# Holley® Sniper Installation Supplement

**Please note, a Holley Sniper instruction manual, as well as some small parts that come with the Sniper unit, will be included with your engine. These small parts will not all be required for Sniper operation on your BluePrint Engine.**

At BluePrint Engines, we do NOT enable the timing control on the Sniper EFI-equipped engines. The Sniper will operate in fuel-only mode, and does not require the addition of a coil driver or ignition box.

Please consult the Holley Sniper full manual and use this guide for supplemental clarification.

The original Holley Sniper instructions are available on the **Holley website** if you have misplaced them.

Your BluePrint Engine will be equipped with a **Holley model 550-510**, or **550-511** (identical except for finish color) on 4150 flanged intake manifolds. (This is true for most BluePrint Engines small blocks and big blocks, typically 540 CID and smaller.)

If your engine has a dominator type intake manifold (example: 632), your Sniper model is **550-842** or **550-841** (again the only difference being the finish).

Your Sniper should have saved its initial setup parameters during dyno testing. If it did not, you will simply need to run the **Setup Wizard**.

Below are the answers to the **Setup Wizard**:

1. We use the "Street Strip" cam profile
2. Enter your CID
3. Enter desired idle RPM (750-950 usually)
4. Use the "coil negative - no timing control" timing setup

**To install the Sniper-equipped engine into your vehicle, take note of the following wiring parameters:**

- It's important to realize the Sniper is a stand-alone unit. It needs its own 12V "On" and main power sources.
- Your distributor/coil ALSO needs 12V power.
- **MAIN POWER:** THICK GAUGE BLACK AND RED WIRES — The Sniper main power and ground needs to be run all the way to the battery per the Sniper instructions.
- **OFF/ON:** PINK SNIPER WIRE — For the Sniper to turn off and on with your engine, you will need to hook up the 12V "On" .
- **DO NOT PUT PINK WIRE DIRECTLY ON COIL!** Run the PINK 12V ACTIVATION WIRE to a keyed 12V power source.
- **TIP: A "carburetor electric choke wire" that is otherwise unused, or another full 12V, key on wire, may be used.**
- **DO NOT** use old radio or ballast resistor wiring without verifying you have a full 12V in CRANK, ON, and RUN.
- **COIL / DISTRIBUTOR POWER:** Remember, your coil also needs 12V keyed power. The Sniper does not supply power to the coil. On a large cap HEI, with the coil in the cap, this is as simple as running a 12V wire to the distributor power wire. This is made easier with a BluePrint Engines HEI pigtail (**Part Number: BPP170072**).
- If you have a Pro-Billet type distributor with an external coil, remember the 12V side of the coil and the distributor need power. You CAN jumper the 12V + coil power to the distributor power wire.
- **TACH SIGNAL INPUT:** The SNIPER YELLOW WIRE (pulled from negative side of coil) – this is how the Sniper knows the engine is running and sustaining RPM (tach input on the handheld reflects negative side of coil).
- **FUEL PUMP RELAY:** FUEL PUMP WIRE (THICK BLUE WIRE) – with relay built in. This built in Sniper relay should be used to power your 58-60 PSI capable fuel pump. It features prime and safety cut features that should be used vs. just "hard wiring" in a pump switch.
- **OPTIONAL:** LIGHT BLUE WIRE – per the Sniper manual, you can control the grounded side of an electric fan relay circuit. See their instructions.

**What does BluePrint Engines recommend to make your EFI experience enjoyable, and get off on the right foot with EFI and my new engine?**

1. **READ** the instructions and follow them. If you do not understand a step, seek assistance!

2. **AVOID EXTENDED OPERATION IN OPEN LOOP.** The **WORST** thing you can do is fire up the engine and shut it back off while it's still cold. Under 180 degrees, the system is in what's called "open loop", meaning it's running in a default (rich) setting. Shutting off cold an extended number of times will lead to fouled plugs. This is no different than starting the engine without the oxygen sensor installed.

3. **MOST IMPORTANT!!! – Wire it properly: MAIN POWER AND GROUND need to go to the battery! Direct to the BATTERY,** not to the fuse panel, starter solenoid, or distribution stud.
   Direct to the battery means to the battery. Make sure you are using proper wiring practices; incorrect connections will result in excessive resistance. Resistance results in heat and heat results in more resistance. A common issue we see is a result of poor fuel pump grounding, running an eyelet from the pump to a rusty or painted surface. The resulting resistance can burn up fuel pumps, wiring, and relays. Extending wires with too small of a wire gauge will also result in this damage.

4. **ENGINE GROUND:** Should be **1AWG or larger** and wired directly from the battery to the engine. Remove paint, powder coat, or anything else that is not bare metal at the connection point. Grounding the battery to the frame and the frame to the engine may have been okay for your carburetor, but it's not sufficient for digital electronics.

5. **IGNITION PARTS:** Be sure to properly gap your plugs. Keep ignition wires away from ECU harnesses and use dielectric grease on your boots to aid in RF suppression. If you have RF and/or EMI issues, you need to correct them or they will result in drivability issues, including idle control problems, and could possibly damage the ECU. Do not mount ignition coil in close proximity to the Sniper ECU (located in the front of the Sniper throttle body).

6. **O2 SENSORS:** These need to be properly installed per Holley instructions. Oxygen sensors read unburnt oxygen, not fuel. Improper install leads to the ECU reading lean, which adds more fuel, which makes the issue worse. When a wide band sensor is fouled or damaged, they read lean. The top cause is excessive fuel. This is the result of the system adding fuel due to false readings. These false readings are the result of incorrect sensor placement, cylinder misfires, exhaust leaks, and/or overly rich tunes.

7. **FUEL PUMPS:** BluePrint Engines offers both external and retrofit in-tank fuel pumps. Your pump needs to be a 58-60PSI capable pump. It is important to note that electric fuel pumps are PUSHERS not pullers. The pump needs to be GRAVITY FEED, meaning the pump inlet needs to be at or below the bottom of the tank and as close to the tank as possible. The pump also will need a proper filter, return line, drop hose, etc. (See Holley instructions for proper fuel system routing.)

8. **Idle / IAC:** The engine should not require any IAC air bypass to idle. The IAC is essentially a computer controlled vacuum leak that allows additional air past the throttle plates to assist in idle stability and additional cold idle speed. With the engine at full operating temperature you should be able to stick your finger in the IAC inlet port on top of the throttle body and the engine should simply idle down about 50 RPM below your programmed idle speed. If it dies or drops more than 50-75 RPM, the throttle is closed too far. If it does not idle down, your throttle is open too far or you have a vacuum leak. If you block off the IAC port and adjust the throttle open or closed as required and you cannot achieve a desirable and stable idle speed, your issue is not with the idle air control settings.

   Two common causes of poor idle are: 1) improper O2 sensor placement; 2) trying to run close loop at idle with a cam that exhibits quite a bit of overlap at low RPM. (Both of these are easily corrected.) If you have an automatic transmission, the IAC inlet is plugged off and the throttle angle is set to your desired idle speed, but it dies when you put it in gear, then the following may be true assuming you have no vacuum leaks or a lean idle AFR: your idle speed is too high for your stall speed or your stall speed is too low for your engine combination.

   Be mindful of harness routing and avoid sources of EMI/RF interference as they can also cause idle and drivability issues.

9. **Unfamiliar Noises:** Clicking, ticking, and air sounds. Many of these are completely normal with EFI. That clicking sound you may be hearing is most likely the fuel injectors cycling. This sound is often more pronounced at Low RPM. Throttle sucking sounds are most often a result of air flowing through the IAC port related to the IAC hold position and are normal. The proximity of a dual plane intake plenum divider to vacuum passages under the throttle body may also result in an odd sucking or whistling sound. While it may sound odd it's not a defect and will not cause any drivability issues. Trying a different mounting gasket configuration or lowering the divider can change the air flow and quiet this down if it occurs. This happens with some carburetors on dual planes as well. Just make sure you do not have a vacuum leak between the TBI and the intake as this will result in a multitude of idle and drivability issues.

10. **Capabilities:** The Sniper has integrated features such as a fuel pump relay circuit that utilizes a fuel pump prime shot for easy starts and resistance to flooding. The Sniper also features a built in fan controller. Using the Sniper's built in capabilities eliminates the need for external fan or pump controllers and eliminates extra wiring.

**Holley Sniper EFI Replacement Sensors -** Typically available at your local auto parts stores:

- CTS Sensor: Standard Motor Products TX3
- TPS Sensor: Standard Motor Products TH191
- IAC Motor: Standard Motor Products AC416
- WBO2 Sensor: Bosch 17025, 0258017025