

# SPY® MODEL 670 PORTABLE WET SPONGE HOLIDAY DETECTOR OPERATING INSTRUCTIONS



# WELCOME

Thank you for purchasing the SPY® Model 670 Wet Sponge Holiday Detector.

Pipeline Inspection Company and our SPY® brand of coating inspection, jeep meter and pig tracking equipment has been serving companies all over the world for over 60 years. With the purchase of this high precision instrument you can now enjoy access to worldwide service and support only SPY® and our vast Distributor network can offer.

For more information about SPY® brand equipment please visit our website at picltd.com.



The SPY® Model 670 Holiday Detector meets the Electromagnetic Compatibility and Low Voltage Directive. This product is a Class B, Group 1 ISM equipment according to CISPR 11. Group 1 ISM product: A product in which there is intentionally generated and/or used conductively coupled radio-frequency energy which is necessary for the internal functioning of the equipment itself. Class B products are suitable for use in domestic establishments and in establishments directly connected to a low voltage power supply network which supplies buildings used for domestic purpose.

**SPY** is a registered trademark of Pipeline Inspection Company, Houston, Texas 77055, United States.

A copy of this Operating Instructions Manual can be downloaded on our website at picltd.com.

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## UNIT CALIBRATION

As the operator of this unit you require accurate, safe, and reliable equipment to perform coating inspections at the proper output voltage.

Prior to leaving our manufacturing facility Pipeline Inspection Co. certifies that SPY® Model 670 Wet Sponge Holiday Detectors has been calibrated and demonstrates the output voltage of 67.5 volts (+/- 5%). Since output voltage is regulated, this tolerance is maintained regardless of load.

Your unit comes with a **Factory Calibration Certificate** and a **Factory Authorized Calibration Decal** applied to the bottom of the unit both with the date your unit was calibrated.

Our units do not tend to drift but it is recommended that this unit be calibrated at least once per year or more frequently based on heavy usage. **Recalibration of our equipment should be performed ONLY at a SPY® Authorized Service Center due to the unique calibration process; test equipment utilized and properly trained SPY® technicians.**

We DO NOT recommend using any other calibration service other than a SPY® Authorized Service Center; using an outside service with technicians not trained to work on SPY® brand equipment could damage the unit and if the enclosure is opened will void the warranty.

When calibration is needed please return your unit to a SPY® Authorized Service Center or SPY® manufacturing facility located at:

Pipeline Inspection Company  
Attn: Calibration  
1919 Antoine Dr.  
Houston, TX 77055

Please include: Company Name and Contact Information. For a complete list of Authorized Service Centers please visit our website at picltd.com. If a copy of the Calibration Certificate on file is needed it may be obtained by emailing a request to sales@picltd.com.

## PRINCIPLES OF WET SPONGE HOLIDAY DETECTION

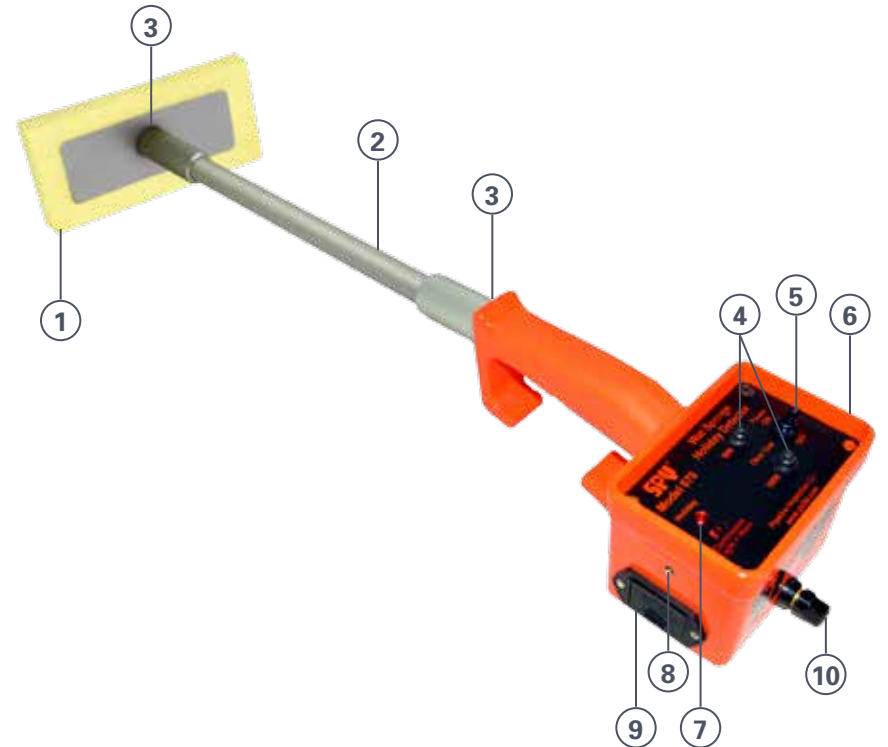
Wet Sponge Holiday Detectors are used for the detection of discontinuities (holidays) in thin film coatings (1-20 mils) of paint, epoxy or any non-conductive material applied to a conductive material. This type of detector uses 67.5 volts DC for a test voltage, which is applied to the test surface via a wet sponge. The fluid media (usually water) in the wet sponge fills the voids in the surface to be tested and allows low current (micro-amps) to flow into any holidays in the test area. The current moves through the holiday and into the conductive substrate which activates a horn to indicate the presence of the holiday.

## 670 OVERVIEW

The NEW SPY Model 670 Wet Sponge Holiday Detector operates on a single 9 volt alkaline battery. Unit output voltage is 67.5 volts DC. This voltage makes the detector highly sensitive and accurate. Compact and light weight with no bulky battery packs allowing for non destructive inspection of paints, epoxy paints and coatings 1-20 Mils.

Inspect larger surfaces faster and with less operator fatigue using a quick attach, easy to use roller sponge electrode. (Optional Accessory).

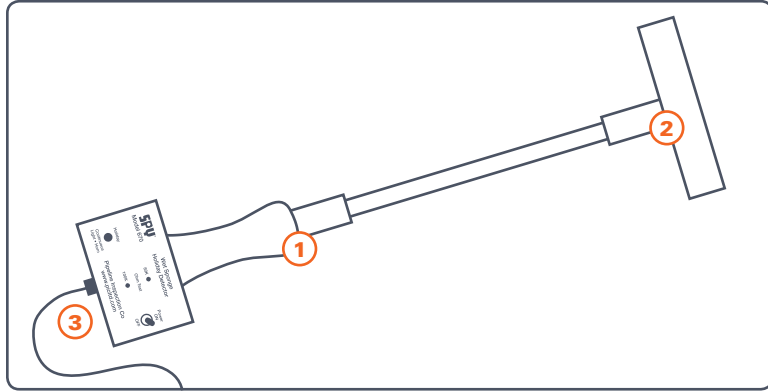
- New Ergonomic, Balanced, Lightweight Hand held Design
- New Rugged, Durable Construction
- 67.5 Volt DC, Sensitive and Accurate
- New Quick Change Battery Compartment
- A New Wide Range of Quick Change Accessories
- New Inspections Kit w/Carrying Case (Optional)



- |   |  |    |  |
|---|--|----|--|
| 1 | Standard Large Sponge                                | 6  | Audible Holiday Indicator                |
| 2 | Standard 14.5" Wand Shaft                            | 7  | Visual Holiday and Low Battery Indicator |
| 3 | Quick Connect Points for Optional Accessories        | 8  | Shoulder Strap Connection                |
| 4 | Built-In 80Kohm and 100Kohm Calibration Test Buttons | 9  | Quick Change Battery Compartment         |
| 5 | Water Proof Power Switch                             | 10 | Ground Cable Connection                  |

## CONNECTING ACCESSORIES

**CAUTION! DO NOT TOUCH** Make sure the switch is in the OFF position prior to connecting any accessory.



**STEP 1. CONNECTING THE ELECTRODE WAND.** Screw the wand onto the base of the 670 holiday detector and firmly tighten with your hand only.

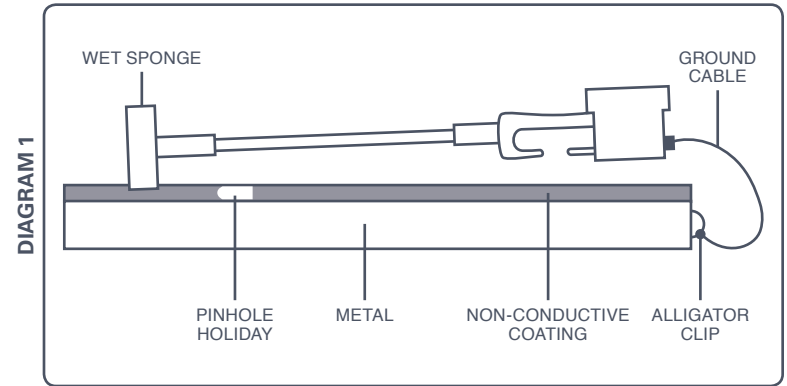
**STEP 2. CONNECTING THE ELECTRODES.** The flat sponge electrode comes standard with the 670 and is already attached to the wand. However, if you purchased the optional roller sponge electrode just unscrew the flat sponge electrode from the top of the wand and screw on the optional roller sponge electrode. You can adjust the flat sponge or roller sponge electrode by simply holding the knurled knob firmly and twisting the electrode to the desired position.

**CAUTION! DO NOT TOUCH** THE ELECTRODE WHILE THE DETECTOR IS OPERATING.

**STEP 3. CONNECTING THE GROUND CABLE.** The ground cable attach point is on the backside of the 670, untwist the black knob to expose the hole in the ground connector, thread the ground wire through the hole and then tighten the black ground connector knob tightly with your hand only.

**PROPER GROUNDING.** Make sure the ground cable is uncoiled and extended.

**DIAGRAM 1:** Shows the method of completing a circuit is by connecting the ground cable of the 670 holiday detector to the uncoated part of the metal substrate of the test piece using the alligator clip. This allows the circuit to complete directly from the detector through the holiday into the substrate back into the detector.



**CAUTION! DO NOT TOUCH** THE ELECTRODE WHILE THE DETECTOR IS OPERATING.

## CONNECTING OPTIONAL ACCESSORIES

For a range of optional accessories and spare parts that enhance and expand the capabilities of the SPY 670 SPY offers an Optional 670 Inspection Kit. See the Accessories page in this manual or call your SPY distributor or manufacturer to order.

### **STEP 5. (OPTIONAL) CONNECTING THE SHOULDER STRAP.**

Attach the strap clips tabs on each side of the 670 detector. Adjust strap for comfort. The strap comes with the optional 670 Inspection Kit which offers the option of attaching a light weight foam handle wand to use while operating rather than holding the weight of the complete unit.

### **STEP 6. (OPTIONAL) CONNECTING ADDITIONAL 14.5" WAND EXTENSION RODS.**

With the 670 turned off simply unscrew the electrode from the wand and screw on the number of 14.5" wand extensions you need for the job, once complete add the electrode back to the end of the wand. The optional 670 Inspection Kit comes with 2-14.4" wand extensions to give the 670 detector added length for hard to reach test areas

### **STEP 7. (OPTIONAL) CONNECTING WAND LEAD CABLE.**

With the 670 turned off disconnect the wand from the base of the unit, screw the knurled portion knob of the wand lead cable to the base of the unit and plug the other end of the wand lead cable to the end of the foam handle wand. Unscrew the electrode from the stock wand electrode and screw it on the foam hand wand.

## BATTERY INSTRUCTIONS

The NEW SPY® Model 670 Wet Sponge Holiday Detector operates on a single 9 volt alkaline battery. Unit output voltage is 67.5 volts DC. This voltage makes the detector highly sensitive and accurate.

**STEP 1:** Make sure the detector switch is in the off position.

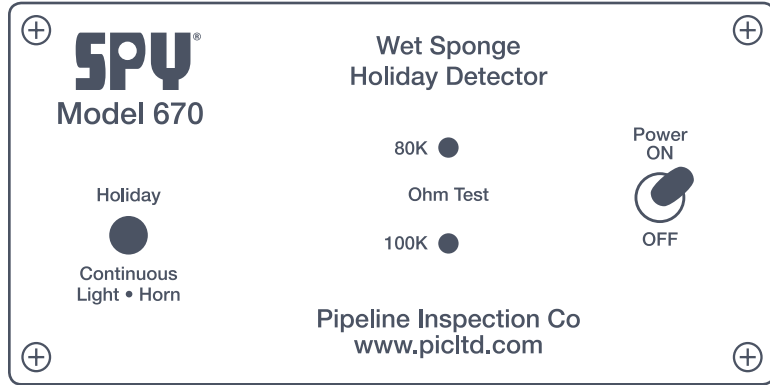
**STEP 2:** The battery compartment is located on the left side of the unit, using the notch on the bottom of the battery compartment lift up and pull out to slide the battery tray out.

**STEP 3:** Insert a new 9V battery into the battery tray and push the battery tray firmly back into the unit making sure it locks back into place.



If the battery discharges to a low level the detector will begin to tone continuously, at this point the detector is not properly detecting holidays and the battery should be changed to a new 9V battery.

## CONTROLS



## TESTING INSTRUCTIONS

No Signal adjustment is necessary with the 670 Wet Sponge Holiday Detector. The unit can easily be tested by means of the test buttons located on the front operating panel.

The test is performed by turning the 670 on and by pressing the 80 Kohm button, the signal will become active causing the horn and LED to be activated. Release the 80 Kohm button then press the 100 Kohm, the signal should NOT activate the horn and LED. This test indicates the unit sensitivity is within calibration.

## 670 OPERATION

**STEP 1:** Insert a new 9V battery in the battery box and push the battery box firmly back into the unit making sure the battery box locks back into place.

**STEP 2:** Attach the electrode wand and electrode.

**STEP 3:** Attach the ground cable to the conductive substrate of the test surface (the uncoated bare metal portion of the surface). See Diagram 1 on page 8.

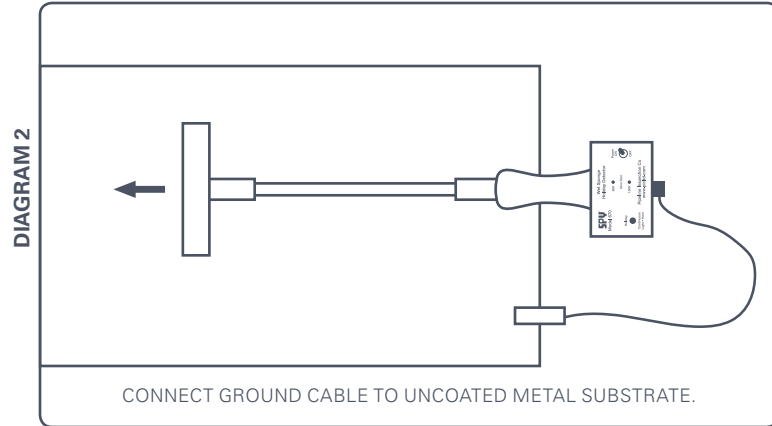
**STEP 4:** Wet the electrode sponge with clean tap water to where it is damp or moist to the touch and apply SPY® wetting agent.

**! IMPORTANT!** While the electrode sponge must be damp or moist to the touch it should not be saturated to the point water is running from the sponge. This can result in the water migrating and causing the current to flow away from the sponge down the test surface to holidays further down the test surface or even on the support surface causing false holiday indications.

**! IMPORTANT!** When the coating thickness is between 11–20 mils, a low sudsing wetting agent such as KODAK Photo-flo™ should be applied to the water (test media). This will allow for a lower surface tension, which will help the test media to penetrate the thicker coatings. You can order Kodak Photo-flo™ direct from SPY®.

**STEP 5:** Keeping the detector away from the test surface and turn the detector to the on position.

**STEP 6:** Place the electrode sponge on the coated surface and begin passing the sponge across the surface (See Diagram 2 Below). Several passes should be made over the test area to ensure that moisture has penetrated any possible holiday. If the sponge passes across a pinhole in the coated surface an audible horn from the detector will begin to sound and the red light on the control panel will light up. The audible and visual alert will stop once the electrode moves away from the pinhole. For more precisely locating the holiday use the corner of the sponge in the area the holiday occurred.



**! IMPORTANT!** Care should be made to ensure that the sponge stays as clean as possible. Dirt or other contamination of the test surface adds resistance, which impedes the current flow capability of the sponge. This can result in missing holidays in the test piece.

## TROUBLESHOOTING GUIDE

PROBLEM	POSSIBLE SOLUTION	CORRECTION METHOD
<b>HOLIDAY DETECTOR WILL NOT DETECT HOLIDAYS</b>	Test Buttons	Push the 80k test button, the horn should sound.  Push the 100k test button, the horn WILL NOT sound.
	Detection Testing	Touch electrode/wand directly to bare ground cable to test that the unit is functioning properly. The horn will sound and the light on the control panel will light up.  If the detector does not detect then ensure ground cable and electrode wand are correctly connected.  If the detector still fails to detect a defect in the coating a repair may be needed, contact Pipeline Inspection Company for support.

TROUBLESHOOTING GUIDE CONTINUED ON THE NEXT PAGE...



## TROUBLESHOOTING GUIDE

PROBLEM	POSSIBLE SOLUTION	CORRECTION METHOD
<b>HOLIDAY DETECTOR WILL NOT DETECT HOLIDAYS</b>	Check Detector Ground Connection	<p>With the detector OFF remove the ground cable, clean banana plug connection point and reconnect ground.</p> <p>Ensure both ends of the ground cable are clean.</p> <p>Ensure the clip end of the ground cable is securely connected to metal substrate.</p>
	Check Electrode/Wand Connection	<p>With the detector OFF unscrew the wand, clean connections and reassemble.</p> <p>Ensure wand and electrode connection points are clean.</p>

## TROUBLESHOOTING GUIDE


PROBLEM	POSSIBLE SOLUTION	CORRECTION METHOD
<b>DETECTOR HORN CONSTANT SOUND</b>	Check Battery	When the battery is low the horn will sound continuously to let you know it needs to be replaced. Replace with new battery.
	Test Buttons Stuck	Check that the test buttons are not stuck by pressing each several times to disengage.
<b>DETECTOR DOES NOT TURN ON</b>	Switch	Check the power switch to make sure its full toggled on.
	Battery	Battery is low. Replace battery.

## TECHNICAL SPECIFICATIONS

<b>MODEL</b>	<b>670</b>
Voltage Type	DC
Voltage Range (kV)	67.5 Volts
Voltage Output Accuracy	±5%
Coating Range (Min-Max)	1 - 20 mils
Operating Temperature	33°F to 148°F
Holiday Indicator Type	Audible/Visual
Battery	9 Volt Battery
Battery Life	8-12 Hours
Low Battery Indicator	Yes
Unit Weight Only Unit Weight With Battery Only	0.9 lbs 1.8 lbs
Unit Dimensions (LxWxH) With Wand	9" x 4.5" x 3.25" 25" x 4.5" x 8"
Domestic/International Standards Unit Complies With	NACE SP0188-2006
Factory Warranty	3 Month

## MAINTENANCE & REPAIR

If maintained the Model 670 Wet Sponge Holiday Detector will offer you years of dependable operation. Regular care and maintenance of the unit is a requirement of good quality preventative maintenance practices.

 **WARNING!** This detector does not contain any user-serviceable parts; your warranty will be voided if the SPY® unit is opened by anyone other than a SPY® Authorized Service Center or SPY® manufacturing facility.

In the event the unit fails to operate properly please return your unit to a SPY Authorized Service Center or SPY manufacturing facility located at:

Pipeline Inspection Company  
Attention: Repair  
1919 Antoine Dr.  
Houston, Texas 77055

Please include: Company name, contact information and a short description of the problem with the unit. For a complete list of Authorized Service Centers please visit our website at [picltd.com](http://picltd.com).

### ELECTRODES AND ACCESSORIES

Sponge electrodes and all attached accessories are prone to wear and tear and will eventually need to be replaced, timing of replacement will depend on how they are maintained and the coatings that they are used on.

## WARRANTY

Pipeline Inspection Company, hereafter referred to as (SPY®) warrants that SPY®, Model 670 Series Holiday Detectors shall, under normal use and service, be free from defects in material and workmanship. SPY®'s entire warranty obligation shall be limited to, at SPY®'s option, the repair or replacement free of charge to the buyer of any defective equipment or parts thereof which prove to be defective in material and workmanship under normal use and service.

Claims for defective parts must be made in writing within three (3) months after shipment of the equipment from the works of SPY®. Fast wearing and consumable parts including, but not limited to, electrodes and ground cables, are expressly excluded from the warranty. SPY® shall have the option to require return of a claimed defective part to SPY®'s manufacturing facility in the U.S.A., freight prepaid by buyer for examination to establish buyer's claim.

Except with SPY®'s prior written approval, SPY® shall not be liable (a) for the cost of repairs, alterations or replacements or any expense connected therewith made or incurred by the buyer or its designers, or (b) for defects resulting from alterations or repairs made by others than SPY®, or its approved representatives.

SPY® shall not be liable for damages, including but not limited to direct, special, indirect or consequential, resulting from the handling, or use, whether alone or in combination with other products, or any SPY® equipment or third party designed or manufactured equipment, including without limitation, any loss or damage sustained or caused by the operation and use of the equipment which is improperly operated or its successful operation is impaired by natural elements after its delivery to the buyer.

The foregoing warranty is exclusive and in lieu of all other warranties whether written, oral or implied (including without limitation, any warranty of merchantability or fitness for purpose).

## ELECTRODE TYPES

The Model 670 uses cellulose sponge electrodes that vary in form and size and fit a wide range of coating inspection projects. If we don't carry it we can custom build an electrode to fit your project needs.



FLAT SPONGE  
3" X 2" X 2"



ROLLER SPONGE



INTERNAL SPONGE  
2"- 28" (50-711mm)



INTERNAL  
SPONGE PULL  
CABLE



**IMPORTANT!** SPY uses ONLY cellulose sponges for our wet sponge units. DO NOT use rubber or urethane sponges!

Different types of electrodes can be used with different units. The most common electrode is a flat sponge electrode wand. The Model 670 wand utilizes a 2"x 4" x 8" (51mm x 102mm x 203mm) size flat sponge. Roller sponges are also available to increase the surface area in contact and the speed at which the test piece can be tested.

Please call our office at (713) 681-5837 or email us at [sales@picltd.com](mailto:sales@picltd.com) for more product details or to place an order.

## ACCESSORIES

The Model 670 has a wide variety of accessories to assist you with your coating inspection project.



GROUND CABLE  
(25 FT.)  
ITEM #11927



SHOULDER  
STRAP  
ITEM #10187



16 OZ. BOTTLE OF  
WETTING AGENT  
ITEM #14001



ROLLER SPONGE  
WAND  
ITEM #14160



4 OZ. BOTTLE OF  
WETTING AGENT  
ITEM #13985



14.5" EXTENSION  
ROD FOR WAND  
ITEM #14162



FLAT SPONGE  
WAND  
ITEM #14159



ROLLER SPONGE  
REPLACEMENT  
PACKS  
AVAILABLE IN  
PACKS OF 3, 5 OR 7

Please call our office at (713) 681-5837 or email us at [sales@picltd.com](mailto:sales@picltd.com) for more product details or to place an order.

## RELATED EQUIPMENT



SPY® MODEL 673  
WET SPONGE  
DETECTOR

Please call our office at (713) 681-5837 or email us at [sales@picltd.com](mailto:sales@picltd.com) for more product details or to place an order.

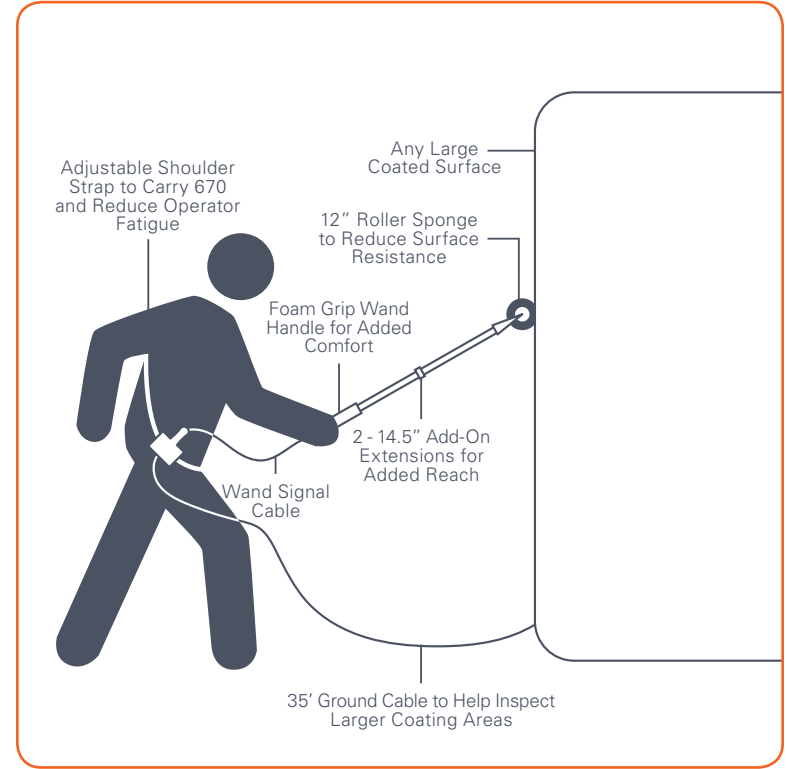
## WET SPONGE INSPECTION KIT



### KIT INCLUDES:

- 1 - CARRYING/SHIPPING CASE
  - 1 - ROLLER SPONGE AXLE
  - 3 - SPARE ROLLER SPONGES
  - 2 - 14.5" EXTENSION SHAFTS
  - 1 - SPARE FLAT SPONGE (4" X 8" X 2")
  - 1 - 35FT GROUND CABLE
  - 1 - FOAM WAND HANDLE
  - 1 - WAND SIGNAL CABLE
  - 1 - 4OZ. WETTING AGENT
  - 2 - 9 VOLT BATTERIES
  - 1 - SHOULDER STRAP
- ITEM #670KIT (DETECTOR NOT INCLUDED)

## OPTIONAL 670 INSPECTION KIT FOR ADDED OPERATOR COMFORT & INSPECTION CAPABILITY



# USER NOTES

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# USER NOTES

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PIPELINE INSPECTION COMPANY

[PICLTD.COM](http://PICLTD.COM)