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## Introduction

The purpose of this document is to provide all the information needed for the TCS Tuner software package. The TCS Tuner software is designed to be extremely easy to use, and flexible enough to allow all users to tune the TCS to their desires. This manual features installation information, tuning information, and special notes. This manual includes many detailed pictures which aid in the understanding of the software. This installation manual shows pictures from the Windows XP® operating system however even if you are using a different version of Windows things may look slightly different.

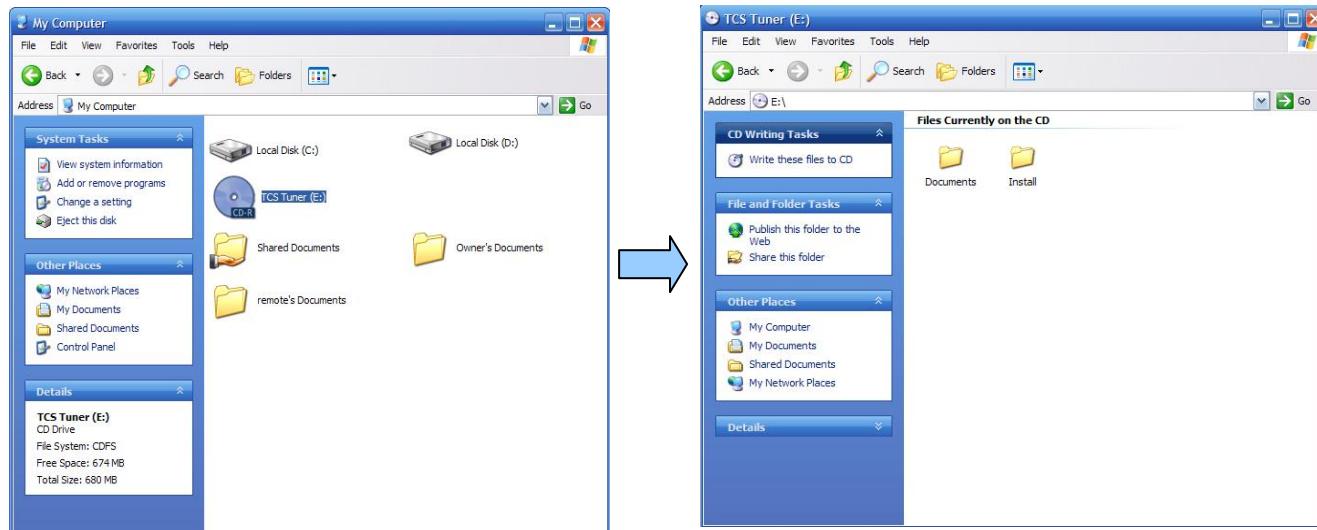
If you have any questions about the tuning software or the operation of the TCS system in general, feel free to contact us at [neil@ndperformance.com](mailto:neil@ndperformance.com)

- Microsoft Windows 2000 or newer (2000, NT, XP, Vista)
- ~400Mhz or faster CPU
- 128Mb of RAM
- At least 10Mb of free hard disk space
- CD Drive
- DB9 serial port. If you have a new laptop you probably won't have this and will need to acquire a "USB to Serial" cable from Best Buy (or somewhere online). The cable is around \$30 at your local Best Buy (probably a little cheaper online) and the cable looks like:



## Installing the TCS Tuner Software

- Insert the TCS Tuner CD into the CD drive on your computer.
- Navigate via “My Computer” to the CD drive, and open it:



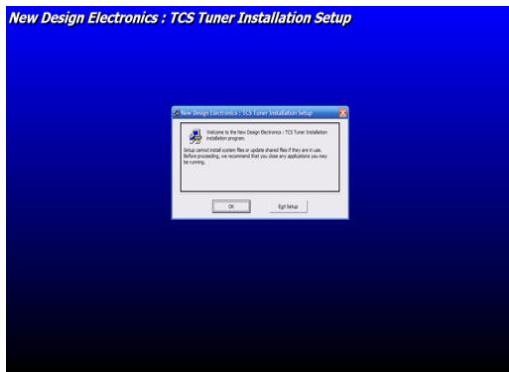
- Once opened you will find two directories. One called “Documents” and one called “Install”. Double click the “Install” directory to open it.



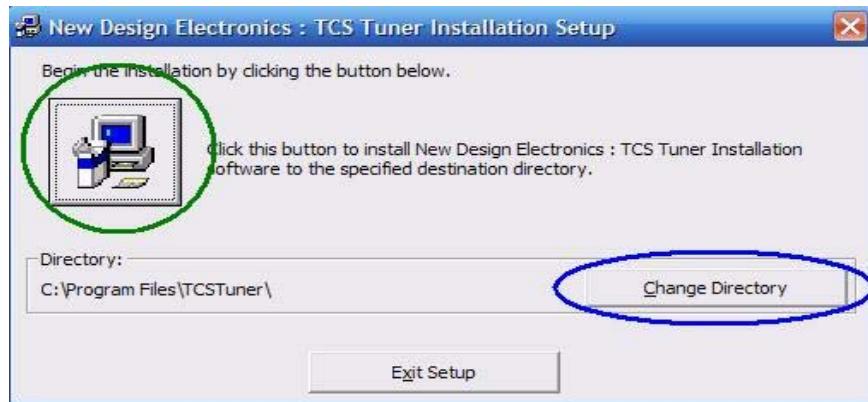
- Double click the “setup” file to begin the installation.



- The setup will begin and after a few moments you will be taken to the installation screen.



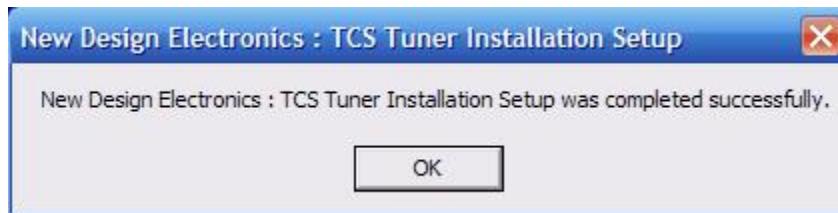
- Click the “OK” button to begin. You will now be asked for the directory where you want to install the software. You can change the directory by clicking on the button circled in blue, otherwise you can simply leave the install at the default directory (recommended). Once you are ready to install click the button circled in green.



- Next you may get prompted with the program group name screen. Simply click the “Continue” button (circled in green).



- The setup will now install all of the files and you should be prompted with a success message.



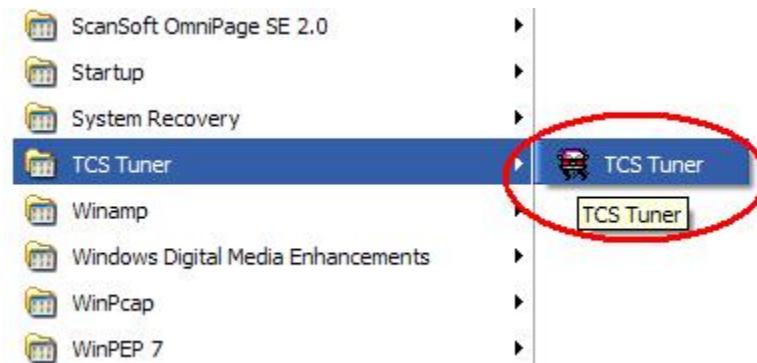
- The TCS Tuner software installation is now complete.

## Starting the TCS Tuner Software / Connecting to the TCS Box

1. Be sure that the DB9 serial communications cable is connected to the TCS box, and connected to your computer. Shown below is the DB9 communications cable connected to a USB to Serial adapter.
  1. NOTE: If you are using a USB to Serial cable, make sure that the USB end of the cable is plugged into the computer and that the drivers are installed so that the USB to Serial cable works as it should. For more information about installing the USB to Serial cable refer to the documentation provided by the manufacturer of the device.



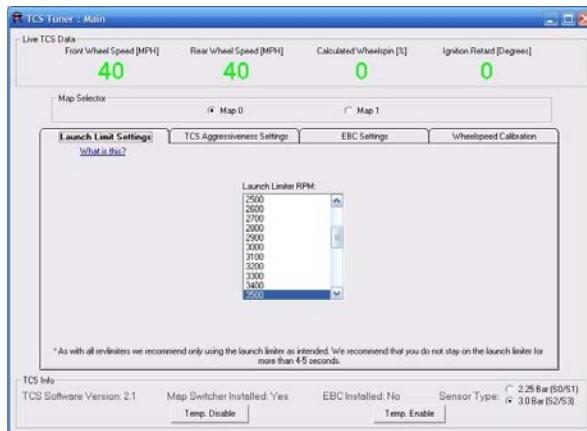
2. Ensure that the vehicle is running. If it is not running, then start the vehicle. The vehicle will have to be running to use the TCS Tuner software.
3. Start the TCS Tuner software by going through the “All Programs” menu at the Windows “Start” button. The TCS Tuner software will be in its own group called “TCS Tuner” and will have a single menu application item called “TCS Tuner”. Click this icon to start the program.



4. The software will open and it will automatically find the TCS box on your system. There is no need to specify which COM Port you are using. You will see the following dialog while the TCS Tuner software is looking for the TCS box (note, your status message may vary slightly).



- Assuming everything is plugged in and installed correctly the TCS Tuner software will find the TCS box and automatically load the current settings. You will see the main screen once connected. This is all that is needed to connect to the TCS box and start using the software.



- If the TCS Tuner software cannot connect to the box on your system you will get the following

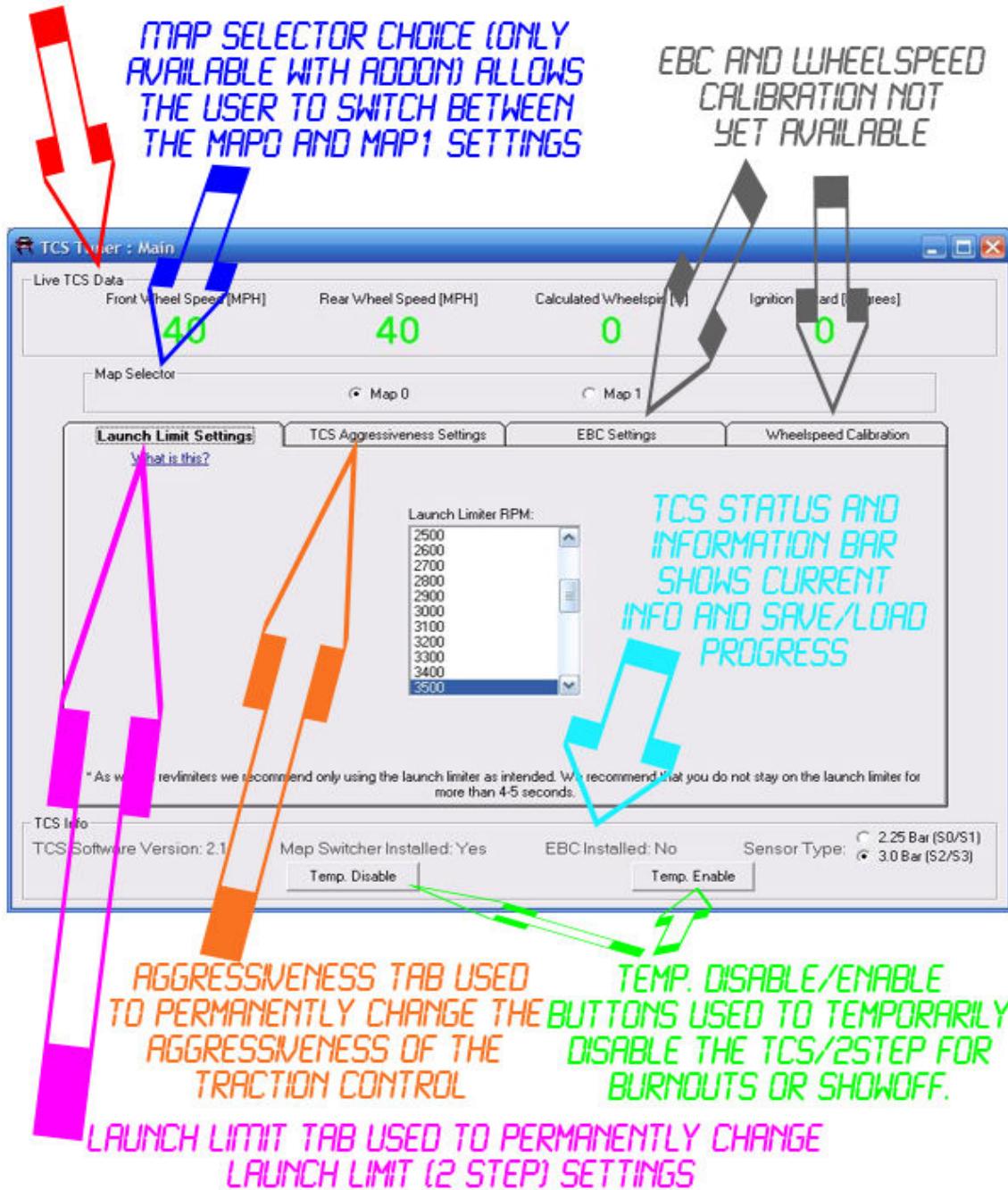


screen:

- Check the following if the software failed to connect to the TCS box:
  - Check that the vehicle is started and running.
  - Make sure the cable is connected to the main TCS box and that it is connected to your computer directly or through a USB to Serial cable.
  - If a USB to Serial cable is being used make sure that the cable is plugged into the computer's USB jack and the DB9 serial cable. Additionally make sure that you have installed the USB to Serial cable correctly according to the device manufacturer's documentation.
  - Make sure no other program is connected to the COM Port that the TCS box is on. Typically this is not a problem, if you are unsure contact us.
- Once you have fixed the problem you can attempt to connect to the TCS box again by pressing the "Reconnect" button.

## Software Quick Reference Diagram

LIVE DATA FRAME SHOWS INSTANTANEOUS DATA FROM TCS



## Using the Map0/Map1 Selector

The map0 / map1 selector buttons will only appear when you have purchased the remote map switch add-on. These buttons are used to switch between the two available saved maps in the TCS box. These maps are called “Map 0” and “Map 1” and correspond to the map switch on the remote map switch add-on.

To modify the values of “Map 0” simply click the “Map 0” selector button (see pic below). The values for “Map 0” will be loaded from the TCS box into the tabs on the screen so that you can modify the values. When you click the “Map 0” selector button note the TCS Info bar at the bottom; it will indicate the progress of the load of the “Map 0” values.



To modify the values of “Map 1” simply click the “Map 1” selector button (see pic below). The values for “Map 1” will be loaded from the TCS box into the tabs on the screen so that you can modify the values. When you click the “Map 1” selector button note the TCS Info bar at the bottom; it will indicate the progress of the load of the “Map 1” values.



**Note:** If you have not purchased the remote map switch add-on then you will not see the map 0 / map 1 selector buttons, so this section does not apply to you. You will only have one map available, and can only load/save the “Map 0” settings.

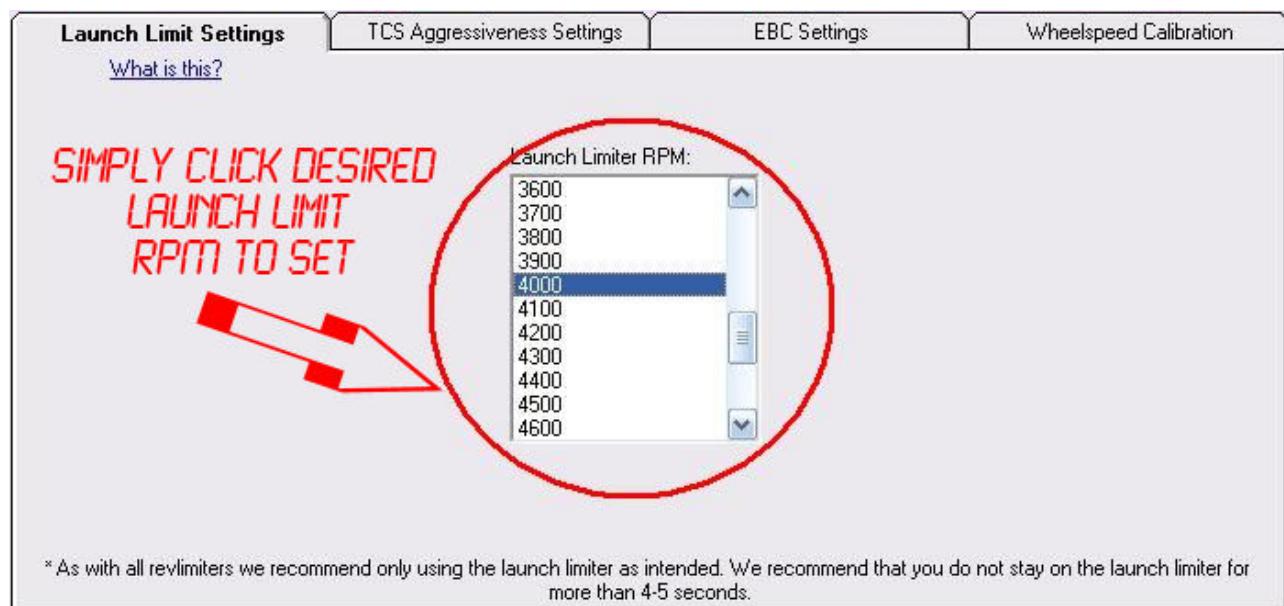
## Setting the Launch Limit (2 Step) RPM

The launch limit (2-step) feature of the TCS is used to effectively and consistently launch the vehicle. To use the 2-step all you have to do is come to a stop or a slow roll and attempt to “rev up” the engine with your foot on the clutch. The TCS box will automatically hold the engine speed at the given RPM with a “soft touch” rev limiter. Even with your foot to the floor the engine speed will still stay at the given set point allowing the driver to concentrate on other things. Additionally, the launch limiter can be used at the drag strip with sticky tires (slicks) to allow the vehicle to actually build boost at the starting line, since the launch limiter places a small load on the engine.

**Note:** Just as with any rev limiter, treat the TCS launch limiter with care! We do not recommend staying activated on the launch limiter for more than 4-5 seconds. Do not stay on it for a long time while shooting fireballs, just to impress your friends.

To permanently set the launch RPM do the following:

1. Click the “Launch Limit Settings” tab (see quick reference for location)
2. Using the listbox on the tab scroll down/up to the desired RPM (1500 to 6000) and click. The launch limit RPM is now set. (Note: The TCS info. bar at the bottom of the screen will indicate the progress of the save)



## Setting the Traction Control Aggressiveness

The traction control settings of the TCS can be modified by the user to allow for a more aggressive or less aggressive setup. For example, typically a more aggressive profile is used when the driver is on the street with typical “street tires”. Whereas, at the track when the driver has sticky tires, such as slicks, the user has no need for such an aggressive profile. Typically if the user feels the vehicle is still spinning too much the traction control should be set more aggressive. A little amount of spin (~10%) is typically desired, so if there is not enough wheelspin the traction control should be set less aggressive.

The user of the TCS software has two distinct options when setting the aggressiveness of the traction control. These options are called “Simple” and “Advanced”. The simple method gives the user a choice between 5 presets and an “off” setting. All the user has to do is use a slider bar to select the desired aggressiveness profile from 0 (traction control off) to 5 (most aggressive). The advanced mode allows a more advanced user to set the exact profile of the aggressiveness. The advanced mode allows the user to view and modify the ignition retard versus wheelspin values in graph form. Essentially this allows the user to program how much power is pulled from the engine output depending upon the severity of wheelspin. The advance mode allows the user to modify the aggressiveness of the traction control as well as bias the vehicle to have a certain amount of wheelspin.

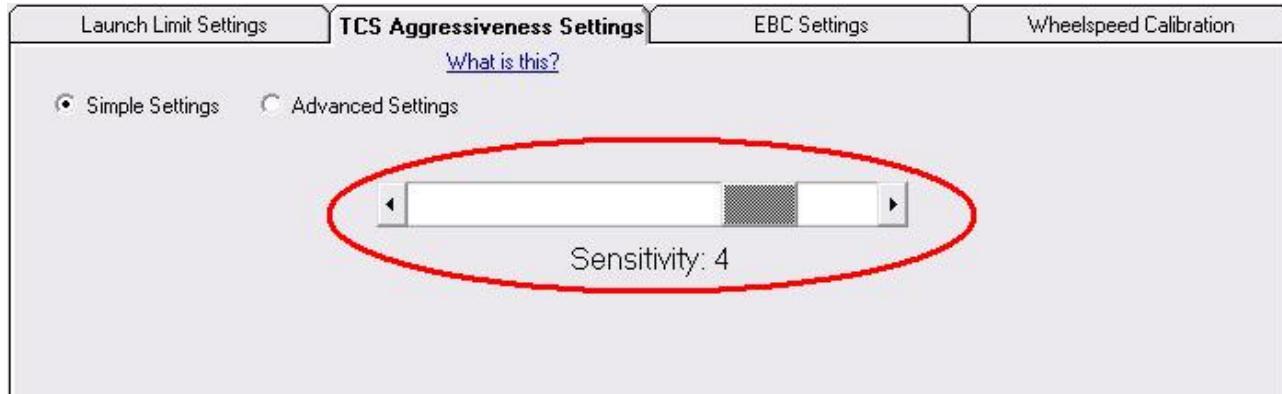
### Setting the Aggressiveness Via the Simple Method

To permanently set the aggressiveness of the traction control via the advanced method do the following:

1. Click the “TCS Aggressiveness Settings” tab (see quick reference for location)
2. Click the “Simple Settings” selector button at the top of the tab:



3. Using the scrollbar move the value left and right to modify the aggressiveness of the traction control. Setting 0 (to the left) is traction control completely off. Setting 5 (to the right) is traction control aggressiveness very high. (Note: The TCS info. bar at the bottom of the screen will indicate the progress of the save)



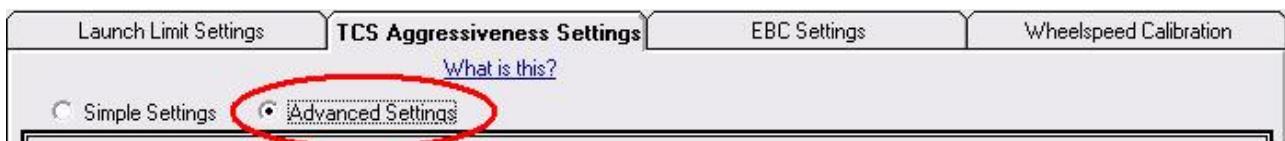
### **Setting the Aggressiveness Via the Advanced Method**

The advanced method can be used to fine tune the traction control settings to exactly what the user desires. The general aggressiveness can be increased and decreased, as well as a wheelspin bias can be applied with this method. This method presents the user with a graph of ignition retard versus wheelspin. The user can modify from 1 to 30 degrees of ignition retard from 4% wheelspin up to 100% wheelspin. The user modifies the graph by simply clicking on it. Every time a value is changed the map will be saved to the TCS box.

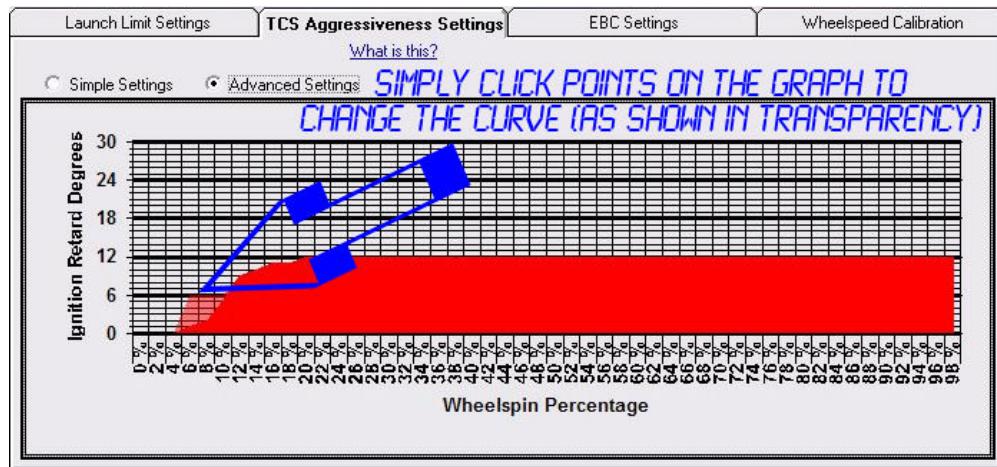
To increase the general aggressiveness of the traction control the user should increase the amount of ignition retard at each point along the graph. To decrease the general aggressiveness the user should decrease the amount of ignition retard at each point along the graph. Of equal importance however is the shape of the graph. The larger the slope (i.e. Increase in ignition retard from one point to the next), the more bias the vehicle will have to stay at that point in wheelspin. For example: let say you had a graph that had no ignition retard until 20% wheelspin where you began to add a few degrees of ignition retard. Let's say by 26% wheelspin you had a full 25 degrees of ignition retard that continued across the remainder of the map. A map like this would naturally bias the vehicle to have wheelspin in the low 20 percent range. However let's say you made a map that had a few degrees of retard at 6% wheelspin and a full 25 degrees of ignition retard by 12% wheelspin. A map like this would naturally bias the vehicle to have around 6-10% wheelspin. Additionally the shape of the curve plays a part in how smoothly the power will be applied and taken away so keep that in mind as well.

To permanently set the aggressiveness of the traction control via the basic method do the following:

1. Click the “TCS Aggressiveness Settings” tab (see quick reference for location)
2. Click the “Advanced Settings” selector button at the top of the tab:



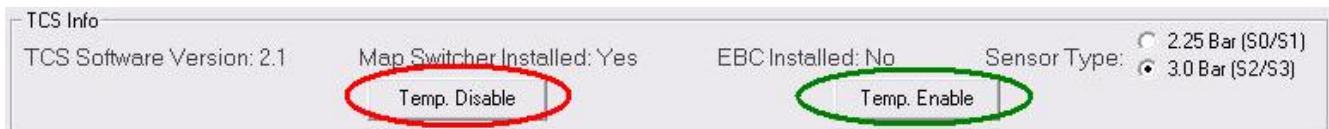
3. By simply clicking on the graph the user can adjust the various points on the graph. Whenever a point on the graph is changed the TCS Tuner software will save the settings to the TCS box.  
(Note: The TCS info. bar at the bottom of the screen will indicate the progress of the save)



## Using the Temp. Disable/Enable Buttons

The temporary disable and temporary enable buttons are used to turn on and off the traction control and launch limiter for the duration of the runtime. This means that if you click the “Temp. Disable” button, TCS system (traction control and launch limiter) will be disabled until you either re-enable it by clicking the “Temp. Enable” button or the vehicle is restarted (i.e. engine off and engine back on). This feature is useful for things such as burnouts, showoff, and general testing/debugging of the vehicle with the system off.

To use the temporary disable/enable click the buttons in the TCS Info bar on the bottom of the main screen. Below is a picture of the buttons with the disable button circled in red and the enable button circled in green:



## Setting the EBC

This feature is currently unavailable.

## Calibrating the Wheelspeed Sensors (For Staggered Rim Setups)

This feature is currently unavailable.

## Special Notes for the TCS

A special feature has been added to the TCS system. Upon boot up (i.e. when the engine is first turned on) the TCS is in a “burnout/dyno mode”, sometimes referred to as the “key trick”. This mode is similar to the temporary disable mode, in that the traction control is completely off as well as the launch limiter. The TCS will exit burnout mode when the vehicle travels faster than 5mph, and then returns to a stop. This feature was added to facilitate the burnouts at the drag strip and to allow for easy dynoing. However, you will also notice that if you start the car up and begin driving the TCS will not turn on until you reach the first stop sign or stop light and the car returns to a stop. Do not be alarmed that until the car reaches a stop, the TCS will not be activated.

## Dynoing a Vehicle with TCS

Dynoing a vehicle with TCS is actually very easy. Simply drive the car on to the rollers as usual and get it strapped down. Before you actually start dynoing have the operator turn the vehicle completely off (i.e. engine stopped) for at least 5 seconds. Then start the car back up and perform the dyno as usual. This works because upon bootup the TCS is in burnout/dyno mode and because the vehicle never travels over 5 mph and back to 0 mph, the TCS will never exit burnout/dyno mode. In fact you do not even need to turn the vehicle off in between runs; just turn the vehicle off for 5 seconds before the first run and that's it. Note, with the remote map switcher add-on or the free TCS Tuner software you can also turn off the TCS system without having to actually turn off the vehicle.

## Taking a Vehicle with TCS to the Drag Strip

A few issues should be considered when taking your vehicle equipped with TCS to the drag strip. If you are taking your car to the strip on street tires much of this section can be avoided, the only thing I would suggest you do on street tires is just play around a little bit with the launch limiter to see what seems to work the best that day based on the track preparation.

However, if you are using sticky tires at the drag strip, such as slicks (or even cheater slicks / drag radials), you have a few things to consider. First off, due to the preparation of the track and fact that you are using sticky tires, the dynamics change greatly because MUCH more traction is available. In many cases it is okay to leave the aggressiveness of the TCS where it is, however most times it makes more sense to decrease the aggressiveness. Assume you have the traction control set to be very aggressive because on the street you have a high horsepower SRT-4. If/When you begin to spin your slicks at the track the TCS will abruptly cut back power, almost too much. Although the TCS will very quickly give you your power back once the tires catch up, for a ever so small split second before the TCS updates (by the way we are talking milliseconds here) you are not at the full potential power for the slicks. And since drag racing is all about squeaking out those last milliseconds, a little bit here and a little bit there can add up. We actually do not recommend turning the aggressiveness all the way to off, instead we suggest a very low aggressiveness setting, in the case that the slicks do begin to spin a little. If the slicks are still spinning very badly at the track remember to check the pressure in the tires, and verify that the TCS is on. If everything is as it should be, then increase the aggressiveness of the TCS accordingly.

The next thing to consider when using sticky tires at the drag strip is the launch RPM. Because



much more traction is available on sticky tires on a drag strip, you will find that your launch RPM should be significantly higher than on the street with street tires. All of our test vehicles on slicks had the launch limiter (2-step) set over 4500 RPM or higher. What we recommend is having a laptop available so that you can start your launches at 4500 RPM and work your way up to find a good launch RPM for your vehicle at the track with the given track preparation.

Finally, there is the burnout. To successfully do the burnout in the burnout box at the track you will need to disable the TCS so that you have all your power and so you do not have a launch limiter holding you back. The easiest way to disable the TCS is to have the remote map switcher add-on which allows you to flip a switch that disables and enables the TCS system. However, if you did not purchase the remote map switcher add-on you can use the free TCS Tuner software to temporarily disable the TCS system for the burnout (see the “Using the Temp. Disable/Enable Buttons” section of this document). Last but not least, if you do not have a laptop or do not want to take it to the track with you, and do not have a remote switch box add-on you can use the “key trick” (see beginning of the “Special Notes for the TCS” section of this document). Essentially all you have to do is turn the car off for at least 3 seconds and then turn the vehicle back on and do the burnout as usual. You will naturally cross 5mph and return to a stop when you rollout of the burnout and stage the vehicle for launch. If you use the key trick, we suggest actually putting the car in neutral and shutting off the car while rolling into the burnout box. By doing this once you have reached the burnout box 3-5 seconds has already elapsed and you can turn the car back on and start your burnout. Another method is to have the car off in the staging lanes and very slowly drive up to the burnout box making sure that you never cross 5mph on your trip to the burnout box (remember if you cross 5 mph you will have to turn the vehicle off again before doing the burnout). Using either of those methods will keep the track officials happy since you don't have to wait with the vehicle off in the burnout box.