



A NOTE REGARDING AFTERMARKET MASS AIR METERS WITH LARGER THAN STOCK INJECTORS

KENNE BELL has long been opposed to aftermarket mass air meters for the simple reason that the meter alone cannot "recalibrate" the factory computer. These meter-large injector combinations can cause serious problems i.e. hard starting, idle problems, detonation, excessive leanout and/or rich conditions, and over advancement of timing which can result in engine and even supercharger damage. Therefore, we do not recommend these meters be used with our supercharger kits or any application we do chips for. That does not mean these meters do not work on racing or other applications or on vehicles that do not require a chip or ECM re-calibration.

We believe the BEST way to properly install a larger mass air meter than stock is to do it the KENNE BELL way and use an OEM factory calibrated meter and install the proper transfer function (voltage vs mass flow values) for the new meter in a chip! A great deal of effort goes into the manufacture of OEM mass air flow meters. They must pass stringent tests for repeatability and accuracy in order to be used on ultra low emissions vehicles of today - and they're calibrated for a specific vehicle.

Practically every function in the computer is dependent on accurate flow signals from the mass air meter. Anything other than a factory meter and chip kit like the ones from KENNE BELL cannot possibly provide all the correct readings your computer is dependent on.

All aftermarket meters essentially work the same way: they "skew" the output signal to your computer and give it false information on true airflow. This is the ONLY way they can do things like "calibrate" for larger injectors.

In a nutshell, here's how they work: Let's use this example: You want to put 30# injectors in where you had factory 19# injectors. The meter manufacturer "calibrates" the meter for 30# injectors. Here's how the "calibration" works:

ORIG INJ SIZE: 19 NEW INJ SIZE: 30

$19/30 = .6333333$ so new skewed meter must output 63% of the factory airflow signal to make the injectors work. How else could they get the computer to deliver a lower fuel pulse width for the bigger injector than to lie to the computer about the true air flow? Let's just pick a true flow rate number with the stock meter and injector combination:

At 2.10 volts a 80MM factory meter flows 3.795 lbs. mass of air per minute (true airflow).

New meter must be skewed to output this much voltage:

$2.10 \times .633333 = 1.33$ volts at 3.795 lbs. mass of air per minute (true airflow), they are telling the computer the airflow is about 2.403 lbs. mass of air per minute (false airflow) to make the 30# injector output the same fuel as the smaller 19# factory injector. Remember, you haven't told the computer the truth about the real airflow, you've given it a LOWER voltage reading from your skewed meter than the real airflow to compensate for the larger injector output.

Now, you say "What's wrong with that?". Here's what's wrong: ALL the calculations for spark (among many other things) are based on LOAD (true load). The meter true airflow is critical to the true LOAD calculation. Because the skewed meter tells the computer the airflow is always .63 less than reality, the computer calculates LOAD based on this false value. Since many of the tables and functions for the computer that run your engine are critical to LOAD, all the preprogrammed values will be incorrect! THERE'S NO WAY A SKEWED METER CAN PROVIDE A CORRECTED SIGNAL TO THE COMPUTER WITHOUT A PROGRAMMED CHIP THAT INCORPORATES THE SKEWED FUNCTION!!

These meters result in far too many call backs and tuning problems for us to support. However, if you are using an aftermarket meter, we recommend you also use their chip. Then you have one responsible party for both and a computer or chip calibrated for their particular meter.

If you're interested in doing it the KENNE BELL way, give us a call at (909) 941-6646 or email us at kennebell@kennebell.net. When you use the KENNE BELL Mass Air Meter / Chip combination, you can't go wrong. The computer always gets the correct signal and you get the benefit of more flow out of your new meter.

Note: Larger meters have their place. They can make HP - but only if the stock meter is too small. Chips cannot prevent a meter that is too small for the application from "pegging," as the chip obviously cannot alter the size (flow) of the meter. Again, if switching to a larger meter on one of our kits or applications, we only recommend OEM meters and Kenne Bell chips.