SERVICE MANUAL

22444

948RX

Heavy Duty Gas Griddles

924RX
936RX
948RX
960RX
972RX
MSA24
MSA36
MSA48
MSA60
MSA72
ASA24
ASA36
ASA48
ASA60
ASA72

- NOTICE -

This Manual is prepared for the use of trained Vulcan Service Technicians and should not be used by those not properly qualified.

This manual is not intended to be all encompassing. If you have not attended a Vulcan Service School for this product, you should read, in its entirety, the repair procedure you wish to perform to determine if you have the necessary tools, instruments and skills required to perform the procedure. Procedures for which you do not have the necessary tools, instruments and skills should be performed by a trained Vulcan Service Technician.

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TABLE OF CONTENTS

SERVICES UPDATES 3
SERVICE UPDATES 3
TIS DOCUMENT LIST - 900RX SERIES 3

GENERAL 4
INTRODUCTION 4
INSTALLATION 4
OPERATION 4
CLEANING 4
SPECIFICATIONS 4
TOOLS 5
COMPONENT LOCATION 5

REMOVAL AND REPLACEMENT OF PARTS 6
COVERS AND PANELS 6
MOMENTARY POWER SWITCH (900RX) 6
ELECTRIC IGNITER (900RX) 7
BASO SAFETY VALVE 7
THERMOSTAT VALVE ASSEMBLY 7
BURNER 9
PILOT, THERMOCOUPLE ASSEMBLY 9

SERVICE PROCEDURES AND ADJUSTMENTS 11
CALIBRATION 11
PILOT ADJUSTMENT 12
GAS PRESSURE MEASUREMENT 12
GAS PRESSURE REGULATOR ADJUSTMENT 13
BURNER ADJUSTMENT 14
THERMOCOUPLE TEST 14

ELECTRICAL OPERATION 16
ELECTRICAL DIAGRAM 16

TROUBLESHOOTING 18
TROUBLESHOOTING 18

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SERVICES UPDATES

SERVICE UPDATES

November, 2018
- Added TIS Document List.

February 2019
- Updated PILOT, THERMOCOUPLE ASSEMBLY.

TIS DOCUMENT LIST - 900RX SERIES

SERVICE TAB	
Document Title	**Document Type**
900RX Series Heavy Duty Gas Griddles Service Manual	Service Manual

SERVICE TAB (Multimedia)	
Document Title	**Document Type**
Repairing Flood-Damaged Food Equipment	Misc
900RX Series Heavy Duty Gas Operation & Installation Manual	Operator
AGE, AGM, 900RE, 900RX, and ASA Series Gas Griddle Grease Chute P/N 498234-A Installation Instructions	Service Instructions
Fundamentals of Gas	Service Instructions
Rating Plate Locations on Current Vulcan-Hart/Wolf Range Equipment	Technical Service Bulletin (TSB)
TSB 0842 4 Position/3 Heat Switch - Ranges, Ovens, Broilers	Technical Service Bulletin (TSB)
TSB 1037A Hobart to Vulcan "Common" Model Cross Reference List	Technical Service Bulletin (TSB)
TSB 1301 Onwatch Quicklook 72 for Gas Cooking Equipment	Technical Service Bulletin (TSB)
TSB 682 Griddle Lead Wire Upgrading	Technical Service Bulletin (TSB)
RobertShaw FS Flame Switch Recall Vulcan & Wolf Equipment Effected - PN 713933	Temporary Service Instructions (TSI)

PARTS TAB	
Document Title	**Document Type**
900RX and MSA Heavy Duty Gas Griddles Parts Catalog	Parts Catalog

GENERAL

⚠ WARNING

The griddle and its parts are hot. Use care when operating, cleaning or servicing the griddle.

INTRODUCTION

This Service Manual covers specific service information related to the models listed on the front cover and built after March 2010.

Procedures in this manual will apply to all 900RX models unless specified. No procedure in this manual will require the removal or raising of the griddle plate. Pictures and illustrations can be of any model unless the picture or illustration needs to be model specific.

MSA griddles have a standing pilot that must be lit manually. One pilot services two burners via a flame tube between the burners. The 900RX utilizes a spark ignition system that has a 'momentarily on' switch - that means the switch must be held down for sparking to take place, and it ceases sparking when released.

The MSA and 900RX have BASO® pilot safety valves that must be pressed to allow gas to feed the pilot burner. For the 900RX, the pilot buttons must be pressed at the same time the power switch is pressed in order to light the pilot.

INSTALLATION

Generally, installations are made by the dealer or contracted by the dealer or owner. Detailed installation instructions are included in the Installation and Operation Manual that is sent with each unit. However, it should be noted that an improperly installed unit, especially an unlevel unit can lead to premature electrical component failures. A unit that is higher in the front will cause the flue gases to vent improperly and gather in the front near the electrical components. All models must be installed with an externally mounted regulator.

OPERATION

Detailed operation instructions are included in the Installation & Operation Manual sent with each unit and are also available at WWW.VULCANHART.COM.

The 900RX models feature an electric ignition system that is controlled by a momentary power switch. The power switch turns the electric ignition system off and on only and will only supply power to the igniters when held down in the ON position. The burners and pilots will continue to work with the power switch in the OFF position until the gas supply to the unit is cut off or the griddle gas shut-off valve is turned to the OFF position. The pilots are monitored by thermocouples and pilot safety valves. If the pilot goes out, the safety valve will shut-off the gas supply to the pilot and main burners. In the event of a failure of the electronic ignition system, it is possible to ignite the pilots with an outside source (such as a lit taper). You will have to reach under the front of the unit and through the pilot cutout to ignite the pilots while again depressing the corresponding red button.

CLEANING

Detailed cleaning procedures are included in the Installation & Operation manual sent with each unit.

SPECIFICATIONS

Stainless steel front, sides and front top ledge. Fully welded stainless and aluminized steel body frame. 11" low profile cooking height on 4" legs. 1" thick polished steel griddle plate with 12 gage, 4" stainless steel back and tapered side splashes. Grease chute is fully welded to stop grease migration.

One 27,000 BTU/hr. “U” shaped aluminized steel burner and mechanical snap action thermostat for each 12" of griddle width. Chrome thermostat knob guards. Temperature adjusts from 200° to 550° F. One pilot safety for every two burners. Manual shut-off valve. 3½" wide stainless steel grease trough. 120V 50/60Hz 1 Amp single phase electric ignition circuit. Plug type is NEMA 5-15 USA. ¾" rear gas connection and gas pressure regulator.

A gas pressure regulator supplied with the unit must be installed.

Check and set the gas pressure after the regulator is installed.

Manifold pressure should be:

Natural Gas 4.0" W.C.

Propane Gas 10.0" W.C.

Incoming pressure should be 5-9" W.C. for Natural Gas and 11.0" W.C. for Propane Gas.

Incoming pressure should not exceed 14.0" W.C.

TOOLS

- Standard set of hand tools.
- VOM with A/C current tester (any quality VOM with a sensitivity of at least 20,000 ohms per volt can be used).
- Temperature tester (thermocouple type).
- U-Tube or Digital Manometer.
- Thread sealant suitable for use with natural or propane gas.
- Aluminum Foil Tape - McMaster Carr Part No. 7631421 or equivalent.
- Adapter to test thermocouple, Johnstone Supply Part No. H23-226 or equivalent.

Fig. 1

COMPONENT LOCATION

Front View 924RX

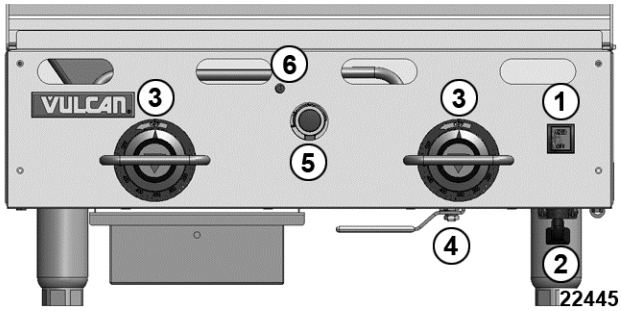


Fig. 2

1. Pilot electric ignition system control switch (RX only)
2. Power cord (RX only)
3. Thermostat
4. Gas shut off valve (RX only)
5. BASO® pilot safety valve
6. Pilot flame adjustment

Top View 924RX

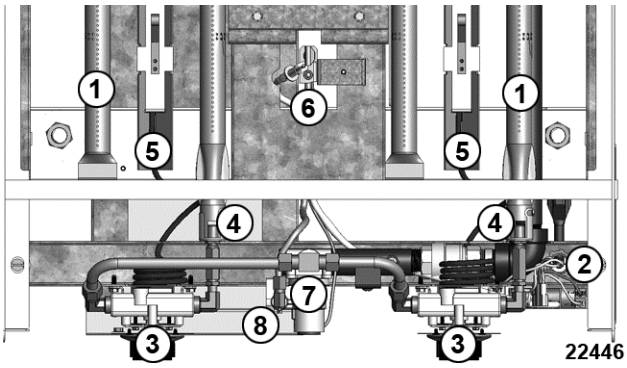


Fig. 3

1. Burner assembly
2. Electric igniter (RX only)
3. Thermostat
4. Orifice
5. Thermostat capillary tube
6. Pilot, igniter (RX only) and thermocouple
7. BASO® pilot safety valve
8. Pilot adjustment valve

REMOVAL AND REPLACEMENT OF PARTS

COVERS AND PANELS

⚠ WARNING

Disconnect the electrical power to the machine and follow lockout / tagout procedures.

FRONT PANEL

1. Turn all thermostats to off position, loosen set screw securing thermostat knobs and pull off knobs.

NOT IN OFF POSITION FOR VIEW

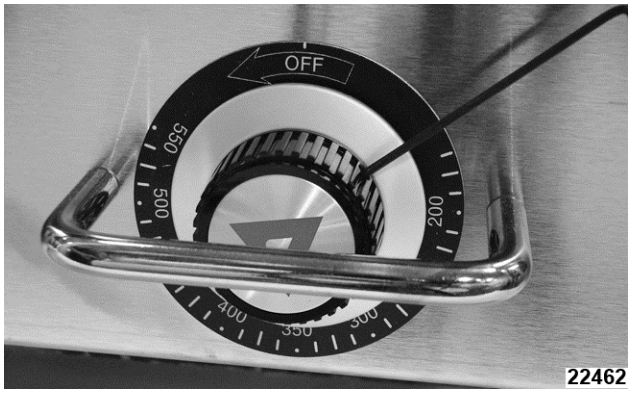


Fig. 4

2. Remove screws securing front panel to griddle.
3. Pull front panel forward and lay aside. If servicing a 900RX lay front panel face down in front of unit.
4. Install in reverse order.

NOTE: Before installing front panel, check that line-of-sight through the front panel to see both pilot burners and griddle burners. Move any flexible gas tubing, or capillary tubing that may obstruct the sight holes.

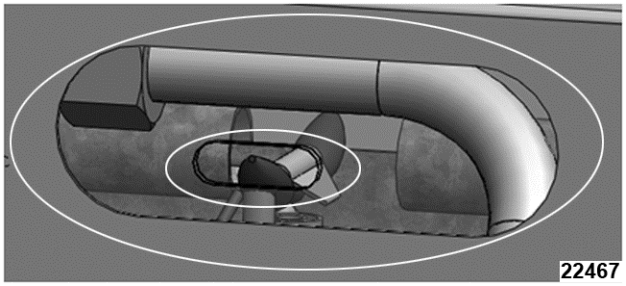


Fig. 5

BACK PANEL

⚠ WARNING

Shut off the gas before servicing the unit and follow lockout / tagout procedures.

⚠ WARNING

All gas joints disturbed during servicing must be checked for leaks. Check with a soap and water solution (bubbles). Do not use an open flame.

NOTE: It will be necessary to remove the back panel when changing a burner or to remove excessive grease build up from flue area.

1. Disconnect gas supply at griddle.

   Remove screws securing back panel to griddle.

   Install in reverse order.

MOMENTARY POWER SWITCH (900RX)

⚠ WARNING

Disconnect the electrical power to the machine and follow lockout / tagout procedures.

1. Remove FRONT PANEL.
2. Label and disconnect wires from power switch.
3. Squeeze switch retainers and slide switch out through front of panel.

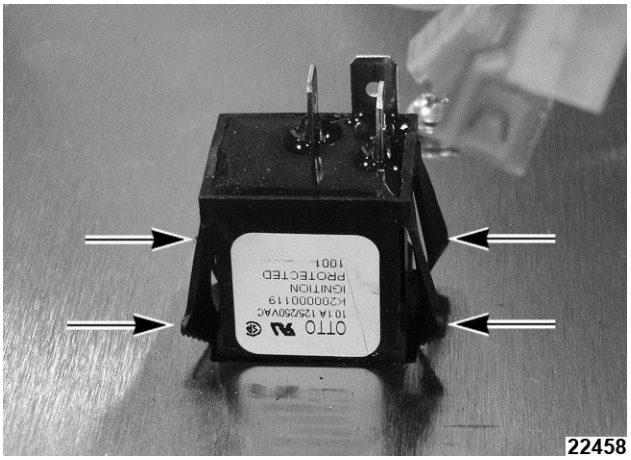


Fig. 6

4. Install in reverse order.

ELECTRIC IGNITER (900RX)

⚠ WARNING

Disconnect the electrical power to the machine and follow lockout / tagout procedures.

1. Remove FRONT PANEL.
2. Push tab to release igniter from frame and pull out of unit.

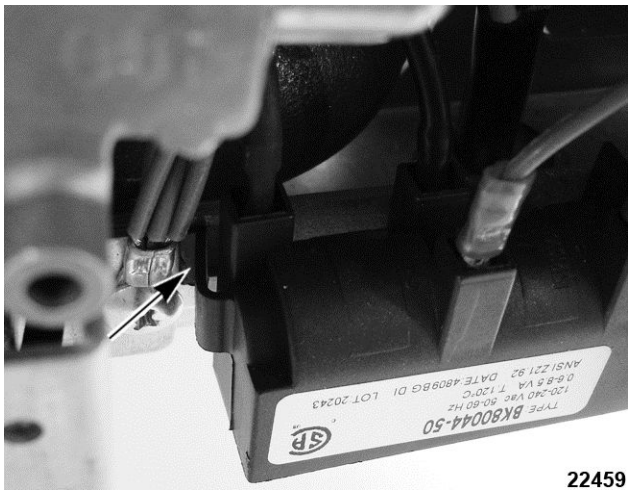


Fig. 7

3. Label and disconnect wires from electric igniter.
4. Install in reverse order.

BASO SAFETY VALVE

⚠ WARNING

Disconnect the electrical power to the machine and follow lockout / tagout procedures.

⚠ WARNING

Shut off the gas before servicing the unit and follow lockout / tagout procedures.

⚠ WARNING

All gas joints disturbed during servicing must be checked for leaks. Check with a soap and water solution (bubbles). Do not use an open flame.

1. Remove FRONT PANEL.
2. Measure distance between manifold pipe and valve for reassembly later.

NOTE: Ignition wires must be routed in front of valves as shown to prevent them from touching hot heat shield.

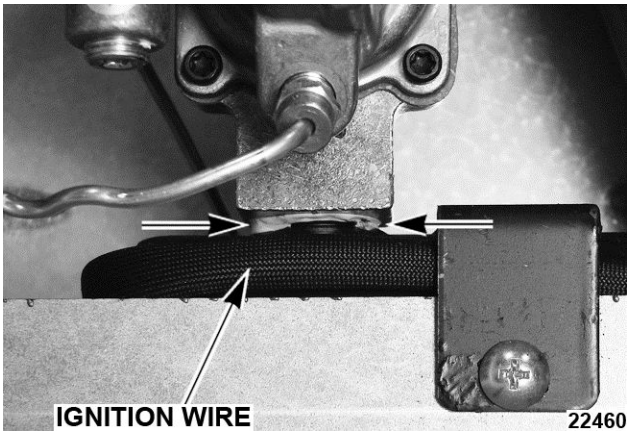


Fig. 8

3. Disconnect all gas lines and thermocouple from valve.
4. Remove valve from unit.
5. Transfer fittings from old valve to new valve. Use thread sealant on assembly.
6. Install new valve to same measurement as in Step 2.
7. Continue to install in reverse order.

THERMOSTAT VALVE ASSEMBLY

⚠ WARNING

Disconnect the electrical power to the machine and follow lockout / tagout procedures.

⚠ WARNING

Shut off the gas before servicing the unit and follow lockout / tagout procedures.

⚠ WARNING

All gas joints disturbed during servicing must be checked for leaks. Check with a soap and water solution (bubbles). Do not use an open flame.

1. Remove FRONT PANEL.
2. Disconnect gas line.

3. Remove screws securing thermostat mounting bracket to frame.

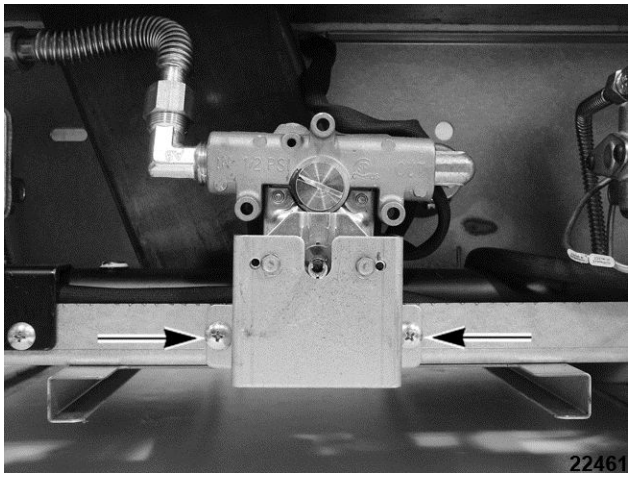


Fig. 9

4. Pull capillary tube out from underneath griddle plate.
5. Transfer fittings from old thermostat to new thermostat. Use thread sealant.
6. Transfer thermostat mounting bracket to new thermostat.
7. Remove insulator sleeve from old capillary tube and install on new thermostat.
8. Secure end of insulator sleeve to thick end of capillary tube with metal tape as shown.

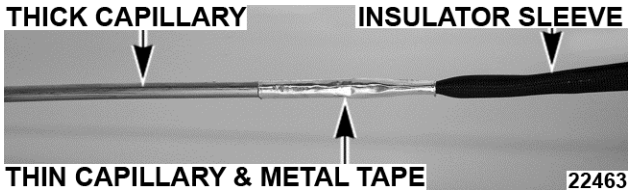


Fig. 10

9. Slide capillary tube all the way into slot underneath griddle plate until it is fully seated.
10. Carefully insert orifice into burner and secure thermostat mounting bracket to frame.

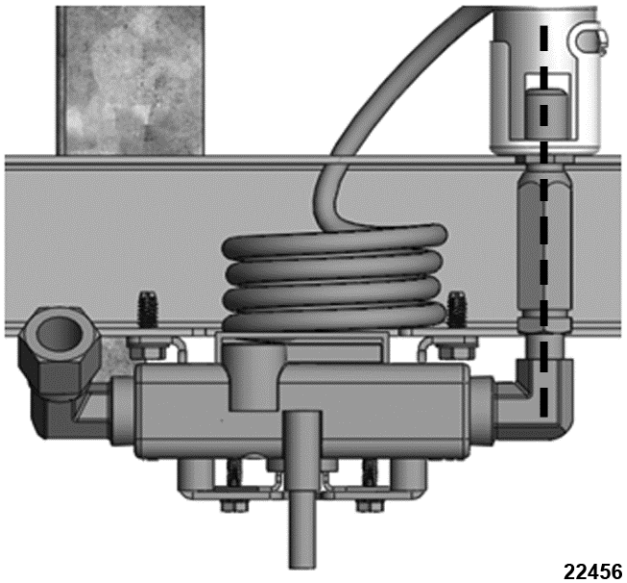


Fig. 11

11. Inlet to burner must be straight. Adjust thread on orifice and/or extension to close gap between orifice and burner to 1/16".

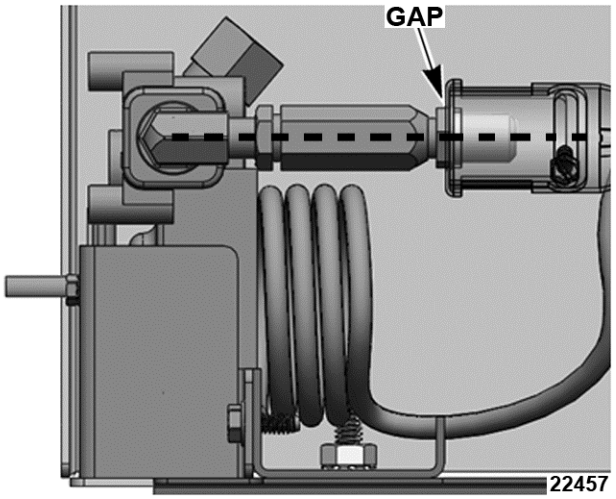


Fig. 12

12. Continue to install in reverse order.

BURNER

⚠ WARNING

Disconnect the electrical power to the machine and follow lockout / tagout procedures.

⚠ WARNING

Shut off the gas before servicing the unit and follow lockout / tagout procedures.

⚠ WARNING

All gas joints disturbed during servicing must be checked for leaks. Check with a soap and water solution (bubbles). Do not use an open flame.

1. Remove FRONT PANEL and BACK PANEL.
2. Disconnect gas supply at griddle.
3. Remove screw securing burner to wall.

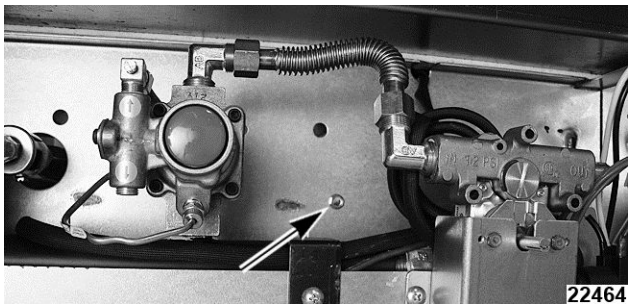


Fig. 13

4. At rear of unit, pull burner enough to disengage burner pin from frame and pull burner out.

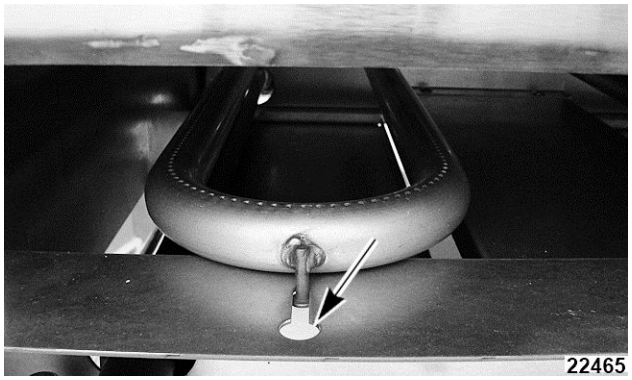


Fig. 14

5. Install in reverse order.
6. Adjust as outlined in BURNER ADJUSTMENT.

PILOT, THERMOCOUPLE ASSEMBLY

⚠ WARNING

Disconnect the electrical power to the machine and follow lockout / tagout procedures.

⚠ WARNING

Shut off the gas before servicing the unit and follow lockout / tagout procedures.

1. Remove FRONT PANEL.
2. From underneath the front of the griddle, remove screw securing pilot assembly bracket.

   VIEW FROM REAR OF UNIT TO SEE PARTS

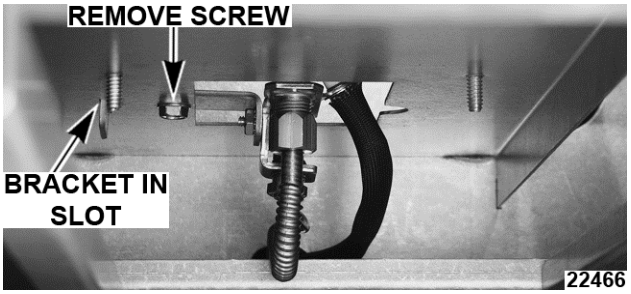


Fig. 15

3. Carefully lift to disengage bracket from slot and work assembly down to access parts.
4. With pilot (1, Fig. 16) centered in flash tube opening, center align ignition ports with both sides of flash tube (2, Fig. 16). Verify 1/8” gap between the end of flash tube and burner on both sides.

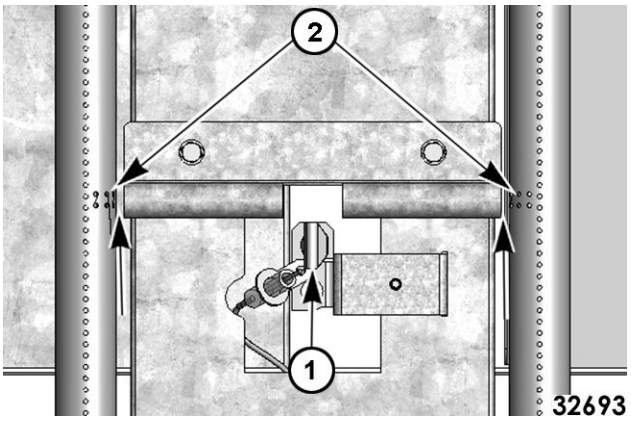


Fig. 16

5. Service assembly as required and assemble in reverse order being sure bracket is seated in slot for alignment.

SERVICE PROCEDURES AND ADJUSTMENTS

CALIBRATION

LEVEL

The griddle must be level (side-to-side and front-to-back) during operation to ensure proper performance. Improper leveling can result in uneven temperature distribution, cold spots, and possibly damage electrical components.

1. Place a level on the griddle.
2. Adjust legs by turning the bullet feet at the bottom of each leg. Using pliers or a crescent wrench, turn the feet counter-clockwise to increase height, and clockwise to decrease height until leveling is achieved. Do not extend the legs more than 1-¾".

CALIBRATE

1. Each thermostat controls a 12" zone of the griddle. Using a Surface Probe temperature measurement device, observe the temperatures at the center points of the cooking zones. These points are located by starting 6" from the side splash (left or right) and every 12" across the width of the griddle, with all points located 12" back from the front edge of the griddle plate.

NOTE: Use of infrared thermometers is not recommended. These devices are highly sensitive to surface color (clean or dirty), angle of reading and distance from the unit.

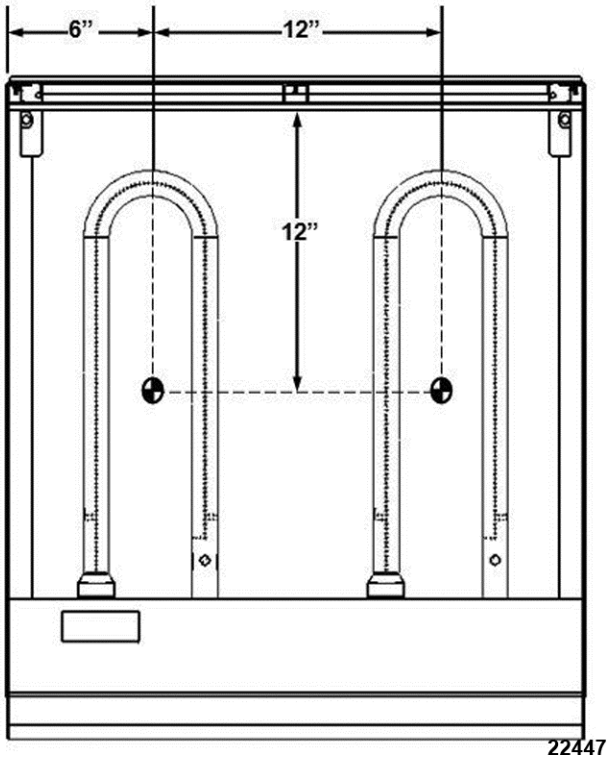


Fig. 17

2. Set thermostats to 350°F and allow to stabilize.
3. Record the temperature tester readouts for each zone for *3 cycles*.

Temperature Tester turn-*off* deg F	**Temperature Tester turn-*on* deg F**	**Turn-Off + Turn-On divide by 2 = average**
		Total averages
		divide by 3 ____ deg F

4. Calculate total average temperature for that zone.
5. The temperature should be 350°F ±15°F. If not, continue to next step.

6. Carefully loosen the knob set screw. DO NOT allow the knob to turn. Carefully remove the knob from the thermostat shaft, exposing the temperature dial.

22448

Fig. 21

7. Loosen screws on the temperature dial and adjust it so that the temperature indicated by the knob arrow matches the griddle plate temperature reading. Knob will have to be carefully placed back on the shaft to verify adjustment.

22449

Fig. 22

NOTICE

Never adjust the screw in the center of the thermostat shaft. This will ruin the factory calibration; the thermostat will no longer operate properly and will need to be replaced.

8. Once calibration is achieved, tighten the temperature dial screws and knob set screws.

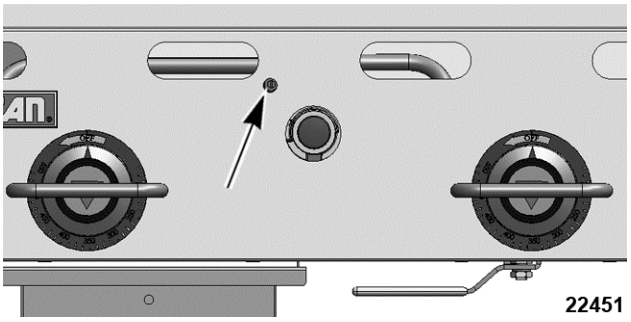
22450

Fig. 23

9. Repeat Steps 3 thru 8 for each zone.

PILOT ADJUSTMENT

Using a flathead screwdriver, turn the slotted pilot adjustment screw clockwise to decrease the flame, and counterclockwise to increase the flame.



22451

Fig. 24

GAS PRESSURE MEASUREMENT

⚠ WARNING

All gas joints disturbed during servicing must be checked for leaks. Check with a soap and water solution (bubbles). Do not use an open flame.

1. Turn the gas supply off at a manual shutoff valve.
2. Remove the control panel.
3. Remove the pressure tap plug and attach manometer.
4. Turn gas back on.
5. Light pilot(s).
6. Turn all thermostats on to the maximum setting so that all burners are on.
7. Turn all the equipment on the same supply line on.

8. Check gas pressure.
9. Gas pressure should read 4” W.C. for natural and 10” W.C. for propane gas. If not correct, refer to GAS PRESSURE REGULATOR ADJUSTMENT.
10. Turn gas supply off, disconnect manometer and reinstall pressure tap plug.

924RX SHOWN

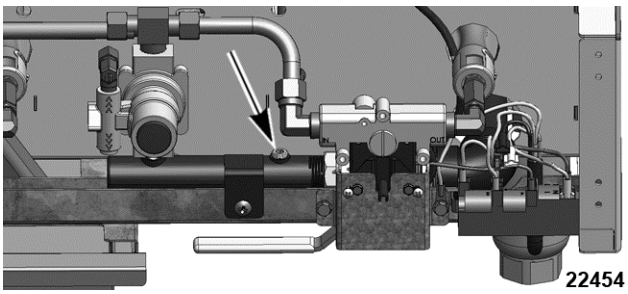


Fig. 25

GAS PRESSURE REGULATOR ADJUSTMENT

A gas pressure regulator is supplied with the griddle and must be installed as close to the griddle on the gas supply line as possible. Make sure that the arrow on the underside of the regulator is oriented in the direction of gas flow to the griddle and the regulator is positioned with the vent plug and adjustment screw upright. Check that vent plug is not clogged by grease and debris.

Check and set the gas pressure after the regulator is installed. The pressure should be set for 4” water column (W.C.) for natural gas and 10” W.C. for propane gas while all burners are on.

The supply pressure (upstream of the regulator) should be 7-9” W.C. for natural gas and 11-12” W.C. for propane gas. At no time should the griddle be connected to supply pressure greater than ½ psig (3.45 kPa) or 14” W.C.

Graphic shows pressure plug location.

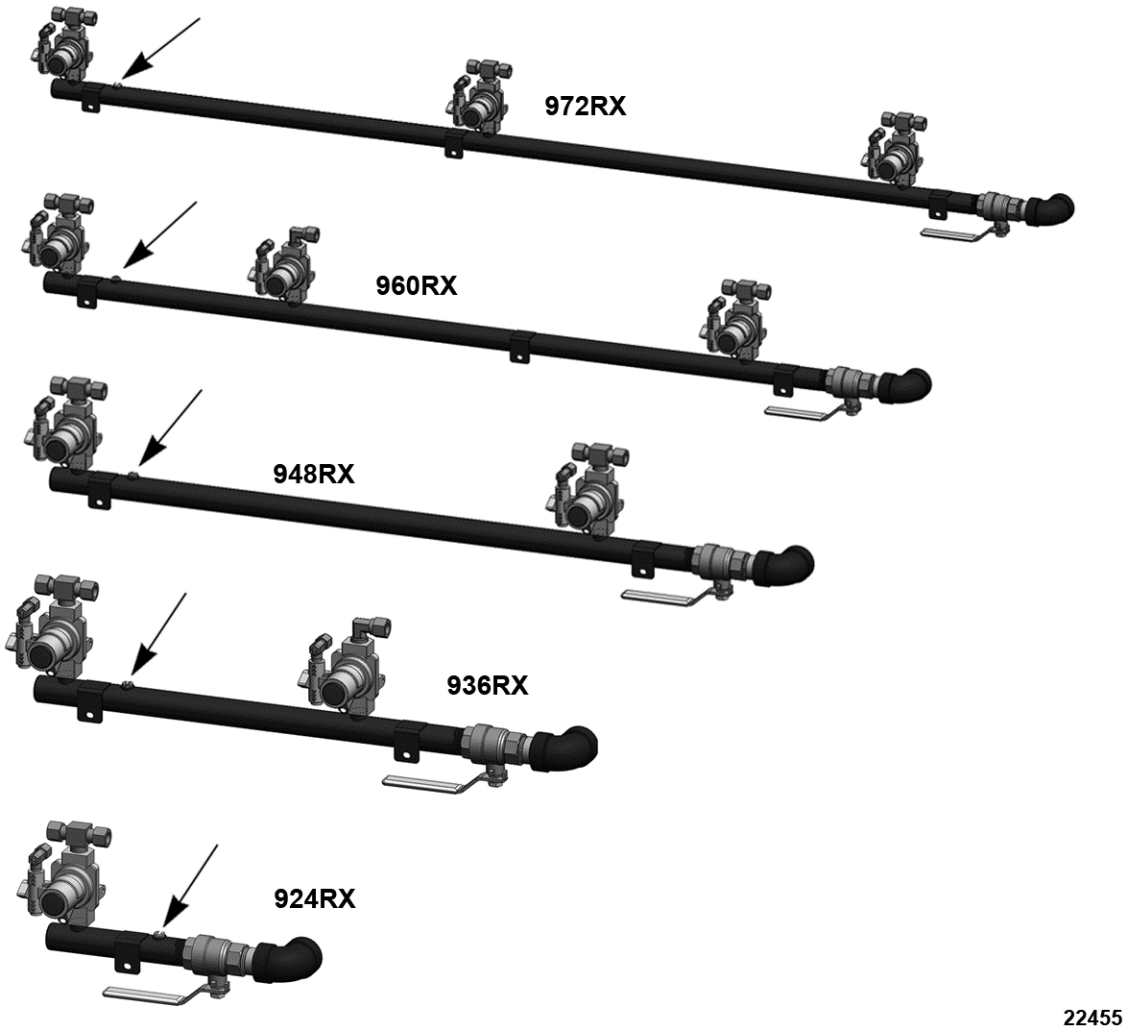


Fig. 26

NOTE: MSA models are in same locations. There are no shut off valves.

BURNER ADJUSTMENT

For efficient burner operation, it is important that a proper balance of gas volume and primary air supply is maintained to give complete combustion. Insufficient air supply results in a yellow streaming flame. Primary air supply is controlled by the air shutter on the front of the burner venturi. Loosen the screw on the venturi and adjust the air shutter to just eliminate yellow tips on the burner flames. Lock the air shutter in place in place by tightening the screw. Repeat this procedure as necessary with all burners.

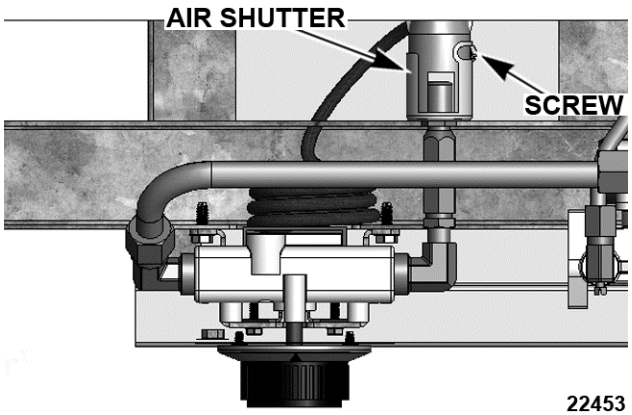


Fig. 27

THERMOCOUPLE TEST

1. Unscrew thermocouple fitting from safety valve.

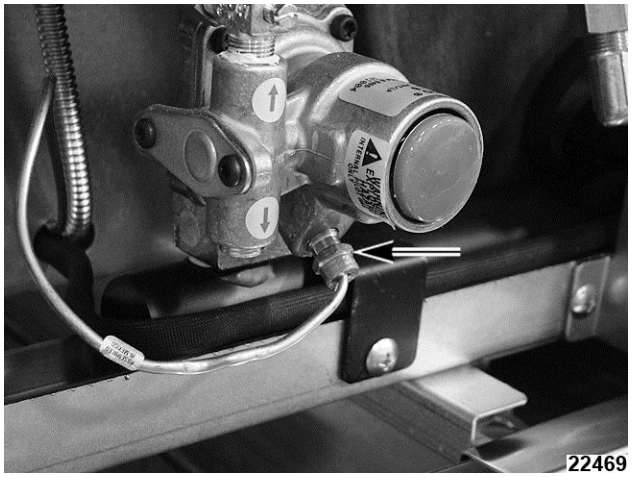


Fig. 28

2. Install thermocouple test adapter finger tight plus a quarter turn.
3. Install thermocouple into test adapter finger tight plus a quarter turn.

NOTE: Over tightening can cause thermocouple tip to short out.

4. Set VOM to DC millivolt scale and connect (+) meter lead to pin on thermocouple adapter and (-) meter lead to thermocouple.

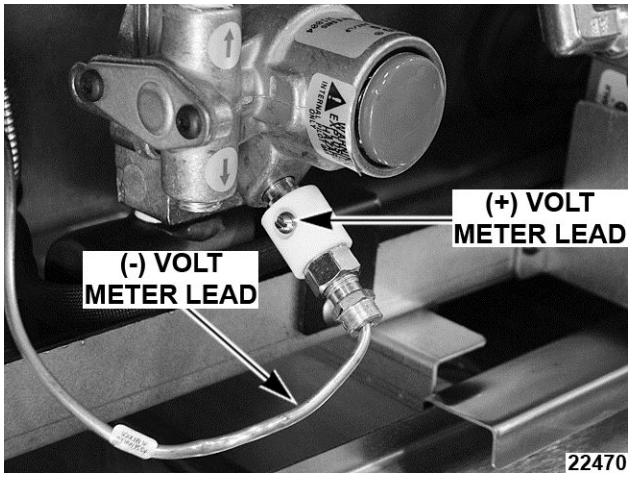


Fig. 29

5. Light pilot flame.
6. Verify that thermocouple is sufficiently immersed in flame. Adjust pilot valve to allow more gas flow if necessary.
7. With thermostat off, allow pilot to burn for 3-4 minutes to stabilize voltage output from thermocouple.
8. Verify thermocouple output voltage.
   A. If 25 - 35 millivolts is measured, the thermocouple is functioning properly.
   B. If less than 17 millivolts is measured, install a replacement thermocouple.
9. Remove test adapter.

ELECTRICAL OPERATION

ELECTRICAL DIAGRAM

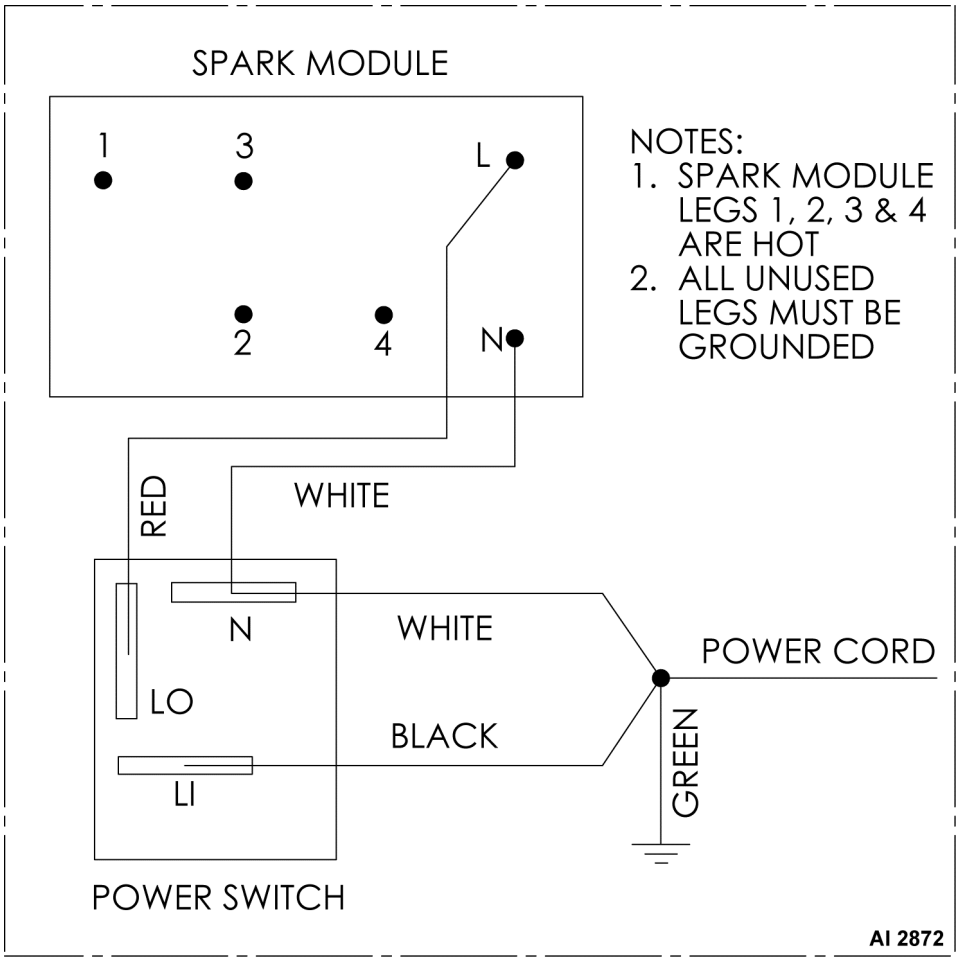


Fig. 30

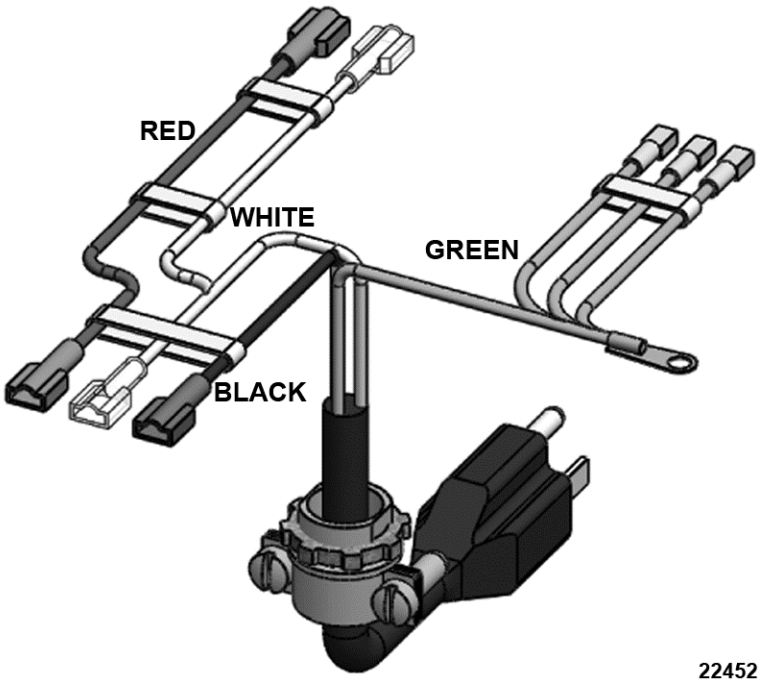


Fig. 31

TROUBLESHOOTING

TROUBLESHOOTING

SYMPTOMS	POSSIBLE CAUSES
No spark to ignite pilot gas.	1. Power cord unplugged. 2. Igniter switch malfunction. 3. Shorted electrode on ignitor. 4. Ignitor cable malfunction. 5. Interconnecting wiring malfunction. 6. Electric Igniter Module malfunction.
Sparks but gas does not ignite.	1. Service gas valve closed. 2. Gas supply not purged of air. Depress pilot safety button until air is purged. 3. Gas supply off or insufficient gas pressure. 4. Adjust pilot valve to allow more gas flow. 5. Safety valve malfunction.
Gas pilot ignites but will not maintain flame.	1. Air blowing pilot out. Prevent air flow from affecting unit. 2. Gas supply not purged of air. Depress pilot safety button until air is purged. 3. Adjust pilot valve to allow more gas flow. 4. Thermocouple not sufficiently immersed in flame. Adjust accordingly. 5. Thermocouple malfunction. Refer to THERMOCOUPLE TEST. 6. Obstructed pilot orifice. 7. Insufficient gas pressure. 8. Safety valve malfunction.
Gas burners ignite but will not maintain flame.	1. Gas pressure incorrect or fluctuating. 2. Obstructed flue. 3. Gas orifice obstructed, improperly aligned / spaced, or incorrect. 4. Burner malfunction.
One or more burners have lower flame level than the others.	1. Check gas pressure. 2. External air flow or vent hood problems may agitate affected burners. 3. Gas orifice obstructed, improperly aligned / spaced, or incorrect. 4. Adjust burner air shutter.

SYMPTOMS	POSSIBLE CAUSES
One burner has a delayed ignition; a several second lapse when the burner actually lights.	1. Check gas pressure. 2. Check that burner is properly seated. 3. Check that burner ignition ports, pilot flash tube and pilot burner are all aligned. 4. Gas orifice obstructed, improperly aligned / spaced, or incorrect. 5. Check burner shutter adjustment. 6. Check pilot flame adjustment.
Excessive or low heat.	1. Gas shut off valve not completely open. 2. Thermostats need calibrated. See CALIBRATION section. 3. Thermostat malfunction. 4. Gas pressure incorrect. 5. Unit's gas regulator not installed or malfunctioning. 6. Incorrect gas type. 7. Gas orifice obstructed or incorrect.
Heat does not come on when the thermostat is turned on.	1. Pilot burner not lit. 2. Griddle shut-off valve not in ON position. 3. Low gas pressure. 4. Thermostat malfunction.