

## 6850/6890 FID Ignition Problems

### Flame will not light or will not remain lit.

The 6890/6850 FID uses a hydrogen flame to burn organic samples, resulting in increased ionization that is measured as a current—values up to the  $10^6$  pa range. The GC will auto-ignite if the following conditions are true:

- FID temperature is > 150 degrees C
- Detector flows are set to recommended values (and the detector EPC module is functional)
- The igniter is functional
- There are no leaks in any of the FID pneumatic connections
  - The gang fitting at the EPC manifold
  - The column adapter or column fitting in the GC oven
  - The external gas delivery manifold
- The FID jet is not plugged or partially plugged.
- The FID jet is sealing properly to the to the base weldment.

The FID will attempt to re-ignite if the detector background in picoamps drops below the “LIT OFFSET” value that is set in the Configure Detector menu. The “LIT OFFSET” value is defined as the difference between the FID output in picoamps with the flame lit and the output with the flame off (typically the output of the FID with the flame off will be a every low value close to or equal to 0 pa.) Default value is 2.0. Some FIDs with high purity gases and low bleed columns will have a background of less than 2 pa when they are actually lit. If this is the case the

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LITOFFSET can be lowered in the detector configuration. If the LITOFFSET is too low, the detector may never try to re-ignite. If the flame is lit, a cold glass should show condensation if held above the FID.

The FID temperature should be maintained at least 20 degrees > the final oven temp of the GC analysis. An optimal temperature is 300 degrees.

To determine the root cause(s) for difficulty lighting the FID the following steps must be followed:

1. Confirm the integrity of the gas supply. (check for leaks, adequate supply pressure and gas purity.)

Pressures

Carrier/makeup- 80-100 psi (150 psi for high pressure)

Air - 80 psi minimum

H2 - 60 psi minimum

Purities are 99.999% or better

(per the 6850/6890 Site Prep Manual)

2. Confirm that the FID igniter is glowing while the FID is trying to ignite.
3. Measure the FID flows with an independent measurement device—bubble flow meter or electronic flow meter. Use the FID flow adapter P/N 19301-60660.

### [Procedure for measuring detector flows](#)

**NOTE:** It is very important to measure the *actual* FID flow rate and not rely on the front panel reading for flows. This is because all of the detector flows are controlled in the EPC module by controlling a calibrated pressure against a known restriction built into the EPC module. These flows can be inaccurate due to restrictions in the flow path or due to leaks in the detector gang fitting.

Recommended gas flows for the 6890/6850 FID are:

- Carrier, packed columns –30-60 ml/min
- Carrier + Makeup, capillary columns –30 ml/min
- H2 set equal to or > the total carrier/makeup flow
- Air 400 ml/min
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FID flows can measure low for the following reasons:

- Leak at the column fitting
- Plugged or partially plugged jet
- Loose or missing gasket at the base of the FID

An electronic leak detector is very good for determining if the column fitting is leaking.

The Handheld controller for the 6850 GC has a built in diagnostic to determine if the jet is plugged called the “JET TEST.” This diagnostic can be performed manually on a 6890 by the following procedure:

- Remove the column from the FID and cap the detector fitting (blank ferrule part# 5181-7458)
- Turn off the makeup gas
- Set the H2 flow to 75 ml/min
- If the jet is restricted, there will be a flow indication on the makeup channel (due to pressure backing up into the makeup channel and being measured by the by the makeup pressure sensor.) If not the makeup will read 0 ml/min

If any of the measured flow rates are incorrect, there is always the possibility that the EPC module is out of calibration or defective, contact Agilent if this is the case.

If all flows measure correctly it is important to make sure that the correct jet is installed, Capillary Optimized or Adaptable FID Jet. Consult detector manual if in doubt.