Electronic Throttle Control

Electronic Throttle control requires several inputs to function properly and safely. These inputs and outputs must be setup properly for safe and accurate operation. It is important to follow safe tuning practices when setting up electronic throttle control.

ETC Tuning Tab:

- Air Control Source – This option sets the idle air control source, the Electronic Throttle, or the Idle air control motor. Note: Electronic throttles normally serve as two functions, Idle control, and Throttle control. When in the Idle State, you MUST treat the Electronic Throttle as an Idle control motor, and make the idle adjustments with the idle control strategy, and NOT the Electronic Throttle control.
- ETC Proportional Gain – This option sets the proportional Gain for the ETC PID Loop.
- ETC Integral Gain – This option sets the integral gain for the ETC PID Loop.
- ETC Minimum Integral Value – This option sets the low side integral amount that can be offset.
- ETC Maximum Integral Value – This option sets the high side integral amount that can be offset.
- ETC Derivative Gain – This option sets the derivative gain for the ETC PID Loop. Typically not used.
- ETC Error Gain – This option sets the total PID loop gain.
- ETC Damp Up Gain – This option sets the gain for the damper on throttle open.
- ETC Damp Gain Down – This option sets the gain for the damper on throttle closed.
- ETC Damper Switch Hysteresis – This option sets the hysteresis used for the damper switch.
- ETC Damper Switch Threshold – This option sets the damper threshold.
- ETC Damper TPS Filter – This option sets the filter rate for the damper TPS filter.
- ETC Upper Limit – This sets the duty cycle upper limit for the output control to the Electronic Throttle Control Motor. Typically 90%
- ETC Lower Limit – This sets the Lower limit for the duty cycle control for the output to the Electronic Throttle control. The duty cycle range is from +100% to -100%, a typical value is -40%
- ETC Low Adapt Rate Limit – Dictates the rate at which the ETC set point is decreased during shutdown to perform a low TPS adapt.
- Maximum ETC Set point Table – This table sets the maximum ETC Set point by Engine RPM.
- ETC Integral Gain Table – This table allows for setting a faster Integral gain when the target error is greater. This gain schedule will help improve the response of the system. The values in this table are typically left alone.
- ETC Proportional Gain Table – This table allows for setting a faster Integral gain when the target error is greater. This gain schedule will help improve the response of the system. The values in this table are typically left alone.
- ETC Duty Cycle Offset Table- This table sets the base duty cycle going to the Electronic Throttle Control motor. To set this table up properly, you want to adjust this table so that at each throttle angle, the Electronic throttle and the Accelerator pedal agree without too much I-term from the PID loop.
ETC Setup Tab:

- ETC Pin – This option sets the output driver to control the Electronic Throttle.
- ETC Frequency – This option sets the output frequency to control the Electronic Throttle motor.
- ETC Request Increasing Filter – This option sets the filter rate of the ETC Request Increasing rate.
- ETC Request Decreasing Filter – This option sets the filter rate of the ETC Request Decreasing rate.
- ETC Shutdown Timer – This option sets the time limit in the stall mode to shutdown the ETC Motor.
- ETC Shutdown Low Adapt Error – This option tells the ecu to drive the ETC closed until this error has been achieved in order to catch the low side adapt point.
- ETC Spring Test High Threshold – Before initiating spring test during shutdown, open the ETC to this set point. When achieved, the ETC controller will release the ETC to have the spring close the valve.
- ETC Spring Test Low Threshold – Spring test timer will measure time of travel between ETC Spring Test Hi Thresh and ETC Spring Test Low Thresh.
- ETC Spring Test Timer Threshold – During spring test at shutdown, TPS must fall to 0% within this time to prevent fault.
- ETC Sticking Threshold – Defines error limit between TPS Request and TPS where ETC sticking fault will be set.
- Minimum ETC Set point – This option sets the minimum target ETC Set point allowed to be commanded.
- Electronic Throttle Request Table – This table sets the Set point to the Electronic Throttle position against the actual Accelerator Pedal position. This table is typically used to slow the opening of the Electronic throttle to provide a smoother more linear feel to the throttle response.
- ETC Request Fall rate table – This table controls how fast the Electronic throttle is permitted to close from an open position against Engine RPM. Typically you will want higher rates at higher Engine Speeds, and lower rates at lower Engine Speeds to control the return to idle.
- ETC Request Rise rate table – This table controls how fast the Electronic Throttle is permitted to open from a closed position against Engine RPM.

ETC Index Tab:

- ETC Set point Index – This index sets the breakpoints for the ETC Set Point table.
- APP17 Index – This index sets the breakpoints for the Accelerator Pedal position tables
- ETC Error Index – This index sets the breakpoints for the ETC Error PID tables
- Throttle Position 9 Index – This index sets the breakpoints for the Throttle position tables using 9 index positions.

ETC Sensors Tab:

- TPS 1-2, APP 1-2 Analog in – This option sets the analog input to be used for these sensors.
- TPS 1-2, APP 1-2 Default – This option sets the default value if the inputs should be considered in fault.
• TPS 1-2, APP 1-2 Adapt Hi Enable – This option enables the adaptive learning of the max positions. Typically this will always remain enabled.
• TPS 1-2, APP 1-2 Adapt Hi Max – This option sets the high side of the ADC count allowed to enable the adapt High throttle positions.
• TPS 1-2, APP 1-2 Adapt Hi Min – This option sets the low side of the high ADC count allowed to enable the adapt High positions.
• TPS 1-2, APP 1-2 Adapt Lo Enable – This option enables the adaptive learning of the base positions. Typically this will always remain enabled.
• TPS 1-2, APP 1-2 Low Adapt Max – This option sets the high side of the ADC count allowed to enable the adapt Low throttle positions.
• TPS 1-2, APP 1-2 Low Adapt Min – This option sets the low side of the ADC count allowed to enable the adapt Low positions.
• TPS 1-2, APP 1-2 Rev Polarity – This option allows the reversing of the ADC inputs for vehicles that rest at high voltage and drop to low voltage.
• TPS 1-2, APP 1-2 High ADC Fault – This option sets the maximum ADC count before a High Fault is considered.
• TPS 1-2, APP 1-2 Low ADC Fault – This option sets the minimum ADC count before a Fault is considered.
• TPS 1-2, APP 1-2 Percent – This parameter displays the current calculated percentage for these inputs.
• TPS 1-2, APP 1-2 ADC Count – This parameter displays the current ADC count for each of the inputs.