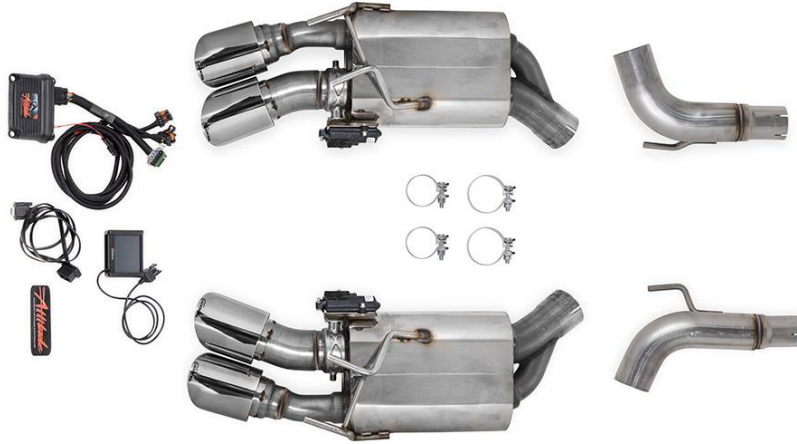




**2012-15 Chevrolet Camaro SS 6.2L V8 with Quad Tip NPP Option
Blackheart Multi-Mode Axle-Back Exhaust Kit
70401340-RHKR**



Thank you for making HOOKER HEADERS your choice in a high-performance exhaust system. Extensive dyno/track testing has enabled HOOKER to offer the most advanced design in exhaust systems. The installation, while not complex, will take a certain amount of time. However, the additional horsepower and improved performance will more than justify your efforts. Proper installation and maintenance will ensure long life and maximum performance from your HOOKER HEADER exhaust system.

BEFORE STARTING:

Your vehicle must be raised a minimum of 18 inches. A floor hoist is ideal. If no hoist is available, we strongly urge the use of axle stands as a safety measure. Please read these instructions in their entirety before attempting installation.

CAUTION! WORK ONLY ON A LEVEL SURFACE. USE JACKS /JACK STANDS OF SUFFICIENT CAPACITY TO LIFT AND SUPPORT YOUR VEHICLE. NEVER WORK UNDER A VEHICLE SUPPORTED BY A FLOOR OR BUMPER JACK.

INCLUDED HARDWARE:

Accessory Pack Contents:					
P/N	Qty.	Description	P/N	Qty.	Description
556R22	2	Band Clamp, 2.5"	539R27	1	¼-20 Lock Nut
556R23	2	Band Clamp, 3.0"	505R73	1	¼-20 x ¾ Bolt
217R4	6	Cable Ties	505R70	2	M5 x 10mm Bolt
204R679	2	3/8" Ring Terminal	199R11	1	Instruction Sheet
204R680	2	1/4" Ring Terminal	599R94	2	Blackheart Decal 4in x 2in
204R681	2	Butt Splice	599R116	1	Attitude Tool Box Sticker
204R682	2	Heat Shrink Sleeve			

Parts List:		Tools Required:
Qty.	Description	
1	Right Muffler Assembly with valve actuator	3/8 Metric Socket Set
1	Left Muffler Assembly with valve actuator	15mm Deep Socket
1	Right Muffler Link Pipe	Reciprocating Saw
1	Left Muffler Link Pipe	Tape Measure or Ruler
1	EVC Control Unit	Straight Edge
1	3.5" LCD Hand Held	Masking Tape
1	Main Wiring Harness CN1	Electrical Tape
2	Valve Harness CN8/CN5	Rotary File
1	OBD Interface Harness DB9	Heat Gun
1	Fused power/Ground Harnesses (2 wire - 1 red /1-black) CN12	Wire Cutters
1	Fused power Harness (single wire - red /black) CN14	Connector Crimping Tool
		Razor Knife

Check the Accessory Kit. If anything is missing, please contact Technical Service at 1-866-464-6553 or 270-781-9741.

Installation of the Multi-Mode Mufflers

1. Disconnect the negative cable from the vehicle battery.
2. Block the front wheels. Lift the vehicle and secure on jack stands.
3. Identify the locations that will be cut in **Figure 1**.

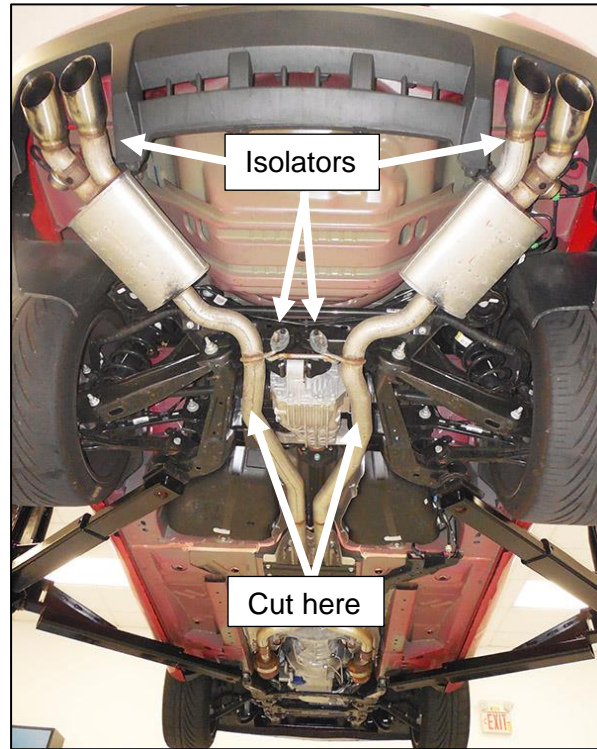


Figure 1

4. Measure 3" back from the bend tangent (where the straight tube starts after the bend) on the driver's side pipe directly under the axle shaft and mark with a pen or sharpie (**Figure 2**).



Figure 2

5. Measure 4.25" back from the bend tangent (where the straight tube starts after the bend) on the passenger's side pipe directly under the axle shaft and mark with a pen or sharpie (**Figure 3**).



Figure 3

6. Use a piece of masking tape and wrap the exhaust pipe with the edge of the tape at the location marked and use as a cut guide (**Figures 2 & 3**).
7. Cut the pipe at the location outlined with the tape using the reciprocating saw. Be careful not to damage surrounding components with the saw blade. Leave a little extra pipe if you're not confident in the measurements, as you can always trim it off later (**Figures 2 & 3**).
8. Spray the exhaust isolators with WD-40® or equivalent. Disconnect the vacuum lines from the exhaust valves at the mufflers. Insert the supplied 5mm screws into the vacuum lines to prevent vacuum leaks.
9. Support the muffler assemblies and remove the isolators above each muffler assembly and the 2 isolators at the differential hangers (**Figure 1**). Remove the left and right muffler assemblies.
10. Deburr all cut edges inside and out with a rotary file. Double check the cut length and adjust if necessary.
11. Install the supplied 2.5" band clamp onto the expanded and notched end of the muffler link pipe with the bolt to the inside of the pipe and the nut facing down.
12. Install the link pipes onto the OEM exhaust pipe and install the isolators at the differential. Tighten the clamps to allow for adjustment.
13. Install the supplied 3" band clamps over the expanded and notched end of the muffler inlet pipes.
14. Install the mufflers on to the outlet of the link pipes. Spray the muffler isolators with WD-40® and install the isolators over the muffler hanger rods and the vehicle hanger rods at the same time (**Figure 4**).
15. Align the clamps to the front of the pipes and the nuts facing down. Tighten the clamps to allow for adjustment.
16. Adjust the tips and tighten the clamps.



Figure 4



Exhaust Valve Controller Installation and User Manual

Introduction & System Requirements

Congratulations on your purchase of the *Attitude* Exhaust Valve and Controller kit. This kit is intended to provide the user with a fully programmable and dynamically active exhaust control system that will enable the vehicle's exhaust system to be transformed from an antiquated one dimensional experience to an active exhaust management system that will allow the exhaust to become an integrated part of the vehicle's engine management system. This system allows the user to tune the exhaust to not just change the sound, but to continuously manage the exhaust velocity at any RPM, throttle position, or load. Active exhaust management can help create an exhaust profile unique to your engine combination that will help produce power and torque that a straight through one dimensional exhaust simply can't.

This manual is intended to provide the user with a basic understanding of the *Attitude* exhaust valve controller kit and the intended uses for this system. If the guidelines of this manual are followed, you will find this system is very easy to install and will provide you with a wide range of tuning options for your vehicle's exhaust system and enhance your driving experience. Please read through the entire manual before attempting to install this system, failure to follow the instructions or attempting to use this product for purposes other than it was intended will result in wasted time and damaged parts.

Installation of the *Attitude* Exhaust Valve Control System

Installation of the Controller:

The installation of the controller and wiring harness is not complicated or difficult, but does require a basic understanding of the vehicle's electrical system and a few specific tools to do the job correctly. If you are not comfortable with splicing wires or lack the tools to complete the job correctly, please allow a professional to install your Attitude exhaust valve controller.

Plan Your Wiring Layout:

The EVC wire harness is a universal harness intended to accommodate a wide range of applications. It is good practice to mock install the controller and harnesses to be sure the intended routing does not have any unexpected issues. Plan the placement of the 3.5" LCD so it can be easily accessed and not interfere with the safe operation of the vehicle (**Figure 5**).

NOTE: The 3.5" LCD fits nicely into a standard Cell Phone windshield mount

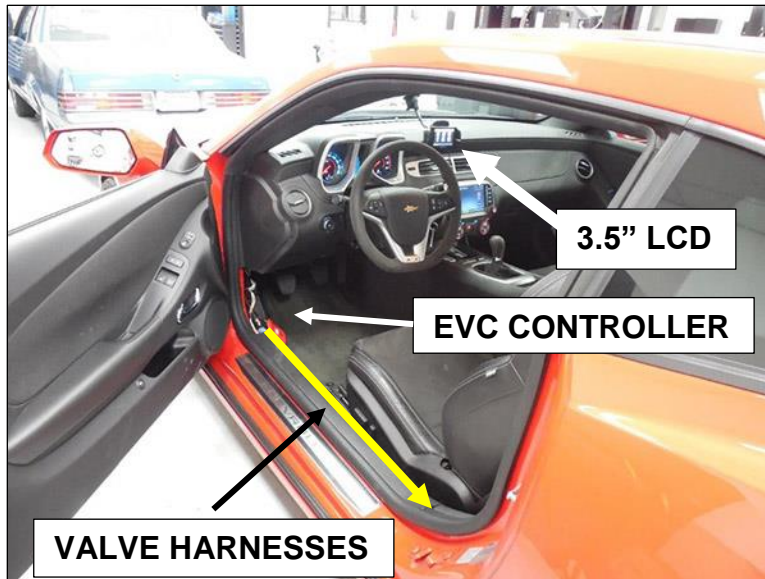


Figure 5

1. Remove the left kick panel behind the parking brake lever and the fuse panel cover at the left dash end cap. Also, remove the harness cover that runs along the door sill (**Figure 6**).

NOTE: It will be necessary to remove the door seal below the A-Pillar and along the door sill (**Figure 6**).

2. Identify and locate the input sources for the Attitude controller. The attitude controller will need the following inputs to function correctly.
 - A clean (10-amp Min) 12v Switched power source that remains hot when the ignition switch is in the Crank and Run positions.
 - Direct battery ground or a clean dedicated chassis ground source free of paint, grease, or additional ground wires from other components. It is not recommended to splice into the vehicle ground circuit from existing electrical components.
 - Engine RPM signal
 - Throttle position signal

Recommended Input Pickup Points

- Chassis Ground - Metal dash structure pre drilled hole next to fuse panel (**Figure 8**).
- Switched 12Volts - Body control module, Black connector, Pin 15, Yellow wire. Located under dash above the pedal assembly (**Figure 9**).
- Engine Speed (RPM) - OBD-II Connector
- Throttle Position Signal (TPS) - OBD-II Connector

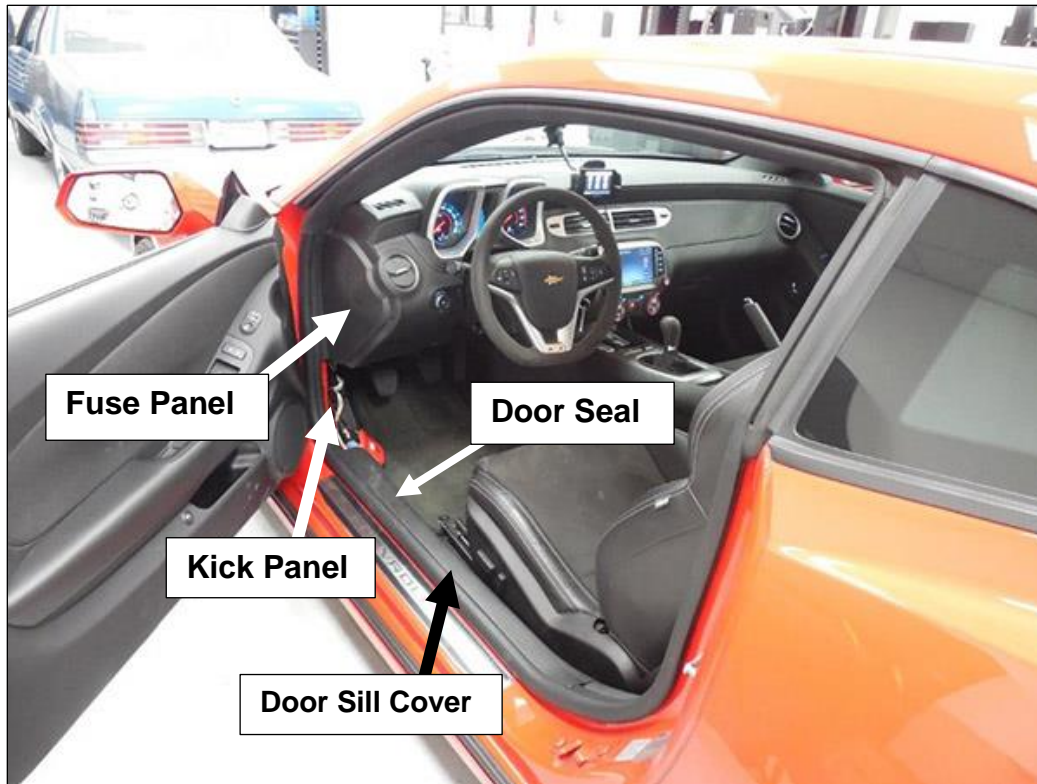


Figure 6

Install the Controller

If you are not comfortable with splicing wires or lack the tools to complete the job correctly, please allow a professional to install your Attitude Exhaust valve controller.

1. Plug the wiring harnesses CN1, CN12, and the OBDII interface cable DB9 into the Attitude Controller (**Figure 7**). Plug in sub-harnesses CN14, CN5, and CN8 into the CN1 main wiring harness. See wiring harness overview on page 19.
2. Mount the controller into the open area behind the driver's kick panel above the body harness bulkhead and secure away from the parking brake mechanism using the supplied cable ties (**Figure 5**).
3. Route the Black wire from Harness connector CN12 to the pre-drilled hole in the metal dash structure next to the fuse panel.
 - Strip approximately ¼" of insulation off the Black wire and install the ¼" ring terminal on to the Black wire using the appropriate crimping tool.
 - Use the heat gun and activate the shrink sleeve around the wire and the ring terminal.
 - Install the Black ground wire to the metal dash panel at the pre-drilled hole next to the fuse panel using the provided ¼" bolt and lock nut. (**Figure 8**).
4. Route the red wire from harness connector CN12 and the single red and Black wire from Harness connector CN14 to the body control module Black connector, pin15, Yellow wire (**Figure 9**). Using the provided Heat shrink Style Butt Connector, connect the Red wire and the red and black wires to the Yellow wire at Pin 15 on the black connector of the Body control module.
 - Verify the wire at pin 15 of the Black connector on the Body control module has 12 Volts when the key is turned to the accessory position, remains 12 volts when the key is advanced to the cranking position, and also remains 12 volts when the engine has started and the vehicle is running.

NOTE: The 12volt power should turn off when the key is turned to the off position.

STOP: USE EXTREME CAUTION WHEN VERIFYING THE POWER REQUIREMENTS FOR CN12/CN15. BE SURE ALL ROTATING ENGINE COMPONENTS ARE CLEAR WHEN THE ENGINE STARTS. THE DRIVER SHOULD BE IN THE NORMAL DRIVING POSITION AND IN COMPLETE CONTROL OF THE VEHICLE AS THE ENGINE IS STARTED TO PREVENT THE VEHICLE FROM MOVING WHEN STARTED.

- Cut the yellow wire approximately 3 inches from the body control module, leaving enough wire to make the splice comfortably.
- Strip approximately ¼" insulation from both ends of the yellow wire.

- Strip approximately ¼" insulation from the red wire from connector CN12.
 - Strip approximately ¼" insulation from the red/black wire from connector CN14.
 - Twist the exposed wire from CN12 to the yellow wire leading to the OEM harness.
 - Crimp the supplied butt connector onto the yellow and red wire from the OEM harness and from CN12. **NOTE:** Both yellow wire and red wire from CN12 should be inserted into the same end of the butt connector. Crimp firmly.
 - Twist the exposed wire from CN14 to the yellow wire leading to the body control module. Insert the yellow wire and red/black wire from CN14 into the opposite end of the butt connector. Crimp securely and be sure all four wires are connected together. Test to be sure all wires have Key On 12V when splicing is complete.
5. Heat the body of the Butt connector to seal and strengthen the connection (**Figure 9**). Be careful not to burn the insulation on the wire.
 6. Connect the OBD-II Interface cable into the 16 PIN OBD-II Diagnostic port on the lower left hand side of the dash just below the steering wheel (**Figure 10**).
 7. Route the harness with connector CN2 (small white connector) to the location you have chosen to use the 3.5" hand held. Plug the 3.5" LCD harness into connector CN2.

NOTE: The connector on the 3.5" LCD harness is double ended and will accept the CN2 connector into either side (**Figure 11**).

NOTE: Using a cell phone holder with a windshield mount works well to hold the 3.5" LCD touch screen (**Figure 5**).

8. Route the valve harnesses CN5 and CN8 down along the rocker and under the rear sail panel and into the trunk area. Split the harnesses left and right just as they enter the trunk area and continue under the trunk liner to the rear of the trunk area. Remove the plastic plugs on either side of the trunk floor just above the mufflers, run the harness through the trunk floor and the frame rail directly over the mufflers.
9. Plug the harnesses into the valve actuators. Pull any excess harness back up into the trunk and place excess harness behind the liner and out of sight.
10. Cut the plastic plug halfway through, install over the harness and snap the plugs into the trunk floor where they were removed (**Figure 12**).
11. Verify the harnesses are clear from interfering with any moving components or hot exhaust pipes.
12. Leave the interior trim panels off until the initial set up procedure is completed and the system is working properly.

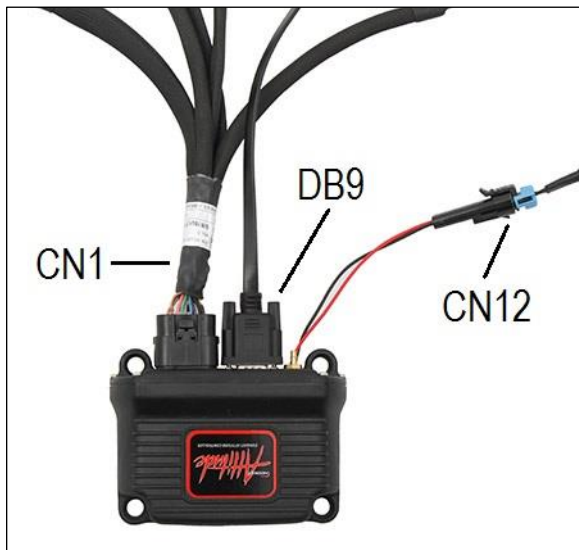


Figure 7



Figure 8

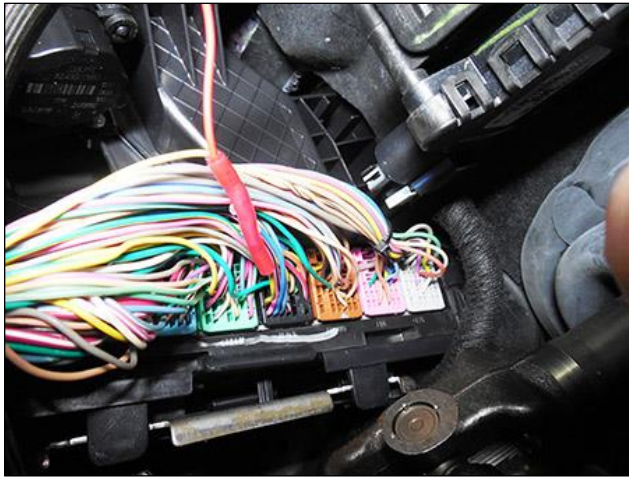


Figure 9

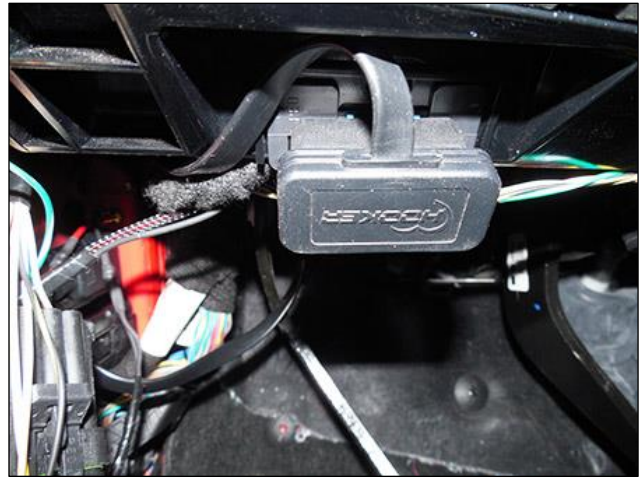


Figure 10

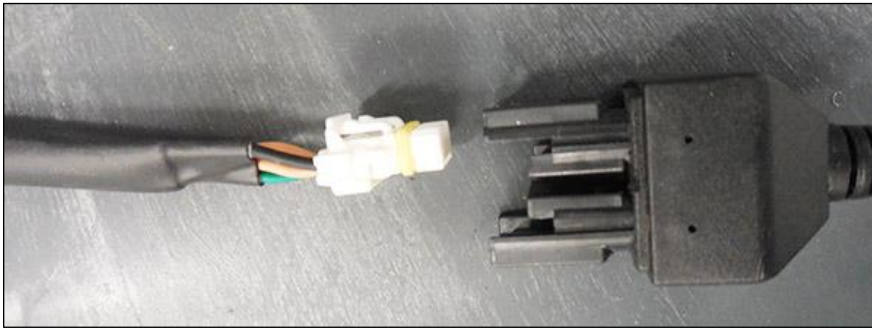


Figure 11



Figure 12

Initial set up of the *Attitude* ECV Control unit

Quick Check List

- Main harness CN1 plugged in to the Attitude controllers 18 Pin connector
- Power harness CN12 plugged in to controller and connected to switched power and grounded to the chassis
- CN13 plugged into CN14 and connected to 12V switched power source
 - Valve harness CN5/CN8 connected to main harness CN1
 - Valve harness connectors CN6/CN9 connected to valves
- 3.5" LCD harness plugged in to EVC harness connector CN2
- OBDII cable plugged in
- Reconnect the battery

Powering up the Controller

- Turn the Ignition to the “run” position (do not start the engine)

The START UP screen on the LCD will illuminate and display the WARNING message

- Read and understand the WARNING message. Then, press AGREE (using your finger or the provided stylist) and the home screen will appear.

STEP 1		Select <u>SETUP</u>
STEP 2		Select <u>OBDII</u>
STEP 3		<p>Select <u>SCAN</u></p> <p>A green status bar will appear and display a <u>Scan Complete</u> or <u>Scan Failed</u> message</p> <p>If <u>scan complete</u> press BACK</p> <p>If <u>Scan Failed</u> REPEAT SCAN x2</p> <p>If <u>Scan Failed</u> refer to trouble shooting page</p>
STEP 4		<p>Select <u>Startup</u></p> <p>Startup screen will appear</p>
STEP 5		<p>Press Valve % at startup bar and use the slider to set the valve position to 0 % and save</p> <p>Press the time bar and set to 10 seconds and save</p> <p>When complete press <u>BACK</u></p>

STEP 6		<p>Select <u>Initial</u></p> <p>Setup screen will appear</p>
STEP 7		<p>Select- <u>8</u> cylinders Select- <u>TPS</u> Load input type Select- <u>0-5 Volts</u> TPS Range Select- <u>Hand held</u> as master control</p> <p>When complete press HOME</p>
STEP 8		<p>Select <u>Active</u></p> <p>The Active Control Screen will appear</p>
STEP 9		<p>Select <u>Touring</u></p> <p>The Touring Icon will highlight red</p> <p>When complete press HOME</p> <p>Initial set up complete!</p>

System Checks and Basic *Attitude* Adjustment

System Checks

Congratulations! You have successfully installed your *Attitude* exhaust valves and controller. Follow a few basic steps to make sure the system is functioning properly and all the correct load inputs are selected and active.

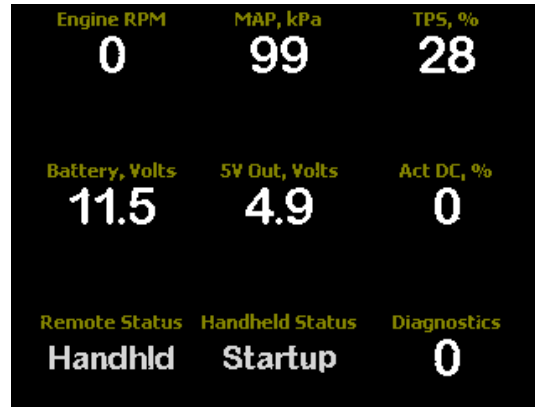
- Turn the Ignition to the “run” position (do not start the engine)

The START UP screen on the LCD will illuminate and display the WARNING message, press AGREE to continue

- When the home screen appears press Gauges –The Gauge screen will appear and display the current setup and sensor values with the **KEY ON and ENGINE OFF**

Note: TPS, MAP, and Battery values will vary depending on throttle type, altitude, and battery condition.

MAP, KPa (can be as low as 70 for very high altitude locations.)
TPS, % (can be as high as 30 for vehicles with electronic throttle bodies)



Checking Load Inputs

TPS - Depress the throttle slowly and release. The TPS % gauge value will rise and fall if TPS is being used as a load input and TPS is selected in the set up screen. Key ON Engine OFF

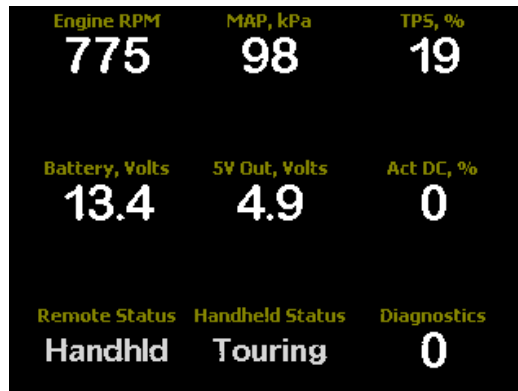
RPM - Will be at 0 with the engine off and follow engine RPM when the engine is running

MAP - MAP value with the engine off will be 70-100 Kpa depending on altitude.

NOTE: This application is not using an external MAP as a load source and will not be active when the engine is Running.

Checking Controller Activity

When the engine is started, the valves will be commanded to the startup position by the Controller. Handheld status will display **Startup** on the gauge screen for 10 seconds after engine startup and the valve position will be 0% (Initial set up values). After 10 seconds the startup feature will expire and the handheld status will change to **Touring** (mode selected during initial setup). The controller is now monitoring engine speed and load and will command the valve follow one of 5 modes when **Active** is selected from home screen. The valves can also be controlled manually when **Manual** is selected from the Home screen.



Checking Valve Control

Manual Valve Control

- Turn the Ignition to the “run” position (do not start the engine).

The START UP screen on the LCD will illuminate and display the WARNING message, press AGREE to continue

- Select Manual from the home screen. The Manual Control slider bar will appear.
- Slide the bar or tap the scale (using a finger or the supplied stylist) to move the valves to the desired position. Listen for the valves to change position as the slider bar moves from 0-100 %.
- Monitor the valve's position on the gauge screen (**Act DC, %**) after each position change. The value will correspond with the scale on the slider bar.

Active Valve Control

Turn the Ignition to the “run” position and start the engine.

The START UP screen on the LCD will illuminate and display the WARNING message, press AGREE to continue

The LCD will display the Home screen and you will be able to select from any of the options displayed by touching the Icon.

- The controller will command the valves to the startup position selected in the startup menu. (0% for 10 seconds)
- Select ACTIVE, then select from one of the 5 options from the Active control screen
- **Touring** – Quietest and least aggressive valve mapping
- **Sport** – More aggressive Idol and low speed mapping with aggressive mid and high speed mapping.
- **Race** – Aggressive Idol with very aggressive mid and high speed mapping
- **Custom** – Create your own mapping strategy using the **Custom** Selection from the home screen (see tuning page).
- **Quick Mute** – Quickly closes the valves for “Quiet” operation if needed

Drive the Vehicle

- Double check the installation of all components and reassemble the interior.

Take the vehicle for a test drive. It is highly recommended to have a passenger ride along as the operator of the LCD while the vehicle is being driven. If a passenger is not available, pull over in a safe location to make changes to the system before continuing the test drive.

Have the passenger change selections and listen to the changes in sound as the valves follow the programmed mapping. Pay attention to how the valves react to a variety of different load and speed conditions in each driving mode. The design of your exhaust system will have a significant impact on the overall volume and sound quality of the exhaust system as a whole. Explore all the options – Active, Manual, and Quick Mute. You can also create your own custom mapping strategy that allows the user to tailor the valve mapping to individual taste and vehicle requirements. See **Custom Settings and Creating Mapping Tables** for details on creating custom settings and mapping strategies.

Custom Settings and Creating Mapping Tables

The ~~Attitude~~ has been configured to allow the user to tailor the functionality of the system to your specific vehicle and personal taste.

You can customize the following settings:

- LCD back lighting
- ~~Attitude~~ Ghost Image
- Startup Settings
- Custom 8x8 Map tables
- Custom RPM axis tables
- Custom LOAD Axis tables

Customize your


LCD backlighting

- Select the System folder from the Home screen
- Select Screen Backlighting
- Adjust slider bar to desired back light
- Exit

Ghost Image

- Select the System folder from the Home screen
- Select Local Setup
- Select Setup Options
- Choose background image option
- Do not change the ECU Type - O.E.M ECU is pre-selected
- Exit

Startup Settings


The  has a Startup function that adjusts the valve position and the duration the valves stay in that position when the engine is started. You can adjust the valve position from 0-100%, also adjust the duration (in seconds) the valves stay in that position before the start up feature expires, the valves return to the mapping position the controller was in when the engine was shut down.

Example: You prefer to drive your car in the Active Track Mode, but you want to be able to leave the house in the morning and not wake the family (or the neighbors). If it takes you 2 minutes to get down the road to a point you want the controller to return to Active Track Mode, adjust the Startup tables to 0% and 120 seconds.

Startup Table Adjustment

- Select Setup from the Home screen
- Select Startup
- Press the Valve % at startup bar
- Use the slider to adjust from 0-100% then press Save
- Press the Length of Time bar
- Use the slider to select the length of time the valves remain at the selected position after startup then press Save
- EXIT
- On the next start up, select the gauges screen. The Act DC % Gauge will read the valve position selected and the handheld status will read Startup for the length of time selected. When the Startup time expires, the controller will return to normal operation. The handheld status will read the mode selected and the Act DC % Gauge will read the Active valve position in real time.

Creating a Custom 8X8 Mapping Table

The  is a very adaptable product and has been preprogrammed with a range of valve mapping selections that will be acceptable for most applications. Holley engineers understand that canned options are not going to satisfy everyone. A custom mapping table was created to allow the user to create a valve mapping table that is specific to the user's vehicle and driving habits. These tables can be set up to accommodate a wide range of vehicle configurations that will require custom tuning options not available in the pre-programmed mode selections.

If you are using MAP (manifold vacuum) as your load input, you will find the custom tables particularly useful to achieve smooth valve transitions. Each vehicle's Manifold Vacuum pressure profile is unique to that vehicle for any number of reasons: engine size, camshaft, carburetor, gearing, and so on. You will be able create custom configurations using the 8x8 tables and also custom scale the RPM and load axis tables to further fine tune the table to match your vehicle's requirements.

Follow the steps below to create a custom 8x8 valve mapping table. Have fun with it! It is not complicated. Just follow the step by step instructions and guidelines and you will be enjoying a new and interactive driving experience before you know it.

Custom Mapping Tables

What type of load inputs are you using? The mapping configurations for TPS and MAP load inputs are going to be different. There are examples of both TPS tables and MAP tables provided to illustrate the difference in tuning requirements and give you a baseline to get started. The controller is pre-loaded with a typical TPS Custom MAP Table, RPM and LOAD axis tables. The best way to understand how a particular adjustment will affect the valve action is to make adjustments and drive the vehicle to evaluate the change.

NOTE: Before attempting to create or adjust any parameters in the custom tuning options, be sure the system is configured and working properly in all the pre-set Active and Manual Modes and there are no Diagnostic codes present in the gauge screen.

Caution: Monitoring the gauge screen or making adjustments to the system while driving the vehicle is dangerous and not recommended. Have a passenger monitor the 3.5" LCD and make any tuning changes to the system. Pull the vehicle over to a safe location and make changes if a passenger is not available.

Building a Mapping TABLE

The map table is divided into two Axis Plains

- X Axis = LOAD (left to right) left side of scale is low load or TPS position – right side of the scale is high load or TPS position
- Y Axis = RPM (up and down) low rpm at the top of the scale – High RPM at the bottom of the scale

The 8x8 table is 64 individual cells that represent a valve position from 0-100%. The table works as an intersection of the X and Y Axis (RPM and Load). The valve position will follow the table as the engine RPM and Load intersect at each cell continually when you drive.

MAP Table Tuning

- Select Custom from the home screen and the custom menu screen will appear (**Figure 13**)
- Select Advanced Table - RPM vs Load, the 8X8 table will appear (**Figure 14**).
- Select one of the Cells within the table and the slider bar will appear (**Figure 15**).
- Adjust the slider bar to the valve position desired and press OK, the table screen will appear with the value highlighted. Press Save to lock the value into the table (**Figure 16**).
- Continue this process until all the table cells are populated with the values you are targeting



Figure 13

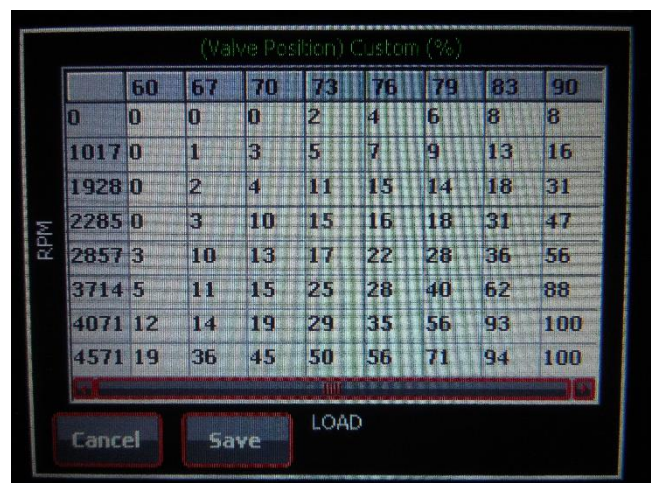


Figure 14

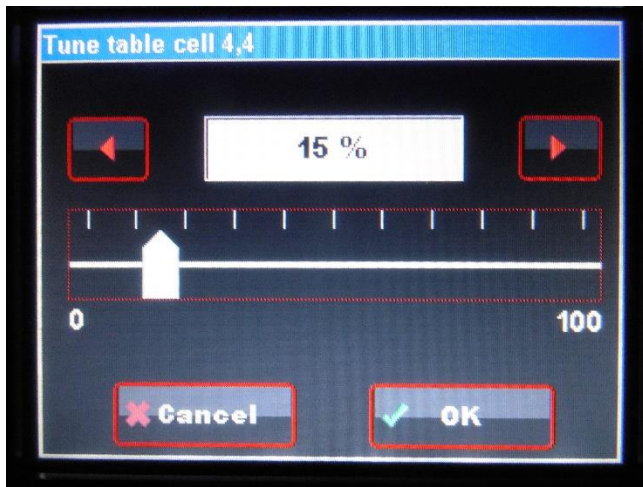


Figure 15

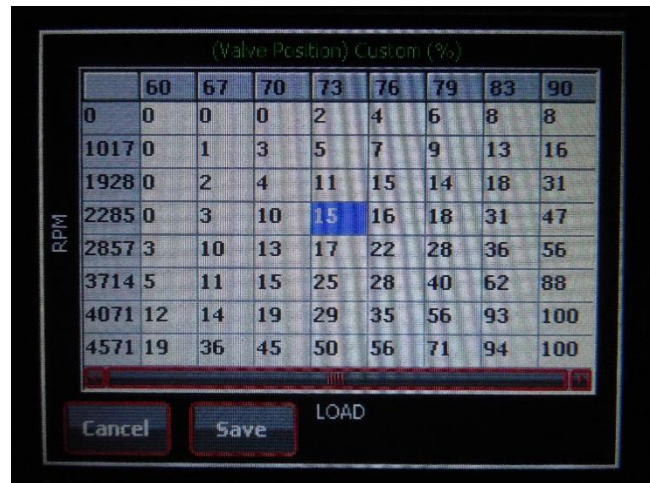


Figure 16

Advanced RPM and Load Axis Tuning

Advanced Axis tuning is designed to allow the user to custom scale the Load Axis and RPM Axis curves independently of one another. This is helpful when the valve mapping table needs to be configured to allow for specific engine or driving characteristics that are outside the pre-set scaling. The pre-set scaling is best suited for use when TPS is being used as the load input and the intended RPM range is 0-6000 rpm.

See the figures below for a quick reference to see the difference in Load and RPM Axis scaling when using TPS as the load input vs. MAP (Manifold Vacuum) as the load input.

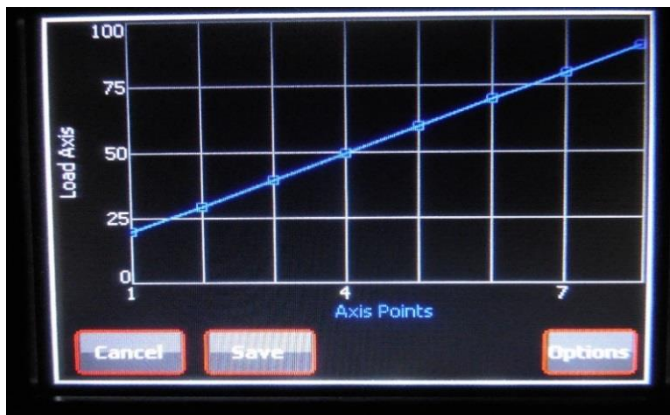


Figure 17 – TPS Load Axis Table

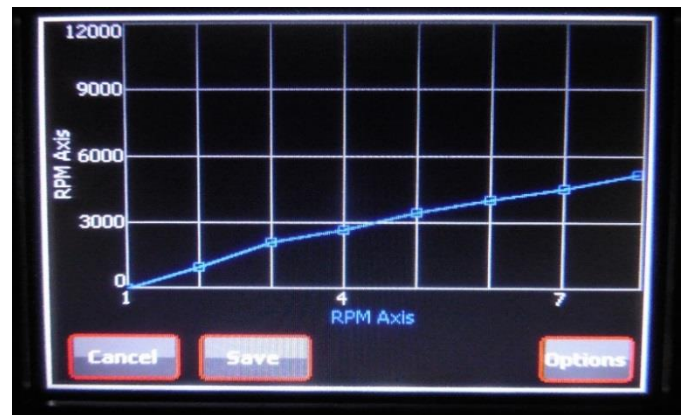


Figure 18 – TPS RPM Axis Table

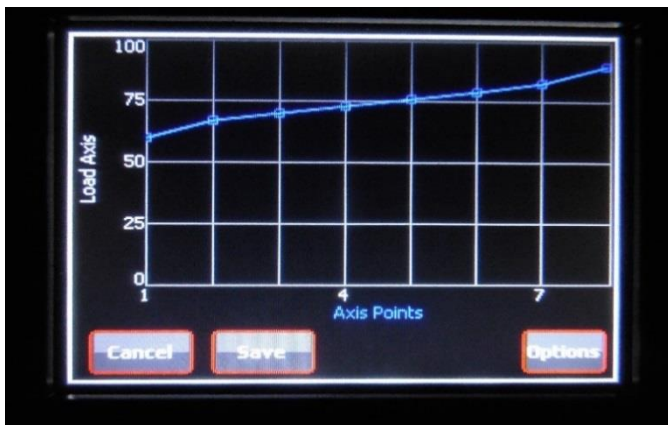


Figure 19 – MAP Load Axis Table



Figure 20 – MAP RPM Axis Table

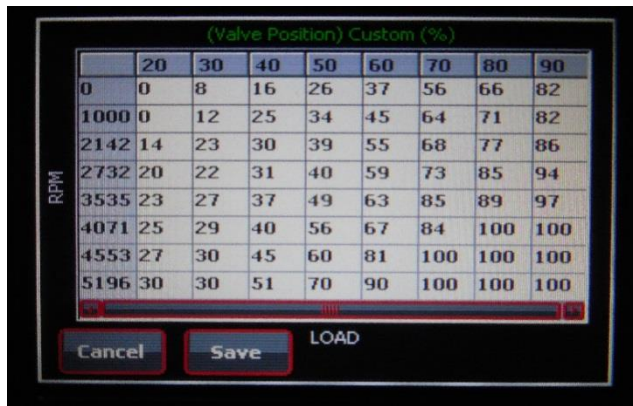


Figure 21 – TPS 8x8 Table



Figure 22 – MAP 8x8 Table

Adjusting the Load Axis Table

- Select - Adv Table Load Axis Edit - from the custom tuning menu, the Load Axis screen will appear (Fig. 17-19).
- Use your finger or the stylist to adjust the load axis points to the desired graph location.
- Press save to return to the menu, then press the - Advanced table – RPM vs. Load - bar to view the changes to the Table

NOTES:

- **TPS** Load scaling will generally be a wide range 20-90% when using TPS as the Load input. The scaling range is represented and should be read in % of throttle position when using TPS. This will provide a very smooth and progressive valve action (Figure 21).
- **MAP** Load Scaling will be a narrower and higher range (50-90 KPa). The Scaling range is represented and should be read as KPa (manifold pressure) when using MAP as the load input. Manifold Vacuum Reference changes very quickly and will require the load targets to be set to the higher ranges of the scale as seen in Figure 22, keeping the valve action smooth and progressive.

Adjusting the RPM Axis Table

- Select - Adv Table RPM Axis Edit- from the custom tuning menu, the RPM Axis screen will appear (Fig. 21-22).
- Use your finger or the stylist to adjust the RPM axis points to the desired graph location.
- Press save to return to the menu, then press the - Advanced table – RPM vs. Load - bar to view the changes to the Table

NOTE:

- Keep the RPM scale within the normal operating range of the engine. If the RPM scale is too tight (1000-2000 RPM), the valves will operate full scale within that range with very little resolution. If the RPM scale is set too wide (0-12000 RPM) and the engine will only operate to 6000 RPM, the table will effectively be cut in half limiting the valve open % to the 6000 rpm intersection of the table.

Use the gauge's screen to monitor TPS %, MAP KPa, RPM, and **Act DC %** (valve position) to help with the tuning process. You will be able to see the valves react to table changes and evaluate how those changes affect the exhaust performance. Use the tuning tips listed to help make the process go smoothly.

Tuning Tips

- Work in small 4 cell blocks to get started.
- Build a Rough table and then make small blending changes to fine tune the overall performance.
- Table cell changes effect the valves % of open position at a particular intersection of the table.
- Load and RPM Axis adjustments do not change the values in the table cells. They move the cells to different load or RPM ranges.
- Tune the Load and RPM Axis tables individually in small steps after the mapping tables are created.
- Save the changes as you go, any changes made will be lost if the Cancel button is selected.

Using the Load Scale at the top of the mapping table 0-90

- Read as TPS % when using TPS as the load input - corresponds to the gauge screen **TPS %**
- Read as KPa (manifold pressure) when using MAP as the load input - corresponds to the gauge screen **MAP**.

Diagnostic Trouble Codes and Troubleshooting

Diagnostic Trouble Codes – displayed at bottom right corner of **Gauges** screen

- **0** = No diagnostic trouble codes reported
- **1-4** = **System Error Reported** Contact Holley Technical Support **1-866-464-6553**

Troubleshooting

This is a quick reference for some common issues that may be encountered during the installation and tuning process

Problem	Possible Cause/Solution
3.5" LCD will not power up	<ul style="list-style-type: none">• Main harness connector CN1 not plugged in to the Controller• No switched 12v power Verify switched 12volt power source Check connector CN12 Check fuse at CN12• No ground or poor ground connection• Harness connector CN2 not connected to 3.5" LCD power harness or connected improperly. (Figure11)
3.5" LCD powers up but the valves are not responding	<ul style="list-style-type: none">• Valve harness connection CN6/CN9 not connected to valves• Valve harness connectors CN5/CN8 not connected to main harness CN1• NO 12V (Key) power on connector CN14• Check fuse at CN14• NO RPM input• Check manual operation of valves after key off /key on cycle• Check for diagnostic codes in Gauge screen
Valves cycle open then closed after the engine starts	<ul style="list-style-type: none">• Normal operation• System performing diagnostic checks
Valves open with a 0% TPS reading and closed with 100% TPS reading	<ul style="list-style-type: none">• TPS voltage range incorrect in the setup menu
Valves not following the load mapping tables with TPS load input	<ul style="list-style-type: none">• No TPS signal input• MAP selected as load input in set up menu
Valves not following the load mapping tables with MAP load input	<ul style="list-style-type: none">• No MAP signal input• TPS selected as load input in set up menu
MAP vacuum signal lost with closed throttle (70-100 KPa at idle)	<ul style="list-style-type: none">• Vacuum source is not connected to direct manifold vacuum
Valve is open on startup then closes to follow Startup Table - System functions normal after Startup Table expires.	<ul style="list-style-type: none">• Valve position was open when the engine was shutdown.• Vehicle has delayed switched power activation• Allow 3.5"LCD to power up before engine start.
Manual valve position returns to zero at start up	<ul style="list-style-type: none">• Normal operation
Very slow or erratic valve response when using OBDII inputs	OBD inputs being shared with another device using a pass through adaptor
OBDII scan failed	<ul style="list-style-type: none">• OBDII cable not connected to vehicle• OBD connector DB9 not connected to Attitude Controller• TPS not selected in Initial setup menu
Vehicle will not start (crank) when the EVC controller is connected to the OBDII connector	<ul style="list-style-type: none">• OEM ECU is not selected in the setup options screen.<ul style="list-style-type: none">- Select system folder from the home screen.- Select local setup.- Select setup options.- Choose OEM ECU.

File Sharing and Calibration Updates

Using the SD card slot in the side of the 3.5" LCD, firmware updates can be uploaded when available and your custom calibration files can be Downloaded and saved or shared with other units. Use this feature to save as many as 20 Custom calibration tables. They can be quickly saved as you are building the custom valve mapping and Axis tables, if you decide you want to change your custom settings you will always have a copy to re install later if you change your mind.

EXO Calibration Load and Save

Step 1:

Insert a standard SD card (2GB – 16GB) into the left side of the 3.5" handheld display.

From the main screen select [System].



Step 2:

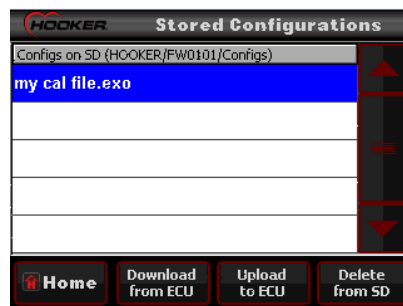
From the [System] page select [File Load & Save]



Step 3:

To save a calibration file from the ECU, select [Download from ECU]. You will then be prompted to enter a file name. Once you have entered a file name press [OK]. Once selected, the file transfer will begin automatically. You can save over 20 different unique file names. The saved calibration files can now be saved, emailed, shared with your friends, etc. from your PC via an SD card reader.

To upload a calibration file to the ECU, select your target file name listed. Example below would be [my cal file]. Once selected, the file transfer will begin automatically.

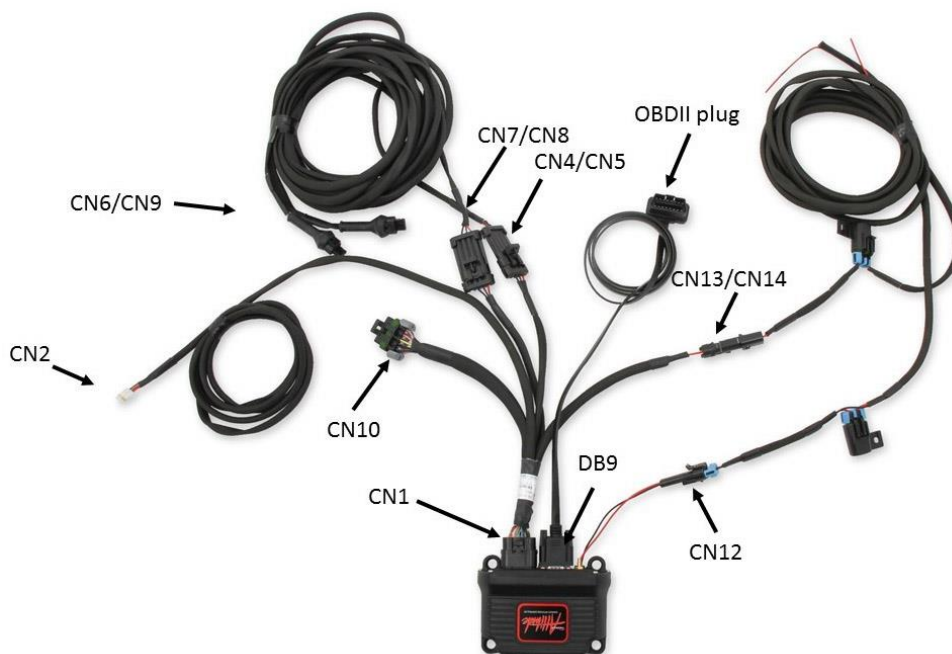


EXO Calibration Delete from SD Card

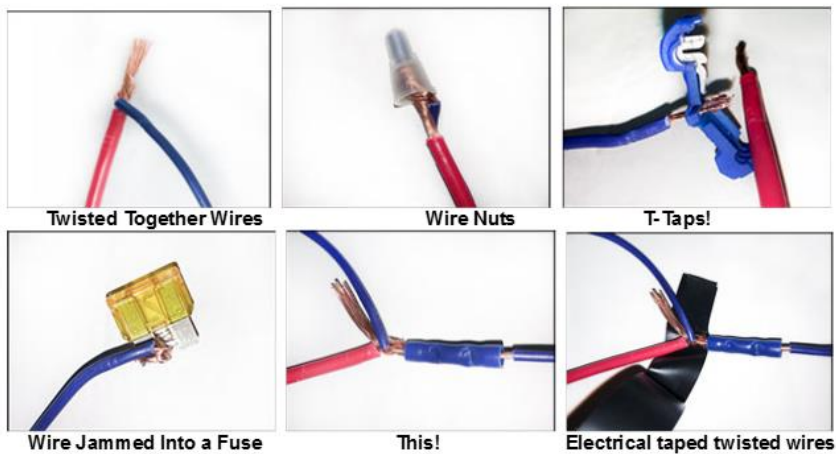
Step 1:

To delete a file from the SD card, select your target file name listed and press [Delete from SD]. Deletion from the SD card is permanent so use care when deleting files.

Wiring Harness Identification



ATTENTION! VERY IMPORTANT!
DO NOT resort to any of these “wiring” methods!



You'll Thank Us Later!

These are Acceptable!



OEM Quality Connectors (supplied)



Soldered Connection w / heat shrink (supplied)

NOTE: It is normal for the Blackheart Exhaust System to emit smoke for the first few minutes during break-in period.

LIMITATION OF LIABILITY – DISCLAIMER:

The regulation of emissions production, noise levels, and safety standards is undertaken by the federal government, each of the fifty state legislatures, and by many local municipalities, towns, and counties.

HOKKER™ makes no warranties of merchantability, of fitness for particular purpose, or that its products are approved for general use, or that its products comply with laws, regulations, or ordinances in the state where they may be sold to the ultimate purchaser, the consumer.

Unless expressly stated to the contrary in the catalog, instruction sheet; or price list, the entire risk as to the conformity of any company product in any such state and as to repair should the product prove to be defective or non-conforming, is on the retail purchaser, the buyer, the ultimate consumer, of such product and it is not upon the seller, distributor, or manufacturer.

In this connection, the retail purchaser, the buyer, the ultimate consumer assumes the burden of the entire cost of any and all necessary service, alterations, or repair.

THE FOREGOING STATEMENT LIMITS THE LIABILITY OF THE MANUFACTURER.

California vehicle code, sections 27156 and 38391, prohibits the advertising, offering for sale, or installation of any device, which modifies a vehicle's emission control system, unless exempted, unless otherwise noted. HOKKER™ Headers that have not received an Executive Order (E.O.) exemption from these code sections are not legal for sale or use in California on vehicles originally equipped with catalytic converters, except for racing vehicles, which may never be driven upon a highway. Check with your local authorities to determine if these headers are legal for use in your particular area.

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