



**550-510, 550-511 & 550-516
REFERENCE MANUAL
199R11031**

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Read this manual before using this product!

WARNING!










This instruction manual must be read and fully understood before beginning installation. If the instructions are not fully understood, installation should not be attempted. Failure to follow the instructions may result in subsequent system failure and could result in serious personal injury and/or property damage. Keep this manual.














For the safety and protection of you and others as well as your vehicle, only a trained mechanic having adequate fuel system experience should perform the installation, adjustment, and repair.

While undertaking any work involving the fuel system, it is particularly important to remember one of the very basic principles of safety: fuel vapors are heavier than air and tend to collect in low places where an explosive fuel/air mixture may be ignited by any spark or flame resulting in property damage, personal injury, and/or death. Extreme caution must be exercised to prevent spillage and thus eliminate the formation of such fuel vapors. All work involving this product and the fuel system generally **MUST** be performed in a well-ventilated area. Do **NOT** smoke or have an open flame present near gasoline vapors or an explosion may result.

Any components damaged due to failure to follow these instructions will not be covered by the warranty. Failure of any one component does not constitute, nor does it justify, warranty of the complete system. Individual service items are available for replacement of components. If assistance is required or if you need further warranty clarification, please call Holley Technical Service at 1 (270) 781-9741.

PARTS IDENTIFICATION

ITEM #	IMAGE	DESCRIPTION	QTY	SERVICE P/N	NOTES
1		Bosch Wide Band Oxygen Sensor	1	554-155	<ul style="list-style-type: none"> Use of leaded fuel will degrade sensor. Prolonged use will require periodic replacement. Mounting procedure below is critical for system performance
2		Clamp-on Oxygen Sensor Bung	1	534-58	<ul style="list-style-type: none"> Requires 3/4" hole to be drilled Mounting procedure below is critical for system performance In order to help prevent condensation in the exhaust from damaging the sensor, ensure that the sensor is installed with at least 10 degrees of vertical angle.
3		Coolant Temperature Sensor	1	543-120	<ul style="list-style-type: none"> 3/8" NPT Threads – Adapters to 1/2" NPT are available Must be installed in a coolant passage in either the intake manifold or cylinder head. Do not install in thermostat housing.
4		Sniper EFI Throttle Body Assembly	1	N/A	<ul style="list-style-type: none"> Dual Bolt Pattern style mounting flange Includes ECU, injectors, MAP sensor, TPS, IAT sensor, and IAC
5		Air Cleaner Gasket	1	108-4	<ul style="list-style-type: none"> Hardware and gaskets for mounting throttle body to intake manifold Should be tightened down progressively in a criss-cross pattern to 5-7ft./lbs. Overtightening will damage throttle body!
6		5/16-24 Nuts	4	N/A	
7		Washers	4	N/A	
8		Flange Gasket	1	108-10	
9		Manifold Flange Studs	4	N/A	

10		3.5" Touch Screen Controller	1	553-115	<ul style="list-style-type: none"> Includes harness to connect directly to CAN connector
11		Grommet	1	N/A	<ul style="list-style-type: none"> Used to route Main Harness through firewall Requires 2" hole to be drilled using a hole saw
12		Output Harness	1	558-491	<ul style="list-style-type: none"> Mates to Input/Output connector on Main Wiring Harness and can be used for A/C Shutdown, Electric Fan #1 Output, and/or Electric Fan #2 Output.
13		Main Harness and Ignition Adapter	1	558-490	
14		Coil Driver Module	1	556-150	
		Throttle Bracket, Throttle and Transmission	1	1953	<ul style="list-style-type: none"> Used for throttle cable and transmission kickdown
17		Throttle Bracket, Throttle Only	1	1953	<ul style="list-style-type: none"> Used on applications with no transmission kickdown
18		1/4-20 x 5/8 Socket Head Cap Screw	1	N/A	<ul style="list-style-type: none"> Used to secure throttle cable bracket to throttle body with a lock washer
19		Throttle and Cruise Control Stud	1	20-36	<ul style="list-style-type: none"> Used for various throttle and/or transmission combinations
20		Throttle Lever Ball	1	20-2	<ul style="list-style-type: none"> Used to secure throttle cable bracket to throttle body with a lock washer
21		Throttle Lever Stud	1	20-37	<ul style="list-style-type: none"> Used for various throttle and/or transmission combinations
22		Transmission Kickdown Stud	1	20-40	
23		Lock Washers	3	N/A	
24		1/4-28 Nuts	2	N/A	



MASTER KIT FUEL SYSTEM INSTALLATION

DANGER! Take precautions to ensure that all fuel components are away from heat sources, such as the engine or exhaust pipes. A fire or explosion hazard could cause serious injury or death!

DANGER! Before disconnecting or removing fuel lines, ensure the engine is cold. Do not smoke. Extinguish all open flames. An open flame, spark, or extreme heat near gasoline can result in a fire or explosion causing property damage, serious injury, and/or death.

DANGER! Never get under a vehicle supported only by a jack. Serious injury or death can result from vehicles falling off of jacks. Before working underneath a vehicle, support it solidly with jack stands.

Parts Identification

ITEM	DESCRIPTION	QTY	SERVICE PART
1	Universal Electric Fuel Pump	1	12-920
2	40ft of 3/8" Vapor Guard Fuel Hose	1	760066ERL
3	3/8" Vapor Guard Hose Clamps	11	750006ERL
4	Post Fuel Filter 10 micron	1	Holley P/N 562-1 or NAPA P/N 3482
5	Pre Fuel Filter	1	NAPA P/N 3033
6	Mechanical Fuel Pump Block-off Plate & Gasket	1	N/A
7	-6AN to 3/8" Vapor Guard Hose End	4	750166ERL
8	Fuel Cuff (240MM long)	1	12-719
9	9/16" Stat-O-Seal	2	178009ERL
10	-6AN Bulkhead Nut	2	24506063
11	-6AN Bulkhead Fitting	1	23506063



1



2



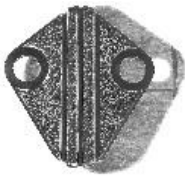
3



4



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6



7



8



9



10



11

Fuel Pump and Filter Installation

The following section covers the installation of the in-line pump as well as the pre and post filters. **The fuel pump MUST be mounted lower than the lowest part of the fuel tank, and as close to the tank as possible. The fuel tank must also be properly vented.**

1. Use **Figure 1** below as a reference for the orientation and location of the fuel system components:

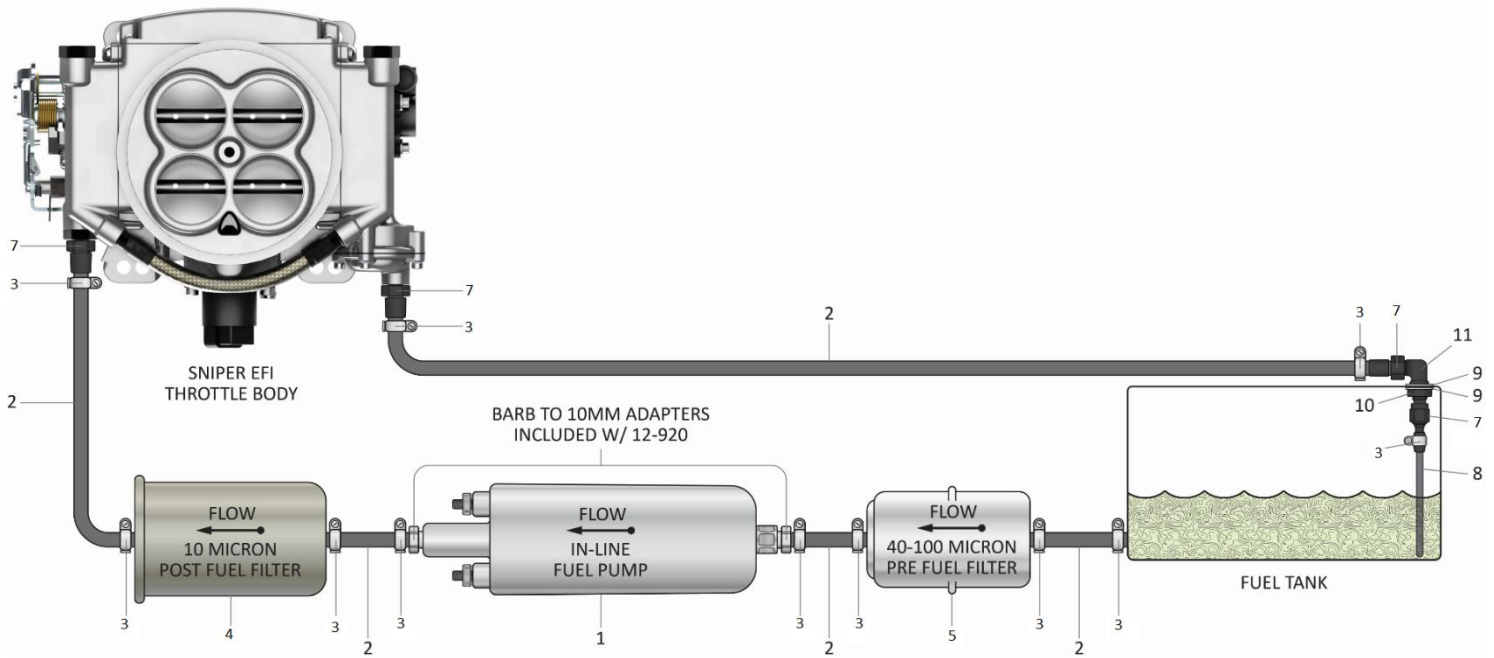


Figure 1

2. Mount the electric fuel pump as close to the fuel tank outlet as possible with the bracket provided. Mounting the fuel pump in this manner will insure that the pump will prime easily to ensure faster starts.
3. There are two filters included with this kit. The pre-filter (**Item 5**) **MUST** be installed between the fuel tank and the fuel pump inlet (unless an in-tank pump is used in place of the pump in this kit). The purpose of this filter is to protect the fuel pump from particles of dirt or other foreign material. The filter should be installed with the arrow on the filter pointing in the direction of the fuel flow.
4. The post-fuel filter (**Item 4**) should be installed between the electric pump outlet and TBI unit. This is a 10 micron EFI filter. Position the filter, so the fuel hoses can be routed without kinks or sharp bends. The filter should be installed with the arrow on the filter pointing in the direction of the fuel flow (**Figure 2**).



Figure 2

WARNING! Ensure both filters are installed in the proper direction. A flow direction arrow is printed on the side of the filter to indicate the direction of fuel flow. Failure to do so will result in a system malfunction.

Return Line Bulkhead Fitting Installation

The Sniper EFI system requires a return fuel line to the fuel tank. This kit includes the hose and fittings necessary for a return line installation on most vehicles. Some late model vehicles that were originally equipped with a throttle body injection system may already have a return line to the fuel tank that can be utilized. The return line must not present a pressure restriction to the return fuel flow. There should never be more than approximately 3 PSI of pressure in the return line. A line that is too small, or has restrictions will cause tuning problems with the system.

DANGER! Do not use the vapor canister lines as a fuel return line. Possible fuel leaks may create a fire or explosion hazard, causing serious injury or death.

DANGER! Proper installation of the fuel return line will necessitate complete removal of the fuel tank. This work should be done by a fuel tank specialist, who regularly does this work and is familiar with safety regulations and precautions necessary to do this work. If a person attempts this work, who is not familiar with the safety regulations and precautions, an explosion hazard may result causing serious injury or death.

1. Choose an ideal location for the bulkhead fitting to be installed. The fitting must be installed through a flat surface where the nut can be tightened from the bottom. It must also be installed in a location where the fuel cuff will not interfere with the

sending unit float. If possible, we strongly recommend removing, cleaning, and drilling into the sending unit. The fitting must be oriented as shown below in **Figure 3**. The item numbers from the parts identification list are referenced.

DANGER! IF DRILLING INTO TANK (RATHER THAN SENDING UNIT), HOLLEY RECOMMENDS HAVING YOUR TANK PROFESSIONALLY CLEANED BEFORE DRILLING. IF YOU CHOOSE NOT TO HAVE THE TANK PROFESSIONALLY CLEANED, DRAIN THE TANK COMPLETELY, LET DRY, AND FILL WITH WATER.

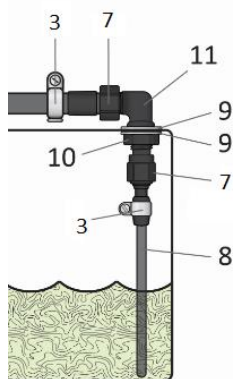


Figure 3

2. Drill a 9/16" hole and debur. Remove all metal shavings and particles from tank.
3. Install bulkhead fitting with one Stat-O-Seal above the surface, and one below.
4. Screw the bulkhead nut onto fitting from the bottom, inside of the tank. Snug with a wrench. A spare bulkhead nut has been provided and will not be used in this installation.
5. Insert the barbed end of a straight Vapor Guard hose end (**Item 7**) into an end of the fuel cuff (**Item 8**) and ensure the cuff is fully installed on the provided hose barb fitting. **NOTE:** Some assembly lubrication may be required.
6. Slide hose clamp (**Item 3**) over fuel cuff and fitting and tighten to secure.
7. Screw fuel cuff assembly to bottom of bulkhead nut and snug with a wrench. Ensure bottom of cuff will be submerged in fuel as shown in **Figure 3**. Cuff can be trimmed if necessary.

Fuel Line Installation

With the fuel pump, filters, and bulkhead fitting all in place. You are now ready to install the fuel lines. Some connections will use hose clamps (**Item 3**), while others will use AN hose ends (**Item 7**). These connections are noted in **Figures 1 & 3**. Be sure to read and thoroughly understand all steps, notes, and hose assembly instructions below before proceeding with the fuel line installation.

DANGER! Failure to use a fuel hose that meets SAE J30 standards could result in fuel leaks. A fuel leak may result in a fire or explosion hazard, which could cause serious injury or death.

DANGER! Failure to use a steel fuel line that meets SAE J526 standards could result in fuel leaks. A fuel leak may result in a fire or explosion hazard, which could cause serious injury or death.

DANGER! Rigid fuel line tubing should be used for under vehicle runs, such as along vehicle frame rails or under floor pans. Failure to do so is a potential fire or explosion hazard, which could cause serious injury or death

1. If using steel line, the hose (**Item 2**) can be used to connect the steel line to the pump and filters. You should not connect a rubber hose directly to a steel line unless the end of the line has a "bead/nipple" or barb that retains the hose. If the steel line is just cut off, purchase a compression fitting that a barbed hose end can be installed on, or use a tool to roll a bead/nipple on the end of the steel line.
2. If you plan to install a fuel pressure gauge, do so at this time. The Sniper EFI systems are designed for an operating pressure of 58.5 PSI. Although this is factory pre-set, it is ideal that it be checked.
3. If using the existing fuel lines, inspect and replace any hose, clamps, or fuel line showing **ANY** sign of aging.
4. Anchor all fuel lines securely to solid chassis members at 1 ½ foot intervals using rubber coated steel clamps (not supplied). Use of only approved steel fuel line tubing will afford maximum fuel line protection against road hazards and premature wearing due to flexing, temperature extremes, road salt, weather, etc.

Hose Assembly

1. Cut the hose square with a sharp knife or Earls Hand-Held Hose Cutter (D022ERL).



Figure 4

2. Install the fitting, by sliding the fitting into the hose. Make sure the hose seats flush with the fitting (Figure 5).



Figure 5

3. Secure the hose clamp.



Figure 6

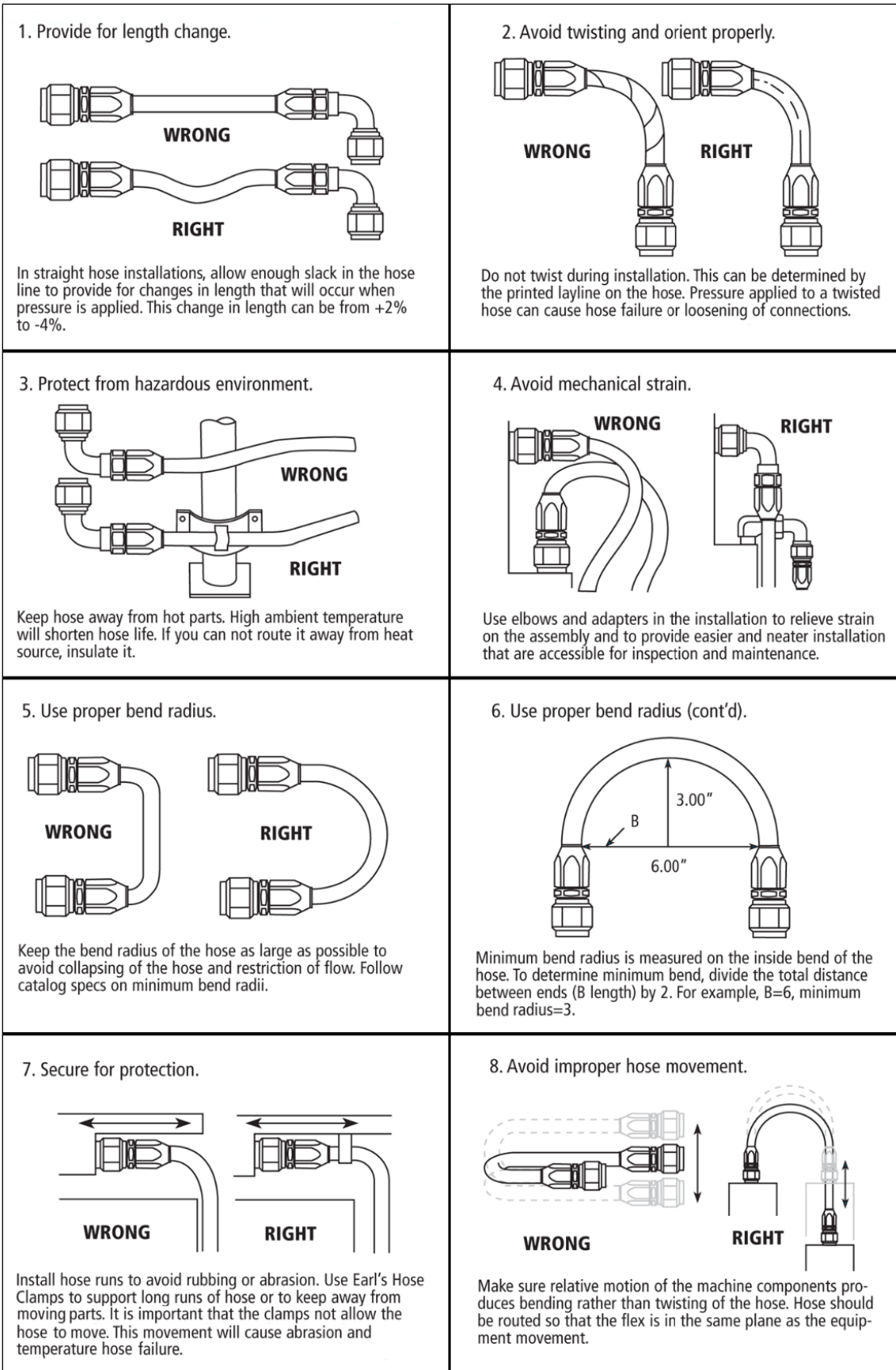


Figure 7



GENERAL WIRING REFERENCE

An EFI system depends heavily on being supplied a clean and constant voltage source. The grounds of an electrical system are just as important as the power side.

Sniper EFI contains multiple processing devices that require clean power and ground sources. The wiring for them must be installed in such a manner that they are separated from “dirty” power and ground sources.

DO'S

- Install the main power and ground directly to the battery. To the POSTS/TERMINALS, not to any other place.
- Keep sensor and crank signal (distributor) wiring away from high voltage or “noisy/dirty” components and wiring, especially secondary ignition wiring (plug wires), ignition boxes, water pumps, fans and other associated wiring. It is best that the plug wires not physically contact any EFI wires.
- Properly crimp or crimp and solder any wire connections. Apply quality heat shrink over any of these connections.
- It is critical that the engine has a proper ground connection from the battery to the chassis, and the battery to the engine.

DON'TS

- NEVER run high voltage or “noisy/dirty” wires in parallel (bundle/loom together) with any EFI sensor wiring. If wires need to cross, try to do so at an angle.
- Don't use the electric fan outputs to directly power a fan. They must only trigger a relay.
- Don't use improper crimping tools.
- Don't use things like “t-taps”, etc. Use proper crimpers/solder and heat shrink.
- It is never recommended to splice/share signal wires (such as TPS, etc.) between different electronic control units (i.e. “piggyback”).
- Don't connect the red/white switched +12V wire to “dirty” sources, such as the ignition coil, audio systems, or 12V sources connected to HID head lamps.
- NEVER start an engine with a battery charger attached

Throttle Body Connections

1. **7 pin Connector** – Connects to the included 558-490 main harness.
2. **10 pin Connector (optional)** – Connects to included 558-491 I/O harness.
3. **Touch Screen LCD Display** – This small 4 pin CAN connector plugs into the 3.5” Handheld Touch Screen display unit.
4. **Coolant Temperature Connector** – Connects to coolant temperature sensor.
5. **Oxygen Sensor Connector** – Connects to oxygen sensor.

Note: All connections on the Sniper system are unique and cannot be plugged into the wrong component.

Pigtail & Loose Wire Connections

1. **Pink Wire = 12V Switched** - Should be connected to a switched +12 volt power source. Power source should only be active when the ignition is on. Make sure source has power when engine is cranking as well (check with voltmeter). Not all sources apply power when the ignition switch is in “cranking” position. **DO NOT connect to a “DIRTY” source like an ignition coil!**
2. **Red Wire = Battery Positive** – Connect directly to the battery post. This powers the Sniper EFI system.
3. **Black Wire = Battery Negative** – Connects directly to battery negative post.
4. **Blue Wire (Optional) = +12v Fuel Pump Relay Power Output** - Used to directly power a fuel pump (max current 15A)

7 Pin Connector

Pin	Color	Labeled Name	Function
E	Red	Battery Positive (+)	Connects directly to battery positive terminal
G	Black	Battery Negative (-)	Connects directly to battery negative terminal
C	Blue	Fuel Pump Output (+)	+12v Fuel Pump Supply from Relay
A	Violet	Crank Signal Positive (+)	Engine Speed Signal Input (see Ignition Wiring Section)
B	Dark Green	Crank Signal Negative (-)	Engine Speed Signal Ground (see Ignition Wiring section)
D	Yellow	Coil (-) Input	Engine Speed Input (see Ignition Wiring section)
F	Pink	Switched Ignition (+12v)	NOTE: must remain powered during cranking

10 Pin Connector – 8 wires are populated. This connector contains:

Pin	Color	Labeled Name	Function
A	Orange	Input #1 (-)	Optional – Connect to a ground triggered A/C relay
B	Yellow	Input #2 (-)	Optional – Connect to a programmable ground input
C	Light Blue	Output #1 (-)	Optional – Connect to Fan #1 relay ground trigger
D	Light Green	Output #2 (-)	Optional – Connect to Fan #2 relay ground trigger
E	Grey	Output #6 (-)	Optional – Connect to ground side trigger of A/C shutdown relay
F	White	Points Output	Used to trigger a CD ignition box or the included Coil Driver Module
G	Dark Brown	Tach Output	Used to drive an aftermarket tachometer
H	Tan	Digital Gauge Output	Used to drive Holley EFI analog gauges via 554-130 Gauge Module

UNUSED WIRES

As you finish the installation of your Sniper EFI you will likely have unused wires. These wires need to be properly taken care of before installation is considered complete or you may end up with problems down the road. You have two options on how to properly handle these wires. The preferred option is to remove them from the connector and insert a weather proof plug in their place. The second option is to shorten the wire and properly seal the end of it to prevent shorting out.

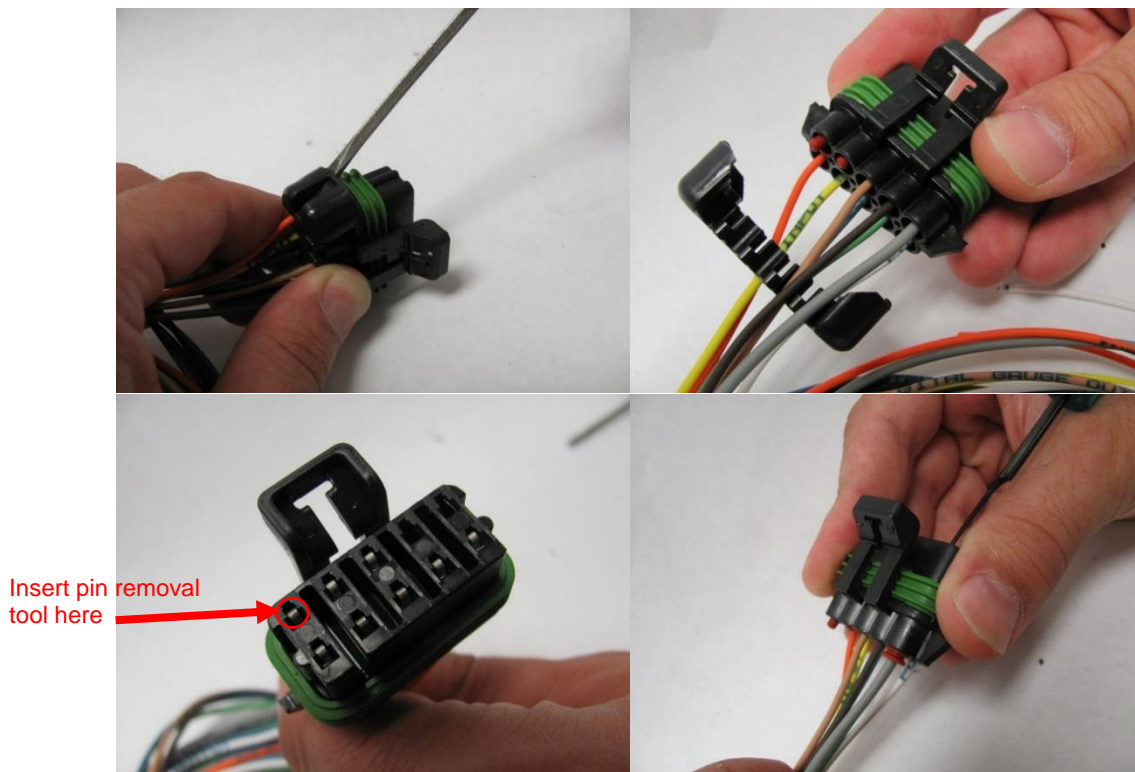
Option 1: Pin Removal

Required tools:

Small flat head screw driver
Pin removal tool # 567-101

Procedure:

1. Use a small screwdriver or other prying tool to gently remove the protective cover from the back of the connector. NOTE: Be careful not to over extend the tabs on the cover or it will not securely fasten during re-installation.
2. Gently insert the 567-101 pin removal tool into the small slot above the pin on front of the connector. It should not require much force and you should feel the tool bottom out solidly in the connector after roughly ¼”.
3. With the removal tool still inserted fully in the cavity gently pull on the wire to remove it.
4. If you will not be putting a sealed wire back in the cavity then you should now install one of the cavity plugs supplied with tool 567-101.
5. Re-install protective cover on back of connector.



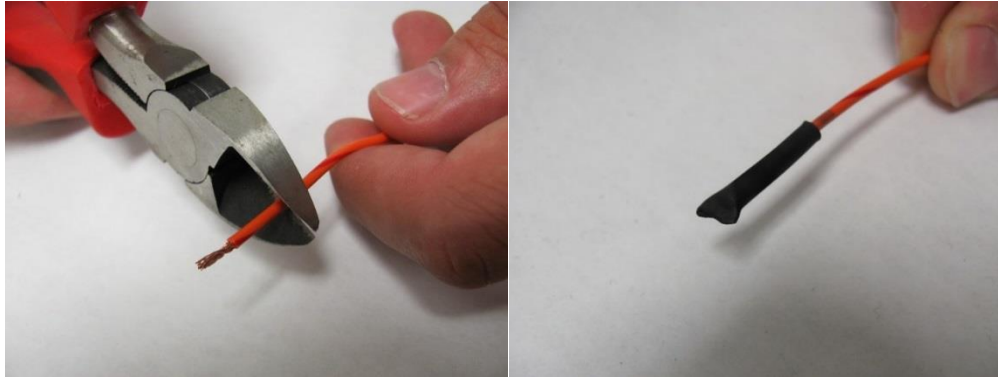
Option 2: Trim and Wrap Wire

Required tools:

Wire cutters
Adhesive heat shrink tubing
Heat source (heat gun or other)

Procedure

1. Disconnect the battery terminals.
2. Cut the end of the wire so that there is no bare copper showing. **NOTE:** Make sure you leave enough length on the wire that you will have room to crimp or solder it at a later date should the need arise.
3. Place a piece of adhesive lined heat shrink roughly 1" long over the wire.
4. With the heat shrink tubing placed so it is covering the wire with two thirds of its length apply heat to shrink the tubing.
5. Give the heat shrink a small pull to verify that it is solidly attached.



Pre-configured Inputs and Output wiring for Nitrous Wizard Calibrations

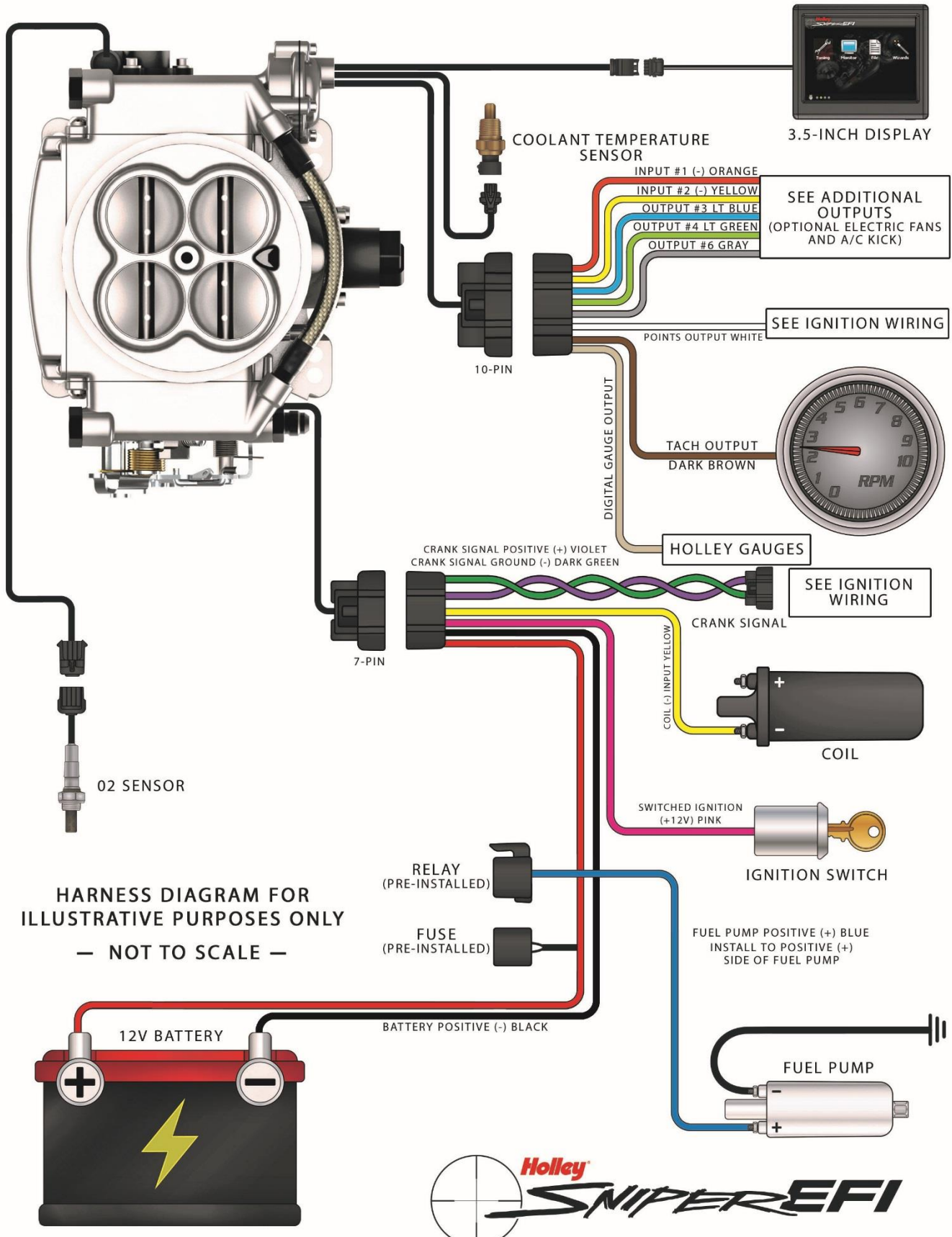
7 Pin Connector

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E	Red	Battery Positive (+)	Connects directly to battery positive terminal
G	Black	Battery Negative (-)	Connects directly to battery negative terminal
C	Blue	Fuel Pump Output (+)	+12v Fuel Pump Supply from Relay
A	Violet	Crank Signal Positive (+)	Engine Speed Signal Input (see Ignition Wiring Section)
B	Dark Green	Crank Signal Negative (-)	Engine Speed Signal Ground (see Ignition Wiring section)
D	Yellow	Coil (-) Input	Engine Speed Input (see Ignition Wiring section)
F	Pink	Switched Ignition (+12v)	NOTE: must remain powered during cranking

10 Pin Connector – 8 wires are populated. This connector contains:

Pin	Color	Labeled Name	Function
A	Orange	Input #1 (-)	Nitrous Master Enable – Switched ground trigger (Required)
B	Yellow	Input #2 (-)	Nitrous Input #1 – Switched ground trigger (Required)
C	Light Blue	Output #1 (-)	Optional – Connect to Fan #1 relay ground trigger
D	Light Green	Output #2 (-)	Optional – Connect to Fan #2 relay ground trigger
E	Grey	Output #6 (-)	Nitrous Relay Trigger - Ground side trigger for the Nitrous relay
F	White	Points Output	Used to trigger a CD ignition box or the included Coil Driver Module
G	Dark Brown	Tach Output	Used to drive an aftermarket tachometer
H	Tan	Digital Gauge Output	Used to drive Holley EFI analog gauges via 554-130 Gauge Module

SYSTEM WIRING OVERVIEW



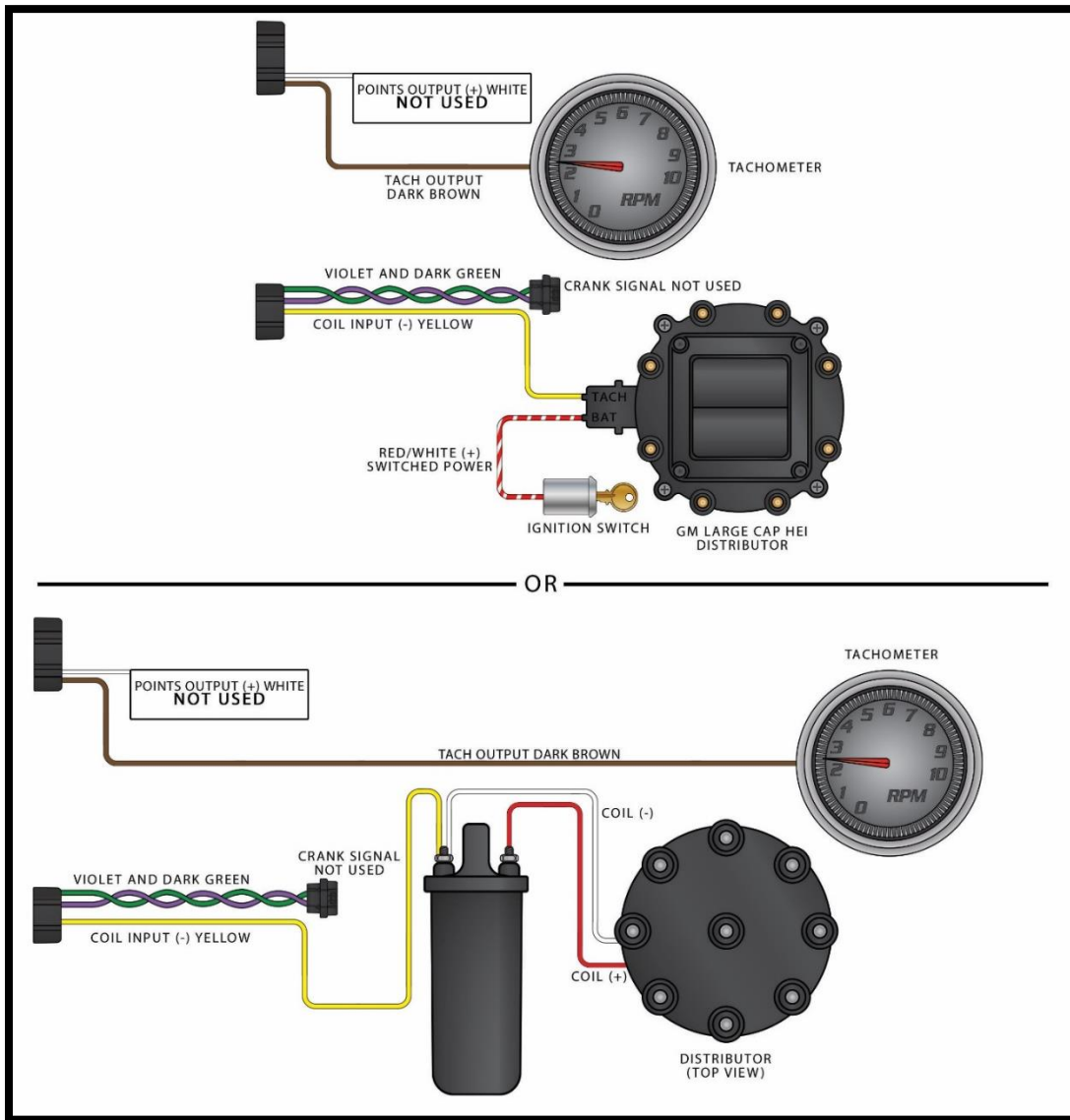


IGNITION WIRING

Coil (-) [no timing control]

This Yellow wire marked "Coil-" is an RPM input wire used for the following applications:

- A stock type mechanical advance distributor with a stock inductive ignition coil. Examples of this would be any older style points distributor.
- A 1974-1981 GM large cap HEI or aftermarket replacement.



WARNING! Do NOT use this input if you are using an aftermarket Capacitive Discharge (CD) ignition system such as a MSD, Mallory, or others. The ECU will be damaged if you connect to a capacitive discharge type ignition coil.

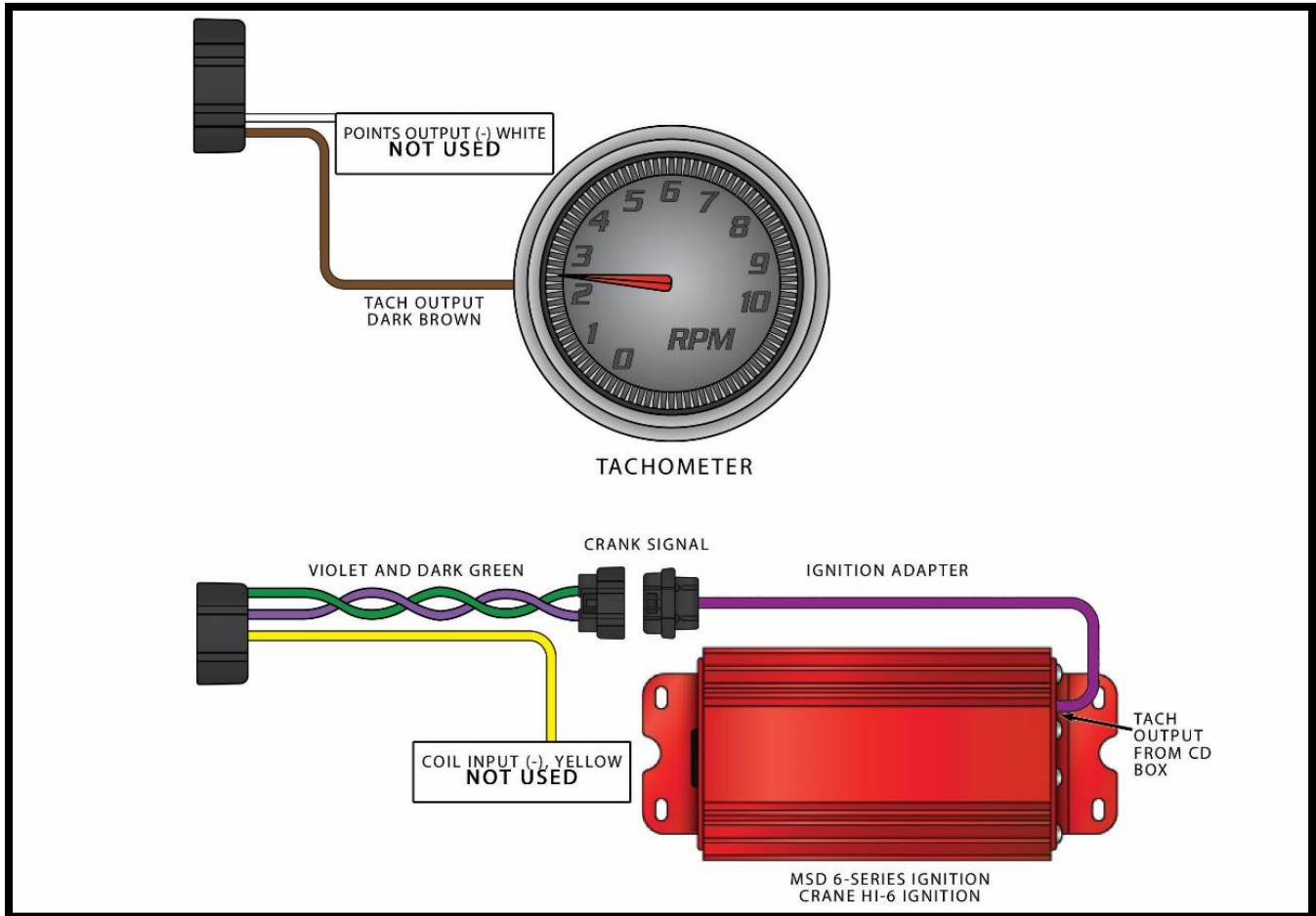
NOTE: Using this input, the EFI will **NOT** control the ignition timing of the engine. The timing will be based on the distributor initial, mechanical, and vacuum advance, just like it did with a carburetor.

Ignition Box Tach Output [no timing control]

This requires use of the Ignition Adapter / Purple Wire that comes packaged with the main power harness.

- If you are using an aftermarket Capacitive Discharge (CD) ignition system such as a MSD, Accel, or others, you need to connect to the "Tach Out" connection or wire these systems provide. This is a 12 volt square wave output.

OPTION 2 WIRING "Tach Out":



CAUTION! NEVER connect any of the EFI wires to the coil on any CD type ignition system. The ECU will be permanently damaged!

NOTE: Using this input, the EFI will **NOT** control the ignition timing of the engine. The timing will be based on the distributor initial, mechanical, and vacuum advance, just like it did with a carburetor.



Timing Control Preface:

The Sniper EFI has the ability to control the engines ignition timing. This is an optional feature and is NOT required for proper functioning of the fuel injection. By implementing ignition timing control through the Sniper EFI, the engine will have more precise control and an improved idle. Please refer to the following instructions on how to use this feature.

Holley recommends that those who wish to use the Sniper's timing control feature first get the engine running without timing control. Splitting the timing control into a secondary process will add very little time to the total install, but could significantly help with trouble shooting, should it be needed.

MSD (magnetic) Distributor [Timing Control]

Before beginning please know the following:

You will need to lock out the advance on the distributor if it is not already done.

You will need an adjustable rotor (available from MSD.)

You will need a timing light.

You will need a mark on the balancer at 15 degrees before top dead center (BTDC). If your balancer is not already marked, please follow step one in the distributor removal section to create a mark on your balancer using a paint pen.

Overview:

Sniper EFI can control timing using most common magnetic pickup distributors currently available (ex. MSD). However you may need to make several very simple changes to the distributor which are outlined in the following section. It is very important that you "lock out" the advance built in to the distributor and install an adjustable rotor. Not "locking out" the distributor and installing an adjustable rotor as outlined in these instructions can cause the engine to run poorly or even cause engine damage.

NOTE: These instructions are directed toward MSD distributor installations however the same basic things need to be done with any magnetic pickup distributor before being used with Sniper EFI.

DISTRIBUTOR REMOVAL:

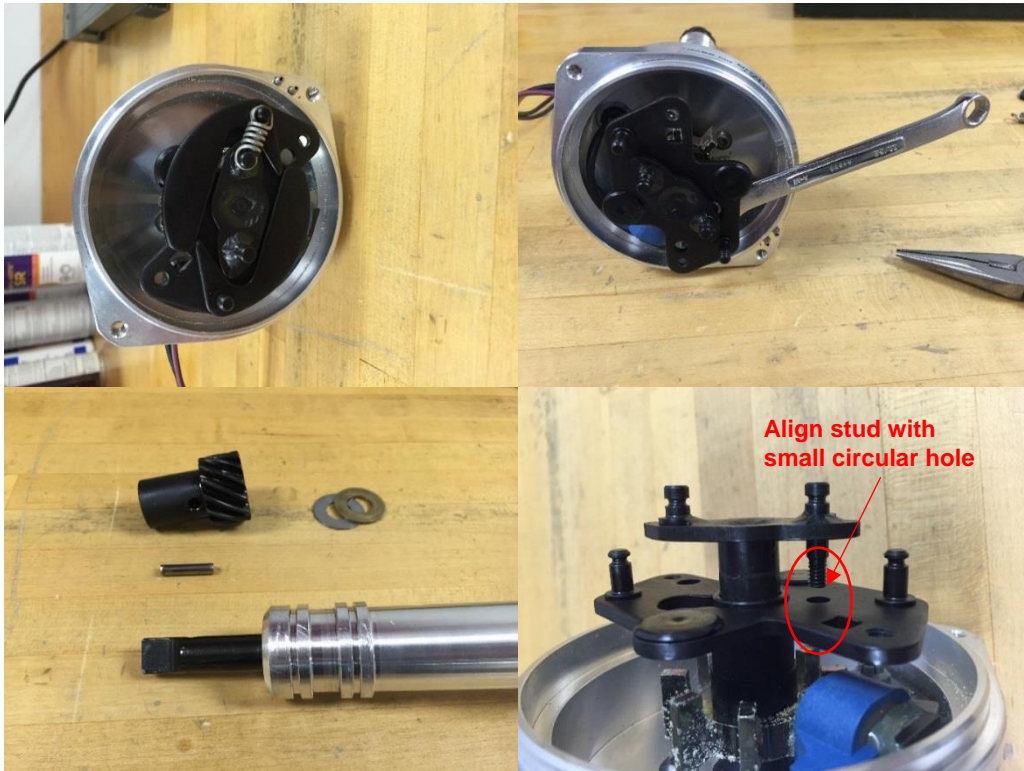
1. Disconnect the Battery NEGATIVE (-) cable.
2. Disconnect the power and or ground connection at the coil/coils. Tape up any non-insulated power and ground terminals to eliminate any chance of a short circuit.
3. Rotate the crankshaft in the direction of engine rotation until it reads 15 degrees before top dead center (BTDC) on the compression stroke. Take the distributor cap off and make sure that the rotor is pointing to cylinder #1. If not, rotate the crankshaft one full revolution (as the engine is not on the compression stroke).
4. If your balancer is not marked at 15 degrees, take a tape measure and measure from the 0 degree mark to the following point (mark does NOT have to be exact):

Balancer Diameter	Distance
6"	3/4"
7"	15/16"
8"	1-1/16"

5. Remove spark plug wires and all other wiring/vacuum hoses from distributor.
6. Remove distributor hold-down. Lift the distributor upwards and remove.

Distributor Lock Out Procedure

1. Remove the Rotor from the distributor.
2. Remove the advance components including the springs, weights, lock nut, and the advance stop bushing from the advance assembly.
3. Remove the roll-pin from the drive gear and then remove the gear from the housing shaft.
4. Slide the shaft up approximately two inches out of the housing.
5. Rotate the shaft 180° so the threaded stud now goes into the locating hole in the base. Insert the advance stop bushing pin into the small hole on the base followed by the lock nut.
6. Tighten the lock nut down. This has now "locked out" the mechanical advance.
7. Slide the drive gear back on to the shaft and line up the dowel holes. Drive in the dowel pin to complete reassembly of your distributor

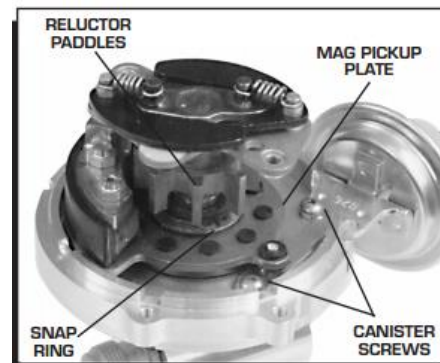
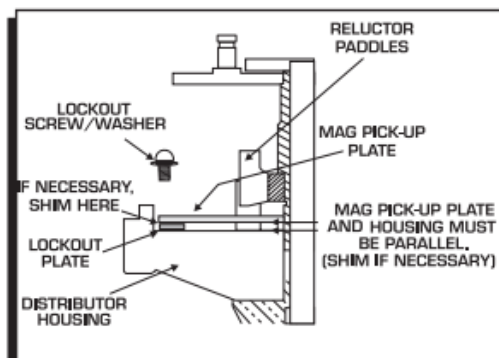


VACUUM ADVANCE

If your distributor has vacuum advance it will need to be removed and locked out, use the following steps.

1. Remove the two Allen head screws that hold the advance canister.
2. Remove the snap ring that holds the magnetic pickup assembly in place.
3. Gently lift up on the mag pickup plate and slide the vacuum canister out.
4. Install the Lockout Plate in place of the canister. Install the two retaining screws.
5. Install the supplied screw and washer through the Lockout and tighten.
6. It is important to make sure the pickup plate is parallel with the housing of the distributor. If it is cocked or slanted, the paddles of the reluctor may contact the pickup. Check the clearance by rotating the distributor shaft. If necessary, use the shims that were supplied with your distributor under the Lockout hold-down to correctly position the pickup plate.

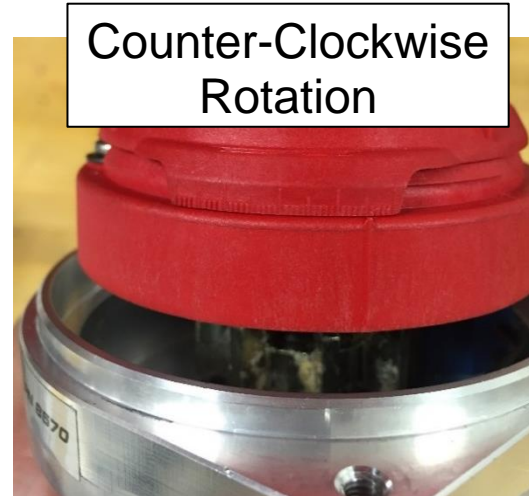
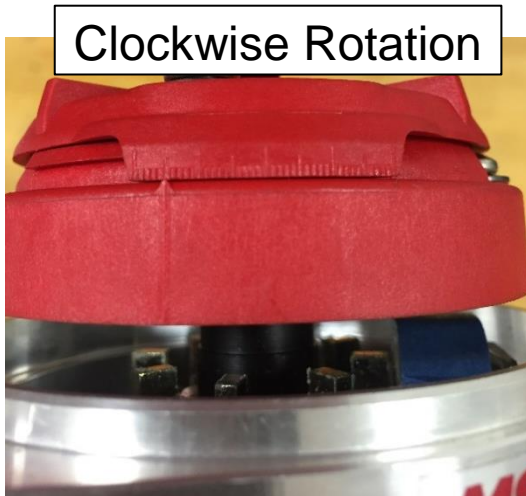
Note: If no shims were required, use one beneath the washer of the Lock-Out Hold Down Screw.



INSTALL THE ADJUSTABLE ROTOR

1. Install the adjustable rotor MSD PN 84211 or PN 8421 on to the distributor shaft (See note below for applications)
2. Set the phasing of the adjustable rotor by putting it retarded (opposite of distributor rotation) 15° on the rotor indicator. See Pictures for reference.

Note: For standard GM size MSD distributors, use rotor PN 84211. For larger, Ford style MSD distributors it is recommended to fit the distributor with a smaller cap (PN 8433) and the PN 84211 rotor. If the larger cap must be used, try rotor PN 8421.

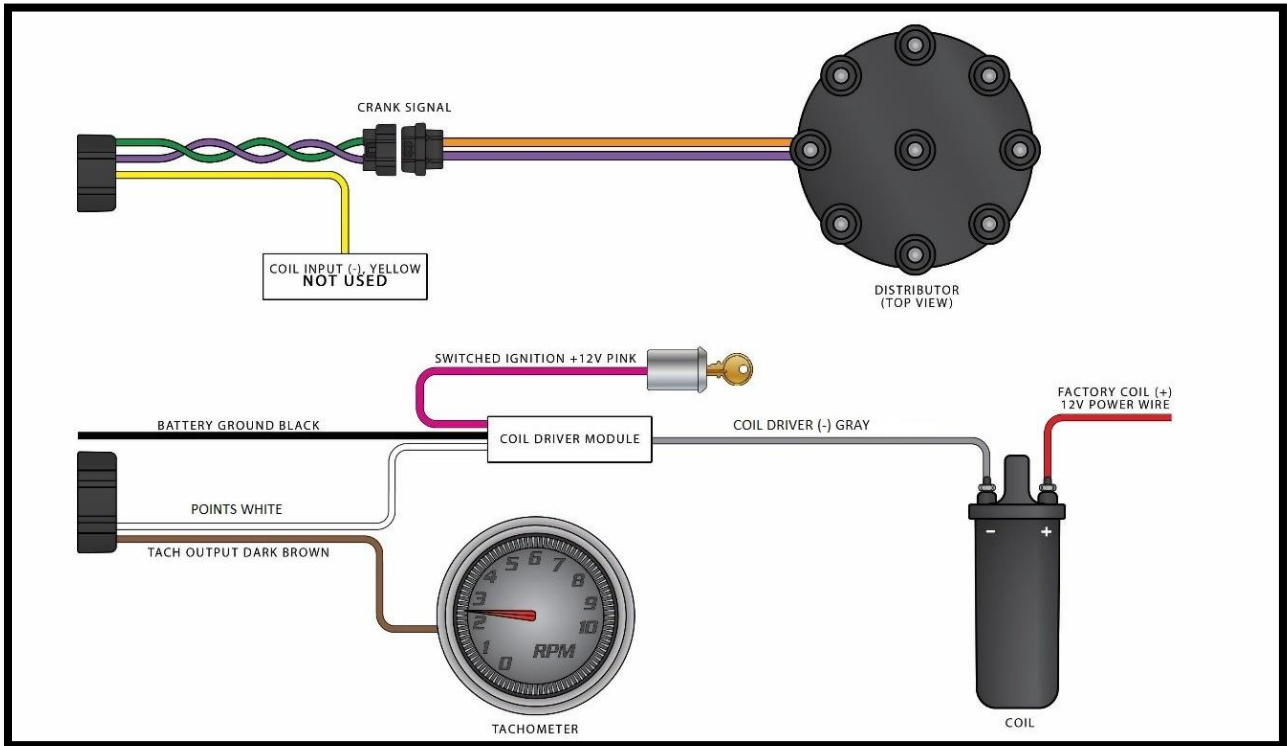


INSTALL THE DISTRIBUTOR

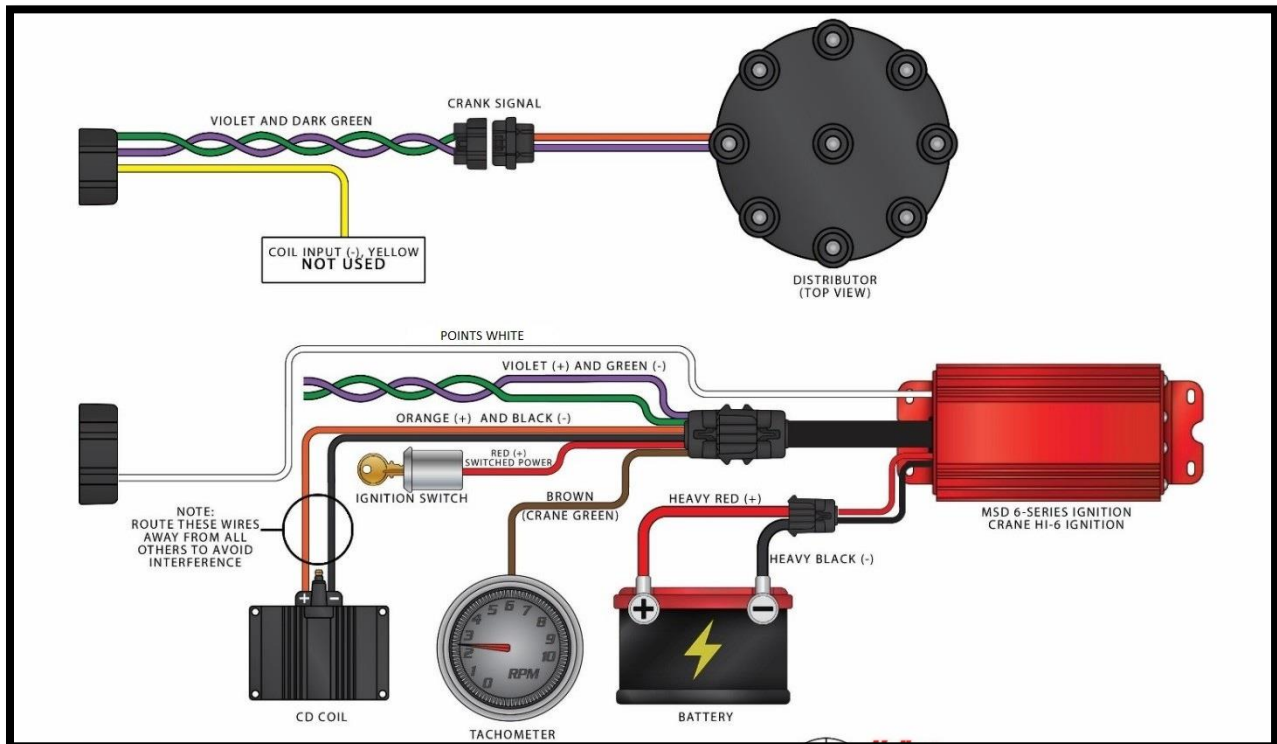
NOTE: If the engine block or heads have been milled, make sure that the distributor will fully seat and not bind or bottom out on the oil pump drive. A quick check is to remove the distributor gasket, and make sure that the distributor still fully seats on the mounting surface. If it does not, further investigation is needed.

1. Rotate the crankshaft in the direction of engine rotation until it reads 15 degrees before top dead center (BTDC) on the compression stroke if it is not already there.
2. Install the distributor gasket on the base of the distributor. Some adhesive can be installed on the distributor side if desired to hold it in place.
3. If the engine has already been broken in/run previously and is about to be fired immediately after the distributor install, coat the gear with motor oil. If the engine is new or will sit a while before it is fired, coat the distributor gear with a moly paste or camshaft break-in lube.
4. Position the rotor contact so it is pointing to the desired direction of the #1 spark plug wire. Insert the distributor and insure that it is fully seated (**see NOTE at beginning of section**). The rotor will rotate as you insert the distributor. If it does not land in the location you desire, remove the distributor and back it up a tooth or two at a time until you are satisfied with its location. You will need to make sure the oil pump drive shaft is turned in a direction that allows for the distributor shaft to mesh with it. You may have to turn the shaft with a long screwdriver or Allen wrench to position it.
NOTE: An engine oil priming tool is an ideal alternative to aid in aligning the oil pump drive shaft. Make sure that the drive shaft meshes and the distributor fully seats.
5. Install and snug the distributor hold down.
6. At this time you should test fit the distributor cap ensuring that the #1 cylinder terminal aligns with the rotor. You should move the body of the distributor to correct for any misalignment at this time.
7. Finish tightening the distributor hold down and install your cap and plug wires in the correct firing sequence for your engine.
8. Connect the 2 wire connector on the distributor to the matching connector on your Sniper EFI power harness. Connect the white points output wire either to the Holley coil driver module or the Points input wire on your ignition box. Refer to the following wiring diagrams to complete the wiring.
9. Refer to page 22 for directions on initial startup and how to sync the distributor.

MSD (Mag) Distributor w/ Direct Drive Coil



MSD (Mag) DISTRIBUTOR W/ CAPACITIVE DISCHARGE BOX (Such as MSD 6AL)



Timing Control Preface:

The Sniper EFI has the ability to control the engines ignition timing. This is an optional feature and is NOT required for proper functioning of the fuel injection. By implementing ignition timing control through the Sniper EFI, the engine will have more precise control and an improved idle. Please refer to the following instructions on how to use this feature.

Holley recommends that those who wish to use the Sniper's timing control feature first get the engine running without timing control. Splitting the timing control into a secondary process will add very little time to the total install, but could significantly help with trouble shooting, should it be needed.

Holley Dual Sync Distributor [Timing Control]

Holley EFI Dual Sync distributors are designed to work with Sniper EFI systems with the addition of an adapter harness (Holley #558-493). The design of these distributors includes dual Hall Effect sensors for the crankshaft and camshaft signals. They can be used as just a crank speed input for applications such as Sniper EFI. The precision machined shutter wheel design ensures accurate timing, even at very high engine speeds making them an excellent choice for Sniper installations utilizing timing control.

NOTE: It is recommended that you use a Holley Dual Sync distributor if you are using a Hall Effect input for your rpm signal. However Sniper EFI will accept a 1x per fire hall effect signal from other devices. It is up to the customer to verify compatibility and proper installation procedure with anything other than a Holley Dual Sync distributor.

NOTE: Holley distributors comes with a hardened steel distributor gear that should be compatible with all applications, other than a billet steel camshaft. If a billet steel camshaft is used, a bronze gear is recommended. (See P/N's at end).

1. Prior to installing the distributor you will need to have properly setup your Sniper EFI for the Holley Dual Sync Distributor using the setup wizard. Failure to properly configure the ignition settings prior to distributor installation may cause erroneous LED readings during the alignment procedure.

Once you have run the setup wizard to properly configure your Sniper EFI, proceed to Distributor removal.

DISTRIBUTOR REMOVAL:

1. Disconnect the Battery NEGATIVE (-) cable.
2. Disconnect the power and or ground connection at the coil/coils. Tape up any non-insulated power and ground terminals to eliminate any chance of a short circuit.
3. Rotate the crankshaft in the direction of engine rotation until it reads 50 degrees before top dead center (BTDC) on the compression stroke. Take the distributor cap off and make sure that the rotor is pointing to cylinder #1. If not, rotate the crankshaft one full revolution (as the engine is not on the compression stroke).
4. If your balancer is not marked at 50 degrees, take a tape measure and measure from the 0 degree mark to the following point (mark does NOT have to be exact):
5. Remove spark plug wires and all other wiring/vacuum hoses from distributor.
6. Remove distributor hold-down. Lift the distributor upwards and remove.

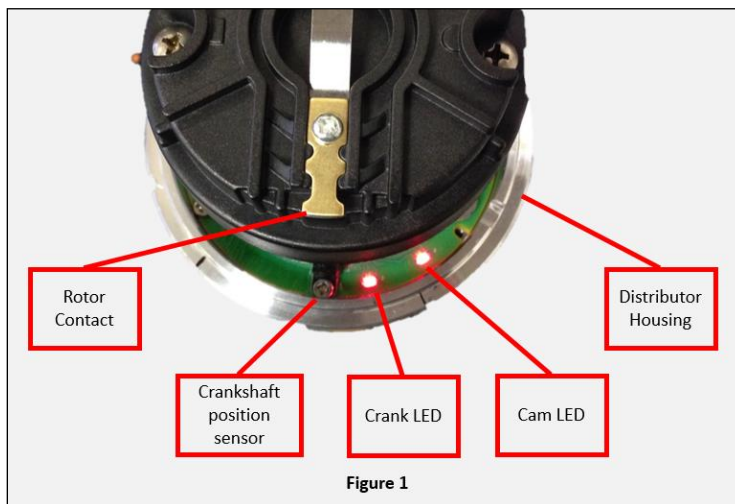
Balancer Diameter	Distance
6"	2-5/8"
7"	3-1/16"
8"	3-1/2"

DISTRIBUTOR INSTALL:

NOTE: If the engine block or heads have been milled, make sure that the distributor will fully seat and not bind or bottom out on the oil pump drive. A quick check is to remove the distributor gasket, and make sure that the distributor still fully seats on the mounting surface. If it does not, further investigation is needed. PN 565-104 utilizes an adjustable slip collar. Ensure that it is properly adjusted to allow for proper housing and gear engagement.

1. Install the distributor gasket on the base of the distributor. Some adhesive can be installed the distributor side if desired to hold it in place.
2. If the engine has already been broken in/run previously and is about to be fired immediately after the distributor install, coat the gear with motor oil. If the engine is new or will sit a while before it is fired, coat the distributor gear with a moly paste or camshaft break-in lube.

3. Position the rotor contact so it is pointing to the desired direction of the #1 spark plug wire. Insert the distributor and insure that it is fully seated (**see NOTE at beginning of section**). The rotor will rotate as you insert the distributor. If it does not land in the location you desire, remove the distributor and back it up a tooth or two at a time until you are satisfied with its location. You will need to make sure the oil pump drive shaft is turned in a direction that allows for the distributor shaft to mesh with it. You may have to turn the shaft with a long screwdriver or Allen wrench to position it. **NOTE:** An engine oil priming tool is an ideal alternative to aid in aligning the oil pump drive shaft. Make sure that the drive shaft meshes and the distributor fully seats.
4. Next, connect the 10 pin distributor connector to the Holley #558-493 adapter harness. **Note: If you have not already completed your installation of the 558-493 harness please do so before continuing.**
5. Reconnect the battery cable(s), **leaving the coil disconnected at this time.**
6. Turn the ignition key to the run position. (**DO NOT CRANK** the engine.) This will power the distributor.
7. **Distributor Alignment:** There are two LED's on the distributor circuit board. These will be used to align the distributor, by indicating when the crank and cam sensors are being triggered. The crank and cam LED's are noted in **Figure 1** below.



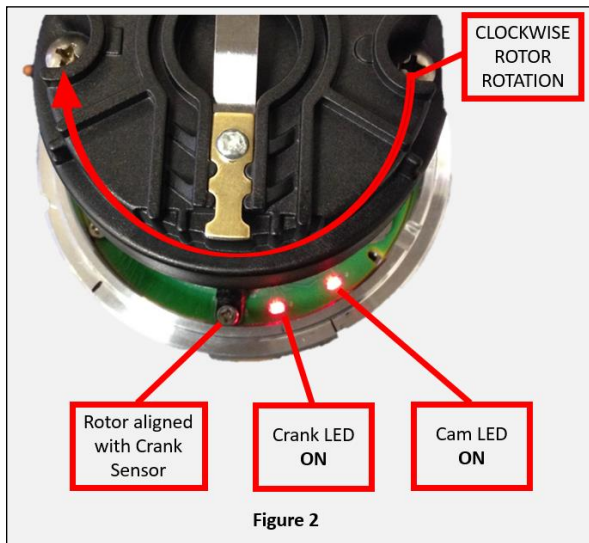
NOTE: All adjustments will be made by rotating the distributor housing only. **DO NOT ROTATE THE CRANKSHAFT** as it should remain at 50 degrees BTDC.

LED (**ON**) represents digital falling. LED (**OFF**) represents digital rising

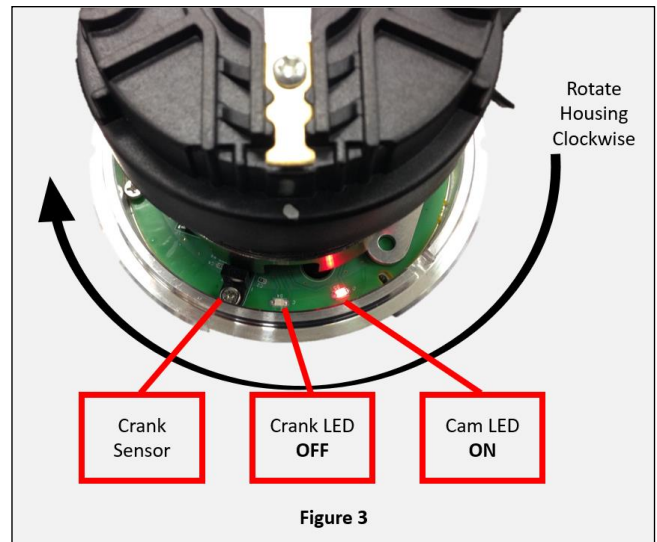
Your distributor will rotate clockwise or counter-clockwise. You will need to determine the proper direction of rotation before proceeding.

Engine Family	Rotor Rotation
Small/Big Block Chevy	Clockwise
Chrysler Small Block	Clockwise
Ford 351W	Counter-Clockwise
Ford 302	Counter-Clockwise
BB Chrysler Wedge	Counter-Clockwise
Ford FE	Counter-Clockwise
Oldsmobile	Counter-Clockwise
Pontiac	Counter-Clockwise

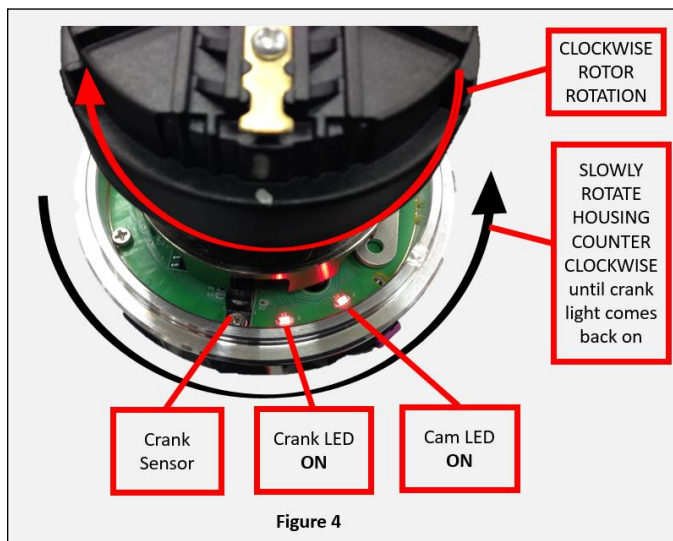
Clockwise Rotor Rotation: (See chart to determine what direction your distributor rotates.)



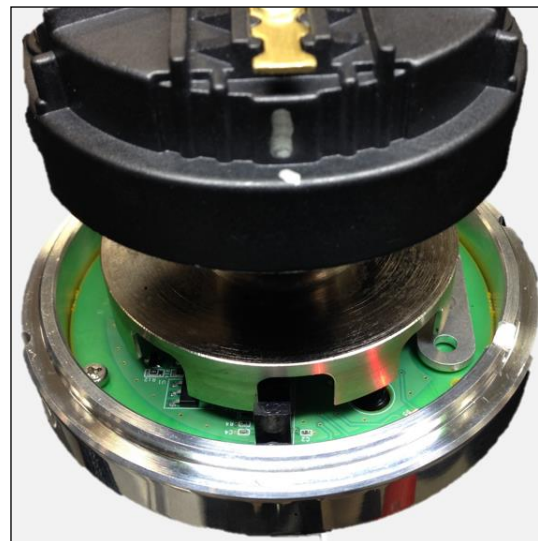
For engines that have the rotor rotating **clockwise**, turn the housing until the rotor contact is pointed at the black crank position sensor (**Figure 2**). Both the cam and crank LED should be illuminated (**ON**).



Slowly turn the housing **clockwise** until the Crank LED goes **OFF** (**Figure 3**).



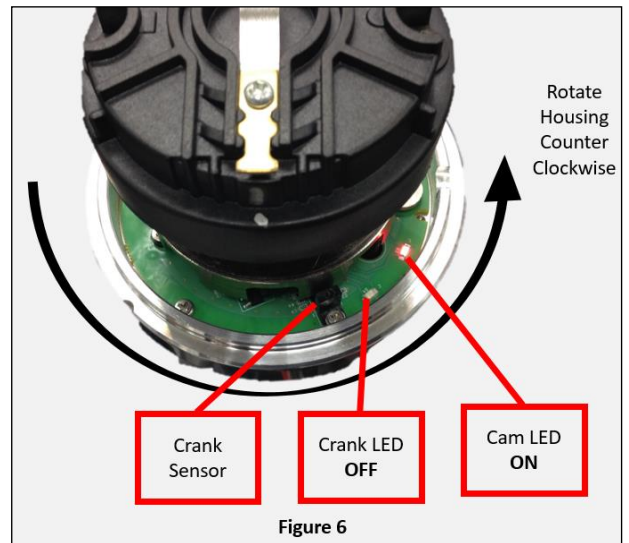
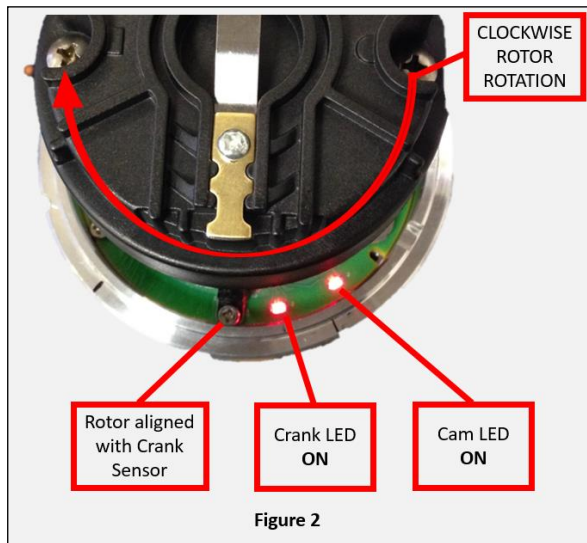
Then slowly turn the housing **counter-clockwise** until the Crank LED comes back **ON** (**Figure 4**). Stop at this point. This will position the distributor close to where it needs to be. Install and snug the distributor clamp down at this point.



The relationship between the crank sensor, shutter wheel opening, and rotor in the picture above should match what is installed in your engine.

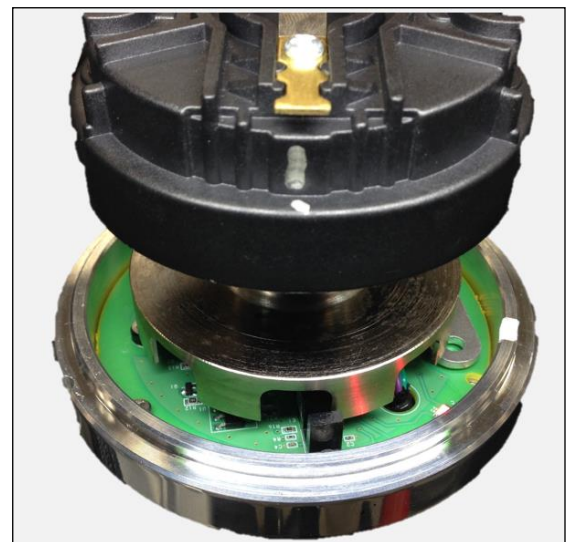
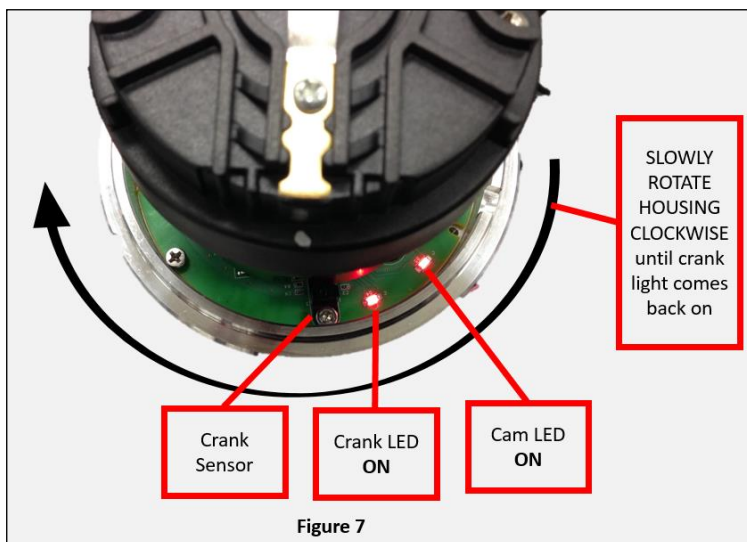
Once these steps are completed, the rotor will be pointing to the cylinder #1 terminal on the distributor cap (ensure the engine is still at 50 degrees BTDC on the compression stroke on cylinder #1). Note which position this is on the distributor cap. Install the cap and install the #1 plug wire. Install the rest of the plug wires based on the engine's firing order and rotor rotation. Reconnect the coil power and ground connection.

Counter-Clockwise Rotor Rotation: (See chart to determine what direction your distributor rotates.)



For engines that have the rotor rotating **counter-clockwise**, turn the housing until the rotor is pointed at the black crank position sensor (**Figure 5**). Both the cam and crank LED should be illuminated **ON**.

Slowly turn the housing **counter-clockwise** until the Crank LED goes **OFF** (**Figure 6**).



Turn the housing **clockwise** until the Crank LED comes back **ON** (**Figure 7**). Stop at this point. This will position the distributor close to where it needs to be. Install and snug the distributor clamp down at this point.

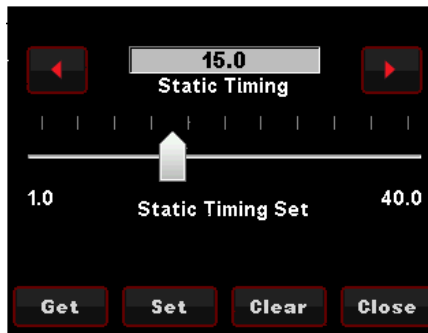
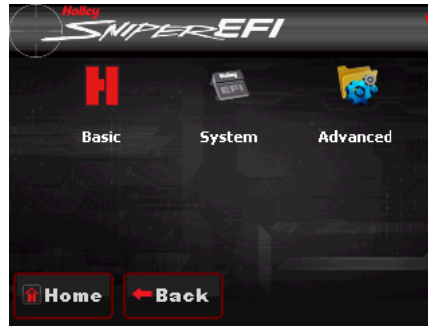
The relationship between the crank sensor, shutter wheel opening, and rotor in the picture above should match what is installed in your engine.

Once these steps are completed, the rotor will be pointing to the cylinder #1 terminal on the distributor cap (ensure the engine is still at 50 degrees BTDC on the compression stroke on cylinder #1). Note which position this is on the distributor cap. Install the cap and install the #1 plug wire. Install the rest of the plug wires based on the engine's firing order and rotor rotation. Reconnect the coil power and ground connection.

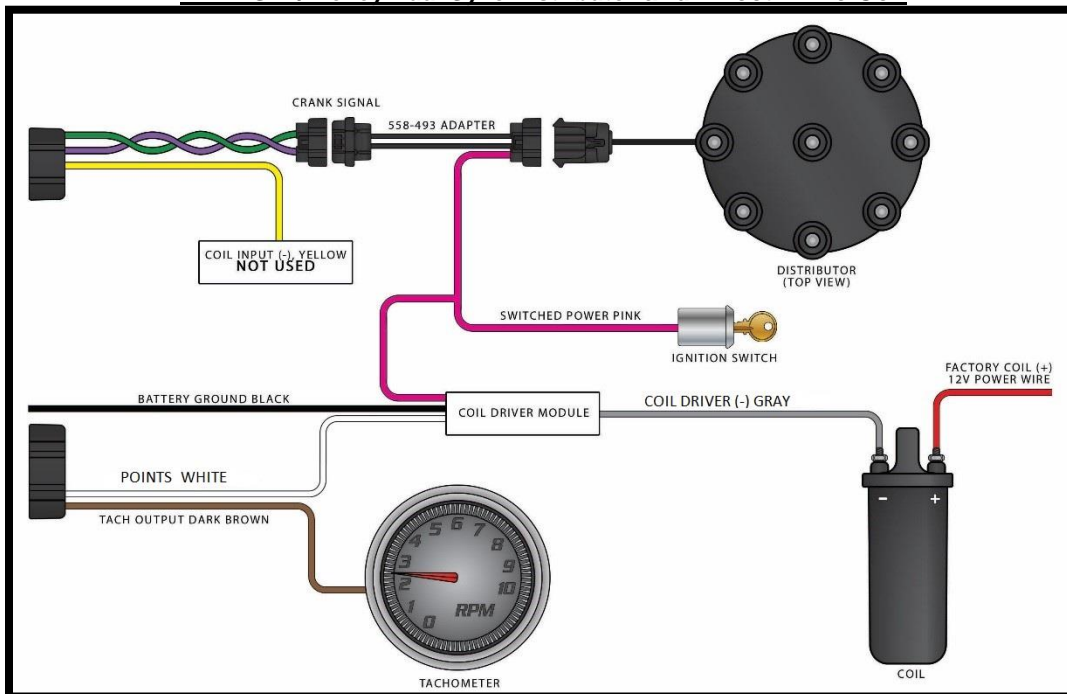
INITIAL STARTUP AND SETTING THE TIMING

Before starting the engine, have a timing light handy as the first step will be positioning the distributor.

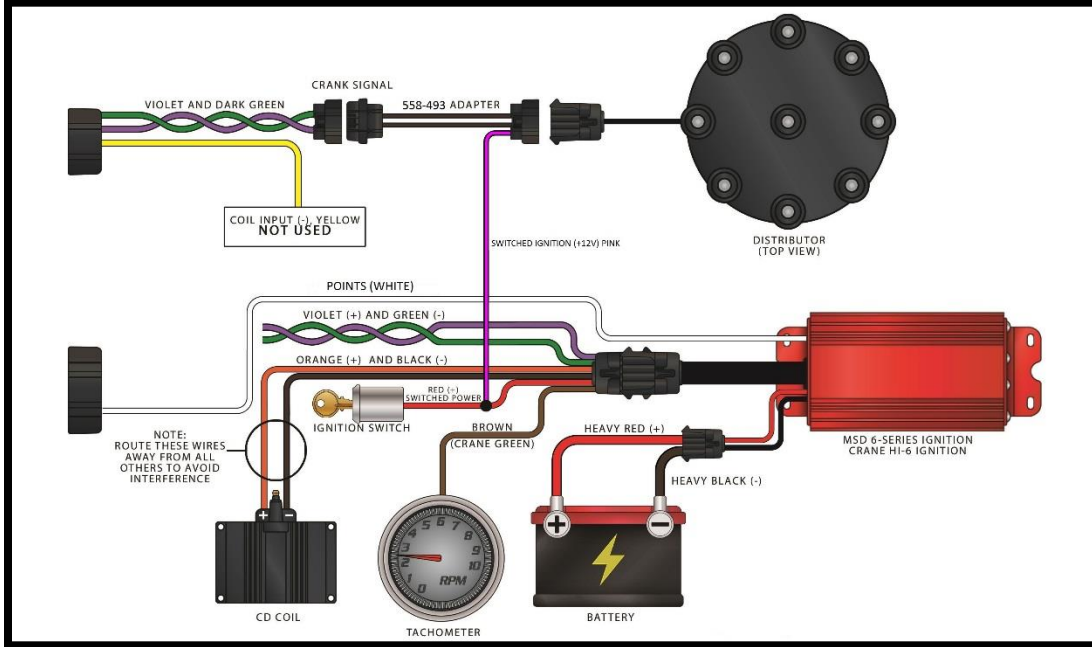
1. Turn the key **ON** to power the system and go to Tuning -> System -> Static Timing. This screen allows you to set the distributor exactly where the Sniper ECU needs it to be positioned to operate the timing.
2. Start the engine, then move the slider on the screen to 15°, then press SET. Now using the timing light, move the distributor until you see 15° BTDC on the balancer. Tighten the hold down clamp.
3. Leave the Static Timing screen by pressing CLOSE. This will take you back to the Home screen and the Sniper will now be controlling the ignition timing. It is important to note that you will not see accurate timing at idle speed when viewing with a timing light. This is due to ECU calculations. If you rev the engine off idle, the timing will appear correctly.
4. From the Spark Screen which is located Tuning -> Basic -> Spark, you can adjust the idle, cruise, WOT and Cranking timing settings.



WIRING W/ Holley Dual Sync Distributor and Direct-Drive Coil



WIRING W/ Holley Dual Sync Distributor and CAPACITIVE DISCHARGE BOX (Such as MSD 6AL)



HOLLEY DUAL SYNC DISTRIBUTOR PINOUT:

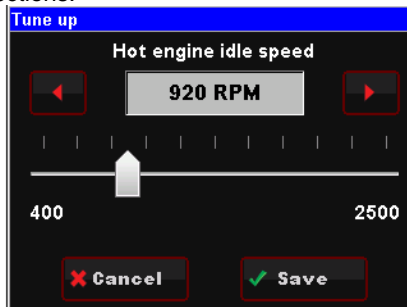
If custom wiring the distributor, use the following pinout:

Connector Location	Channel	Wire Color
A	Crank Signal	Purple/White
C	Signal Ground	Green
E	Switched +12V	Red

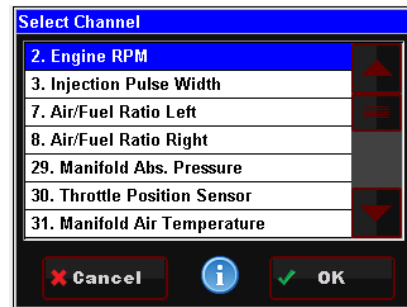


TOUCH SCREEN NAVIGATION & USE

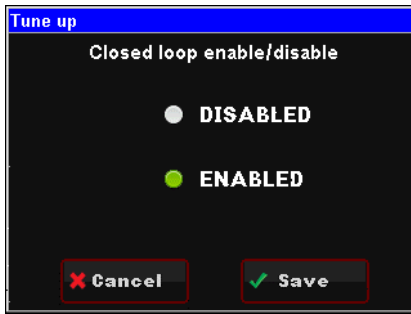
The 3.5" handheld utilizes a touch screen display. All navigation is done through "touching" an icon or button on the screen. The following is an overview of the different types of adjustment screens that are used in the display, and that may be utilized when tuning or making selections.



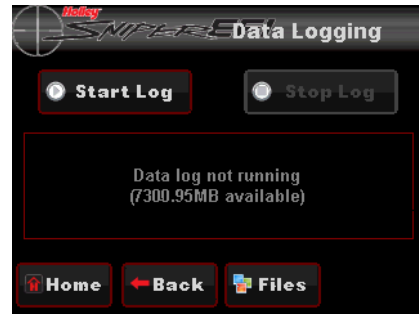
Slider Bar: Slide the bar left or right with the stylus, or use the right and left arrow keys for fine adjustment



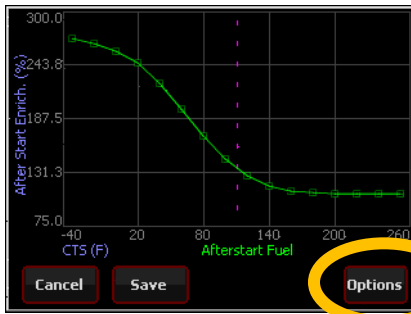
List: Use the scroll bar on the right hand side of the screen to view all list entries. Touch the desired list item and click 'OK' to make a selection



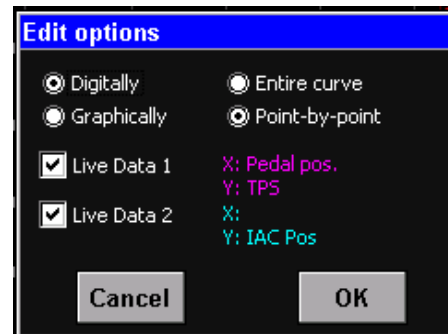
Radio Button: Touch the desired list item to select it



On Screen Prompts: Follow the on screen text and use on the screen



Graph



Digitally: Selecting this option enables slider bar adjustment of individual data points on the graph or the entire curve.

Graphically: Selecting this option enables single point or whole curve adjustment. A stylus may be used to select and drag data on the graph screen.

Entire Curve: Selecting this will 'lock' all the data points together allowing the entire curve to be shifted up or down

Point by Point: Selecting this will allow point by point curve adjustment for fine tuning

Live Data 1 & 2: This will enable live telemetry on the graph screen making fine tuning easier

The Key Icon next to a tuning parameter means that the ignition must be cycled for the tuning change to take effect.



Tuning : Basic : Basic Fuel



Target AFR	Target air fuel ratio at idle	Typically between 13.5 and 15.0. Engines with larger cams may need a richer setting for smoothest idle.
	Target air fuel ratio at cruise	Typically between 13.5 and 15.5. Engines with larger cams may need a richer setting for smoothest operation.
	Target air fuel ratio at WOT	Typically between 12.0 and 12.8. Running richer may reduce power. Running leaner may reduce power or cause potential engine damage
		NOTE: The Target Air/Fuel setting between IDLE, CRUISE, and WOT is blended together automatically. Consequently, the air/fuel you see on the MONITOR screen, may not be exactly what you set for the settings. Changing these settings raises or lowers the “curve” of that specific area.
Acceleration Enrichment	Acceleration Enrichment	Changes the “accelerator pump” function of the fuel injection. Raising the number increases the amount of fuel added when the pedal is pushed. Lowering the number decreases the amount of fuel added when the pedal is pushed. It is highly recommended NOT to change this until the ECU is allowed to perform self-tuning
Fuel Prime	Fuel prime enable	Fuel prime is an option that is enabled by default in all of the base calibrations. The fuel prime function injects a small shot of fuel into the intake manifold 2.5 seconds after the ignition is turned on (which is also the amount of time it takes the 3.5 touch screen to power up) , wetting the intake and allowing the engine to start much quicker. The amount of fuel injected is based on coolant temperature and cranking fuel. This amount of fuel can be increased or decreased by changing the “Percent” value.
	Fuel prime percent	If the engine seems flooded reduce this value, if the engine seems to want more fuel, increase it. Experiment for best results. Typically this value will range from 75-150% with a maximum of 200% typically used.
	Fuel Prime Multiplier	This value will multiply the "Fuel Prime Percent" at CTS values colder than 160°F. It is a linear decay from -40°F to 160°F (i.e. a value of '5' will provide 5 times the prime shot at -40, 2.5 times at 60, and zero change at or above 160).
		Note: Fuel Prime occurs 2.5 seconds after key-on. If you quickly turn the ignition key without waiting for the full 2.5 seconds, the prime will not occur and it may take longer for the engine to start.



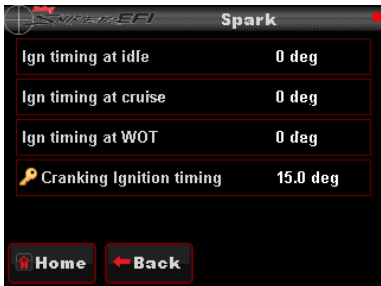
Tuning : Basic : Closed Loop / Learn

Closed Loop	Closed loop enable/disable	This menu enables or disables closed loop operation. There is typically no reason to turn off closed loop operation unless you suspect an oxygen sensor problem and want to disable the sensor. Note: Self-Tuning requires closed loop operation to function.
	Min CTS enable/disable	Enable or disable the minimum coolant temp for closed loop operation
	Coolant Temp	Once enabled, use this to set the minimum coolant temp for closed loop operation
Fuel Learn	Fuel Learn enable / disable	The LEARN Enable / Disable menu turns the Self Tuning "On" and "Off". If enabled, self-tuning is performed. Learning should be enabled when an engine is just started and the tuning process is occurring. After the vehicle is driven under various operating conditions, and is running well, it is advised to disable learning, OR slow the Learn Speed to "Slow".

Tuning : Basic : Basic Idle

Hot engine idle speed	This will adjust the target HOT (above 160°F) idle speed
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Tuning : Basic : Spark

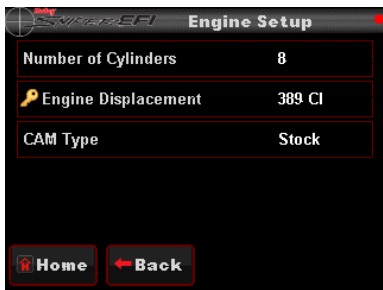


Ignition timing at idle	18-34 degrees is typically used at idle. The larger the camshaft, the more timing is usually used.
Ignition timing at cruise	32-44 degrees is typically used when cruising for optimal fuel economy.
Ignition timing at WOT	Varies by engine, but typically between 28 and 40
Cranking Ignition timing	This is the actual timing during cranking. It is set to 15 degrees at any RPM below 400 by default. Note: Too much timing can cause pre-ignition that can damage an engine. Be cautious when tuning. Note: The actual timing between IDLE, CRUISE, and WOT is blended together automatically. Consequently, the timing you see on the MONITOR screen, may not be exactly what you set for these settings. Changing these settings raises or lowers the "curve" of that specific area



Tuning : System : Outputs

Fan #1 On Temperature	The OUTPUT screen allows for the Fan #1 and Fan #2 ON and OFF temperatures to be adjusted. The ON temp needs to always be a higher value than the OFF temp. Use a difference of at least 5 degrees so they aren't cycling excessively. In Sniper Kits these are ground outputs that should be wired to trigger a fan relay. NEVER wire them directly to the fans! Preset to 190°F
Fan #1 Off Temperature	Preset to 180°F
Fan #2 On Temperature	Preset to 205°F
Fan #2 Off Temperature	Preset to 195°F
AC Shutdown Max TPS	The AC Disable value is a TPS value above which a ground output is sent out to deactivate the air conditioning compressor at wide open throttle Preset to 65%



Tuning : System : Engine Setup

Number of Cylinders	Set the number of cylinders your engine has.
Engine Displacement	This value should reflect your actual engine size. The base fuel table calculates proper fuel flow based upon this value.
Cam Type	Display only, does not change anything in the tune

Tuning : System : Sniper Setup

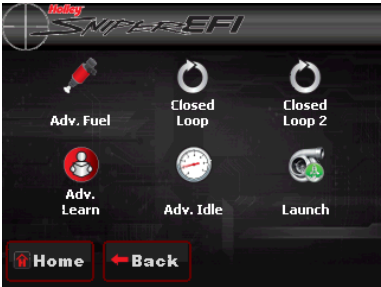
System Type	550-510/550-511 Sniper 4-injector
Fuel injector flow	Sniper injectors flow 100 lb/hr @ 60 psi. This value should not be changed.
Actual system fuel pressure	The internal Sniper regulator is set at 60 psi. If you are using an external regulator instead of the internal regulator, ensure that this setting matches your external regulator's set point.
Progressive TBI enable / disable	Not available with 4 injector Sniper kits
TBI secondary blend	Not available with 4 injector Sniper kits

Tuning : System : Ignition Setup

Ignition Type	This shows the RPM input type (Coil (-), CD Box, Magnetic, Dual Sync)
Reference Angle	Only shown if Magnetic or Dual sync is selected. This is the value in crank degrees of the distributor's crank pulse. These values are preset in the base calibrations and should not need to be adjusted.
Main Rev Limiter	If Sniper is being used for Timing Control, this is the main over-rev value. This rev limiter is Spark Only

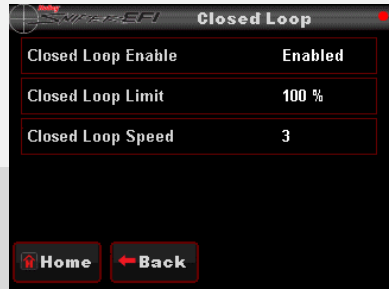
Inductive Delay	Use this value to sync timing at higher RPMs. These are preset in the base calibrations and should not need to be adjusted.
Output Dwell	This value changes the points output dwell time. This value is preset in the base calibrations and should not need to be adjusted. Note: Values above 2.5 can lead to premature coil driver failure.

Tuning : Advanced : Adv. Fuel



Coolant enrichment	Coolant enrichment is similar to the choke on a carburetor. Adjustments are made as a percentage of the base map from 100% to 150%. 100% would mean no additional fuel is being added by the Coolant Enrichment, 110% would mean that an additional 10% of fuel is being added to the base fuel map which will decay back to 100% in relation to actual engine coolant temperature.
Load acceleration enrichment	This parameter provides another way of adding fuel when the accelerator is depressed. It adds fuel depending on how fast the MAP sensor reading changes (detects a change in engine load). There is typically no need to adjust this parameter except possibly under some extreme conditions of vehicles that are heavy and under-powered. Adjustment values are in pounds of fuel per hour (pph) and should initially be adjusted in increments of 5-10 pph
Cranking fuel	This dictates how much fuel is injected when the engine is cranking and is dependent on coolant temperature. Changing this value offsets the entire curve at all temperatures. Adjustment values are in pounds of fuel per hour (pph) and should initially be adjusted in increments of 2-4 pph.
Afterstart fuel	The afterstart parameter is fuel that is added for a short time immediately after an engine starts. This value varies depending on engine temperature. Changing this value offsets the entire curve at all temperatures. Adjustments are made as a percentage of the base map from 75% to 200%, 100% would mean no additional fuel is being added, 110% would mean that an additional 10% of fuel is being added to the base fuel map, and 85% would mean that 15% of fuel is being taken away from the base map. All selections will decay back to 100% over a predetermined amount of time.
AE TPS vs CTS	This curve adjusts the acceleration enrichment as a function of coolant temperature and TPS rate of change. This should not need to be adjusted.

Tuning : Advanced : Closed Loop

	<p>enable / disable</p>	<p>This menu enables or disables closed loop operation. There is typically no reason to turn off closed loop operation unless you suspect an oxygen sensor problem and want to disable the sensor. Note: Self-Tuning requires closed loop operation to function</p>
	<p>mit</p>	<p>The maximum percentage the ECU is allowed to deviate (+/-) from the base fuel calibration in order to maintain the commanded target air fuel ratio. This is set to 100% by default and under most circumstances should not need to be changed.</p>
	<p>Closed loop speed</p>	<p>This is the “speed” (gain) at which closed loop operation occurs. This can be set to five levels, 1, 2, 3, 4, or 5. 3 is the base setting and should be good for most applications. 4 or 5 is typically not used as the closed loop speed may be too excessive for certain applications. If the oxygen sensor is installed far back in the exhaust (more than 1 foot back from the collector in long tube headers), a value of 1 or 2 may be needed.</p>
<p>Closed Loop #2</p>	<p>Open Loop below this</p>	<p>This setting is usually zero. If an extremely large camshaft is used (specs only typically found on race camshafts), the overlap sometimes causes a “false lean” reading at low RPM. In these cases, it may be required to put in a value of 1500-2000 RPM so the system operates open loop below this RPM setting</p>
	<p>Enable Open Loop below this</p>	<p>Enable or Disable min RPM for Closed Loop operation</p>
	<p>CL Min Coolant Temp</p>	<p>Sets the minimum Coolant Temp for Closed Loop operation</p>
	<p>Enable CL Min Coolant Temp</p>	<p>Enable or Disable min CTS for Closed Loop operation</p>

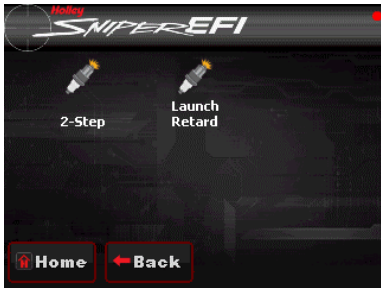
Tuning : Advanced : Adv. Learn

	<p>Learn compensation limits</p>	<p>This value is set to 100% by default, and should remain there until ample driving time and tuning has occurred. The LEARN COMPENSATION LIMIT is a parameter that ECU is allowed to work within when making changes to the fuel map based upon CLOSED LOOP operation. Unlike the CLOSED LOOP LIMIT which is a set parameter for commanded changes to actual fuel flow based upon the O2 sensor reading, LEARN COMPENSATION LIMITS are the percentage of change that is allowed to actually be saved as a modifier to the fuel map.</p>
	<p>Transfer Learned Data</p>	<p>This will transfer data from the Learn Map to the Base Fuel map.</p>

Tuning : Advanced : Adv. Idle



IAC Rampdown	IAC hold position	This is the position the IAC motor will “hold” or “freeze” at when the TPS moves above idle (when TPS becomes greater than 0%). If it is too high, the engine RPM will “hang” and not return to idle.
	IAC Ramp Decay	This is the time (in seconds) it takes for the IAC to return to the target idle range of movement.
	IAC Ramp Start(RPM above idle)	This value is the RPM added to the target idle speed that the IAC will automatically start to ramp back down to idle. If this is too low, the engine RPM will “hang” and not return to idle.
	IAC Kick	The IAC Kick provides a temporary increase in IAC position to keep engine the RPM from dropping. Typically this is used in conjunction with an A/C system keep the engine speed from ‘dipping’ as the compressor cycles on and off.
IAC Speed	IAC Speed	This menu is used to select the type of IAC motor application that is being used. This selection drives the background parameters that control the IAC motor. These parameters have been fine tuned for each of these applications, eliminating the need for the user to perform further modifications
IAC Startup	IAC parked position (Cranking)	This is the position the IAC motor will be at during cranking and immediately after the engine starts. If it is too high, the engine will be at too high of an RPM once it starts. Too low and poor starting will result. Note that this is a temperature based table. The percentage value changed in the handheld offsets this entire curve.
	IAC startup hold time	This is the amount of time that the IAC will remain at the “IAC Parked Position”. Lower this if the engine 'hangs' at a higher RPM for too long after startup.
	IAC startup decay time	This is the amount of time for the IAC to decay from the “IAC Parked Position” back to its “Target Idle” position. It is a linear decay.
Idle spark	Idle spark enable / disable	Idle spark is a feature active only when the ECU is controlling timing. When enabled, the ECU modifies commanded timing at idle to help maintain the target idle speed
Idle Speed	Idle speed curve	Unlike the Idle speed slider bar found in the Basic Tuning menu, this allows for full customization of target idle speed at all coolant temperatures



Tuning : Advanced : Launch

2-Step	Rev Limiter #1 Enable	Enable or Disable Rev Limiter #1
	Rev Limiter #1 RPM	RPM set point for Rev Limiter #1
	Rev Limiter #1 Input	Choose the input wire used on the 10-pin harness
Launch Retard	Launch Retard Enable	Enable or Disable the programmable launch retard
	Launch Retard	Use this to edit the launch retard curve
	Type	RPM or Time Based
	Launch Retard Activation	Set to Launch Retard to activate with input or at input release
	Launch Retard Input	Choose the input wire used on the 10-pin harness
Note: Launch Retard requires Sniper EFI laptop software for initial setup		

File : ECU Overview

Current Global Folder/File	Displays the name of the current ECU calibration
Ignition input type	Displays the current Ignition Type
Wide band O2 sensor type	Displays the current O2 sensor type
Throttle body type	Displays the current Sniper Type
ECU Firmware Version	Displays the current Sniper ECU Firmware version



File : Global Configs

Up- down- loading of GCFs from and to SD	List view of all saved Sniper calibrations on the SD card. This is where you can save, rename, and upload saved ECU calibrations (i.e. pump gas tune, race gas tune)
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File : ECU HW/FW

ECU HW FW info, FW reflash	This screen displays more detailed Sniper ECU information, and is also where you go to upgrade ECU firmware
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File : Local Setup

Touch Calibrate	Calibrate touch screen	The touch screen can be recalibrated by following the on-screen instructions
Local Info	Device HW FW Info, reflash FW	Displays detailed ECU firmware information
Local Options	Device options	Checkbox to enable the "Restore Last Screen at Startup" option



Super Sniper : Nitrous : Activation

Disable	If using Sniper for Nitrous Control, this will Enable or Disable the Stage
Min RPM	Minimum RPM required for NOS activation
Max RPM	Maximum RPM allowed for NOS activation. Any RPM above this will turn off the stage.
Activation Delay	This will delay the activation by the amount selected. The delay starts from the time the stage is triggered. A value of zero means the nitrous will turn on as soon as all activation conditions are met
Stage Duration	This will set the duration of the nitrous stage, allowing a stage to be turned off at a precise time for bracket racing, or for another layer of safety. This parameter is enabled by default.

Super Sniper : Nitrous : Stage 1 Tuning

Fixed Timing Value	If you are using Sniper for timing control, this is the actual timing value the engine will operate with when the Nitrous is activated
Timing Retard	1x16 editable timing curve. Only available when <i>not</i> using a fixed timing value. This parameter requires Sniper EFI laptop software to configure.
Progressive Control	Enable/Disable progressive timing retard curve. This parameter requires Sniper EFI laptop software to configure
Target AFR	Closed Loop compensation will override the target AFR table and use this value as its new target only when the nitrous is on.



Super Sniper : Boost : Launch

Launch Target	Boost control not available on 550-510 & 550-511 Sniper kits. This parameter requires software for initial configuration.
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Super Sniper : Boost : Safety Setup

Instantaneous boost pressure safety	Boost control not available on 550-510 & 550-511 Sniper kits. This parameter requires software for initial configuration.
Time delay boost pressure safety	Boost control not available on 550-510 & 550-511 Sniper kits. This parameter requires software for initial configuration.
Time delay	Boost control not available on 550-510 & 550-511 Sniper kits. This parameter requires software for initial configuration.

Super Sniper : Boost : Boost vs RPM

Boost Curve	Boost control not available on 550-510 & 550-511 Sniper kits. This parameter requires software for initial configuration.
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Super Sniper : Boost : Boost vs Time

Boost Curve	Boost control not available on 550-510 & 550-511 Sniper kits. This parameter requires software for initial configuration.
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Super Sniper : Advanced : 1D Tables

Table #1-4	Enable/Disable	These tables require software for initial configuration and are intended for advanced users only!
	Table Name (display only)	
	Table Type (display only)	
	Enable Start Delay	
	Time Delay to Start	
	Edit Curve	

Super Sniper : Advanced : 2D Tables

Table #1-2	Enable/Disable	These tables require software for initial configuration and are intended for advanced users only!
	Table Name (display only)	
	Table Type (display only)	
	Enable Start Delay	
	Time Delay to Start	
	Edit Table	

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