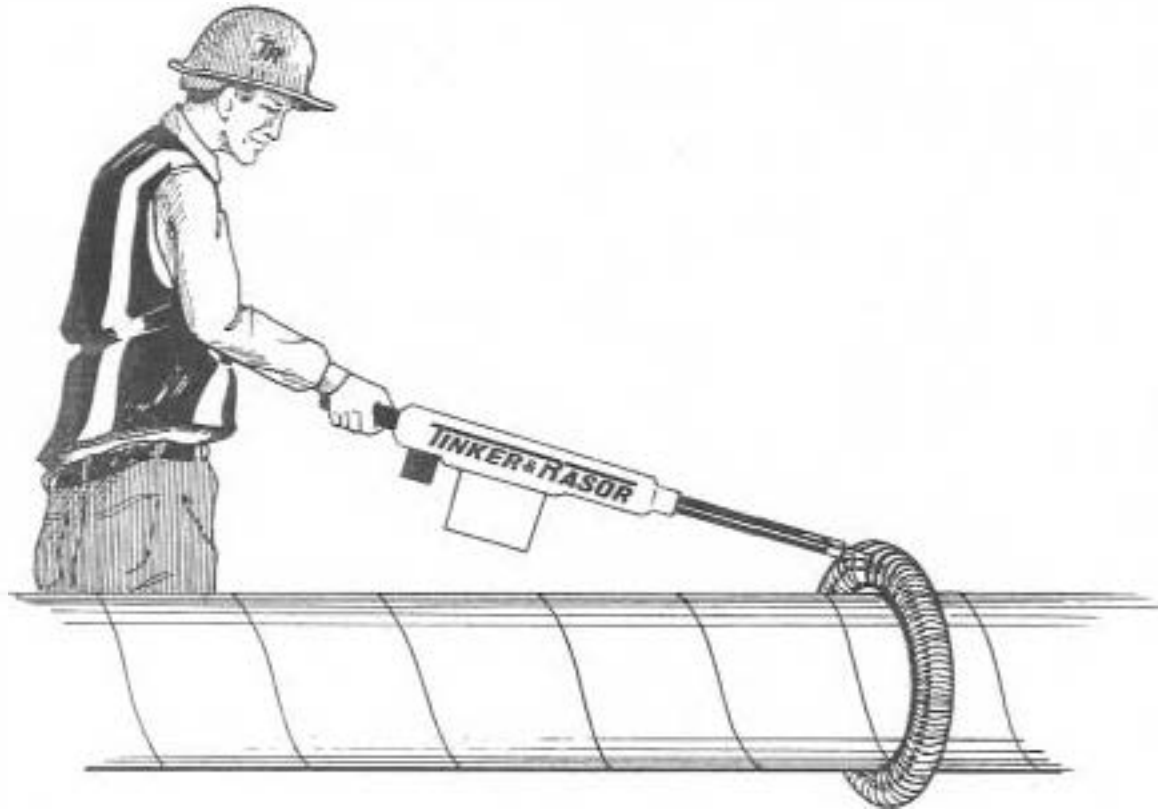


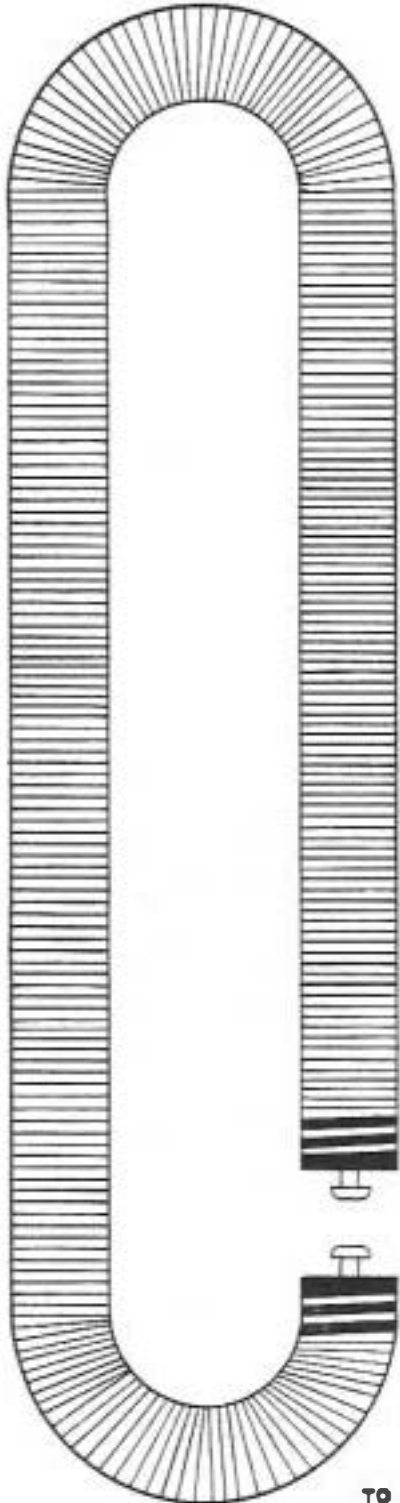
TINKER & RASOR HOLIDAY DETECTORS



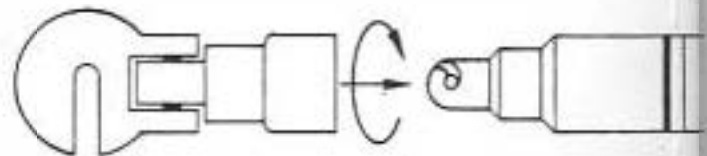
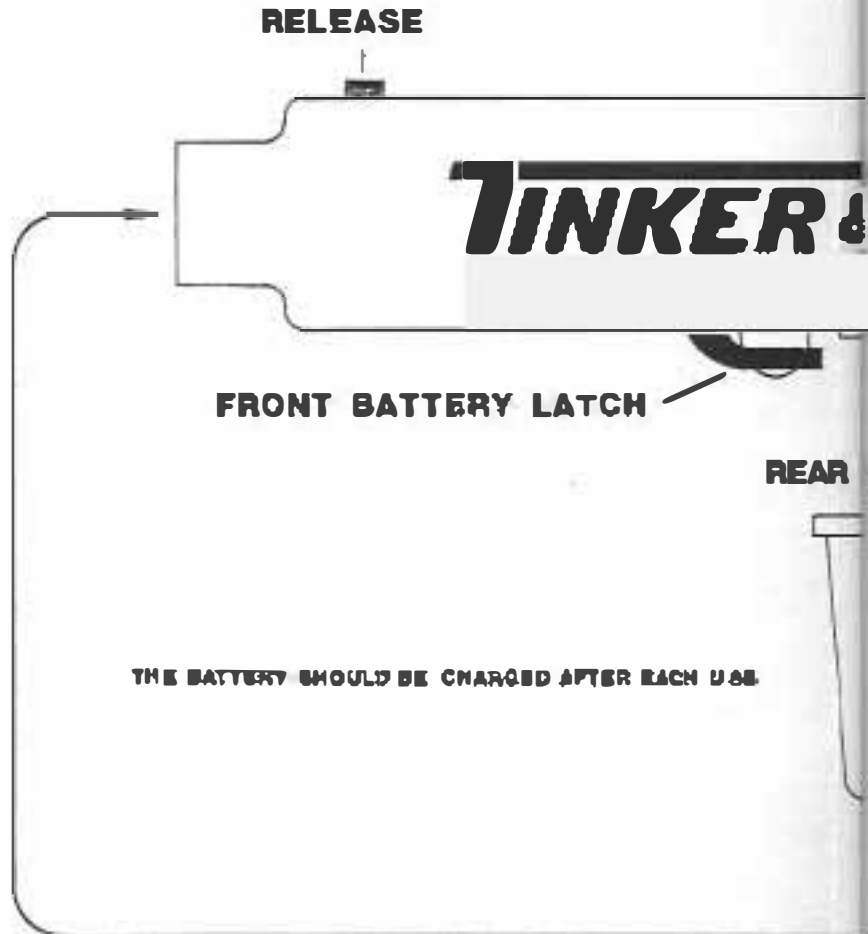
ASSEMBLY AND OPERATING PROCEDURES

ASSEMBLY PROCEDURE

COILED SPRING ELECTRODE



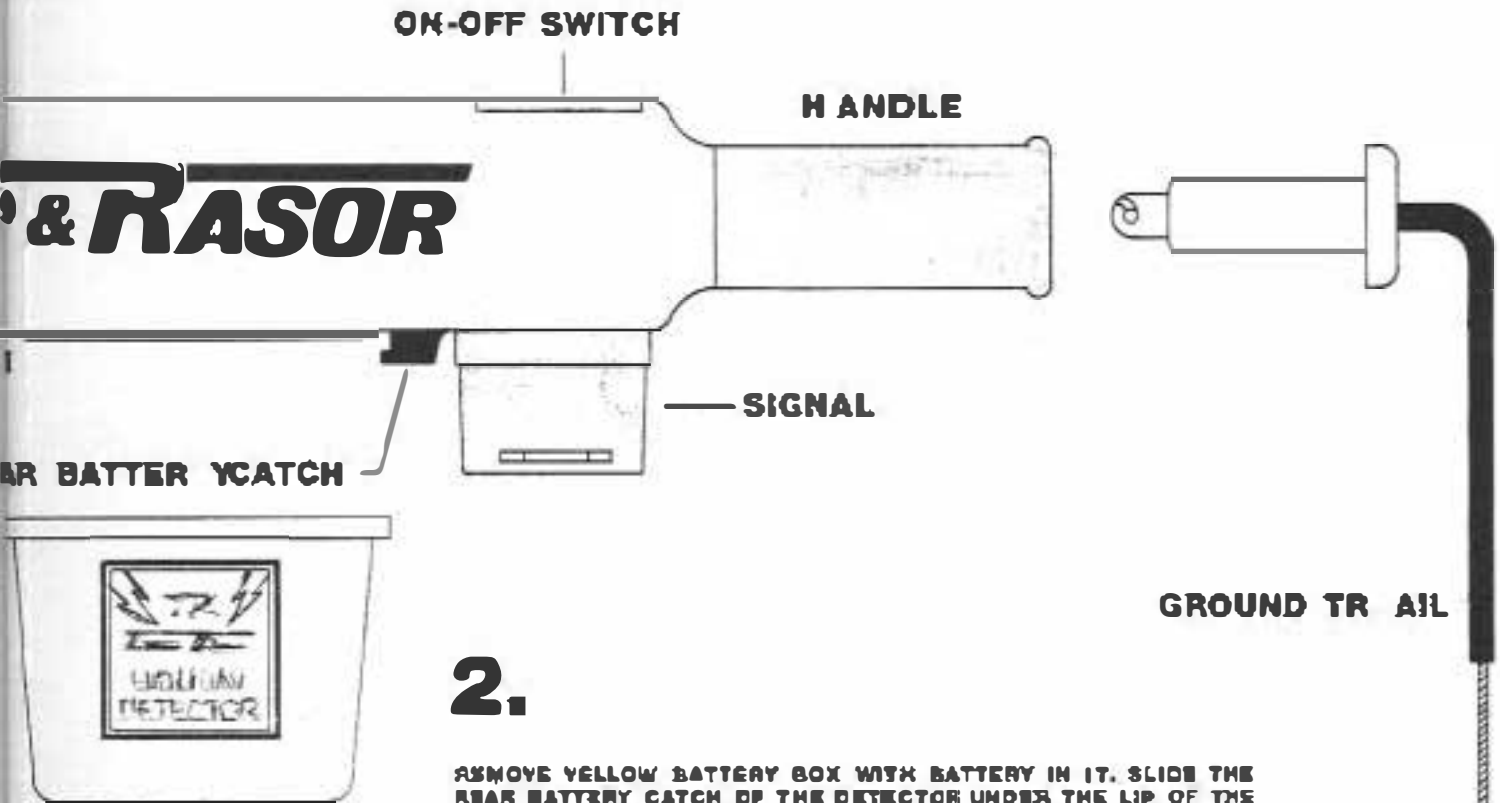
1. Remove detector from the latch is turned crosswise



TO REMOVE ELECTRODE FROM PIPE, LOCATE NOTCH IN ELECTRODE CONNECTOR, PUSH ENDS TOGETHER AND SLIDE OPPOSITE SIDE TOWARDS NOTCH.

MAKE CERTAIN THE PIPE IS GROUNDED.

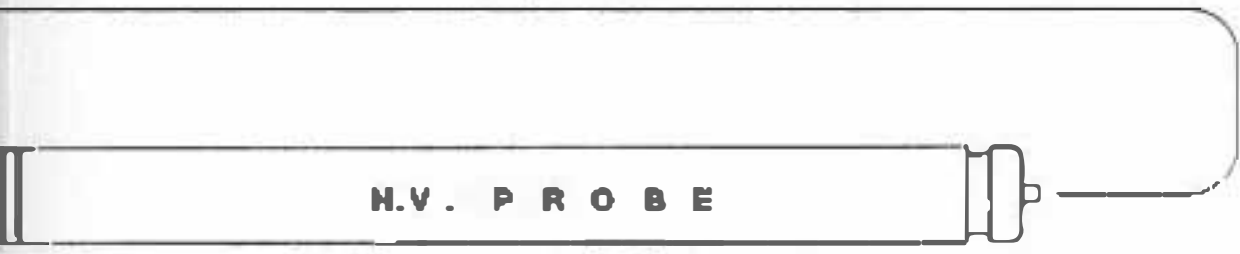
in the case, be sure front battery
is
wise.



2.

REMOVE YELLOW BATTERY BOX WITH BATTERY IN IT. SLIDE THE REAR BATTERY CATCH OF THE DETECTOR UNDER THE LIP OF THE BATTERY BOX. BE SURE IT IS LINED UP PROPERLY. PASTE TOGETHER AND TURN LATCH.

NOTE: IF THE DETECTOR COMES ON, PUSH THE ON/OFF SWITCH.



3.

REMOVE H.V. PROBE FROM THE CASE, INSERT IN THE FRONT OF THE DETECTOR. TO REMOVE, PUSH IN ON RELEASE BAR.

4.

REMOVE GROUND TRAIL FROM TOP OF SHIPPING CASE, INSERT PLASTIC FITTING IN END OF HOLE, PUSH IN AND ROTATE CLOCKWISE UNTIL IT LOCKS IN PLACE. UNROLL BALANCE OF CABLE.

IN CASE OF TROUBLE

1. Clean battery contacts.
2. Replace battery with one that has been properly charged.
3. Moderately shake the detector while it is running. If it does not continue to run steadily, remove battery box and slightly bend battery contacts out from detector.
4. The pipe must have good electrical contact with the earth - - grounded properly.
5. The ground wire must also have good electrical contact with the earth. It should be about 25 feet long, clean and reasonable free of kinks. Pulling over skids, dried vegetation or dry clods of earth can cause the detector to indicate a holiday where one does not exist or to pass over a known holiday without finding it. In extremely dry conditions it maybe necessary to connect the ground wire directly to the pipe. Usually a thin weak spark indicates poor grounding.
6. It is the general consensus of the industry that a spark discharge at least twice the thickness of the coating will give adequate inspection voltage and compensate for any irregularity in coating thicknesses. A common practice used in setting inspection voltages in the field is to adjust the output voltage by visual observation. If this practice is desired for determining inspection voltage, it should be done while the spring electrode is in normal operating position. This suggestion for setting voltage is supplied as a guide is not necessarily recommended by the manufacturer of this detector. Consult the coating manufacturer for recommended voltage application.
7. To test detector operation - make a holiday in the thickest portion of the coating to be inspected. Bare metal should be visible. Turn the detector on and move the spring electrode over this spot at normal speed. There should be a spark at the holiday and a distinctive "beeping" sound. If not rectcheck 1 thru 8.

TINKER & RASOR

P.O. Box 281
417 Agostino Road
San Gabriel, Ca 91778
(818) 287-5259

Safety Information for User

Unpacking and Reviewing your Tinker & Razor Holiday Detector Before Every Use

- Make certain the inside of the case is clear and dry.
- Inspect each component for damage, such as cables, instrument & wand handles.
- Make sure all of the electrodes are clean.
- Verify the unit is fully charged.
- Verify that the output voltage is correctly set to the coating manufacturers recommend inspection voltage.
- If manufacturers requirements are not stated, NACE International, SSPC or ASTM Standards can be followed.

AND..... **ALWAYS READ THE INSTRUCTIONS THROUGHLY PRIOR TO USING ANY TEST EQUIPMENT!**

WARNING! This is a HIGH VOLTAGE device capable of producing an electrical shock if not properly grounded and/or operated in accordance with the instructions and procedures prescribed in this manual!

DANGER! IF YOU HAVE A PACEMAKER DO NOT USE THIS DEVICE.

If you have a pacemaker, life critical electronic medical devices or any medical condition effected by High Voltage, DO NOT use this type of equipment. Only trained and responsible personnel should operate high voltage equipment. Alert all personnel nearby prior to testing and display warning signs. It is important to realize you are now using a high voltage, low energy holiday detector. Tinker & Razor holiday detectors, APS & AP/W, are designed to generate between 800 to 35,000 volts, pulsating DC. While these voltages are high, the energy emitted is well within US, OSHA guidelines. <https://www.osap.org/page/GuideOSHA>

Rubber or plastic gloves and non-conductive footwear can minimize potential shock. Keep in mind that the shock prevention effectiveness of the rubber or plastic glove and footwear is limited to the condition of their protective surface. Make sure your gloves and footwear are in good condition and have no holes or tears. Most Portable Holiday Detectors are limited to finding defects in nonconductive coating materials. Testing should **ONLY** be conducted clear of personnel not involved in the testing procedure. Personnel operating Holiday Detectors should always be aware of their environment and the safety limitations imposed by same. Operator should have an alert assistant, to ensure that all unauthorized personnel are kept clear of the testing area.

DANGER!!! Portable Holiday Detectors create an arc or spark. Use of a Portable Holiday Detector in or around combustible or flammable environments can result in an explosion. When operating in any potentially hazardous area, consult with the plant or site safety officer before proceeding with a holiday detection test in any potentially hazardous or suspect area.

CAUTION! DO NOT USE AROUND SENSITIVE ELECTRONICS OR RADIO EQUIPMENT.

When "on" but not in use, Tinker & Razor Pulse Type Holiday Detectors, APW and APS will generate radio frequency emissions which are within the limit defined by the Electromagnetic Compatibility Directive. Due to its method of operation however, the APW and APS Pulse Type Holiday Detector will generate broadband RF emissions when the unit is generating high voltage or when a spark is produced at the electrode. It is therefore recommended that the user does not activate the high voltage within the vicinity of sensitive electronics or radio equipment.

DO NOT SHORTEN THE GROUND CABLE. NEVER TOUCH THE BARE GROUND WIRE WHEN THE DETECTOR IS TURNED ON.

WARNING! USE CAUTION WHEN RAINING. If it is raining then there is a safety concern for the operator. Surface water on the sub straight is usually not conductive enough to transmit voltage, but almost any contaminant will cause water to become more conductive. If water covers the wand handle while connected to the APW Power-Pak or the APS Instrument, then the operator could become the return path for the high voltage. While the output voltage will cause harm to a healthy person, according to OSHA, your environment must be taken into consideration when operating this type of equipment. For example; if you are standing on top of a flag pole and receive a jolt of high voltage, it will most likely cause you to jump, and you will fall off the flag pole. *Stay Alert, Stay Aware and Stay Alive.*

If it isn't raining, but the coating surface is wet, Tinker & Razor Holiday Detectors are designed to minimize the effects of damp or wet coatings. In extreme cases, "ghost" holidays might be witnessed, should a continual path of water reach a holiday. If this continues, dry the sub straight and continue testing.

It is important to note that all accidents are preventable. Take caution when using Tinker & Razor holiday detectors or any other high voltage test equipment.