



## 4.6 Advanced Propane Appliance Service and Troubleshooting Performance-Based Skills Assessment 2020



<b>Section One</b>	<b><u>Review of Advanced Propane Appliances and the Systematic Approaches to Troubleshooting</u></b>
Task 1	Explain the Differences Between Basic and Advanced Propane Appliances
Task 2	Explain the Systematic Approaches to Troubleshooting Advanced Propane Appliances
<b>Section Two</b>	<b><u>Demonstrate an Understanding of Electrical Safety, Electrical Currents, and How to Identify Components in Advanced Propane Appliances</u></b>
Task 1	Explain General Electrical Safety Guidelines for Propane Appliances
Task 2	Demonstrate How to Verify Current, Voltage, and Phase to an Advanced Propane Appliance
Task 3	Identify Components and Explain their Purpose in Advanced Propane Appliances
Task 4	Identify and Interpret Circuit Board Elements and Diagrams for Advanced Propane Appliances
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Task 2	Demonstrate Techniques for Taking Pressure and Vacuum Readings
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Task 1	Explain the Principles of How Flame Rectification Works
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Task 3	Explain the Proper Sequence of Operation for Each Type of Electronic Ignition System
Task 4	Demonstrate How to Troubleshoot the Different Electronic Ignition Systems
Task 5	Identify the Types of Gas Control Valves Used in Appliances with Electronic Ignition Systems and Explain the Differences of Each
<b>Section Six</b>	<b><u>Demonstrate Understanding of Electronic Control Circuit Diagrams</u></b>
Task 1	Determine Sequence of Operation in a Ladder Diagram
Task 2	Troubleshoot Electrical Circuits and Components

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**Section Seven**      **Demonstrate an Understanding of the Air and Water Distribution Systems of Advanced Propane Appliances and the Troubleshooting Techniques for Each**

- Task 1      Demonstrate an Understanding of Air and Water Distribution Systems
- Task 2      Explain and Troubleshoot Different Types of Air Distribution Systems
- Task 3      Explain and Troubleshoot Different Types of Water Distribution Systems

**Section Eight**      **Demonstrate an Understanding of Universal Replacement Parts and Preventative Maintenance Procedures**

- Task 1      Demonstrate an Understanding of Using Universal Replacement Parts
- Task 2      Demonstrate Preventative Maintenance Procedures for Advanced Propane Appliances

**Section Nine**      **Understand Propane Emergency Response Information for Uncontrolled Release of Propane and Troubleshoot Propane Leaks, Odor and Carbon Monoxide Complaints**

- Task 1      Demonstrate Understanding of Propane Emergency Response Information for Uncontrolled Release of Propane
- Task 2      Troubleshoot Propane Leaks
- Task 3      Troubleshoot Odor Complaints
- Task 4      Troubleshoot Carbon Monoxide Complaints

**NOTICE:** The Skills Evaluator must be the candidate's supervisor or another qualified person who has:

1. Completed CETP 4.6 *Advanced Propane Appliance Service and Troubleshooting* **or** is familiar with the subject matter, **and**
2. Is an PERC Registered Skills Evaluator.

**CETP Certification requires that the employee seeking certification cannot act as his/her own evaluator.**

## **Instructions for Use:**

The Performance Based Skill Assessment Evaluation is designed to standardize conditions under which the candidate demonstrates performance of tasks to meet the requirements for PERC CETP Certification.

The Skills Assessment should be supplemented with company policies and procedures related to each task being evaluated as needed.

1. The candidate has 12 months from the date of successfully passing the CETP Certification exam to train and successfully complete the tasks within the evaluation.
2. The affidavits and a final checklist are provided on the last two pages of the skills packet.
  - Affidavits must be signed by both the candidate and the skill evaluator
  - The final checklist must be fully completed within 12 months of passing the exam (Candidates may use this time to practice skills as often as necessary)
  - Make a copy for the training records when the skills assessment is completed for future audits
  - Send the affidavit page and final checklist (last two pages) to the testing center within 12 months of passing the exam
3. All requirements and prerequisites must be met before certification will be granted.

### **4.6 “Advanced Propane Appliance Service and Troubleshooting” Certification Requirements**

- Passing exam score on 4.6 “Advanced Propane Appliance Service and Troubleshooting” exam
- Completed and signed 4.6 “Advanced Propane Appliance Service and Troubleshooting” Skills Assessment Affidavit and Final Checklist returned to the testing center within 12 months of passing the exam.
- 1.0 *Basic Principles and Practices* certification completed within 12 months of passing the exam
- It is recommended that the candidate be familiar with the materials and skills covered in the 4.5 CETP program Basic Propane Appliance Service and Troubleshooting, in order to successfully complete this skills evaluation.

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Users of this material should consult the law of their individual jurisdictions for codes, standards and legal requirements applicable to them. This material is not intended to be an exhaustive treatment of the subject, and should not be interpreted as precluding other procedures that would enhance safe LP-gas operations. This training material merely suggests methods the user may find useful in implementing applicable codes, standards, and legal requirements. This publication is not intended nor should it be construed to (1) set forth procedures which are the general custom or practice in the propane industry; (2) to establish the legal standards of care owed by propane distributors to their customers; or (3) to prevent the reader from using different methods to implement applicable codes, standards or legal requirements. This material was designed to be used as a resource only to assist expert and experienced supervisors and managers in training personnel in their organizations and does not replace federal, state, local, or company safety rules. The user of this material is solely responsible for the method of implementation. The Propane Education and Research Council, the National Propane Gas Association and Industrial Training Services, Inc. assume no liability for reliance on the contents of this training material.

Issuance of this material is not intended to nor should it be construed as an undertaking to perform services on behalf of any party either for their protection or for the protection of third parties.

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### **PERC 4.6 Advanced Propane Appliance Service and Troubleshooting Skills Assessment (2020)**

Return to: INDUSTRIAL TRAINING SERVICES, INC.

120 Max Hurt Drive.  Murray, KY 42071  TELEPHONE: 270/753-2150  Page 3

2020

## **Instructions for Candidate:**

Practice the operations as many times as needed to become confident and proficient with the documents or equipment necessary to complete each task. Your evaluator will check and observe your performance, using the steps to complete each hands-on operation and/or company procedures.

The candidate must adhere to all safety precautions. If a safety precaution is violated, then the demonstration shall be stopped and the skills evaluator must instruct the candidate on the proper safety procedures that apply before allowing the candidate to continue.

After completing the skills evaluation, the candidate must fill out the Employee Information section and sign the Affidavit.

**Required information includes the candidate's last four digits of the SSN to assist the testing center in locating the correct records.**

## **Instructions to the Skills Evaluator:**

The candidate must adhere to all safety precautions. If a safety precaution is violated, then the demonstration shall be stopped and the skills evaluator must instruct the candidate on the proper safety procedures that apply before allowing the candidate to continue.

- Review the tasks within the Skills Evaluation with the candidate.
- Review all of the instructions, answering any questions and explaining how the skills assessment will be used.
- Demonstrate and/or talk the candidate through each of the steps required to perform each task.
- Allow the candidate time to ask questions and/or study the steps.
- Observe the candidate performing the required steps, providing corrections as needed
- Allow the candidate to practice until he/she is confident. *Remember:* the candidate has 12 months from the date of passing the exam to complete and return the skills assessment.
- Evaluate the candidate when ready.
- An PERC Registered Skills Evaluator must complete the Final Checklist and sign the Affidavit, including the assigned PERC Registered Skills Evaluator Number, in order to process the Skills Assessment for certification purposes.
- Skills Assessments submitted without an PERC Registered Skills Evaluator Number will not be processed.***
- Ensure that the Affidavit and Final Checklist are copied for the Employee Training Records and then sent to the testing center.

Each task is divided into one or more operations upon which the candidate's performance is evaluated. All tasks must be completed unless the "Not Applicable" option is both available for the task and applicable to the candidate or the marketer's present situation.

- Satisfactory** - When all the operations within a task are successfully performed by the candidate according to the criteria provided, the evaluator will check off the box marked "Satisfactory."

\* **Not Applicable** – Certain tasks have the "Not Applicable" option available. The Skills Evaluator must ensure the circumstances described under the option are applicable to either the candidate or marketer's present situation.

## Section One: Review of Advanced Propane Appliances and the Systematic Approaches to Troubleshooting

### Task 1: Explain the Differences Between Basic and Advanced Propane Appliances

*Preparation Guide: Wear appropriate Personal Protective Equipment (PPE) for the skills assessment task evaluation:*

1. Provide examples of the differences between Basic and Advanced Propane Appliances in the following categories:
  - Types of Ignition Systems
  - Sources of Electricity
  - How electrical components connect to each other
2. Provide examples of Advanced Propane Appliances that connect to the following:
  - Air distribution systems
  - Water distribution systems
3. Identify the following components on an Advanced Propane Appliance:
  - Thermostat
  - Gas Control Valve
  - Ignition System
  - Burners
  - Induced Draft Blower
  - Heat Exchanger
  - Electrical System
  - Air Handling System
  - Safety Controls
  - Accessories and Other External Components (Humidifiers, EACs, Air Purifiers, etc.)

**Satisfactory**

### Task 2: Explain the Systematic Approach to Troubleshooting Propane Appliances

*Preparation Guide: Wear appropriate Personal Protective Equipment (PPE) for the skills assessment task evaluation:*

1. Explain what is meant by “Actively Listening” to customer concerns.
2. Explain the following steps in the systematic approach to troubleshooting an appliance problem:
  - Observe with all your senses
  - Isolate the problem
  - Follow initial basic troubleshooting steps
  - Clean or replace components
  - Retest the system
3. Explain company policies and procedures for documenting the following:
  - Safety issues
  - Recording systems tests and checks
  - Verifying system is working order prior to leaving customer location
  - Logging the work complete
  - Initiating proper invoicing

**Satisfactory**

## Section 2: Demonstrate an Understanding of Electrical Safety, Electrical Currents, and How to Identify Components in Advanced Propane Appliances

### Task 1: Explain General Electrical Safety Guidelines for Propane Appliances

*Preparation Guide: Wear appropriate Personal Protective Equipment (PPE) for the skills assessment task evaluation:*

1. Explain the following electrical safety procedures used while servicing an appliance:
  - Work on de-energized circuits whenever possible, unless troubleshooting
  - How to avoid electrical shock (becoming part of an energized electrical circuit) when working on energized circuits while troubleshooting or testing
  - Unplug small appliances from the power outlet
  - For large appliances, use service shutoff switch located at the appliance. If no shutoff switch is available, determine which electrical circuit is involved and turn off the power to the circuit at the electrical panel.
2. Explain company policies and procedures regarding lockout / tagout procedures.
3. Identify the following safety responsibilities according to company policies and procedures:
  - Personal Protective Equipment (PPE) and tools
  - Safe Work Habits
  - Working in wet areas

**Satisfactory**

### Task 2: Demonstrate How to Verify Current, Voltage, and Phase to an Advanced Propane Appliance

*Evaluator: Please use a propane appliance 240/120-volt circuit ladder diagram for the following task.*

*Preparation Guide: Wear appropriate Personal Protective Equipment (PPE) for the skills assessment task evaluation:*

1. Verify the current in a circuit by looking at the electrical panel box
2. Determine the following using the ladder diagram provided:
  - How many wires are used, and what are they?
  - Identify the load(s) and how much voltage is received
3. Explain the following:
  - Difference between alternating and direct currents
  - Difference between single and three phase circuits
  - Which current and circuit is used most in residential applications
4. Demonstrate how to measure a three-phase circuit, and explain how to troubleshoot for voltage imbalance.

**Satisfactory**

### Task 3: Identify Components and Explain their Purpose in Advanced Propane Appliances

*Evaluator: Please use an advanced propane appliance electrical circuit designed to heat air or water, with an electronic ignition system for the following task.*

*Preparation Guide: Wear appropriate Personal Protective Equipment (PPE) for the skills assessment task evaluation:*

1. Identify the following components on the electrical circuit and explain their purpose within the appliance:
  - Operational switches
  - Safety switches
  - Sensor activated switches
  - Spill switches
  - Water flow switches
  - Float type devices

**Satisfactory**

## Task 4: Identify and Interpret Circuit Board Elements and Diagrams Advanced Propane Appliances

*Evaluator: Please use a universal integrated furnace control board for the following task.*

*Preparation Guide: Wear appropriate Personal Protective Equipment (PPE) for the skills assessment task evaluation:*

1. Identify the following components on the electrical circuit and explain their purpose within the appliance:
  - Processor
  - Relays
  - Transformer, if present
  - Resistors
  - Spade Connectors
  - Float type devices
  - Molex-Type Connectors
  - Dip Switches
  - Indicator Light(s)
  - Fault Code Display
  - Fuse

**Satisfactory**

## Section Three: Demonstrate an Understanding of Measuring Differential Temperature, Pressure, and Other Key Tests on Advance Propane Appliances

### Task 1: Demonstrate Techniques for Taking Temperature Differential Readings

*Preparation Guide: Wear appropriate Personal Protective Equipment (PPE) for the skills assessment task evaluation:*

1. Explain how differential temperature is measured and identify the tools used.
2. Calibrate a thermometer
3. Demonstrate techniques for taking temperature differential readings for the following:
  - Measure temperature of supply and return water for a hydronic heating system
  - Measure air temperature rise on a forced warm air distribution system
  - Measure flue gas temperature

**Satisfactory**

### Task 2: Demonstrate Techniques for Taking Pressure and Vacuum Readings

*Preparation Guide: Wear appropriate Personal Protective Equipment (PPE) for the skills assessment task evaluation:*

1. Explain how differential pressure is measured, and explain the differences between a water, incline, and electronic manometer.
2. Calibrate a manometer.
3. Measure differential pressure by verifying the manifold gas pressure on a gas appliance.
4. Demonstrate how to measure air pressure and vacuum readings.
5. Explain what abnormal air pressure/vacuum readings would indicate.

**Satisfactory**

### Task 3: Demonstrate Techniques to Operate a Combustible Gas Indicator and a Combustible Gas Detector

*Preparation Guide: Wear appropriate Personal Protective Equipment (PPE) for the skills assessment task evaluation:*

1. Review the features of a CGI and a CGD unit.
2. Explain the differences between the two units.
3. Explain company policies and procedures for the safe operation of a CGI and a CGD.
4. Demonstrate how to properly operate a CGI and CGD.

**Satisfactory**

## Section Four: Explain and Troubleshoot Common Components in Advanced Propane Appliance Systems

### Task 1: Explain and Troubleshoot Different Types of Motors and Contactors

*Preparation Guide: Wear appropriate Personal Protective Equipment (PPE) for the skills assessment task evaluation:*

1. Explain the differences between the following motors, and provide examples of appliances where each might be used:
  - DC motors
  - Permanent split-capacitor motors (PSC)
  - Electronically communicated motors (ECM)
2. Demonstrate how to test or troubleshoot each of the above motors.
3. Explain the difference between a relay and contactor, and identify contactor in a circuit.
4. When troubleshooting, demonstrate how to test a contactor when:
  - A load is not working
  - A load will not stop working
5. Explain the steps that should be taken if a contactor needs replacing.

**Satisfactory**

### Task 2: Explain and Troubleshoot Adjustable Fan Timers, Draft Fans, and Controls

*Preparation Guide: Wear appropriate Personal Protective Equipment (PPE) for the skills assessment task evaluation:*

1. Explain the purpose of fan timers and how they operate.
2. Demonstrate how to properly troubleshoot a fan timer for a customer that complains of a furnace blowing cold air whenever the unit comes on.
3. Explain the purpose of draft fans and draft inducers.
4. Explain the purpose of a pressure switch in the draft inducer system.
5. Demonstrate how to troubleshoot the operation of a draft inducer and the draft inducer pressure switch.
6. Explain the necessary steps involved when replacing a draft inducer and/or a draft inducer pressure switch.

**Satisfactory**

## Section Five: Demonstrate Understanding of Ignition Systems and Gas Control Valves for Advanced Propane Appliances

### Task 1: Explain the Principles of How Flame Rectification Works

*Preparation Guide: Wear appropriate Personal Protective Equipment (PPE) for the skills assessment task evaluation:*

1. Explain the principles of how flame rectification works in propane appliances.
2. Explain how the components below function to complete the flame rectification circuit:
  - Flame
  - Control box
  - Positive probe
  - Negative probe
  - Ground
  - Flow of AC current
  - Flow of DC current

**Satisfactory**



## **Task 2: Demonstrate How to Measure for Proper Microamp Signal of a Flame Rectification Circuit, and How to Interpret the Results**

*Preparation Guide: Wear appropriate Personal Protective Equipment (PPE) for the skills assessment task evaluation:*

1. Explain how to use the following devices are used when measuring microamps:
  - Digital meter and Microamp meter
  - Signal transducer
  - Current pad
  - Shunt switch
2. Demonstrate how to measure for proper microamp signal of a flame rectification circuit.
3. Explain what the following test results indicate:
  - Normal
  - Abnormal
  - Negative
  - Zero reading

**Satisfactory**

## **Task 3: Explain the Proper Sequence of Operation for Each Type of Electronic Ignition System**

*Evaluator: Please use CETP Training Materials, Module 5 – Lesson 3, for the following task, as needed.*

*Preparation Guide: Wear appropriate Personal Protective Equipment (PPE) for the skills assessment task evaluation:*

1. Explain the sequence of operation for each of the following types of Electronic Ignition Systems:
  - Intermittent spark ignition system (ISI)
  - Direct spark ignition system (DSI)
  - Hot surface (to Burner) ignition system (HSI)
  - Hot surface (to Pilot) ignition system (HSP)

**Satisfactory**

## **Task 4: Demonstrate How to Troubleshoot the Different Electronic Ignition Systems**

*Preparation Guide: Wear appropriate Personal Protective Equipment (PPE) for the skills assessment task evaluation:*

1. Demonstrate how to troubleshoot the following Electronic Ignition Systems:
  - Intermittent spark ignition system (ISI)
  - Direct spark ignition system (DSI)
  - Hot surface (to Burner) ignition system (HSI)
  - Hot surface (to Pilot) ignition system (HSP)

**Satisfactory**

## Task 5: Identify the Types of Gas Control Valves Used in Appliances with Electronic Ignition Systems and Explain the Differences for Each

*Preparation Guide: Wear appropriate Personal Protective Equipment (PPE) for the skills assessment task evaluation:*

1. Identify the types of gas control valves used in appliances for each of the following electronic ignition systems, and explain the differences for each:
  - Intermittent spark ignition (ISI)
  - Hot spark ignition (HSI)
  - Direct spark ignition (DSI)
  - Hot surface to pilot (HSP)
2. Explain how the following gas control valves openings vary in the length of time it takes the flow of gas to reach its full capacity:
  - Standard opening
  - Slow opening
  - Step opening
3. Explain the differences between the following types of gas control valves and examples of gas appliances where each might be utilized:
  - Single stage
  - Two stage
  - Modulating

**Satisfactory**

## Section Six: Demonstrate Understanding of Electronic Control Circuit Diagrams

### Task 1: Determine Sequence of Operation in a Ladder Diagram

*Evaluator: Please use a condensing gas furnace ladder diagram for the following task.*

*Preparation Guide: Wear appropriate Personal Protective Equipment (PPE) for the skills assessment task evaluation:*

1. Using the ladder diagram provided, explain each of the steps in the sequence of operation, beginning with a call for heat.

**Satisfactory**

### Task 2: Troubleshoot Electrical Circuits and Components

*Evaluator: Please evaluate the candidate on a service call to troubleshoot an advanced propane appliance*

*Preparation Guide: Wear appropriate Personal Protective Equipment (PPE) for the skills assessment task evaluation:*

1. Troubleshoot electrical circuits and components and components on an advanced propane appliances, ensuring to utilize the following:
  - Explain all safety considerations
  - Observe with all senses
  - Follow the basic troubleshooting steps
  - Check fault codes, explain the sequence of operation, and explain any necessary testing of components
  - Isolate the problem
  - Determine the root cause of the problem and explain reason for failure
  - Provide diagnostic solution

**Satisfactory**

## Section Seven: Demonstrate Understanding of the Air and Water Distribution Systems of Advanced Propane Appliances and the Troubleshooting Techniques for Each

### Task 1: Demonstrate an Understanding of Air and Water Distribution Systems

*Preparation Guide: Wear appropriate Personal Protective Equipment (PPE) for the skills assessment task evaluation:*

1. Identify and explain the function of the following components for a forced warm air furnace:
  - Supply and Return air plenums
  - Dampers and Registers
  - Grilles and ceiling diffusers
  - High limit switches
  - Duct temperature sensors
  - Blower motor assembly
  - Fan switch and fan timer control
2. Demonstrate how to calculate air flow requirements.
3. Demonstrate how to check air temperature rise across the furnace.
4. Explain possible causes for an abnormal temperature rise.
5. Identify and explain the function of the following components for a hydronic heating system:
  - Air eliminator/separator/scoop
  - Water pressure regulator and Backflow preventer
  - Circulator
  - Purge Station
  - Aquastat and high and low limit switches
  - Low water cutoff devices and water flow sensors
  - Pressure relief valve
  - Operating controls and sensors
6. Provide a general overview for the operation of a hydronic heating system
7. Demonstrate how to purge air from a hydronic heating system.
8. Demonstrate how to measure temperature differential on boiler supply and return piping.

**Satisfactory**

### Task 2: Troubleshoot Air Distribution Systems

*Preparation Guide: Wear appropriate Personal Protective Equipment (PPE) for the skills assessment task evaluation:*

1. Demonstrate troubleshooting techniques for a forced warm air furnace with the following problems:
  - System is noisy
  - Some rooms are too hot
  - Some rooms have cold spots

**Satisfactory**

### Task 3: Troubleshoot Water Distribution Systems

*Preparation Guide: Wear appropriate Personal Protective Equipment (PPE) for the skills assessment task evaluation:*

1. Demonstrate troubleshooting techniques for a water distribution system with the following problems:
  - The boiler will not start
  - System is noisy
  - No hot water
  - Water on the floor

**Satisfactory**

## Section Eight: Demonstrate an Understanding of Universal Replacement Parts and Preventative Maintenance Procedures

### Task 1: Demonstrate an Understanding of Using Universal Replacement Parts

*Preparation Guide: Wear appropriate Personal Protective Equipment (PPE) for the skills assessment task evaluation:*

1. Identify which universal replacement components can be used on advanced propane appliances.
2. Explain the benefit of having universal replacement components on the service vehicle, and why doing so can lead to better customer service.
3. Correctly select and install a universal replacement part on an advanced propane appliance.

**Satisfactory**

### Task 2: Demonstrate Preventative Maintenance Procedures for Advanced Propane Appliances

*Preparation Guide: Wear appropriate Personal Protective Equipment (PPE) for the skills assessment task evaluation:*

1. Explain the steps involved for each of the following preventative maintenance procedures:
  - Establish the current operating condition
  - Take apart, clean, and inspect
  - Put back together again
  - Verify the appliance is operating properly
  - Verify the safety devices are working properly
2. Explain or demonstrate the preventative maintenance tasks on a gas appliance for the following:
  - Burner assembly
  - Condensate traps
  - Electrical system
  - Flame rod and ignition electrode
  - Motors and circulators
  - Vent systems

**Satisfactory**

## Section Nine: Understand Propane Emergency Response Information for Uncontrolled Release of Propane and Troubleshoot Propane Leaks, Odor, and Carbon Monoxide Complaints

### Task 1: Demonstrate Understanding of Propane Emergency Response Information for Uncontrolled Release of Propane

*Preparation Guide: Wear appropriate Personal Protective Equipment (PPE) for the skills assessment task evaluation:*

1. Explain how to identify an uncontrolled release of propane.
2. Explain how and when to effectively evacuate the area in the event of an uncontrolled release of propane.
3. Describe who to call and what information you should provide in the event of an uncontrolled release of propane.

**Satisfactory**

## Task 2: Troubleshoot Propane Leaks

*Preparation Guide: Wear appropriate Personal Protective Equipment (PPE) for the skills assessment task evaluation:*

1. Explain how and where the following methods are used to conduct a leak check:
  - Water or electronic manometer method
  - Test-block gauge method
  - High-pressure gauge method
  - Vapor meter method
  - Isolated testing of piping
2. Explain what action should be taken if a leak is found to be caused by a defective appliance or gas distribution system that cannot be immediately repaired.

**Satisfactory**

## Task 3: Troubleshoot Odor Complaints

*Preparation Guide: Wear appropriate Personal Protective Equipment (PPE) for the skills assessment task evaluation:*

1. Explain some of the common causes of odor complaints.
2. Describe the safety concerns that you should be aware of anytime there is an odor complaint.
3. Explain what testing you should perform on the gas system and/or appliance(s) in the event of an odor complaint.
4. Explain what action should be taken if an odor is found to be caused by a defective appliance or gas distribution system that cannot be immediately repaired.

**Satisfactory**

## Task 4: Troubleshoot Carbon Monoxide Complaints

*Preparation Guide: Wear appropriate Personal Protective Equipment (PPE) for the skills assessment task evaluation:*

1. Describe the characteristics of carbon monoxide, and explain the conditions that may indicate carbon monoxide is present.
2. Identify specific locations in a house or building to test for carbon monoxide.
3. Explain how to test an appliance, and an appliance vent, for carbon monoxide.
4. Explain why an appliance might produce carbon monoxide, and provide possible corrective measures for each.

**Satisfactory**

# CETP Certification Performance Evaluation / Candidate Record

(4.6)

## Completing your PERC CETP Certification:

- 1: Successfully pass the exam.
- 2: Complete and return the *CETP Performance Evaluation / Employee Record* to the testing center below within 12 months of passing the exam.
- 3: Complete any necessary prerequisites within 12 months of passing the exam.

Make a copy for your training records and then send to:

**Industrial Training Services, Inc.**

120 Max Hurt Drive ● Murray, KY 42071 ● PH: 270-753-2150 ext. 2 ● EMAIL: [skills@its-training.com](mailto:skills@its-training.com)

The information requested below will be used to assist in locating your records in the CETP database.

Please make sure to complete all requested information; we thank you in advance for your assistance.

**Candidate Information:** (print or type) Test Group Number (if known): \_\_\_\_\_

Name: \_\_\_\_\_ Last four digits of SSN (only): \_\_\_\_\_

Employer: \_\_\_\_\_ Email: \_\_\_\_\_

Address: \_\_\_\_\_ Daytime Phone#: \_\_\_\_\_

City, State: \_\_\_\_\_ Zip Code: \_\_\_\_\_

### Affidavit

I affirm that I am the person who has performed those items checked on this checklist. I acknowledge that the performance checklists used are solely for the purpose of skills assessment for the CETP Certification requirements, and are not intended to replace or modify company operating or safety procedures, and may not be appropriate for use in all circumstances. I acknowledge that I am responsible for recognizing hazards and abnormal conditions in my workplace and must exercise care and good judgment, always using appropriate equipment, procedures and tools for the tasks I perform. The Propane Education and Research Council, the National Propane Gas Association and Industrial Training Services, Inc. assume no liability for my actions, or for my application of the skills assessment performance guides used in this evaluation checklist.

**Candidate Signature** \_\_\_\_\_ **Date** \_\_\_\_\_

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**Skills Evaluator Information:** (print or type)

Name: \_\_\_\_\_

Organization/Employer: \_\_\_\_\_

### Affidavit

I affirm that I am the person who has administered this checklist, and that I have conducted this Performance-Based Skills Assessment Evaluation with integrity. I also affirm that the above-named Candidate is the person whose performance I evaluated, and that the above-named person performed the checked tasks at the indicated level without assistance from me or any other person.

**Skills Evaluator Signature** \_\_\_\_\_ **Date** \_\_\_\_\_

**Skills Evaluator Phone #** \_\_\_\_\_ **Email** \_\_\_\_\_

**PERC Registered Skills Evaluator Number** \_\_\_\_\_

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**PERC 4.6 Advanced Propane Appliance Service and Troubleshooting Skills Assessment (2020)**

Return to: **INDUSTRIAL TRAINING SERVICES, INC.**

Page 14 □ 120 Max Hurt Dr. □ Murray, KY 42071 □ TELEPHONE: 270/753-2150

2020

**Final Checklist for: 4.6 “Advanced Propane Appliance Service and Troubleshooting”**

Name: \_\_\_\_\_ Last four digits of SSN (only): \_\_\_\_\_

The candidate has been evaluated on the following tasks at the following level:  
 (The N/A option is available only as listed in the Not Applicable column/available box(s)  below. All other tasks must be completed.)

Satisfactory	Not Applicable	Section One: Review of Advanced Propane Appliances and the Systematic Approaches to Troubleshooting
<input type="checkbox"/>		Explain the Differences Between Basic and Advanced Propane Appliances
<input type="checkbox"/>		Explain the Systematic Approaches to Troubleshooting Advanced Propane Appliances
Section Two: Demonstrate an Understanding of Electrical Safety, Electrical Currents, and How to Identify Components in Advanced Propane Appliances		
<input type="checkbox"/>		Explain General Electrical Safety Guidelines for Propane Appliances
<input type="checkbox"/>		Demonstrate How to Verify Current, Voltage, and Phase to an Advanced Propane Appliance
<input type="checkbox"/>		Identify Components and Explain their Purpose in Advanced Propane Appliances
<input type="checkbox"/>		Identify and Interpret Circuit Board Elements and Diagrams for Advanced Propane Appliances
Section Three: Demonstrate an Understanding of Measuring Differential Temperature, Pressure, and Other Key Tests on Advanced Propane Appliances		
<input type="checkbox"/>		Demonstrate Techniques for Taking Temperature Differential Readings
<input type="checkbox"/>		Demonstrate Techniques for Taking Pressure and Vacuum Readings
<input type="checkbox"/>		Demonstrate Techniques to Operate a Combustible Gas Indicator/Detector
Section Four: Explain and Troubleshoot Common Components in Advanced Propane Appliance Systems		
<input type="checkbox"/>		Explain and Troubleshoot Different Types of Motors and Capacitors
<input type="checkbox"/>		Explain and Troubleshoot Adjustable Fan Timers, Draft Fans, and Controls
Section Five: Demonstrate an Understanding of Ignition Systems and Gas Control Valves for Advanced Propane Appliances		
<input type="checkbox"/>		Explain the Principles of How Flame Rectification Works
<input type="checkbox"/>		Demonstrate How to Measure for Proper Microamp Signal of a Flame Rectification Circuit, and How to Verify if the Safety System is Functioning
<input type="checkbox"/>		Explain the Proper Sequence of Operation for Each Type of Electronic Ignition System
<input type="checkbox"/>		Demonstrate How to Troubleshoot the Different Electronic Ignition Systems
<input type="checkbox"/>		Identify the Types of Gas Control Valves Used in Appliances with Electronic Ignition Systems and Explain the Differences of Each
Section Six: Demonstrate Understanding of Electronic Control Circuit Diagrams		
<input type="checkbox"/>		Determine the Sequence of Operation in a Ladder Diagram
<input type="checkbox"/>		Troubleshoot Electrical Circuits and Components

**Continued on next page – next page must be completed also**

**Final Checklist for: 4.6 “Advanced Propane Appliance Service and Troubleshooting” continued**

Name: \_\_\_\_\_ Last four digits of SSN (only): \_\_\_\_\_

The candidate has been evaluated on the following tasks at the following level:  
 (The N/A option is available only as listed in the Not Applicable column/available box(s)  below. All other tasks must be completed.)

Satisfactory	Not Applicable	Section Seven: Demonstrate an Understanding of the Air and Water Distribution Systems of Advanced Propane Appliances and the Troubleshooting Techniques for Each
<input type="checkbox"/>		Demonstrate an Understanding of Air and Water Distribution Systems
<input type="checkbox"/>		Explain and Troubleshoot Different Types of Air Distribution Systems
<input type="checkbox"/>		Explain and Troubleshoot Different Types of Water Distribution Systems
Section Eight: Demonstrate an Understanding of Universal Replacement Parts and Preventative Maintenance Procedures		
<input type="checkbox"/>		Demonstrate an Understanding of Using Universal Replacement Parts on Advanced Propane Appliances
<input type="checkbox"/>		Demonstrate Preventative Maintenance Procedures for Advanced Propane Appliances
Section Nine: Understand Propane Emergency Response Information for Uncontrolled Release of Propane, and Troubleshoot Propane Leaks and Odor and Carbon Monoxide Complaints		
<input type="checkbox"/>		Demonstrate Understanding of Propane Emergency Response Information Release of Propane
<input type="checkbox"/>		Troubleshoot Propane Leaks
<input type="checkbox"/>		Troubleshoot Odor Complaints
<input type="checkbox"/>		Troubleshoot Carbon Monoxide Complaints

**Make a copy for your training records and then send the original to:**

***Industrial Training Services, Inc.***

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