

INSTALLATION INSTRUCTIONS FOR HOLLEY PRO-JECTION CLOSED-LOOP KIT PART NUMBER 534-27

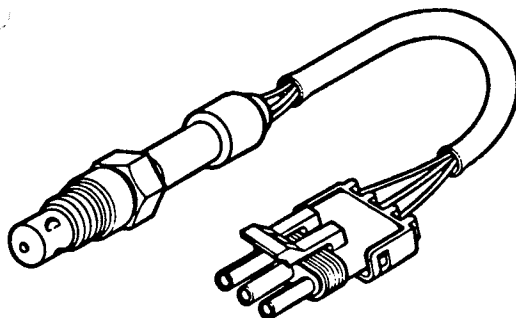
NOTE: To preserve warranty, these instructions must be read and followed thoroughly and completely, before and during installation.

INTRODUCTION: This closed-loop kit is designed for use only with Holley Pro-Projection fuel injection systems, both two barrel and four barrel versions. It enhances the fuel delivery process by constantly monitoring the air/fuel ratio by way of an exhaust oxygen sensor which signals by ECU to supply the correct amount of fuel to the engine. It can also be used as a tuning aid when the Pro-Projection system is operated in the open-loop mode.

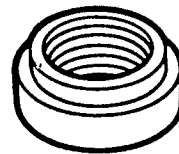
This kit makes the Pro-Projection system almost self tuning and will increase engine efficiency because it compensates for changes in air temperature and pressure. It allows the engine to receive the proper amount of fuel even if the IDLE and MIDRANGE ECU controls are not set exactly right. The unit functions only when the engine is warmed up and during idle and part throttle operation. At throttle openings over 2/3 or when the engine is cold, the unit allows the Pro-Projection system to run open-loop whereby fuel delivery is based on the ECU adjustment controls.

PARTS LIST

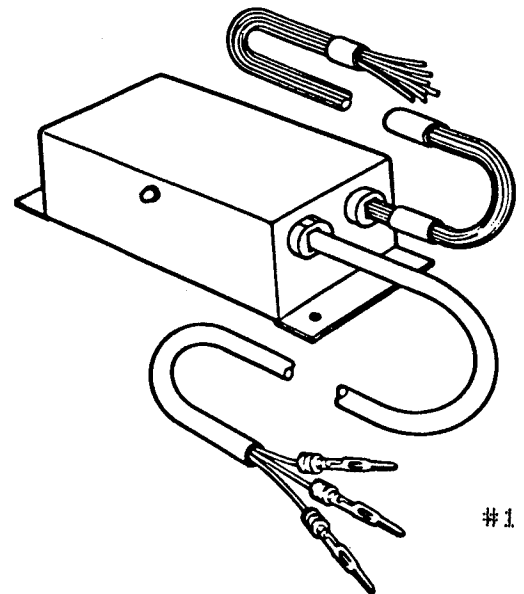
Item number *****	Description *****	Quantity *****	Service Number *****
1	Closed-Loop Control Box	1	
2	Heated Oxygen Sensor	1	43-106
3	Weld Ring	1	
4	Ring Terminal	1	
5	T-Tap Connector	3	
6	Three-Way Shroud	1	
7	Male Disconnect	5	
8	Female Disconnect	2	
9	Cable Tie	6	



#2



#3



#1



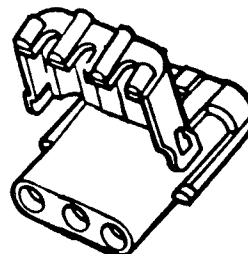
#9



#4



#5



#6



#7



#8

INSTALLATION INSTRUCTIONS

1. Install the oxygen sensor (Item #2) in the exhaust pipe. If your vehicle has single exhaust with a "Y" pipe, mount the sensor just after the "Y" and before the catalytic converter if equipped. If your vehicle has dual exhaust with stock manifolds, mount the sensor in one of the pipes about three feet from the manifold. If your vehicle has headers, mount the sensor in one of the header collectors.

IMPORTANT: The sensor must sample exhaust from a group of cylinders and not just one. Also, be sure to mount the sensor so it does not come in contact with anything and so it will not be damaged by road debris.

2. Locate the desired position of the oxygen sensor. Drill or cut a 7/8" diameter hole in the exhaust. **NOTE:** It may be helpful to remove the exhaust pipe, "Y" pipe, or header to do this. Position the weld ring (Item #3) into the hole leaving the larger portion toward the outside of the exhaust. Weld the ring to the pipe making sure there are no air leaks around the ring. **NOTE:** Tapping the surface to weld against. You may want to have this part of the installation performed at a muffler shop or by someone with welding experience.

IMPORTANT: There should be no exhaust leaks between the engine and the oxygen sensor as this may cause an error in the sensor reading.

3. Install the sensor in the weld ring and tighten like a spark plug. If the threads need to be cleaned, use a spark plug chaser or a metric tap 18 x 1.5 - 6g. There should be some anti-seize compound on the sensor threads already. If not, apply a small amount.
4. The closed-loop control box (Item #1) and wiring must be located inside the vehicle near the Pro-Jection ECU. Run the three long wires in the black tubing to the oxygen sensor. This will require a 1/2" hole to be drilled or punched in the firewall or use an existing hold from when the Pro-Jection system was installed. Route the wires to the oxygen sensor keeping them away from any hot or sharp objects. Use the wire ties provided in the kit (Item #9).
5. Insert the three male terminals into the three-way shroud (Item #6). The YELLOW wire in hole "A", the BLACK wire in hole "B", and the GRAY wire in hole "C". The letters can be found on the three-way shroud. Push the terminals in until they lock in place then snap the cover tight. Now plug the wiring into the oxygen sensor making sure the connectors lock together.
6. Connect the seven shorter wires. Crimp the ring terminal (Item #4) to the BLACK wire and secure it to a good vehicle ground. **NOTE:** It is very important that a good ground is maintained.
7. Strip back the protective covering on the Pro-Jection wiring harness about six inches from the ECU connector. Both sensor and power cable bundles will need to be spliced into. See Fig. 1.
8. Cut the BLUE wire a few inches from the ECU connector and crimp a female disconnect (Item #8) to the end coming from the ECU connector. Crimp a male disconnect (Item #7) to the cut BLUE wire coming from the engine compartment.
9. Attach T-tap connectors (Item #5) to the RED, PINK AND YELLOW wires on the Pro-Jection harness. See Fig. 2. If you have a four barrel system, the correct YELLOW wire is located on pin E of the six pin connector or if you have a single white connector it is located in the top row between a BLACK wire and a blank pin just above a RED wire.

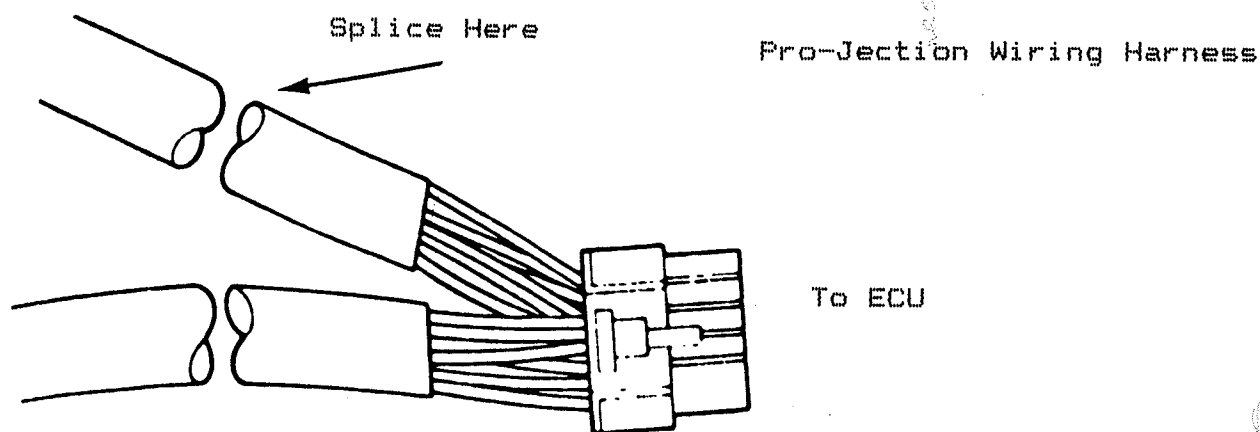


Figure 1

10. Crimp a female disconnect (Item #8) to the BLUE wire from the closed-loop control box. Crimp male disconnect terminals (Item #7) to the RED, PINK, VIOLET, and YELLOW wires of the closed-loop box. Now plug these five wires into the connections made on the Pro-Jection harness matching up the colors. Crimp a male disconnect (Item #7) on the VIOLET wire from the control box and plug it into the remaining BLUE wire on the Pro-Jection harness. The WHITE wire remains unconnected. See Fig. 3 for wiring diagram.

IMPORTANT: The WHITE wire is used to default the system into open-loop mode. This is done by simply grounding the wire. If installing the closed-loop kit at the same time as the Pro-Jection system, ground the WHITE wire and tune according to the manual, then disconnect the WHITE wire to run in the closed-loop mode.

11. Start the engine. It should run the same as before installing the closed-loop kit. If not, double check all wiring and make sure the terminals have been crimped properly.

OPERATION

The red light on the control box should come on about ten seconds after the engine is started if the air/fuel ratio is rich. The light will remain off or be very dim if the mixture is lean. When the engine is fully warmed up, the closed-loop circuit becomes active and the red light will begin to flash on and off. This indicates the unit is functioning properly and the engine is running at the ideal fuel mixture. At throttle openings greater than 2/3, the unit will go open-loop and the red light should stay lit indicating a rich mixture. During changing engine and/or vehicle speeds, the light may be on or off for a length of time. This is normal while the circuitry is adjusting to the correct fuel mixture.

To use the unit as a tuning aid, ground the WHITE wire to operate the system in the open-loop mode. Watch the red light while making adjustments on the Pro-Jection ECU. If the light stays on, the mixture is rich, and if the light is off or dim, the mixture is lean. The light will flash on and off in the closed-loop mode when the adjustment is correct.

TROUBLESHOOTING

Correct function of this kit depends upon the oxygen sensor which should give many miles of trouble free operation. Because it is exposed to severe heat and vibration, it cannot be expected to last forever. Always use unleaded fuel in oxygen sensor equipped vehicles. Coolant leaking into the combustion chamber and the use of some RTV sealants will also damage the sensor.

Engines that are sensitive to a lean mixture may experience a slightly rough idle or have an idle speed that varies slightly. If this occurs during closed-loop mode while the RED light is flashing, the system is working properly and is responding to the oxygen sensor signal.

TESTING THE OXYGEN SENSOR

Using a digital voltmeter, probe the GRAY wire of the sensor with the positive (+) lead of the meter and ground the negative (-) lead. With the engine running open-loop, the meter reading should be either near zero or one volt. During closed-loop, the readings should constantly change between zero and one volt. If you always get zero volts, be sure +12V and ground are present on the YELLOW and BLACK wires. If so, the sensor is probably bad. If you see a changing voltage but the readings do not vary far from 0.5V, the sensor is lazy and should be replaced.

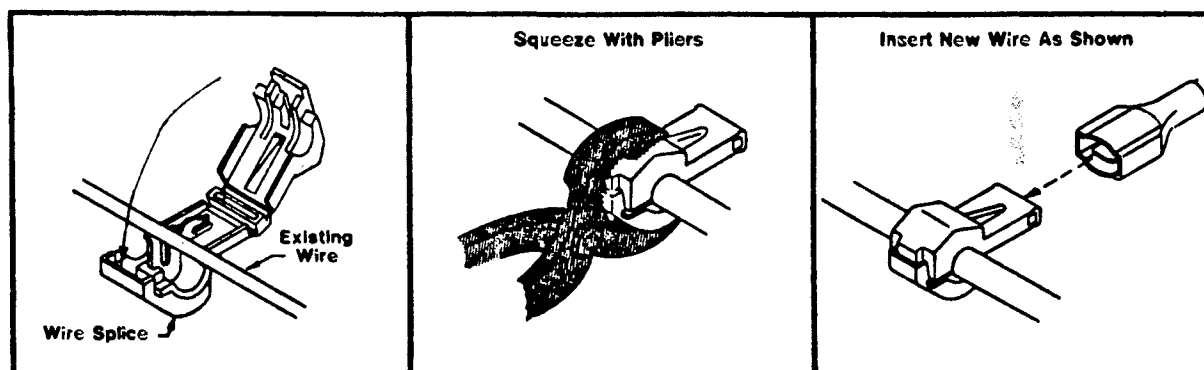
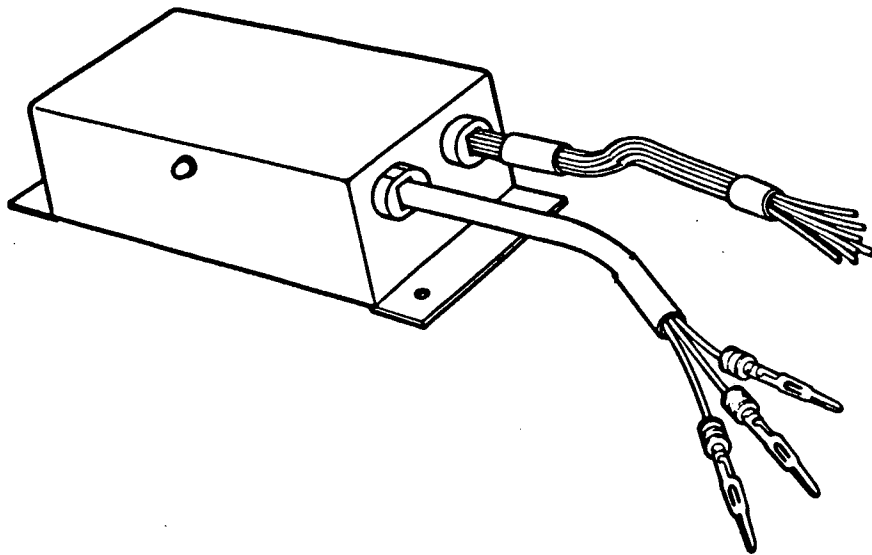


Figure 2



BLACK - ground

RED - +12V Power

BLUE - TPS in from sensor

VIOLET - TPS out to ECU

PINK - Crank

YELLOW - Fast idle solenoid

WHITE - Open-loop default

YELLOW (A)

BLACK (B)

GRAY (C)

} To oxygen sensor

Figure 3