

Advanced Fire Training Props Boulder, CO

User's Manual Rev 0 dated 4/25/2011



WARNING

1. Improper installation, connecting, adjustment, alteration, service, or maintenance could result in property damage, death, or serious injury.
2. Read the setup, operation and maintenance instructions thoroughly before installing, using, or servicing this equipment.



Table of Contents

- Introduction 3**
- General Functionality 5**
- System Component Overview 6**
 - Overview: 6
 - Console: 6
 - Propane Regulator:..... 10
 - Pilot Box: 11
 - Burn Tray:..... 13
 - Audio Rack (Optional):..... 13
 - Smoke Generator (Optional):..... 13
- Wireless Control System 14**
 - Connecting and Starting the System:..... 14
 - Using the Wireless System Remote..... 23
 - Charging the Wireless Remote 24
 - Shutting Down the System..... 24
- Troubleshooting 27**
- Maintaining the System..... 28**
- Car Prop 32**
 - Car Prop Set Up 32
 - Training Tips..... 37
 - Using the Car Prop 37
 - Car Prop Shut Down and Storage..... 39
- Pressure Vessel Prop..... 40**
 - Pressure Vessel Prop Set Up 40
 - Training Tips..... 45
 - Using the Pressure Vessel Prop 46
 - Pressure Vessel Prop Shut Down and Storage..... 48
- Using the Smoke Generator..... 49**



Introduction

Congratulations on purchasing your Advanced Fire Training Prop package.

BullEx Advanced Fire Training Props provide safer, cleaner, and repeatable full scale fire fighter training scenarios. Different full scale props, including a car, pressure vessel, and helicopter can be paired with the BullEx Hoseline Fire Training System to provide different scenarios. Each prop utilizes up to four different burn zones to simulate several different training scenarios including a car engine fire, leaking pressure vessel, and even a helicopter turret fire.

BullEx Advanced Fire Training Props can also be outfitted with a Smoke Generator and Sound System to add to the realism of the scenario. The Sound System package comes with standard fire and rescue sounds but any mp3 audio file can be uploaded and played through the system. The Smoke Generator package includes ducting to direct the smoke.



WARNING

FOR YOUR SAFETY

1. This appliance is for outdoor use only. Do not use in a building, garage, or any other enclosed area.
2. Do NOT use this appliance for indoor heating. TOXIC carbon monoxide fumes can accumulate and cause asphyxiation.
3. Always use in accordance with all applicable local, state and national codes. Contact your local fire department for details on outdoor burning.
4. When using this appliance, exercise the same precautions you would with any open fire.
5. The use of alcohol, prescription or non-prescription drugs may impair the consumer's ability to safely operate this appliance.
6. Do NOT use this appliance without reading the entire "Owner's Manual".
7. Do NOT alter this appliance in any manner.
8. Do NOT store or use gasoline or other flammable vapors or liquids in the vicinity of this or any other appliance.
9. Do NOT use this appliance within 30 feet of automobiles, trucks, vans or recreational vehicles.
10. Do NOT use in an explosive atmosphere. Keep the area surrounding the appliance free and clear from combustible materials, gasoline and other flammable liquids.
11. Do NOT use this appliance under any overhead or near any unprotected combustible constructions. Do not use this appliance near or under overhanging trees and shrubs.
12. Always use this appliance on a hard, level, non-combustible surface such as concrete, rock or stone.
13. Do NOT smoke while using unit.
14. Always fill this appliance with the proper amount of water specified in the "Setup Instructions" before each use.
15. Trainees must wear proper PPE when using fire props.
16. Do NOT attempt to manually light the pilot.
17. All surfaces of this appliance are hot when in operation. To avoid burns, do NOT touch appliance until it has completely cooled for at least 15 minutes.
18. Do NOT attempt to move or store props until completely cooled.
19. Do NOT move this appliance when the "Burn Tray" contains water.
20. Do NOT lean over this appliance when lighting or when in use.
21. Avoid breathing smoke from the fire and avoid getting it into your eyes.
22. This appliance should be thoroughly inspected and cleaned on a regular basis by trained personnel.
23. CAUTION: The gas pressure regulator provided with this appliance must be used.
24. The LP-gas supply hose must be disconnected when this appliance is not in use.
25. Connect only to cylinders marked PROPANE or LPG.
26. Do NOT use for cooking food.
27. Do NOT use props when the temperature is below 32 degrees Fahrenheit (0 degrees Celsius).
28. Do NOT use props when the temperature is above 120 degrees Fahrenheit (50 degrees Celsius).
29. Do NOT use props when the temperature is above 150 degrees Fahrenheit (65 degrees Celsius).
30. **Death, serious injury or damage to property** may occur if the above is not followed exactly.



General Functionality

Liquid Propane (LP) is delivered from the source to the BullEx Console. The Console contains a hand shutoff valve, a strainer for the LP, and two redundant solenoid valves. The solenoid valves are open only when the Console is energized and the E-Stop button is not depressed. The Console also contains two propane relief valves to prevent the system from being over pressurized.

The LP on the Console is connected to the Pilot Box using a flexible hose and quick connect fitting. An adjustable regulator is used at the end of the hose to regulate the amount of propane used by the system.

The Pilot Box contains a strainer and main solenoid gas valve. The main solenoid gas valve is controlled by the ignition controller system and is operated with the pilot gas valve. The main gas valve and pilot valve will remain closed until the air pressure in the forced air pilot nozzle is high enough and the pilot vaporizer is warmed up. Once both are ready, indicated by lights on the wired system controller or wireless system enclosure turning off, the pilot can be lit.

The LP for the pilot passes through a regulator and solenoid valve before going to a vaporizer. The vaporizer turns the liquid propane to vapor. The gaseous propane is ignited by a spark and burned in the pilot burner. To prevent the pilot from being extinguished during training, it is built in a burner nozzle. The Pilot Box uses ionisation flame detection to determine if the pilot is lit and burning properly. The pilot box solenoid valves will shut if the flame is not detected.

The Pilot Box also contains four solenoid valves that control the flow to the four burn zones on the Prop. The valves are controlled independently using a wired or wireless System Controller. The zone solenoid valves will not open unless the pilot flame is detected. The propane is carried to the prop through flexible hoses with quick connect fittings to attach to the Pilot Box and Prop or Burn Tray.

The copper propane tubes on the Burn Tray or Prop contain orifice fittings that regulate the flow and turn the liquid propane into vapor. For the Burn Tray, the gaseous propane flows out of holes in the submerged copper tubing and rises to the water surface. The pilot burner which is located just above the water level will ignite the propane. Some special Prop burn zones such as the Wheel Fire zone on the Car Prop or the Engine Fire zone on the Helicopter do not use the Burn Tray. These zones flow propane directly into the atmosphere where it is ignited and burns.

When the E-Stop button is depressed, all solenoid valves close and power to the Pilot Box is turned off. Although no propane is flowing out of the Pilot Box, the Prop will continue to burn for several seconds while the remaining propane in the lines downstream of the Pilot Box is burned off.



System Component Overview

Overview:

The Hose Line Training System (HLTS) is made up of the following components:

- 1) Console
- 2) Pilot Box
- 3) Burn Tray (this is not used with all props)
- 4) Propane hoses to connect the Pilot Box to the Burn Tray or Prop
- 5) All of the required electrical and signal cables to operate the system

Console:

The Console is a mobile cart that holds an electrical enclosure and gas components. One side of the Console holds an electrical enclosure with the E-Stop button on it. The other side of the Console holds gas piping which includes the main solenoid valves for the gas system.



Figure 1: Gas Side of Console

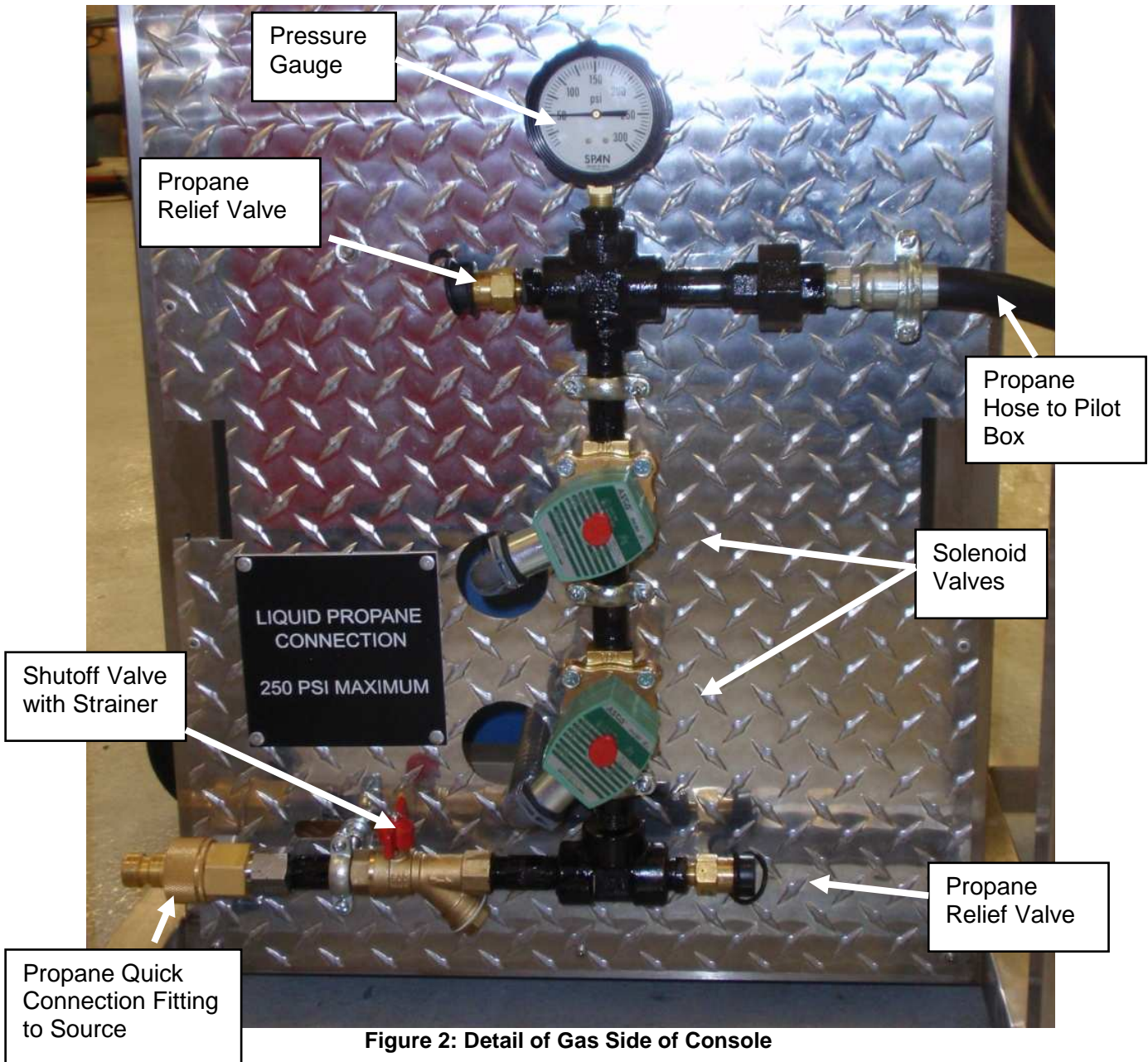




Figure 3: Electrical Side of Console with Wireless System Remote

Propane Regulator:

The flow rate of propane used by the system can be adjusted using the Propane Regulator. To reduce or increase the flow rate, loosen the lock nut on the regulator and turn the adjustment screw. Turning the adjustment screw clockwise increases the pressure setting and therefore increases the propane flow rate. Turning the adjustment counterclockwise decreases the pressure setting and therefore decreases the propane flow rate.

NOTE:

Do not completely unscrew the adjustment screw, this may damage the valve.

Do not remove the lock nut, this may allow the adjustment screw to damage the diaphragm.

The flow rate is affected by many other variables and the system may appear to be very sensitive or insensitive to regulator adjustments.

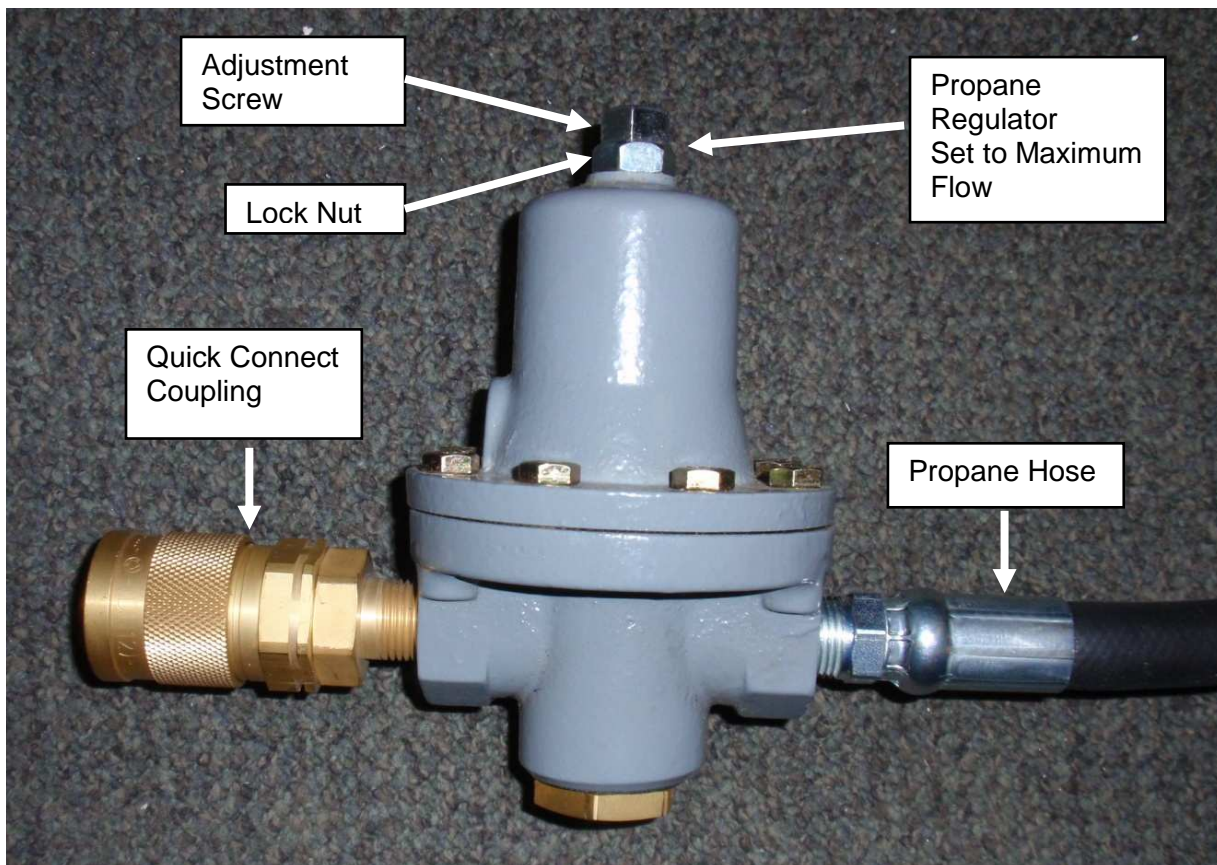


Figure 4: Propane Regulator shown set to maximum flow

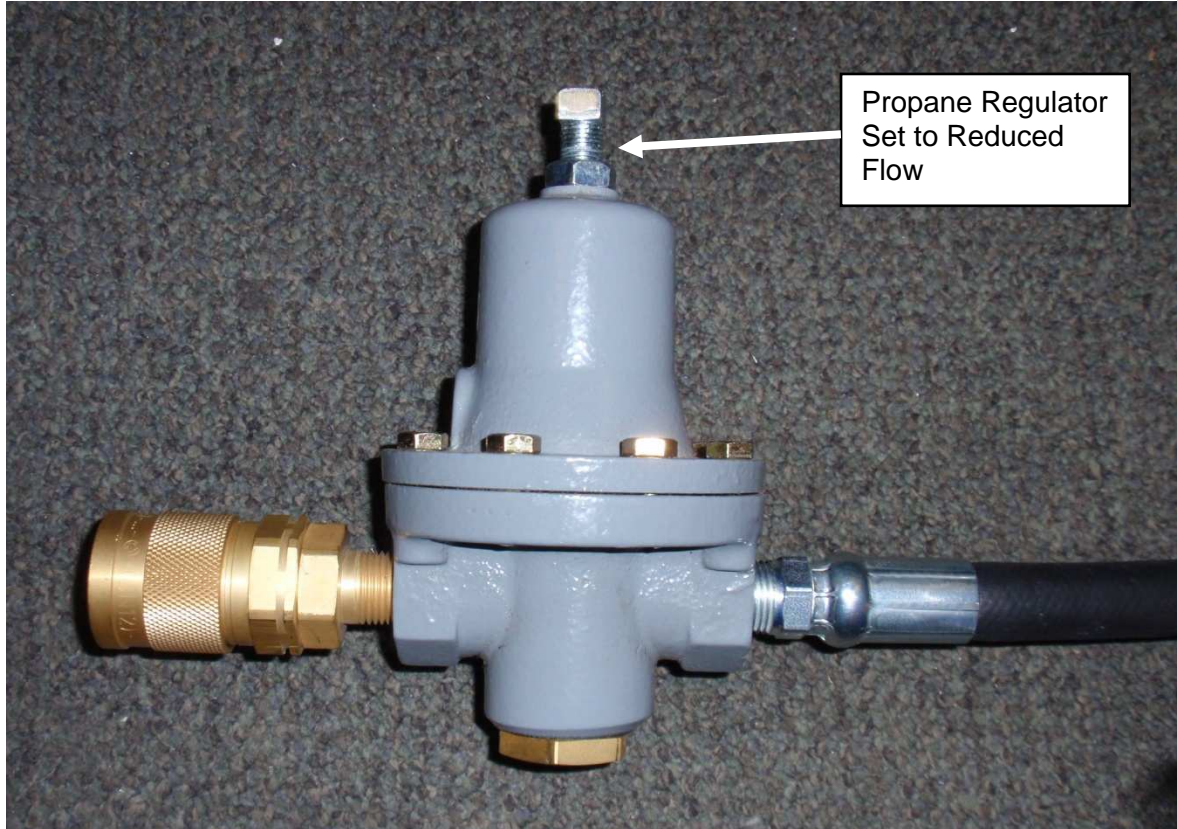
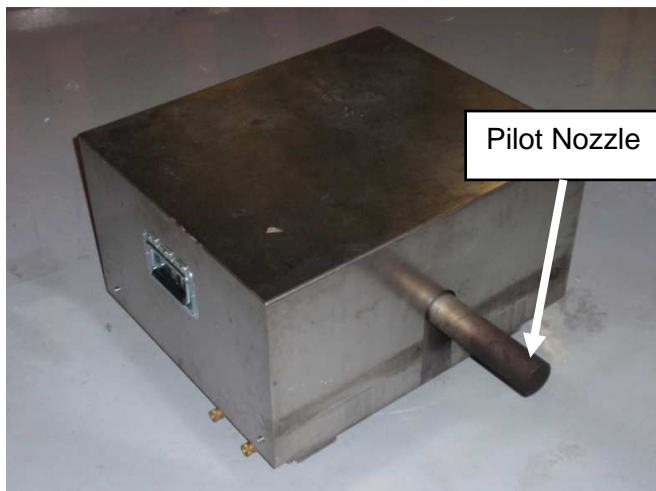


Figure 5: Propane Regulator shown set to reduced flow

Pilot Box:

The Pilot Box is a stainless steel box containing the forced air pilot and solenoid valves that control the four burn zones. The Pilot Box takes in air through the air intake on the back of the box using a centrifugal fan. This air cools the internal components and helps keep air flowing through the pilot nozzle. The pilot nozzle has an additional centrifugal fan that forces air through the nozzle where propane is injected into the airstream and ignited using the sparker in the nozzle.



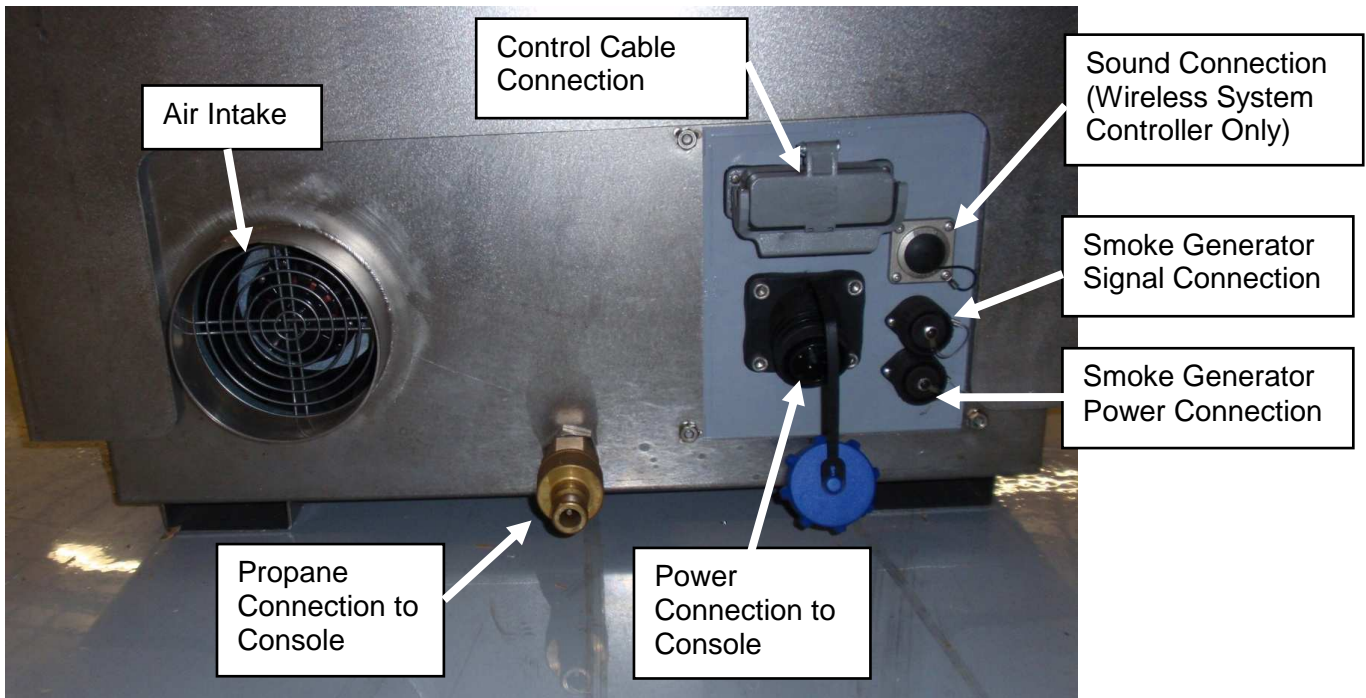
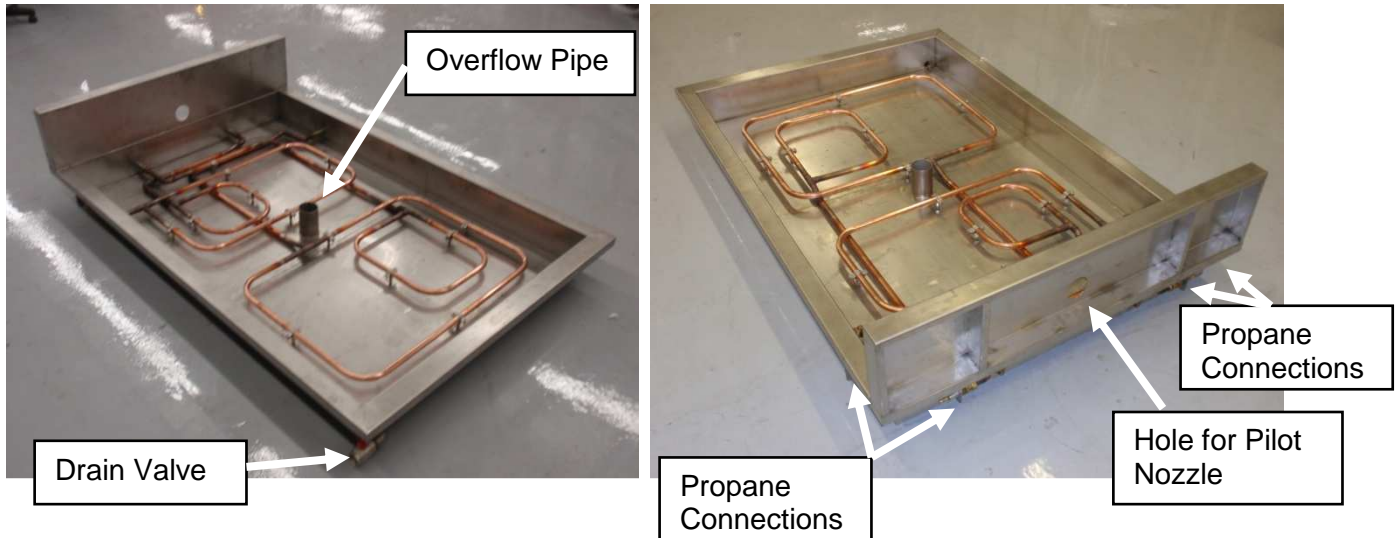


Figure 6: Detail of back side of Pilot Box

Burn Tray:

The Burn Tray is a 4'x6' stainless steel tray containing copper tubing. The Burn Tray has four zones that the Pilot Box can be connected to.



Audio Rack (Optional):

The Audio Rack is a portable case containing the sound equipment used to generate sounds in the Car and Helicopter Props.



Smoke Generator (Optional):

See the User's Manual for the Smoke Generator for more information.

Wireless Control System

The wired control system is made up of a control console (Console), a wired remote control (Wired System Remote), and the necessary cables and hoses. The Console is where the liquid propane supply and power supply connect to the training system.

Connect all of the components of the training system before connecting the propane supply and power supply to the console. See the appropriate Prop sections of this manual to set up your Props.

The system can be set up such that the Console is permanently connected to the propane source or such that it can be disconnected using a special quick connect fitting.



The propane must be supplied to the system in liquid form and not vapor.

The maximum supply pressure is 250 psi.

The training system uses pressure relief valves set to 250 psi. Supplying propane at or above 250 psi could result in venting propane from the system which can cause a dangerous situation. Proper caution must be taken.

The control panel is designed to be mobile but has provisions to be anchored in place if desired.

Power is supplied to the system using the provided 20 amp 120V power cord. The power cord plugs into the console via the weather resistant socket on the console. The power source must have a 20 amp breaker protecting the power supply.

Connecting and Starting the System:

1. Ensure that all components in the system, including hoses and cables, are free of visible defects before each use.



Do not use damaged components. Using damaged components could result in death or serious injury.

Contact BullEx immediately if any defects are found.

2. Ensure the Prop, Burn Tray (if applicable), and Pilot Box are set up and connected together as specified in the applicable section of this manual for the Prop you are using.

3. Depress the E-Stop Button on the console.



4. Connect the power cable to the console and pilot box. Make sure the blue collar on the power cable is turned clockwise to completely make the connection.



5. Connect the Control Cable between the Console and Pilot Box. Make sure the latches on the Pilot Box and Console are engaged to secure the Control Cable.



Figure 7: Detail of Control Cable ends

6. Connect the main propane hose from the Console to the Pilot Box. Make sure the quick connect fittings are fully engaged. If the supply hose is pressurized it may be extremely difficult to make this connection; the supply hose should be depressurized during the shutdown procedure to prevent this from happening.
7. If your system is equipped with a Smoke Generator, make sure all connections have been made and the Smoke Generator is switched on. The Smoke Generator will not power on since the console is not energized at this time.
 - a. See the appropriate Prop section of this manual for specific directions on how to connect and set up the Smoke Generator.
 - b. Note that on systems with a Wired System Remote, the smoke machine is controlled by a separate wireless remotes specifically for the smoke machine.
8. If your system is equipped with a sound system, make sure all connections have been made. The sound system will not power on since the console is not energized at this time.
 - a. See the appropriate Prop section of this manual for specific directions on how to connect and set up the sound system.
9. If your Console is not already connected to the propane supply:
 - a. Make sure the valve on the console is turned off (the handle should be perpendicular to the pipe)



- b. Connect the supply hose to the Console using the supplied quick connect fittings. Make sure the quick connect fittings are fully engaged.
10. Slowly open the hand valve on the Console.



WARNING

Make sure the relief valves on the Console are not bleeding propane.

Press the E-Stop button and close the hand valve on the Console immediately if the relief valves are bleeding propane.

Bleeding propane could result in death or serious injury.

Verify that the supply pressure is less than 250 psi. Contact BullEx if the supply pressure is less than 250 psi and the relief valves are bleeding propane.

11. Connect the Power Supply Cable to the Console using the "POWER IN" connection on the side of the Console. The outlet on the Console is weather resistant and contains a rubber gasket to seal around the power plug. As a result it may be very difficult to make this connection. Make sure the plug is completely inserted into the socket before continuing.



Figure 8: Close-up of Power Supply Cable end

12. Turn on the Remote

- a. Make sure the remote's E-Stop is not pressed.
 - i. Confirm by pressing the button and then pulling it away from the remote to reset it.
 - ii. The E-Stop only moves about one eighth of an inch.
- b. Simultaneously press and hold buttons "9" and "0" for 2-3 seconds and then release them.
 - i. While holding them, LED 3 should be lit up orange.
 - ii. After releasing the buttons, LEDs 1 and 2 will flash and then LED 3 will light up green.
- c. The remote is operational as soon as LED 3 is green. If LED 3 is red it needs to be charged.

13. At any time press the E-Stop to turn off the remote and cut power to the Control Panel.

14. Turn the “Main Power” switch on the left side of the Console to the “On” position.



15. Pull out the E-Stop Button on the console. You should hear a click as the solenoid valves on the Console open. The system is now energized and the two solenoid valves on the Console are open.

16. Press the green System "On" button.

- a. The green LED next to the button will light up.
- b. You should hear a click as the solenoid valves on the Console open. The system is now energized and the two solenoid valves on the Console are open.



17. Verify that the relief valves on the Console are not bleeding propane.

WARNING

Make sure the relief valves on the Console are not bleeding propane.

Press the E-Stop button and close the hand valve on the Console immediately if the relief valves are bleeding propane.

Bleeding propane could result in death or serious injury.

Verify that the supply pressure is less than 250 psi. Contact BullEx if the supply pressure is less than 250 psi and the relief valves are bleeding propane.

18. Turn the "Fire Training System" power knob to the "ON" position.
 - a. The LED marked "Power On" will also light up.



19. Wait for the “AIR PRESSURE LOW” and “VAPORIZER COLD” lights on the controller to turn off. This may take several minutes as the system warms up.



20. Make sure it is safe to light the pilot flame on the Pilot Box.

21. Press the “Pilot On” button to ignite the pilot.
 - a. A sparker lights the pilot and it is confirmed by ionization flame detection.
 - b. The “Pilot On” LED will be lit after the button has been pressed.



- c. The pilot will attempt to light for 2 minutes, after which it will turn off if unsuccessful. The zones on the pilot box will not open until flame from the pilot is detected.
22. The system is now ready to start a simulation.
23. To turn the pilot off, turn the Fire Training System power knob to the “OFF” position or press the E-Stop button on the Console.

Using the Wireless System Remote

The Wireless System Remote has ten buttons; seven of them are used for general operation.

Button 1: “Valve 1” – Operates the valve controlling the first of the four propane outlets as long as it is held.

Button 2: “Valve 2” – Operates the valve controlling the second of the four propane outlets as long as it is held.

Button 3: “Valve 3” – Operates the valve controlling the third of the four propane outlets as long as it is held.

Button 4: “Valve 4” – Operates the valve controlling the fourth of the four propane outlets as long as it is held.

Button 5: "Multi-valves" – Operates all valves for all propane outlets as long as it is held.

Button 6: Not Labeled – Unused

Button 7: "Smoke" – If a smoke machine is connected and set up properly, press the button once to start the smoke and again to stop the smoke.

Button 8: "Aux" – If a speaker is connected, press the button once to start the sound and again to stop the sound.

Button 9: Not Labeled – Used to turn on the wireless remote: Pull out E-Stop on the wireless remote and hold with 0 to turn the remote on.

Button 0: Not Labeled – Used to turn on the wireless remote: Pull out E-Stop on the wireless remote and hold with 9 to turn the remote on.

NOTE:

Buttons 1 – 4 are not labelled more specifically because it is possible to connect different outlets to different Burn Pan/Prop burn zones.

Before any training is conducted, confirm which valve operates which burn zone for the current setup.

NOTE:

At any time the wireless remote's E-Stop can be pressed to cut power to the Control Panel.

To continue training, the E-Stop will need to be reset and the entire start-up process must be repeated.

Charging the Wireless Remote

The wireless remote has a hardwired rechargeable battery. LED 3 indicates the battery status. Green is acceptable and red indicates the remote needs to be charged. The operating time is approximately 30 hours of continuous usage. When LED 3 changes to red there is approximately 10% battery or 3 hours of usable battery left.

Plug the remote in using the supplied plug to charge the battery. When LED 3 turns green the remote is fully charged.

NOTE:

The lifespan of the battery increases if you wait until the LED changes to red before recharging. However, it should be charged at least once every second month.

Shutting Down the System

1. At the end of a training session the propane hose between the Console and Pilot box should be depressurized as follows:

- a. Turn off the valve on the Console (the handle should be perpendicular to the pipe).



- ii. Cool the prop during this process to keep the temperature of the Prop within acceptable limits.
 - iii. After a few minutes the pressure will begin to drop.
 - iv. Wait for the pressure to drop to below 10 psi then stop the burners.
2. Wait for the pilot flame to go out as the last of the propane is used. The Pilot light on the Wired System Remote will go out when the pilot flame goes out.
3. Wait several minutes for the Pilot Box, Burn Tray, and Prop to cool down.
4. Press the E-Stop button on the Console to de-energize the system.
5. Disconnect the system hoses and cables:
 - a. Disconnect power cable between the Pilot Box and Console.
 - b. Disconnect the Wired System Remote from the Pilot Box.
 - c. If applicable, disconnect the Smoke Generator connection from the Pilot Box.
 - d. If applicable, disconnect the speaker wire from the speaker and Console.
 - e. Disconnect the propane hose between the Console and Pilot Box at the pilot box. The propane hose is permanently connected to the Console and should not be disconnected.
 - f. Disconnect the power supply to the Console.
 - g. Disconnect the propane supply hose to the Console if desired and equipped with a quick disconnect fitting.
6. See the applicable Prop section of this manual for directions on how to disconnect the Prop.



7. Inspect the equipment for damage before putting it away. Contact BullEx if any damage is found.
8. Store the following components out of the weather:
 - a. Power cable for between the Console and Pilot Box
 - b. Pilot Box
 - c. Wired System Remote
 - d. Sound System (if equipped). Speakers in props can be left with the prop.
 - e. Pilot Box Breather System (if equipped)
 - f. Smoke Generator Wireless Controller (if equipped)
 - g. If possible, store the remaining components out of the weather. This will increase the lifespan of the equipment.

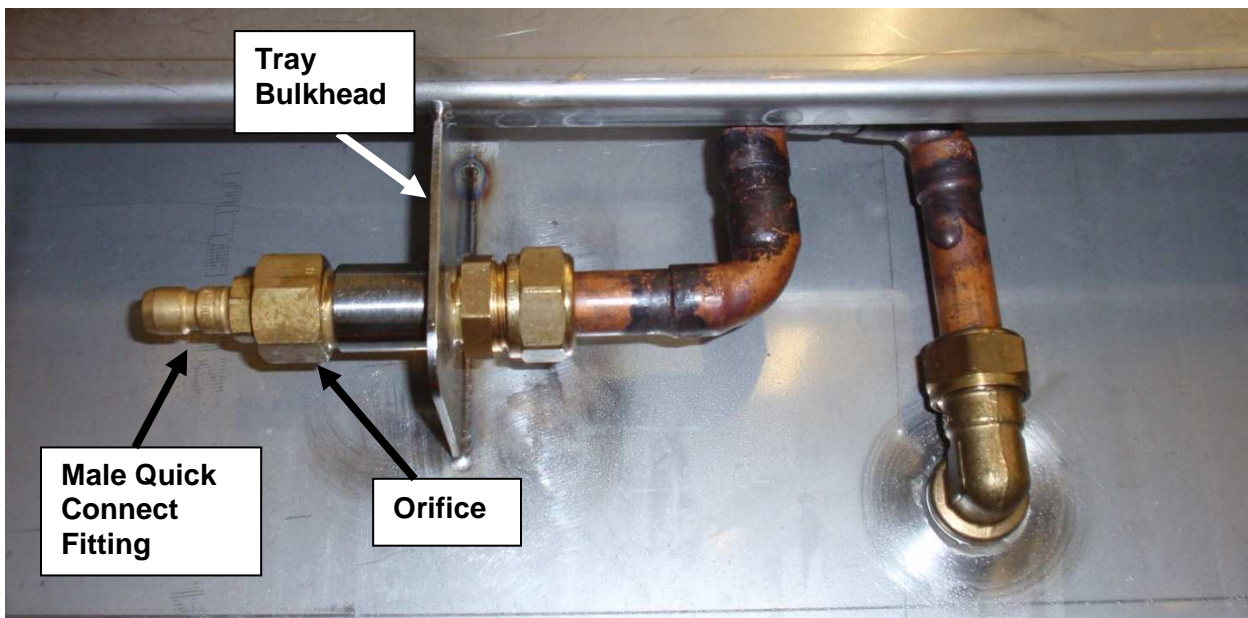
Troubleshooting

If you have a question that is not answered by reading this manual, contact BullEx at 1-888-4BULLEX for assistance.

1. **Symptom:** A cable or hose is frayed or questionable.
 - a. Safely shutdown the system and contact BullEx before using the system.
2. **Symptom:** Pilot Box is making a loud buzzing noise when energized.
 - a. There is likely a problem with one of the solenoids inside the Pilot Box. Contact BullEx for assistance.
3. **Symptom:** The flames are small.
 - d. Check the pressure at the Console and at the propane source. Discrepancies between these readings indicate the problem is between these two gauges.
 - e. Verify that the propane tank and supply lines are open.
 - f. Verify that the hand valve on the Console is open.
 - g. Verify that all electrical connections have been made correctly.
 - h. Adjust the regulator to increase the pressure. See the “Console” section of this manual for information on the regulator.
 - i. Low ambient temperatures can cause low supply pressures. In some circumstances tank heaters may be required to increase the supply pressure.
 - j. High ambient temperatures can cause the propane to vaporize early, restricting the flow rate.
 - k. Contact BullEx for further assistance.
4. **Symptom:** The flames are too large.
 - a. Adjust the regulator to decrease the pressure. See the “Console” section of this manual for information on the regulator.
 - b. The flame height and propane usage can be altered during a simulation by pressing and releasing the valve buttons at different intervals. For example, press the “multiple valves” button for two seconds then release the button for two seconds; repeating this process will reduce the amount of propane used for a given period and reduce the flame height.

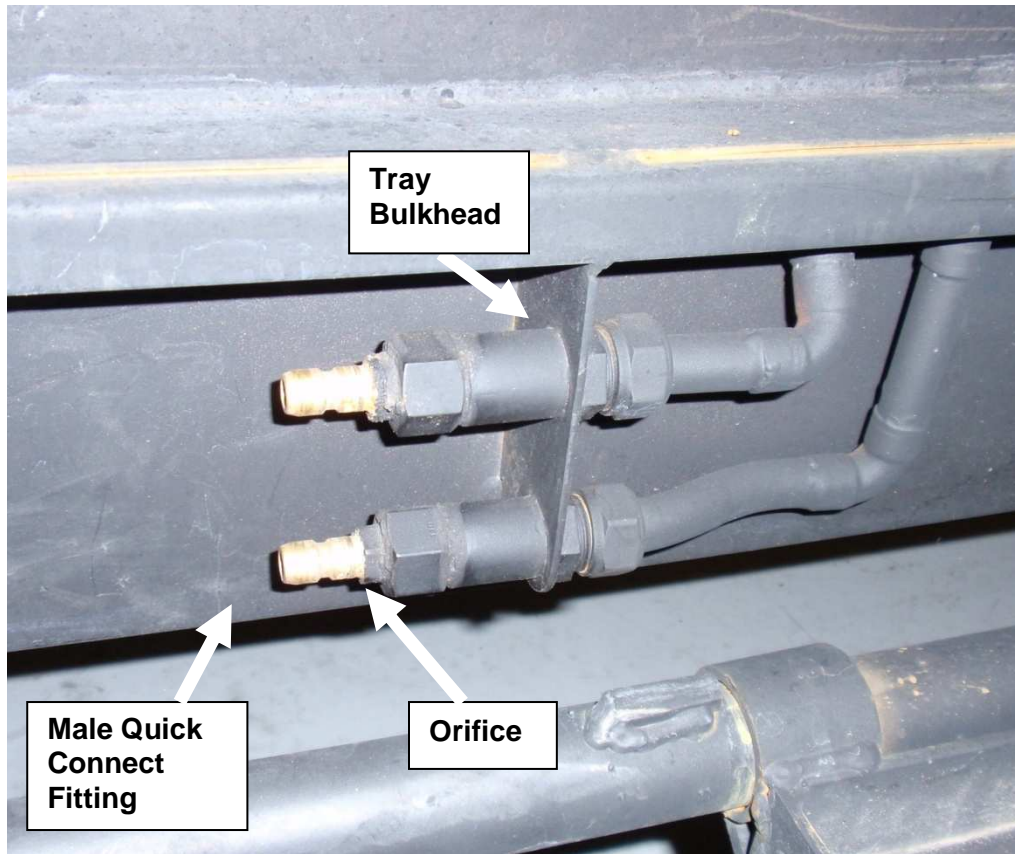
Maintaining the System

1. Inspect the equipment for damage before and after every use.
2. Clean the orifices on the Burn Tray and special fire zones on the Prop:
 - a. After every training session for the first three uses
 - b. After every fifth training session
 - c. If you are experiencing poor lighting or persistent small flames
 - d. To clean a Burn Tray Orifice:
 - i. Disconnect propane hoses from the Burn Tray



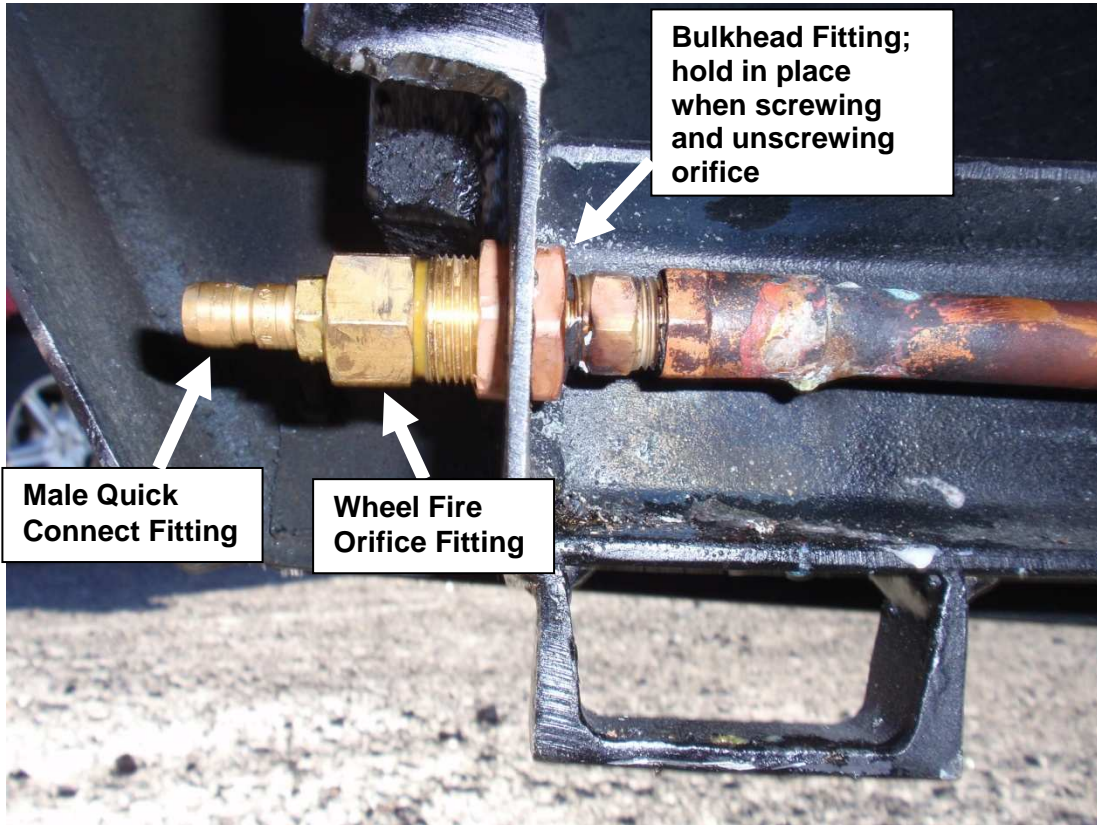
- ii. Unscrew the Orifice from the Tray Bulkhead
 - iii. Clean the Orifice using the supplied cleaning wire and/or compressed air
 - iv. Reassembly is opposite of disassembly
 - v. Check for leaks once the system is set up and operational. Retighten fittings if necessary to stop leaks.

- e. To clean a Propane Vessel Prop orifice:
 - i. Disconnect propane hoses from the Prop and remove the Pilot Box



- ii. Unscrew the Orifice from the Tray Bulkhead
 - iii. Clean the Orifice using the supplied cleaning wire and/or compressed air
 - iv. Reassembly is opposite of disassembly
 - v. Check for leaks once the system is set up and operational. Retighten fittings if necessary to stop leaks.

- f. To clean the Wheel Fire Orifice (applicable to Car Prop ONLY):
 - i. Disconnect the propane hose from the Wheel Fire Connection
 - ii. Unscrew the Wheel Fire Orifice from the bulkhead fitting while making sure not to turn the bulkhead fitting



- iii. Clean the Orifice using the supplied cleaning wire and/or compressed air
 - iv. Reassembly is opposite of disassembly
 - v. Check for leaks once the system is set up and operational. Retighten fittings if necessary to stop leaks.
3. Inspect quick connect fittings on the hoses, Burn Tray, and Prop. Clean if necessary. Dirt and debris in the connectors can result in damage to the equipment and poor sealing of the connections.
4. Inspect all electrical connections and clean if required.
5. Rinse out the burn tray with fresh water at the end of each training session.
6. Rinse off Props at the end of each training session.
7. Touch up the paint on Props if necessary after each training session. This will help prolong the life of the Prop.
8. Clean the propane strainer on the console if you suspect that it is clogged.



9. Periodically check that all threaded connections are properly tightened.

Car Prop

The Car Prop is used to simulate a burning car.

Optional features may include a sound system, Smoke Generator, cooling system, pry-able hood, and/or smash-able headlights.

Car Prop Set Up

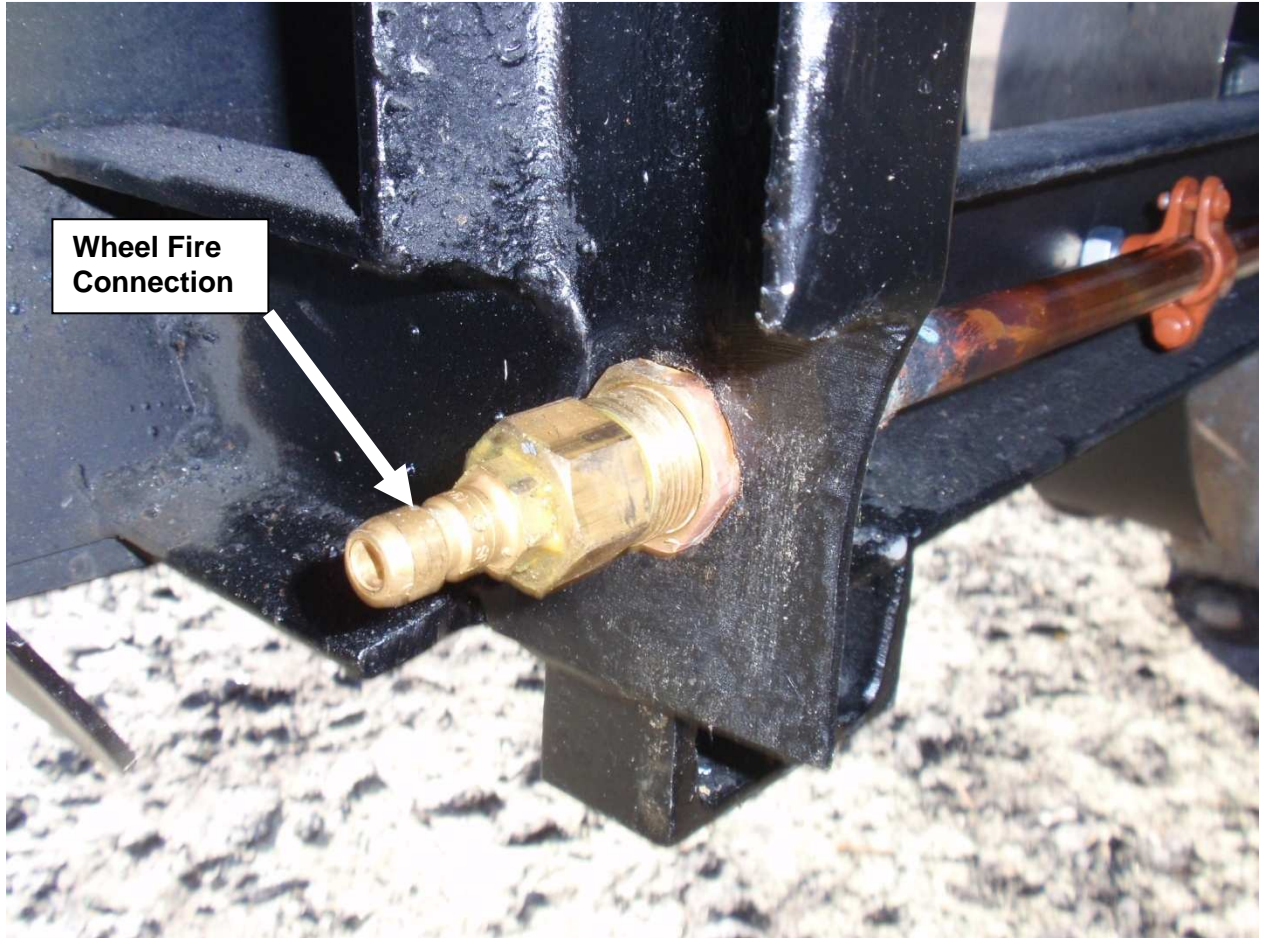
1. Begin by selecting a suitable location for training.
 - a. The burn zone should be at least 30 ft from any other cars, buildings, or other environmental obstructions.
 - b. The burn zone **MUST** be at least 50 ft from other readily combustible materials.
2. With at least two people, bring the Burn Tray to the training location and place it on the ground.
3. Make sure the drain valve is closed on the Burn Tray and fill the tray with water until it overflows out of the pipe in the center of the Burn Tray.



Do not operate the system without water in the Burn Tray. The copper tubing in the tray must be completely covered with water before using.

Periodically check the water level during the training session since the water level will drop during use.

4. With two people, bring the Pilot Box to the Burn Tray and guide the pilot burner nozzle through the hole in the back of the Burn Tray. Make sure the Pilot Box is completely pushed into position; the Pilot Box and Burn Tray should be touching.
5. Attach the supplied elbow or Fresh Air Breather System to the air inlet on the Pilot Box to prevent water from being ingested into the Pilot Box. Use the Fresh Air Breather System whenever training with suppressants other than water.
6. Connect the Pilot Box propane outlets to the Burn Tray using the provided hoses.
 - a. If the Wheel Fire will be used, connect a long hose to the Pilot Box but wait to connect the hose to the Car Prop until the Car Prop is in position.



- b. There are four outlets on the Pilot Box. All four **MUST** be connected before operating the system.

WARNING

ALL FOUR CONNECTIONS FROM THE PILOT BOX MUST BE CONNECTED BEFORE USE. Make sure to double check that the Wheel Fire Zone hose is connected after rolling the Car Prop into place.

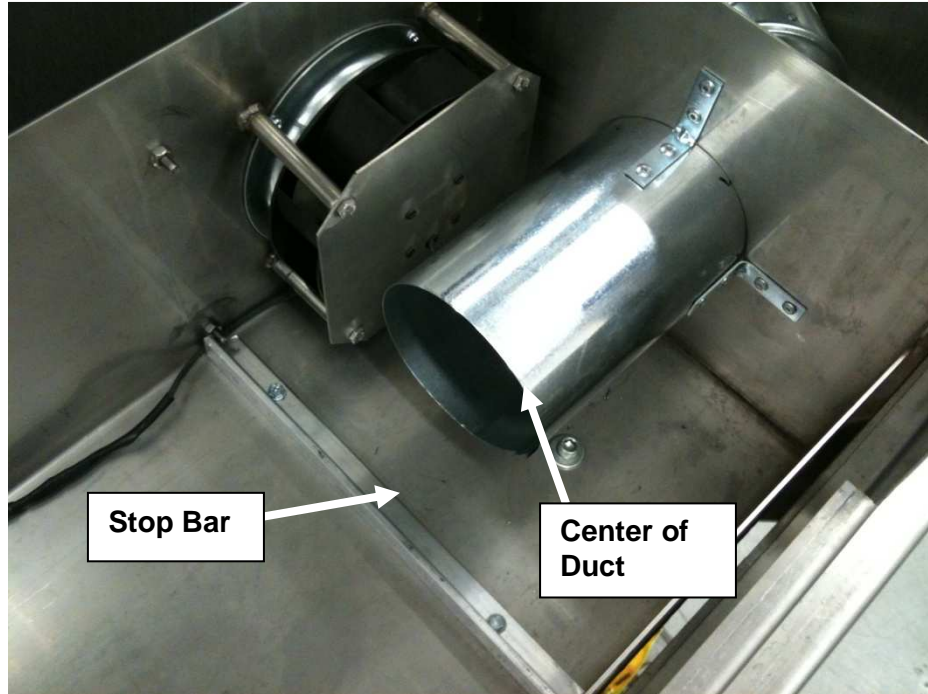
Operating the system without connecting all four connections could result in spraying propane out of the Pilot Box which could result in death or serious injury.

7. With several people, roll the Car Prop into position. The rear of the car must be rolled over the front of the Burn Tray first such that the Pilot Box is finally positioned toward the rear of the car.
 - a. The Burn Tray must be no farther forward than having the front lip of the Burn Tray just inside the front bumper.

- b. The Burn Tray must be no farther back than having the back of the Burn Tray at the back of the passenger compartment.
 - c. Positioning the Car Prop so that the Burn Tray is too far forward or backward can damage the equipment
 - d. If the Wheel Fire Zone is being used, position the Burn Tray such that at least one third of the burn tray is in the engine bay. This will ensure that the Wheel Fire Zone ignites properly.
8. If the Wheel Fire Zone is being used, connect the long hose to the Wheel Fire quick connect fitting.
 9. If applicable, set up the Smoke Generator
 - a. Open the trunk lid and remove the clips holding the trunk box cover in place. The clips are tethered to the cover so they are not lost.



- b. With two people, remove the trunk box cover.
- c. Position the Smoke Generator such that the front of the smoke machine is pushed up against the stop bar and the nozzle is aimed at the center of the duct.



- d. Connect the power cable to the Smoke Generator.
 - i. If the Smoke Generator is controlled using a dedicated wireless remote (for systems with a Wired System Remote), screw the wire for the antenna into the top of the Smoke Generator.
 - ii. If the Smoke Generator is controlled using a Wireless System Remote (not for systems with a Wired System Remote), connect the control cable in the trunk box to the back of the Smoke Generator.
- e. Turn the Smoke Generator on using the switch on the back of the machine. The power will not come on unless the Pilot Box has power.
- f. Adjust the settings on the Smoke Generator as desired once the system is energized. See the Smoke Generator Manual for more information.
- g. Replace the trunk box cover
- h. Close the trunk lid.

⚠ CAUTION

The trunk lid had many pinch points. Caution must be taken when closing the lid. Improper use could result in serious personal injury.

- i. Test the Smoke Generator to make sure it is working as desired.

10. If applicable, connect the speaker:

- a. If the system is controlled using a Wired System Remote, connect the speaker to the sound system using the provided cable:
 - i. Plug one end of the cord into the pigtail coming out of the trunk box.
 - ii. Plug the other end of the cord into the Audio System.
 - iii. Plug the sound system into the power source for the Audio System located on the Console.



- iv. For instructions on how to use the audio system, see the “Using the Audio System” section of this manual.

11. If applicable, connect a water hose to the cooling system.

- a. The connector on the car is a standard female garden hose connection and is located on the rear of the car.
- b. Turn on the water flow to the cooling system before lighting the Burn Tray.
- c. Adjust the water as necessary to make sure the water is spraying onto the panels and is not shooting too high or too low.

NOTE:

It is still possible to exceed the temperature limits of the car even when the cooling system is being used. High metal temperatures decrease the lifespan of the Prop and may result in permanent damage to the Prop even over a short period of time.

Training Tips

- Become familiar with the system and its capabilities so that the best training scenarios can be simulated.
- If applicable, start the sounds and smoke before igniting the burn zones.
- Release the smoke button after igniting burn zones to free up your fingers.
- There is some LP still in the burners after releasing the button(s), but the button(s) can be pulsed to produce diminishing flames.
- It is a good idea to have someone watching the training but near the Control Panel's Emergency Stop button.

Using the Car Prop

1. Ensure that the system has been properly set up (See the previous section of this manual)
2. Check the propane system for leaks before starting the training session.



Do not use the system if propane leaks are found. Shut the system down immediately. Repair the leaks as necessary. Using leaking equipment could result in death or serious injury.

Contact BullEx immediately if any defects are found.

3. Light the desired burn zones on the Burn Tray using the System Controller. The buttons on the System Controller can control different zones depending on how the hoses between the Pilot Box, Burn Tray, and Car Prop were connected.
4. The zones can be controlled independently using the individual valve buttons or all together using the "multiple valves" button.
5. To start the Wheel Fire Zone:
 - a. Light all of the fire zones by pressing the "multiple valves" button
 - b. Once all of the zones are on fire including the Wheel Fire Zone, press the "valve" button corresponding to the Wheel Fire Zone and release the "multiple valves" button.
 - c. The Wheel Fire Zone will remain lit.



WARNING

The Wheel Fire Zone will not light automatically from the pilot. Light the Wheel Fire Zone using the other zones in the Tray.

The Wheel Fire Zone will dispense propane even if it has not lit on fire. Dispensing unlit propane could result in death or serious injury.

6. The height of the flame and flow rate of the propane can be adjusted using the regulator at the end of the propane supply hose that connects to the Pilot Box.
7. The flame height and propane usage can be altered during a simulation by pressing and releasing the valve buttons at different intervals. For example, press the “multiple valves” button for two seconds then release the button for two seconds; repeating this process will reduce the amount of propane used for a given period and reduce the flame height.
8. The height of the flames and flow rate of the propane is dependent on many variables. The typical reasons for low flame height are:
 - a. Low propane supply pressure (often due to low tank temperatures)
 - b. Regulator adjustment
 - c. Clogged orifices in the Burn Tray or special fire zone
9. The temperature of the Prop directly affects the lifespan of the Prop. High temperatures will reduce the lifespan of the Prop. Keep this in mind when operating the system. Replacement parts and panels are available from BullEx.
10. The doors, hood, and optional pry-able hood can be used during a simulation as desired.



WARNING

The Prop, Burn Tray, Pilot Box, and hoses will be hot during a simulation. Care must be taken when touching these or any time when persons are close to the Car Prop. The hot metal, flames, and propane could cause death or serious injury.

Car Prop Shut Down and Storage

1. Shut down and depressurize the hose following the steps in the Wired or Wireless Control System sections of this manual, as applicable.

WARNING

The Prop, Burn Tray, Pilot Box, and hoses will be hot during a simulation. Care must be taken when touching these or any time when persons are close to the Car Prop. The hot metal, flames, and propane could cause death or serious injury.

2. If applicable, disconnect the propane hose for the Wheel Fire Zone. Once the Wheel Fire Zone hose is disconnected you may push the Car Prop forward to disconnect the hoses and cables more easily. You may have to push the car backward before pushing the car forwards to get the casters pointing in the correct direction.
3. Drain the Burn Tray using the ball valve on the front.

WARNING

The water in the Tray may be very hot. Caution must be taken to avoid injury.

4. Rinse out the Burn Tray with fresh water and drain all remaining water.
5. With two people, pull the Pilot Box out of the Burn Tray and stow it out of the elements.
6. If applicable, the speaker and Smoke Generator can stay in the trunk provided the Truck Box Cover is on, the clips are inserted, and the trunk is closed.
7. Rinse off the car with fresh water.
8. Wipe down the car to remove excess water.
9. Touch up the paint on the car if necessary.
10. Clean the orifices on the Burn Tray and Car Prop as recommended in the “Maintaining the System” section of this manual.
11. Inspect all equipment for wear and damage before storing.
12. Store the following components out of the weather:
 - a. Power cable for between the Console and Pilot Box
 - b. Pilot Box
 - c. System Controller (both Wired and Wireless)
 - d. Sound System (if equipped). Speakers in props can be left with the prop.
 - e. Pilot Box Breather System (if equipped)

- f. Smoke Generator Wireless Controller (if equipped)
- g. If possible, store the remaining components out of the weather. This will increase the lifespan of the equipment.
- h. In areas where subfreezing temperatures are expected, it is highly recommended that the entire system be kept out of the weather.

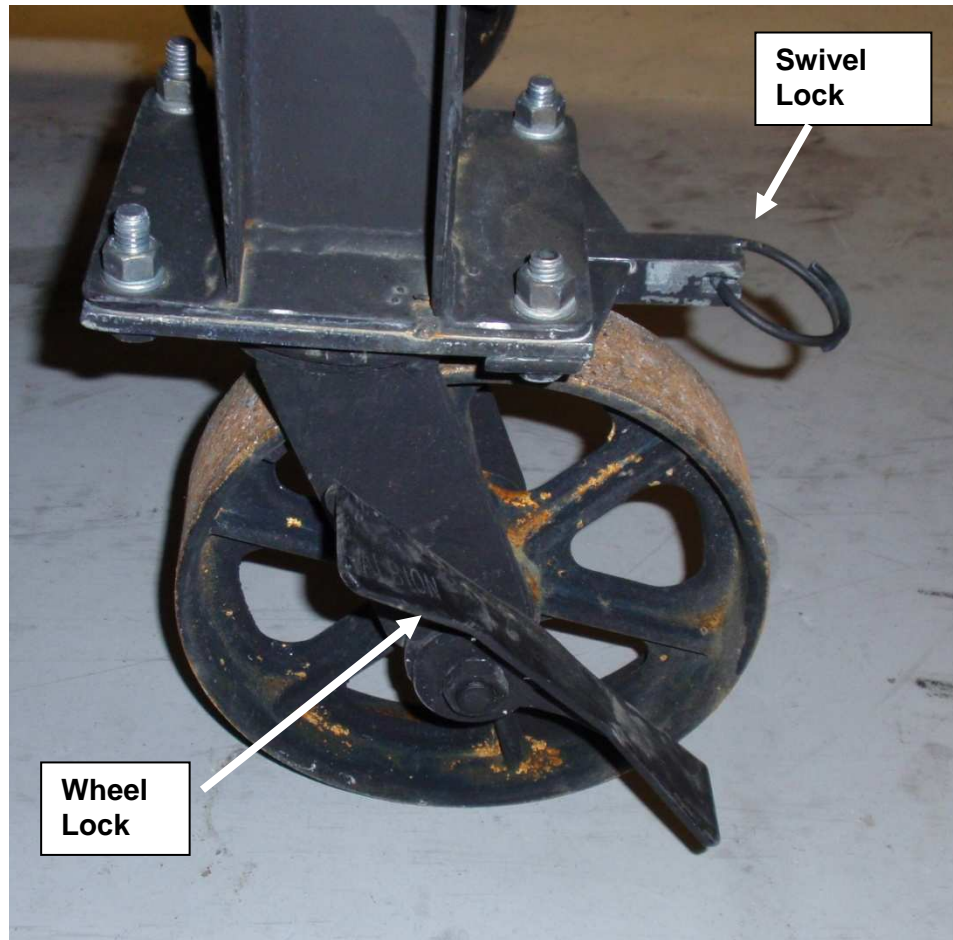
Pressure Vessel Prop

The Pressure Vessel Prop is used to simulate a burning and/or leaking pressure vessel.

The BullEx Pressure Vessel Prop is a heavy-duty training tool with intense flames, real heat and smart controls. BullEx Pressure Vessel Prop can be used to create multiple scenarios that challenge fire fighters to use the correct strategies when responding to hazardous situations. The built-in burner system below the tank can be used to train fire fighters to reduce the chance of a BLEVE. With a functioning vapor service valve, fire fighters can practice approaching the tank while shielded by hose lines secure the fuel and extinguish the fire. The system operates using the removable Pilot Box.

Pressure Vessel Prop Set Up

1. Begin by selecting a suitable location for training.
 - a. The burn zone should be at least 30 ft from any cars, buildings, or other environmental obstructions.
 - b. The burn zone **MUST** be at least 50 ft from other readily combustible materials.
2. Lock the casters in place using the wheel locks.
 - a. The wheels can be prevented from rotating by pressing the wheel locks until resistance is felt and the wheel no longer rotates
 - b. The swivel wheels are equipped with a swivel lock that will prevent them from swiveling. They can lock at 90-degree intervals.
 - i. To lock the swivel locks, pull out the locking pin using the ring and turn the ring 90-degrees. Release the pin. Swivel the wheel until the pin locks the wheel in place.
 - ii. It is suggested that the wheels be locked in place at 90-degrees from each other to help provide a more secure setup.

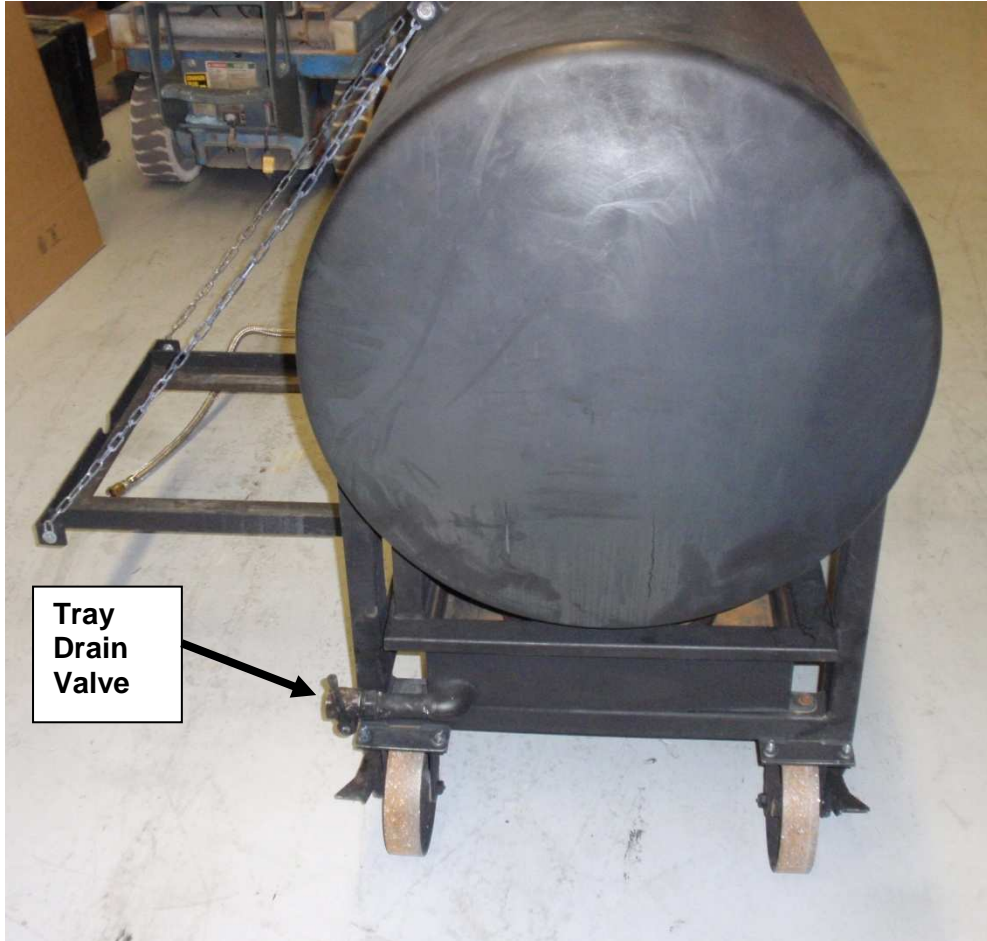


3. Make sure the drain valve is closed on the Tray and fill the tray with water until it overflows out of the pipe in the center of the Burn Tray.

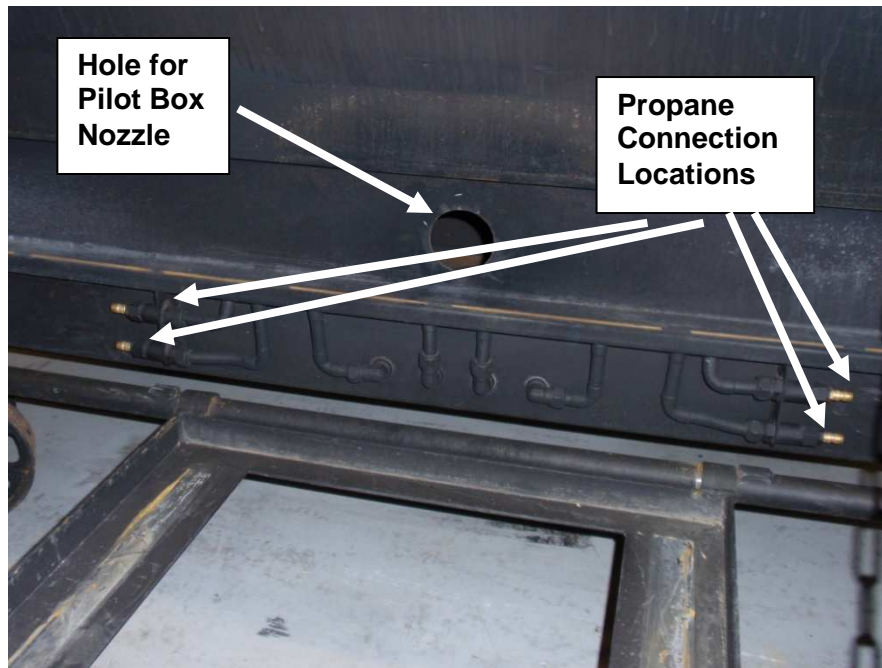
WARNING

Do not operate the system without water in the Tray. The copper tubing in the tray must be completely covered with water before using.

Periodically check the water level during the training session since the water level will drop during use.



4. With two people, bring the Pilot Box to the Prop and guide the pilot burner nozzle through the hole in the back of the Prop. Make sure the Pilot Box is completely pushed into position; the Pilot Box and Prop should be touching.



5. Connect the Pilot Box propane outlets to the Tray using the provided hoses.
 - a. There are four outlets on the Pilot Box. All four MUST be connected before operating the system.

WARNING

ALL FOUR CONNECTIONS FROM THE PILOT BOX MUST BE CONNECTED BEFORE USE.

Operating the system without connecting all four connections could result in spraying propane out of the Pilot Box which could result in death or serious injury.

6. Attach the supplied elbow or Fresh Air Breather System to the air inlet on the Pilot Box to prevent water from being ingested into the Pilot Box. Use the Fresh Air Breather System whenever training with suppressants other than water.
7. If desired, connect a water hose to the water hose connection for the Tank Leak Simulator.
 - a. The connector on the Prop is a standard female garden hose connection.
 - b. Adjust the water as desired.



Figure 9: Damaged area on tank for leak simulation



Figure 10: Garden hose connection point for leak simulator

8. Position the valve hood as desired.
 - a. The hood is equipped with a lock hasp for training purposes. This can be used if desired.
 - b. Warning: Burning the Propane Service Valve with the hood down creates a potentially dangerous situation.



WARNING

Burning the Propane Service Valve with the hood down could result in a dangerous situation that could result in death or serious injury.

9. Position the Propane Service Valve as desired. Note that this is a functional valve.



Figure 11: Prop Propane Service Valve

Training Tips

- Become familiar with the system and its capabilities so that the best training scenarios can be simulated.
- There is some LP still in the burners after releasing the button(s), but the button(s) can be pulsed to produce diminishing flames.

- It is a good idea to have someone watching the training but near the Control Panel's Emergency Stop button.

Using the Pressure Vessel Prop

1. Ensure that the system has been properly set up (See the previous section of this manual)
2. Check the propane system for leaks before starting the training session.



Do not use the system if propane leaks are found. Shut the system down immediately. Repair the leaks as necessary. Using leaking equipment could result in death or serious injury.

Contact BullEx immediately if any defects are found.

3. Light the desired burn zones on the Tray using the System Controller. The buttons on the System Controller can control different zones depending on how the hoses between the Pilot Box and Tray were connected.
4. The zones can be controlled independently using the individual valve buttons or all together using the “multiple valves” button.
5. To start the Propane Service Valve Zone:
 - a. Light all of the fire zones by pressing the “multiple valves” button
 - b. Once all of the zones are on fire including the Propane Service Valve Zone, press the “valve” button corresponding to the Propane Service Valve Zone and release the “multiple valves” button. The Propane Service Valve Zone will remain lit.



The Propane Service Valve Zone will not light automatically from the pilot. Light the zone using the other zones in the Tray.

The Propane Service Valve Zone will dispense propane even if it has not lit on fire. Dispensing unlit propane could result in death or serious injury.

6. The height of the flame and flow rate of the propane can be adjusted using the regulator at the end of the propane supply hose that connects to the Pilot Box.
7. The flame height and propane usage can be altered during a simulation by pressing and releasing the valve buttons at different intervals. For example, press the “multiple valves” button for two seconds then release the button for two seconds; repeating this process will reduce the amount of propane used for a given period and reduce the flame height.

8. The height of the flames and flow rate of the propane is dependent on many variables. The typical reasons for low flame height are:
 - a. Low propane supply pressure (often due to low tank temperatures)
 - b. Regulator adjustment
 - c. Clogged orifices in the Tray
9. The temperature of the Prop directly affects the lifespan of the Prop. High temperatures will reduce the lifespan of the Prop. Keep this in mind when operating the system.



WARNING

The Prop, Tray, Pilot Box, and hoses will be hot during a simulation. Care must be taken when touching these or any time when persons are close to the Prop. The hot metal, flames, and propane could cause death or serious injury.

Pressure Vessel Prop Shut Down and Storage

1. Using caution, completely open the Propane Service Valve. Warning: the valve zone may contain pressurized propane which will be released when the valve is opened.

 **WARNING**

The valve zone may contain pressurized propane which will be released when the valve is opened. This could cause death or serious injury.

2. Shut down and depressurize the propane hose between the Console and Pilot Box following the steps in the Wired or Wireless Control System sections of this manual, as applicable.

 **WARNING**

The Prop, Tray, Pilot Box, and hoses will be hot during a simulation. Care must be taken when touching these or any time when persons are close to the Prop. The hot metal, flames, and propane could cause death or serious injury.

3. Drain the Tray using the ball valve on the side.

 **WARNING**

The water in the Tray may be very hot. Caution must be taken to avoid injury.

4. Rinse out the Burn Tray with fresh water and drain all remaining water.
5. Disconnect the propane hoses between the Pilot Box and Prop.
 - a. Warning: The

 **WARNING**

The hoses may contain pressurized propane which will be released when the hoses are disconnected. This could cause death or serious injury.

6. With two people, remove the Pilot Box from the prop and stow it out of the elements.
7. Rinse off the Prop with fresh water.
8. Wipe down the Prop to remove excess water.
9. Touch up the paint on the Prop if necessary.

10. Clean the orifices on the Prop as recommended in the “Maintaining the System” section of this manual.
11. Inspect all equipment for wear and damage before storing.
12. Store the following components out of the weather:
 - a. Power cable for between the Console and Pilot Box
 - b. Pilot Box
 - c. System Controller (both Wired and Wireless)
 - d. Pilot Box Breather System (if equipped)
 - e. If possible, store the remaining components out of the weather. This will increase the lifespan of the equipment.
 - f. In areas where subfreezing temperatures are expected, it is highly recommended that the entire system be kept out of the weather.

Using the Smoke Generator

See the Smoke Generator manual for information.