

HP 6890Series
Gas Chromatograph

Installation Guide

Flame Ionization Detector

Accessories
HP G1561A
HP G1562A
HP G1591A
HP G1598A

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HP part number
G1531-90300

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Warranty

The information contained
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**Hewlett-Packard makes
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with regard to this
material, including, but
not limited to, the
implied warranties of
merchantability and
fitness for a particular
purpose.** Hewlett-Packard
shall not be liable for errors
contained herein or for
incidental or consequential
damages in connection with
the furnishing,
performance, or use of this
material.

Safety Information

The HP 6890 Gas
Chromatograph meets the
following IEC
(International
Electrotechnical
Commission) classifications:
Safety Class 1, Transient
Overvoltage Category II,
and Pollution Degree 2.

This unit has been
designed and tested in
accordance with recognized
safety standards and
designed for use indoors. If
the instrument is used in a
manner not specified by the
manufacturer, the
protection provided by the
instrument may be
impaired. Whenever the
safety protection of the HP
6890 has been
compromised, disconnect
the unit from all power
sources and secure the unit
against unintended
operation.

Refer servicing to qualified
service personnel.
Substituting parts or
performing any
unauthorized modification
to the instrument may
result in a safety hazard.
Disconnect the AC power
cord before removing
covers. The customer
should not attempt to
replace the battery or fuses
in this instrument. The
battery contained in this
instrument is recyclable.

Safety Symbols

Warnings in the manual or
on the instrument must be
observed during all phases
of operation, service, and
repair of this instrument.
Failure to comply with
these precautions violates
safety standards of design
and the intended use of the
instrument.
Hewlett-Packard Company
assumes no liability for the
customer's failure to
comply with these
requirements.

WARNING

A warning calls attention
to a condition or possible
situation that could cause
injury to the user.

CAUTION

A caution calls attention to
a condition or possible
situation that could
damage or destroy the
product or the user's work.

The following safety
instructions should be
followed at all times:

Hydrogen (H₂) is
flammable and is an
explosion hazard when
confined in an enclosed
space such as the oven. In
any application using
hydrogen, turn off the
supply at its source before
working on the instrument.

The flame ionization
detector (FID),
nitrogen-phosphorus
detector (NPD), and flame
photometric detector (FPD)
use hydrogen gas as a fuel.
Be sure all hydrogen gas is
shut off to the detectors
before shutting off the
power to the instrument.

The oven, inlet, and
detector zones may be hot
enough to cause burns.
Turn off the heated zones
and allow time for cooling
before working on the
instrument.

To avoid shock hazard,
turn off the power and
unplug the instrument
before removing the
instrument's covers.

Wear safety glasses when
using compressed gas and
when handling glass or
fused silica capillary
columns. It is good practice
to wear safety glasses at all
times when working with
the instrument.

The insulation on the GC is
made of refractory ceramic
fibers (RCF) and
recommend the following
safety procedures.
Ventilate your work area.
Wear long sleeves, gloves,
safety glasses, and a
disposable dust/mist
respirator. Dispose of
insulation in a sealed
plastic bag. Wash your
hands with mild soap and
cold water after handling.

Overview

This section reviews the procedure for installing a flame ionization detector (FID) on an HP 6890 Gas Chromatograph (hereafter referred to as the GC). Before following this procedure, refer to the safety information on the inside front cover.

Parts List

EPC

- FID assembly: capillary optimized *or* adaptable
- Top insulation
- Bottom insulation
- Nutwarmer cup and insulation (for adaptable FID only)

NonEPC

- FID assembly: capillary optimized *or* adaptable
- Top insulation
- Bottom insulation
- Makeup gas regulator
- 2 machine screws
- Nutwarmer cup and insulation (for adaptable FID only)

Tools

- Electrostatic protections such as grounded wrist strap (HP part no. 9300•0969 for large wrists or HP part no. 9300•0976 for small wrists)
- T•20 Torx screwdriver
- Diagonal cutters
- 7/16•in wrench (nonEPC detector only)

Steps

1. Preparing the GC
2. Installing the flow manifold
3. Installing the makeup gas regulator (nonEPC detector only)
4. Positioning and securing the detector
5. Connecting the detector
6. Routing the tubing
7. Installing the nutwarmer cup (adaptable FID only)
8. FID chimney insert (optional)
9. Restoring the GC to operating condition
10. Calibrating your detector (EPC detector only)

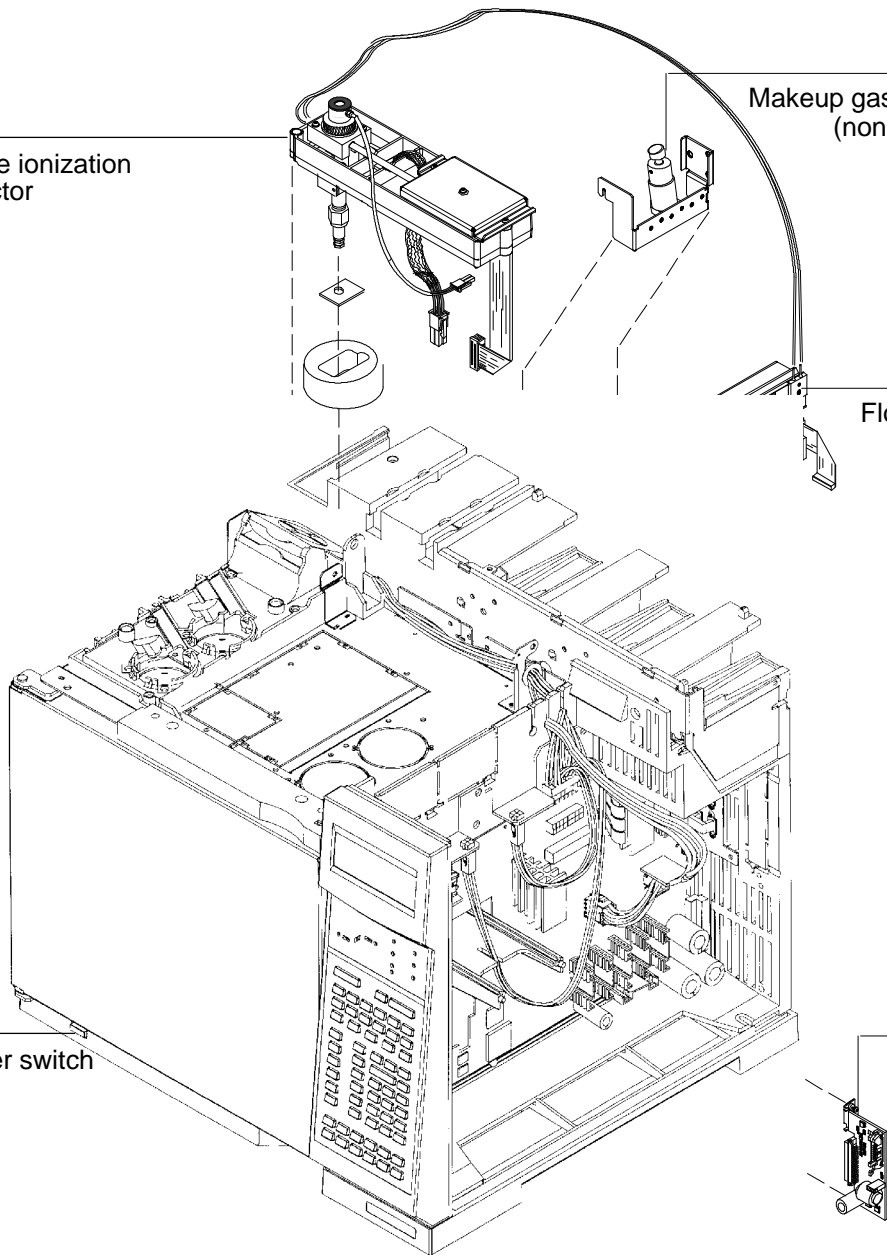
Flame ionization detector

Makeup gas regulator
(nonEPC only)

Flow manifold

Power switch

Printed circuit board



Preparing the GC

WARNING

Hazardous voltages are present in the mainframe when the GC is plugged in. Avoid a potentially dangerous shock hazard by unplugging the power cord before removing the side panels.

1. Turn off the GC and unplug the power cord. Allow time for all heated zones to cool and then turn off supply gases at their sources.

From the back of the GC:

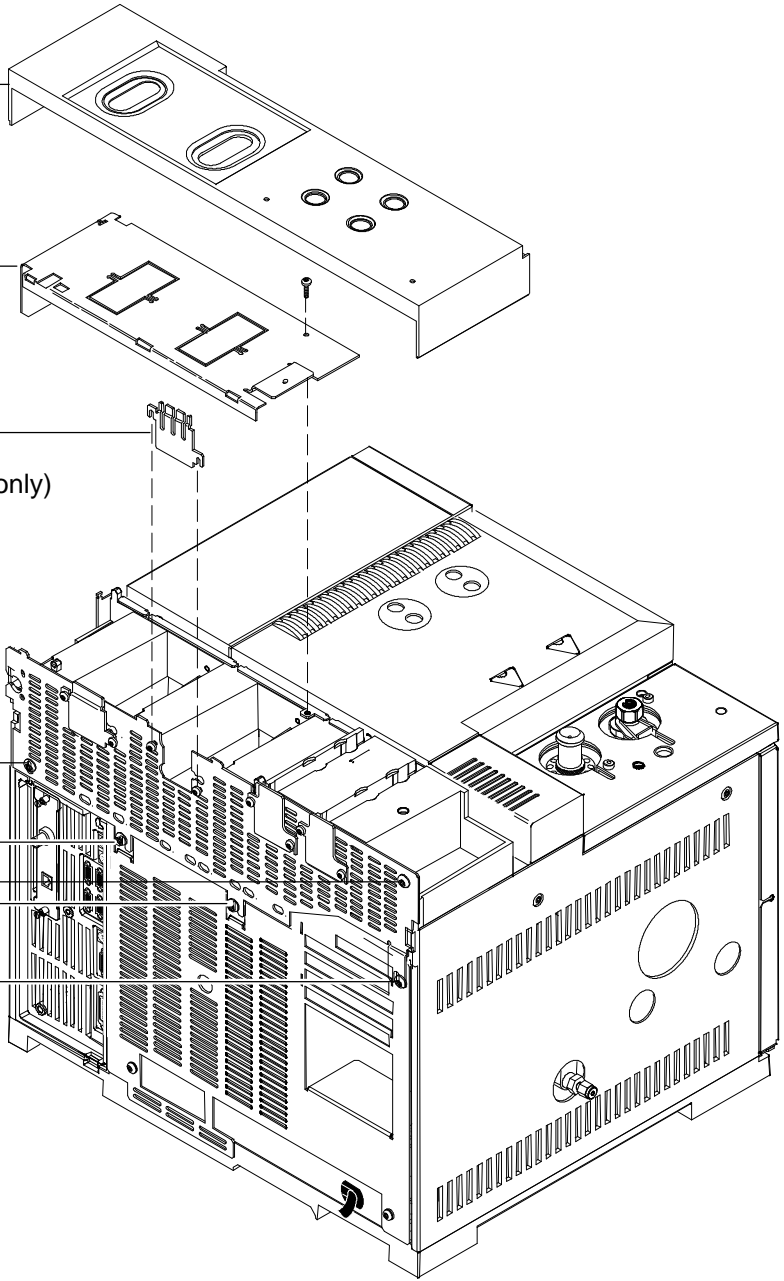
2. Unsnap and lift off the pneumatic stop cover
3. Remove the RFI cover. Remove the screw with a T•20 Torx screwdriver, slide the cover to the left until it disengages from the top rear panel, and remove it.
4. If you are installing a nonEPC detector, remove the detector cover plate from the front or back position by loosening the two screws with a T•20 Torx screwdriver and sliding the plate up and off.
5. Loosen the five screws in the top rear panel with a T•20 Torx screwdriver. Grasp the panel at each end and gently lift it up and then away from the GC. Be careful not to disrupt the supply tubing.

2

3

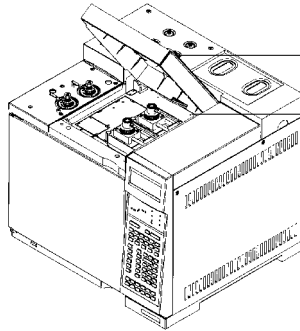
4
(nonEPC detectors only)

5
Loosen
five screws



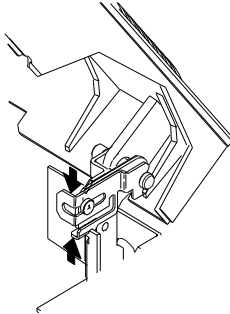
6. Remove the detector cover:

- a. Lift the cover as shown and locate the hinge in the right, rear corner

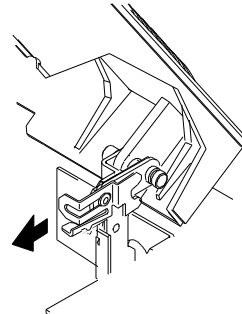


Detector
cover
Hinge

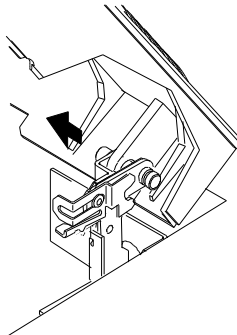
- b. Squeeze the clip as shown.



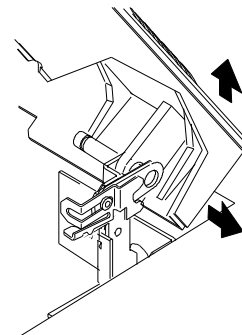
- c. Pull the clip toward you.



- d. Pull the pin to the left.



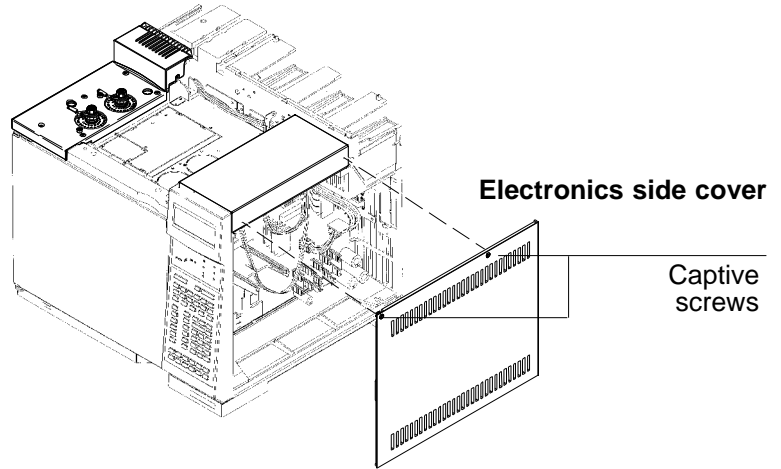
- e. Slide the detector cover to the right and lift it off.



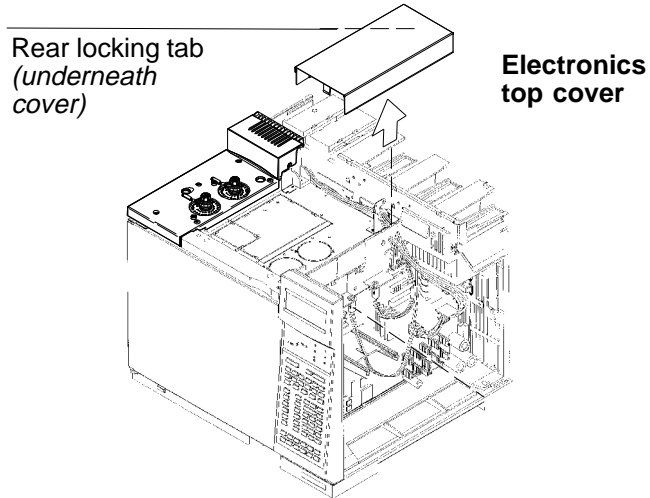
Caution

Board components can be damaged by static electricity; use a properly grounded static control wrist strap when removing the electronics covers.

7. Remove the electronics side cover: Loosen the two captive screws with a T•20 Torx screwdriver, slide the cover to the rear, and lift it off.



8. Remove the electronic top cover: Press the rear locking tab toward the front of the GC while lifting the back of the cover. Slide the cover back, up, and out of the GC.



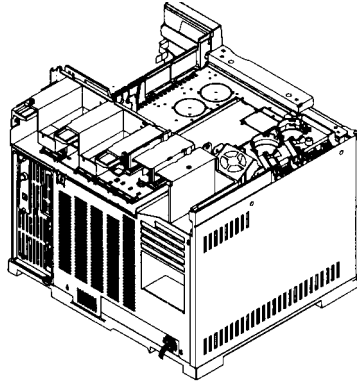
Installing the flow manifold

Caution

Board components can be damaged by static electricity; use a properly grounded static control wrist strap when removing the electronics covers.

1. From the back of GC, locate the pneumatics carrier.

Pneumatics carrier



2. If you are installing a detector in the front position and an inlet is installed in the back position, unplug the back inlet ribbon cable. Unlock the connector by pushing the tabs away from the center.

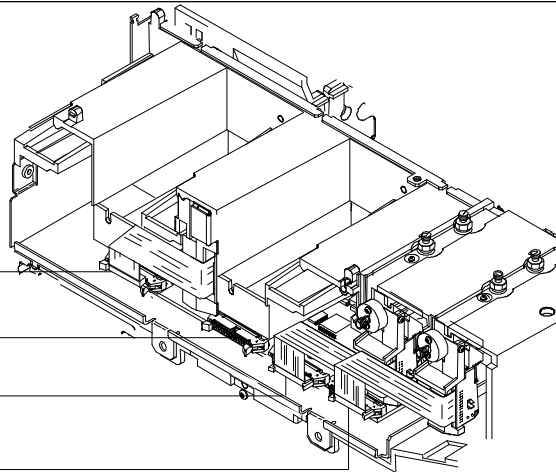
Connector locations

Back detector

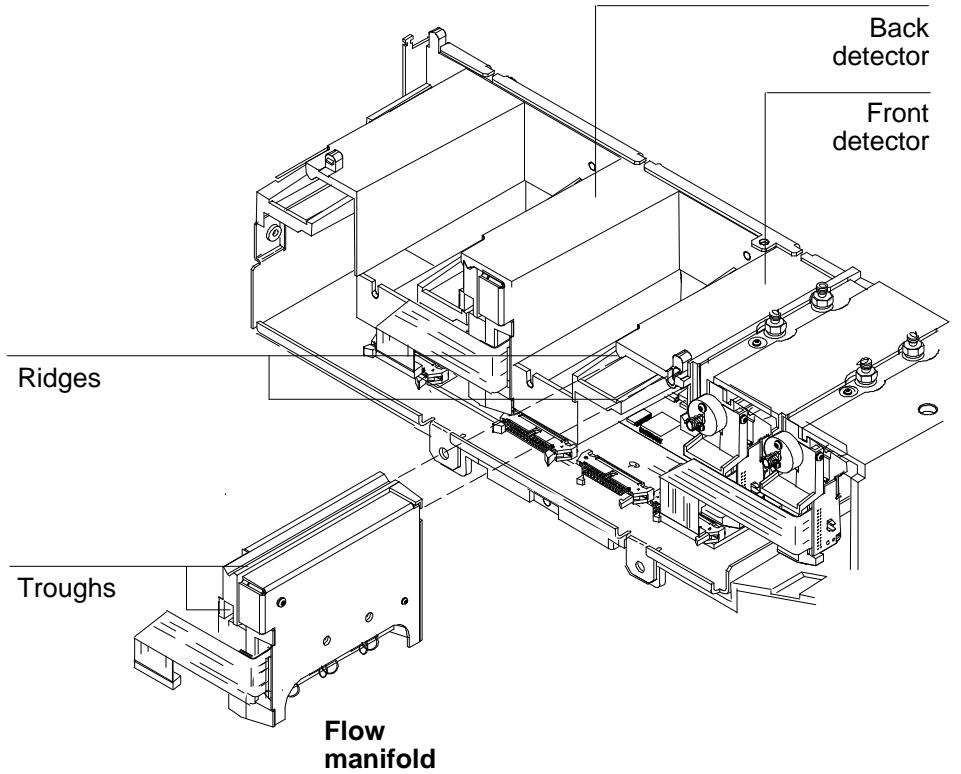
Front detector

Back inlet

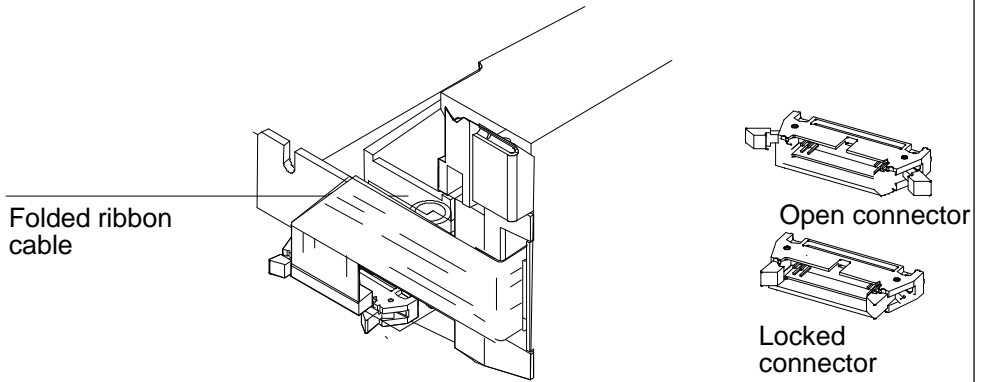
Front inlet



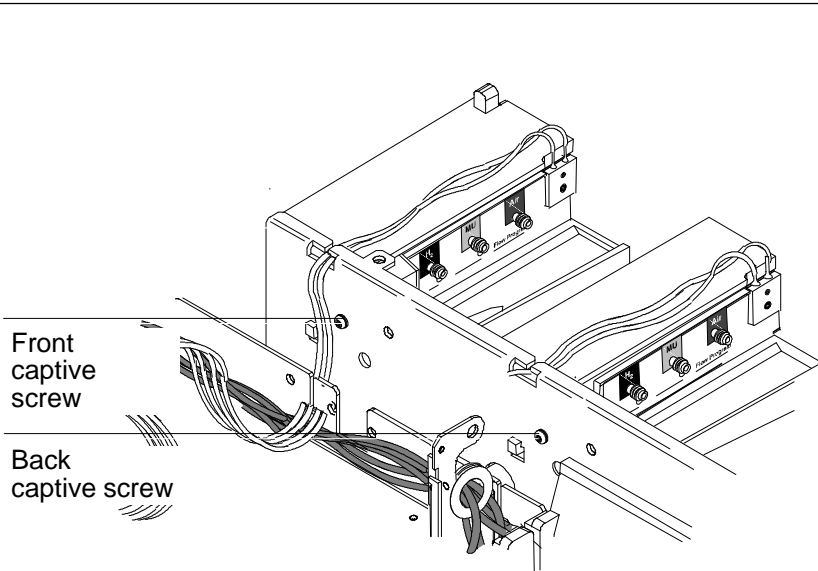
3. Locate the troughs in the flow manifold and the ridges in the pneumatic carrier. Slide the flow manifold into the carrier, lining up the ridges and troughs.



4. Plug the ribbon cable into the front or back connector(see page 8, step 2.) Make certain the connector is firmly seated and locked. If the flow manifold is installed and plugged into the correct position, the ribbon cable will retain its fold as shown in the diagram. If you unplugged an inlet ribbon cable in Step 2, replace it.

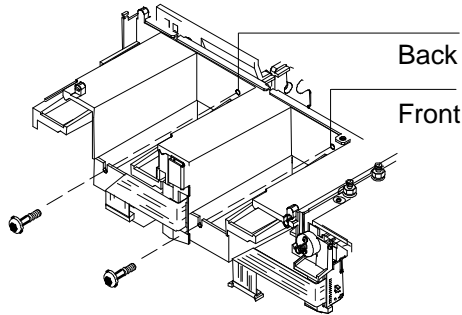


5. From the front of the GC, secure the flow manifold to the carrier by tightening the captive screw until snug using a T•20 Torx screwdriver

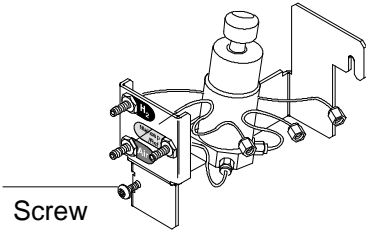


Installing the makeup gas regulator (nonEPC detectors)

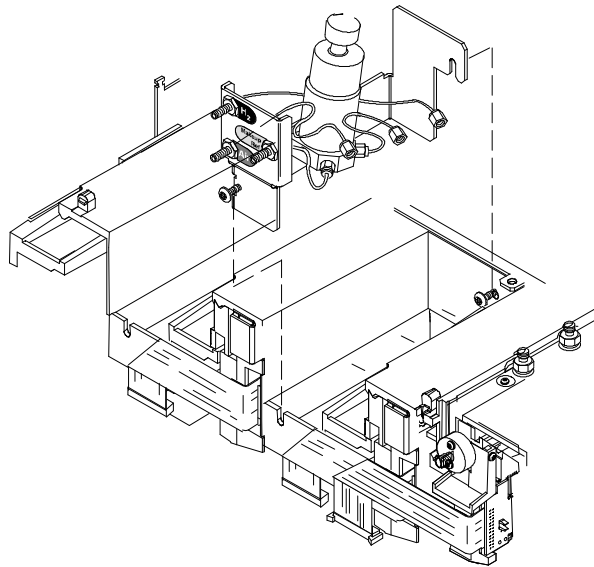
1. Install a screw in the front or back position of the pneumatics carrier as shown. Do not tighten the screw



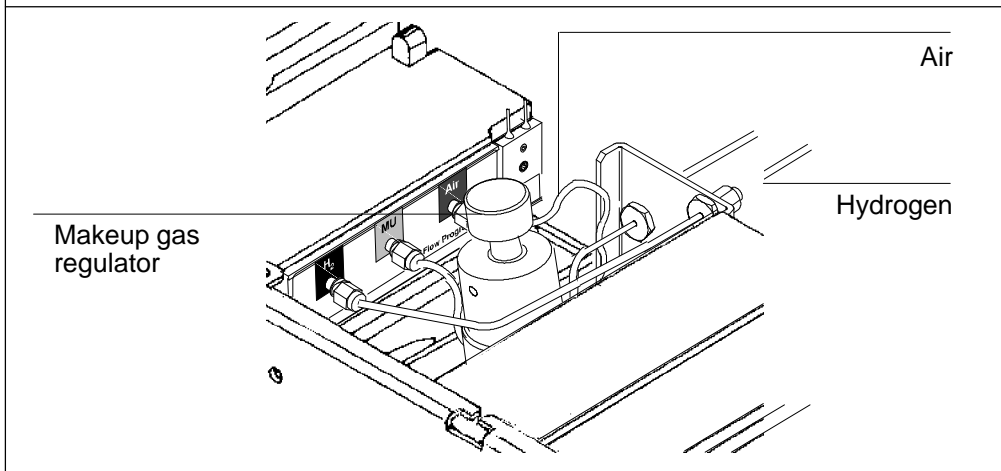
2. Install a screw in the makeup gas regulator as shown. Do not tighten the screw



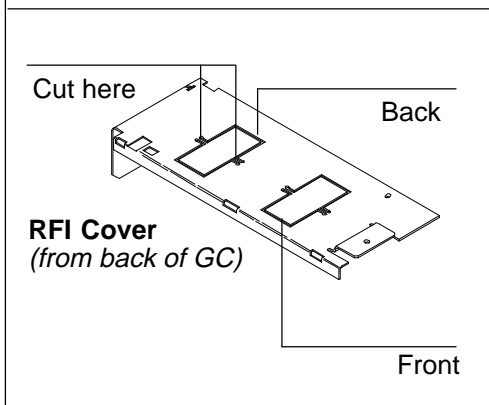
3. Place the makeup gas regulator in the front or back position of the pneumatics carrier. Tighten the screws with a T•20 Torx screwdriver



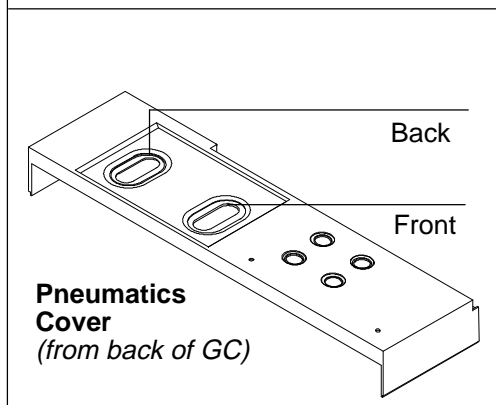
4. Connect the tube on the makeup gas regulator to the fitting labeled MU on the flow manifold. Tighten the nut fingertight, then use the 7/16" wrench to tighten it 3/4 of a turn. Follow the same procedure for connecting the air and hydrogen tubing (labeled at the back of the GC) to the flow manifold.



5. Locate the RFI cover that you removed in *Preparing the GC* (p. 4). Remove the rectangular cutout in the front or back detector position. Use diagonal cutters to cut the metal in the two locations or work the cutout back and forth until it breaks free from the cover.

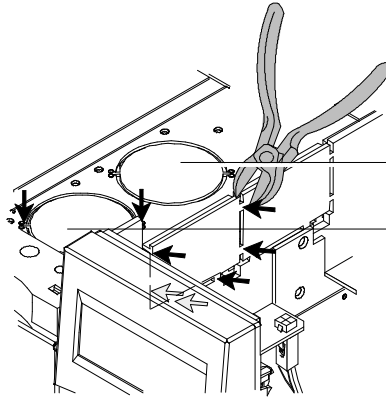


6. Locate the pneumatics cover that you removed in *Preparing the GC* (p. 4). Remove the oval labels in the front or back detector position by pushing on the label from underneath the cover.



Positioning and securing the detector

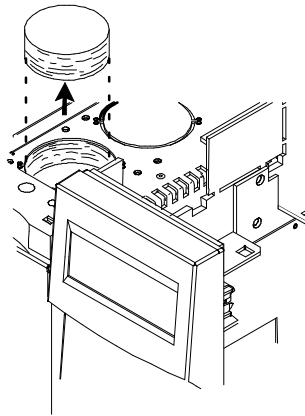
1. Remove the round metal cutout on the oven top and the square plastic cutout in the electronics carrier in the front or back detector position, if necessary. Cut the metal circle with diagonal cutters so that the nibs are connected to the piece removed. Cut the plastic in six places with diagonal cutters. Discard the cutouts.



Back

Front

2. Lift out the die-cut insulation plug from the front or back detector position, if necessary.



Caution

Be careful to remove only the insulation within the scribed circle.

3. Carefully remove the scribed circle of insulation from the oven top to create an opening into the oven.

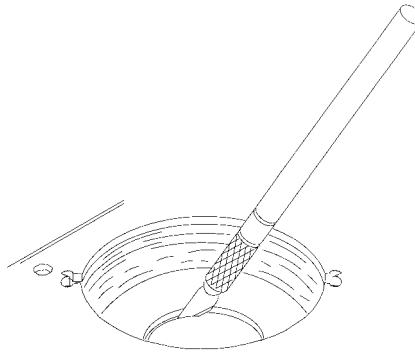
Method 1:

Use an Xacto knife to cut out the insulation using the scribed circle as a guide.

Method 2:

Pierce the insulation with a screwdriver. Rotate the screwdriver around the circumference of the scribed circle to remove excess insulation.

Clean up any pieces of insulation that fall inside the oven.



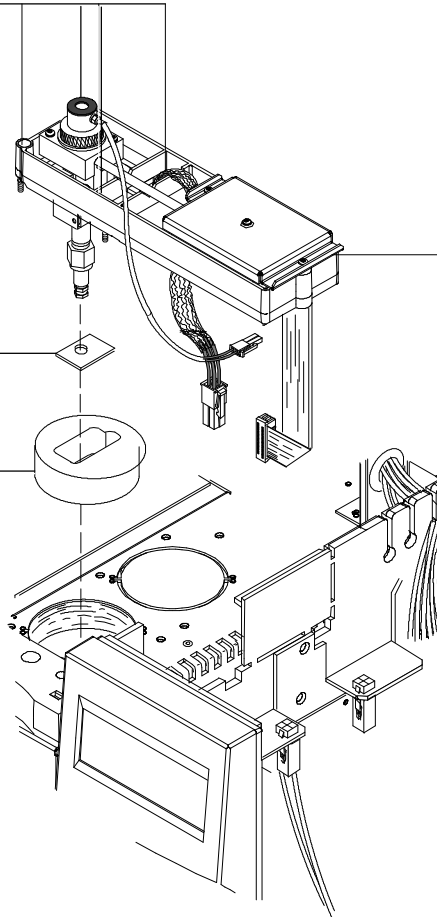
4. Place the bottom insulation in the detector cavity as shown.
5. Place the top insulation in the bottom insulation so that the hole in the insulation lines up with the hole in the oven top..
6. Place the detector pallet into the insulated cavity. Partially tighten the four screws with a T•20 Torx screwdriver. Tighten all the screws to snugness.

Captive
screws
(4)

Top insulation

Bottom insulation

Pallet

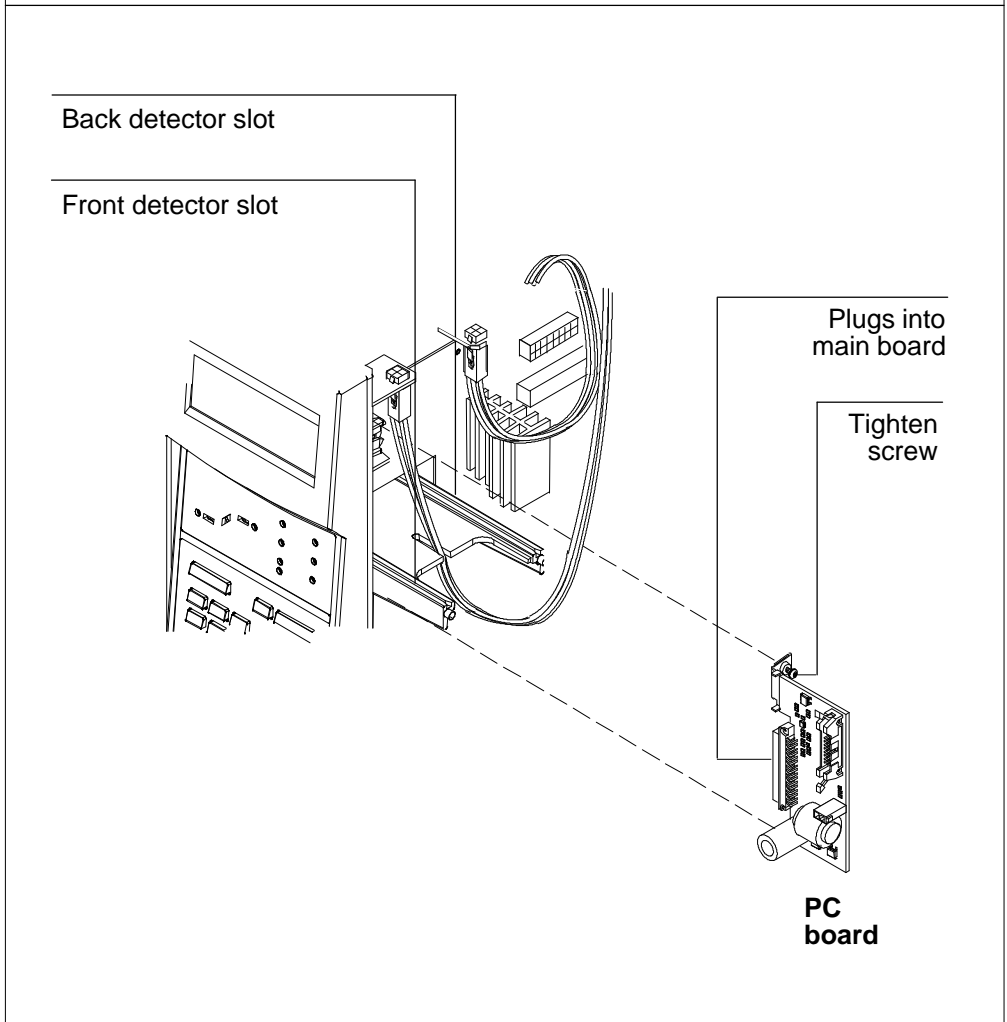


Connecting the detector

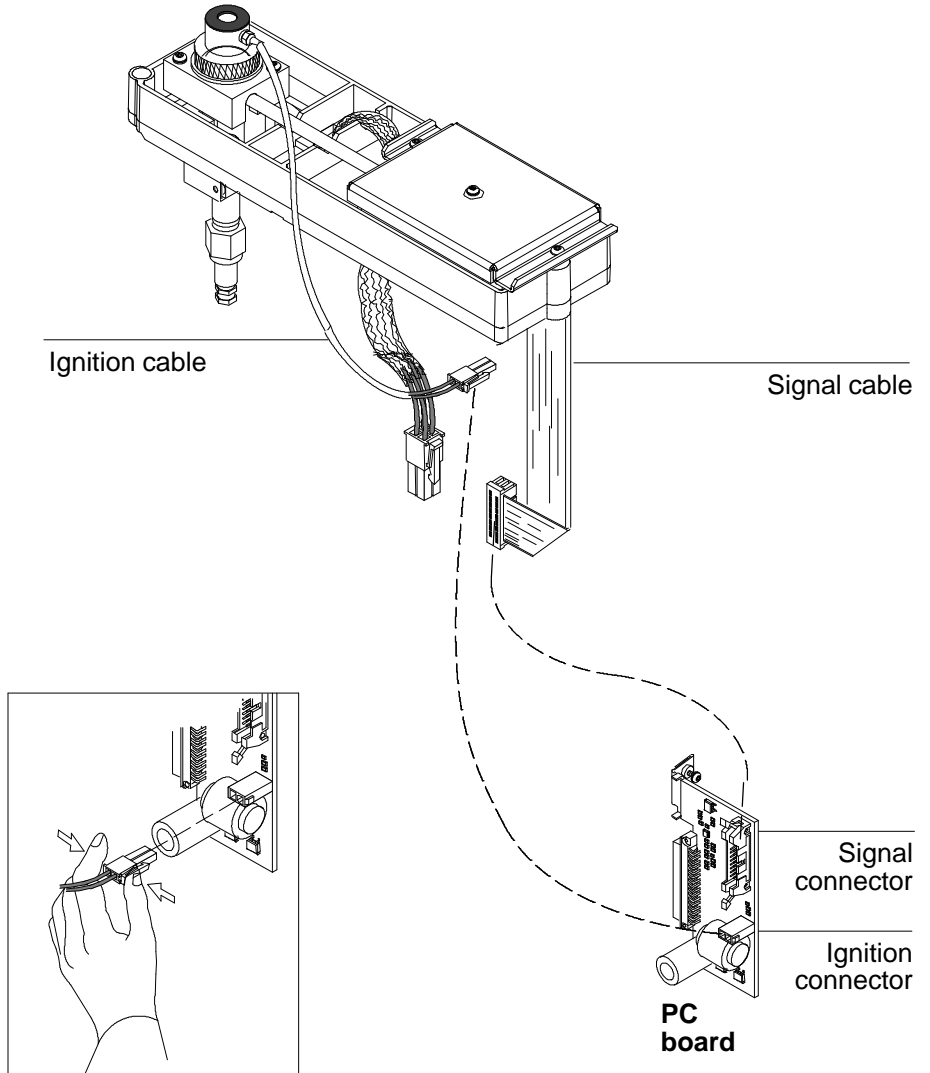
Caution

Board components can be damaged by static electricity; use a properly grounded static control wrist strap when handling the FID board.

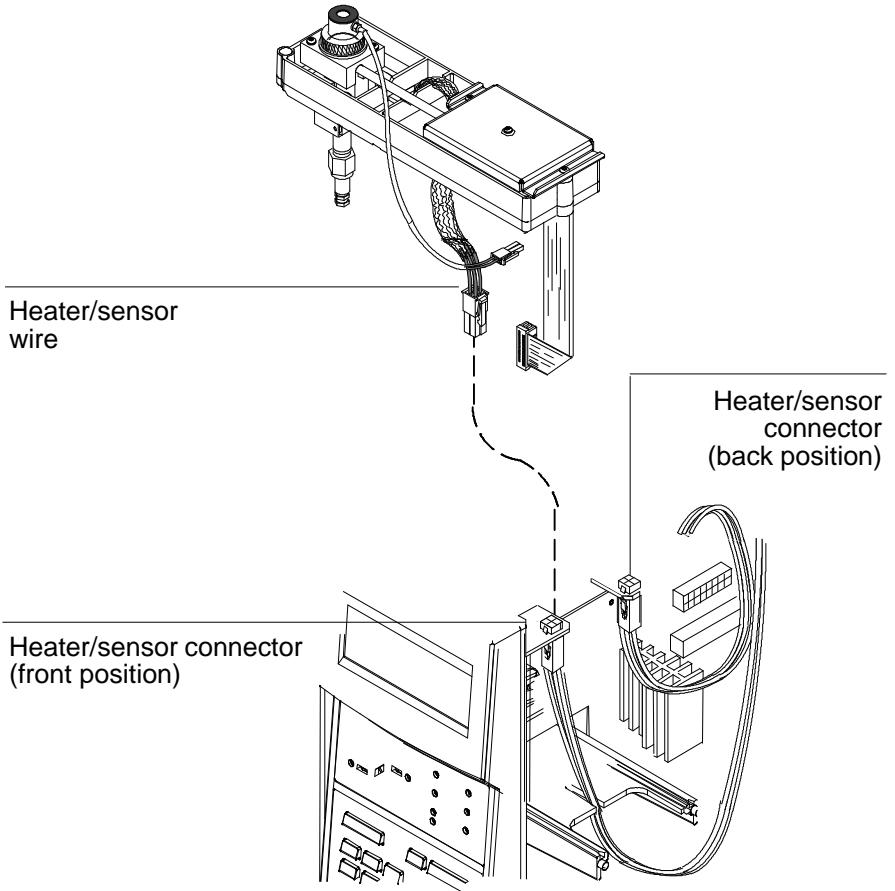
1. Remove the PC board from its static control bag and slide into the front or back slot on the main circuit board until it is plugged in. Tighten the screw on the PC board bracket with a T•20 Torx screwdriver



2. Attach the signal cable and ignition wire to the PC board, if not already connected.

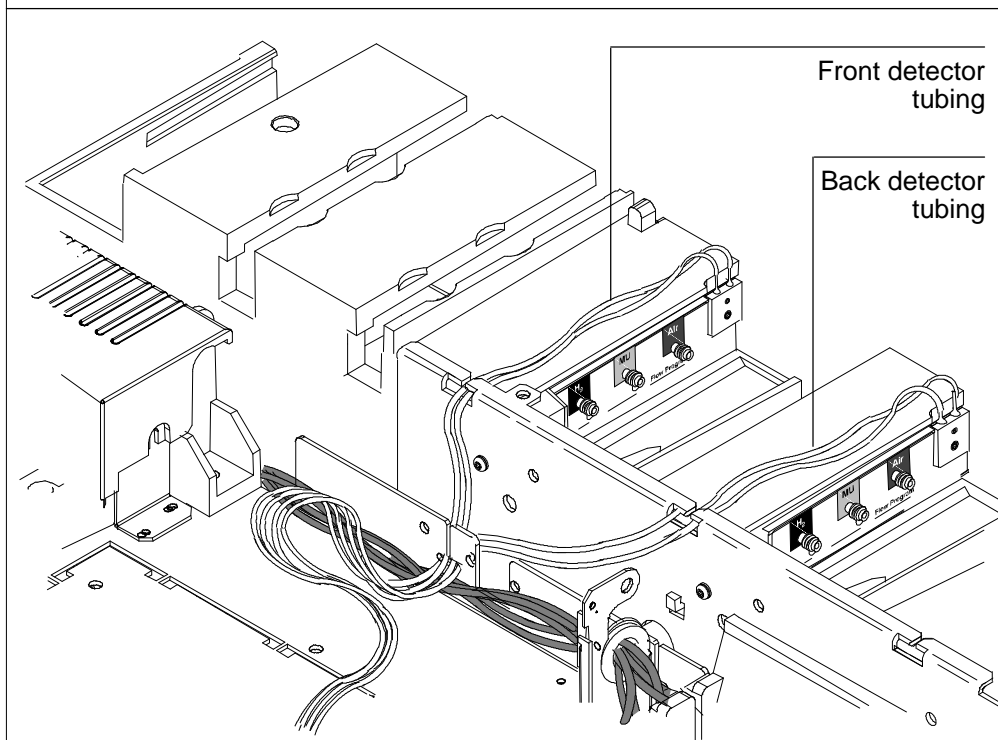


3. Connect the heater/sensor wire to the square connector closest to the front or back detector



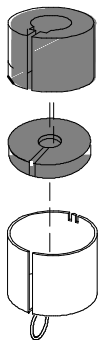
Routing the tubing

Route the tubing from the flow manifold to the detector as shown.

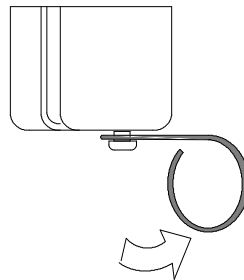


Installing the nutwarmer cup (adaptable FID)

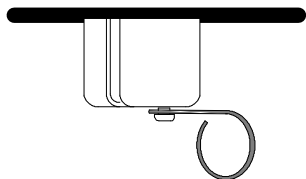
1. Install the insulation in the cups as shown.



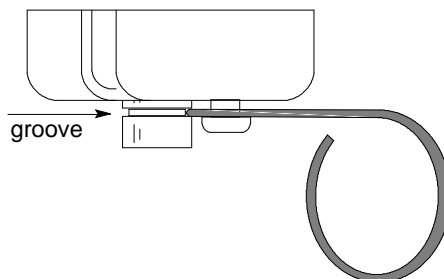
2. Take the insulation cup and push the wire spring lever at the bottom of the cup to the right to uncover the hole.



3. From inside the oven, place the cup over the detector fitting so that the top of the cup touches the top of the oven.

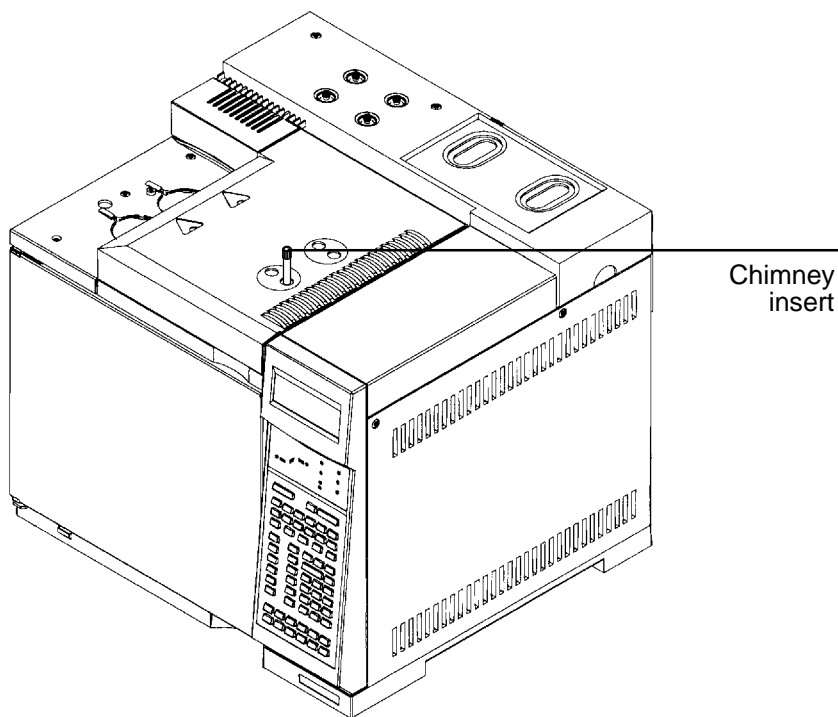


4. Release the spring. Make certain the spring fits in the groove of the detector fitting.



FID chimney insert (optional)

Purchase a PTFE chimney insert (HP part no. 19231•21050) if you are running highly corrosive analytes. These inserts may be ordered from the *HP Analytical Supplies Catalog*.



Restoring the GC to operating condition

1. Reinstall the electronics side panel.
2. Reinstall the top rear panel
3. Reinstall the detector cover
4. Reinstall the electronic stop cover
5. Plug in the GC and turn it on.
6. Press [Front Det] or [Back Det]. If the detector has been properly installed, you will see the following display:

EPC

FRONT DET (FID)		
Temp	24	Off <
H2 flow	0.x†	Off
Air flow	0.x†	Off
Mkup flow	0.x†	Off
Flame		Off
Output		0.0

NonEPC

FRONT DET (FID)		
Temp	24	Off <
H2 flow		Off
Air flow		Off
Mkup (N2)		Off
Flame		Off
Output		0.0

†An actual flow value is displayed when the gases are off or not connected. This is not an error. After the gases are connected and the detector is operational, the actual flow values will be equal to the setpoint values.

Calibrating your detector (EPC only)

Your detector's flow manifold contains a pressure sensor that must be zeroed after it is installed on your GC. This calibration procedure ensures an accurate detector display.

Caution

Do not connect the detector and makeup gases to your flow manifold until you have zeroed your detector's pressure sensor.

1. Plug in your GC and turn it on, if you haven't already done so.
2. Wait 15 minutes. This allows your GC to reach thermal equilibrium.
3. Zero the detector's pressure sensor:
 - a. Press [Options], scroll to Calibration and press [Enter].
 - b. Scroll to Front detector or Back detector and press [Enter].
 - c. Scroll to Oxidizer zero and press [On].
 - d. Scroll to H₂ zero and press [On].
 - e. Scroll to Makeup zero and press [On].
4. Turn off your GC and unplug the power cord.
5. Plumb the air, hydrogen, and makeup gases to your detector. See the *HP 6890 Site Preparation and Installation Manual* for instructions.
6. Reinstall the RFI cover.
7. Replace the pneumatic stop cover.
8. Plug in the GC again and turn it on.

Manual Part No.
G1531•90300



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