Barrel Valve Leak adjustment

I have had some questions on the leak procedure as described in the Tune Up chapter in the book. After re-reading it, I can see that it presumes too much and I apologize for the confusion. Below is a more complete outline.

The amount of fuel the barrel valve lets through at idle is known as "Leak" and is nothing more than a reference point. There is no right or wrong Leak setting nor is there only one way to perform the measurement. The key is to perform the measurement in the same manner each time. There are a couple reasons why leak is important: A) it sets the temperature of the engine while idling preventing any cylinders from getting too hot or flooded with fuel B) most importantly, because constant flow injectors of this type lack any accelerator pump, it is necessary to richen the mixture enough so that when the throttle blades are wacked open, a sudden lean condition does not cause a backfire which can be quite destructive and very dangerous for any bystanders.

A Leak Gauge is used to make the measurement but be aware that some are a two-

gauge set up where one gauge reads the pressure being applied, usually 100 psi and the second reads the "leak" (in the caption, the left gauge is attached to the supply air). In this instance, if the second gauge reads 75, it means that 25% is leaking and 75% of the available input is remaining. It does not mean the 75% of the fuel is being used for engine idle. On this type of gauge the lower the number on the right meter



Dual gauge used for idle leak

the richer the mixture (more fuel is "Leaking"). The yellow knob in the above caption provides for adjustment of pressure on the first gauge. Setting this to 100 psi makes reading of the leak on the second gauge easier to understand vs. using something like 80 or 125 psi though as mentioned before, the number isn't important but its reference to idle mixture is.

The following procedure is one method for Leaking a barrel valve and the easiest to understand and repeat. Air pressure is attached to the primary gauge and adjusted to read

100 psi. The secondary gauge is attached to the barrel valve. Cap off anything other than the Injector nozzles (see captions below) and attach the gauge to the "In" port. Mark the turnbuckle flat with black magic marker and loosen the jam nuts.



Actual Leak used on Cammer, adjust the left gauge until it read exactly 100 so that it can be accurately repeated. This is not adjusted yet.

To richen the mixture, turn the buckle one flat at a time so that it lengthens the distance between the bell cranks (in other words so that the barrel valve bell crank moves in the same direction as throttle operation) and to lean the mixture so that it shortens the distance. There is no correct leak setting; each combination will be different so start with a setting of < 35% as read on the second gauge (which is > 65% actual leak). The pipes pyrometers should read around 450 F then use the tuning technique outlined above to creep up if needed. Do not panic if this is too fat, keep repeating the procedure.



Cap all returns and feeds except to the Injector



Leak down with caps and gauge attached and adjusted to 100 psi on the primary gauge. Note % leak marked on injector.