

Air Density Gauge Instructions

AIR DENSITY METER FOR ENGINE TUNING

Standard engineering charts readily show the effect of air temperature and barometric pressure on engine power output. The maximum power output of an engine is directly related to "air density", provided the same fuel/air ratio is maintained. If the fuel/air ratio is permitted to go rich or lean, the reduction in power output is considerable greater. In addition, the ignition timing will be fast or slow and the spark plug heat range will be affected. To maintain a balance of these conditions and secure maximum power output at a given "air density" the correct fuel/air ratio must be maintained. The **Air Density Gauge** combines the factors of air temperature and barometric pressure and gives a direct reading in percent air density.

JETTING STEPS

1. Establish a starting point by tuning the engine jetting, spark advance, plug heat-range, etc., at a known "air density". This must be done through experimentation until the best performance is obtained.
2. To maintain the proper fuel/air ratio as determined above, the carburetor/injector main jets must be changed to match new air density conditions. The area of the jets must be reduced or increased by the same percentage increase or decrease in "air density" as indicated by the **Air Density Gauge**. The chart shows the jet area for different size jet diameters.

EXAMPLE:

Say an engine has been tuned for maximum power output at a drag strip in the morning with an air density of 98% and selecting .072 diameter jets. In the afternoon the "air density" drops to 92%. This indicates that the main jet area should be reduced by 6% to maintain maximum power output. To determine the correct jet size make the following computation:

1. Find the jet area from the chart .072 dia. or .004072 sq. in.
2. Subtract "air density readings: 98% - 92% = 6%
3. Multiply jet area by % difference: $.004072 \times 6\% = .000244$ sq. in.
4. Subtract step 3 from step 1: $.004072 - .000244 = .003828$ sq. in.
5. The new jet area should be .003828 sq. in., the closest area on the chart is .003848 sq. in., so use a .070 in. diameter main jet at 92% "air density".

NOTE: The temperature as sensed by the **Air Density Gauge** must be that of the "free air" measured in the shade. (Allow time for instrument temperature to stabilize.) direct sunlight on the meter or head from one's hands may cause a higher temperature and therefore an error in the true "air density" reading.