Apexi AVC-R Electronic Boost Controller Set-up procedure

Introduction

The Apexi like most other boost controllers remove the boost/waste gate operation away from the ECU, it replaces the Electronic Bleed Valve (EBV). It will manipulate the turbo waste gate as to hold - higher boost, pre-longed boost so that you get more efficiency out of the turbo. The Apexi offers some additional features which are currently only available on a motorsport replacement ECU which could cost thousands, the Fiat Coupe boost control facility (EBV/ECU) provides limited boost in the first two gears, add this to the Viscodrive provides the driver with a reasonable traction control, however when by passing the EBV the limited boost is no longer available, the Apexi not only offers you to custom set you boost levels in each gear - both -/+ but also gives the user ability to set boost levels via RPM or throttle position. It will also offer a host of other displays, memory playback and custom settings as detailed below. The main feature of the Apexi is that it has a memory self learn mode that allows it to self adjust to optimise the boost/duty cycle levels. However note that the Apexi is calibrated for use with Japanese cars so the speed sensor will not show correct speed in KPH, this will not cause a problem with use as it used the speed reading to gear learn – the only down side is that if you select speed to see what you are doing it is not 'true' but then you have your speedometer anyway. Main thing to remember is that all cars are different, so you will have to set the levels to your own required settings and of course relative to your modifications/tuning, I have placed (in blue) my figures levels but these are specific to my Coupe and may not be right for yours - but it give you an idea

Apexi Functions/Menu's/Set-up's

On the Apexi there are 3 main menu's

1) Monitor - this allows you to pre-select up to 4 channels, each channel will show the following:

Bst - boost in bar
Thr - throttle position
Rev - Rpm
Spd - Speed
Sol - solenoid signal
Inj - Injector cycle

You can see this values as a digital, analogue (dial)or graph readings. Or activate a memory mode that records your sensor levels such as boost, rpm etc. It's up to you to select what you want to see on the display - I have just the Boost level and RPM - so 2 channel.

2) Setting - this allows you to enter one of three settings: A, B or Off. The A/B setting will allow you to set the following modes:

Boost/Duty - Sets your boost and duty cycle limits I have A - 1.0 bar, 60% Duty. B - 1.3 bar, 85% duty

Scramble - this allows you to set a pre-determined amount of boost for time limit set by you, this is activated by a switch that you have to purchase separately, if cruising on track and you come up against a car that wants to have a go - hit the button and you're off with whatever boost you have set for whatever time that you have set. I have not set this up as yet

Ne-Points - these are used if you wish to set boost levels according to rpm level I have set - 1500, 2000, 2500, 3000, 3500, 4000, 5000, 6000.

F/B Speed - this is used to provide the Apexi unit a speed feedback, 1 is slowest 9 the fastest - use this to either sort out fluctuating boost levels or if the boost drops off. My settings – 1ST -3, 2ND - 3, 3RD - 4, 4TH - 4, 5TH - 4

Learn Gear - 'o' means it is learning the gear, 'X' means that it is turned off. Currently mine are off but will reselect later

Start Duty - this allows you to adjust the amount of boost that you get in each gear, you can reduce the boost to maintain grip in the first gears and then raise the over boost for the upper gears to give you more "go" at top end. I have: 1st -20%, 2nd -10%, all others @ 0%

3) etc - you input the settings for your car i.e.

Cyl = 5, Spd = 16, Thr = / (this is an arrow, same direction as this slash) These are the settings I have entered.

Gear Judge - this allows the Apexi to know what gear that you are in, it uses a calculation of rpm and speed to establish this, you highlight the gear then drive and select 'Next' for it to memorise the reading/calculation. Each car will be different so you have to input

Grph Scale - this is where you put in what you want to see in the graph mode in the monitor menu. Not really used this as yet

Sensor Chk - speaks for its self.

Initialize - this is the default reset, it will reset all the values to factory original levels, however once pressed you have to switch off the ignition for it to complete reset.

ECU Wiring/Installation

I spliced only three wires into the ECU loom, I had to take the main DIN plug apart to trace the pin wires as the colours have been duplicated, I splice above the ECU:

Fm AVC-R = Purple to ECU - pin 6 = Rev Counter Signal.
Fm AVC-R = Grey to ECU - pin 53 = Throttle valve position sensor.
Fm AVC-R = White to ECU - pin 9 = Speed Sensor.

The other three wires from the AVCR = Red - power, Green and Black - Earth was wired into the left elect window button for 12v and x1 earth. The other earth was taken to a chassis point.

(I took the power from an alt source as I was not happy with the voltage going to the ECU, there are several power feeds going into the ECU but the lowest one is +15/54 so decided to use a proven 12v switched from the window button)

The cables were routed to the engine bay via the passenger side bulkhead, (you have to remove the wiper shield), I placed the pressure sensor in the cavity next to the pollen filter and 'T'd into the boost pipe to my boost gauge (which runs the same route).

The solenoid was placed onto the main framework where the EBV is mounted, just to the left there is a 10mm hole which it was bolted to.

I fitted the grey plastic hose nipple to the solenoid so that I had three hose attachment points.

Red hose to NO
Blue hose to COMM
Top EBV hose to NC

Here is a link to the AVC-R Manual Link