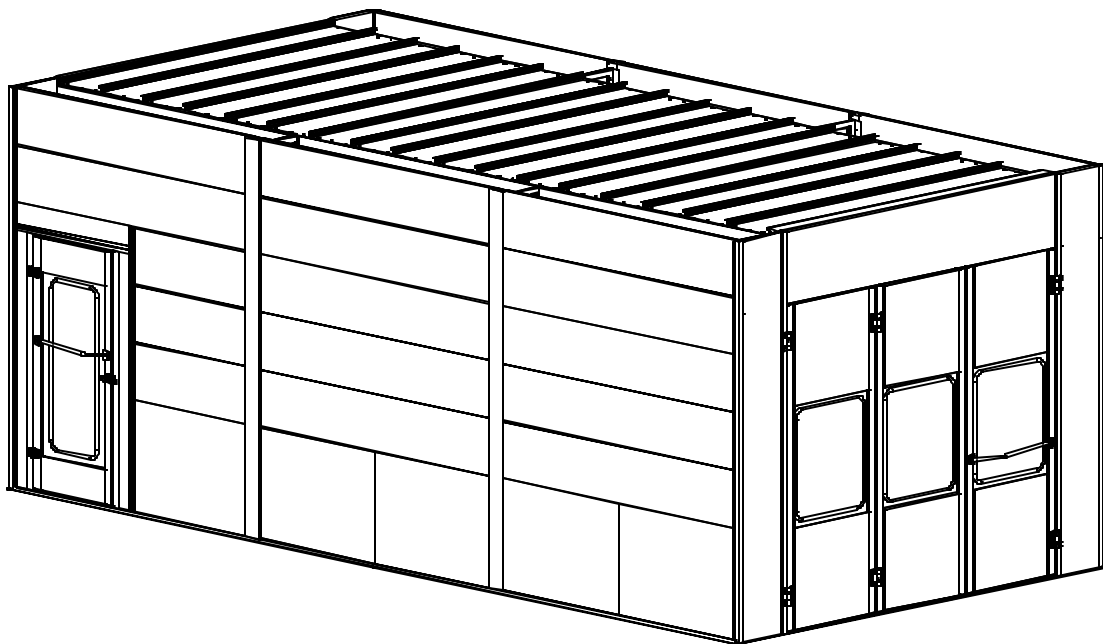




Owners Manual  
Garmat USA  
Enclosed Paint Spray Booths



Garmat USA, Inc. 1401 West Stanford Ave. Englewood, CO 80110

(800) 781-6802 ph.

(303)781-2683 fax

[www.garmat.com](http://www.garmat.com)



<b>OPERATIONS INSTRUCTIONS.....</b>	<b>Page 2</b>
<b>MAINTENANCE INSTRUCTIONS.....</b>	<b>Page 8</b>
<b>MAINTENANCE SCHEDULE.....</b>	<b>Page 10</b>
<b>TROUBLESHOOTING.....</b>	<b>Page 12</b>
<b>OPERATION SEQUENCE.....</b>	<b>Page 12</b>
<b>FILTER CHANGE RECORD.....</b>	<b>Page 15</b>
<b>WARNING LABELS.....</b>	<b>Page 16</b>
<b>LIMITED WARRANTY.....</b>	<b>Page 17</b>

## Garmat Booth/Oven

**WARNING: FAILURE TO HEED WARNINGS INCLUDED IN THIS MANUAL COULD RESULT IN PROPERTY DAMAGE, PERSONAL INJURY, AND/OR DEATH.**

The Garmat Downdraft Paint Booth is designed and manufactured in the United States. The Garmat Downdraft Paint Booth provides the optimal environment for the application of fine automotive finishes. Through continuous product design and improvement, Garmat is committed to providing you and your customer with the finest automotive finish possible. Thorough study of this manual will not only aid you in your pursuit of a fine finish, it will assist you in making your pursuit safer and easier.

### SUGGESTIONS FOR SAFETY

Before using this unit be sure to read all of the operation instructions and these safety suggestions carefully. Afterward, place them in the main control panel of the booth for future reference. Take special care to follow the warnings indicated on the unit, as well as the operating instructions.

### PREPARATION OF THE CAR

One of the key elements of a fine finish is a dust free environment. The design of a Garmat Downdraft Paint Booth is centered on providing a relatively dust free environment. Your preparation of the car before it enters the booth is very important to maintain a dust free environment.

Before moving the car into the spray booth, after the body of the car is properly prepared to accept the finish, wash the entire vehicle. Attention during the wash procedure should be directed to the underside of the vehicle as well. When the vehicle is completely dry and ready for refinishing, the entire vehicle should be blown off with compressed air.

Again, attention must be paid to crevices around the hood, trunk lid, doors, air vents, etc.

Masking of the vehicle should be performed outside of the booth. Remember, your efforts to introduce a clean vehicle into a relatively dust-free environment provided by the Garmat Downdraft Paint Booth will assist you in your pursuit of the finest finish with a minimum of work.

### PREPARATION OF THE PAINTER

Proper protective clothing and gear is essential for the safety of the painter and production of a quality paint job. Paint suits are readily available in a variety of styles. Garmat recommends a close weave nylon type that breathes and has a hood. The suits should be cleaned regularly and should be worn only when the painter is actually engaged in painting. The painter should remove all dust from his clothes before putting the paint suit on. Whenever entering the Paint Booth, all dust should be removed from the paint suit, and any equipment. Anything that the painter brings into the booth is a potential cause of dust.

**WARNING: APPROVED RESPIRATORS MUST BE WORN WHENEVER FINISHES ARE APPLIED.**

### NOTE: THE BOOTH MUST BE OPERATING WHENEVER ENTERING THE BOOTH

The Painter should try to stay in the booth as much as possible and limit going in and out between paint coats. He should have enough paint in the booth to complete that portion of the job.

### PAINT BOOTH ENTRY

The Garmat Downdraft Paint Booth can be installed in a variety of configurations. Your Paint Booth as installed will include some of the following features:

FRONT ENTRY  
DRIVE-THROUGH

FRONT ENTRY WITH RAISED FLOOR  
DRIVE- THROUGH WITH RAISED FLOOR  
FRONT ENTRY, SIDE OUT WITH TRACKS  
AND LIFT  
SIDE ENTRY, SIDE OUT WITH TRACKS  
AND LIFT

The booth may be installed with a grated in-line single row pit, three row central pit or full grated floor. Always center vehicle side-to-side, and front to back on pit or floor.

**NOTE: THE BOOTH FANS MUST BE RUNNING WHENEVER A CAR IS MOVED IN OR OUT. THIS WILL REDUCE THE POSSIBILITY OF CONTAMINATION FROM THE SHOP**

**FRONT ENTRY AND DRIVE THROUGH:**

Before moving a vehicle into the booth, assure that the vehicle and/or any attachments, i.e. mirrors, antennas, etc. will fit through the door you intend to use. All recommended preparation procedures outlined above must be completed. The booth must be operating.

Grated floors are designed to support standard passenger vehicles and light trucks and vans. Do not move extremely heavy vehicles, i.e. armored cars, or vehicles containing heavy loads into the booth. Vehicles should be driven slowly and carefully. Rapid acceleration or hard braking should be avoided at all times and can damage the floor grates.

**WARNING: USE CAUTION IN MOVING VEHICLES ONTO GRATED FLOORS.**

**FRONT ENTRY AND DRIVE THROUGH WITH RAISED FLOOR:** Review instructions for the FRONT ENTRY AND DRIVE-THROUGH. Raised floor booths require the use of ramps for the vehicle to enter and exit the booth. The ramps are designed for standard vehicle weights. Do not

attempt to move unusually heavy vehicles or vehicles with heavy loads into the booth.

**WARNING: USE CAUTION IN MOVING VEHICLES ONTO RAMPS.**

**FRONT ENTRY AND DRIVE THROUGH WITH RAISED FLOOR:**

Review instructions for the front entry and drive through. Raised floor booths require the use of ramps for the vehicle to enter and exit the booth. The ramps are designed for standard vehicle weights. Do not attempt to move unusually heavy vehicles or vehicles with heavy loads into the booth.

**WARNING: USE CAUTION WHEN DRIVING VEHICLES INTO BOOTH USING RAMPS. FRONT ENTRY SIDE OUT OR SIDE ENTRY SIDE OUT WITH TRACKS AND LIFTS.**

Review instructions for the FRONT ENTRY AND DRIVE THROUGH. Side entry booths necessitate the use of lifts or dollies and tracks. Insure that the vehicle to be moved into the booth does not exceed the capacity of the lift or dollies installed. Lifting pads must be positioned properly. Consult vehicle and lift manufacturer recommendations. Lift the vehicle only enough to provide easy movement into the booth. Do not place any part of your body under the vehicle while supported by the lift. Use care while lowering the vehicle.

**WARNING: USE CAUTION WHEN MOVING A VEHICLE WITH LIFTS.**

**SUGGESTIONS FOR SAFETY**

Before using this unit be sure to read all of the operating instructions and these safety suggestions carefully. Afterward, place them in the main electrical control panel for future reference. Take special care to follow the warnings indicated on the unit itself as well as the operating instructions.

**WARNING: IF YOU SMELL GAS:**

- 1. OPEN WINDOWS.**
- 2. DO NOT OPERATE ELECTRICAL SWITCHES.**
- 3. EXTINGUISH ANY OPEN FLAME.**
- 4. IMMEDIATELY CALL YOUR GAS SUPPLIER.**

**WARNING: DO NOT USE OR STORE GASOLINE, PAINT, OR OTHER FLAMMABLE MATERIALS NEAR THE INTAKE AIR HEATER APPLIANCE (BOOTH MECHANICALS).**

**WARNING: REMOVE ALL PROPANE TANKS FROM VEHICLES BEFORE MOVING THE VEHICLE INTO THE BOOTH.**

**WARNING: DO NOT ENTER THE BOOTH DURING THE BAKE CYCLE.**

**WARNING: APPROVED RESPIRATORS MUST BE WORN WHENEVER FINISHES ARE BEING APPLIED.**

The booth fans must be running whenever a car is moved into or out of the booth. The booth must be running whenever personnel are entering the booth.

**WARNING: USE CAUTION IN MOVING VEHICLES ONTO GRATED FLOORS.**

**WARNING: SERVICE VEHICLES (TOOL BOX BED) MUST BE EMPTIED. AMBULANCES AND SAFETY VEHICLES ARE TOO HEAVY.**

Place only standard cars and light truck on the grated area. Grating will not support forklift

**WARNING: USE CAUTION WHEN DRIVING VEHICLES INTO BOOTH USING RAMPS.**

**WARNING: USE CAUTION WHEN MOVING A VEHICLE WITH LIFTS.**

Consult with your paint jobber or manufacturer concerning recommended “flash-off” time period, application temperature and bake temperature.

**WARNING: DO NOT EXPOSE THIS EQUIPMENT TO EXCESSIVE MOISTURE OR RAIN. DO NOT PRESSURE WASH OR HOSE WASH THE INTERIOR, EXTERIOR OF THE CABIN OR ITS RELATED EQUIPMENT. THIS WILL VOID THE WARRANTY.**

Review the recommended maintenance procedures and insure that the prescribed schedule is followed.

Disconnect all electrical supply and lock-off whenever covers on the mechanicals are removed for maintenance procedures.

Do not over-tighten the fan belts. Proper tension is when there is ½” deflection at a mid point between the pulleys with moderate pressure on the belt. Belt tension testers are available from drive belt suppliers. Drive belts should be adjusted after the first 40 hours of use and every three months after that.

Except for adjustments explained in the maintenance instructions never attempt repairs your self. Be sure to request service from a qualified technician or your distributor.

## **THE CONTROLS**

Identification of components. The control components are located on the face of the Remote Control Panel.

- 1. EMERGENCY (EM) STOP SWITCH** is red in color.
- 2. LIGHTS ON/OFF SWITCH**
- 3. OFF/SPRAY/BAKE SWITCH OR OFF/SPRAY SWITCH**
- 4. BURNER SUMMER/WINTER SWITCH**
- 5. POWER PILOT LIGHT (GREEN)** indicates booth is ready for or already in operation when lit.
- 6. THE INTAKE PILOT LIGHT (RED), THE EXHAUST PILOT (RED) OR THE BURNER**

**PILOT (RED)**, when lit indicates a problem exists with the Intake Motor, the Exhaust Motor, or the burner safeguard system.

**7. HOURMETER** records hours of operation in the spray mode. The hour meter is used to schedule filter replacement.

**8. BAKE TIMER** is energized only during the bake mode. This timer features a bar (top portion of unit), which initializes at 100% at the right and decreases to 0 at the end of the timed period. The mode indication (lower left corner of the timer) should be set at C. The bake time is set via thumbwheels (lower center). The timer function (lower right) should be set at M for minutes.

**9. TEMPERATURE CONTROLLER** provides a readout of the booth internal temperature and current set-point (one for spray and one, or three, for bake depending on controller option).



**10. EXHAUST FAN PILOT LIGHT (GREEN)** when lit indicates all is well with the exhaust motor and the exhaust fan is running.

**11. INTAKE FAN PILOT LIGHT (GREEN)** when lit indicates all is well with the intake motor and that the intake fan is running.

**12. BURNER PILOT LIGHT (GREEN)** when lit indicates power has been given to the burner safeguard system.

**13. PHOTOHELIC** provides readout of interior booth pressure and is set to maintain the cabin pressure automatically.

## MAIN ELECTRICAL PANEL

The control panel is fully described in the maintenance section of this manual.

The control panel is mounted to the intake mechanical unit above and to the side of the intake motor. It is white in color and contains the power and the controls for the booth.

**WARNING: THE MAIN ELECTRICAL PANEL IS SUPPLIED BY TWO SOURCES OF ELECTRICAL POWER. INSURE BOTH SOURCES ARE DISCONNECTED BEFORE ANY ADJUSTMENTS IN THE PANEL ARE MADE. A THIRD SOURCE IS PRESENT WHEN USING ALTERNATIVE INTAKE HEATED MAKE UP UNITS.**

The flash-off timer is an internal function of the PLC (Programmable Logic Controller) and is adjustable in minutes. This timer should not be set any lower than 3 minutes according to national codes. Consult your paint supplier or manufacturer for recommended flash-off time.

The cool down timer is an internal function of the PLC (Programmable Logic Controller) and is adjustable in minutes. Generally this timer is set a maximum of 10 minutes. This allows the operator to set the paint booth to bake mode and go home in the evening. The booth will complete the bake cycle, cool down for 10 minutes, and then shut down completely. The Off/Spray/Bake switch will need to be set to the Off position to allow the booth to operate after the system has gone through a cool down cycle and shut off automatically.

Adjustment of the flash-off and cool down cycles can be done using a modem (if option has been purchased) and an FTX external program unit. Contact your local Garmat USA, Inc. authorized service center for these adjustments.

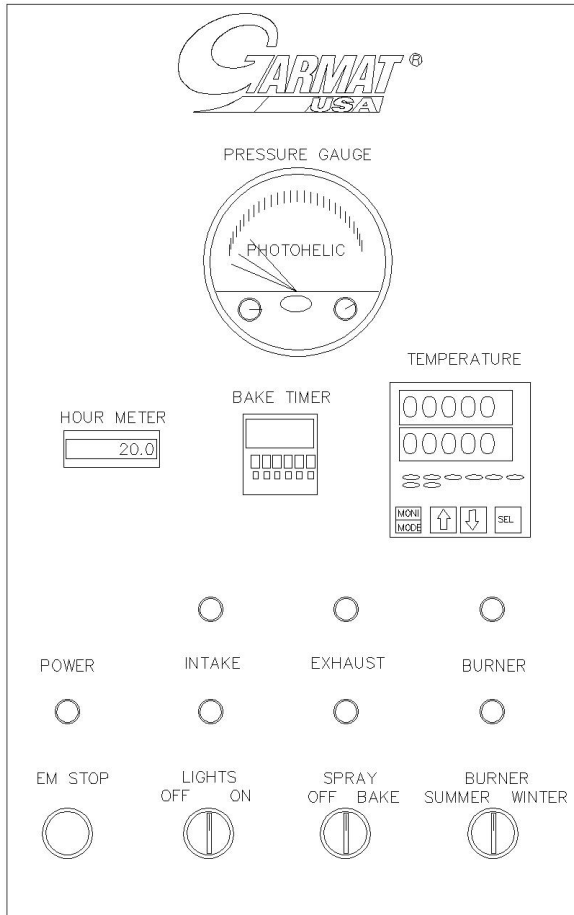
If booth is supplied with model 99270 heater, the flash-off, bake, and cool down times are internal functions of the PLC (Programmable Logic Controller) inside the remote control panel. These time sequences can be adjusted on the PLC itself.

## HOW TO OPERATE THE BOOTH/OVEN

### OVERVIEW

Your Garmat Downdraft Paint Booth is designed to provide the user with the maximum information concerning the booth operation as possible. A

close review of the control components and their functions is very important. **DO THIS BEFORE PROCEEDING.** If the booth does not perform as anticipated, review the TROUBLESHOOTING portion of this manual. Observe the position of the LIGHT switch, the OFF-SPRAY-BAKE switch and the BURNER switch.



## SPRAY

Step 1: Turn the EM switch clockwise; the green power light will come on. Allow 5 seconds for the PLC (programmable Logic Controller) to scan the internal program.

Step 2: Turn the LIGHT switch clockwise; the lighting within the booth will come on.

Step 3: Starting with the switch in the OFF position, turn the OFF-SPRAY-BAKE switch to SPRAY, the green lights for the Intake and the Exhaust fans will light up and the temperature controller will begin self-checking.

Step 4: After the booth has been operating for a moment and with all of the doors closed, check the Photohelic gauge. The booth is designed to operate at 0.02-0.04 inches of water column positive pressure. The Photohelic gauge is provided with adjustment knobs for low and high side pressure adjustments. The low side pressure adjustment is set with the orange crosshair on the left side of the gauge controlled with the knob on the left of the gauge face. The high side pressure adjustment is set with the orange crosshair on the right side of the gauge controlled with the knob on the right of the gauge face. The low side crosshair should be set to 0.01 inches of water column and the high side crosshair should be set to 0.04 inches of water column. In all cases it is important to maintain positive pressure in the booth.

Step 5: If the outside temperature is lower than what is acceptable for spray operations turn the BURNER switch clockwise to the WINTER position. The green light for the burner will come on. The burner does not need to be engaged during summer operation when the ambient (outside) temperature is higher than spray set point.

Step 6: If the burner has been engaged, check the Spray Temperature (SP). Adjust as necessary.

Step 7. Move the vehicle into the booth, centering it front to back and side to side.

## BAKE

A major premise of the Garmat Downdraft Paint Booth is to provide an environment in which the finish is properly dried. All major manufacturers of automotive finishes specify raising the surface temperature of the painted part to a recommended temperature and to maintain that temperature for a certain period of time. Contact your local paint representative for this information. To control the baking process, the operator has two tools: the temperature controller and the bake timer. The temperature controller displays air temperature. In order to reach the recommended surface temperature, some experimentation may be required. Increase or decrease the bake temperature and/or the bake time until the desired



results are achieved. Garmat does not recommend baking at temperatures above 180°F for an extended period of time. The booth will not operate at bake temperatures above 190°F.

Step 1. Turn the OFF-SPRAY-SWITCH to bake. The flash off cycle will begin. During the flash-off period, the booth temperature will remain at the Spray Temperature (SP or area 1). At the end of the flash-off period (not less than 3 minutes according to national codes) the Bake Temperature (2SP) will be displayed on the temperature controller. The booth lighting will shut off at the end of the flash-off period. The controller will then raise the temperature to the desired bake temperature (2SP). When using the 4 set point controller option, at the end of the flash off period, bake temperature area 2 will be displayed and the “VB” bake area timer, located in the remote control panel, will be energized. Area 2 is used for a ramp up of the air temperature in the booth and can be set to 190 degrees F. At the end of the first time sequence of the “VB” timer ends the bake temperature area 3 will be displayed. Area 3 is used for a ramp down of the air temperature in the booth and should be set to a mid point between the actual bake temperature and the ramp up temperature setting. At the end of the second time sequence of the “VB” timer ends the bake temperature area 5 will be displayed. Area 5 is the actual bake temperature setting.

Step 2. The Bake Timer will begin timing as soon as the purge time sequence has finished. Adjust the bake time setting. The bar display on the Bake Timer will decrease in length as the time set elapses. When using the 4 set point controller option, the bake time setting will include the operation of the “VB” timer settings. It will be necessary to add the “VB” time settings to the required bake time.

Step 3. When the Bake Timer has completed its’ cycle, the booth lighting will come back on. The Temperature Controller will revert back to the Spray Temperature (SP or area 1). This is the cool down cycle (10 minutes). At any time during the cool down cycle, the OFF-SPRAY-BAKE may be

returned to the SPRAY position and the entire bake sequence can begin anew. At the end of the cool down cycle, if the OFF-SPRAY-BAKE switch is still in the BAKE position, all functions will shut down. Turning the OFF-SPRAY-BAKE switch to OFF will be necessary to turn all functions of the booth back on.

## **REMOVING THE CAR**

Review the instructions for entering the booth. Heed the warnings for the style of booth installed.

## MAINTENANCE INSTRUCTIONS ENCLOSED PAINT BOOTH

### FILTERS

To assure that the optimum-finishing environment designed into your Garmat Downdraft Paint Booth is maintained, filter replacement at recommended intervals and regular cleaning of the booth and the air-handling units is essential. Use only recommended filters and insure that the filters are properly installed.

The quality of finish produced by your Garmat paint booth is affected by the following:

- a. The filter media used and the timeliness of filter replacement.
- b. The purity of compressed air used for applying the finish. Use a quality filter and moisture trap on compressed air lines supplying the booth. When using copper airline, make sure that all connections to the equipment have dielectric unions.
- c. Spray guns and other application equipment must be maintained perfectly clean and in proper working order.
- d. Personnel clothing (paint suits) should be established for use only in the booth.
- e. DO NOT mix paint within the booth.
- f. LIMIT ACCESS to the booth.
- g. DO NOT open booth doors unless the booth is operating.

**FILTER LOCATION-** Three main filter groups control the dust entering the booth and the paint particles emitted by the booth.

### INTAKE PRE-FILTERS- CLEAN AT 250-HOUR INTERVALS

The intake pre-filters are located behind an access door on the side of the intake air-handling unit. Six 5/16" bolts secure the access door. These filters will be of an aluminum washable type and should be

removed and cleaned thoroughly at 250-hour intervals.

Turn the paint booth off and insure it will not be re-started. Remove the 5/16" bolts, open the compartment door, and slide three intake pre-filters out. Hose wash the three intake pre-filters, dry the filters with low air pressure and replace them. Record date, time and hour meter reading on the filter change schedule at the back of this manual. Re-start the paint booth.

### EXHAUST FILTER CHANGE AT 50-60 HOUR INTERVALS

**FULL DOWNDRAFT BOOTHS-** Raise the grates above the exhaust filters to be changed. Remove the used filters and place in airtight container. Sweep and/or vacuum all debris and dust. Place the new filter media insuring tight placement. Replace the grates. Record date, time and hour meter reading on the filter change schedule at the back of this manual. Re-start the paint booth.

**WARNING: USED EXHAUST FILTER MATERIAL IS FLAMMABLE AND IS SUSEPTIBLE TO SPONTAINOUS COMBUSTION. DISPOSE OF PROPERLY.**

### CEILING FILTER CHANGE AT 1000-1200 HOUR INTERVALS

**NOTE: ALTHOUGH ONE MAN CAN REPLACE THE CEILING FILTERS, IT IS RECOMMENDED THAT TWO PEOPLE INSTALL THE NEW FILTERS TO INSURE PROPER PLACEMENT. USE HAND TOOLS ONLY.**

Ceiling Filters are held in place by a removable filter frame in the ceiling of the cabin. Support bars secure the filter frame. Slide the support bars clear of the frame, insuring that the frame will not fall free, and remove from the filter frame opening. Set filter frame on stands. Remove the used filter media, and thoroughly clean the filter frame with a tack rag. Place the new filter media in the filter

frame, tuck the media into the ends of the frame, and then tuck the media into the sides of the frame. Raise the filter frame up into the filter frame opening. Slide the support bars back into place and tighten bolts by hand making sure not to over tighten. Record the date and hour meter reading on the FILTER CHANGE SCHEDULE at the back of this manual. The FLAME ROD in the burner should be replaced at this time.

## MAINTENANCE SCHEDULE

### DAILY

CHECK booth pressure and make sure the booth pressure is operating in the proper range (black crosshair between orange crosshairs).

SWEEP the floor while the booth is in operation, (other than completely grated floor). The booth floor may be mopped, with a well rung out mop.

CHECK the exhaust filters.

NOTE: The cabin floor grates must be thoroughly cleaned whenever the exhaust filters are replaced (60-100 hrs).

Media blasting will not remove galvanization, but may be done to completely remove over spray build-up. This can be done at 500-1000 hour intervals.

**(Sand Blasting will remove galvanization and damage the floor grates)**

### 1000-HOUR INTERVAL (ANNUALLY)

At each 1000-hour interval, the following preventative maintenance checklist should be reviewed. If any malfunction is found, it should be repaired immediately.

MOTORS - Replace fan belts. Adjust for proper tension.

NOTE: Proper tension is 1/2" deflection at a mid point between the pulleys using moderate pressure. Tension testers are available at local belt and drive suppliers.

FANS- Check fan blade surfaces. Clean if necessary. Oil the blade surfaces after cleaning. DO NOT USE SILICON BASED OIL. In addition, oil the changeover damper hinges. Some hinges will have grease zerks.

BOOTH - Examine all door seals, replace with Garmat approved seals only. Change ceiling filters. Check exhaust filters and replace if necessary. Remove the door hinge pins on the smaller hinges and grease with a high quality lubricant. The larger hinges are provided with grease zerks and removal of the pin is unnecessary.

**CAUTION: FAILURE TO PERFORM THE REQUIRED LUBRICATION WILL CAUSE PREMATURE FAILURE OF THIS EQUIPMENT.**

The moving mechanical portions of this equipment require regular lubrication not less than every 3 months. The items requiring regular lubrication include and are not limited to: door hinges, dampers, and motors. If you are unsure which items need lubrication, contact the equipment supplier. If extreme moisture is present, lubrication may need to be performed daily.

CONTROL AIR - Examine the regulator/filter and oilier for the control air (located at the side of the main control panel). Pressure should be set between 45-60 psi, drain the filter and refill the oilier with air tool oil.

CONTROL PANEL - Review the following:

- a: Indicator lamp operation.
- b: Pressure settings.
- c: Temperature settings.

FINALLY - Run the booth a complete cycle of operation and observe all functions.

### AS RECOMENDED

MOTORS - In general, the motors supplied with your Garmat paint booth require lubrication and are fitted with grease zerks. Lubricate the motor with a good quality grease quarterly making sure not to force grease into the bearings. A 1/4 squeeze on a normal hand pump grease gun is sufficient.

Forcing grease into the bearing will damage the bearing seals and shorten the motor life.

HEATER - Gas fired heaters require little or no maintenance. However the burner manifold should be inspected to make sure there is no build up of debris or moisture. The flame rod in the burner manifold should be replaced Annually. Also the burner manifold should be completely cleaned out every Four Years by a qualified service technician.

#### MAINTENANCE OF INTERNAL AND EXTERNAL SURFACES

To clean, use a soft, dry cloth. If the surfaces are extremely dirty, use a soft cloth, dipped into a soap and water solution or a weak detergent solution. Wring the cloth before wiping the surface. Wipe again with a soft, dry cloth.

Never use alcohol, paint thinner, benzine, nor a chemically treated cloth to clean this equipment. Such chemicals may damage the finish of your booth. Never pressure wash or hose down the interior or exterior of the booth, electrical shorts or shocks can occur. In addition, water will collect in light fixtures and various components of the booth cabin and rust deterioration will begin.

**PRESSURE WASHING WILL VOID YOUR WARRANTY.**

## TROUBLESHOOTING

### OPERATOR TROUBLESHOOTING CHART

SYMPTOM RECOMMENDED	POSSIBLE CAUSE(S)	ACTION
NOTHING WORKS. (GREEN POWER LIGHT IS NOT ON).	EM switch is off. Incoming 3 phase voltage is off. The 110-v control breaker in main control panel is tripped.	Turn EM switch on. Check incoming 3 phase breaker at wall panel. Reset breaker in main control panel.
NOTHING WORKS. (GREEN POWER LIGHT AND A RED MOTOR LIGHT IS ON).	Overload relay is tripped. Loss of a phase. Low 3 phase voltage.	Reset overload relay. Check for 3 phase. Measure motor amps. Measure 3 phase voltage.
EVERYTHING WORKS BUT BOOTH LIGHTS.	Lighting breaker(s) are tripped. Change-over damper is stuck open.	Reset lighting breaker(s). Check change-over damper.
TEMPERATURE DOES NOT RISE. (BURNER GREEN LIGHT IS ON).	Outside air temperature is greater than set-point temperature. High limit is tripped. Low gas pressure. High gas pressure. Proof of Closure switch is open.	Increase set point temperature on Temperature controller. Booth temperature will not exceed 190°F. Manually reset high gas switch. Manually reset low gas switch. If either problem persists, call a Garmat USA authorized service technician. Gas blocking valve is not holding the proof of closure switch closed. Call Garmat Authorized service-technician.
TEMPERATURE DOES NOT RISE. (BURNER RED LIGHT IS ON).	Pilot has failed during fire cycle. Pilot manual gas valve turned off.	Push reset button on red enclosure marked FIREYE. Turn manual valve ON. If lockout repeats, call a Garmat USA authorized service-technician.
TEMPERATURE TOO HIGH DURING SPRAY MODE.	Controller is set to Bake or second Set - Point.	Outside temperature above 70°F. Press the Moni/Mode button and press the up arrow to Put the control into AUTO mode, press Moni/Mode button to go back top the normal display. Set SUMMER/WINTER switch to SUMMER.

This section is provided to assist a service technician and explain in detail what is happening during “normal” operation.

#### SPRAY/BAKE BOOTH OPERATION

The spray/bake booth has four separate modes of operation: POWER ON, SPRAY, BAKE, and SHUTDOWN.

#### POWER ON:

The green light marked POWER is lit when the booth is in POWER ON mode. The 110v and 24v control voltages are provided from the secondary side of the control transformer. The primary side of the control transformer is connected to the incoming three-phase motor voltage supply.

The 120v is connected through a jumper connection provided for use with a NC contact on an alternative fire suppression system that requires shutdown of the booth fans. Breaking the circuit at that point will shut down all booth operations. The 120v continues through the EM (emergency) stop switch in the remote control panel, and NC overload contacts of each Motor Starter. The 120v is then present at the light switch, off/spray/bake switch, and bake timer. If either motor trips to an overload condition, a RED light for the respective motor is lit, and all booth operations quit. Breakers protect both control voltages, 110v and 24v.

The EM switch, when depressed, shuts down all both operations. Turning the EM switch clockwise reconnects the supply voltage, unless the jumper circuit for the fire suppression system is open.

#### SPRAY MODE:

When the green power light is lit, placing the OFF-SPRAY-BAKE switch in the spray position begins the Spray Mode. The booth will operate in SPRAY mode indefinitely. The operator must shut off the booth, or switch to the Bake Mode. The SPRAY position provides 120v to the PLC (Programmable Logic Controller) and shows input "0" on the PLC input display. This in turn provides 110v to starter SM2 located in the Control Panel. SM2 controls the Exhaust Motor and shows as "10" on the PLC output display. The green light for the exhaust motor on the Control Panel should be lit. A time sequence is also started in the PLC as SM2 is energized. At the end of the time sequence, 110v power is provided to SM1 and the Temperature Controller and shows as "9" on the PLC output display. SM1 controls the intake motor and provides 120v to the green light for the intake motor and the BURNER switch. The temperature controller should show display and go through its' boot operations. All are located on the remote control panel.

If the BURNER switch is in the WINTER position, 120v power is provided to the PLC and shows as "3" on the PLC input display, which in turn provides 110v to the gas train power circuit shown as "7" on

the PLC output display. See the text of the Gas Train Power Circuit. If the BURNER switch is in the SUMMER position, the Gas Train Power Circuit will not be energized as there will be no input to the PLC.

#### BAKE MODE:

Place the OFF-SPRAY-BAKE switch in BAKE provides 120v to the PLC and shows as "1" on the PLC input display. The PLC will perform a time sequence then power is applied to the Bake Timer located on the Remote Control Panel, the change over damper solenoid and relay RP in the main control panel. This places the booth in Bake Mode. The timer will begin timing. The Bake Timer should be set in its' "C" mode, on the left of the timer face, and "M" for minutes, on the right.

When the Change over damper solenoid is energized, the changeover damper is opened pneumatically releasing the Damper Position Valve. When released, the pressure switch (RA) connected to the Position Valve de-energizes input to the PLC shown as "11" on the PLC input display. This disconnects 110v power to the compressed air solenoid, shown as "5" on the PLC output display, and eliminates the 120v circuit to RL contactor, turning off the booth lighting. If the burner switch is in the summer position, the PLC will give 120v to the gas train circuit. The (RP) relay closes the second set point loop on the temperature controller. This sets the temperature controller to the second set point or starts the sequence of multiple temperature settings on a multi-set point controller (optional).

At the completion of the bake time, the Bake Timer stops timing and gives 120v input to the PLC shown as 14 on the PLC input display. This begins the Cool Down time sequence (Shutdown mode).

#### SHUTDOWN MODE:

The Bake Timer directs 120v power to then PLC and shows as 14 on the input display in the Main Control Panel, beginning the Shutdown mode. The power to the changeover damper solenoid and RP relay are interrupted. The changeover damper closes, RA are energized, the booth lights come back on, and the Temperature Controller returns to set point, SP, also known as the Spray Temperature. The output from the PLC will be de-energized shutting off the burner if the OFF-SPRAY-BAKE switch is set to summer position.

The PLC also begins an internal time cycle, normally 10 minutes, all functions of the booth will shut down completely at the end of the time cycle. The logic of the PLC will not allow the booth to restart until the OFF-SPRAY-BAKE switch is set to the OFF position. The Operator may interrupt the Shutdown Mode at any time by placing the OFF-SPRAY-BAKE switch in the SPRAY position.

#### GAS TRAIN POWER CIRCUIT:

When the burner switch is set to the winter position there will be input to terminal 4 of the PLC and will show number 3 on the input display of the PLC. The PLC checks to make sure that the input is at 0 on the input display and outputs to 7 on the output display, giving power to the low gas pressure switch. The PLC then makes a scan of the input to 4,5, 6 & 7, on the input screen, and then gives output to 12 on the output display, giving power to the Fireeye unit and power to 1 on the output display giving power to the burner green light. The PLC will have input at 8 on the input display, showing power to the airflow switch. When the Fireeye has done its' job there should be power to 9 on the input screen, showing that power has been given to the vent and blocking valves on the gas train. The PLC will also make the signal connection 0 on the output display, making the connection between the gas modulating valve and the temperature control. In the event the Fireeye goes into the alarm state, there will be input to 10 on the input display and no input to 9 on the PLC input display. There will also be output to 2 on the output

display, giving power to the burner red light and the output to 1 on the display, discontinuing the power to the burner green light.

The Low Gas and High Gas Limit, the Proof of Closure switch (all three are located on the gas train), the High Temperature switch (located on the roof of the cabin) or the Air Flow switch (Intake Pressure switch). Each of these items may be checked by proving 110 volts from their respective terminals at the top of the Main Control Panel. The airflow switch (intake pressure switch) is powered through the flame safety module, and has two terminals.

The flame safety module will give an alarm state (lighting the red burner light) for one of three reasons. One, there is no spark in the burner to ignite the burner pilot. Two, there is no fuel being delivered to the pilot to create a flame. Three, the flame guard device is not sensing that there is flame in the burner.

#### COMPRESSED AIR FOR SPRAY APPLICATIONS WITHIN BOOTH:

A solenoid is provided to control compressed air in the booth. It is located within the Main Control Panel. 110v power is provided to the solenoid through the PLC output 5 on the display. For the PLC to output at 5, the RA air over electric switch, Door air switch, and exhaust pressure switch must be closed giving power to the PLC input 12.



FILTER	HOURS	DATE	COMMENTS
	SPEC/ACTUAL		
EXHAUST	50/		
EXHAUST	100/		
EXHAUST	150/		
EXHAUST	200/		
EXT & INT	250/		
EXHAUST	300/		
EXHAUST	350/		
EXHAUST	400/		
EXHAUST	450/		
EXT & INT	500/		
EXHAUST	550/		
EXHAUST	600/		
EXHAUST	650/		
EXHAUST	700/		
EXT & INT	750/		
EXHAUST	800/		
EXHAUST	850/		
EXHAUST	900/		
EXHAUST	950/		
EXHAUST	1000/		
INTAKE	1000/		
CEILING	1000/		

**WARNING**

Do not enter during the brake cycle.

Remove propane fuel systems from vehicles prior to reaching the boot/door.

**CAUTION**

**DO NOT WALK OR STAND OR STORE OBJECTS ON ROOF.**

**CAUTION**

Use only the approved and authorized collection kit. Do not use electrical activity in the laboratory.

The safety training manual of the National Institute of Standards and Technology (NIST) is available at <http://www.nist.gov>. The safety training manual is available at <http://www.nist.gov>. The safety training manual is available at <http://www.nist.gov>.

© 2008 NIST. All rights reserved. Page 1 of 1. NIST-800-001-001

**WARNING**



**CAUTION**

POTENTIAL OVERHEATING



LET REFLECTIVE SURFACES

**WARNING**

Avoid all electrical wires. This panel has wires that are exposed to power. Disconnect all power sources before opening the panel.

All final wiring provided with factory with final install. In the absence of final install, the National Electrical Code (NEC) - 2011.

Panel fire or building codes may require fire protection - check with local jurisdiction authorities for requirements.

**WARNING**

EXPOSURE FOR EXTENDED PERIODS MAY CAUSE EYE IRRITATION. ALWAYS WEAR SAFETY GLASSES AND GOGGLES. ALWAYS WEAR GLOVES. ALWAYS WEAR A HAT. ALWAYS WEAR A HAT.

**WARNING**

All wiring connections to this panel must be done using proper wiring techniques. Always use proper wiring techniques. Always use proper wiring techniques.

**WARNING**



Do not look at the surface or other reflective surfaces in the vicinity of the panel.

# **GARMAT® USA** 1401 W. Stanford Ave. Englewood, CO 80110 303-781-6802 fax 303-781-2683

## **LIMITED WARRANTY**

By this warranty, Garmat® USA ("Garmat,") issues limited warranties subject to the terms and conditions stated below. These limited warranties are extended only to the original Commercial/Industrial purchaser from either Garmat®, or an authorized distributor of Garmat ("Original Purchaser) of Paint Booths Preparation areas, Sanding Stations, Jamming Tunnels and Paint Mix Rooms and related products, supplied by Garmat (referred to collectively as "Garmat Products"). These warranties are issued only to the Original Purchaser and only when the equipment is in the original installation site. Any warranty provided for herein is void if Garmat® Products are moved from their original location.

Garmat® warrants to Original Purchaser that Garmat® Products are free from defects in materials or workmanship for a period of one year from date of installation and start-up. In the event that any part of a Garmat® Product is found to be defective in material or workmanship during this one year period, then Garmat® will repair or replace, at Garmat®'s exclusive option, the defective part.

All component-parts in Garmat® Products that are manufactured by other manufacturers, shall be limited to the respective component-part manufacturer's warranties, if any.

Garmat® warrants to the Original Purchaser that the galvanized sections of Garmat® Products are warranted against rust-through for a period of five years.

## **THIS IS A PARTS ONLY WARRANTY.**

These are the only warranties given by Garmat®. Garmat® does not have nor authorizes anyone to assume for it any other obligation or liability in connection with Garmat® Products, and does not authorize the Distributor or any other person to extend Garmat®'s obligation hereunder. Neither the Distributor nor any other person is authorized to make any representations in connection with these warranties or Garmat® Products.

Garmat® does not warrant the performance or results that may be obtained or are expected to be obtained by the Original Purchaser.

**GARMAT® SHALL NOT BE LIABLE TO ANY PERSON FOR ANY CONSEQUENTIAL, INCIDENTAL OR CONTINGENT DAMAGES WHATSOEVER ARISING OUT OF BREACH OF WARRANTY, BREACH OF CONTRACT, OR OTHERWISE.**

**ANY EXPRESS WARRANTY NOT PROVIDED HEREIN AND ANY REMEDY FOR BREACH OF WARRANTY OR CONTRACT WHICH, BUT FOR THIS PROVISION, MIGHT ARISE BY IMPLICA-**

**TION OR OPERATION OF LAW, HEREBY IS EXCLUDED AND DISCLAIMED. ANY IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE HEREBY ARE DISCLAIMED.**

## **THIS WARRANTY DOES NOT COVER:**

1. Any defects caused by or resulting from the abuse, misuse, overloading, accident (including shipping damage), improper maintenance, modification, alteration, use of improper fluids, repair or service or any other reason unrelated to manufacture of the equipment.
2. This warranty cannot be considered as a guarantee or warranty of workmanship of any installer connected with the installation of Garmat® Products, or as imposing on Garmat® liability of any nature for unsatisfactory performance as a result of faulty workmanship in the installation, which liability is expressly disclaimed.
3. This warranty will not apply to Garmat® Products which are not installed in accordance with applicable codes or ordinances.
4. Damage due to lightning or conditions beyond the control of Garmat® is not covered by this warranty.
5. Filter media, fluorescent tubes, motor drive belts, spark igniter, flame rods, and/or other consumable components are not warranted, and must be replaced at Original Purchaser's expense.

**PRODUCT IMPROVEMENTS:** Garmat® reserves the right to change or improve Garmat® Products or any component thereof without being obligated to provide such a change or improvements for Garmat® Products sold and/or shipped prior to such change or improvement.

**WARRANTY PROCEDURE:** Garmat® Warranty Installation Report must be completed and returned to Garmat® within 30 days of installation or warranty will be void. For prompt warranty assistance, notify the Garmat® Distributor from whom you purchased the Garmat® Product. If this action does not result in warranty assistance, contact: Garmat., 1401 W. Stanford Avenue, Englewood, CO 80110, (303) 781-6802, giving full particulars in support of the claim. If the Garmat® Product was purchased directly from Garmat®, contact Garmat®, at the above address for warranty assistance. Alleged defective part or parts must be returned through trade channels in accordance with the Garmat®, procedure currently in force for handling returned goods for the purpose of inspection or determination of the cause of failure.

## NOTES

---



