THROTTLE POSITION LIMIT CALIBRATION

AUTOMATIC / ADAPTIVE LIMIT LEARNING

All Autronic ECUs are equipped with an automatic adaptive learning function that simplifies the procedure for throttle position sensor calibration.

SM3 and SM4 ECUs, and derivatives with firmware revisions from v1.08, require that this mode be activated and set-up using the PC calibration program. All other ECUs use this mode exclusively and do not require any initial set-up using the laptop calibration program.

The adaptive limit learning function of all ECU models is compatible with throttle / sensor assemblies that meet the following specifications:
   a. The fully closed throttle sensor output voltage must be in the range 0.4 to 1.8 volts.
   b. The fully open throttle sensor output voltage must be in the range 3.2 to 4.7 volts.
   c. The difference between the voltages at the extremes of travel should be greater than 2.5 volts.
   d. The sensor output voltage must increase smoothly with increasing throttle opening, and
       there should be no dead spots in the total range of throttle travel.

(SM3 and SM4 ECUs, and derivatives with firmware revisions from v1.08 require user selection of error detection thresholds and have less restrictive voltage requirements. See the relevant calibration software TPS setup screen for applicable limits).

The adaptive learning initialization procedure is as follows:
   1. Ignition switch on, engine stopped.
   2. Disconnect throttle position electrical connector for at least 5 seconds.
   3. Reconnect throttle position electrical connector.
   4. Ensure that the throttle remains fully closed for at least 5 seconds.
   5. Fully open the throttle for at least 5 seconds.

New limits of throttle travel will have been learnt and stored in the ECU during the above procedure. Additional ECU functions ensure that throttle stops and sensor wear are compensated for over the life of the engine. The above adaptive learning initialization procedure need only be repeated if the throttle travel stops are adjusted to reduce the range of throttle travel, or if the throttle / sensor assembly is serviced or replaced.

MANUAL / FIXED LIMIT SETTING

SM3 and SM4 ECUs and derivatives with firmware revisions from v1.08, also have a non-adaptive fixed throttle position limit setting mode. This mode requires the use of the PC calibration software for activation, and setting limits of travel and error detection thresholds. This is the non-preferred method, and should only be used in applications where throttle travel limits are affected by temperature, boost pressure or are inconsistent because of poor mechanical construction. Fixed limit mode MUST NOT be used in road car applications where either emissions control or idle speed control are utilized. See the relevant calibration software TPS setup screen for applicable limits.

IMPORTANT

Do not forget to use the PC calibration software to set-up the 'Limp Home TPS' and 'Limp Home Manifold' tables. In most applications, when correctly set these tables allow safe and almost normal engine operation during Throttle position and/or Manifold Absolute Pressure sensor failure.