# BD Loops

# Air Pocket Test

*Observations of a loop's performance
with an air pocket*

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an air pocket.*

## Purpose:

- Observe and record a loop's performance when an air pocket is present in its design.

## Hypothesis:

If a loop has an air pocket, then a detection can occur from ground vibration.

## Materials:

- 24' sized Pre-formed loop made of 20 AWG wire, with 3 turns, inside PVC tubing (Air pocket loop)

- 1 – EDI Detector Model#LMA-1250-HV Ser#237375 090600071 (detector has a deflector meter to show how much a loop's inductance changes)

- Resin (to simulate a loop underground)

- Wooden board to mount loop and resin

- Rubber Mallet

## Procedure:

Preformed air pocket loop was created by wrapping the 20 AWG wire, 3 turns, through the PVC tubing. All joins were soldered. The air pocket loop was then wrapped and encased in resin to simulate a loop underground (concrete or asphalt) on top of the wooden board. Resin was given time over night to harden.

The air pocket loop was then connected to the EDI Detector. The detector was set to a sensitivity level of 5 and reset. The rubber mallet then lightly struck the surface of the resin (see figure 1). The detector showed a detection data was recorded under "Surface". The detector was reset and the test preformed a second time striking the surface in a different area. A detection occurred and its data recorded under "Surface".

The detector was reset. The wooden base of the air pocket loop was then lightly shaken by tapping the rubber mallet against its side (see figure 2). A detection occurred and its data was recorded under "Base". The detector was reset and the test preformed a second time tapping the base in a different area. A detection occurred and its data recorded under "Base".

The above process was then repeated and result data recorded for sensitivity level 9.



Figure 1



Figure 2

*Picture of detection occurring during "Surface" and "Base" test.*

## Results:

"Surface" test data:

| Detector Sensitivity | Test #1 Detection Occur? | Test #2 Detection Occur? |
|---|---|---|
| **5** | Yes | Yes |
| 9 | Yes | Yes |

"Base" test data:

| Detector Sensitivity | Test #1 Detection Occur? | Test #2 Detection Occur? |
|---|---|---|
| **5** | Yes | Yes |
| 9 | Yes | Yes |

*Data Recorded.*

Results show that detection occurred whenever the loop was affected by vibrations.

## Conclusion:

Ground vibrations can cause false detections when a loop with an air pocket is used.

## What this means, BD Loops comments:

A loop with an air pocket should never be installed. This test shows that ground vibrations has the potential of causing a false detection. This ground vibration could be caused by cars, trains, horses, or even the gate itself moving along its track.

The reason why detection occurs is because each wire has its own EMF (detection) field. The ground vibration causes the wires to move within the air pocket and each wire's EMF field trips over each other resulting in a chance of the loop's inductance (detection).

When a false detection occurs the gate will open up by itself, or cause the detector to lock up resulting in an upset customer and a repeat service call.

# BD Loops Test Results

Conducting the same test with BD Loops 14AWG preformed direct burial loops.

## Results:

"Surface" test data:

| Detector Sensitivity | Test #1 Detection Occur? | Test #2 Detection Occur? |
|---|---|---|
| 5 | No | No |
| 9 | No | No |

"Base" test data:

| Detector Sensitivity | Test #1 Detection Occur? | Test #2 Detection Occur? |
|---|---|---|
| 5 | No | No |
| 9 | No | No |

*Data Recorded.*

Results show that a detection never occurred whenever the loop moved.



*Figure 1*

*Picture of a BD Loops direct burial loop in resin*

## Conclusion:

Always recommend and install a loop without an air pocket. BD Loops preformed loops do not have an air pocket and will not get a false detection from ground vibrations. Avoid costly repeat service calls, failed loops, and returned detectors by recommending and installing a BD Loop.