

Instruction 106-3161  
4-29-08

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Because every industry has a leader

## Installation Instructions for S&S® Freedom® Performance Tuner for 2003-'07 Victory® Motorcycles

### DISCLAIMER:

S&S parts are designed for high performance, off road, racing applications and are intended for the very experienced rider only. The installation of S&S parts may void or adversely affect your factory warranty. In addition such installation and use may violate certain federal, state, and local laws, rules and ordinances as well as other laws when used on motor vehicles used on public highways, especially in states where pollution laws may apply. Always check federal, state, and local laws before modifying your motorcycle. It is the sole and exclusive responsibility of the user to determine the suitability of the product for his or her use, and the user shall assume all legal, personal injury risk and liability and all other obligations, duties, and risks associated therewith.

The words Victory®, Victory Freedom®, and all Victory part numbers and model designations are used for reference only.

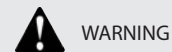
### SAFE INSTALLATION AND OPERATION RULES:

Before installing your new S&S part it is your responsibility to read and follow the installation and maintenance procedures in these instructions and follow the basic rules below for your personal safety.

- Gasoline is extremely flammable and explosive under certain conditions and toxic when breathed. Do not smoke. Perform installation in a well ventilated area away from open flames or sparks.
- If motorcycle has been running, wait until engine and exhaust pipes have cooled down to avoid getting burned before performing any installation steps.
- Before performing any installation steps disconnect battery to eliminate potential sparks and inadvertent engagement of starter while working on electrical components.
- Read instructions thoroughly and carefully so all procedures are completely understood before performing any installation steps. Contact S&S with any questions you may have if any steps are unclear or any abnormalities occur during installation or operation of motorcycle with a S&S part on it.
- Consult an appropriate service manual for your motorcycle for correct disassembly and reassembly procedures for any parts that need to be removed to facilitate installation.
- Use good judgment when performing installation and operating motorcycle. Good judgment begins with a clear head. Don't let alcohol, drugs or fatigue impair your judgment. Start installation when you are fresh.
- Be sure all federal, state and local laws are obeyed with the installation.
- For optimum performance and safety and to minimize potential damage to carb or other components, use all mounting hardware that is provided and follow all installation instructions.
- Motorcycle exhaust fumes are toxic and poisonous and must not be breathed. Run motorcycle in a well ventilated area where fumes can dissipate.

### IMPORTANT NOTICE:

Statements in this instruction sheet preceded by the following words are of special significance.



WARNING

Means there is the possibility of injury to yourself or others.



CAUTION

Means there is the possibility of damage to the part or motorcycle.

NOTE

Other information of particular importance has been placed in italic type.

S&S recommends you take special notice of these items.

### WARRANTY:

All S&S parts are guaranteed to the original purchaser to be free of manufacturing defects in materials and workmanship for a period of twelve (12) months from the date of purchase. Merchandise that fails to conform to these conditions will be repaired or replaced at S&S's option if the parts are returned to us by the purchaser within the 12 month warranty period or within 10 days thereafter.

In the event warranty service is required, the original purchaser must call or write S&S immediately with the problem. Some problems can be rectified by a telephone call and need no further course of action.

A part that is suspect of being defective must not be replaced by a Dealer without prior authorization from S&S. If it is deemed necessary for S&S to make an evaluation to determine whether the part was defective, a return authorization number must be obtained from S&S. The parts must be packaged properly so as to not cause further damage and be returned prepaid to S&S with a copy of the original invoice of purchase and a detailed letter outlining the nature of the problem, how the part was used and the circumstances at the time of failure. If after an evaluation has been made by S&S and the part was found to be defective, repair, replacement or refund will be granted.

### ADDITIONAL WARRANTY PROVISIONS:

- (1) S&S shall have no obligation in the event an S&S part is modified by any other person or organization.
- (2) S&S shall have no obligation if an S&S part becomes defective in whole or in part as a result of improper installation, improper maintenance, improper use, abnormal operation, or any other misuse or mistreatment of the S&S part.
- (3) S&S shall not be liable for any consequential or incidental damages resulting from the failure of an S&S part, the breach of any warranties, the failure to deliver, delay in delivery, delivery in non-conforming condition, or for any other breach of contract or duty between S&S and a customer.
- (4) These S&S parts are designed exclusively for use in Victory motorcycles. S&S shall have no warranty or liability obligation if an S&S part is used in any other application.

S&S® Freedom® Performance Tuner is designed for downloading S&S calibrations into Victory® motorcycles when S&S performance parts are installed. Before installing S&S Freedom Performance Tuner, please ensure that your PC meets the following minimum requirements.

### General PC Requirements

- Windows® NT 4.0, 2000, XP, or Vista® operating systems
- Pentium 233 MHz, or equivalent processor
- Standard serial port (RS-232). If your PC is not equipped with a RS-232 port a USB to Serial Port adapter will be needed. If you're using a USB to serial port adapter with Digital Wrench™ you should use the same adapter. If you need a USB to serial adapter it is recommended to purchase the adapter that is available through Diagnostic System Associates (DSA) PT # 06-10001. To order a USB to serial port adapter go to [www.diagsys.com/catalog](http://www.diagsys.com/catalog)
- SVGA monitor and video card capable of 800x600 pixel resolution.
- 200 Megabytes of hard disk space required.
- Internet Explorer 6.0 or newer.

### Special Tool Requirements for Calibration Re-flash on 2003-2007 Victory Motorcycles

**NOTE:** The hardware listed below is the same that is used with Digital Wrench. If you do not have the hardware listed below it can be purchased through SPX Corporation. Phone 800-328-6657.

- PU-47151 – Interface Cable. **Picture 1.**
- PV-46085-2 – Victory Interface Cable Adapter. **Picture 2.**



Picture 1



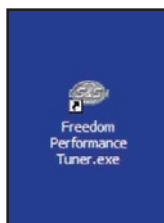
Picture 2

### Before you start:

- You will need to connect to the internet to perform calibration downloads using S&S Freedom Performance Tuner. Make sure you have internet connection at this time.
- Make sure the battery on the motorcycle is fully charged. Measure battery voltage and verify that it has a minimum of 12.5 volts with the key on. Connect a battery charger if necessary to bring battery voltage level above the minimum.

### Downloading S&S Calibrations using S&S Freedom Performance Tuner Software

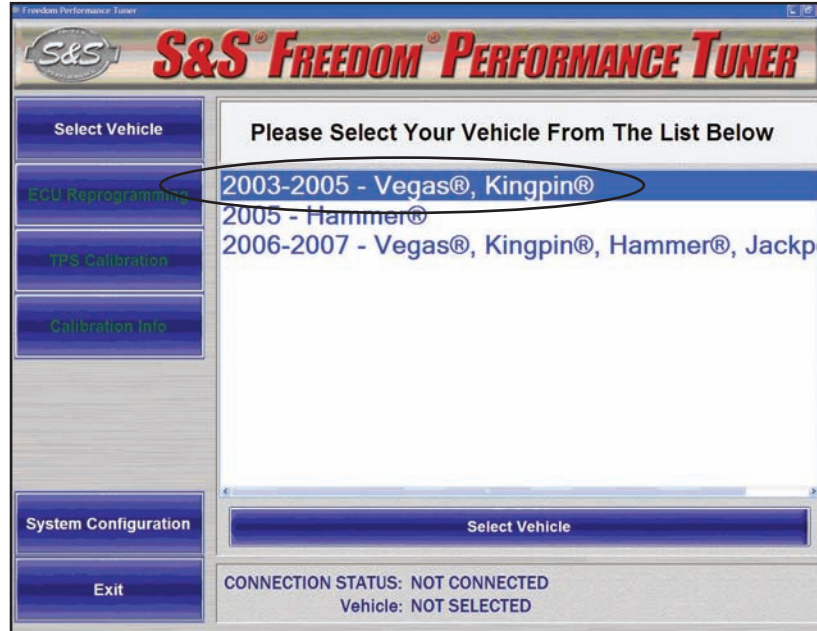
- 1- Once the download of S&S Freedom Performance Tuner has been installed on your PC, double click the icon on your desk top. **Picture 3** illustrates the S&S Freedom Performance Tuner icon.



Picture 3

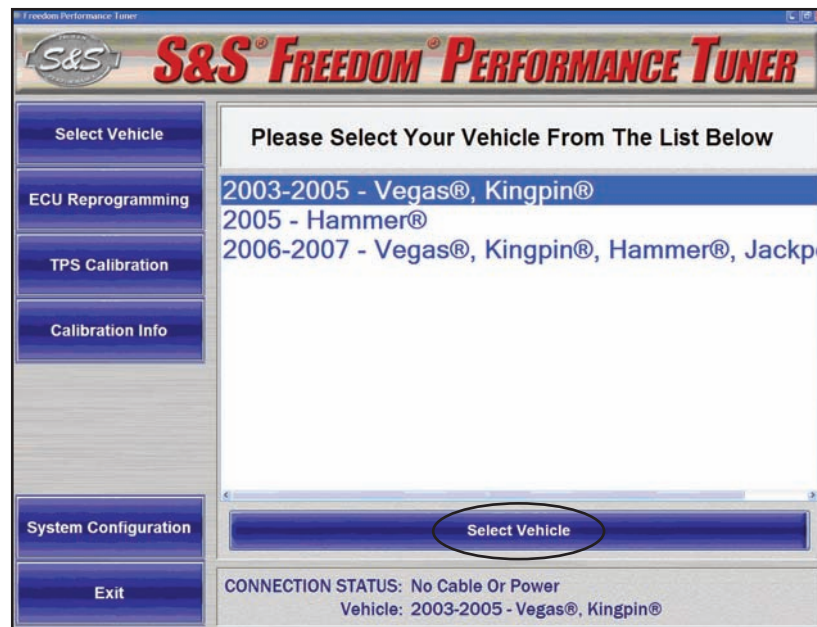
- 2- Enter in your Username and Password and click the login button. Your Username and Password for logging in will be the same as your login for [www.ssdealer.com/victory/](http://www.ssdealer.com/victory/)

3 – Once you're logged onto S&S® Freedom® Performance Tuner, click on the **Year and Model** of the bike you're performing the work on in the middle of the page as illustrated in **Picture 4**.



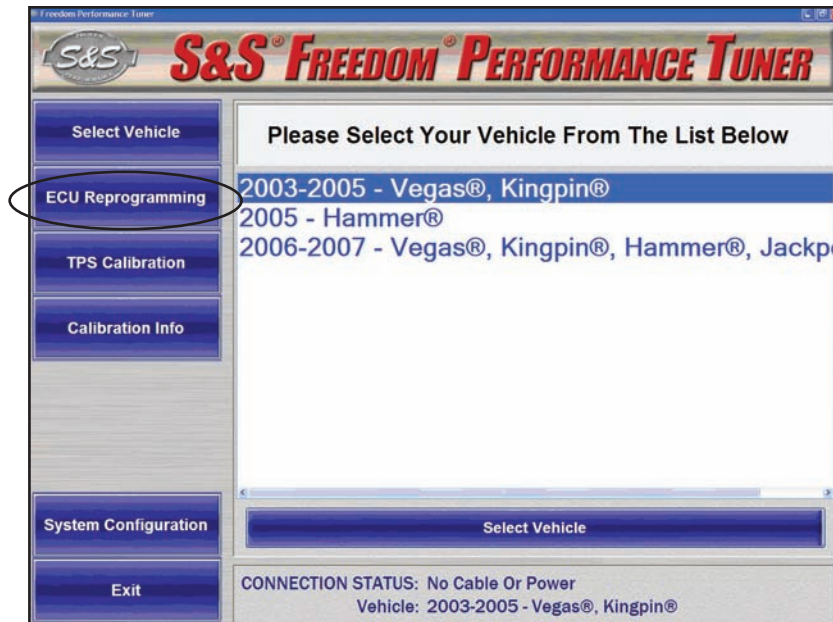
Picture 4

4 – Click on the **Select Vehicle** tab at the bottom of the page as illustrated in **Picture 5**. The tabs on the left side of the page will now be illuminated.



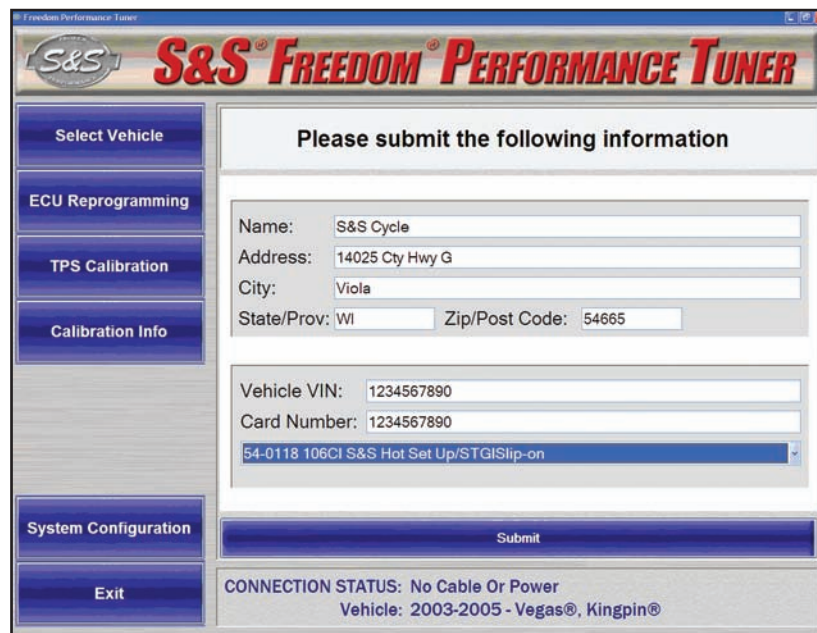
Picture 5

5- Click on the **ECU Reprogramming** tab on the left side of the screen as illustrated in **Picture 6**.



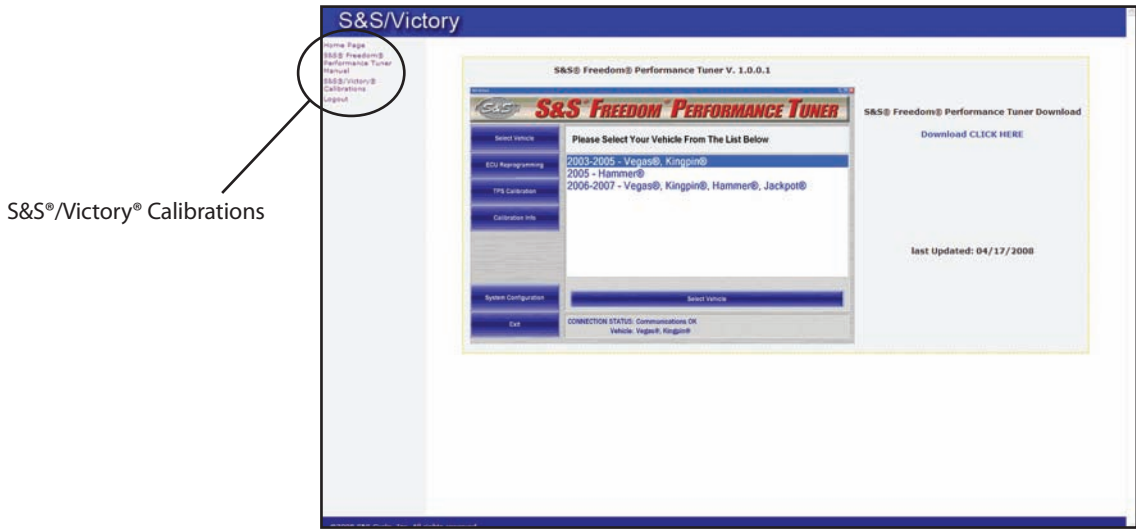
**Picture 6**

6- In the center of the screen you will now be prompted to enter in customer information, VIN number of the motorcycle you are performing calibration download on, and calibration card number. Select a re-flash file from the drop down list that you want to download into the motorcycle. All the fields must be filled out for you to continue with the download. **Picture 7** illustrates the information screen with required fields filled out.

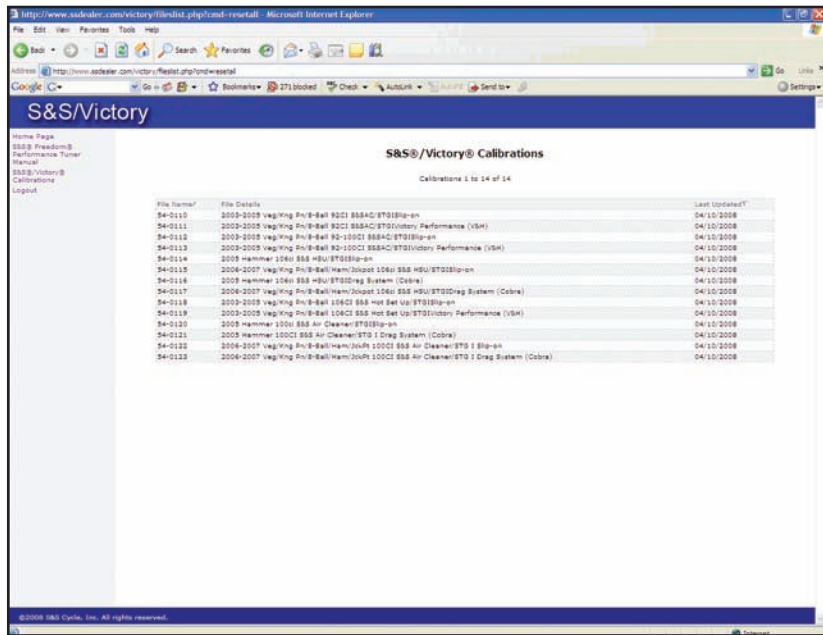


**Picture 7**

**NOTE:** Due to the limited description space available in the drop down list in S&S® Freedom® Performance Tuner, a detailed list of available calibrations and part numbers can be viewed on the S&S dealer web. Go to [www.ssdealer.com/victory/](http://www.ssdealer.com/victory/) and click on **S&S®/Victory® Calibrations** on the left side of the home page. Here you will find a detailed list of calibrations and part numbers for reference only. **Picture 8** illustrates the home page and location for the S&S/Victory Calibrations. **Picture 9** illustrates the calibrations for reference.



Picture 8



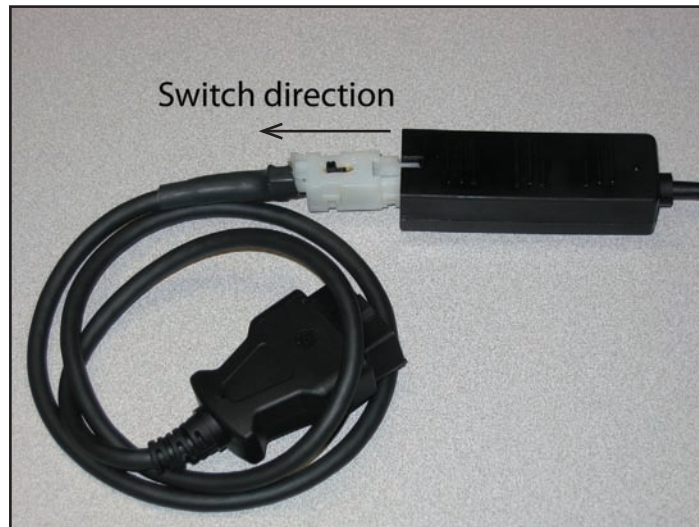
Picture 9

7- Once all the fields have been filled out click on the **Submit** tab in S&S® Freedom® Performance Tuner. **Picture 10** illustrates the **Submit** tab.



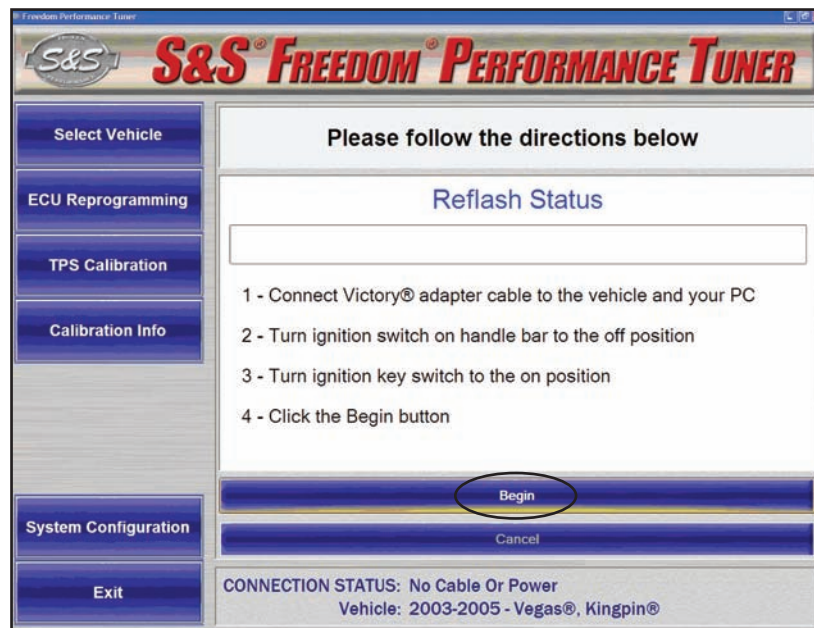
**Picture 10**

8- Connect your interface cable and interface cable adapter to your PC and to the motorcycle you are performing the calibration download on. The switch on the interface cable adapter needs to be positioned toward the vehicle plug as illustrated in **Picture 11**.



**Picture 11**

- 9- Turn the on/off switch on the handlebar to the **Off** position.
- 10- Turn the key ignition switch to the **On** position.
- 11- Click the **Begin** button in S&S® Freedom® Performance Tuner illustrated in **Picture 12**.



**Picture 12**

- 12- Turn the on/off switch on the handlebar to the **On** position.
- 13- Calibration downloading will begin and takes approximately one minute. Once transfer of data is complete the tabs on the left side of the screen will illuminate and you will be prompted that the download has completed successfully.
- 14- Turn the on/off switch on the handlebar to the **Off** position and wait ten seconds.
- 15- Click on the **Calibration Info** tab on the left side of the screen and turn the on/off switch on the handlebar to the **On** position. Calibration information will appear on the screen with the calibration that was downloaded into the ECU as illustrated in **Picture 13**.



**Picture 13**

- 16- Turn the on/off switch on the handlebar to the **Off** position and click on the **Exit** tab on the left side of the screen to exit out of S&S Freedom Performance Tuner.
- 17- Disconnect the interface cable and interface cable adapter from the motorcycle and your PC. Start the motorcycle and test drive.

### Throttle Position Sensor Adjustment

- S&S® Freedom® Performance Tuner has a Throttle Position Sensor (TPS) adjustment feature for 2003-2007 model year motorcycles. If the motorcycle you have performed a calibration download on has a lean or rich condition the TPS can be adjusted to target a desired air fuel ratio. Most motorcycles will not require a TPS adjustment unless the idle screw on the throttle body has been moved or the throttle body has been cleaned.

### Throttle Position Sensor Calibration

- Special Tool Requirements for Throttle Position Sensor Adjustments on 2003-2007 Victory® Motorcycles
    - a- PV-45410 – Victory Exhaust Gas Analyzer Kit. **Picture 14.**
    - b- Volt meter (Fluke 73 or higher recommended)
- 1- Install the Victory exhaust gas analyzer kit to the exhaust system of the motorcycle you are performing TPS calibration on. **Picture 14** illustrates the Victory exhaust gas analyzer kit.



Picture 14

**NOTE:** Some exhaust systems have a removable lambda sensor plug in the exhaust system that the lambda sensor can be threaded into; others will require removing one muffler and installing the exhaust gas analyzer tool between the header pipe and the muffler.

- 2- Connect the lambda sensor cable to the lambda sensor and volt meter.

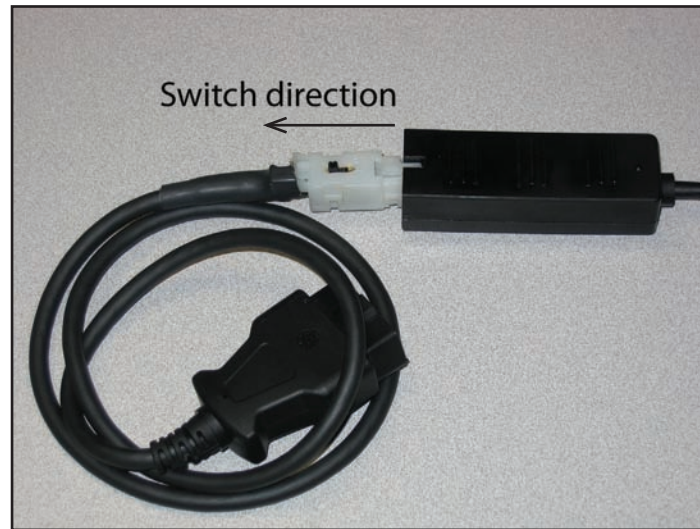
**NOTE:** Do not connect the lambda sensor power leads to the battery at this time, the sensor may heat unevenly and reduce the service life.

- 3- Secure an exhaust extraction system on the exhaust pipes or take the motorcycle outside before starting.

### WARNING

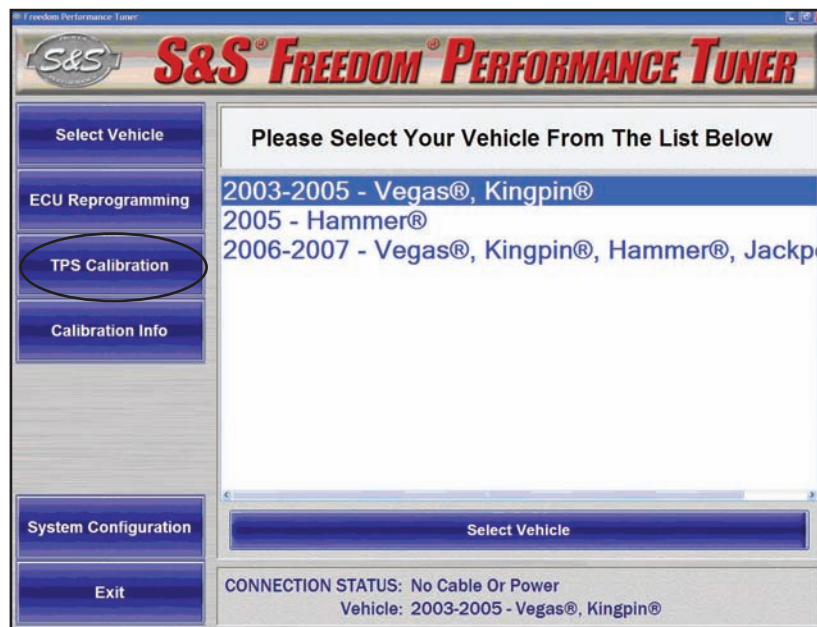
- **Never run the motorcycle in an enclosed area without a properly functioning exhaust gas evacuation system connected to the exhaust outlet.**
- **Engine and exhaust components get hot and remain hot after the engine has been shut off. Wear protective clothing to avoid injury and make sure no cables or wires are touching engine or exhaust components.**

- 4- Open up S&S® Freedom® Performance Tuner and click on the **Select Vehicle** tab on the bottom of the page. The tabs on the left side of the screen will now be illuminated.
- 5- Connect your interface cable and interface cable adapter to your PC and to the motorcycle you are performing the TPS calibration on. The switch on the interface cable adapter needs to be positioned toward the vehicle plug as illustrated in **Picture 15**.



Picture 15

- 6- Turn the on/off switch on the handlebar to the **Off** position and the key ignition switch to the **On** position.
- 7- Click on the **TPS Calibration** tab on the left side of the screen as illustrated in **Picture 16**.

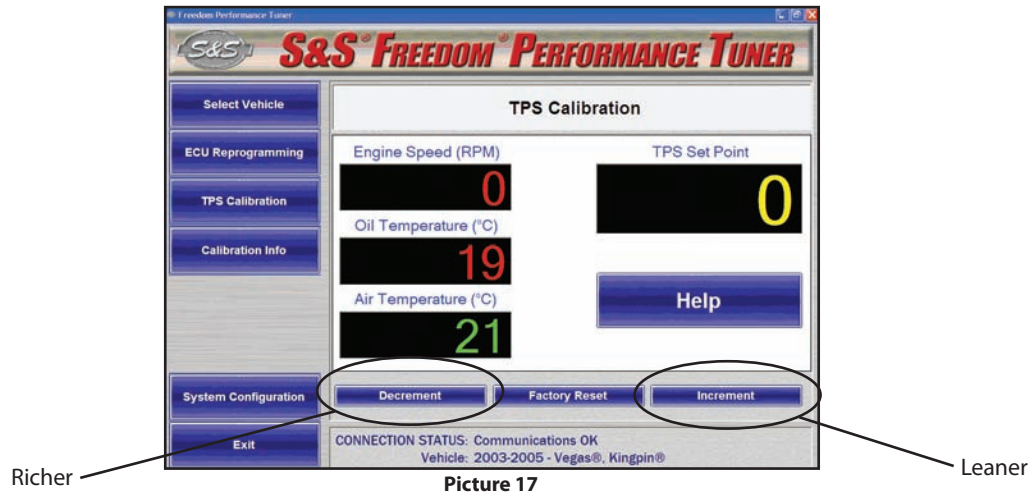


Picture 16

- 8- Turn the on/off switch on the handlebar to the **On** position. You will hear the fuel pump cycle on the motorcycle. The TPS calibration page in S&S Freedom Performance Tuner will display the actual oil temperature and air temperature of the motorcycle.
- 9- Start the motorcycle that you are performing the TPS calibration on. After 30 seconds of engine idle time, connect the lambda sensor red lead to the battery positive(+) terminal and black lead to the negative(-) terminal. Connect the lambda sensor cable to your volt meter and turn switch to **DC voltage**.
- 10- With the motorcycle idling and the fast idle lever on the handle bar in the off or closed throttle position, watch your S&S Freedom Performance Tuner screen and warm the motorcycle engine until oil temperature reaches 90 degrees Celsius.

**NOTE:** Before making any TPS adjustments the motorcycle must be at an operating oil temperature of 90-100 degrees Celsius. A cooling fan can be placed next to the motorcycle and air blown on the engine to keep engine temperature stable.

- 11- TPS adjustment must be made between 950-1050 RPM. If motorcycle is idling above or below the target RPM, adjust the throttle stop screw on the throttle body until desired RPM is achieved.
- 12- With your volt meter turned on and switched to DC voltage, check voltage that is displayed on the volt meter. The voltage should read between 0.01 and 1.2 volts. If the voltage reading reads below 0.5 volts the motorcycle is running in a lean condition. Click the **Decrement** tab, illustrated in **Picture 17**, on the lower left side of the TPS calibration screen until the voltage remains above 0.5 volts.
- 13- If the volt meter reads above 0.5 volts click the **Increment** tab on the lower right side of the TPS calibration screen. **Picture 17** illustrates the **Increment** tab.



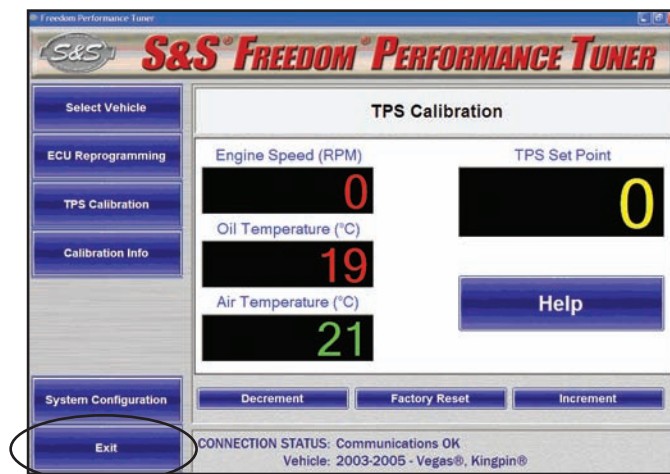
**Picture 17**

**NOTE:** "Increment" will lean air fuel ratio and "Decrement" will richen the air fuel ratio.

- 14- Use the **Increment** and **Decrement** tabs to adjust the sensor voltage until the volt meter display jumps back and forth evenly across 0.5 volts.

**Example:** Volt meter display will "swing" or jump back and forth between 0.3 and 0.7 volts.

- 15- Once the voltage swing has been achieved click on the **Exit** tab on the left side of the screen as illustrated in **Picture 18**. Your TPS has now been calibrated.



**Picture 18**

- 16- Turn off the motorcycle and disconnect the interface cable and interface cable adapter from the motorcycle and your PC.
- 17- Disconnect the volt meter and the positive and negative leads on the exhaust gas analyzer cables that lead to the battery and route away from any hot parts on the motorcycle. Let the engine and exhaust cool down and then remove the exhaust gas analyzer kit from the motorcycle.
- 18- Start the motorcycle and test drive.