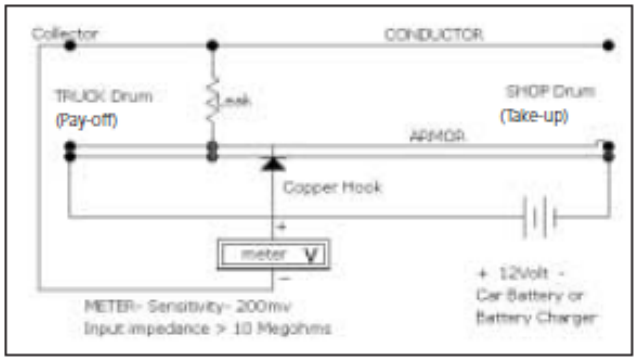
# Precise Method for Locating Electrical Leaks

The most common method of locating electrical leaks in a wire-line is to "burn out" the leak until the conductor is shorted to the armor and then use a digital ohmmeter to determine an approximate location of the leak. This is a quick and easy method of finding a leak; but, there is a disadvantage. When burning out the leak, it can melt the copper, plastic and sometimes burns the inner armor wires. If this occurs it can be impossible to determine the cause of the original leak.

If it is important to determine exactly what caused the leak or if the high voltage equipment is not available to burn out the leak, then a alternate leak locating procedure is required. This procedure will locate leaks that are as high as 10 Meg-Ohms and locate the leaks within +/-1 inch. To use this method, the following shop conditions must exist:

- The shop is setup to reel the cable from a metal pay off or truck drum to a metal take up shop drum.
- The pay off frame is electrically insulated from the take up stand.
- A POWER SOURCE, such as a 6 or 12 volt car battery or a battery charger is available, with leads long enough to connect the power between the pay off and take up stands.
- A collector is mounted on the pay off, truck, drum and is called TRUCK DRUM.
- A DC voltmeter that will indicate plus and minus voltages and has 200mv sensitivity and 10 Meg Ohms input impedance is required.
- A set of well insulated test leads to reach between the meter, the collector on TRUCK DRUM and one test lead, fixed with a copper hook, to reach the cable.




1. If the meter indicates a **POSITIVE** voltage, the leak is towards the **SHOP DRUM**.
2. If the meter indicates a **NEGATIVE** voltage, the leak is towards the **TRUCK DRUM**.

## Setup Procedure

- String the cable between the pay off, truck, and shop drums. Going around a sheave wheel is ok as long as this sheave wheel is electrically insulated from both pay off and take up drums.
- Connect the leaking conductor to the collector on **TRUCK DRUM**.
- Be sure the insulation on the conductor is clean.
- The other end of the leaking conductor, on the **SHOP DRUM,** must be free and clean.
- Turn the meter on, set it at the lowest dc voltage range, 200 mv.
- Connect the Meter **NEGATIVE**, long test lead to the collector, mounted on the **TRUCK DRUM**.
- The test lead with the copper hook is connected to the Meter **POSITIVE**, and the copper hook is hung on the cable between the pay off and take up.
- Connect the **POSITIVE** lead of the POWER SOURCE to the frame of **TRUCK DRUM**.
- Connect the **NEGATIVE** lead of the **POWER SOURCE** to the frame of **SHOP DRUM**.
- **DO NOT CONNECT THE POWER SOURCE DIRECTLY TO THE CABLE ARMOR, ONLY TO THE FRAME**. The power source can arc when connected and burn an armor wire.

## Leak Location

- With all of the connections made in accordance to the **SETUP PROCEDURE** listed above, place the copper hook from the meter positive in contact with the cable armor.
- The meter will indicate a positive voltage if the leak is on the **SHOP DRUM.**
- The meter will indicate a negative voltage if the leak is on the **TRUCK DRUM**.
- The cable is then spooled in a direction to move the leak off of the drum it is located on.
- The copper hook, connected to the meter positive terminal, is held in contact with the cable armor as it is being spooled.
- When the leak comes off the drum, the meter voltage reading will start to decrease.
- When the meter reads zero, the leak is located directly under the copper hook location.
- If the meter voltage changes polarity, you have passed the leak.

## Connection Summary

- **TRUCK DRUM** has the collector
- Connect leaking conductor to the collector
- Connect **NEGATIVE METER** lead to the Collector **TRUCK**
- Connect the test lead with the copper hook to the **METER POSITIVE**
- Connect **POSITIVE** power source to frame of **TRUCK DRUM**.
- Connect **NEGATIVE** power source to frame of **SHOP DRUM**

## Miscellaneous

- Be sure the plastic insulation is **CLEAN** on both ends.
- The pay off and take up stands must not be connected mechanically.
- Do not connect the power source leads directly to the cable armor. This connection can spark when connected, burning cable armor.

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