

General description of the fuel injection

The applied fuel injection system is a sequential multipoint fuel injection. The throttle body injection is installed instead of the carburetor. Both throttle body injection (TBI) units are connected at the bell crank and are synchronized with each other through the throttle body shaft.

The fuel pressure is 42 Lbs. PSI. This is produced through an electric fuel pump and stays consistent with the help of a pressure regulator. Min voltage is 10v.

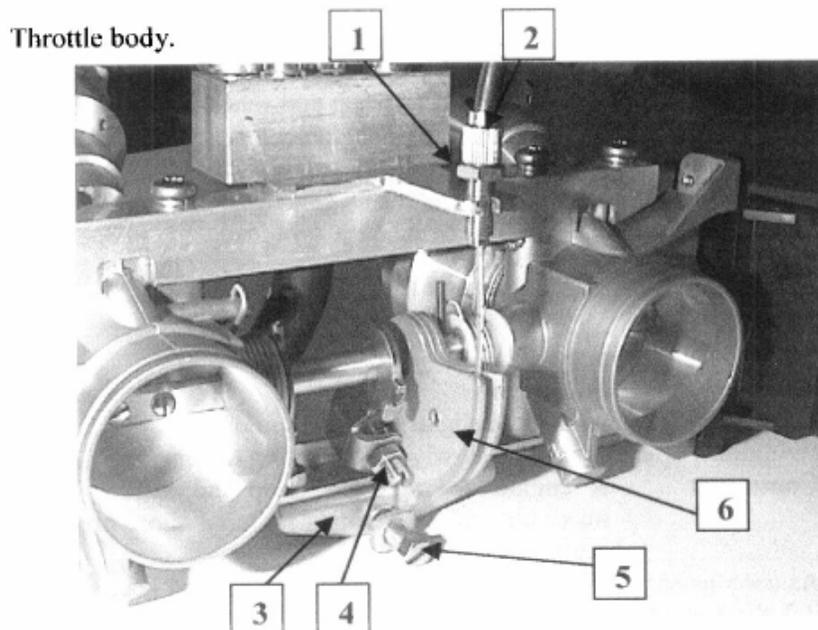
To avoid interruption from contaminated fuel, a series of fuel filters are installed fore and aft of the fuel pump.

The amount of fuel is controlled through the injector nozzle (governed by the throttle position/RPM).

The dosage is refined through different adjustment parameters.

The following parameters are used for the calculation of fuel ratio-amount of injection:

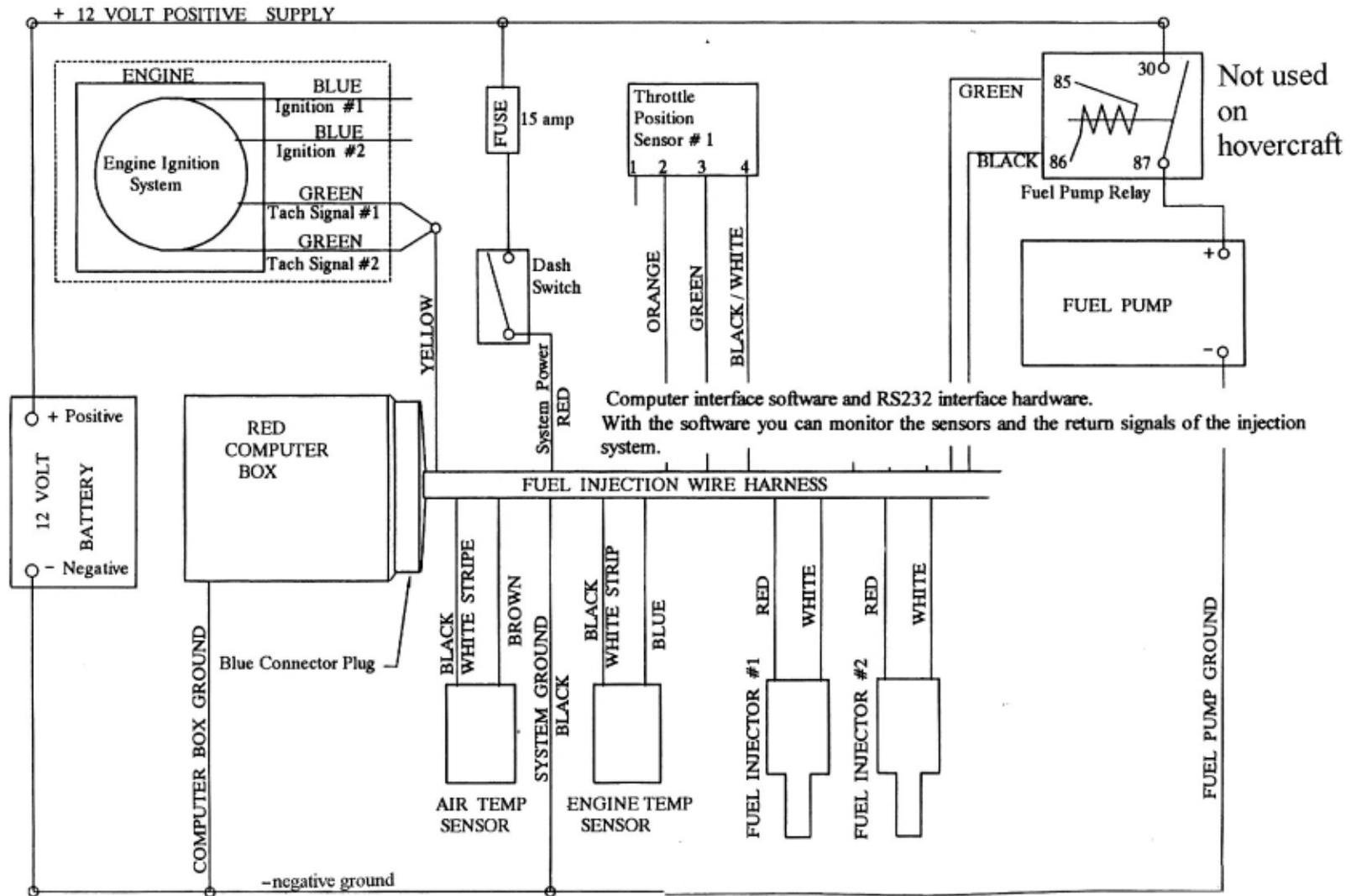
- Throttle position
- RPM
- Ambient air temperature
- Barometric pressure
- Engine crankcase temperature
- Acceleration rate
- Manual manipulation (optional)



Position # Description

- | | |
|---|--|
| 1 | Throttle cable tension adjustment stop nut |
| 2 | Throttle cable tension adjustment |
| 3 | Throttle stop plate |
| 4 | Synchronization adjustment screw (do not change) |
| 5 | Idle stop adjustment screw |
| 6 | Throttle bell crank |

ELECTRICAL CIRCUIT DIAGRAM



Form 16949

NOTE: Fuel Injection components and parts can be found under 65HP Engine Manual.

How to determine if Fuel Injection tach signal is working.

In order for the fuel injectors to activate at the correct time the Fuel Injection Computer, ECU needs to know the RPM of the engine. This information is delivered from the CDI box(s) as a tach pulse. Each CDI box(s) has a green wire that carries the tach signal. Both green wires on dual ignition engines are connected to a yellow wire from the fuel injection wiring harness. This yellow wire delivers the tach signal to the ECU. If the tach signal is never received from the CDI box(s) the ECU does not know the engine is turning and does not deliver any fuel. To find out if there is a missing tach signal turn on the power to the ECU, then advance the throttle to 65% open. A buzzing noise coming from the injectors should be heard.

Every time the throttle goes from idle to past 65% open, the ECU turns all injectors to full power for 1 second. The injectors rattle making the buzzing sound and a quantity of fuel is shot into the engine. Return the throttle to about 20% and turn the engine over with the starter (put ignition switch(s) in run position). The injected fuel will make the engine run for about 2 seconds and then stop. This test proves that the ECU is receiving power and working, the engine ignition system is working but the ECU is not getting the tach signal, if it were the engine would continue to run. If the tach signal is the problem then track down why. As mentioned above the circuit from the 2 green wires from the CDI box(s) to the yellow wire in the ECU plug must be complete. If the yellow wire is broken then the signal can not get through. If the wire is OK but the terminal in the ECU plug is corroded the signal can not get through. If after inspection the tach signal wiring turns out to be sound then 2 other possibilities exist.

The reason both green wires from the CDI(s) are attached to the yellow wire is for redundancy. If one of the ignition system fails on dual ignition systems the tach signal from the remaining ignition system keeps the engine running. In rare cases a CDI can go to ground internally and ground out the tach signal. Since it is wired directly to the other CDI it can also ground out the signal of the other CDI that is still working properly. To determine if a bad CDI is the problem separate the green wires. Break the splice where the 2 green wires come together and attach only one to the yellow wire from the wiring harness. Make the injectors buzz again, pull throttle to 20% and crank. If the engine now continues to run then the connected CDI is bad. If it will not stay running switch the yellow wire to the green wire from the other CDI and repeat the test. Can only do this on dual injection systems. If the engine now continues to run the CDI tested previously is bad. If a bad CDI turns out to be the culprit replace it and wire it as previously. If both tests fail to reveal a bad CDI then the problem is in the ECU.

When the yellow wire delivers the tach signal to the ECU it is read with an input device within the ECU. This device in turn sends the tach signal to an internal processor. If the input device should fail the signal does not get through. If the wiring is good and that both CDI's are good then the only thing left is the ECU. To confirm plug in another ECU that is known to be good and start the engine. If the engine runs then the original ECU must be bad. Obtain a new ECU to perform this test or send the suspect ECU in to the Hirth repair center to have it tested. After testing proves it bad it can be repaired or a new ECU is purchased but at least by having it tested the next step is obvious.

Additional Fuel Injection Comments

If the engine will run when you squirt fuel in but stops when the fuel is gone. First advance the throttle to 65% to force it to purge the fuel, (buzzing noise). If it does not squirt fuel for 1 second then the problem is in either the injector driver in the ECU, or the injector common wire (red) is broken, or the injector driver wire (white) is broken. If it does squirt fuel then the problem is in the tach signal. Either the CDI is not generating a tach signal, (green wire). or the ECU is not accepting the signal or the yellow tach signal wire from ignition to ECU is broken.