

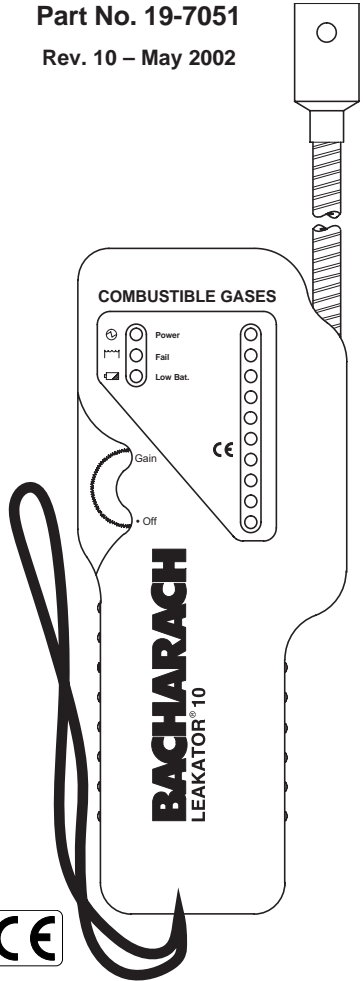
®
BACHARACH

LEAKATOR® 10

INSTRUCTION 19-9167
COMBUSTIBLE GAS DETECTOR

Part No. 19-7051

Rev. 10 – May 2002



WARRANTY

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Regulatory Information (Europe) Declaration of Conformity

Manufacturer's name: Bacharach, Inc.
Manufacturer's address: New Kensington, PA

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Product name: Leakator® 10

conforms to the following product specifications:

EMC: European Directive 89/336/EEC
EN 50081-1 (Emissions)
EN 50082-1 (Immunity)

WARNING!

Because this instrument is used to detect and monitor materials and conditions which are listed by OSHA or others as potentially hazardous to personnel and property, the information in this manual must be fully understood and utilized to ensure that the instrument is operating properly and is both used and maintained in the proper manner by qualified personnel. An instrument that is not properly calibrated, operated and maintained by qualified personnel is likely to provide erroneous information, which could prevent user awareness of a potentially hazardous situation for the instrument user, other personnel and property.

If, after reading the information in this manual, the user has questions regarding the operation, application or maintenance of the instrument, supervisory or training assistance should be obtained before use. Factory assistance is available by calling 724-334-5000.

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1.0 INTRODUCTION

The Leakator 10 is an intrinsically safe, battery-powered portable instrument designed to primarily detect the source of combustible-gas leaks. The instrument is ideally suited for heating service contractors, utility personnel, and other users who are interested in pinpointing gas leaks, and testing gas appliances in residential, commercial and industrial installations.

The instrument is supplied with a durable plastic carrying case, 20" probe and instruction manual.

The Leakator 10 features:

- Ten bright-red LEDs and a speaker that provide both a visual and audible indication to the presence of gas.



Figure 1. Leakator 10 and Accessories

- Three operation-status LEDs that show power on, sensor operation, and low battery.
- A 20-inch flexible probe.
- Simple thumb wheel on/off and gain control allowing one-handed operation.
- A solid-state sensor that has a typical life of 5 years.
- A battery capacity of 30 hours under normal use conditions.
- The ability to detect natural gas (methane) in concentrations as low as 20 ppm. In addition, the following gases and vapors are also detectable:

Acetone	Ethanol	Industrial Solvents
Acetylene	Ethylene Oxide	Paint Thinners
Ammonia	Gasoline	Propane
Benzene	Hexane	Naphtha
Butane	Hydrogen	

WARNINGS!

For safety reasons, the Leakator 10 must only be operated and serviced by qualified personnel. Read and understand the contents of this instruction manual before operating or servicing.

To prevent ignition of a hazardous atmosphere, do not perform any maintenance work, such as replacing the instrument's batteries, sensor, or sensor-matching resistor, in an area classified as being hazardous.

2.0 TECHNICAL CHARACTERISTICS

Power	Five C-size Alkaline Batteries.
Battery Life	Approximately 30 hours of continuous operation under normal-use conditions.
Sensor:	
Type	Solid State, plug-in replacement.
Life Expectancy	Typically 5 years.
Calibration	No user calibration required.
Probe	Self storing 20" (51 cm) flexible probe, includes integral sensor.
Response Time	Less than 3 seconds to full scale indication.
Sensitivity	20 ppm Methane.
Warm-Up Time	Approximately 10 seconds.
Duty Cycle	Continuous with no limitation.
Gas Indication	Visual: 10 red ultra-bright LEDs. Audible: Variable speed ticking sound (earphone provided for use in noisy environments).
Status LEDs	Power On (green) Sensor Failure (yellow) Low Battery (yellow)

Weight 17.8 oz (0.5 kg) (w/o batteries)

Dimensions: 8.5" x 2.25" x 1.75"
(21.6 x 5.7 x 4.4 cm)

Operating Environment:

Position Any

Temperature 23° to 130°F (-5° to 54°C)

Humidity 10% to 90% RH, non-condensing

Safety Approvals UL Classified, Intrinsically Safe for use in Class I, Division 1, Groups A, B, C and D. CE Mark.

3.0 BATTERY INSTALLATION

WARNING!

Do not replace batteries in a hazardous area.

CAUTION:

To maintain agency approval, use only NEDA-14A type batteries or equivalent.

Remove battery cover. Install five (non-rechargeable) 1.5V C-size alkaline batteries per Figure 2 – observe proper polarity. Then reinstall battery cover.



Figure 2. Battery Installation

4.0 OPERATION

4.1 Turning ON the Instrument

Turn ON the instrument by rotating its thumb-wheel switch (Fig 3) clockwise until a click is heard. Observe the following:

- The Power LED lights.
- The Fail LED will light, but should turn off in a few seconds if the sensor is good and properly seated in its socket.
- If the Low Bat. LED is on, replace the batteries per Section 3.0 *Battery Installation*.

After the instrument stabilizes, rotate the Gain control in the direction necessary to cause the bottom Gas Level LED to just turn off. Be sure to always set this control in the same environment you intend to test in.

The instrument is now ready for use.

4.2 Taking a Gas Reading

To verify that the instrument is operating, sample a known combustible gas (e.g., a gas-air mixture from an unlit burner of a natural-gas range). If no response is observed or heard, refer to Section 6.0 *Troubleshooting*.

Important! *The sensor becomes less sensitive after being exposed to an excessive amount of gas. Therefore, after testing the instrument as described above, leave it on for several minutes to restabilize the sensor.*

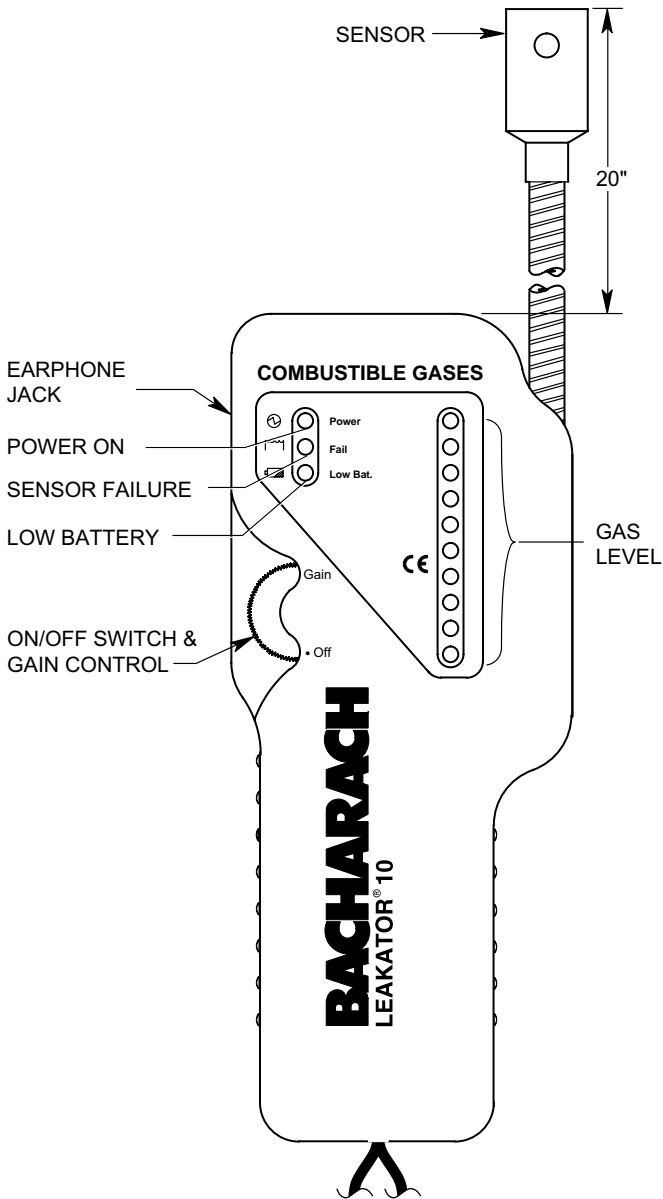


Figure 3. Jack, Control, and Indicators

Take a gas reading by positioning the end of the instrument's flexible probe near the area to be sampled.

The presence of a combustible gas is indicated by a column of ten red LEDs and a speaker. The number of lighted LEDs gives visual indication of the relative gas level, while the speaker produces clicking sounds, similar to a Geiger counter, that increase in repetition rate as the gas concentration goes up in relation to the instrument's gain setting.

The instrument's sensitivity to gas concentrations is adjusted by means of its thumb-wheel Gain control. Clockwise rotation increases sensitivity, while counterclockwise rotation decreases sensitivity. The Gain control is useful in pinpointing large leaks by starting with the control set to light 1 or 2 LEDs, and then gradually rotating the control counterclockwise as the probe gets closer to the leak.

4.3 Using the Earphone

The earphone is an optional accessory that provides private monitoring of the Leakator 10, and is recommended for use in high-noise environments. The earphone plugs into the side of the instrument, just above the thumb-wheel control.

4.4 Turning OFF the Instrument

Turn OFF the instrument by rotating the thumb-wheel control counterclockwise until a click is heard. There is no need to purge the instrument with fresh air before turning it off.

5.0 MAINTENANCE

WARNING!

Do not replace the batteries, sensor, or sensor matching resistor in a hazardous area.

Since the Leakator 10 does not require calibration at regular intervals, very little needs to be done to maintain the instrument in working order.

If the instrument has not been used for more than 3 months, you may wish to turn it on and let it run in fresh air for several minutes to keep the sensor at peak sensitivity.

If a problem should occur with your instrument, refer to Section 6.0 *Troubleshooting*.

Detailed procedures of how to replace the sensor and other components in the instrument are provided below.

5.1 Replacing the Sensor

Replacement sensors are classified at the factory according to sensitivity, and are shipped with a matching resistor that ensures the sensor will function properly when installed in your instrument. It is important that the sensor and its resistor be used together – DO NOT intermix resistors and sensors.

Items required:

- Small and medium flat-blade screwdrivers
- Wire cutter
- Replacement sensor with matching resistor (P/N 19-0398)

Procedure:

1. Turn OFF instrument.
2. Pry sensor out of its socket using a small flat-blade screwdriver (Fig 4) and discard.
3. Remove battery cover.
4. Remove old matching resistor (Fig 5) and discard.
5. Locate new sensor's matching resistor; then cut and bend the resistor leads using the forms that are molded into the battery cover (Fig 6). *Note that If the resistor leads are cut too short, the instrument may not function.*
6. Insert new matching resistor into printed circuit board, and plug new sensor into socket at end of probe. *Notice that the sensor's six pins and the socket are symmetrical and not keyed, thus permitting the sensor to be plugged in two ways. The socket, however, is wired so that it doesn't matter which way the sensor is installed.*
7. Install battery cover.
8. Test instrument response (refer to Section 4.2).

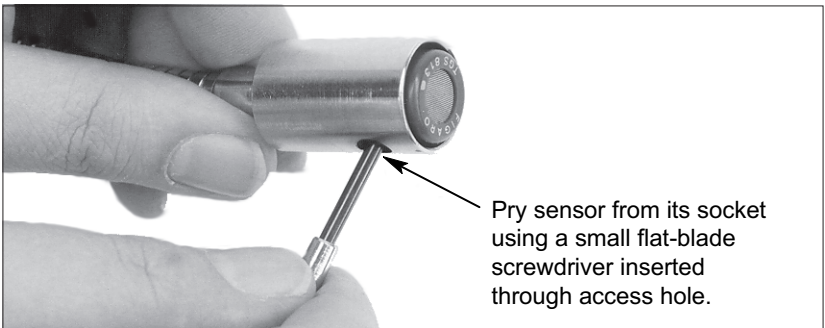


Figure 4. Removing Sensor

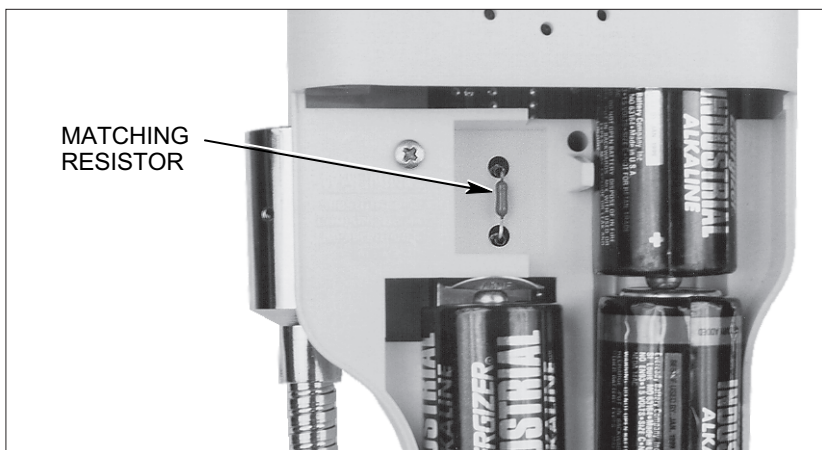


Figure 5. Location of Matching Resistor

Cut Matching Resistor leads to correct length by inserting each lead into form as shown and cutting here.

NOTE: The plastic clip guide length represents the minimum lead length. If the resistor leads are cut too short, the instrument may not function.

Optimum lead length is 11/16".

After cutting resistor leads, use this form to bend leads as shown.

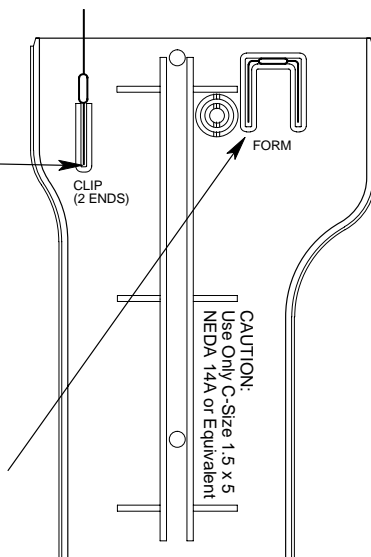


Figure 6. Cutting and Bending Resistor Leads using Forms Molded into Battery Cover

5.2 Replacing the Printed Circuit Board

Items required:

- Medium flat-blade screwdriver
- Medium Phillips screwdriver
- Replacement printed circuit board (P/N 19-0418)

Procedure:

(See Figure 7)

1. Turn OFF instrument and lay it face down on work area.
2. Remove battery cover and batteries.
3. Remove sensor-matching resistor.
4. Remove four screws securing rear case.
5. Carefully lift rear case and flexible arm assembly away from instrument, being careful not to pull wires attached to printed circuit board. Lay rear case face down on work area.
6. Carefully remove printed circuit board from front case.
7. Unplug connectors J2 and J3 from printed circuit board.
8. Plug connectors J2 and J3 into new printed circuit board; then install board into front case.
9. Install flexible arm assembly and rear case using the screws that were removed in Step 4.
10. Replace sensor-matching resistor.
11. Replace batteries and battery cover.
12. Test instrument response (refer to Section 4.2).

5.3 Replacing the Speaker

Items required:

- Medium flat-blade screwdriver
- Medium Phillips screwdriver
- $11/32$ " Nut driver
- Replacement speaker (P/N 19-0400)

Procedure:

(See Figure 7)

1. Turn OFF instrument; then remove battery cover and batteries.
2. Remove sensor-matching resistor.
3. Remove four screws securing rear case; then carefully lift rear case and flexible arm assembly away from instrument, being careful not to pull wires attached to printed circuit board. Lay rear case face down on work area.
4. Carefully remove printed circuit board from front case; then unplug speaker connector J2 from printed circuit board.
5. Remove two nuts and washers securing speaker to rear case; then remove speaker.
6. Install new speaker and secure in place using the nuts and washers that were removed in Step 5. *CAUTION! Do not overtighten the nuts!*
7. Replace flexible arm assembly and rear case using the screws that were removed in Step 3.
8. Replace sensor-matching resistor.
9. Replace batteries and battery cover.
10. Test instrument response (refer Section 4.2).

5.4 Replacing the Flexible Probe Assembly

Items required:

- Medium flat-blade screwdriver
- Medium Phillips screwdriver
- Replacement flexible probe assembly (P/N 19-3091)

Procedure:

(See Figure 7)

1. Turn OFF instrument and lay it face down on work area.
2. Remove battery cover and batteries.
3. Remove sensor-matching resistor.
4. Remove four screws securing rear case.
5. Carefully lift rear case and flexible arm assembly away from instrument, being careful not to pull wires attached to printed circuit board. Lay rear case face down on work area.
6. Carefully remove printed circuit board from front case.
7. Unplug sensor connector J3 from printed circuit board.
8. Remove flexible probe assembly and remove sensor.
9. Plug connector on new flexible probe assembly into printed circuit board connector J3.

10. Replace printed circuit board, new flexible probe assembly, and rear case using the screws that were removed in Step 4.
11. Replace sensor.
12. Replace sensor-matching resistor.
13. Replace batteries and battery cover.
14. Test instrument response (refer to Section 4.2).

6.0 TROUBLESHOOTING

WARNING!

Do not perform any maintenance work in a hazardous area.

Because of the Leakator 10's advanced design, trouble with the instrument can usually be diagnosed by looking at the LEDs as seen through the front-case. See Figure 3.

If the Fail LED lights, check that the sensor is seated and J3 is connected to the printed circuit board. If still no change, replace the sensor per Section 5-1 *Replacing the Sensor*.

If the Low-Bat. LED lights, replace the batteries per Section 3.0 as soon as possible. The instrument should operate, however, for several hours before the batteries go dead.

If the instrument doesn't respond to a combustible gas, perform the following in the order presented until the problem is corrected:

- First ensure that all connectors are securely in place on the printed circuit board, and that the sensor is firmly seated into its socket.
- Replace sensor, even though the Sensor-Fail LED isn't on, per Section 5.1 *Replacing the Sensor*.
- Replace circuit board per Section 5.2 *Replacing the Printed Circuit Board*.

7.0 PARTS/SERVICE

7.1 Parts List

Replacement Parts (See Fig 7)

Item	Description	Part No.
1	Battery Cover (2 Screws)*	19-0405
2	Nut, Palnut Fastner	102-3736
3	Flexible Probe Assembly (4 Wire)**	19-3091
4	Front Case	19-0392
5	Printed Circuit Board Assembly	19-0418
6	Rear Case	19-0449
7	Replacement Sensor with Matching Resistor***	19-0398
8	Screw, #4-20 x 3/4 thd. forming	102-1976
9	Speaker Assembly	19-0400
10	Washer, #10 Plain	02-4140
11	Wrist Strap	19-0443
---	Instruction Manual	19-9167

* Call factory if your battery cover has only 1 screw.

** Call factory if your probe assembly has 3 wires.

*** Available only as a matched set.

Accessories

Description	Part No.
Carrying Case	19-0397
Earphone	04-9910

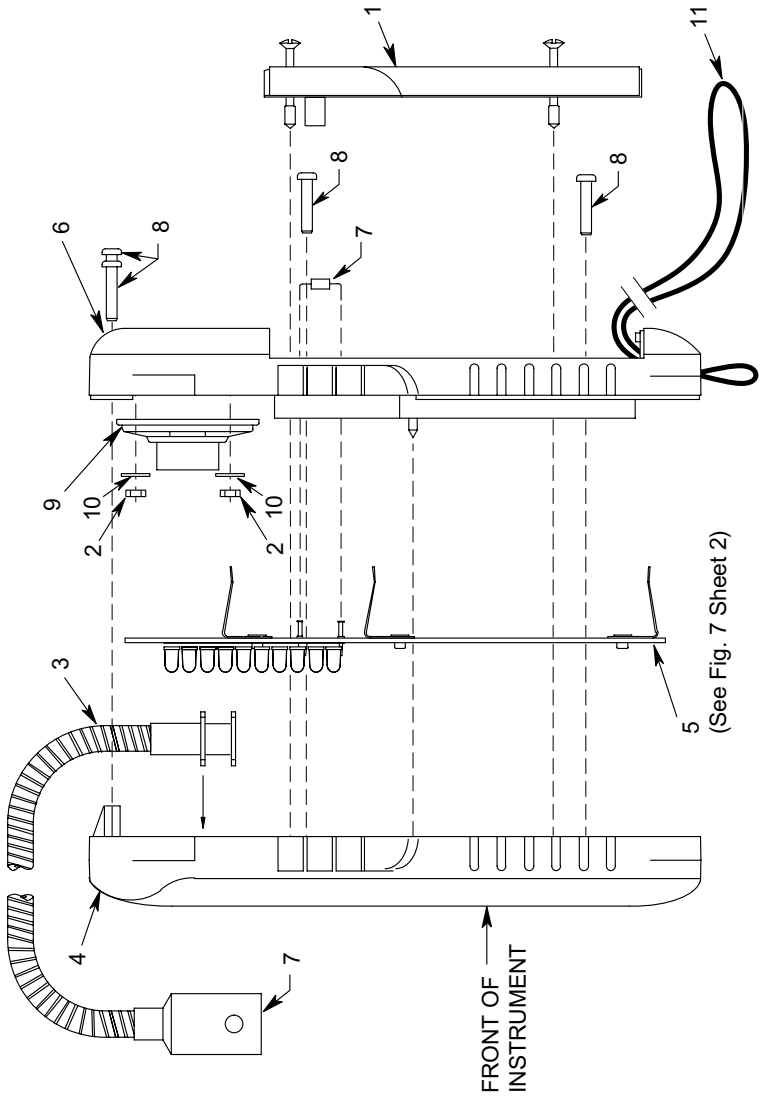


Figure 7. Leakator 10 Part Locations (Sheet 1 of 2)

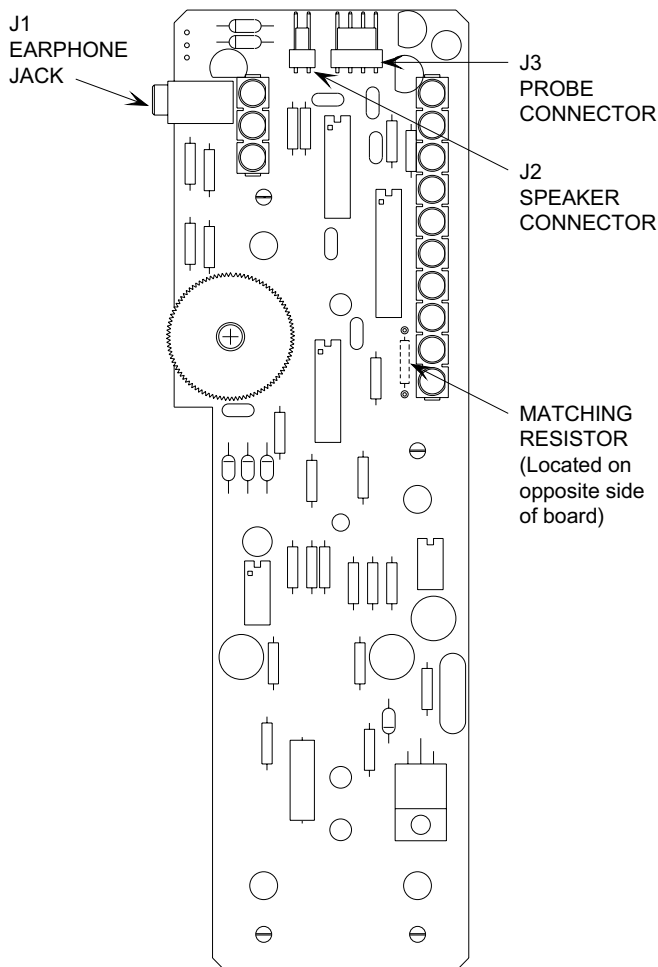


Figure 7. Leakator 10 Part Locations (Sheet 2 of 2)