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GM Mass Airflow Sensor Calibrator Installation Instructions (Read Carefully Before Starting Project)

Granatelli Motor Sports is proud to announce our new truly innovative adjustable mass airflow sensor. Engineered to OEM standards and guaranteed for parts and workmanship for the life of the product, The new **GM Calibrator** is designed to give the end user the ability to match a mass airflow calibration to a specific application, change injector size and to optimize your sensor specifically for your cars needs. The **GM Calibrator** even gives you the ability to pick your full throttle air/fuel ratio.

Description:

The **GM Calibrator** is designed to be compatible with any 1994-current GM mass airflow sensor with the sandwich type housing and non-integral air charge temperature sensor (Factory or After-market).

However, changing from one application to another may reduce the operating range.

See diagram attached

Installation:

1. Prior to beginning installation confirm the vehicle is set to proper factory specifications. (I.e. – TPS throttle positioning sensor etc.)
2. Disconnect positive and negative battery terminals.
3. Disconnect the harness plugged into the factory mass airflow sensor. If you are changing sensors, store factory unit in a safe place for a later date.
4. Connect the **GM Calibrator** in line with the factory wiring harness and the mass airflow sensor.
5. Re-connect positive and negative battery terminals.

NOTE: DO NOT START THE VEHICLE UNTIL YOU HAVE CONFIRMED THE SETTINGS ON THE GM CALIBRATOR ARE ALL IN THE NEUTRAL OR 500 POSITION AS SHOW ABOVE. IT IS IMPORTANT TO NOTE THAT THESE SETTING MUST BE SET PRIOR TO FINE TUNING THE SENSOR.

The **GM Calibrator** comes factory preset in the neutral position. This means when all knobs are set at 500 the installation of the calibrator will not affect sensor calibration until the unit is turned on.

Key On Engine Off (KOEO)

1. With the ignition key in the on position and the **GM Calibrator** in the off position, measure the no flow frequency. This frequency should range from 200 to 500 Hz. Record this frequency for potential later use.
2. Start Engine
3. With engine running, the idle should be stable. The frequency should now range from 2.0 to 2.3 kHz.
4. All fine-tuning should be done with a warm engine

Adjustments:

Idle Adjustment Screw

Turn the **GM Calibrator** on (to the recal position.) Adjust the idle frequency by first unlocking the safety lever and then turning the center knob clockwise for rich (increased frequency) or counter clockwise for lean (decreased frequency). Adjust for best idle.

If the engine stalls or will not start, check the **No Flow Frequency** measured in the KOEO step above. If the **No Flow Frequency** has changed, re-adjust to obtain previous 200 to 500 Hz.

High Speed Adjustment Screw

If you have access to an air/fuel ratio sensor, you can fine-tune your ultimate fuel throttle air/fuel mixture.

Every graduation mark of the adjustment knob approximates a 3% increase or decrease in Air/Fuel Ratio.

With your A/F sensor installed, determine your full throttle A/F reading. We have found for optimum performance the vehicle should idle at 14.25 – 15.0 to 1 and under wide-open throttle it should be about 12.5 to 1 naturally aspirated and 11.5 to 1 supercharged. Fine tuning should be done by changing the high speed trim pot by no more than ½ a digit “click” at a time. Again, turning the adjustment screw clockwise will richen up your mixture and counter-clockwise will lean it out. **It is always better to start out rich than lean.**

NOTE: IF A HIGH FLOW ADJUSTMENT IS MADE, IT MAY BE NECESSARY TO RE-ADJUST YOUR LOW FLOW TRIM.

User Friendly Tips On Adjustment of A/F Ratio Using A Wide Band O2 Sensor.

For best results, we recommend installing your wide band O2 in front of your catalytic converters. Furthermore, it is best if you install the O2 sensor in its own temporary hole. However, it is possible to remove one the factory O2 sensors temporarily while tuning. Be sure to re-install your factory O2 as soon as possible.

With a warm engine, observe the digital read out. The display should indicate a desired A/F ratio of between 14.25 – 15.0 to 1). If it does not, adjust your low speed trim pot to **optimize** the reading.

It is highly recommended that all high-speed adjustments be done with the aid of an assistant. This way you can keep your eye on the road. After adjusting your high-speed trim be sure to recheck your idle trim.

User Friendly Tips On Adjustment of A/F Ratio Using an Exhaust Gas Temperature Sensor.

One of the best indications as to how your engine is performing is by monitoring the exhaust temperature. While this is not as accurate at determining A/F as a wide band O2, it is a lot less expensive to purchase an exhaust temperature probe than it is to buy an accurate A/F ratio sensor. The usual set up is to put a “K” type thermocouple in the exhaust header of the hottest cylinder and monitor the temperature while performing various driving cycles. On Mustangs, we have found the #7 cylinder to be the most logical choice. Be sure to install your probe as close to the cylinder head as possible.

1. **Idle:** While the engine is idling for a long period of time the EGT should not exceed 1000 degrees F and should not be lower than 700 degrees F. By adjusting the idle trim pot of the optimizer the temperature should be regulated. If the exhaust temperature is too high, turn idle trim pot clockwise to lower exhaust temperature (richening). If the exhaust temperature is too low, turn idle trim pot counter-clockwise to increase exhaust temperature (leaning). **NOTE: ALLOW EGTS TO STABILIZE WHEN MAKING CHANGES. THIS COULD TAKE UP TO 2 MINUTES PER ADJUSTMENT.**
2. **Road Load:** 1800-2200 RPM flat road for at least 2 minutes to insure stable exhaust gas temperature (EGT). At cruise EGT should never exceed 1400 F and be no less than 1000 F. If the exhaust temperature is too high, turn idle trim pot clockwise to lower exhaust temperature (richening). If the exhaust temperature is too low, turn idle trim pot counter-clockwise to increase exhaust temperature (leaning).
3. **Wide-open Throttle (WOT):** Under full throttle acceleration EGT should never exceed 1400 F natural aspirated and no more than 1300 F when supercharged.

Disclosure

The optimizer if not properly used can cause serious engine damage. The optimizer comes factory preset for stock injectors. Rotating the knobs as indicated either rich or lean will change the idle quality and the over all air/fuel ratio. Make sure the adjustment setting match the injector size of the vehicle. The optimizer is a calibration tool and must be used to the manufactures instructions. Failure to do so may result in severe engine damage and/or mis-calibration. Granatelli Motor Sports' liability is limited to the prompt correction or replacement at Granatelli Motor Sports' discretion and at no cost to the customer other than freight of any defective part of the Product determined to be necessary by Granatelli Motor Sports We do not make any warranty or claim to any part or component not manufactured directly or otherwise by Granatelli Motor Sports. Therefore the customer assumes all risk associated with the use of this product.

LIMITED WARRANTY:

Granatelli Motor Sports warrants that all products shall be free from defects in materials and/or workmanship for ninety days from the date of purchase (except in-tank and in-line fuel pumps purchased at dealer or wd prices as these items have no warranty and roller rocker arms which have a 12-month limited warranty). The following requirements and exclusions apply: (1) You must be the original purchaser and must complete the warranty registration form (located at www.GranatelliMotorSports.com/warranty.asp) and return the defective product within 10 days after the expiration of the product warranty. Failure to do so voids all warranty, either express or implied set forth herein. (2) You must reside in the United States or Canada and use the product as described in the warranty registration. (3) The product must not have been altered, disassembled, modified, or converted for any other use than intended by Granatelli Motor Sports. (4) The product, or any part thereof, is not used in accordance with the operating parameters specified by Granatelli Motor Sports. (5) The product or any part thereof is damaged or rendered unserviceable due to negligence, vandalism, theft, fire, debris, flood, Act of God, or other peril, malfunction of equipment, or by any cause within the Customer's control. (6) The serial number (if applicable) must not have been altered or removed. The extent of Granatelli Motor Sports' liability under this warranty shall be limited to the prompt correction or replacement, at Granatelli Motor Sports' option and at no cost to the customer other than return shipment, of any defective part of the product determined to be necessary by Granatelli Motor Sports. This only applies if written Granatelli Motor Sports received notice of the claimed defect prior to expiration of the warranty period. All warranties of merchantability and fitness for a particular purpose are expressly excluded. The duration of any and all implied warranties is limited to the duration of this express warranty. All incidental and consequential damages including but not limited to loss profits even if it has been advised of the possibility of such damages are hereby excluded. Regardless of the form of the claim, Granatelli Motor Sports liability for any damages to the customer for such product is limited to the guidelines herein. This stated, expressed warranty is in lieu of all liabilities or obligations of Granatelli Motor Sports for damages arising out of or in connection with delivery, use or performance of the product. This warranty cannot be amended or changed by any Granatelli Motor Sports representative, employee, or agent and any promises inconsistent with this warranty are void and unenforceable against Granatelli Motor Sports. Some states do not allow limitations of incidental or consequential damages, so the above limitations or exclusions may not apply to you. This warranty gives you specific legal rights and you may have other rights that vary from state to state. Your sole remedy for the above warranties is the repair or replacement of the defective product only, at Granatelli Motor Sports' sole discretion.

RETURN POLICY:

Before you return a product for a warranty claim, contact our service department M-F 8AM-5PM (PST) at 805-486-6644 or techsupport@GranatelliMotorSports.com for an RGA number. No returns are accepted without a pre-approved RGA (return goods authorization). No returns on special orders, electrical items or after 90 days from date of original shipment. All returns must be safety packaged in original packaging (if available) and clearly marked with your RGA number on the top and two sides of the box. Please insure your shipment for full replacement value as lost, stolen or items damaged in shipment are not covered by our limited warranty. We recommend using FedEx (www.FedEx.com) or UPS (www.UPS.com) for shipping. Lost, stolen or damaged items claims must be made by the customer and resolved by the freight company and not Granatelli Motor Sports. All returns may be subject to a restocking fee of up to 25%. The balance will be returned in the form of a company check or may be applied as credit towards another purchase.

PERFORMANCE CONSUMER'S BILL OF RIGHTS:

Legally, a vehicle manufacturer cannot void the warranty on a vehicle due to an aftermarket part unless they can prove that the aftermarket part caused or contributed to the failure in the vehicle (per the Magnuson Moss Warranty Act, www.GranatelliMotorSports.com/magnusonmoss.htm (15 U.S.C. 2302(C))). For best results, consider working with performance-oriented dealerships with a proven history of working with customers. If your vehicle manufacturer fails to honor emission/warranty claims, contact EPA at (202) 260-2080 or www.epa.gov. If federal warranty protection is denied, contact the FTC at (202) 326-3128 or www.ftc.gov. For additional information, check out www.GranatelliMotorSports.com/TechSupport.htm.

Disclaimer:

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