

# Western Instruments

Established 1965

## Operating Instructions



# ***W-IC Series***

*Mobile*

# **Inspection Booth**

January, 2012

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Established 1965

26509 Township Road 543  
Sturgeon County, Alberta  
T8T 1M1

Phone: (780) 459-6720  
Fax: (780) 459-7837  
E-mail: [info@westerninstruments.com](mailto:info@westerninstruments.com)

Web: [www.westerninstruments.com](http://www.westerninstruments.com)

W-IC-Series Inspection Booths are designed to be used as Mobile or Temporary Inspection Stations, for Magnetic Particle Inspection (MPI). These Mobile Inspection Booths should be used within the parameters set in this specifications and guide. Features and Options are listed below in this guide.

#### Booth Hood;

- Adjustable Opening.
- Extends to Work Surface.
- Fire Retardant
- Ventilation Fan (Optional)
- Retractable (Optional)

#### Work Surfaces;

- Standard Rubber Covered & 2 Storage Shelves.
- Optional – Wet Method Perforated Surface. (as illustrated)
- Longitudinal Rails with Coil Car and 2 Steady Rests.

#### Bath Recirculation Tank;

- Up to 8 Gallon Capacity.
- Bath Agitation Outlet
- Bath Supply Nozzle.
- Modular Pump Assembly
- Tank Drain.



- Power Bar, with illuminated Switches for;
- White Light
  - UV Light
  - Bath Pump
  - Accessories (Coil or Yoke)

#### Overhead Coil Suspension Trolley

- Fully Adjustable Height.
- Full Longitudinal Travel.
- Coil Swivel (Rotation).

#### W-IC's are offered in two sizes - Work Surface;

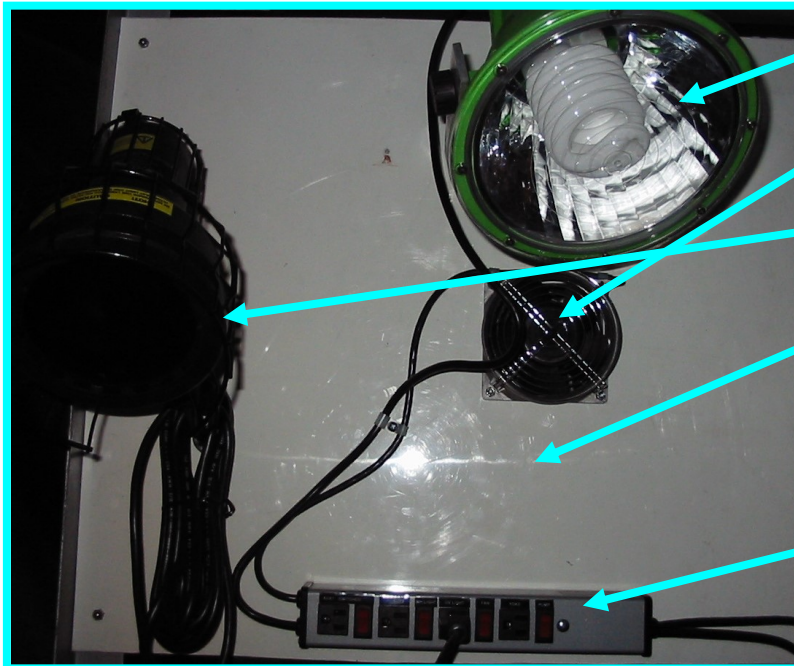
- Standard – 40" x 30".
- Bench – 60" x 30".

Easy to Assemble Bolted Frame, breaks the W-IC down for shipping to a standard 40" x 30" Pallet.

W-IC's are equipped with Casters, for easy movement around the shop floor.

## 1. Operational Parameters

Due to the extra width for the Operator's Area, care must be taken while moving the Inspection Cart. Prior to moving, the operator must ensure the Power Cord is secure. When a temporary location has been selected, the Inspection Cart can be Plugged into a 115 or 230 VAC Supply, and the cord positioned in such a manner that it doesn't become a hazard for others in the area. The power cord is simply feed into the Power Bar located on the Mounting Panel.



Fluorescent White Light Fixture

Exhaust Fan

UV Lamp & Mount

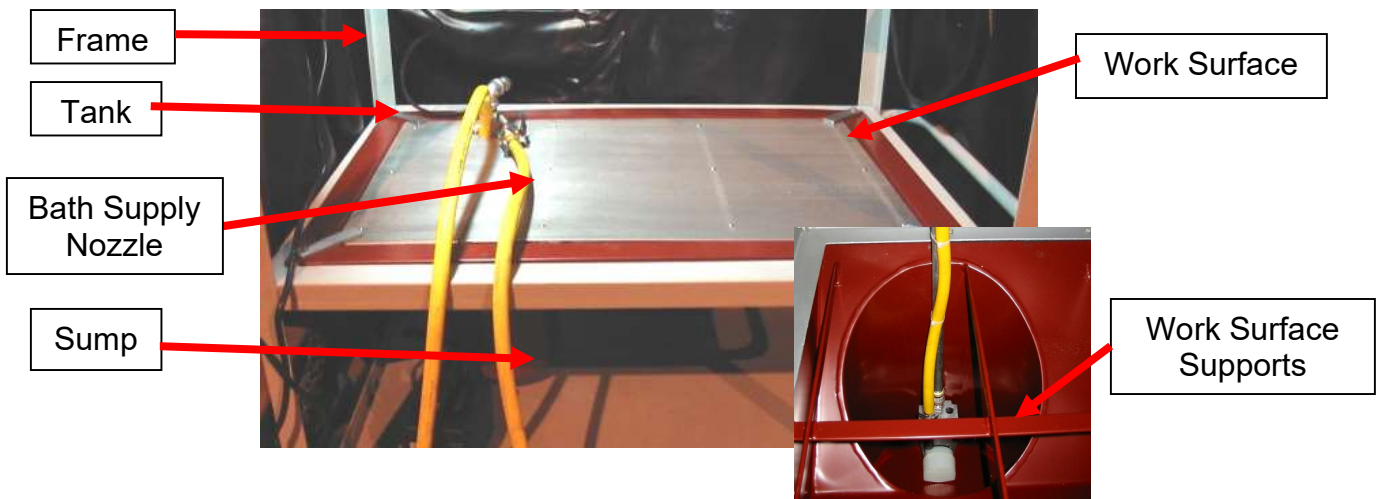
Mounting Panel

Power Bar, with Switches for;  
 -White Light  
 -Bath Pump (Supply and Agitation)  
 -Exhaust Fan  
 -Accessory (#1)  
 Receptacles (un-switched) for;  
 -UV Light  
 -Yoke  
 -Accessory (#2)

All Power Bar outputs can be turned on or off, independently. Therefore, the Yoke or Coil can be left plugged into the power bar, and the Black Light can be left on indefinitely so the irradiance (output) will be at a maximum.

## **2. Bath Recirculation**

W-IC Inspection Carts fitted with a Bath Recirculation System, have a tank installed in the top shelf of the Cart. The Tank has a Vee Bottom, as well as a large round Sump where the Pump and Agitation Outlet are contained. The Tank and Sump have a special powder coating, which allows different Carriers to be used. The most common Carrier is a 100% Stoddard Solvent, with a flash point



above 230°C (Tag Closed Cup flash point of 41 to 43°C), such as *Varsol*® (Mineral Spirits). Water can also be used as a Carrier, however operators must be very careful in the bath mixing and its maintenance. In any case, the

operator should wear appropriate safety equipment when operating MPI equipment. Operators must be mindful to not direct the bath outside the work surface, to avoid spillage.



The Work Surface of the W-IC is perforated which permits the bath to return to the tank. The tank's Sump is fitted with a large drain to allow the bath to be quickly drained. The Work Surface can be quickly removed to clean the tank and sump. The Work Surface is reinforced for heavy work pieces. Access to the sump is enhanced by the free-standing pump assembly – simply lift the assembly out.

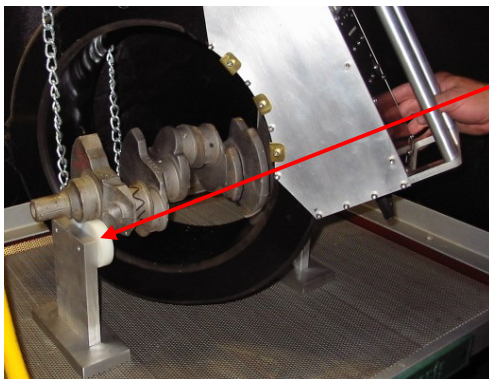
The recirculation system and the UV Lamp should be turned on at the start of the day. This will permit the bath to be mixed within about an hour, so a settling test (Centrifuge Tube) can be performed. If the operator wants to test the bath immediately, the work surface should be removed and the bath should be thoroughly mixed by hand. Operators must ensure the bath is not permitted to settle and dry, as particles will collect in the Vee of the Tank.



Fitted to the Pump is a ball valve that controls the bath flow, for agitating in the Sump. If the valve is closed, the volume of bath exiting the Supply Nozzle will be to high and could wash away indications. Opening the valve completely will diminish the bath flow, and will cause a delay of bath flow when the Nozzle's valve is opened. Obviously, bath agitation is paramount. When Shipping, the bottom of the pump assembly is padded to ensure the tank coating is not damaged, so before putting filling the Sump with carrier, ensure this padding is removed.

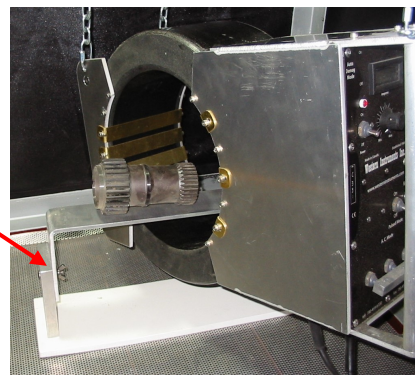
### **3. Features**

The features offered or that can be built into W-IC's is to numerous to list, so this section has been added to outline these to Inspectors and :Process Engineers.



Portable Steady Rests

Adjustable Height Platform



Western offers simple, to engineered, solutions for workpiece holding fixtures, with some of the more basic ones illustrated above. Steady Rests are offered in two forms for W-IC's; either mounted on Longitudinal Travel Rails in conjunction with a Coil Car, or as

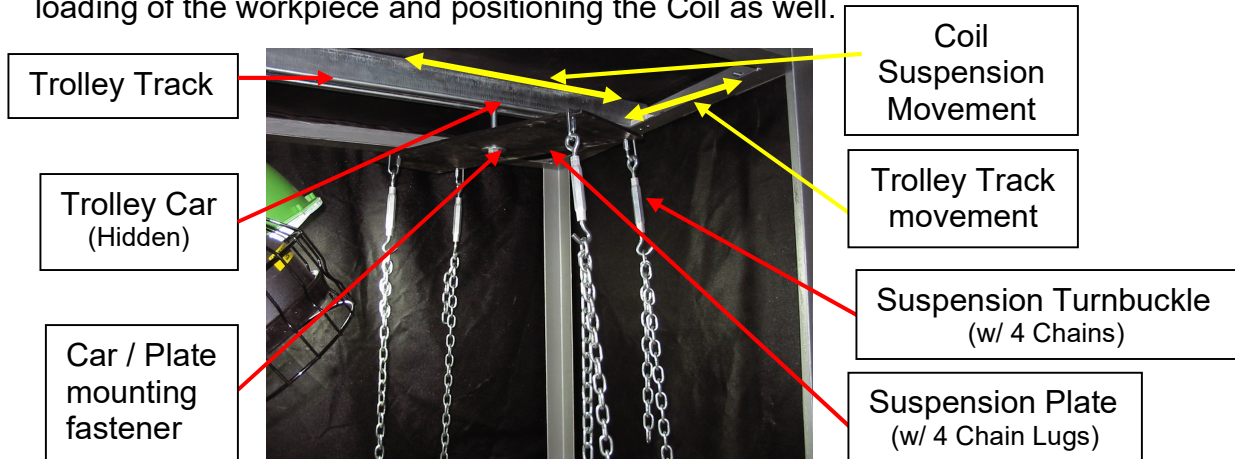
Portable models (as illustrated), which are simply positioned on the Work Surface. For small parts, W-IC's are offer with Fixed or Adjustable Height Workpiece Platforms, as Platforms, as illustrated above. For larger pieces, requiring higher throughputs, Forked Platforms are designed to allow rapid loading and unloading, as well as rapid longitudinal movement to bring parts in and out of the Coil's centerline.

When used on the finishing floor, or in final inspection, for end area's of Tube, Pipe, or Bar, Hoods are offered with Transverse Pass Throughs, for end area inspection. These Pass Throughs have Brush type Skirting (to block visible light) and permit approximately 18" of the product to extend into, and roll through, the rear of the Inspection Booth. For In-Line Conveyer applications, Longitudinal Openings are fitted, to the sides of W—IC's to allow these long workpieces to travel through the Inspection Stations. For these applications, the Work Surface is easily lowered (or raised) to accommodate Pass Line heights.

### **5. Coil Handling**

Any type of Magnetizing device can be used on a W-IC, such as a Yoke, Portable Coil, even a Power Pack (Generator) with Cables. To start, Yokes do not require any special handling or storage equipment. The operator just needs to ensure he isn't discharging bath over the Yoke.

W-Series Coils can be handled in many different ways, with the simplest being to allow it to sit upright on the Work Surface. However, at this height, moving the Coil to accommodate its position with respect to a workpiece is awkward. Therefore, Western offers a Overhead Coil Suspension Trolley, that allows the operator to easily manipulate large Coils over the Work Surface to accommodate loading of the workpiece and positioning the Coil as well.



The Suspension Plate is fitted with adjustment holes for the 4 Chain Lugs, from which the Coil is suspended by chains. When the elevation and angle the Coil has been made, the position of these lugs is adjusted to ensue the suspension Plate sits as level as possible about the Mounting Fastener. The Suspension Turnbuckles are used to give a more fine positioning of the Coil and not for balancing. With the Suspension Plate sitting level, there will be a minimum of interference between it and obstruction at either end of its longitudinal movement.. The Trolley Track is not mounted to the Frame of the Inspection

Booth, as it is fitted with End Guides that keep it square to the Frame, and allow for transverse movement toward the front or rear of the Inspection Booth. All of these adjustments are incorporated for Operator Convenience, as there are no hard and fast rules for Coil Positioning, other than inducing a given field direction.

When an Inspection Booth is disassembled for Shipping, the Coil Suspension Chains and Suspension Plate lugs are numbered, to allow for faster assembly and adjustments.

## **6. Operation**

The W-IC is wheeled to the inspection location, and the operator plugs in the cart, ensuring the Power Cord does not become a hazard. The White Light, as well as the Black Light are turned, so the Black Light warm-up up for at least 10 minutes. If the surrounding work space is warm, the operator should turn on the Exhaust Fan to keep down the temperature inside the booth. If the booth is equipped with a Coil, do not plug the Coil into the Power Bar, as it may overload the breaker inside the power bar.

The power bars installed on Inspection Booths are not an “off the shelf” model and has been modified for this specific use. The view below illustrates the power bar, and working from right to left the following are the various function.



1. Pump Switch. Turns on and off the supply / agitation pump.
2. Yoke Receptacle. When the Power Bar is connected to Mains, there is always power on this plug.
3. Fan Switch. Turns the fan on and off.
4. UV Lamp Receptacle. Always has power on. Use the switch on the Lamp's handle to turn it on and off.
5. White Light Switch. Turns the main light on and off.
6. Auxiliary 2 Receptacle. Always has power on, can be used with an auxiliary power tool, etc.
7. Auxiliary 1 Switch and Receptacle. The switch is actually used for the adjacent receptacle. Multiple uses.

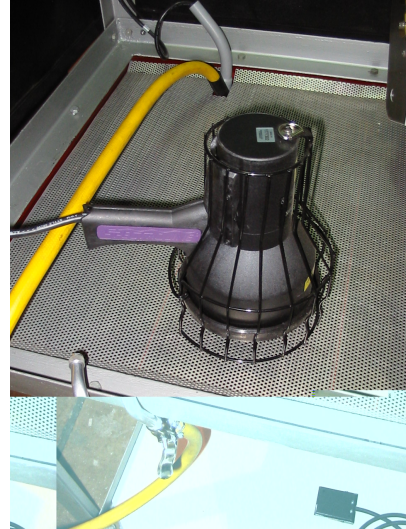
No matter how long the Bath Recirculation System has been sitting, time must be taken to remove the Work Surface (perforated Aluminum) and ensure the bath is fully agitated. If any part of the tank (or sump) have been allowed to dry, the area should be wetted and the florescent particle put back into suspension.

Again, with every use, the bath concentration should be tested with a Centrifuge Tube. Parts will 'Drag Off' particles and over time the concentration can become

lower than necessary. Review Centrifuge Tube write up to review accepted concentration range for fluorescent particles. No matter how clean parts being tested are, foreign material will make its way into the bath. The bath should be checked for cleanliness at the same time the concentration is evaluated.



The view of the UV Lamp to the left, shows the Booth's receptacle for the Lamp, with the excess power cable neatly wrapped and hanging on it. The view to the right shows the lamp sitting face down on the work surface. It is recommended to keep the UV Lamp on the receptacle at all times. It is acceptable to set the lamp face down for short periods of time during an inspection. If the bath is allowed to splash up onto the



Lamp's Lens, it will either break or explode outwards, causing great risk of burns to the operator and affecting the cleanliness of the bath.

After the bath is fully agitated and the UV Lamp has reached full output, the operator can now proceed with the inspection. Between inspections, the operator turns on the white light whenever needed. The UV Lamp should not be turned off, as the warm-up / cool-down cycles are far to long.

## **7. Maintenance & Storage**

After all the inspections are complete, the operator should clean excess inspection media (Oil or Water Carrier) off the work surface. If the unit will sit unused for a week or more, spend extra effort to wipe the tank and sump dry (a squidgy), and drain the bath into a clean 20 liter (5 gallon) pail that will seal tightly. The pail will make mixing the bath easier when using the Inspection Booth again, and will eliminate evaporation of the carrier.

To clean the tank and sump, we recommend *Knight's Spray Nine®*, for cleaning both water, or oil baths. After the cart is clean, the operator turns off the White Light, , and unplugs the cart's 8' Power Cord. The cord can then be re-wrapped, and the cart wheeled to its storage location. When filling the sump, the carrier should only be filled to within 1cm or 1/2" of the bottom of the Vee on the tank, which is approximately 12 liters or 3 gallons.

After extended use the Cart and Curtain should be cleaned with a mild soap solution. The unit should be visually inspected for any damage that could cause harm to the operator, or the material being inspected. If the unit is new, any potential problems with a W-IC-Series unit must be reported to the Distributor or Western Instruments for instructions on corrective action.

Whether industrial specifications are being observed or not, a measure of both White Light and UV irradiance should be tested, to ensure ASTM E709 requirements are followed. If the White light falls below acceptable limits, the bulb should be replaced. Only use 32-Watt Fluorescent Bulbs for replacement, as they are equivalent to 125-Watt Incandescent Bulbs. Fluorescent bulbs produce only a fraction of the heat of an incandescent bulb, with the fixture being rated for fluorescent bulbs.

### **Warranty**

Western Instruments warrants its products, against defects in materials and workmanship for a period of 1 year from receipt by the end user. If Western Instruments receives notice of such defects during the warranty period, Western Instruments will either, at its option, repair, replace, or condemn products that prove to be defective. Consumable items, such as Batteries are warranted for 30 days, from receipt by the end user.

Any warranty is void if the unit has been modified in any way, or if it has been repaired by an unauthorized agency. The end user agrees that any equipment's disposition, when returned for warranty work, is at the full discretion of Western Instruments as to whether a claim is under warranty, or due to misuse. Western Instruments warranty shall overlook normal wear, however does not include operation outside the environmental specification of the product. All warranty work is FOB Western Instruments, and any returned units shall include a written description, by the end user, of the fault.

Western Instruments makes no other warranty, either expressed or implied, with respect to this product. Western Instruments specifically disclaims any liability arising from the use of this equipment. For the correct use of the product, refer to the Operating Instructions, furthermore we recommend instructional training to CGSB, ASNT, or other regulatory authority qualifications. Western Instruments highly recommends the end user exercise all possible safety precautions, including use of protective equipment, while operating this or other industrial equipment. Product may not be exactly as illustrated.

### **Specifications:**

Model W-IC & W-ICK  
Capacity: 200 Pounds (91 Kg) – Work Surface  
150 Pounds (68Kg) – Storage Shelf  
Work Surface: 40" x 30" (1016mm x 760mm)  
Booth Height: 7 Feet (1150mm)  
Weight: 230 Pounds (105 Kg)  
Power Bar Capacity: 15 Amps @ 115VAC

### **Western Instruments Inc.**

Phone: (780) 459-6720

Fax: (780) 459-7837

E-mail: [info@westerninstruments.com](mailto:info@westerninstruments.com) Web: [www.westerninstruments.com](http://www.westerninstruments.com)