POWER VISION 3

Installation Guide for: PV3-15-02

Model Coverage:

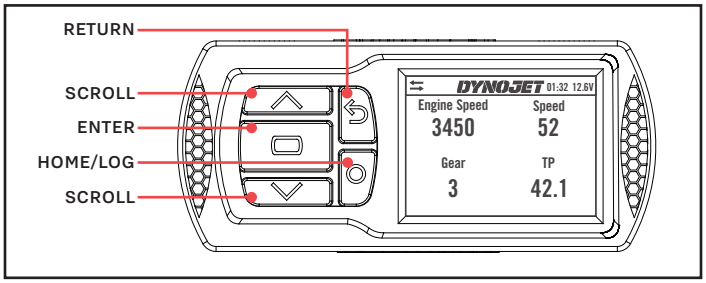
2011-2017 Harley Davidson Softail Models
96” Twin Cam / 103” Twin Cam
2012-2017 Harley Davidson Dyna Models
96” Twin Cam / 103” Twin Cam
2014-2016 Harley Davidson Touring Models
96” Twin Cam / 103” Twin Cam / 110” Twin Cam
2018-2020 Harley Davidson Softail Models
107” Milwaukee M8 / 114” Milwaukee M8
2017-2020 Harley Davidson Touring Models
107” M8 / 114” M8 / 117” M8
2014-2022 Harley Davidson Sportster 883 Models
2014-2022 Harley Davidson Sportster 1200 Models
2015-2019 Harley Davidson Street 500
2015-2021 Harley Davidson Street 750

PARTS LIST

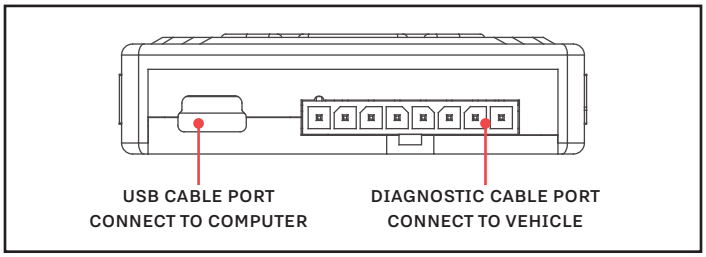
1	POWER VISION	2	VELCRO
1	REFLASH HARNESS	2	DYNOJET DECAL
1	USB CABLE		

PLEASE READ ALL DIRECTIONS BEFORE STARTING INSTALLATION

INTRODUCTION



POWER VISION OVERVIEW—FRONT VIEW



POWER VISION OVERVIEW—SIDE VIEW

Thank you for purchasing the Power Vision from Dynojet Research. At Dynojet, our mission is to make every ride the ultimate ride. The Power Vision allows you to tune your stock ECU to achieve optimal performance from your vehicle.

The Power Vision is the device to interface between your computer and the vehicle ECU. Use the buttons to navigate the device menus, make selections, cycle through the four full-color available gauge screens, and log data. Connect to the diagnostic port to flash a tune; use the USB connection to interface between the Power Vision and your computer.

Make your Power Vision device yours; display the channels you want to see with four user-customizable full-color gauge screens. Make the Power Vision your window into your vehicle; secure the Power Vision to your dashboard or handlebars to monitor any desired set of gauges such as Throttle Position, Engine Speed, and more. Wideband Air:Fuel Ratio can be added as a channel to the Power Vision's monitors by adding the accessoriy available at www.dynojet.com.

For state of the art technical support, please visit www.dynojet.zendesk.com.

INSTALLING THE POWER VISION

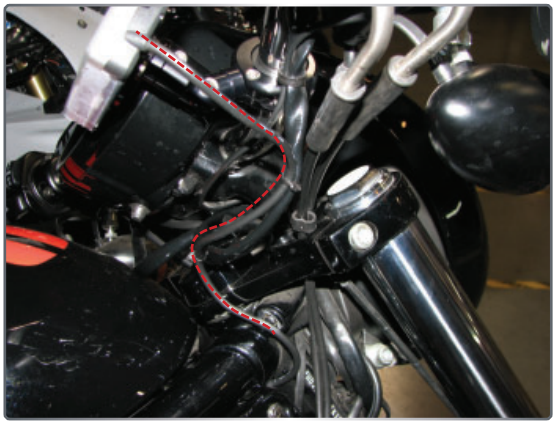
DIAGNOSTIC PORT

This installation was done on a Harley-Davidson Night Rod. Your bike and set-up may vary.

1 Attach the diagnostic cable to the diagnostic port on the Power Vision and to the diagnostic port on the vehicle. Refer to the Diagnostic Port Location on page 3.

Note: The Power Vision may be damaged if installed improperly. The location of the diagnostic port varies depending on the model, please refer to a service manual or contact Dynojet for the exact location. Use caution as many models use the same style connector for accessories; your Power Vision MUST be connected to the diagnostic port.

INSTALLING THE POWER VISION CONTINUED



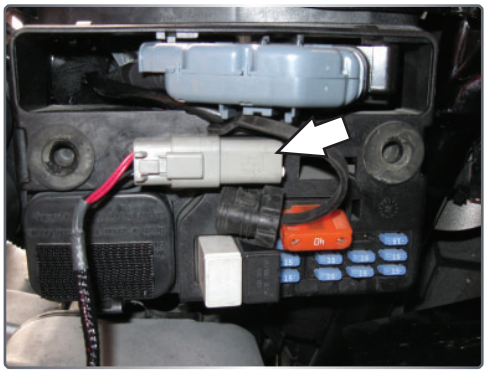
ROUTING THE CABLE

2 Route the Power Vision cable away from any moving or hot parts. Dynojet recommends using zip ties to secure the cable to existing non-moving components.

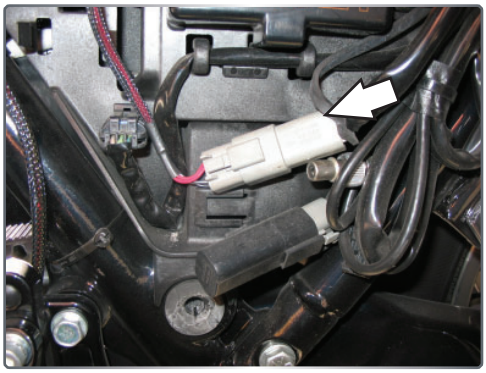
3 Secure the Power Vision to the vehicle using the supplied Velcro or mounting hardware. Make sure the Power Vision will not interfere with the operation of the vehicle. Visit www.dynojet.com for an array of mounting solutions for your Power Vision.

Note: The Power Vision does not need to be mounted to the vehicle, however, the Power Vision provides a window into your vehicle. Mount the Power Vision to your handlebars and gain access to customizable full-color gauge screens, along with data logging and troubleshooting screens.

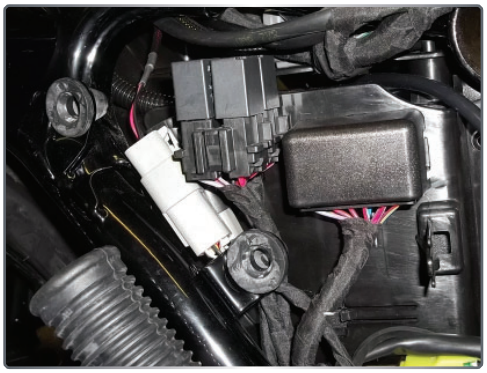
DIAGNOSTIC PORT LOCATION



2012-2017 Dyna Models
Diagnostic connector is located behind the Left hand side cover. Connector is Light Grey in color with black rubber plug installed.

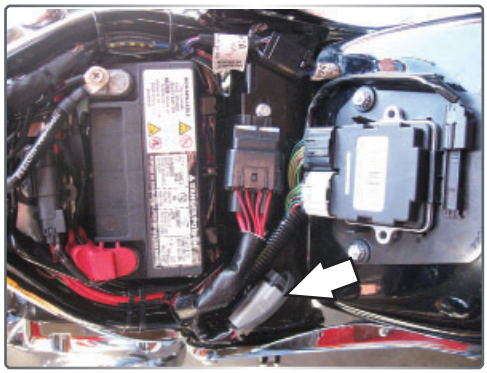


2014-2020 Touring Models
Diagnostic connector is located behind the left hand side cover. Connector is Light Grey in color with a black rubber plug installed.



2015-2021 Street Models
Diagnostic connector is located behind right hand side cover. Connector is Light Grey in color with black rubber plug installed.

2014-2021 Sportster Models
(including XR Models)
Diagnostic connector is located behind the Left hand side cover. Connector is Light Grey in color with black rubber plug installed.



2011-2017 Softail Models
Diagnostic connector is located under the seat, attached to the frame by the rear fender. Connector is Light Grey in color, with black rubber plug installed.

GETTING STARTED

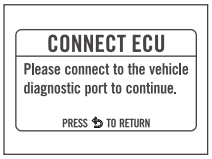
Use the Tune File Wizard to prepare your Power Vision device with the stock (stk) and tune (djt) files needed to flash your vehicle.

1 Connect the Power Vision to the vehicle.

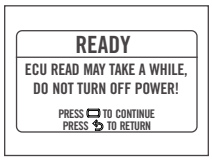
2 Turn the key on. The Power Vision will scan for files.
There are three possible file states:
File State 1: No compatible tune or stock files.
File State 2: No compatible tune files.
File State 3: All required files found.

3 Gauges are displayed.

Connect the Power Vision to the vehicle diagnostic port to collect ECU information. Turn the key on.



File State 1:
Press the **Enter** button for ECU read to begin the tuning process. This process takes about fifteen minutes.



File State 2:
Go to tunes.dynojet.com/ to download tune files.

File State 3:
All required files found. The Power Vision is ready to flash a tune to the connected vehicle.

FLASHING YOUR VEHICLE

The Power Vision must be paired to the connected vehicle ECU to function properly.

Note: Once paired to the vehicle ECU, the Power Vision will not work on another vehicle without purchasing a tune license.

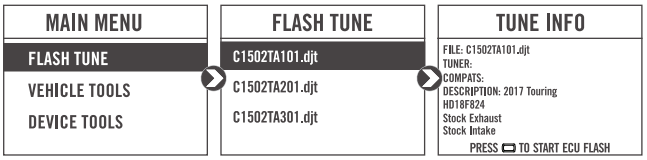
1 From the Main Menu, select **Flash Tune**.

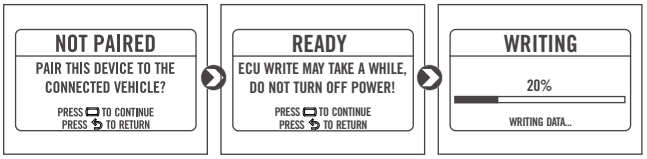
2 Select the tune file (.djt) and press **Enter** to view the Tune Info.
Note: The Dynojet tune file (.djt) is a tune file which is different (better than stock performance or the necessary file when bolting on an exhaust, for example); the stock file (.stk) is the direct duplicate of what the OEM shipped.

3 Press **Enter** to accept the tune and pair the Power Vision to the vehicle.
Note: Pair to vehicle will only happen on the first flash.

4 Press **Enter** to pair and lock the Power Vision to the ECU and to begin the flash. Do not turn off the key switch or disconnect the Power Vision during the flash.

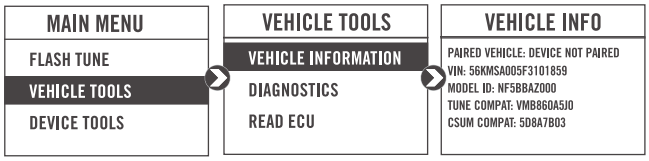
5 After the flash is complete, turn the key off and wait 45 seconds before turning the key back on to start.





VIEWING THE VEHICLE INFORMATION

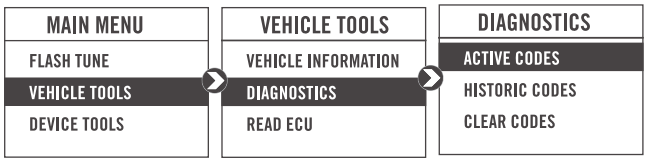
This menu allows you to view the device status (paired/not paired), VIN #, Model ID, ECU serial number, tune compat, and checksum compat.
Select **Vehicle Tools**>**Vehicle Information**.



VIEWING THE DIAGNOSTIC CODES

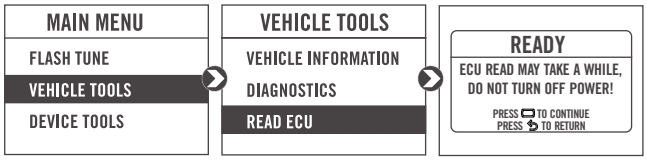
This menu allows you to read and clear diagnostic trouble codes.

1 To read codes, select **Vehicle Tools**>**Diagnostics**>**Active Codes**.
2 To clear codes, select **Vehicle Tools**>**Diagnostics**>**Clear Codes**.



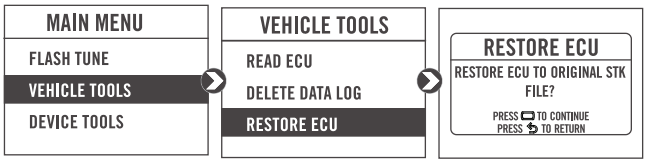
READING THE ECU

This menu allows you to read the ECU. This process takes about fifteen minutes.
Select **Vehicle Tools**>**Read ECU**.



RESTORING THE ECU

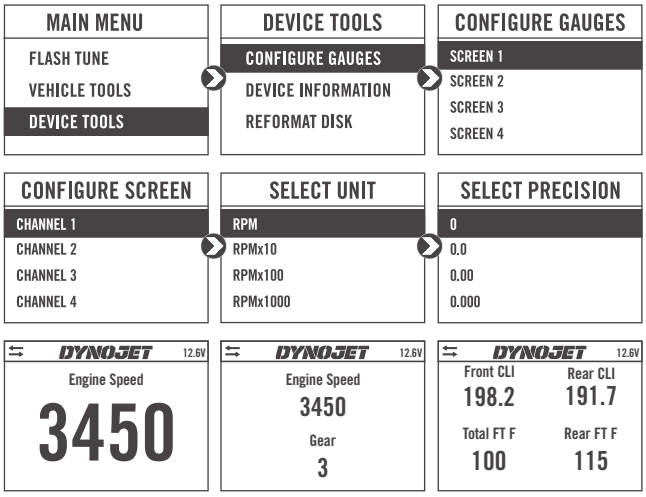
This menu allows you to restore the ECU. Use Restore ECU if the device does not complete the flash or if your vehicle will not start.
Select **Vehicle Tools**>**Restore ECU**.



CONFIGURING GAUGES

Make your Power Vision device yours; display the channels you want to see with four user-customizable full-color gauge screens. Each gauge screen has one, two, or four configurable channels. Monitor channels such as Wideband, AFR, Boost, and integrated belt temperature sensor. Sample gauges shown here; for a complete list of monitors available, open the tune file in Power Core or scroll through the gauges on the device when configuring or selecting channels for the list of options.

1 From the Main Menu, select **Device Tools**>**Configure Gauges**.
2 Select a gauge screen and press **Enter**.
3 Select a channel and press **Enter**.
4 Select a channel from the list and press **Enter**.
5 Select the precision or units for that channel and press **Enter**.
6 Continue setting up the remaining channels as desired.
7 Continue configuring the remaining gauge screens as desired.

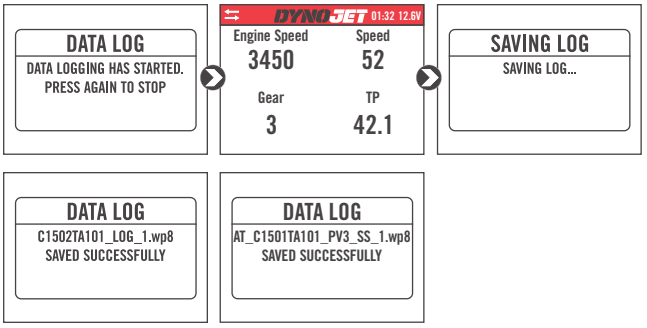


LOGGING DATA

The Power Vision is a powerful logging tool to diagnose running issues. Use the Power Vision to log all vehicle operating data and review the data in the Power Core software. Troubleshoot an issue such as knock, speed/RPM limitation, throttle blade closure and more by keeping the Power Vision mounted to view and record channels.

1 Press the **Log** ◎ button to begin logging. The Power Vision screen will illuminate a bright red banner across the top when logging.
2 Press the **Log** ◎ button again to stop logging.
3 Use the Power Core software to view log files.

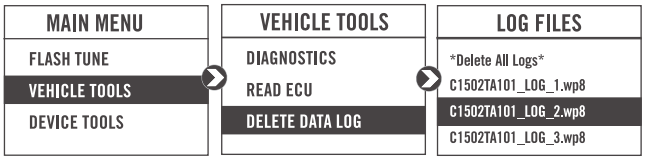
Snapshot Log: Press and hold the **Log** ◎ button for two seconds to record the previous two minutes of operating time.



DELETING DATA LOGS

This menu allows you to delete data logs.

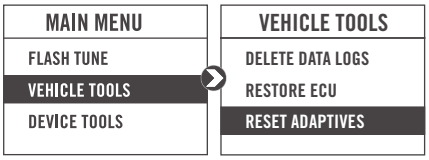
1 Select **Vehicle Tools**>**Delete Data Log**.
2 Select a specific log to delete or select ***Delete All Logs***.



RESET ADAPTIVES

This menu allows you to reset the learned long term narrowband fuel trims.

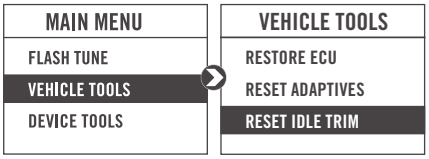
Select **Vehicle Tools**>**Reset Adaptives**.



RESET IDLE TRIM

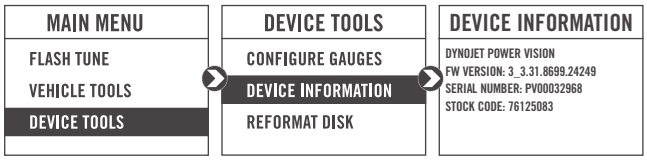
This menu allows you to reset the idle trim.

Select **Vehicle Tools**>**Reset Idle Trim**.



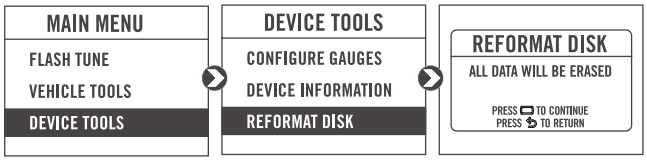
VIEWING THE DEVICE INFORMATION

This menu allows you to view the device firmware version, serial number, and stock code.
Select **Device Tools**>**Device Information**.



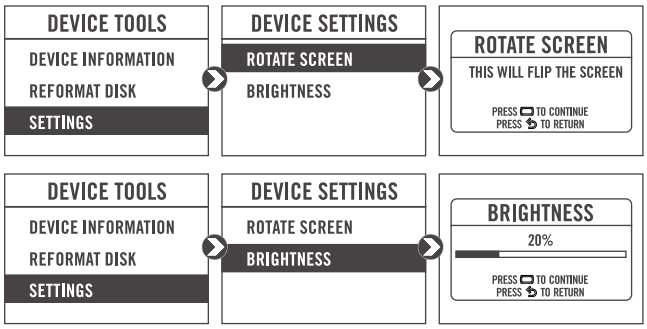
REFORMATTING THE DISK

This menu allows you to reformat the disk and erase all data.
Select **Device Tools**>**Reformat Disk**.



CHANGING THE SETTINGS

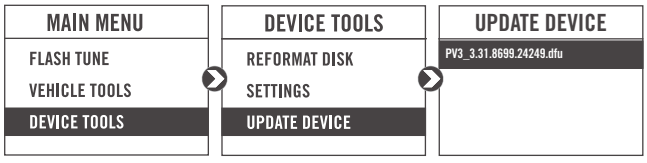
This menu allows you to rotate the screen allowing you to change the orientation of the Power Vision device along with adjusting the screen brightness. Turn the brightness up and make your screen pop!
Select **Device Tools**>**Settings**>**Rotate Screen** to flip the screen.
Select **Device Tools**>**Settings**>**Brightness** to change the screen brightness.



UPDATING THE DEVICE

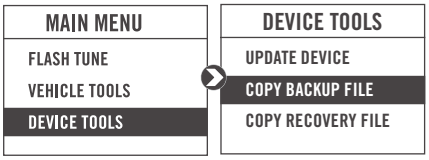
This menu allows you to update the device with the latest firmware.

1 Go to www.dynojet.com.
2 From the top navigation menu, select **Support**>**Downloads**.
3 Click **Power Vision 3**.
4 Click the **Firmware** drop-down and download the Power Vision 3 Firmware for Harley-Davidson.
5 Save the file to your device.
6 Select **Device Tools**>**Update Device**.



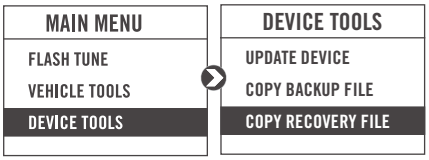
COPY BACKUP FILE

This menu allows you to drop the paired vehicle stock file (.stk) to the device file system to open in Power Core.
Select **Device Tools**>**Copy Backup File**.



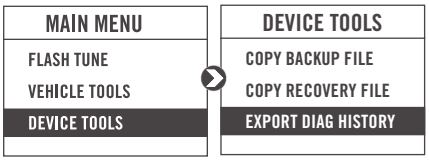
COPY RECOVERY FILE

This menu allows you to drop the most recently flashed vehicle stock file (.stk) to the device file system to open in Power Core.
Select **Device Tools**>**Copy Recovery File**.



EXPORT DIAG HISTORY

This menu allows you to export the diagnostic history log (a record of the most recent operations) to the file system for viewing or to send to technical support.
Select **Device Tools**>**Export Diag History**.

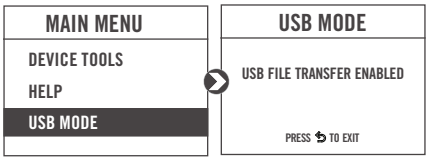


USB MODE

This menu allows you to connect your Power Vision to your computer and enables sending and receiving files.

1 Connect the Power Vision to your computer using the included USB cable. The Power Vision will automatically enter USB Mode.
OR
From the Main Menu, select **USB Mode**.

2 Transfer the desired files to your computer or to the Power Vision.



USING AUTOTUNE

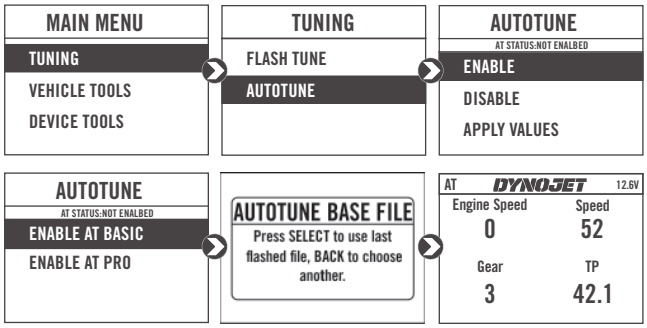
Autotune is a process that tunes the VE Tables in an ECU using AFR (air/fuel ratio) readings from O2 sensors. The VE Tables control how much fuel is injected into the engine. The more accurate the VE Tables in the ECU are, the better the engine will run. Autotune uses a process that compares the known target AFR values in the Target AFR Tables of the ECU to the actual AFR values read from the O2 sensors in the exhaust pipe and tunes the VE Tables in the ECU to more accurately reflect the real VE of the engine.

Autotune Basic utilizes the stock narrowband O2 sensors to read the AFR data from the engine's exhaust. Additionally, because Autotune Basic uses narrowband O2 sensors to read AFR data, the Target AFR Tables of the ECU are set to a single constant value very close to stoich AFR (14.7) when Autotune is enabled so that the narrowband O2 sensors are able to read AFR across the whole range of the VE Tables. The Target AFR Tables are then restored to the original values when Autotune Basic is disabled. It is especially important to remember to disable Autotune when finished using Autotune Basic for this reason.

Autotune Basic can be used on most bikes that have factory narrowband O2 sensors installed.

Autotune Pro uses accessory wideband O2 sensors to read the AFR data from the engine's exhaust. Autotune Pro however requires the installation of an appropriate Dynojet wideband O2 kit (P/N AT-130, AT-131, or AT-132).

Enabling Autotune



1 Connect the Power Vision to the vehicle. Verify the vehicle is on and the engine is off.

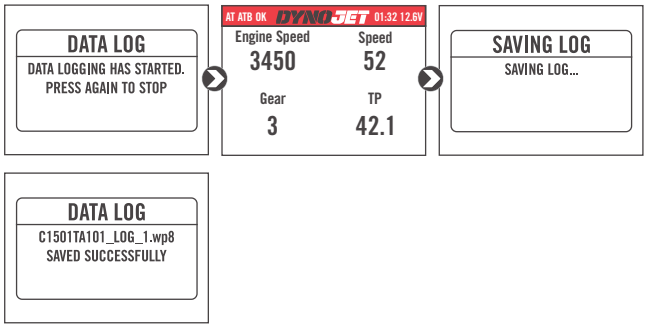
2 From the Main Menu, select **Tuning**>**Autotune**>**Enable**>**Enable AT Basic** or **Enable AT Pro**.

3 Autotune will prompt you to select a base file. Press **Select** to use the last flash file as the base file, or **Back** to choose a different file. All Autotune corrections will be built on top of this base file. You may select the original stock file read from the ECU or another tune file.

- Autotune will turn on the special Autotune enable settings inside the tune file and save it as an Autotune Enable file to the PV3 file system. Autotune will automatically flash the Autotune Enable file to the ECU. For more information, refer to Understanding Autotune Files on page 11.

4 Once the flash is complete, cycle the vehicle power. "AT" will appear in the upper left corner of the gauge screen indicating Autotune is enabled. Autotune will remain enabled on the ECU until disabled.

Logging Sample Data



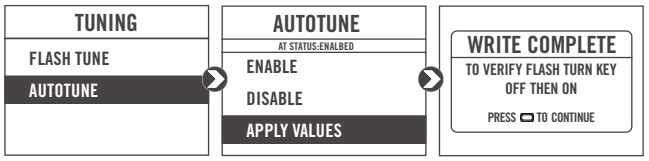
1 Start the vehicle. Autotune will automatically log sample data when the engine is running. An Autotune logging status code will appear in the top left corner of the gauge screen.
For example, the Autotune ready code (ATB OK or ATP OK) will appear in the top left once all conditions are met and Autotune can use the current sample data to calculate and apply corrections later. For more information, refer to the Autotune Logging Status Codes on page 12.

2 Spend time driving under all conditions that you would like Autotune to correct. Spend time in as many combinations of RPM and throttle position as possible. The more varied the driving conditions, the more areas of the map Autotune will be able to correct.

3 When finished with the Autotune logging session, press the **Circle**◎button to stop logging and to save the log before turning the vehicle off.
Autotune saves the log files during logging sessions to an internal location not accessible with a computer. For more information, refer to Exporting Autotune Log Files on page 10.

USING AUTOTUNE CONTINUED

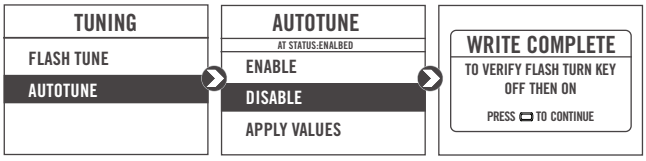
Applying Values



1 Verify the vehicle is on and the engine is off. From the Main Menu, select **Tuning>Autotune>Apply Values**.
- Autotune will process the internal log files recorded during the logging session(s) and determine the corrections needed to tune the VE Tables.
- Autotune will only use sample data when the status code was ATB OK or ATP OK.
- Autotune will apply the corrections and save a new correction file to the PV3 file system. For more information, refer to Understanding Autotune Files on page 11.
- Autotune will turn on the Autotune enable settings inside the correction file (this allows the ECU to remain in an Autotune state) and automatically flash this tune file to the ECU. This tune file, the correction file with enable settings turned on, is not saved to the PV3 file system.

2 For best results, Dynojet recommends repeating the Logging Sample Data and Applying Values sections two to three times.

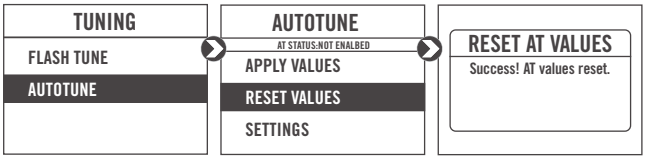
Disabling Autotune



1 Verify you are finished logging and applying values and the desired results have been achieved.

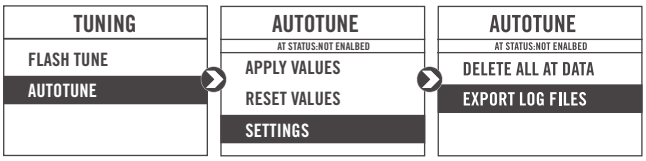
2 Verify the vehicle is on and the engine is off. From the Main Menu, select **Tuning>Autotune>Disable** to disable Autotune.
- Autotune will automatically flash the last saved correction file to the ECU. This correction file contains the latest Autotune corrections but without the Autotune enable settings turned on, therefore disabling Autotune.
- "AT" in the upper left corner of the gauge screen will be replaced with the double arrow icon to confirm Autotune is disabled.

Resetting Values



Reset Values can only be used during the Autotune logging session. From the Main Menu, select **Tuning>Autotune>Reset Values** to reset the Autotune values. This will delete all existing Autotune log files allowing you to start over fresh.

Exporting Autotune Log Files



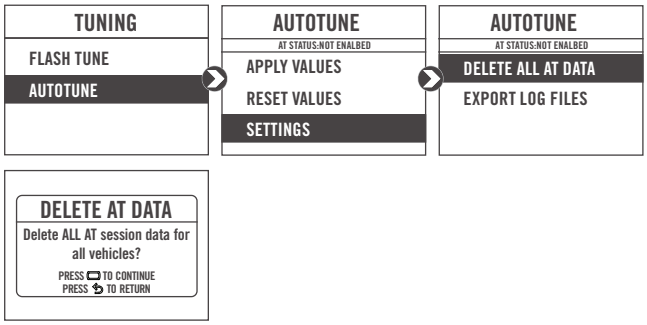
From the Main Menu, select **Tuning>Autotune>Settings>Export Log Files**. This will copy all existing internal Autotune log files to a folder named AUTOTUNE_LOGFILES located on the main POWERVISION drive accessible by computer.

Note: You must export internal Autotune log files before applying values because the log files are automatically deleted once the values are applied.

USING AUTOTUNE CONTINUED

Erasing All Autotune Data

From the Main Menu, select **Tuning>Autotune> Settings>Delete All AT Data**. This erases all stored internal Autotune information and data for all vehicles. Use this feature to reset Autotune to a known good starting point if you ever experience any errors and other remedies do not work.
Note: The PV3 will forget all vehicles it remembers as being Autotune Enabled. Dynojet recommends you disable Autotune for all Autotune enabled vehicles before deleting all Autotune data.



UNDERSTANDING AUTOTUNE FILES

Autotune Enable File

The Autotune Enable file is a copy of the selected base file with the necessary Autotune Enable settings turned on and is generated when Autotune is enabled. The autotune enable settings are special settings applied to the ECU tune allowing the PV3 to gather proper sample data needed to calculate the corrections for the VE tables.
For example, if the settings for disabling acceleration enrichment and deceleration enleanment were left on, the AFR readings under acceleration or deceleration would not be reliable to use for calculating Autotune corrections and the corrections in this area would be incorrect.
The Autotune Enable File is saved for diagnostic purposes only. Never flash the Autotune Enable File manually.
The Autotune Enable file format is:

AT_EN-<ECU-SERIAL-NUMBER>.djt.

- <ECU-SERIAL-NUMBER> is the serial number of the ECU that was Autotune enabled.
- The Autotune Enable file name will be the same for a particular ECU regardless of what base file is chosen.

Note: The stock (.stk) file format is similar and it may appear the Autotune Enable file was built using the stock (.stk) file; however, the Autotune Enable file is always created using the tune file selected as the base file, whether it was a stock file or another tune file (.djt).

Autotune Correction File

An Autotune correction file is a copy of either the original selected base file (in the case of the first correction file being generated) or the previous correction file (correction files #2 and up build on the previous correction file) with new Autotune corrections applied. A new Autotune correction file is generated whenever Apply Values is performed.
The Autotune Correction file format is:

AT_NN_<BASE-FILE-NAME>.djt.

- NN is the number marking what correction iteration the file is, starting at 01 and counting up with each correction file generated.
- <BASE-FILE-NAME> is the name of the original base file selected.

Example	
ECU serial number	15-ABC-TUVWXYZ
VIN number	1HD1ABC1234567890
Selected Autotune base file	MY-TUNE-01.djt
STK will be named	15-ABC-TUVWXYZ-7890_PV3.stk
Autotune Enable file will be named	AT_EN_15-ABC-TUVWXYZ.djt
First correction file will be named	AT_01_MY-TUNE-01.djt

AUTOTUNE LOGGING STATUS CODES

Refer to the table below for Autotune logging status codes, explanations, and remedies.
For state of the art technical support, please visit www.dynojet.zendesk.com.

Code	Meaning	Explanation	Remedy
ATB OK	Autotune Basic OK	Autotune Basic is OK and is acquiring valid sample data.	NA
ATP OK	Autotune Pro OK	Autotune Pro is OK and is acquiring valid sample data.	NA
AT ER	Autotune Error	Autotune has an unknown error.	Contact technical support.
NO WB	No WB Data	There is no Wideband O2 sensor channel data available for logging. Wideband O2 sensor channel data is needed to use Autotune Pro.	Connect a WB module. Use Autotune Basic.
WB1 NR	WB 1 Not Ready	Wideband O2 sensor #1 is heating up.	Wait until ready.
WB2 NR	WB 2 Not Ready	Wideband O2 sensor #2 is heating up.	Wait until ready.
AFR L	AFR Too Low	The Air Fuel Ratio is too low (AFR too rich) for Autotune to use the sample data. Autotune only learns in a certain range of AFR.	Modify your tune to run leaner. Modify your AT Settings File. Contact technical support.
AFR H	AFR Too High	The Air Fuel Ratio is too high (AFR too lean) for Autotune to use the sample data. Autotune only learns in a certain range of AFR.	Modify your tune to run richer. Modify your AT Settings File. Contact technical support.
MAP L	MAP Too Low	The Manifold Absolute Pressure is too low for Autotune to use the sample data. Autotune only learns while in cruise or acceleration conditions, not while in deceleration.	Accelerate to increase MAP. Modify your AT Settings File.
NO ET	No ET Data	There is no Engine Temperature channel data available for logging. Engine Temperature channel data is needed to use Autotune.	Contact technical support.
ET L	ET Too Low	The Engine Temperature is too low for Autotune to use the sample data. Autotune only learns in a certain range of engine temperatures.	Warm up the engine. Modify your AT Settings File.
ET H	ET Too High	The Engine Temperature is too high for Autotune to use the sample data. Autotune only learns in a certain range of engine temperatures.	Cool down the engine. Modify your AT Settings File.
NO VE	No VE Data	There is no VE channel data available for logging. VE channel data is needed to use Autotune.	Contact technical support.
VE L	VE Too Low	The VE is too low for Autotune to use the sample data. Autotune only learns in a certain range of VE. VE is likely out of valid range in your base tune.	Adjust the VE in your tune to be within valid range (40-127.5). Contact technical support.
VE H	VE Too High	The VE is too high for Autotune to use the sample data. Autotune only learns in a certain range of VE. VE is likely out of valid range in your base tune.	Adjust the VE in your tune to be within valid range (40-127.5). Contact technical support.

USING EEPROM CONFIGURATION

This menu allows you to enable/disable EEPROM options on your bikes ECU. Features available are based on the software level and model of the connected ECU and can vary significantly between them.

Note: Some features require a feature license in order to adjust.

1 From the Main Menu, select **Tuning**>**Quick Tune>EEPROM Configuration**.

Warning 1 of 3: Not all components are installed on every Harley-Davidson bike.

Warning 2 of 3: Enabling an uninstalled component can cause DTCs.

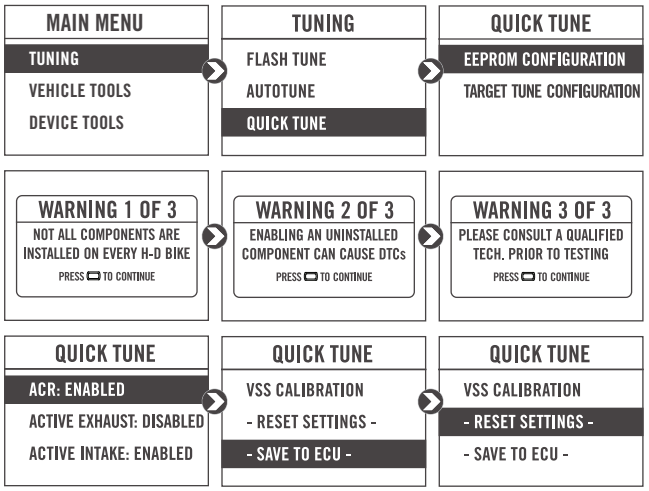
Warning 3 of 3: Please consult a qualified tech prior to testing.

2 Using the up/down arrows, scroll through the Quick Tune list.

3 Press the **Enter** button to open the value adjustment window for a particular EEPROM option. Use the up/down arrows to edit the current value. Press the **Enter** button to confirm the new value.

4 Once your changes are complete, scroll down and select **- Save to ECU -** to save your changes. You must select **- Save to ECU -** in order to write the new settings back to the ECU.

5 If needed, select **- Reset Settings -** to reset all values to those initially read upon entering the menu.



ACTIVATE TARGET TUNE

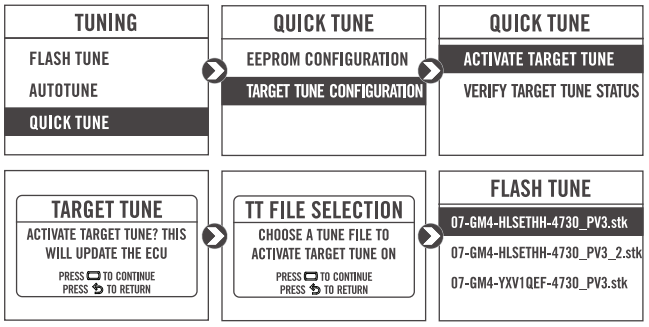
This menu allows you to choose a stk or djt to apply Target Tune Enable Values to and then flash that file to the ECU.

1 From the Main Menu, select **Tuning**>**Quick Tune>Target Tune Configuration>Activate Target Tune**.

2 Press the **Enter** button to continue.

3 Select a stk or djt to apply Target Tune Enable Values to. These values are applied to a temporary copy of the selected file and do not change the original file.

The PV3 will flash the Target Tune enabled file to the ECU.



VERIFY TARGET TUNE STATUS

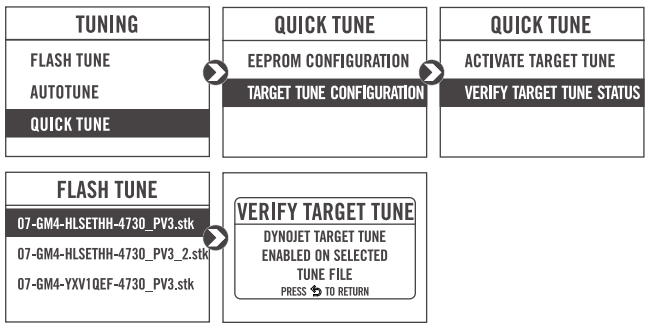
This menu allows you to view the Target Tune status.

Note: You must perform a Read ECU after activating Target Tune in order to verify the current status of Target Tune.

1 From the Main Menu, select **Tuning**>**Quick Tune>Target Tune Configuration>Verify Target Tune Status**.

2 Select a stk or djt to verify Target Tune Status.

The PV3 will compare the values and display the status.



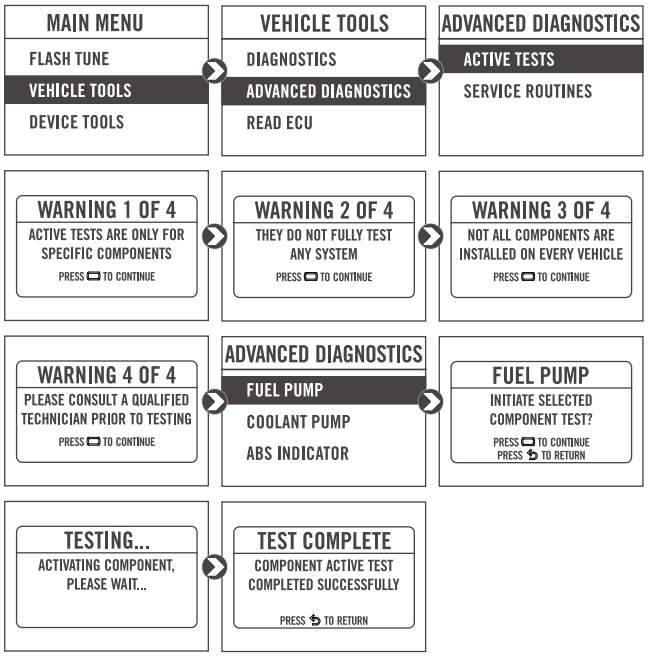
USING ACTIVE TESTS

This menu allows you to check various components and systems on your bike. Features available are based on the software level and model of the connected ECU and can vary significantly between them.

1 From the Main Menu, select **Vehicle Tools**>**Advanced Diagnostics>Active Tests**.
Warning 1 of 4: Active Tests are only for specific components.
Warning 2 of 4: They do not fully test any system.
Warning 3 of 4: Not all components are installed on every vehicle.
Warning 4 of 4: Please consult a qualified technician prior to testing.

2 Using the up/down arrows, scroll through the Active Tests list.

3 Press the **Enter** button to initiate the selected component test.



USING SERVICE ROUTINES

This menu allows you perform front and rear ABS bleed on your bike. Features available are based on the software level and model of the connected ECU and can vary significantly between them.

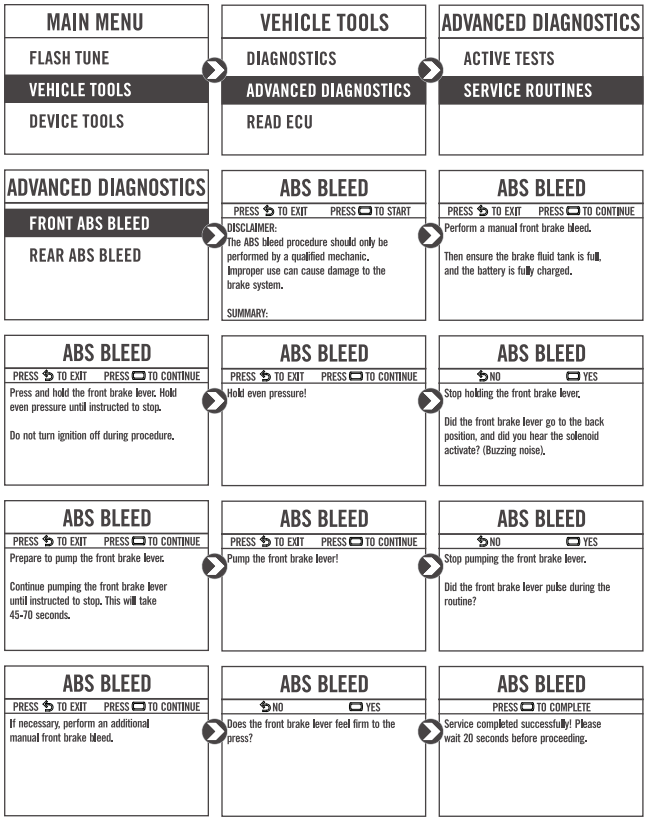
Note: This feature requires a vehicle specific feature license to function.

1 From the Main Menu, select **Vehicle Tools**>**Advanced Diagnostics>Service Routines>Front ABS Bleed**.
Disclaimer: The ABS bleed procedure should only be performed by a qualified mechanic. Improper use can cause damage to the brake system.
Summary: The routine energizes the ABS pump and actuates the corresponding solenoid valve to remove trapped air and old fluid from the system.

2 Verify the brake fluid reservoir is full and the battery is charged.

3 Follow the on-screen prompts.

4 Once the service is completed successfully, please wait twenty seconds before proceeding.



USING THE POWER VISION UPDATE CLIENT

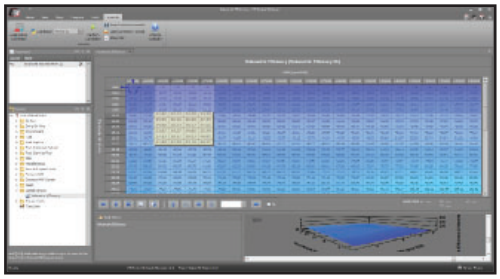
This stand alone application will launch the Update Client allowing you to update your Power Vision with the latest firmware, retrieve additional tunes, or restore the Power Vision to the original Dynojet factory settings.

1 Connect the Power Vision to your computer using the included USB cable.
2 Navigate to the POWERVISION drive attached to your computer and run the **Update.exe** file.
3 Click **Update** to load the current firmware. If the Update button is grayed out, your Power Vision already has the latest firmware.
4 Click **Restore** to reload all original Dynojet tune and stock files.
5 Click **Get Tunes** to open the Dynojet Tune Finder. Follow the instructions to Upload your PV_Info.txt file and retrieve new tunes.
6 Click **Manual Firmware Update** to navigate to and load a version of firmware already saved on your computer.

INSTALLING THE POWER CORE SOFTWARE

Download the Power Core software and take tuning to a whole new level.

Note: Downloading the Power Core software is optional and not necessary to use the Power Vision.



1 Go to www.dynojet.com.
2 From the top navigation menu, select **Support**>**Downloads**.
3 Click **Power Vision 3**.
4 Click the **Software** drop-down and download the Dynojet Power Core software.
5 Double-click the saved file to begin installation. Follow the on-screen prompts. Refer to the Power Core Help for more information.

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