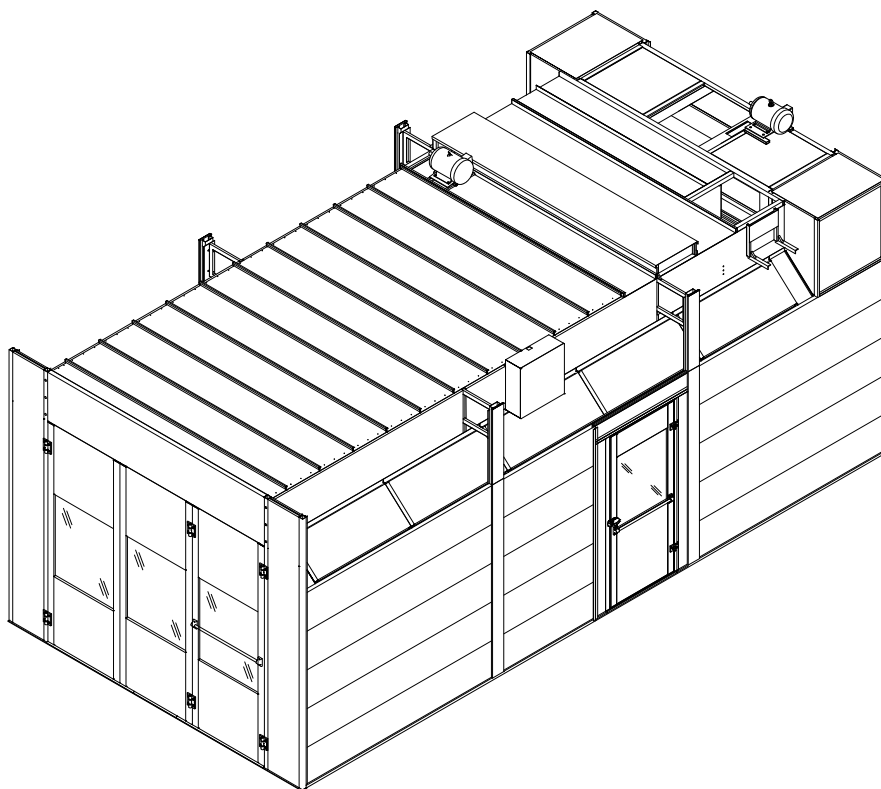




Operations and Maintenance Manual
Garmat USA, Inc.
Chinook II Paint Spray Booths



Garmat USA, Inc. 1401 W. Standford Ave. Englewood, CO 80110
(800) 442-7628 ph. (303) 781-2683

www.garmat.com

OPERATIONS AND MAINTENANCE INSTRUCTIONS

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OPERATIONS INSTRUCTIONS ENCLOSED PAINT BOOTH

Garmat® Booth/Oven

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

The Garmat® Tier 1 Paint Booth is designed and manufactured in the United States. The Garmat® Tier 1 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® Tier 1 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 Frontier 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® Tier 1 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

Always center vehicle side-to-side, and front to back on the 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. Vehicles should be driven slowly and carefully. Rapid acceleration or hard braking should be avoided at all times.

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: WHEN VEHICLES ARE EQUIPPED WITH PROPANE (LPG) FUEL, THE FUEL TANK MUST BE LESS THAN

HALF FULL BEFORE MOVING THE VEHICLE INTO THE BOOTH. THE PROPANE (LPG) TANK MUST HAVE ROOM FOR EXPANSION WITHIN THE TANK DURING BAKE CYCLE.

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.

Consult with your paint jobber or manufacturer concerning recommended refinishing temperatures, recommended bake temperatures and times.

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 CABIN 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 1/2" 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

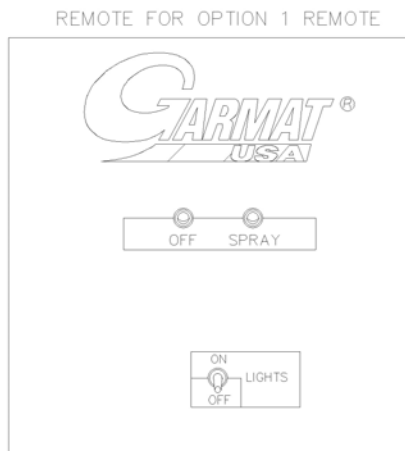
first 40 hours of use and every three months after that.

In addition to adjustments explained in the maintenance instructions, you may attempt repairs your self. However, if you are not sure how to repair the unit, be sure to request service from a qualified technician or your local distributor.

THE CONTROLS

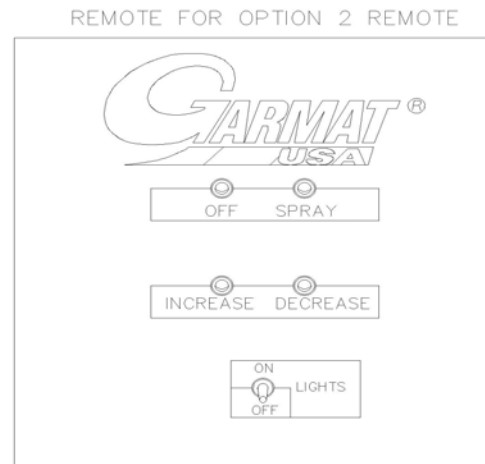
Identification of components. The control components are located on the face of the Remote Control Panel. There are three available options for control of the booth.

42004(X) Exhaust Only:



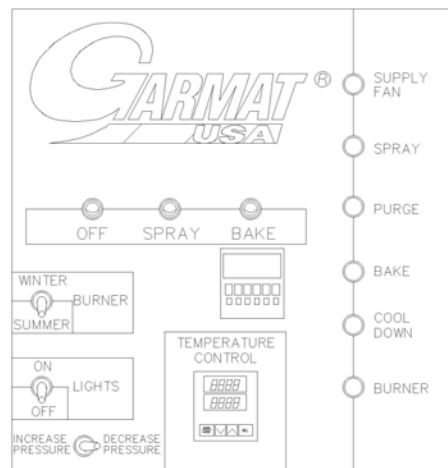
1. **SPRAY SWITCH**, is a black push button switch that will start the exhaust fan when pushed.
2. **OFF SWITCH**, is a black push button that will turn the exhaust fan off when pushed.
3. **LIGHT SWITCH**, is a toggle switch, which turns the lighting on and off.

42104(X) Intake & Exhaust, No Heat:



1. **SPRAY SWITCH**, is a black push button switch that will start the intake and exhaust fans when pushed.
2. **OFF SWITCH**, is a black push button switch that will turn off the intake and exhaust fans when pushed.
3. **LIGHT SWITCH**, is a toggle switch that turn the lighting on and off.
4. **INCREASE/DECREASE PRESSURE SWITCHES**, are black push buttons that open and close the pressure damper.

83400 / 83600 /42106(X) WITH HEAT:



1. **SPRAY SWITCH**, is a black push button switch that will start the intake and exhaust fans when pushed.

2. OFF SWITCH, is a black push button switch that will turn off the intake and exhaust fans when pushed.

3. LIGHT SWITCH, is a toggle switch that turn the lighting on and off.

4. BURNER SUMMER/WINTER SWITCH, is a toggle switch that turns on and off the burner circuit.

5. INCREASE/DECREASE PRESSURE SWITCH, is a toggle switch that opens and closes the pressure damper.

6. SUPPLY FAN PILOT LIGHT (GREEN) indicates the supply fan is in operation when lit.

7. BURNER PILOT LIGHT (GREEN) indicates the burner is in operation when lit.

8. SPRAY, PURGE, BAKE, COOL DOWN PILOT LIGHTS (GREEN), when lit indicate mode of operation that the paint booth is operating in.

9. 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 readout of the booth internal temperature and current set-point (one for spray and one for bake).

MAIN ELECTRICAL PANEL

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

The control panel is mounted to the side of the intake plenum near the booth front. It is white in color and contains the power and operational 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.

The purge 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 bake timers are an internal function of the PLC and are adjustable in minutes. Consult your paint supplier or manufacturer for recommended bake times.

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 purge, bake, and cool down cycles can be made at the face of the PLC by accessing the parameter screen.

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® Tier 1 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 a copper airline, make sure that all connections to the equipment have di-electric 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- Two main filter groups control the dust entering the booth and the paint particles emitted by the booth.

EXHAUST FILTER CHANGE AT 50-60 HOUR INTERVALS

The exhaust filters are located in the two towers located at the back of the booth. To access the filters rotate the access door latches, swing the access doors open and slide the filter racks out. The filter racks consist of two halves with one half nested inside of the other. Separate the two halves and remove the filter material and place in an airtight container. Sweep and/or vacuum up all debris and dust. Cut new filter material slightly larger than the filter rack and place in the larger half of the filter rack. Slip the smaller half of the filter rack into the larger half. Repeat this for each filter rack and then replace in the exhaust towers. On the filter schedule at the back of this manual, record the date, time and hour meter reading. 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. Filter support bolts secure the filter frame. Rotate the support bolts 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. Rotate the support bolts back into place and tighten by hand making sure not to over tighten. 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.

SWEEP the floor while the booth is in operation. The booth floor may be mopped, with a well rung out mop.

CHECK the exhaust filters.

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. Lubricate the larger hinges provided with grease zerks.

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 weekly.

CONTROL AIR - The air supplied to the Garmat USA, Inc. paint spray booth must be clean and dry before the attachment to the electrical control panel. Water separators, filter systems for compressed air shall be installed up stream of the Garmat USA, Inc. main electrical control panel and filters, desiccant...etc. should be changed annually. 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: Pressure settings.
b: 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 SECTION- 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.	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.	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.	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.	Increase set point temperature on Temperature controller. Booth temperature will not exceed 190°F
TEMPERATURE DOES NOT RISE. (BURNER RED LIGHT AT FIREYE IS ON).	Pilot has failed during fire cycle. Pilot manual gas valve turned off. High limit, low gas and/or high gas pressure switch tripped. proof of closure Open.	Push reset button on red enclosure marked FIREYE. Turn manual valve ON. If lockout repeats, call a Garmat USA authorized service-technician. Touch alarm on screen and follow instructions.
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.

OPERATION SEQUENCE

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: SPRAY, BAKE, COOL DOWN and SHUTDOWN.

SPRAY:

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 Off and SPRAY switches in the remote control panel, and NC overload contacts of each Motor Starter. The 120v is then present at the light switch, and the programmable logic controller (PLC). If either motor trips to an

overload condition, all booth operations quit. Breakers protect control voltages, 110v and 24v. Pressing the SPRAY button gives input “2” to the PLC and the PLC outputs “Q1” giving power to the exhaust motor starter and the temperature control. The exhaust motor will begin to run and the temperature control will energize and run through the start up checks. After a 0 to 10 second delay the PLC will output to “Q2” giving power to the intake motor and the Supply Fan light. The Intake motor will begin to run and the Supply Fan light will light up. The paint booth will run in the Spray mode indefinitely until the off switch or bake switch is pressed, the fire suppression switch (jumper) is opened, or a power outage occurs. When the doors on the spray booth are closed, there will be input to input “5” at the PLC the PLC will then output to “Q3” giving power to the spray air solenoid and the Spray Cycle light.

If the BURNER switch is in the WINTER position, power is provided to the PLC and shows as “3” on the PLC input display. The PLC then looks for input “6” from the air flow switches. The PLC then provides power to the gas train circuit shown as “Q7” on the PLC output display.

BAKE MODE:

Touching the BAKE button begins the Bake Mode and provides power to the PLC and shows as “4” on the PLC input display. The PLC will perform a purge time sequence, during which the output “Q3” will be de-energized and “Q4” will be energized. This will drop power to the spray air solenoid and the Spray Cycle light and light the Purge Cycle light. At the end of the purge cycle the PLC drop output to “Q4” and give power to output “Q5”. This will shut off the purge light and give power to the Bake Cycle light, Bake timer and the RRB relay. The Bake timer will begin to count down, the RRB relay will energize the change over damper solenoid, bypass the spray high limit switch and set the temperature control to the second set point (bake temperature). The PLC will then look for input an input 8 from the bake timer.

COOL DOWN MODE.

When the bake timer completes cycle, the timer will input “8” at the PLC. The plc will then drop output at “Q5” and output to “Q6” de-energizing the bake timer, RRB relay and bake cycle light and energizing the Cool Down light. The booth returns to the spray cycle mode during the cool down cycle with the compressed air non-functional. The internal timer, from 0 to 10 minutes, for cool down begins in the PLC.

SHUT DOWN MODE.

When the PLC internal cool down timer makes, the booth will shut down and will not restart until the spray button is pressed.

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
take cycle.

Remove propane fuel
systems from vehicles
prior to reaching the
booths.

CAUTION

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

CAUTION

Use only the approved fire extinguisher combination (ABC, DRY CHEM) and avoid inhaling the fire extinguisher discharge. The extinguisher should be used from a safe distance. Do not use the extinguisher on electrical fires. For more information, see the fire extinguisher instructions.

WARNING



WARNING

Do not use the fire extinguisher on electrical fires. The fire extinguisher should be used from a safe distance. Do not use the extinguisher on electrical fires. For more information, see the fire extinguisher instructions.

CAUTION

POTENTIAL OVERHEATING



DO NOT RECHARGE BATTERIES

WARNING

Read all safety instructions. This manual has more than one volume of power. Disconnect all power sources before opening electrical panels.
All final wiring connected must comply with local codes or in the absence of local codes, the National Electrical Code (NEC) - 2011.
Local fire or building codes may require fire protection - check with local jurisdiction authorities for requirements.

WARNING

WARNING FOR BATTERIES
DO NOT RECHARGE BATTERIES
DO NOT RECHARGE BATTERIES
DO NOT RECHARGE BATTERIES
DO NOT RECHARGE BATTERIES

WARNING

ALL WIRE CONNECTIONS TO BATTERIES MUST BE DONE WITH THE BATTERY COVER CLOSED AND KEYS REMOVED FROM THE IGNITION.

WARNING



Do not store or use gasoline or other flammable liquids or gases in the vicinity of the motor.