

Electronic-True Twin Conversion (E-TTC)

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This page is currently Under Development and some illustrations may not be available at this time. Please check back at a later time and sorry for the inconvenience.

*******IMPORTANT NOTICE*******

This mod may put additional stress on your pressure tank, which is used to "lock on" your actuators during 1st->1st+2nd transition. The tank will be mainly used in this mod to keep the Intake Air Control Valve (IACV) and Exhaust Gas Control Valve (EGCV) open during TTC mode. So make sure your pressure tank is working properly before performing this mod. If you notice your turbo(s) not properly spooling up after performing this mod, you may want to replace your pressure tank. (About \$35) Perform this mod at your own risk and make sure that you are knowledgeable with simple electrical wiring/splicing/soldering and that you have an complete understanding with the Supra's vacuum/turbo system routing. So pretty much: Make sure you know exactly what you are doing!

What this Mod does:

This mod (when done properly) will enable you to electronically switch, using a simple rocker switch, from the Supra's conventional sequential turbo setup to TTC without the use of check valves nor having to tamper with the hoses. Many have often complained about the lag associated with TTC (especially on autos), this mod will eliminate such problems by letting YOU the driver choose which turbo mode (Seq/TTC) you want your car to run in with a flip of a switch!

The Concept:

Originally, the IACV and EGCV actuators are only to be opened by the ECU via VSV's at around 4500rpm, thus switching to car to twin turbo mode. The original "TTC" method works when the IACV and EGCV actuators are forced open by pressure being trapped inside the actuator itself (pressurized from the pressure tank), either by using check valves or wiring the actuators shut. With these two actuators always open now, the turbos will then spool up simultaneously. What this mod pretty much does, is simply bypass the ECU's signal into the IACV and EGVC VSV's (which only occurs at ~4500rpm), and substitute it with a constant GND signal. This will keep the VSV's always "activated" and always closed. As the pressure tank then pressurizes the system under boost, the activated VSV's will keep the pressure trapped inside the system, thus keeping the IACV and EGCV actuators open as well. The output of the pressure tank will function as the "check valve," for it only allows pressure out one way when it is built

up. (You may want to place a check valve in front of the pressure tank output, to prevent probable leakage) The purpose of this mod is to make a toggle switch between the ECU signal, and a constant signal into the VSV's.

Tools/Supplies required:

- Splicing/crimping pliers
 - Electrical tape
 - Butt-connectors or wire splices
 - (SW-1) Dual-latch rocker switch. (Can be found at radio shack)
 - (4) Spools of wire of different colors, (24AWG or greater, stranded, high temp recommended)
 - Soldering Iron and Solder
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!STOP!

Like performing any other mod, be sure the negative cable of the battery has been disconnected before continuing.

Step 1:

- Locate the IACV and EGCV VSV's, and remove wiring harness.
The IACV VSV is located on top of the 2nd turbo, and the EGCV is located directly behind the Wastegate Valve VSV.

Hint: For easier access to the EGCV VSV, you may want to remove the surrounding wire harnesses (i.e. alternator, wastegate VSV...etc)

Step 2 (Refer to Wiring Schematics):

- Identify VSV wires: (Constant +12v wire and ECU Signal wire)
Each VSV contains two wires. The 1st wire is a Black/Red* constant +12v signal (for both VSV's) when the ignition is ON. The 2nd wire is the wire you will need to perform this mod (Green/Yellow - EGCV, Green/Blue - IACV)*, these are the wires which put out a GND signal from the ECU during transition to activate the VSV(s). What you need to do is locate these 2 wires: Green/Yellow for EGCV VSV, and Green/Blue for IACV VSV.

* = This mod was performed on my '94 Supra (should be same for '93-'96). Wire colors may vary on different cars depending on production date, check with your service manual (or Mohd) if you have a later model for the correct wire color.

[CLICK HERE TO VIEW WIRING SCHEMATICS](#)

Step 3 (Refer to Wiring Schematics):

-EGCV VSV: Cut (yes i know...sorry) the **Green/Yellow** ECU wire, leaving at least 1-1/2" of wire off from the harness to have enough of it left so you can crimp or put back to stock at a later time.

-IACV VSV: Do the same as you did for the EGCV VSV, but with the **Green/Blue** wire.

Step 4:

-Crimp and extend cut wires through firewall and into the dash.

Using the wire crimper and butt-connectors, crimp and extend each of the cut ends of the wires into the dash. Make sure you know "which wire is which" when doing this, use different color wire for each. You should have a total of FOUR wires going into the car (**all properly identified with correponding colors: EGCV To-ECU, EGCV To-VSV, IACV To-ECU, and IACV To-VSV**). These wires will later be used to wire up the e-TTC switch. Familiar yourself with these four wires! (Pics not available yet)

Step 5:

-Follow the wiring instructions for "SW-1" as described in the [wiring schematics](#).

Using a soldering iron, solder the wires onto SW-1 accordingly. I would recommend also using Heat-Shrink tubing or electrical tape to insulate the leads. Be sure the IACV wires are on one side of the switch, and the EGCV wires are on the other as shown in the diagram. Find a good grounding post on the chassis to make a ground for the switch (SW-1). When the switch is flipped upwards, the car should be in Sequential Mode, and TTC when flipped downwards. (Assuming that you've done everything right)

Step 6:

-Find a location to mount SW-1.

I mounted mines next to the TRACTION switch for easy access.
(Pics not available yet)

Step 7:

-Finishing up

Double check your wiring to ensure that it's correct. After you've checked and rechecked, use electrical tape and/or flex tubing to clean up the wires under the hood. (Meaning, organizing them to make them look neat) Make sure the wires will not come into contact with extremely hot surfaces or moving objects (Watch out especially for the EGCV wires) Now reconnect the negative battery cable, and ENJOY! :)

Using E-TTC (From SEQ to TTC):

During Idle: When the car idling, you can be able to switch to TTC by flipping the E-TTC switch. After that, run the car to build up some boost to pressurize the pressure tank. Once proper pressure is achieved inside the tank, the actuators will then open, engaging the car in TTC mode.

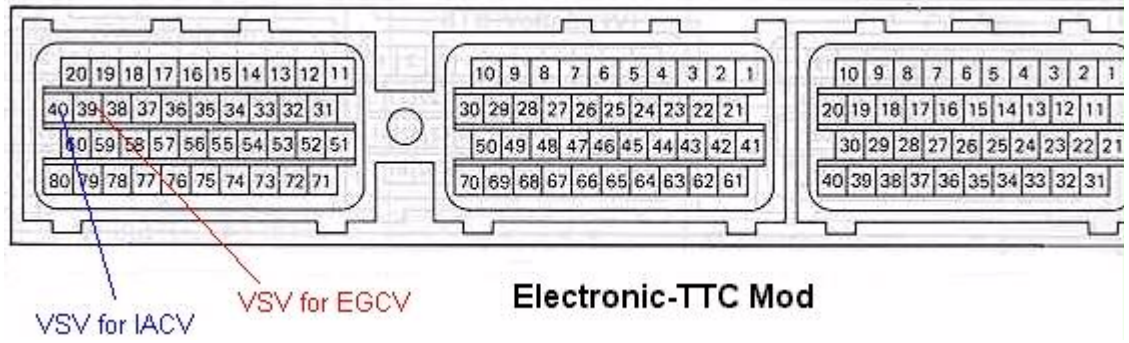
While in Motion: It is ***not*** recommended that you attempt to switch to TTC mode when both turbos are not online, for this will "kick-start" the 2nd turbo if the EBV is not open yet. In order to engage the car in TTC while the car is in motion, rev the car up to at least 4500rpm, allowing both 1st and 2nd turbo to be active, then flip the E-TTC switch. This will "Lock-In" the turbos, and thus keep the car in parallel TTC mode immediately.

Using E-TTC (From TTC to SEQ):

During Idle or While in Motion: You can switch back to Sequential mode at any time, as long as the car is not under boost. Let off the throttle for a bit, and flip the E-TTC switch to switch back to Sequential mode. (I also do this while cruising next to a cop, which turns my exhaust sound from a loud "growl"... to a soft "Lexus-like" sound. TTC → SEQ :))

FOR ADVANCED USERS WITH FIELDS HARNESS:

You may be able to perform this mod at the ECU using Terminals 39 and 40 ([as shown in schematics](#)). #39 is the EGCV wire, and #40 is the IACV VSV wire.



[Questions? Comments? E-Mail Me](#)

