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VGT Controller Software Instructions

This VGT Controller Software and VGT Controller Module are designed to control an HE351VE turbo on a 1998.5 to 2005 Dodge/Cummins Truck only.

The VGT Controller Software is packaged into a .zip file to ensure that all of the files are downloaded appropriately from fleeceperformance.com/software. You will need an unpacking program such as 7-Zip or WinRar to open the .zip file.

Installing the VGT Controller Software

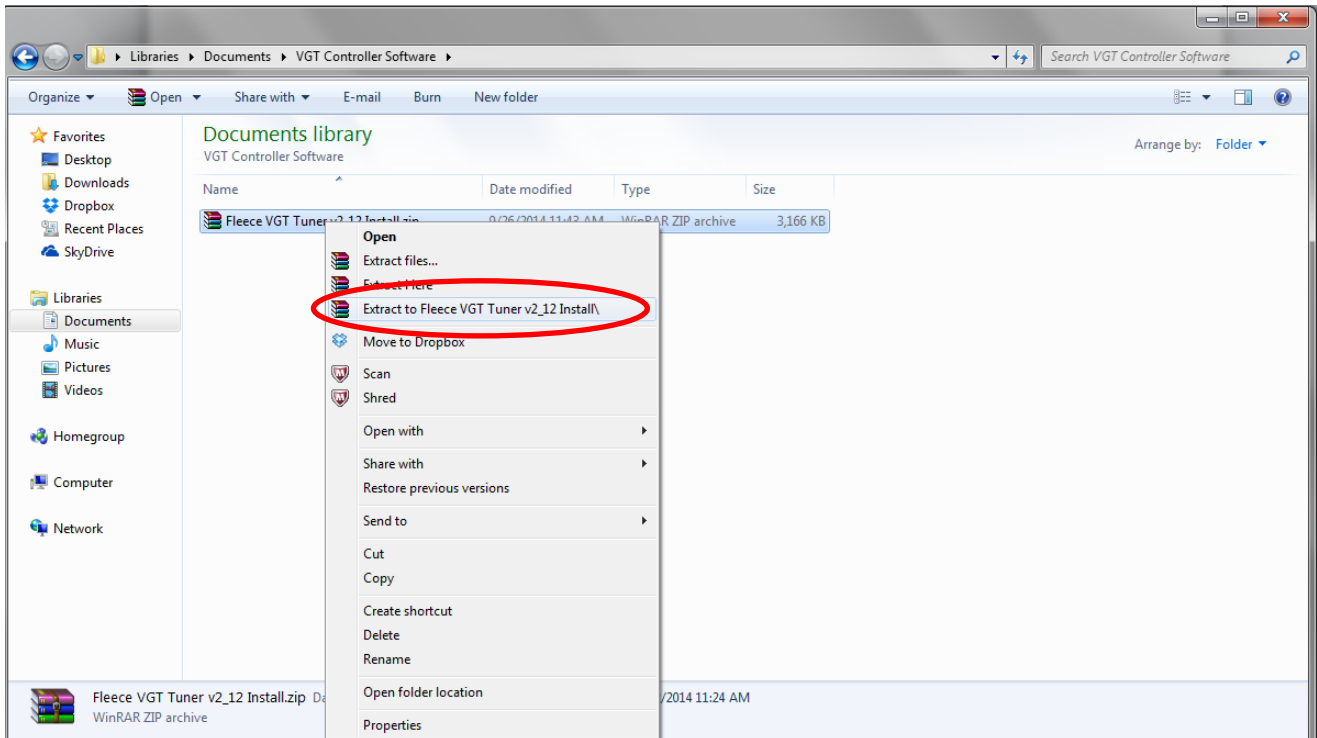
1. Download the latest VGT Controller software from fleeceperformance.com/software.

NOTE: The latest VGT Controller Software can only be used with the controller pictured to the right on the top. It will not work with the controller pictured to the right on the bottom.

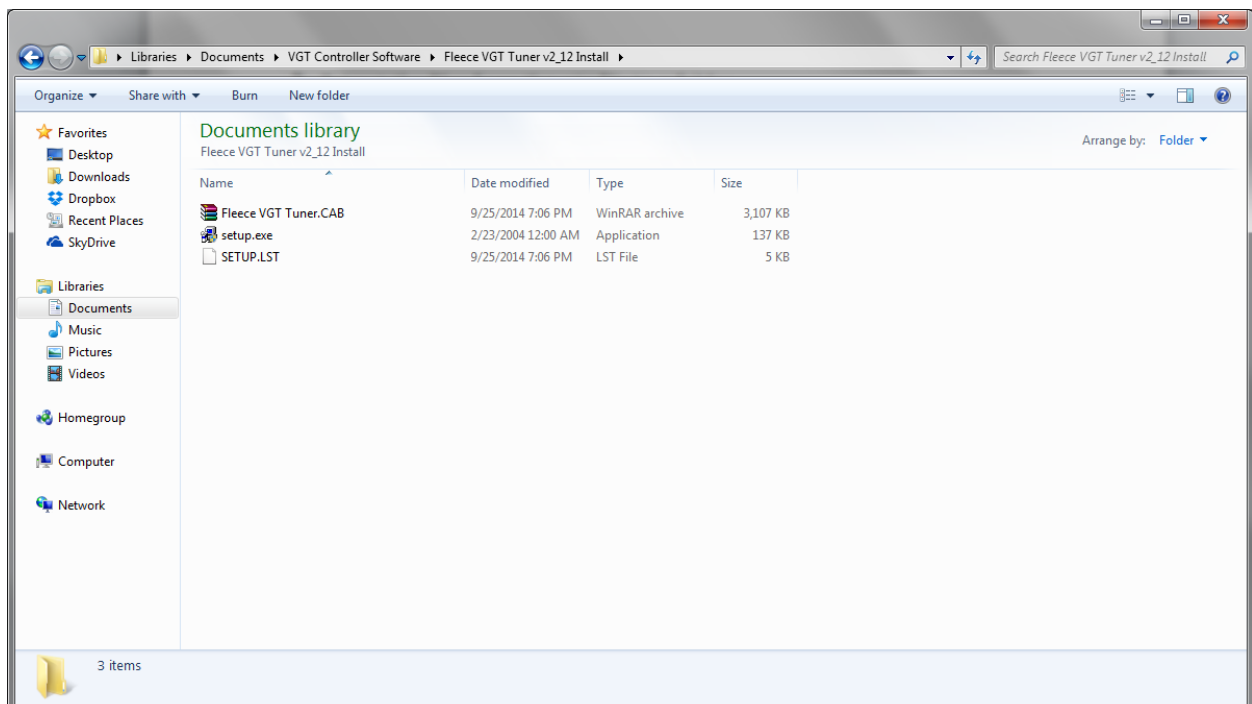
2. Save the VGT Controller Software to a folder on your computer such My Documents. Don't save it to you Desktop.



3. Extract the files from the .zip file to a folder

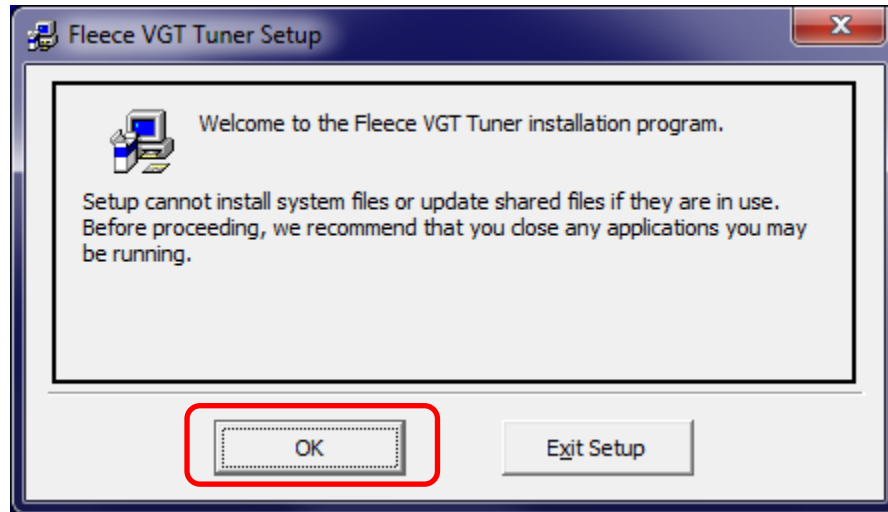


4. Run the setup.exe application

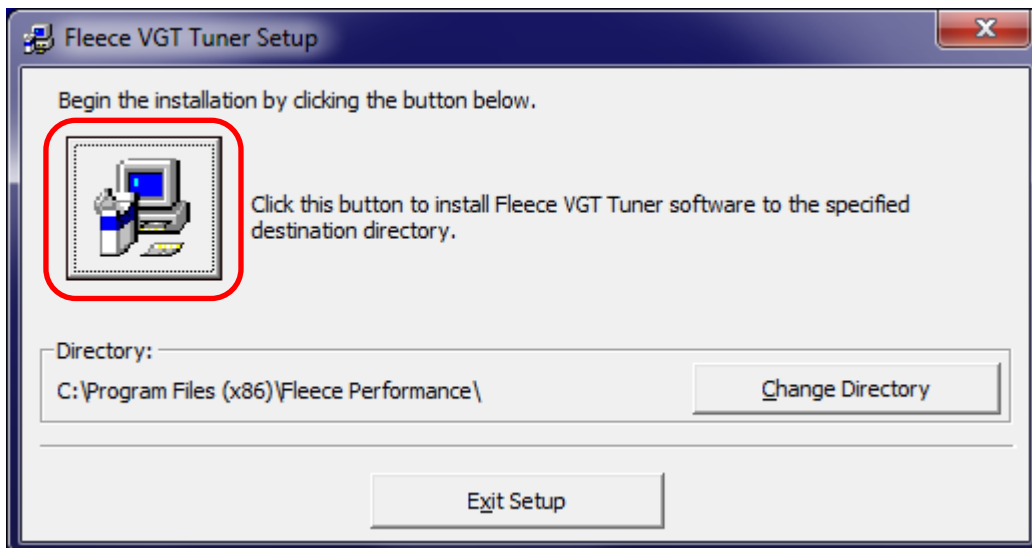


5. If your computer asks you if you want to allow this program to make changes to your computer, select “Yes”.

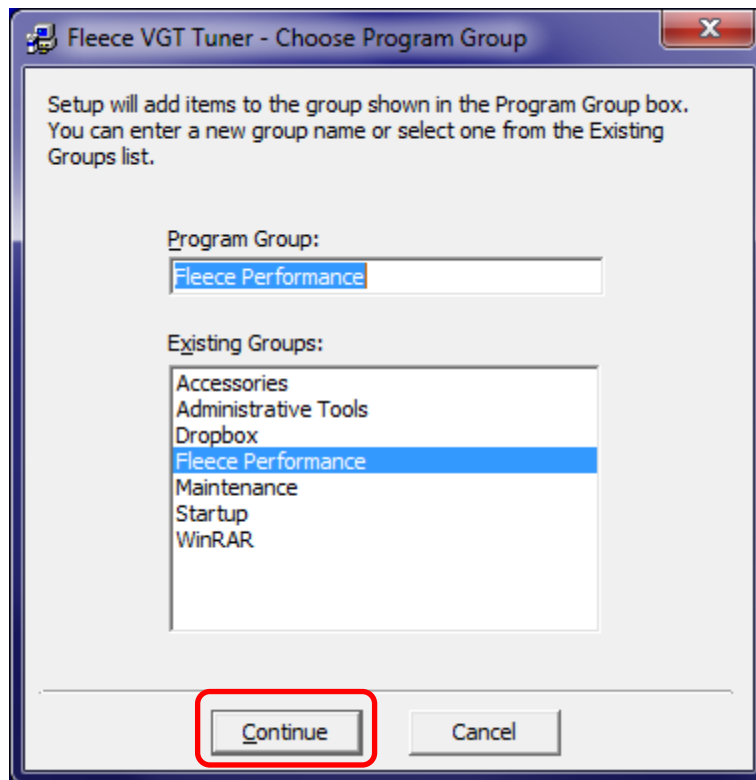
6. Click OK



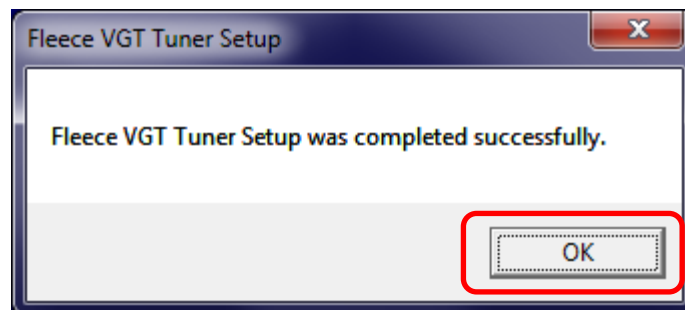
7. Click on the computer icon



8. Click Continue

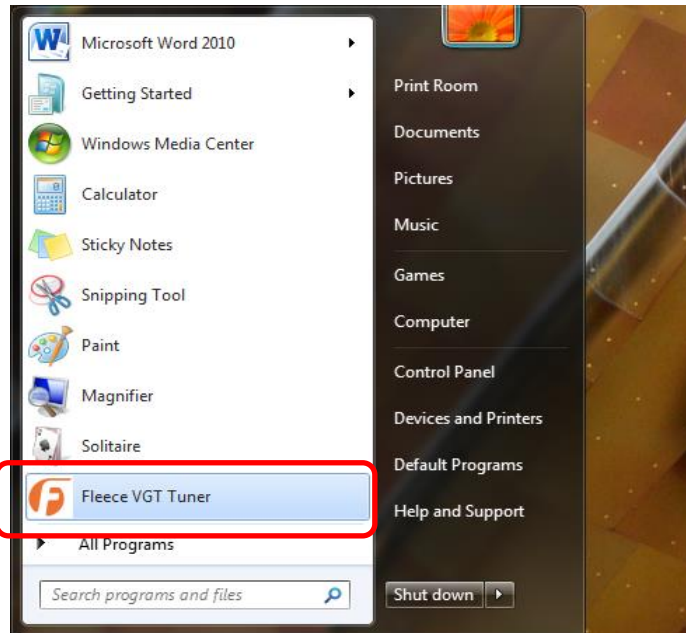


9. Click OK

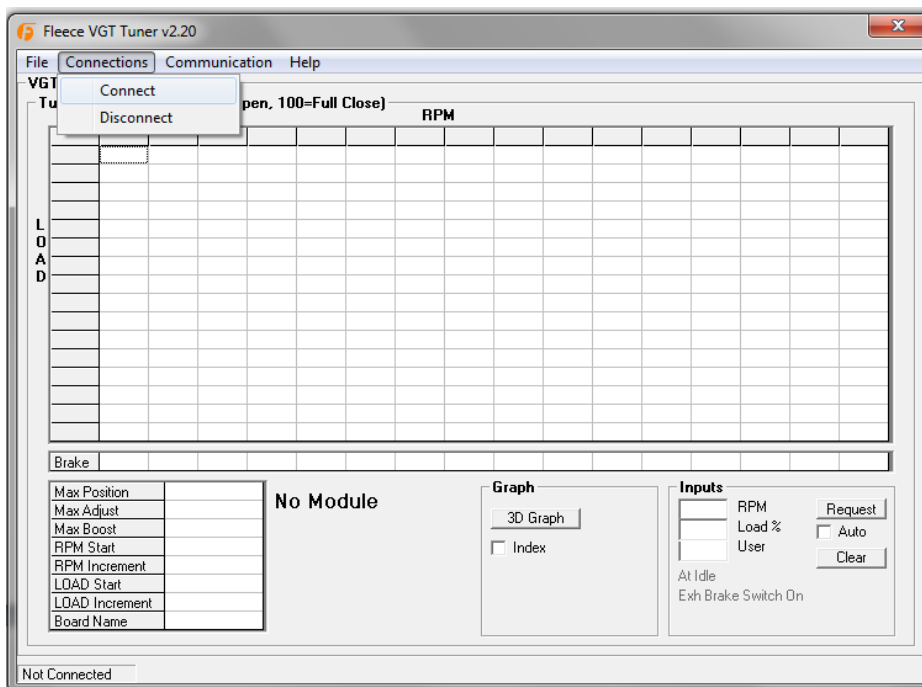


Connecting to the VGT Controller

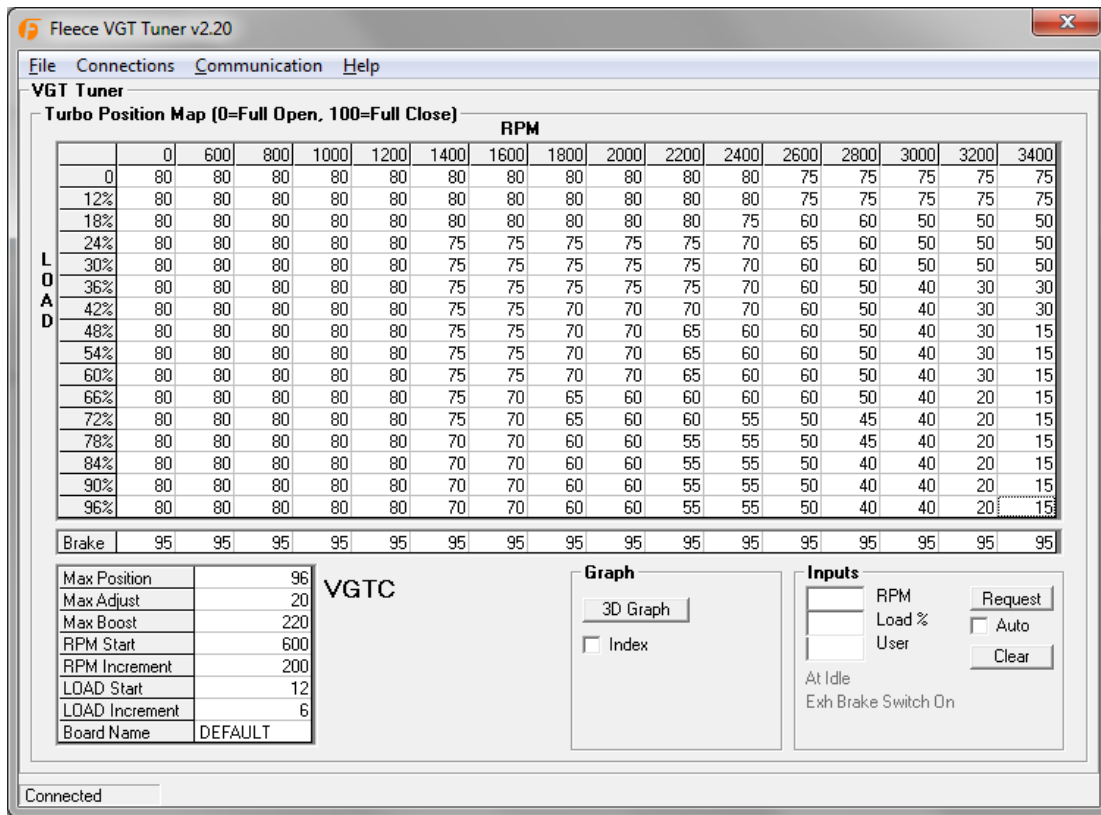
1. Open the VGT Controller Software



2. Using the supplied USB cable, plug the VGT Controller Module into your computer.
3. Click on **Connections** in the menu bar and select **Connect**. This will establish a connection from your computer to the VGT Controller Module, and automatically populate the parameters stored on the module.



Using the VGT Controller Software



The figure above is a representation of the VGT Controller software when connected your computer. The following will describe the function and meaning of each part of the VGT Controller Software.

File Menu

- **Open**
 - This will open a .dat file that contains all of the values displayed in the VGT Controller Software
- **Save**
 - This will save a .dat file that contains all of the values displayed in the VGT Controller Software
- **Graph**
 - This will pop up a 3-dimensional graph that is a representation of the values that are displayed in the RPM vs Load table
- **Clear**
 - This will clear all of the values displayed on the VGT Controller Software

The screenshot shows the 'Fleece VGT Tuner v2.20' application window. The 'File' menu is open, listing 'Open', 'Save', 'Graph', and 'Clear'. The main interface features a large table with 'LOAD' on the y-axis (18% to 96%) and 'RPM' on the x-axis (600 to 3400). Below the table is a 'Brake' row and a 'VGTC' parameter table. On the right, there are 'Graph' and 'Inputs' control panels.

LOAD	600	800	1000	1200	1400	1600	1800	2000	2200	2400	2600	2800	3000	3200	3400
18%	80	80	80	80	80	80	80	80	80	80	75	75	75	75	75
24%	80	80	80	80	80	75	75	75	75	70	65	60	50	50	50
30%	80	80	80	80	80	75	75	75	75	70	60	60	50	50	50
36%	80	80	80	80	80	75	75	75	75	70	60	50	40	30	30
42%	80	80	80	80	80	75	75	70	70	70	60	50	40	30	30
48%	80	80	80	80	80	75	75	70	70	65	60	60	50	40	30
54%	80	80	80	80	80	75	75	70	70	65	60	60	50	40	30
60%	80	80	80	80	80	75	75	70	70	65	60	60	50	40	30
66%	80	80	80	80	80	75	70	65	60	60	60	60	50	40	20
72%	80	80	80	80	80	75	70	65	60	60	55	50	45	40	20
78%	80	80	80	80	80	70	70	60	60	55	55	50	45	40	20
84%	80	80	80	80	80	70	70	60	60	55	55	50	40	40	20
90%	80	80	80	80	80	70	70	60	60	55	55	50	40	40	20
96%	80	80	80	80	80	70	70	60	60	55	55	50	40	40	20

Brake	95	95	95	95	95	95	95	95	95	95	95	95	95	95	95
Max Position	96														
Max Adjust	20														
Max Boost	220														
RPM Start	600														
RPM Increment	200														
LOAD Start	12														
LOAD Increment	6														
Board Name	DEFAULT														

VGTC

Graph

Index

Inputs

RPM

Load % Auto

User

At Idle
Exh Brake Switch On

Connected

Connection Menu

- **Connect**
 - With the VGT Controller Module connected to the computer via the USB cable that was provided in the kit this will enable communication between the VGT Controller Software and the VGT Controller Module
- **Disconnect**
 - This will safely disconnect the VGT Controller Module from the VGT Controller Software, ending the communication link

The screenshot shows the Fleece VGT Tuner v2.20 software interface. The 'Connections' menu is open, showing 'Connect' and 'Disconnect' options. The main window displays a table of Load vs. RPM settings, a 'VGTC' parameter table, and 'Graph' and 'Inputs' control panels.

LOAD	0	600	800	1000	1200	1400	1600	1800	2000	2200	2400	2600	2800	3000	3200	3400
0	80	80	80	80	80	80	80	80	80	80	80	75	75	75	75	75
12%	80	80	80	80	80	80	80	80	80	80	80	75	75	75	75	75
18%	80	80	80	80	80	80	80	80	80	80	75	60	60	50	50	50
24%	80	80	80	80	80	80	75	75	75	75	70	65	60	50	50	50
30%	80	80	80	80	80	80	75	75	75	75	70	60	60	50	50	50
36%	80	80	80	80	80	80	75	75	75	75	70	60	50	40	30	30
42%	80	80	80	80	80	80	75	75	70	70	70	60	50	40	30	30
48%	80	80	80	80	80	80	75	75	70	70	65	60	50	40	30	15
54%	80	80	80	80	80	80	75	75	70	70	65	60	50	40	30	15
60%	80	80	80	80	80	80	75	75	70	70	65	60	50	40	30	15
66%	80	80	80	80	80	80	75	70	65	60	60	60	50	40	20	15
72%	80	80	80	80	80	80	75	70	65	60	60	55	50	45	40	15
78%	80	80	80	80	80	80	70	70	60	60	55	55	50	45	40	15
84%	80	80	80	80	80	80	70	70	60	60	55	55	50	40	40	15
90%	80	80	80	80	80	80	70	70	60	60	55	55	50	40	40	15
96%	80	80	80	80	80	80	70	70	60	60	55	55	50	40	40	15

Brake	95	95	95	95	95	95	95	95	95	95	95	95	95	95	95	95
Max Position	96															
Max Adjust	20															
Max Boost	220															
RPM Start	600															
RPM Increment	200															
LOAD Start	12															
LOAD Increment	6															
Board Name	DEFAULT															

VGTC

Graph

Index

Inputs

RPM

Load % Auto

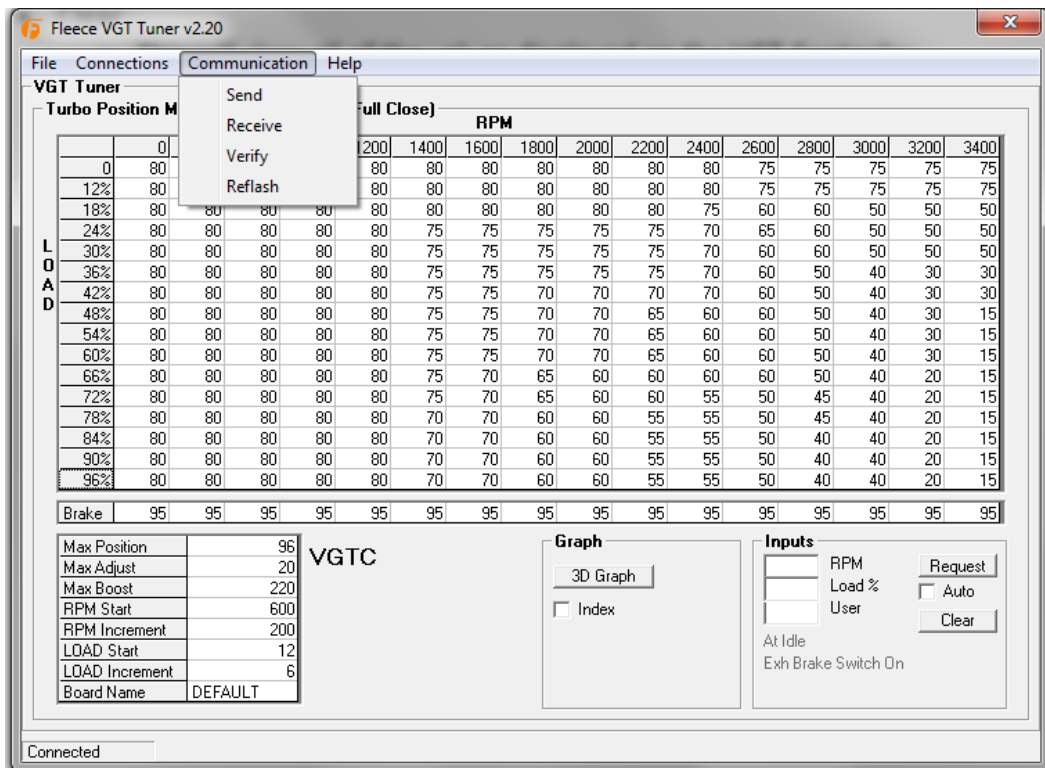
User

At Idle
Exh Brake Switch On

Connected

Communication Menu

- **Send**
 - This function will send all of the values displayed in the VGT Controller Software to the VGT Controller Module. This is used to update the calibration saved on the VGT Controller Module
 - A successful “Send” will result in the parameter being saved on the VGT Controller followed by a “Download Complete” message
- **Receive**
 - This function will update all of the values in the VGT Controller Software with the current values that are stored on the Module
- **Verify**
 - This function will compare the values displayed on the Software to the values on the Module. If the values match, “Verify OK” will be displayed. If they values don’t match, “Verify FAILED” will be displayed.
- **Reflash**
 - This function is only used by Fleece Performance Engineering to update firmware.



Help Menu

- **Board Version**
 - This will display the version of the firmware on the Module
- **Test Turbo**
 - When the turbo is connected to a proper 12V source and the Module is connected to the turbo this will send a signal to the turbo to cycle the vanes. This can be used as a diagnostic tool to make sure that the turbo actuates.
- **About**
 - Fleece Performance contact information

Fleece VGT Tuner v2.20

File Connections Communication **Help**

VGT Tuner
Turbo Position Map (0=Full Open, 100=Full Closed)

	0	600	800	1000	1200	1400	1600	1800	2000	2200	2400	2600	2800	3000	3200	3400
0%	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80
12%	80	80	80	80	80	80	80	80	80	80	80	75	75	75	75	75
18%	80	80	80	80	80	80	80	80	80	80	75	60	60	50	50	50
24%	80	80	80	80	80	80	75	75	75	75	70	65	60	50	50	50
30%	80	80	80	80	80	80	75	75	75	75	70	60	60	50	50	50
36%	80	80	80	80	80	80	75	75	75	75	70	60	50	40	30	30
42%	80	80	80	80	80	80	75	75	70	70	70	60	50	40	30	30
48%	80	80	80	80	80	80	75	75	70	70	65	60	60	50	40	30
54%	80	80	80	80	80	80	80	75	70	70	65	60	60	50	40	30
60%	80	80	80	80	80	80	75	75	70	70	65	60	60	50	40	30
66%	80	80	80	80	80	80	75	70	65	60	60	60	60	50	40	20
72%	80	80	80	80	80	80	75	70	65	60	60	55	50	45	40	20
78%	80	80	80	80	80	80	70	70	60	60	55	55	50	45	40	20
84%	80	80	80	80	80	80	70	70	60	60	55	55	50	40	40	20
90%	80	80	80	80	80	80	70	70	60	60	55	55	50	40	40	20
96%	80	80	80	80	80	80	70	70	60	60	55	55	50	40	40	20
Brake	95	95	95	95	95	95	95	95	95	95	95	95	95	95	95	95

VGTC

Max Position	96
Max Adjust	20
Max Boost	220
RPM Start	600
RPM Increment	200
LOAD Start	12
LOAD Increment	6
Board Name	DEFAULT

Graph

3D Graph

Index

Inputs

RPM Request

Load % Auto

User Clear

At Idle
Exh Brake Switch On

Connected

RPM vs Load Table

- **Turbo Position Map (0=Full Open, 100=Full Close)**
 - This is an explanation for the turbo vane position values in RPM vs Load Table. 0 means the vanes are fully open, 100 means that vanes are fully closed
- **RPM**
 - Engine RPM Axis
- **Load**
 - Engine Load Axis. This determined by the ECM and broadcast to the VGT Controller Module
- **Brake Table**
 - This line of values is the vane position during exhaust braking. Values on this line should never exceed 95% closed, and should typically decrease as engine RPM increases.
 - The exhaust brake will not engage until the ECM broadcasts the “At Idle” CAN message. This doesn’t mean that the engine need to be at idle RPM, just an idle state as determined by the ECM.
- **Max Position**
 - This will limit the maximum vane position at any time during operation.
 - This value should not exceed 96 (Vanes 96% Closed)
- **Max Adjust**
 - This is the amount of adjustability the user dial is allowed
 - If the current vane position is 60%, and the “Max Adjust” is 20, the user dial can be used to open the vanes to 40% or close the vanes to 80%.
- **Max Boost**
 - Not used for this version of VGT Controller
- **RPM Start**
 - Sets the value of the 2nd column of RPM values. The first column is always set to 0 RPM
- **RPM Increment**
 - Sets the increment value for the RPM axis
 - When changing the RPM Increment the values, the table will not follow the previous RPM value that it was associated with. The RPM axis will change, but the table will stay the same.

RPM vs Load Table (Continued)

- **Load Start**
 - Sets the value of the 2nd row of Load values. The first row is always set to 0% Load
- **Load Increment**
 - Sets the increment value for the Load axis
 - When changing the Load Increment the values, the table will not follow the previous Load value that it was associated with. The Load axis will change, but the table will stay the same.
- **Board Name**
 - The board name can be personalized
- **VGTC vs No Module**
 - VGTC is displayed when the VGT Controller Module is prepared to communicate to the VGT Controller Software via USB.
 - No Module is displayed then the module is NOT prepared to communicate to the VGT Controller Software via USB.

The screenshot shows the 'Fleece VGT Tuner v2.20' application window. The main area displays a 'Turbo Position Map (0=Full Open, 100=Full Close)' table with 'LOAD' on the y-axis (0% to 96% in 6% increments) and 'RPM' on the x-axis (0 to 3400 in 200 RPM increments). Below the table is a 'Brake' row with a constant value of 95. To the left of the table is a 'VGTC' status indicator. Below the table is a parameter list with the following values:

Max Position	96
Max Adjust	20
Max Boost	220
RPM Start	600
RPM Increment	200
LOAD Start	12
LOAD Increment	6
Board Name	DEFAULT

Below the parameter list are 'Graph' and 'Inputs' sections. The 'Graph' section has a '3D Graph' button and an unchecked 'Index' checkbox. The 'Inputs' section has three input fields for 'RPM', 'Load %', and 'User', with 'Request' and 'Auto' buttons. Below these are 'Clear' and 'At Idle' options, and a note 'Exh Brake Switch On'. The status bar at the bottom indicates 'Connected'.

Graph Functions

- **3D Graph Button**
 - Creates a 3-dimensional graph of the RPM vs Load Table
- **Index**
 - When selected, and the CAN connector is connected to the truck's CAN bus, and the module is properly powered and connected to the VGT Controller Software, the cell that meets correlates to the RPM and Load of the truck will be highlighted to identify which values is being sent to the VGT Turbo

Fleece VGT Tuner v2.20

File Connections Communication Help

VGT Tuner

Turbo Position Map (0=Full Open, 100=Full Close)

	0	600	800	1000	1200	1400	1600	1800	2000	2200	2400	2600	2800	3000	3200	3400
0	80	80	80	80	80	80	80	80	80	80	80	75	75	75	75	75
12%	80	80	80	80	80	80	80	80	80	80	80	75	75	75	75	75
18%	80	80	80	80	80	80	80	80	80	80	75	60	60	50	50	50
24%	80	80	80	80	80	75	75	75	75	75	70	65	60	50	50	50
30%	80	80	80	80	80	75	75	75	75	75	70	60	60	50	50	50
36%	80	80	80	80	80	75	75	75	75	75	70	60	50	40	30	30
42%	80	80	80	80	80	75	75	70	70	70	70	60	50	40	30	30
48%	80	80	80	80	80	75	75	70	70	65	60	60	50	40	30	15
54%	80	80	80	80	80	75	75	70	70	65	60	60	50	40	30	15
60%	80	80	80	80	80	75	75	70	70	65	60	60	50	40	30	15
66%	80	80	80	80	80	75	70	65	60	60	60	60	50	40	20	15
72%	80	80	80	80	80	75	70	65	60	60	55	50	45	40	20	15
78%	80	80	80	80	80	70	70	60	60	55	55	50	45	40	20	15
84%	80	80	80	80	80	70	70	60	60	55	55	50	40	40	20	15
90%	80	80	80	80	80	70	70	60	60	55	55	50	40	40	20	15
96%	80	80	80	80	80	70	70	60	60	55	55	50	40	40	20	15

Brake | 95 | 95 | 95 | 95 | 95 | 95 | 95 | 95 | 95 | 95 | 95 | 95 | 95 | 95 | 95 | 95

Max Position: 96
 Max Adjust: 20
 Max Boost: 220
 RPM Start: 600
 RPM Increment: 200
 LOAD Start: 12
 LOAD Increment: 6
 Board Name: DEFAULT

VGTC

Graph

3D Graph
 Index

Inputs

RPM
 Load % Auto
 User

At Idle
 Exh Brake Switch On

Connected

Inputs

- **RPM**
 - Engine RPM displayed numerically
- **Load %**
 - Load % displayed numerically
- **User**
 - User dial position in counts.
 - The user dial is used to adjust the turbo vane position above or below the value that is being referenced in the RPM vs Load table. The total range of the user dial is from 0-255 counts. When the user dial is at 127 counts (middle position), the vane position will be determined by the values in the RPM vs Load table. When the user dial is at 255 (turned all the way to the right), the vane position will be the value in RPM vs Load table + the max adjust value. When the user dial is at 191 (halfway between the middle position and all the way to the right), the vane position will be the value in RPM vs Load table + $\frac{1}{2}$ the max adjust value.
- **At Idle**
 - This will highlight black when the ECM determines the engine is at an idle state.
 - NOTE: The exhaust brake cannot turn on unless “At Idle” is active
- **Exh Brake Switch On**
 - This will highlight when the exhaust brake switch is enabled
- **Request**
 - Requests the RPM, Load %, and User Dial position at the time the button is selected
- **Auto**
 - Continuously requests RPM, Load %, and User Dial position
- **Clear**
 - Clears the RPM, Load %, and User Dial position values

