Installation, Operation and Service Instructions

GTHS-80  GTH-80  GTH-100  
GTH-125  GTH-150

Installer:  Please take the time to read and understand these instructions prior to any installation.

Owner:  Keep this manual in a safe place to provide your serviceman with information if the situation arises.

WARNING

Improper installation, adjustment, alteration, service or maintenance can cause property damage, injury or death. Read the installation, operating and maintenance instructions thoroughly before installing or servicing this equipment.

Roberts & Gordon
Canada, Inc.

241 South Service Road West
Grimsby, Ontario, Canada  L3M 1Y7
Tel. (416) 945-5403, Fax (416) 945-0511

Energy Efficient Comfort.
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# GENERAL SPECIFICATIONS

<table>
<thead>
<tr>
<th>MODEL</th>
<th>RATING (0-4500 ft. above sea level)</th>
<th>WEIGHT (lbs.)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>NATURAL GAS (btu/h)</td>
<td>PROPANE (btu/h)</td>
</tr>
<tr>
<td>GTHS-80 (30')</td>
<td>80,000</td>
<td>80,000</td>
</tr>
<tr>
<td>GTH-80 (40')</td>
<td>80,000</td>
<td>80,000</td>
</tr>
<tr>
<td>GTH-100 (40')</td>
<td>100,000</td>
<td>100,000</td>
</tr>
<tr>
<td>GTH-100 (50')</td>
<td>100,000</td>
<td>100,000</td>
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<tr>
<td>GTH-125 (40')</td>
<td>125,000</td>
<td>125,000</td>
</tr>
<tr>
<td>GTH-125 (50')</td>
<td>125,000</td>
<td>125,000</td>
</tr>
<tr>
<td>GTH-150 (40')</td>
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<tr>
<td>GTH-150 (50')</td>
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<tr>
<td>GTH-150 (60')</td>
<td>150,000</td>
<td>150,000</td>
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</table>

<table>
<thead>
<tr>
<th>MANIFOLD PRESSURE</th>
<th>GAS INLET PRESSURE</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>MAXIMUM</td>
</tr>
<tr>
<td>Natural Gas</td>
<td>3.5 W.C.</td>
</tr>
<tr>
<td>Propane</td>
<td>10.5 W.C.</td>
</tr>
</tbody>
</table>

| ELECTRICAL RATING | 115V 60 Hz .8 Amps |
| FLUE CONNECTION SIZE | 4" O.D. |
| GAS CONNECTION     | 1/2" NPT       |

60' Vantage 150
50' Vantage 100-125
40' Vantage 80-100-125
30' 6" Vantage GTHS-80

(Horizontal only)
TUBING ASSY. ATTACHMENT TO THE CONTROL HOUSING

5/16 LOCK WASHER

5/16-18 HEX NUT

WELDED TUBING ASSY.
P/N 02536000

GASKET
P/N 025693200

TUBE AND REFLECTOR HANGER
P/N 02550100

REFLECTOR
P/N 77145

MINIMUM OVERLAP (TYP)
(SEE FIGURE 4)

WIRE FORM CLAMP
P/N 57116

4" O.D. TUBING (REF)

8x3/4" TYPE "B"
SHEET METAL SCREW

REFLECTOR SUPPORT STRAP
P/N 02560000

NOTE: BEGINNING AT THE REFLECTOR SUPPORT STRAP NEAREST THE CONTROL HOUSING TIGHTEN THE REFLECTOR SUPPORT STRAP SCREWS SECURELY AT EVERY OTHER SUPPORT. THE REFLECTORS MUST BE ALLOWED TO SLIP AS EXPANSION OCCURS. AT JOINTS THAT ARE NOT SECURELY ATTACHED THE SCREWS SHOULD BE KEPT APPROXIMATELY 1/16" FROM CONTACTING THE REFLECTOR.

TYPICAL ASSEMBLY OF A MODEL GTH HEATER
<table>
<thead>
<tr>
<th>TWO SIDE EXTEN.</th>
<th>4</th>
<th>8</th>
<th>16</th>
<th>24</th>
</tr>
</thead>
<tbody>
<tr>
<td>ONE SIDE EXTEN.</td>
<td>4</td>
<td>8</td>
<td>16</td>
<td>24</td>
</tr>
<tr>
<td>STANDARD REFL.</td>
<td>4</td>
<td>8</td>
<td>16</td>
<td>24</td>
</tr>
<tr>
<td>SIDE SIDE BELOW TOP</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Brooders' Burner, 5 ft. I.D. not spaced more than 5 feet downstream of

Space heating minimum clearances to combustibles (including)

Brooder minimum clearances to combustibles (including)

CAUTION: CLEARANCES AS SHOWN ARE NOT FOR USE IN FOUR SIDED ENCLOSURES.
HANGING THE HEATER - (Horizontal Only)
Suspension Chain should be used to support the unit between the ceiling and suspension hangers provided. Chain should have a load rating of at least 400 lbs. at each suspension point. For instructions on mounting height and locations of heaters, refer to installation plans of supplier of equipment. Heater should be pitched down towards vent horizontal 1" in 20'.

Hang the heater tube sections using the tube and reflector supports supplied. One tube and reflector support must be located with 8" of the burner/control housing assembly (See Fig. 4).

Tube sections are connected by wrap-around couplings which clamp by means of a tapered hammer-driven lock member. The starting ends of the coupling and lock members are identified by 1/4" holes which are put together when starting assembly.

Be sure tubes are in line and tube ends butt against stop pins inside the coupling. The slide bar is to be hammer driven to the point of securing the coupling to the tubes. Over driving will result in distortion of the coupling or slide bar lip decreasing the holding capability of the coupling (see figure 5).

The slide bar has a 2" tolerance in reference to lining it up with the end of the coupling at the point of being secure (Slide bar may tighten coupling when driven 2" short or 2" past the edge of the coupling). See Fig. 5.
BURNER AND CONTROL HOUSING
Secure the burner/control housing assembly to the reducer tube assembly with the 5/16 - 18 bolts, nut and lockwashers provided.

REFLECTORS
Install the reflectors (Fig. 1) overlapping 9" minimum to allow for expansion. Slide the reflector up to the burner housing and drill holes in reflector and control housing brackets to secure same. Use sheet metal screws (#8 X 3/8") provided.

This is the part of the system that is most apparent and where a neat job marks the installer as a craftsman.

Basic features of reflector installation are:
- Reflectors are locked with "U" clips
- Reflectors not supported by a hanger should rest on a reflector that is supported. Provide at least a 9" overlap to provide for thermal expansion.
- Reflectors should be level side to side.
- Reflector end cap must be used at the flue end of the reflectors.
- Reflectors must be carefully handled to avoid finger marks and dents.
- Finger marks are best removed with window spray cleaner.

VENTING
The venting must be installed in accordance with CAN/CGA-B149.1 and B149.2 Installation Codes. Partial information relating to this Specification is provided in this section with regard to size and configurations for venting arrangements (see following tables and diagrams). However, it is the responsibility of the installer to make the installation in strict accordance with Codes and provide assurance of proper and safe operation.
For best results, Vantage heaters should be vented individually or in groups of heaters with a common vent and controlled by a common thermostat. This reduces condensation and provides a stronger natural draft. The use of vent caps and positioning of the top of the vent with respect to roof structure should be in accordance with Codes. For other situations not covered here, the installer must consult Codes.

VENTING METHODS
1. HORIZONTALLY through outside wall, (See Fig. 4 & 10a). The certified vent terminal, supplied with heater, must be used.

DO NOT INSTALL VENT TERMINAL:
- LESS THAN 3 Feet from any building opening.
- LESS THAN 6 Feet from the combustion air opening of this unit or any other appliance.
- LESS THAN 3 Feet from above grade.
- OVER a gas utility meter or service regulator.
- LESS THAN 18" from the outside wall.

2. VERTICALLY through the roof using double wall type "B" vent (See Fig. 6 & 7).

3. If condensation is a problem, the vent length should be shortened or the pipe insulated.
UNVENTED HEATER
The Vantage® is also certified for unvented installations provided the following conditions are met:

1. An interlock must be used with exhaust fans to prevent the heater, or heaters from coming on when the exhaust fans are off. This may be done using an air proving switch as shown in the electrical wiring diagram (Fig. 19) in this manual. Capacity of the exhaust fan must be 300 CFM for every 100,000 BTU/hr. of input.

2. The vent terminal must be installed on the unit.

3. When installed in adequately ventilated agricultural buildings used ONLY for brooding purposes, the interlock is not required provided that maximum input does not exceed 30 BTU per cubic foot or the input specified by local codes or authorities.

4. If condensation is a problem, the vent length should be shortened or the flue should be insulated.

GAS PIPING
All piping and connections shall be made in accordance with CAN1-B149.1 and B149.2 "Installation codes for gas burning appliances" and/or local codes.

A drip leg consisting of a tee, nipple, and pipe cap, which forms a trap for dirt and moisture, must be attached to the gas line as shown in Figure 8. A 1/8" N.P.T. plugged tapping, accessible for a test gauge connection, must be supplied immediately upstream of the gas supply connection of the appliance.

The gas line and meter which feeds the heater(s) must be large enough to supply the required gas. If there is any question, check with the gas company.

<table>
<thead>
<tr>
<th>CAUTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>For high pressure testing on gas piping, COMPLETELY DISCONNECT ALL BURNER UNITS AND THE SHUT-OFF COCKS SUPPLIED WITH SAME; then install pipe cap on system and conduct test. Failure to follow this procedure will exceed pressure rating of burner gas controls and this will require complete replacement of these parts.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>WARNING</th>
</tr>
</thead>
<tbody>
<tr>
<td>There is expansion of the radiant pipe with each firing cycle, and this will cause the burner to move with respect to the gas line. This can cause an unsafe condition if the gas connection is not made strictly in accordance with Figure 4.</td>
</tr>
</tbody>
</table>
The purpose of the gas connector from the heater to the gas piping is twofold as follows:
✓ To facilitate installation and replacement of the burner
✓ To accommodate any movement between the heater and the gas piping. See warning below.

The flexible metallic connector assembly, as supplied, must be installed as shown in Figure 4.

SEQUENCE OF OPERATION
MODEL VANTAGE® D.S.I. CONTROL

The Vantage® heater is equipped with a direct spark ignition system.

Sequence of Operation:
✓ The thermostat on call for heat, energizes blower motor.
✓ When motor approaches nominal running R.P.M., the air proving switch closes energizing the ignition module which energizes the spark igniter and opens the redundant gas valve.
✓ As the flame is established, the spark ceases.
✓ If the flame is not established during the flame establishing period, the system closes the gas valve and locks out.
✓ If the flame is extinguished during the duty, the igniter will provide one immediate retry for ignition before going into lockout.
✓ After lockout, control must be reset by turning down thermostat for five (5) seconds, and then raising it again to desired temperature, or unplugging appliance cord, and then plugging in again.
✓ When thermostat is satisfied all power to the unit is de-energized.

WIRING
All electrical wiring and connections shall be made in accordance with the CSA standard C22.1 Canadian Electrical Code Part 1 and/or local codes.
Refer to wiring diagrams.
WIRING DIAGRAM FENWAL DSI.

Figure 18

WIRING DIAGRAM FOR UNVENTED HEATER ELECTRICAL INTERLOCK

Figure 19
A REFLECTOR SIDE EXTENSION, used to reduce clearances to combustible construction may be installed on either side of the unit as shown below.

- Attach a reflector side extension support bracket (#77187) to tube as needed. These brackets should be located adjacent to the overlapped joints of the reflector side extension.

- Insert lower edge of reflector side extension in extension support bracket.

- Cut suitable relief notch for each reflector hanger. (#77180)

- Hook top edge of reflector side extension (#77140) over edge of reflector (#77145) (See Detail "A").

- A slip joint must be provided in the reflector side extension at the location of each slip joint in the reflector. The overlap should be the same as the reflector.

- Where severe air movement may be encountered, as at a large door, one (1) or two (2) sheet metal screws should be used, except where a slip joint is required.

- Install at least two brackets #77198 for each reflector side extension.

NOTE: TO INSTALL #77198 BRACKETS:

Lay bracket over the reflector side extension and standard reflector at selected location. By using hole as template, drill or punch approximately 3/32" dia. pilot hole in the standard reflector. Install #8 x 3/8" sheet metal screws (see Detail A).
Outside air supply

The building has a slight negative pressure or contaminants are present, outside combustion air may be supplied to the heater. See Fig. 10.

4" Dia. duct MAY BE ATTACHED to the heater outside air adaptor. This duct may be up to 60 feet, less the vent pipe, in length. Deduct 10 feet for each elbow in the air supply duct or vent pipe.

NOTE:

- The air supply duct may have to be insulated to prevent condensation forming on outer surface.

---

Outside air supply

Blower

(Fits 4" vent pipe)

End View (Cut-A-Way)

Outside wall

Fresh air intake hood

Part No. 58124

Flashing

(by others)

Outside air pipe

4" dia.

(by others)

Seal all joints with duct tape or sealant

Yantace®-Heater

---

Installation through combustible wall

Combustible wall

4" dia. vent pipe

Vent terminal

Thimble

P/N 58122

16" min.

40" max.

1 1/2" gap

12"

7" dia. thimble

12"
VANTAGE—HEATER CONFIGURATION

Plan view VANTAGE

NOTE: Elbow may be installed in either direction.

INSTALLATION OF REFLECTOR JOINT PIECE AND END CAP

Assembly details
(optional heater assembly)
VANTAGE® HEATER CONTROL
150,000 125,000 BTU/hr
100,000 BTU/hr 40 and 50' only
80,000 BTU/hr 60' on 150,000 only

Legend:
- 40' length of tubing
- 20' length of tubing
- 10' tubing length extension, OPTIONAL (Vantage 100 and 125 only)
- Optional elbow package P/N 55325

Can go in either direction typ.
Note: 5' length field cut from 10' length (supplied) and requires extra coupling (not supplied).
TROUBLE SHOOTING GUIDE

NO GAS PRESENT:
Gas pressure downstream of gas control can be measured by using a manometer and connecting to pressure tap on control.
✓ Check to see if manual valve to heater in "ON".
✓ Check to see if manual valve knob on heater gas control is "ON".
✓ Supply gas pressure can be checked at 1/8" NPT pressure tapping on heater external manual valve (see figure 8).
✓ Check to see if gas control is opening; no manifold pressure indicates valve closed.

Trouble could be:
✓ Defective gas control
✓ Defective ignition module

- DO NOT DISCONNECT GROUND LEADS ON HEATER
- DO NOT INTERCHANGE GROUNDED AND UNGROUNDED LEADS ON TRANSFORMER OR IGNITION MODULE.

BURNER LIGHTS AND THEN GOES OUT:
Flame current is the current which passes through the flame from the sensor to ground to complete the primary circuit. A minimum flame generated current, usually about 2.0 MICRO-AMPS is necessary to prevent lockout, (see figure 14) for measuring flame current.

![Diagram](image-url)
D.S.I. CONTROLS

Caution:
Before opening control housing cover for any type of service be sure the GAS has been shut off at the heater, and the ELECTRICAL SUPPLY CORD ON THE HEATER IS UNPLUGGED.

NO POWER (Heater plugged in):
✓ Check to see that thermostat is calling for heat.
✓ Check fusing in electrical supply to heater.
✓ Check for 115V at receptacle.

BLOWER MOTOR FAILS TO RUN
✓ Check for broken motor wire.
✓ Does blower wheel turn freely? If motor is seized replace same.

NO SPARK
✓ Turn off gas and check for spark at the burner observation window.
✓ Some modules have a built-in pre-purge (30 sec.)
✓ Recycle thermostat or power if no spark appears.
✓ Check for loose or broken leads.
✓ Is air switch making?
✓ Electrode gap should be .125".
✓ Check if maximum vent or fresh air pipe has exceeded 60 equivalent feet.
✓ Is vent terminal plugged?
✓ Check air switch plastic tubing connection.
✓ A hole in a line or disconnection of a tube will prevent ignition.
✓ Differential pressure can be measured across the air switch and is 0.50" W.C. cold (i.e. burner off.

PROCEDURE TO REMOVE BURNER
✓ Remove gas connector from heater.
✓ Open housing cover.
✓ Disconnect wires between blower, control valve, ignitor/sensor and rear bulkhead.
   Disconnect air switch tubes.
✓ Remove six (6) screws holding burner control housing shroud to burner tube partition.
✓ Remove bulkhead with control components and housing from burner; this exposes the blower and burner.
✓ Remove blower from burner tube.
✓ Remove burner.
✓ To reassemble, reverse above steps.
MAINTENANCE

For best performance, maintenance procedures should be performed each heating season.

✓ BE SURE GAS AND ELECTRIC SUPPLY TO HEATER ARE OFF BEFORE PERFORMING ANY SERVICE OR MAINTENANCE.
✓ Check condition of blower scroll and motor. Dirt and dust may be blown out with compressed air or a vacuum cleaner may be used.
✓ Check condition of burner.
✓ Make visual check of electrode. Replace if there is excessive carbon residue, erosion of electrodes or other defects. Gap should be .125".
✓ Check inside of firing tube with flashlight. If carbon or scale are present, scrape out deposits with wire brush or a rod, or metal plate attached to wooden pole.
✓ Check flue pipe for soot or dirt. After cleaning as necessary, re-attach flue pipe to heater.
✓ Outside surfaces of heater reflector may be cleaned by wiping with a damp cloth.
✓ A qualified service agency should be contacted for service other than routine maintenance.
✓ Check vent terminal and fresh air inlet to see that they have not become blocked during the "OFF" season. If either pipe is restricted, the air switch won't close, resulting in a no heat situation.

FIELD CONVERTIBILITY
This unit has been approved for use with natural gas or propane. A version kit is available to convert this to the alternate fuel.

SPECIAL NOTE
Regulators must be replaced by ones from the same manufacturer. When ordering a conversion kit specify: HONEYWELL OR ROBERSHAW.

THE CONVERSION SHALL BE CARRIED OUT IN ACCORDANCE WITH THE REQUIREMENTS OF THE PROVINCIAL AUTHORITIES HAVING JURISDICTION AND IN ACCORDANCE WITH THE REQUIREMENTS OF THE CAN/CGA AND B149.2 INSTALLATION CODE.

CONVERSION INSTRUCTIONS:
✓ Disconnect gas supply line and unplug electrical supply cord.
✓ Remove gas connector from heater.
✓ Open housing cover.
✓ Disconnect wires between blower, valve, igniter/sensor and rear bulkhead.
✓ Remove six (6) screws holding burner housing/shroud to burner tube partition.
✓ Remove bulkhead with control components and housing from burner; this exposes the blower and burner.
✓ Remove blower from burner tube.
✓ Remove burner.
✓ To reassemble, reverse above steps.
✓ Remove the brass orifice adapter from the burner.
✓ Reassemble the heater reversing the above steps.
✓ Affix data label supplied in kit.

<table>
<thead>
<tr>
<th>This appliance has been converted to:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Orifice:</td>
</tr>
<tr>
<td>Manifold Pressure:</td>
</tr>
<tr>
<td>Input:</td>
</tr>
<tr>
<td>Cet appareil a été converti au</td>
</tr>
<tr>
<td>Injecteur</td>
</tr>
<tr>
<td>Pression à la tubulure d'alimentation</td>
</tr>
<tr>
<td>Débit calorifique</td>
</tr>
</tbody>
</table>
VANTAGE REPLACEMENT PARTS

MODEL GTH-( ) & GTHS-80 HEATERS

INTERNAL PARTS

MODEL GTHS-80F & GTH-( ) F HEATERS

FIGURE 20
### Vantage Replacement Parts
(Refer to Figure 20)

<table>
<thead>
<tr>
<th>Item</th>
<th>Description</th>
<th>Part No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Motor/Blower Assembly</td>
<td>90708601</td>
</tr>
<tr>
<td>2.</td>
<td>Transformer</td>
<td>90435700</td>
</tr>
<tr>
<td>3.</td>
<td>Ignition Module Package</td>
<td>02713500</td>
</tr>
<tr>
<td>4.</td>
<td>Ignition Electrode Assembly</td>
<td>90427400</td>
</tr>
<tr>
<td>5.</td>
<td>Electrode Mounting Package</td>
<td>02516200.</td>
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<tr>
<td>6.</td>
<td>Ignition Cable Assembly</td>
<td>90434800</td>
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<tr>
<td>7.</td>
<td>Ring Viewer Package</td>
<td>58087</td>
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<tr>
<td>8.</td>
<td>Gas Valve (LP) - Honeywell</td>
<td>90032501</td>
</tr>
<tr>
<td></td>
<td>- Robertshaw</td>
<td>90031100</td>
</tr>
<tr>
<td>9.</td>
<td>Gas Valve (Nat) - Honeywell</td>
<td>90032500</td>
</tr>
<tr>
<td></td>
<td>- Robertshaw</td>
<td>90031200</td>
</tr>
<tr>
<td>10.</td>
<td>Air Sensing Switch GTH - 80,100,125</td>
<td>63206</td>
</tr>
<tr>
<td></td>
<td>GTHS-80 (only)</td>
<td>63198</td>
</tr>
<tr>
<td>11.</td>
<td>Burner Casting Assembly</td>
<td>02552000</td>
</tr>
<tr>
<td>12.</td>
<td>Orifice Adapter</td>
<td>02591800</td>
</tr>
<tr>
<td>13.</td>
<td>Orifice - Natural Gas 80,000 BTU/HR</td>
<td>58361</td>
</tr>
<tr>
<td></td>
<td>Orifice - Propane Gas 125,000 BTU/HR</td>
<td>58362</td>
</tr>
<tr>
<td></td>
<td>Orifice - Propane Gas 80,000 BTU/HR</td>
<td>58363</td>
</tr>
<tr>
<td></td>
<td>Orifice - Natural Gas 125,000 BTU/HR</td>
<td>58364</td>
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<tr>
<td></td>
<td>Orifice - Natural Gas 100,000 BTU/HR</td>
<td>58366</td>
</tr>
<tr>
<td></td>
<td>Orifice - Propane Gas 100,000 BTU/HR</td>
<td>63545</td>
</tr>
</tbody>
</table>

### Fuel Conversion Kits (Robertshaw Gas Valve)

- Propane to Natural Gas - 125,000 BTU/HR: 58377
- Natural Gas to Propane - 125,000 BTU/HR: 58378
- Propane to Natural Gas - 80,000 BTU/HR: 58383
- Natural Gas to Propane - 80,000 BTU/HR: 58384
- Natural Gas to Propane - 100,000 BTU/HR: 58388
- Propane to Natural Gas - 100,000 BTU/HR: 58389

### Fuel Conversion Kits (Honeywell Gas Valve)

- Propane to Natural Gas - 80,000 BTU/HR: 03012004
- Natural Gas to Propane - 80,000 BTU/HR: 03012005
- Propane to Natural Gas - 100,000 BTU/HR: 03012006
- Natural Gas to Propane - 100,000 BTU/HR: 03012007
- Natural Gas to Propane - 125,000 BTU/HR: 03012008
- Propane to Natural Gas - 125,000 BTU/HR: 03012009
Troubleshooting Guide: VANTAGE

1. Turn up thermostat.
2. Does the blower turn on? 
   - No: Check Voltage to motor, is it 110V?
   - Yes: Is the blower obstructed? 
     - Yes: Remove obstruction.
     - No: Replace motor.
3. Is there spark at the ignitor? 
   - No: Is Ignitor Gap set at .120”?
   - Yes: Is the Ignitor damaged?
     - No: Is Ignition Wire in good repair and not grounding?
       - No: Replace Wires.
       - Yes: Reset Spark Gap.
     - Yes: Replace ignitor.
4. Is the inlet or outlet of the unit obstructed?
   - No: Check the transformer secondary voltage, is it 24 volts?
     - No: Remove obstruction.
     - Yes: Place jumper at both wires at pressure switch. Do you have spark?
       - No: Replace Ignition module.
       - Yes: Replace pressure switch.
5. Check wiring and connection diagram.
   - No: Is the voltage between the black and white loads of the transformer 110V?
     - Yes: Replace transformer.
   - Yes: Replace transformer.