all a fuel flow of about #165 (present Mikuni labelling). The #180 jets from Götz had almost the same flow rate as the #170 Mikuni (#173 and #171). What made it even worse was that the #22.5 idle jets had a bore which compared to Mikuni #60 power jets (Mikuni number N100606).
With that knowledge I dared reduce the jet size to stock #195 (= front #163, rear #168) combined with #30 power jets which lead to a usable engine behaviour.

For this reason I'd advise anyone who is going to change jetting to make his own jet measurements. The values will be different but the intention is to compare "unknown" with "known" jets and to judge if the jet label is in a valuable range.

I used a rinsing bottle for battery acid (diameter about 70 mm, about 180 mm height) with an 80 mm hose with 5 mm inner diameter (to screw in the jets).
Pour in an exact amount of water (small bucket with scale or letter scales) and measure the time in which the whole amount has flowed out.
To avoid deviation in measuring you should follow exactly the following instructions.

- Clean the jet very carefully and pour in a full bottle charge of water before starting.
- Make about 5 to 10 measures for one single jet. (Typical values would be: 129s, 125s, 122s, 122s, 121s, 123s, 120s)
- Clean the values from obviously too high/low times (here 129 and 125), calculate the average time and standard deviation (mean-square error). See your math teacher or use a scientific calculator to perform that point. (Average = 121.6 ; standard deviation = 1.14 => The right time is between 120.459 s and 122.74 s with a likelihood of 68.3%)
- The flow rate in ccm per minute is calculated by: 125 [ccm] x 60 / flow time [s] = flow rate [ccm/s] (121.6 s lead to 61.67 ccm/s). Make the same calculation for the min/max values of the standard deviation to judge the accuracy of this single jet measurement.
- Make a diagram (scale paper or PC/EXCEL) where the x-axis is the jet size (labelled number) and the y-axis represents the flow rate.
- Connect the average points with a straight. This is your reference straight for future measurements with your special equipment (Here: Y=0.397*X).
- To calibrate your individual testrig to the statement flow rate = jet label you have to introduce a proportional factor k to convert the straight to Y=k*0.397*X. For our "good" jets (which are not too far away from our reference straight) this is calculated: k = Jet No. / Flow rate [ccm/s] (For the jet #170 with 110.4 s and 67.93 ccm/s the value for k is 2.5024). Calculate the k value for all jets and use the average k value (here 2.5188) for your converted reference straight.
- Now you can directly use the measured times to compare to the reference straight by calculating the corrected flow rate: y = 2.5188 x 125 x 60 / flow time [s].

My test setup had the disadvantage that you have to measure quite exactly. If you use a higher test volume (250 ccm) the measurement will be more accurate but it will double the time you need! As an example I've listed my measurements (for 125 cc):

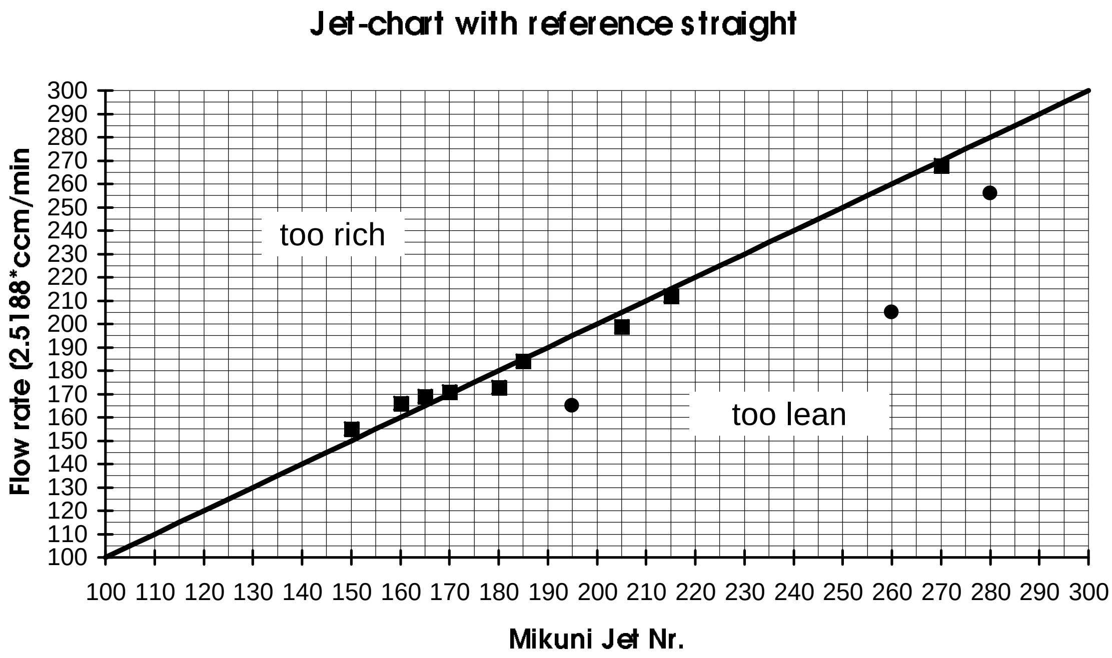

Figure 22: Reference straight for the corrected flow rate

Jet-No. (Mikuni) #	Average 125 ccm [s]	Std. deviation [s]	Flow rate (calculated) [ccm/min]	k-factor [ ]	Jet-No. (calculated) #	Jet No. Max. #	Jet No. Min. #
150	122	1.211	61.48	2.4400	**155**	***156***	***153***
160	113.75	2.121	65.93	2.4267	**166**	***169***	***163***
165	111.857	2.2677	67.05	2.4609	**169**	***172***	***166***
170	110.4	1.91	67.93	2.5024	**171**	***174***	***168***
180	109.4	3.0956	68.56	2.6256	**173**	***178***	***168***
185	102.6	2.5099	73.10	2.5308	**184**	***189***	***180***
205	94.8	1.923	79.11	2.5912	**199**	***203***	***195***
215	89.2	0.836	84.08	2.5571	**212**	***214***	***210***
270	70.4	3.4	106.53	2.5344	**268**	***282***	***256***
			Average k=	**2.5188**			

Table 5: Jetsize measurement part one

Jet-No. (Mikuni) #	Average 125 ccm [s]	Std. deviation [s]	Flow rate (calculated) [ccm/min]	k-factor [ ]	Jet-No. (calculated) #	Jet No. Max. #	Jet No. Min. #
195	112.75	3.507	66.52	2.9315	**168**	***173***	***162***
195	116	2.16	64.66	3.0160	**163**	***166***	***160***
195	116	0.81	64.66	3.0160	**163**	***164***	***162***
195	114.8	1.3	65.33	2.9848	**165**	***166***	***163***
260	92.25	1.5	81.30	3.1980	**205**	***208***	***202***
280	73.75	1.8	101.69	2.7533	**256**	***263***	***250***
			Average k=	**2.9833**			

Table 6: Jetsize measurement part two (out-of-range jets)

The conclusion from the whole thing is: **Do not trust any jetting specifications** without comparing it to your own experience or at least two other independent origins. If you want to find a carb setup use a complete set of new jets purchased completely from one source. **Do not work with old jets** unless you've measured them thoroughly and have compared them to new ones.