

Owner's Manual

Includes the Installation, Operation, Maintenance, and Service of Legion's

Gas-Fired Tilting Skillet

Models TGSE, TGSP & TGSM - 2430 or 2440



THIS MANUAL MUST BE RETAINED FOR FUTURE REFERENCE. READ, UNDERSTAND AND FOLLOW THE INSTRUCTIONS AND WARNINGS CONTAINED IN THIS MANUAL.

FOR YOUR SAFETY

DO NOT STORE OR USE GASOLINE OR OTHER FLAMMABLE VAPORS OR LIQUIDS IN THE VICINITY OF THIS OR ANY OTHER APPLIANCE.

ESURE DE SÉCURITÉ

NE PAS ENTREPOSER NI UTILISER DE ESSENCE NI AUTRES VAPEURS OU LIQUIDES INFLAMMABLES À PROXIMITÉ DE CET APPAREIL OU DE TOUT AUTRE APPAREIL.

POST IN A PROMINENT LOCATION

INSTRUCTIONS TO BE FOLLOWED IN THE EVENT THE USER SMELLS GAS. THIS INFORMATION SHALL BE OBTAINED BY CONSULTING YOUR LOCAL GAS SUPPLIER. AS A MINIMUM, TURN OFF THE GAS AND CALL YOUR GAS COMPANY AND YOUR AUTHORIZED SERVICE AGENT. EVACUATE ALL PERSONNEL FROM THE AREA.

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.

AVERTISSEMENT: L'INSTALLATION, LE RÉGLAGE, LA MODIFICATION, LA RÉPARATION OU L'ENTRETIEN INCORRECT DE CET APPAREIL PEUT CAUSER DES DOMMAGES MATÉRIELS, DES BLESSURES OU LA MORT. LIRE ATTENTIVEMENT LES INSTRUCTIONS D'INSTALLATION, DE FONCTIONNEMENT ET D'ENTRETIEN AVANT DE PROCÉDER À SON INSTALLATION OU ENTRETIEN.



Table of Contents

Uncrating & Inspecting the Equipment	3	<i>Hi-Limit Thermostat Replacement</i>	18
Introduction	4	Actuator Maintenance and Adjustment	18
Safety Precautions	5	<i>Actuator Tension Adjustment</i>	18
Gas/Combustion Precautions	5	<i>Actuator: Re-Packing with Grease</i>	18
Pressure Testing Precautions on Gas Units	5	<i>Fig. 4.1: Actuator Components & Assembly</i>	18
Positioning Precautions	5	<i>Actuator Replacement</i>	19
Electrical Precautions	6	Gas Control System	19
General Use Precautions	6	<i>Maintenance of the Gas Control System</i>	19
Warning & Operating Plates	6	<i>Control Knob Settings</i>	19
Product Improvements	6	<i>Frequency of Maintenance Required</i>	19
Important Warranty Information	7	<i>Fig. 4.2: VR8205 Gas Control</i>	19
Service Calls	8	<i>When to Replace the Gas Control</i>	20
Section I: Installation	9	Main and Worm Gear	20
Positioning the Unit	9	Other Components	20
<i>Fig. 1.1 Minimum Clearances</i>	9	Section V: Caring for Stainless Steel	21
Flue Diverter Installation	9	Sanitizing	21
Leveling and Securing the Unit	9	Section VI: Troubleshooting	23
Electrical Connection	10	Troubleshooting - General Problems	23
Gas Connection	10	If Main Burner Does Not Come On With Call For Heat	23
<i>Fig. 1.2 Sediment Trap Installation</i>	10	Preliminary Checks for S87D Control Module	23
Checking for Gas Leaks	11	S87 Components Checks	24
Gas Control - Pressure Verification	11	<i>Spark Ignition Circuit</i>	24
<i>Fig. 1.3 Pressure Regulator Specification Pressures</i>	11	<i>Ignition Cable</i>	24
How to check inlet pressure - with other equipment on		<i>Grounding Connections</i>	24
the same line - turned on and turned off	11	<i>Flame Sensor Circuit</i>	24
<i>Fig. 1.4 Inlet Pressure Tap</i>	12	<i>Low or Unsteady Flame Current</i>	24
How to check outlet pressure - with other equipment on		<i>Burner Flame</i>	25
the same line - turned on and turned off	12	<i>Flame Sensor</i>	25
<i>Fig. 1.5 Outlet Pressure Tap</i>	12	<i>Electrical Connections and Shorts</i>	25
Completing the "Installation Checklist"	12	<i>Fig. 6.1: S87 Flame Current Measurement</i>	25
Section II: Startup & Checkout	13	<i>Fig. 6.2: Burner Flame Conditions</i>	25
Gas Leak Test	13	<i>Troubleshooting Sequence - S87D Module</i>	26
Start System	13	Section VII: Parts List	27
Check Safety Lockout	13	General Parts List	27
<i>Fig. 2.1: Specified S87D Lockout Time</i>	13	Actuator Parts List & Assembly	27
Reset S87D After Safety Lockout	13	<i>Fig. 7.1: Actuator Assembly Diagrams</i>	27
Checkout	13	For Your Use & Review	28
Operation - S87D Control Module	13	Installation Checklist	28
<i>Fig. 2.2: Normal System Sequence of Operation</i>	14	Maintenance & Service Log	29
Operation - VR-8205 Direct Ignition Gas Control	14	Legion Limited Warranty & Extended Warranty	
Turn on System	14	Cover	30
Turn on Main Burner	14	Domestic U.S. Sales Only	30
Section III: Operation	15	Canada Only	31
Initial Cleaning	15		
Control Functions	15		
<i>Fig. 2.1 Control Panel Features</i>	15		
Summary of Control Functions	15		
Shutting Down the Unit	16		
How to Start Cooking	16		
Section IV: Service and Maintenance	17		
Servicing	17		
<i>Replacing Primary Thermostat</i>	17		

Important!

Legion Industries, Inc. is not responsible for loss or damage incurred in transit. The unit has been assembled, tested, and inspected at the factory prior to shipment. Do not pay the freight bill until the shipment has been thoroughly inspected!

Uncrate the equipment carefully and inspect for any damage. Also check the contents against the packing list to make sure all accessories are included.

Important: The carrier is responsible for any shipping damage or lost parts during transit, whether visible or concealed. You, as the recipient, are responsible for inspection and for filing all claims with the carrier.

Visible Loss/Damage: Be certain to note this on the freight or express receipt and have it signed by the delivery person. File a claim for damages immediately, regardless of the extent of damage.

Concealed Loss/Damage: If damage is noticed after the equipment is unpacked, notify the freight company and file a concealed damage claim. This must be done immediately. Be sure to retain the shipping container for inspection.

Introduction

Congratulations on your Legion equipment purchase. This manual covers the installation, operation, and maintenance of the Gas-Fired Classic Tilting Skillet.

This manual contains complete information. By reviewing it thoroughly and following its guidelines, your equipment will provide you with a lifetime of dependable use.

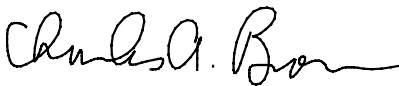
IMPORTANT! There are three things you need to do as soon as possible after receiving and/or installing your equipment, since they affect your warranty coverage.

1. Send in your "Warranty Registration Card" or register on our web site at <http://www.legionindustries.com/service/warranty.html>. This is vital and necessary in the processing of any future service required on your equipment.
2. Complete the "Installation Checklist," contained in this manual, at the time of installation. This is necessary for your warranty to be valid.
3. Record the model number, serial number, and installation date for your unit and file this information for future reference. Space for these entries is provided at the top of the "Maintenance and Service Log" included at the end of this manual.

If, at any time, you have questions about warranty coverage, operating procedures, service, repairs, or maintenance, contact:

Legion's Service Department
Post Office Box 728
Waynesboro, Georgia, 30830
Toll Free: (800) 887-1988
Fax: (706) 554-2035
Email: service@legionindustries.com

Once again we thank you for the purchase of your equipment. From its versatility, safety features, and durable construction, to its time-tested performance and full HACCP compliance, you've selected the finest equipment available. We know it will provide you with reliable, efficient service for years to come.



Charles A. Brown
President
Legion Industries, Inc.

Please visit us at our web site @ www.legionindustries.com

Safety Precautions

☑ Installation of the equipment must be done by a qualified technician, knowledgeable of and experienced in the installation of commercial gas and electrical cooking equipment.

☑ Retain this manual for future reference.

Gas/Combustion Precautions

☑ Your installation must conform to local codes or in the absence of local codes, with the current National Fuel Gas Code ANSI Z223.1/NFPA 54 (latest edition), or the National Gas and Propane Installation Code, CSA B149.1 (latest edition), as applicable.

☑ Appliances equipped with casters the installation must be made with a connector that complies with the Standard for Connectors for Movable Gas Appliances, ANI Z21.69•CSA 6.16 (latest edition), and a quick-disconnect device that complies with the Standard for Quick-Disconnect Devices for Use With Gas Fuel, ANSI Z21.41•CSA 6.9 (latest edition). The appliance must be limited in its movement by a restraining device attached to the frame of the appliance and an adjacent wall. Adequate means must be provided to limit the movement of the appliance without depending on the connector and the quick-disconnect device or its associated piping.

☑ **AVIS:** Les appareils sur roulettes doivent être pourvus des roulettes fournies, d'un tuyau de raccordement conforme à la norme ANSI Z21.69 ou CAN/CGA-6.16 et d'un raccord à débranchement rapide satisfaisant les exigences de la norme ANSI Z21.41 ou CAN1-6.9. Ils doivent aussi être munis d'un dispositif de retenue pour empêcher toute transmission de tension au tuyau de raccordement conformément aux instructions du fabricant.

☑ Appliance **MUST** be connected **ONLY** to the gas type identified on the attached rating plate.

☑ This unit is not suitable for connection to Type B Gas Vent.

☑ Ne convient pas au raccordement à un conduit d'évacuation de type B.

☑ **FOR YOUR SAFETY:** Do not store or use gasoline or other flammable vapors or liquids in the vicinity of this or any other appliance.

☑ **ESURE DE SÉCURITÉ:** Ne pas entreposer ni utiliser

de essence ni autres vapeurs ou liquides inflammables à proximité de cet appareil ou de tout autre appareil.

☑ Always disconnect from the power supply and close the main gas valve before servicing.

☑ The ignition system controls of this equipment have been factory set for either natural (manufactured) or LP gas. Do not attempt to use an ignition system control set for natural (manufactured) gas with LP gas or an ignition system set for LP gas with natural (manufactured) gas. Ignition system controls cannot be field converted from one gas type to the other.

☑ The lighting sequence on this appliance is automatic; do not attempt to manually light the main burner.

☑ It is your responsibility to post, in a prominent location, instructions to be followed in the event the user smells gas. This information must be obtained from your local gas supplier. Until it is obtained, post the label that came with this manual.

IMPORTANT! In the event gas odor is detected, do the following.

☑ Observe the posted instructions.

☑ Shut down the unit at the main shut-off valve.

☑ Contact the local gas company or supplier—from a phone away from the building—for emergency service and follow the supplier's instructions.

☑ If the gas supplier cannot be reached, call the fire department.

☑ Do not use any phone in the building.

☑ Do not light or start any appliance.

☑ Do not touch any electrical switch.

Pressure Testing Precautions on Gas Units

☑ The equipment and its individual shut-off valve must be disconnected from the gas supply piping system during any pressure testing of that system at test pressures in excess of 1/2 psig (3.45 kPa).

☑ The equipment must be isolated from the gas supply piping system by closing its individual manual shut-off valve during any pressure testing of that system at test pressures equal to or less than 1/2 psig (3.45 kPa).

Safety Precautions

Positioning Precautions

- ☑ The unit must be placed on a non-combustible floor, under an exhaust hood, with a fire retardant system and all connections and placement must comply with all applicable local and national codes. Your ventilation hood, when installed, must conform to ANSI/UL 705 and ANSI/NFPA 96 (latest edition).
- ☑ Installer sur un plancher incombustible seulement.
- ☑ Installer en dessous d'une hotte de ventilation seulement.
- ☑ Adequate make-up air must be provided for exhaust systems in the area where the equipment is to be installed.
- ☑ No frame or restriction shall be constructed around the equipment that will restrict air movement into the equipment's combustion area or prevent proper combustion.
- ☑ Keep the appliance area free and clear from combustibles. Failure to do so may cause fire or property damage.
- ☑ Adequate clearance for servicing and proper operation must be maintained.
- ☑ The appliance must be restrained to prevent tipping when installed in order avoid the splashing of hot liquid. The means of restraint may be the manner of installation or by separate means.

Electrical Precautions

- ☑ This equipment must be electrically grounded in accordance with local codes or, in the absence of local codes, with the National Electrical Code, ANSI/NFPA No. 70 (latest edition) or the Canadian Electrical Code, CSA C22.1 (latest edition), as applicable.
- ☑ Never attempt to operate the equipment during a power failure.
- ☑ This appliance is equipped with a three prong (grounding) plug for your protection against shock hazard and should be plugged directly into a properly grounded three-prong receptacle. Do not cut or remove the grounding prong from this plug.
- ☑ Cet appareil est pourvu d'une fiche à trois broches dont une mise à la terre assurant une protection contre

les chocs électriques. La prise dans laquelle elle est branchée doit être correctement mise à la terre. Ne pas couper ni enlever la broche de mise à la terre de la fiche.

General Use Precautions

- ☑ Always instruct employees on the proper use of this equipment.
- ☑ Never attempt to move this equipment when it is full of hot oil or another hot liquid.
- ☑ Never operate this equipment during a power failure.
- ☑ This equipment is intended for other than household use.
- ☑ Non destiné à l'usage domestique.

Warning & Operating Plates

- ☑ All warning and operating plates on the equipment should be in place at all times. If plates are damaged or lost, replace them immediately.

Product Improvements

- ☑ Be aware that as continuous product improvement occurs, specifications may be changed without notice.

Important Warranty Information

The Legion Limited Warranty is valid in the Continental United States and Hawaii and is void elsewhere. A complete statement of warranty terms and conditions is included in this manual. However, to ensure that you are familiar with the installation, maintenance, and other important warranty-related conditions, please study the following.

The instructions in this manual must be read thoroughly before attempting installation, operation, maintenance, or service. Legion Industries, Inc. reserves the right to render void any warranty on equipment not installed in accordance with the manual by a qualified technician, knowledgeable of and experienced in the installation of commercial gas and electrical cooking equipment.

Legion products are built to comply with applicable standards of manufacturers. Many local codes exist and it is the responsibility of the equipment owner and installer to comply with these codes.

If the equipment has been changed, altered, modified, or repaired by other than a qualified service technician during or after the one year limited warranty period, Legion Industries, Inc. shall not be liable for any incidental or consequential damages to any person or to any property which may result from the use of the equipment thereafter.

The Limited Warranty does not extend to:

1. Installation and start-up. Proper installation is the responsibility of the owner/installer. Repair services for the same will not be covered.
2. Malfunction as a result of improper maintenance.
3. Failure as a result of improper use or abuse of equipment.
4. Repair services initiated without prior authorization from Legion.
5. Repair services for problems caused by inadequate gas supply pressure or low voltage supply.
6. Repairs made by anyone other than qualified service personnel recommended by Legion.
7. Damage caused in shipment.
8. Repair services for problems caused by routine maintenance or cleaning.
9. Damage caused by tampering with, removing, or changing a preset control or safety device.
10. Damage caused by hitting the cooking surface with

implements or by rubbing or scraping the cooking surface with abrasive materials.

11. Damage caused by simple adjustments, such as actuator adjustments.
12. Lubrication of grease fittings or actuator springs and gears. These parts should be greased at least once every six months.
13. Moving other equipment to gain access to the unit.
14. Damages to any part of the unit as a result of cleaning with high-pressure water or steam. Do not spray the exterior of the equipment with water or steam!
15. Use of any replacement parts other than those supplied or authorized by Legion voids all warranties and can cause bodily injury to the operator and damage to the equipment.

Refer to your warranty statement for those items that are covered for only a 90-day period.

Service Calls

All repair services under Legion's Limited Warranty must be authorized in advance by Legion or performed by Legion. Authorization may be obtained by calling:

1-(800) 887-1988

(within the Continental U.S. and Hawaii)

8 a.m. through 5 p.m. (EST), Monday through Friday

When calling, please have the following information available:

- name, address, and telephone number of the end-user;
- location of the product;
- name, model number, and serial number of the product;
- description of the problem or defect.

Legion will then issue a service authorization work order number to one of its approved independent servicing organizations or request that the product or part be shipped to Legion for repair or replacement, as appropriate. Any defective part subject to a claim under the Limited Warranty must be shipped freight prepaid to Legion for testing and examination. Legion's decision as to the cause and nature of any defect under this Limited Warranty shall be final.

Section I: Installation

IMPORTANT! Installation of the equipment must be done by a qualified technician, knowledgeable of and experienced in the installation of commercial gas and electrical cooking equipment. It is the responsibility of the owner and installer to comply with all applicable local and national codes and regulations when installing the unit.

All internal wiring of the equipment is supplied complete and ready for final connection. A wiring diagram is supplied behind the cover of the unit's control console. Legion's Engineering Department must approve any mechanical or electrical changes.

Positioning the Unit

WARNING:

- ☞ The unit must be placed on a non-combustible floor, under an exhaust hood, with a fire retardant system and all connections and placement must comply with all applicable local and national codes. Your ventilation hood, when installed, must conform to ANSI/UL 705 and ANSI/NFPA 96 (latest edition).
- ☞ Installer sur un plancher incombustible seulement.
- ☞ Installer en dessous d'une hotte de ventilation seulement.
- ☞ Adequate make-up air must be provided for exhaust systems in the area where the equipment is to be installed.
- ☞ No frame or restriction shall be constructed around the equipment that will restrict air movement into the equipment's combustion area or prevent proper combustion.
- ☞ Adequate clearance for servicing and proper operation must be maintained

Position the unit where you intend to use it. A minimum of fifteen (15) inches must be provided for servicing of controls. Remember to also consider the required clearances of any other adjoining pieces of equipment.

Model	Back of Unit	Sides of Unit
TGS(E)(M)(P)	6	6

Flue Diverter Installation

WARNING: This unit is not suitable for connection to Type B or any other type gas vent. It is required that flue gases be vented to a ventilating hood. This unit must be installed under a ventilation hood.

- ☞ Ne convient pas au raccordement à un conduit d'évacuation de type B.
- ☞ Installer en dessous d'une hotte de ventilation seulement.

Leveling & Securing the Unit

The feet of the unit may be adjusted so that the unit is properly leveled.

Appliances must be a room temperature, empty of all liquids, and if fitted with legs, lifted during movement to avoid damage and possible bodily injury.

WARNING: Hot liquids can cause severe burns. Avoid contact. Under all circumstances, oil must be removed from the fryer before attempting to move it to avoid spills, and the falls and severe burns that could occur. This fryer may tip and cause personal injury if not secured in a stationary position.

Appliances equipped with casters the installation must be made with a connector that complies with the Standard for Connectors for Movable Gas Appliances, ANI Z21.69•CSA 6.16 (latest edition), and a quick-disconnect device that complies with the Standard for Quick-Disconnect Devices for Use With Gas Fuel, ANSI Z21.41•CSA 6.9 (latest edition). The appliance must be limited in its movement by a restraining device attached to the frame of the appliance and an adjacent wall. Adequate means must be provided to limit the movement of the appliance without depending on the connector and the quick-disconnect device or its associated piping.

AVIS: Les appareils sur roulettes doivent être pourvus des roulettes fournies, d'un tuyau de raccordement conforme à la norme ANSI Z21.69 ou CAN/CGA-6.16 et d'un raccord à débranchement rapide satisfaisant les exigences de la norme ANSI Z21.41 ou CAN1-6.9. Ils doivent aussi être munis d'un dispositif de retenue pour empêcher toute transmission de tension au tuyau de raccordement conformément aux instructions du fabricant.

Section I: Installation

Electrical Connection

WARNING: Electrical Grounding Instructions

☞ This appliance is equipped with a three-prong (grounding) plug for your protection against shock hazard and should be plugged directly into a properly grounded three-prong receptacle. Do not cut or remove the grounding plug from this plug.

☞ AVERTISSEMENT: Mise à la terre

Cet appareil est pourvu d'une fiche à trois broches dont une mise à la terre assurant une protection contre les chocs électriques. La prise dans laquelle elle esst branchée doit être correctement mise à la terre. Ne pas couper ni enlever la broche de mise à la terre de la fiche.

☞ Also, it is required that an electrical cut-off device, such as a fused disconnect switch or equivalent, be installed in the power supply line between the main power supply and the unit.

☞ The pilot flame on this equipment is lit automatically and requires electrical power to operate. The unit will not operate if the power is off.

A power cord is provided on the back of the unit, for connecting to the electric power supply. The installer should verify the electrical requirements of the unit to make sure your power supply line is capable of powering the equipment properly. This information is listed on the unit's nameplate.

Standard 120 Volt Model: Connect a 120-volt, 60 Hz, single (1) phase power cord.

Optional 240 Volt Model: Connect a 240-volt, 60 Hz, single (1) phase power cord.

Gas Connection

WARNING:

☞ Your installation must conform to local codes or in the absence of local codes, with the current National Fuel Gas Code ANSI Z223.1/NFPA 54 (latest edition), or the National Gas and Propane Installation Code, CSA B149.1 (latest edition), as applicable.

☞ Do not store or use gasoline or other liquids with flammable vapors in the vicinity of this equipment.

☞ Always disconnect the fuel source before servicing.

☞ The ignition system controls of this equipment have been factory set for either natural (manufactured)

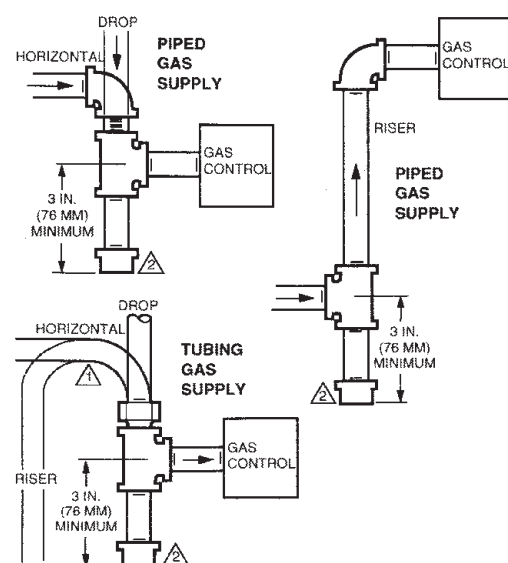
or LP gas. Do not attempt to use an ignition system control set for natural (manufactured) gas with LP gas or an ignition system set for LP gas with natural (manufactured) gas. Ignition system controls cannot be field converted from one gas type to the other.

☞ It is your responsibility to post, in a prominent location, instructions to be followed in the event the user smells gas. This information must be obtained from your local gas supplier.

☞ Before connecting new pipe to this appliance the pipe must be blown out thoroughly to remove all foreign material. Foreign material in the burner and gas controls will cause improper and dangerous operation.

1. Shut off the main gas supply before beginning the gas connection.
2. Properly configure the gas supply line to be used (see Fig. 1.2). The gas supply line must be a minimum of 3/4" npt pipe. It is your responsibility to ensure that the supply line installed is large enough to achieve the proper pressure and allow the required volume of gas to flow. A sediment trap must be installed to protect against contamination of the ignition system control. Install a manual shut-off valve between the gas supply line and the sediment trap to allow for maintenance of the trap.

Fig. 1.2 Sediment Trap Installation



Section I: Installation

3. In making the connections, use a good quality joint compound. If LP gas is supplied, a joint compound resistant to LP gas should be used. Connect the supply line to the ball valve at the rear of the unit. Tighten the connection securely.

Checking For Gas Leaks

WARNING:

Do not permanently supply gas to the unit until the gas lines have been pressure tested. Faulty operation and even equipment damage will result if the gas supply falls below requirements.

The equipment and its individual shut-off valve must be disconnected from the gas supply piping system during any pressure testing of that system at test pressures in excess of 1/2 psi (3.5 kPa).

The equipment must be isolated from the gas supply piping system by closing its individual manual shut-off valve during any pressure testing of that system at test pressures equal to or less than 1/2 psi (3.5 kPa).

1. Turn on the main gas supply. With burner off, douse the pipe connections up stream of the ignition system control with a rich soap and water solution. Bubbles indicate a gas leak. If a leak is detected, tighten pipe connections. Replace the part if the leak cannot be stopped.
2. With main burner in operation, douse pipe joints and control inlet and outlet with rich soap and water solution. If another leak is detected, tighten joints and pipe connections. Replace the part if the leak cannot be stopped.

Gas Control - Pressure Verification

Using a pressure gauge or a manometer, the installer must record the gas pressure at both the inlet and outlet of the ignition system control—first with all equipment on the same gas line turned on, then with all equipment turned off. These readings are necessary for your installation and warranty records. Gas pressure input and output ratings for your equipment are listed on the unit's nameplate. Acceptable pressure ranges are provided below. Do not exceed these ratings. **NOTE:** Since outlet pressure is dependent upon proper inlet pressure, *inlet pressure must be checked first.*

Fig. 1.3 Pressure Regulator Specification Pressures (in Inches Water Column)

Gas Valve Type	Type of Gas	Nominal Inlet Pressure Range	Factory Set Nominal Out-let Pressure	Adjustment Setting Range
Direct Spark Ignition	Natural	5.0 - 7.0" w.c.	3.5" w.c.	3 - 5
	LP	12.0 - 14.0" w.c.	10.0" w.c.	8 - 12

To check inlet pressure - with other equipment on the same line turned on and turned off:

Check the inlet pressure with all equipment on the same gas supply line turned on and turned off.

1. Shut off the gas supply and remove the cover panel of the control console. Remove the inlet pressure tap and connect the pressure gauge or manometer (See Fig. 1.4).
2. Turn the gas supply back on. Light the main burner. Turning the primary thermostat dial above room temperature lights the main burner.
3. Record the inlet pressure readings on the Installation Checklist for Warranty Validation. Be sure to take readings with other equipment on the same line turned on and turned off.
4. Reverse the procedure in step 2 to turn off the main burner and shut off the gas supply before disconnecting the manometer or pressure gauge.
5. Replace the inlet pressure tap plug.

Important! Always shut off the gas supply at the manual valve in the gas supply piping to the unit (or at the tank for LP gas), before removing the inlet pressure tap plug to connect or disconnect a pressure gauge or manometer.

Inlet Pressure Too High? If natural gas pressure exceeds 7" water column or LP gas pressure exceeds 14" water

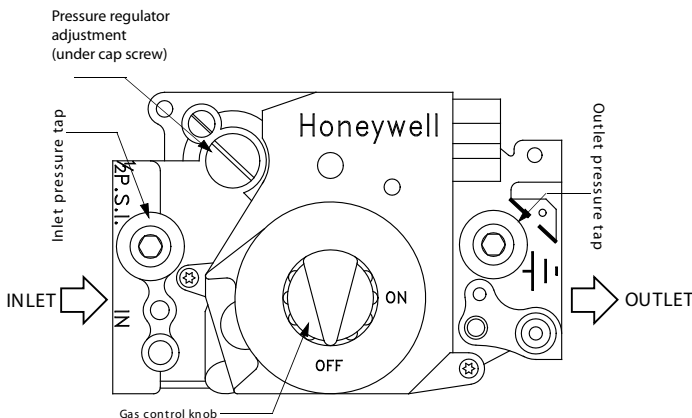
Section I: Installation

column, then a pressure-regulating valve must be installed in the gas supply line.

Inlet Pressure Too Low? If natural gas pressure is below 5" water column or LP gas pressure is below 12" water column, then the installer must determine the problem. Too much equipment may be on the same line or a larger gas supply line may be required.

Inlet pressure must be correct before checking the outlet pressure.

Fig. 1.4 Inlet Pressure Tap



To check outlet pressure - with other equipment on the same line turned on and turned off:

Check the outlet pressure with all equipment on the same gas supply line turned on.

1. Be sure the ignition system control knob is in the OFF position. Remove the outlet pressure tap plug and connect the pressure gauge or manometer (See Fig. 1.5). Turn the ignition system control knob to the ON position.
2. Turn the gas supply back on and light the main burner by following Step 2 in the previous procedure for checking the inlet pressure.
3. Record the outlet pressure readings by following Step 3 in the Check inlet pressure procedure for checking the inlet pressure.
4. Turn OFF the main burner and shut off the gas supply before disconnecting the manometer or pressure gauge by reversing the procedure in Step 2 in the previous procedure for checking the inlet pressure.
5. Replace the outlet pressure tap plug
6. Replace the cover panel of the control console and turn the gas supply back on.

Important! Always shut off the gas supply at the manual

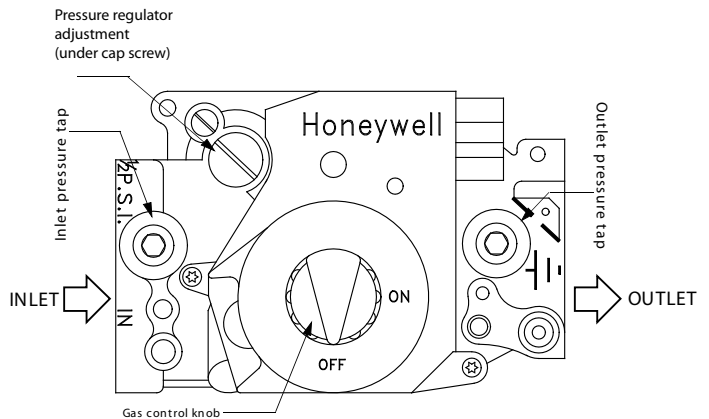
valve in the gas supply piping to the unit (or at the tank for LP gas), before removing the outlet pressure tap plug to connect or disconnect a pressure gauge or manometer.

Outlet pressure too high or too low? If the outlet pressure is too high or too low, but the inlet pressure is nominal, the outlet pressure can be adjusted by the installer using the following procedure.

- Remove the pressure regulator adjustment cap screw.
- Using a screwdriver, turn the inner adjustment screw clockwise to increase pressure and counterclockwise to decrease pressure to the infrared burners.
- When proper outlet pressure has been achieved, replace the pressure regulator adjustment cap screw. The unit will not operate properly if the cap screw is not in place.

Proper outlet pressure cannot be achieved? If following the above procedure fails to attain proper outlet pressure, and the inlet pressure is nominal, then the ignition system control needs to be replaced.

Fig. 1.5 Outlet Pressure Tap



Completing the "Installation Checklist"

With all of the preceding installation steps completed, the primary aspects of the installation have been completed. This manual contains an Installation Checklist that must be filled out to show that certain key elements of the installation have been performed properly.

IMPORTANT! The Installation Checklist must be completed for your warranty to be valid. Do not neglect this step.

Section II: Startup & Checkout

The following start-up and checkout procedures are basic to all S87D control modules.

Note: If one of the system components fail, the S87D will either not operate or it will go into safety lockout (depending on the type of failure). If the system does not perform as outlined in START SYSTEM and CHECK SAFETY LOCKOUT steps below, refer to the SERVICE section to determine cause.

Gas Leak Test

If this is the unit's first time startup or the gas control has been replaced as part of the S87D installation, perform the following tests for gas leaks.

WARNING

The gas leak test must be performed to avoid possible explosion or fire.

1. Paint pipe connections upstream of the gas control with rich soap and water solution. Bubbles indicate a gas leak.
2. If a leak is detected, tighten the pipe connections.
3. Light the main burner. Stand clear of the main burner while lighting to prevent injury caused from hidden leaks that could cause flashback in the appliance vestibule.
4. With the main burner in operation, paint the pipe joints (including adapters) and the control inlet and outlet with rich soap and water solution.
5. If another leak is detected, tighten the adapter screws, joints, and pipe connections.
6. Replace the part if a leak cannot be stopped.

Start System

1. Turn on the power and the gas supply.
2. Set thermostat to call for heat and watch for spark at the igniter. Time the length of the spark operation; it must be within the lockout timing period (see Fig. 2.1).
3. Check that the system starts as follows: Spark turns on, gas valve opens at once, and burner ignites after gas reaches the main burner. Once burner flame is established, spark igniter cuts off.

NOTE: If the gas control has been replaced or serviced, lightoff may not be satisfactory until air has been purged from the gas line or the gas input have been adjusted.

Check Safety Lockout

1. With the system power off and the thermostat set to call for heat, manually shut off the gas supply.
2. Turn power on to energize the S87D and begin spark ignition, immediately start timing.
3. Determine the number of seconds to safety lockout (spark cutoff). It should not exceed the time shown in Fig. 2.1

Fig. 2.1

Specified S87D Lockout Time (stamped on S87D control module)	Safety Lockout Time Should Not Exceed---
11.0 sec.	15.0 sec.

4. After spark cutoff, manually reopen gas supply cock. No gas should flow to the main burner.
5. Reset system as described below.

Reset S87D After Safety Lockout

If the control goes into safety lockout, it will remain locked out until the system is reset.

To reset the system, adjust the thermostat setting below room temperature, wait 30 seconds, and move the thermostat setting up to call for heat. Normal ignition should occur as described in Start System.

Checkout

Start system and observe operation through at least one complete cycle to make certain all controls are operating safely.

Operation - S87D Control Module

The S87D control module performs the following basic functions:

- Supplies power to the electronic pulse-generator circuit for the spark igniter (30,000 volts, open circuit).
- Allows up to 15 seconds for ignition before system safety lockout occurs.
- Senses the burner flame for safe lighting.
- Shuts off spark after burner is lit.

The S87D is powered by a 25V transformer and activated when the thermostat calls for heat. Operation is as follows, see Fig. 2.2.

When the S87D is activated by a thermostat call for heat, an internal transformer provides power to the electronic generator circuit for spark ignition and the safety lockout timing begins. At the same time, the S87D opens the gas control's main valves which allows gas to flow to the main burner.

Section II: Startup & Checkout

Power is supplied to the spark generator until:

- the main burner lights and flame sensor current reaches $1.5 \mu A$, or
- the safety lockout timing period ends.

If the main burner lights, a flame sensing circuit is completed through the flame to the burner head to ground. This current flow sets the safety lockout timer to the reset (normal) condition and interrupts the spark ignition circuit. Should the current flow be interrupted; i.e., flame-out condition, the trial-for-ignition begins again.

The S87D will keep the gas control main valve open as long as there is a call for heat and current through the flame sensing circuit. If, however, the safety lockout timing period ends before the main burner lights or the flame sensor establishes enough current, the system will go into safety lockout.

When the systems goes into safety lockout, power to the spark generator is interrupted, the gas control circuit is interrupted and the alarm circuit is completed. The system will stay locked out until it is reset by moving the thermostat set point below room temperature, no call for heat, for 30 seconds. Then re-energize the system by moving the thermostat set point $5^{\circ}F$ ($3^{\circ}C$) above room temperature.

Operation - VR8205 Direct Ignition Gas Control

Gas Control Knob Settings

Gas control knob settings are as follows:

- OFF:** Prevents pilot and main gas flow through control.
- ON:** Permits gas to flow into the control body. Under control of the thermostat and direct ignition module, gas can flow to the main burners.

NOTE: Controls are shipped with the gas control in the **ON** position.

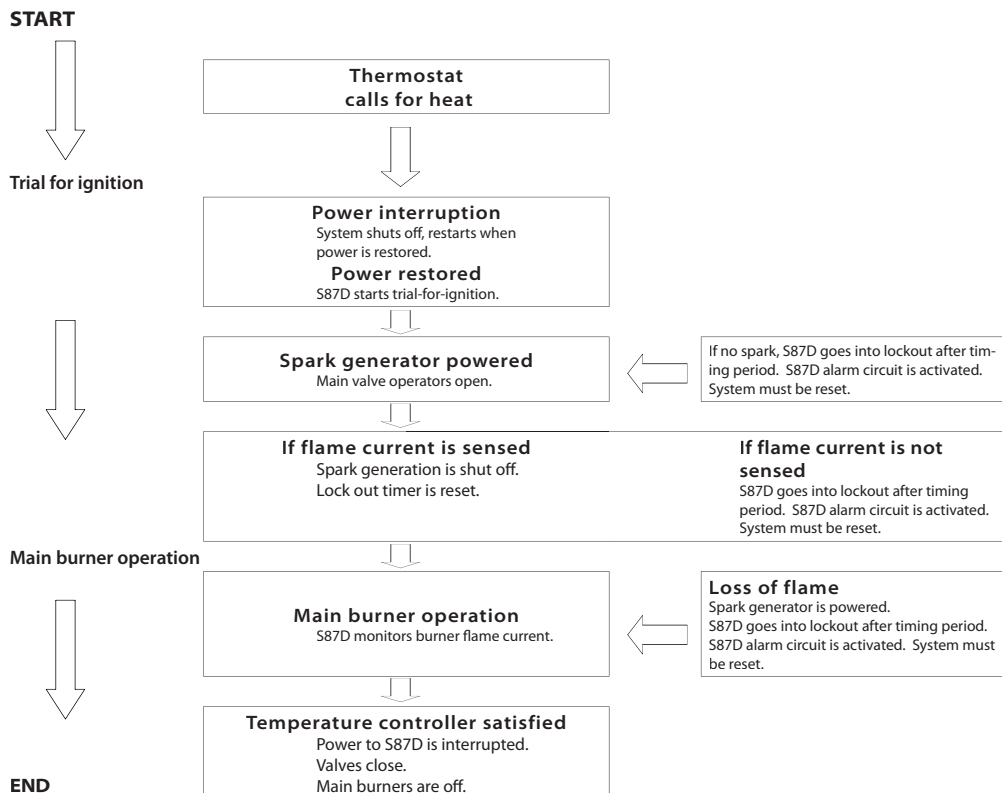
Turn On System

Rotate the gas control knob counterclockwise to **ON**.

Turn On Main Burner

Press the rocker switch to **ON** position, turn the primary thermostat clockwise to the desired temperature. This will cause the red indicator light to come on, showing that the burner is operating.

Fig. 2.2: Normal System Sequence of Operation



Section III: Operation

Warning:

Always disconnect power before cleaning (or servicing) the unit.

The control console is not waterproof. Never spray the control console, electrical controls, ignition system controls, or connections with water. Clean these areas by wiping them with a clean, damp cloth.

When cooking, never allow water or foodstuff to come in contact with any electrical components.

Initial Cleaning

Before operating your equipment, it must be cleaned thoroughly. Refer to section IV: Caring for Stainless Steel for instructions.

Important! Disconnect all electrical power before cleaning the unit.



Clean the unit thoroughly with a mild detergent solution. Always “wipe” around the control console (never spray). Never rinse control consoles with a spray hose or let water come in contact with any electrical and control components.

For routine cleaning, Legion’s optional “Care Kit” accessories help you thoroughly clean all surfaces, including the inside of the lid. Rinse the entire unit with clean water.



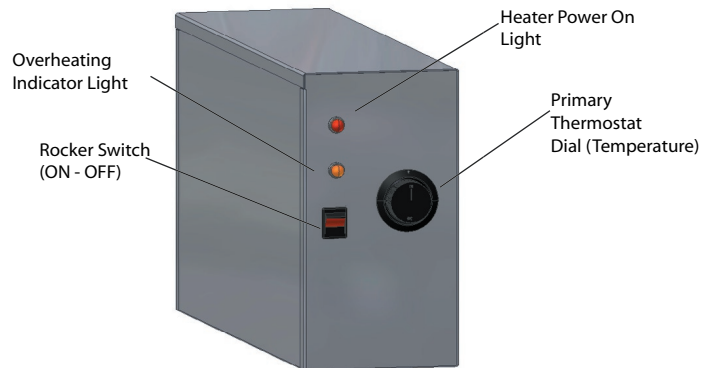
Control Functions

We’ve already started the unit up during installation. Now we’ll examine all control functions, step by step, for a full understanding.

IMPORTANT: After installation or service and prior to operating the unit, make sure the following are done, otherwise the unit will not operate.

- ☑ Make sure the ignition system control knob is in the **ON** position.
- ☑ Make sure the main electrical power and the gas supply to the unit have both been turned on.
- ☑ The tilting gas braising pan is provided with a direct spark ignition to light the main burner directly. Ignition stops after a preset time (11 Seconds) or when the main burner is properly lit.
- ☑ All electrical components and the gas control valve are located in the left-hand console box. The tilting mechanism is located in the right-hand console box.

Fig. 2.1 Control Panel Features



Summary of Control Functions:

- ☑ *Rocker Switch (On - Off)*. Energizes the unit for operation.
- ☑ *Primary Thermostat Dial (Temperature)*. Allows the user to set the cooking temperature of the unit.
- ☑ *Burner On Indicator Light (Red)*. Illuminates upon turning up the thermostat to show that the burners are operating. Note: If the temperature of the unit is already above the set temperature, the red heater power on light will not come on.
- ☑ *Overheating Indicator Light (Amber)*. It alerts the user that the primary thermostat has allowed the temperature to exceed its maximum setting and that the secondary, high-limit cutoff thermostat has been activated, turning off the burners as a safety precaution until the unit cools.

Section III: Operation

Once it cools down below the cutoff temperature, the primary thermostat automatically resets and permits normal operation. Be aware that activation of this light is unusual and may signal that the primary thermostat needs to be replaced.

Tilt Switch Automatically shuts off the unit when tilted. Care should be taken when tilting unit filled with hot product.

Shutting Down the Unit:

Normal (Routine) Shutdown. Turn the primary thermostat dial to the lowest temperature setting and press the rocker switch to **OFF**.

Complete System Shutdown. Perform normal shut down as described above. Then, turn the ignition system control knob (located in the control console, clockwise to **OFF**. Do not force the knob. The appliance will completely shut off. To resume normal operation, turn the ignition system control knob to the **ON** position and set the primary thermostat dial to the desired temperature setting.

CAUTION!

Avoid dumping cold water into a very hot pan to cool it down. This will cause severe thermal shock which can crack welds or warp the pan.

Note: The lighting sequence on this unit is automatic; do not attempt to manually light main burner.

How to Start Cooking:

1. Press the rocker switch to **ON** position, turn the primary thermostat clockwise to the desired temperature. This will cause the red indicator light to come on, showing that the burner is operating.
2. Close the lid to speed up the heating process.
3. Once the unit has cycled (the red indicator light goes out), you can start cooking immediately. However, to guarantee the most even, stable heat you may want to let it cycle several times.
4. If a new temperature is desired during a cooking operation, simply turn the thermostat to the new setting. Again, allow several cycles to ensure proper heat stabilization.
5. To shut down the unit, turn the thermostat dial to **OFF** and press the rocker switch to **OFF**.

Section IV: Service and Maintenance

This section covers the basics of servicing and maintaining your equipment. A "Maintenance and Service Log" is included in this manual for your use in recording all maintenance and service performed.

IMPORTANT: Service must be done by a qualified technician experienced with commercial gas and electric cooking equipment. Use only Legion supplied parts. Unauthorized or generic parts can cause bodily injury and equipment damage. If the unit ever needs repair during the warranty period, prior authorization from Legion is required. Also refer to the sections of this manual entitled Service Calls and also Important Warranty Information.

Servicing

Warning: Always disconnect the power supply and shut off manual gas valve before cleaning or servicing.

A) Replacing Primary Thermostat

Re-Calibrating Thermostats (Do Not Attempt)

IMPORTANT! If thermostat is defective or not working properly, it must be replaced (without breaking the seal) and returned to Legion. The warranty is voided if the seal is broken or any attempt is made to recalibrate a thermostat. See below for replacement instructions.



1. Disconnect the unit from its power supply.



2. Turn off the manual gas valve at the rear of the unit.

Primary Thermostat Replacement

1. Disconnect power and remove service panel.
2. Disconnect and mark wire(s) connected to the normally closed position with the enclosed tag marked normally closed.
3. Disconnect and mark wire(s) connected to the common position with the enclosed tags marked common.
4. Remove the thermobulb hold-down bracket which secures the thermobulb to the plate surface. Pull thermobulb and capillary tube back through the access port to remove the thermostat from the control console.
5. Remove the two mounting screws on the existing thermostat from the front panel.
6. Use the existing hole locations for mounting the thermostat. The two outer holes on the new thermostat bracket are for mounting the thermostat and the two inner holes are for mounting the bezel. With a marker, mark the hole locations for drilling the bezel holes.
7. Drill holes through the front panel with a #32 drill bit.
8. Locate the new replacement thermostat on the inside of the control box where the existing thermostat was mounted. The thermostat should be mounted with the flat side of the dial stem facing the right side of the unit and the common pole ("P" terminal) will be on the left side. You will use the #6-32x1/4" round head slotted screws provided to mount the thermostat in the two outer holes.
9. After this has been completed, Secure the bezel in place with the #6 Type "F" x 5/16" pan head phillips thread cutter screws provided in the two inner holes which should have been drilled out in step 7. Note: The triangular indicator marking on the bezel should be in the 3 o'clock position.
10. Reconnect the wires marked normally closed to the normally closed position on the new replacement thermostat with the piggyback push-on connector (if more than one connection is needed) or a single push-on connector (if only one connection is needed) as provided in the installation package.
11. Carefully uncoil the capillary tube. Re-insert the capillary tube and thermobulb through the access port from which the old tube and bulb was removed and re-install the thermobulb in the same location from which the old thermostat thermobulb was removed.

Section IV: Service and Maintenance

12. Replace access panel and secure in place.

Hi-Limit Thermostat Replacement

1. Follow steps 1 through 4 of the primary control replacement procedure.
2. Remove the two mounting screws on the existing hi-limit thermostat from mounting bracket.
3. Reconnect the wires marked normally closed to the normally closed position on the new replacement thermostat with the piggyback push-on connector (if more than one connection is needed) or a single push-on connector (if only one connection is needed) as provided in the installation package.
4. Reconnect the wires marked common to the common position ("P" terminal) on the new replacement hi-limit thermostat with the piggyback push-on connector (if more than one connection is needed) or a single push-on connector (if only one connection is needed) as provided in the installation package.
5. After wiring connections are complete, place the hi-limit thermostat in the control console. Locate the new replacement hi-limit thermostat on the mounting bracket and secure in place using the 6-32x 1/4" round head slotted screw.
6. Carefully uncoil the capillary tube. Re-insert the capillary tube and thermobulb through the access port from which the old tube and bulb was removed and re-install the thermobulb in the same location from which the old thermostat thermobulb was removed.
7. Replace access panel and secure in place.

Actuator Maintenance and Adjustment

A) Actuator Tension Adjustment

The lid on the tilting skillet operates with a spring-loaded actuator. If the lid can be raised to any position, and it remains in that position, the actuators are adjusted properly. Should the tension need adjustment after shipping, or at any time in the future, the following procedure can be performed.

Raise the unit's lid completely. Removal of the stop nut may be needed to raise the lid completely.

Remove the tube closure cap on the actuator. With a 3/4" deep hex socket, turn the adjusting nut (located inside the actuator sleeve) clockwise to increase the tension or counterclockwise to decrease tension. Rotate the nut one turn at a time and test the lid's operation. When the

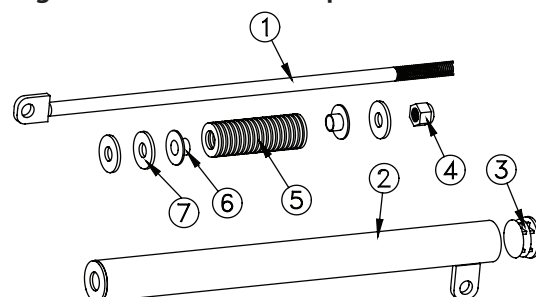
adjustment is complete, replace the tube closure cap on the actuator sleeve.

B) Actuator: Re-Packing With Grease

The lid actuator(s) of your unit must be re-packed with grease every six months to ensure proper operation. Perform the following steps. Refer to Figure 3.1.

1. Raise the lid of the unit fully.
2. Remove the tube closure cap.
3. Remove the self-locking 1/2-13 hex nut on the actuator rod.
4. If the components inside the actuator sleeve do not slide out easily, remove the bolt, which secures the actuator sleeve to the frame lug. Put aside the bolt, nut, and lock washer for re-assembly later.
5. Grasp the actuator sleeve and pull down away from the actuator rod. The components inside the actuator sleeve will slide out.
6. Pack the spring (or springs) with Bel-Ray No-Tox Clear Grease #2. The grease must be liberally applied between each coil.
7. After re-packing with grease, reassemble the components back inside the actuator sleeve and slide the sleeve back over the actuator rod.
8. Reconnect the actuator assembly to the frame lug using the bolt, nut, and lock washer previously set aside.
9. Adjust the tension of the actuators using the procedure described earlier in this section.

Figure 4.1: Actuator Components & Assembly



1. Actuator rod
2. Actuator sleeve
3. Tube closure cap
4. Hex nut, self-locking
5. Spring 8"
6. Nylon shoulder washer
7. Nylon washer

Section IV: Service and Maintenance

C) Actuator Replacement

Should the actuators on your unit ever require replacement, use the following procedure. Refer to Figure 4.1.

1. Raise the lid of the unit fully.
 2. Remove the tube closure cap.
 3. Using a deep socket tool, loosen the self-locking hex nut on the actuator rod (by turning it counterclockwise) to eliminate pressure on the springs.
 4. From the pivot arm of the actuator, remove the acorn nut, bolt, lock washer, and spacer and retain them for mounting the new actuator(s).
 5. From the frame lug (at the other end of the actuator) remove the acorn nut, bolt, and lock washer and retain them for mounting the new actuator(s).
 6. Mount the new actuators using the bolts, nuts, lock washers, and spacers set-aside in the above steps.
- Note:** The actuator rod must be free to pivot during use. Therefore, when tightening the hex bolt into the acorn nut, tighten it completely, and then back off a half turn.
7. After the new actuator(s) are installed, adjust the tension using the procedure described earlier in this section.

Gas Control System

A). Maintenance of the Gas Control System

Your equipment came with a direct ignition gas control system. The systems is as follows:

The S87D Direct Spark Ignition Control Module, VR8205 Main Gas Control Valve, gas control spark igniter, flame sensor, thermostat, temperature limit controller and 25 VAC transformer complete the direct spark ignition system.

The S87D performs the following functions when the thermostat calls for heat.

1. Checks for a false flame condition (short to ground). Module will lock out if false flame condition is present. Reset is manually done from the thermostat.
2. Generates 30,000 volts (open circuit) at the spark igniter stud for direct ignition of the main burner.
3. Opens the main gas control valve
4. Senses the presence of main burner flame and discontinues ignition spark. If the burner fails to ignite

within the trial-for-ignition period, the S87D goes into safety lockout. Reset is manually done from the thermostat.

5. On a loss of power, the S87D allows the system to shut down safely. Start-up is initiated when power is restored.

6. On a loss of main burner flame, the timed trial-for-ignition is repeated. Safety lockout occurs if flame is not reestablished within the trial-for-ignition period. Reset is manually done from the thermostat.

Control Knob Settings:

OFF. Prevents pilot and main gas flow through the ignition system control.

ON. Permits gas flow into the control body and, under control of the thermostat, to the pilot and main burners.

Frequency of Maintenance Required:

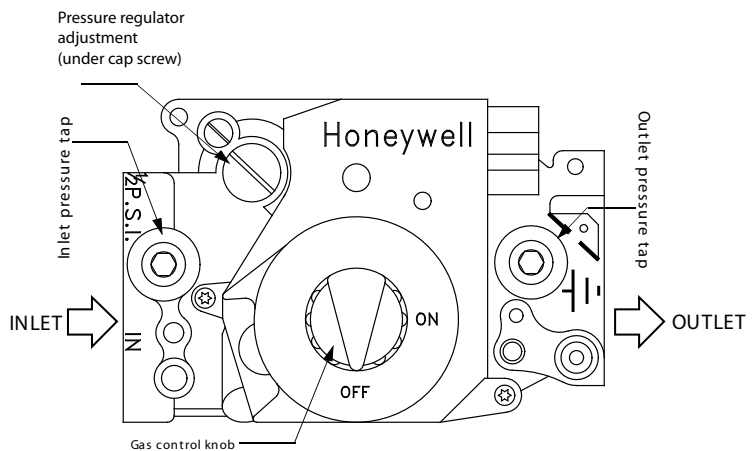
Cycling Frequency. Appliances that may cycle 20,000 times annually should be checked monthly.

Intermittent Use. Appliances that are used seasonally should be checked before shutdown and again before the next use.

Consequence of Unexpected Shutdown. Where the cost of an unexpected shutdown would be high, the system should be checked more often.

Dusty, Wet, or Corrosive Environment. Since these types of environments can cause the gas control to deteriorate more rapidly, the system should be checked more often.

Fig. 4.2: VR8205 Gas Control



Section IV: Service and Maintenance

WARNING

Fire or Explosion Hazard. Can cause property damage, severe injury, or death.

Do not disassemble the gas control; it contains no replaceable components. Attempted disassembly, repair, or cleaning can damage the control, resulting in gas leakage.

When to Replace the Gas Control:

- ☑ The gas control does not perform properly on checkout or troubleshooting.
- ☑ The gas control knob is hard to turn.
- ☑ The gas control is likely to have operated more than 200,000 cycles.
- ☑ The control is wet or looks as if it has been wet.

Main And Worm Gear

Monthly, check the tilt mechanism (main and worm gear) along with the trunnion support bearings for adequate lubrication. Use Bel-Ray No-Tox Open Gear Grease or equivalent. The tilt mechanism is located in the right-hand console box. The trunnion bearings are located in the left-hand console box and between the right-hand console box and the pan.

Other Components

Most electrical component failures can be easily diagnosed by following a logical process. The toggle or rocker switch, thermostats, gas control valve, gas modules, and indicator lights can be easily tested for proper function. No special tools are required for the removal or replacement of malfunctioning components. Make sure all covers are replaced after all repairs are completed. Note: Mark or note wiring connections before removing from components

Section V: Caring For Stainless Steel

This section provides specific guidelines for cleaning and protecting the stainless steel surface of your equipment.

Important!

Always disconnect power before cleaning (or servicing) the unit. Never spray the control console, electrical controls, gas controls, or connections with water. Clean these areas by wiping them with a clean, damp cloth.

The stainless steel can be cared for using any good commercial stainless steel cleaner or polish. Contrary to popular belief, stainless steel remains resistant to corrosion only as long as its passive surface remains intact. There are some basic rules to prevent the breakdown of this surface.

Only plastic scouring pads and soft cloths should be used, since they will not damage the stainless steel surface. Never use anything that will scratch the surface such as steel pads, wire brushes, or scrapers. In the pan, scratches make cleaning more difficult and provide places for bacteria to collect and grow. Never use steel wool since it can leave particles embedded in the pan and can also lead to eventual corrosion and pitting. Never let deposits from water, particularly hard water, or deposits from food sit on the surface for extended periods. Wipe up deposits and spills promptly. After cleaning, rinse off the cleaning agents thoroughly with water, wipe dry, and then allow the surface to air dry. Oxygen actually helps maintain stainless steel's protective surface.

Never use cleaners containing chlorides (or quaternary salts, since they can also contribute to pitting and rusting). Use only alkaline, alkaline-chlorinated, or non-chloride cleaners.



Tip: If you've been doing a lot of continued boiling or steaming, you may notice a build-up of lime or scale in the pan. This cleans up easily using vinegar, a vinegar/water mixture, or any commercial de-liming / de-scaling solution.

Sanitizing

Suggested Tools:

- Cleaner, such as Klenzade HC-10 or HC-32 from ECOLAB, Inc.
- Kettle brushes in good condition
- Sanitizer such as Klenzade XY-12.
- Film remover such as Klenzade LC-30.

Procedure:

- Clean food contact surfaces as soon as possible after use. If the unit is in continuous use, thoroughly clean and sanitize the interior and exterior at least once every 12 hours.
- Scrape and flush out food residues. **Be careful not to scratch the unit with metal implements.**
- Prepare a hot solution of the detergent/cleaning compound as instructed by the supplier. Clean the unit thoroughly. A cloth moistened with cleaning solution can be used to clean controls, housings, and electrical conduits.
- Rinse the unit thoroughly with hot water, and then drain completely.
- As part of the daily cleaning program, clean soiled external and internal surfaces. Remember to check the sides of the unit and control housing.
- To remove stuck materials, use a brush, sponge, cloth, plastic or rubber scraper, or plastic wool with the cleaning solution. To reduce effort required in washing, let the detergent solution sit in the unit and soak into the residue. Do **NOT** use abrasive materials or metal tools that might scratch the surface. Scratches make the surface harder to clean and provide places for bacteria to grow.
- The outside of the unit may be polished with a stainless steel cleaner such as "Zepper" from Zep Manufacturing Co.
- When equipment needs to be sanitized, use a solution equivalent to one that supplies 200 parts per million available chlorine. Obtain advise on sanitizing agents from your supplier of sanitizing products. Following the supplier's instructions, apply the agent after the unit has been cleaned and drained. Rinse off the sanitizer thoroughly.
- It is recommended that each piece of equipment be sanitized just before use.

Section V: Caring For Stainless Steel

10. If there is difficulty removing mineral deposits or a film left behind by hard water or food residues, clean the unit thoroughly and use a deliming agent, like Lime-Away® from Ecolab, in accordance with the manufacturer's directions. Rinse and drain the unit before further use.

NOTICE: NEVER LEAVE A CHLORINE SANITIZER IN CONTACT WITH STAINLESS STEEL SURFACES LONGER THAN 30 MINUTES. LONGER CONTACT CAN CAUSE STAINING AND CORROSION.

Section VI: Troubleshooting

Troubleshooting-General Problems

The Gas Self-Contained Steam Jacketed Kettle is designed to operate smoothly and efficiently if properly maintained. However, in the event of a problem, following is a list of checks to be made by qualified personnel. The wiring diagram for the unit is located behind the removable panel of the control console.

IMPORTANT: Service must be done by a qualified technician experienced with commercial gas and electrical cooking equipment. Use only Legion supplied parts. Unauthorized or generic parts can cause bodily injury and equipment damage. If the unit ever needs repair during the warranty period, prior authorization from Legion is required. Also refer to the sections of this manual entitled Service Calls and also Important Warranty Information.

Symptom	Possible Causes
Pan will not heat, ignition does not take place	Gas and/or power supply not turned on
	Pan is in horizontal position
	Mercury switch out of adjustment
	Loose or broken wires
	Low voltage transformer failure
	Thermostat malfunctioning
	Igniter-Sensor (thermocouple)
	Automatic high temperature cutoff thermostat engaged. When units cools down the circuit will automatically reset for normal operation.
Pan continues to heat after it reaches desired temperature	Thermostat setting - too high
	Primary thermostat malfunctioning
Pan does not reach desired temperature	Thermostat setting - too low
	Primary thermostat malfunctioning
Uneven cooking due to "cold spots"	Low gas pressure
	Plugged orifice(s) in burner
	Plugged burner supply tube
	Plugged burner
Pan is hard to tilt	Lubrication of gear
	Alignment of gear

Important

1. Only persons trained and experienced in DSI systems should service this equipment
2. If a condition exists that causes the S87D control module to go into safety lockout, meter readings must be taken quickly after restart - within trial-for-ignition period.
3. Always de-energize the system for at least 30 seconds before recycling for further tests.
4. Always turn off gas supply before performing ignition checks.
5. S87D control module cannot be repaired. If the troubleshooting procedure indicates a malfunction in the S87D, it must be replaced.
6. The following service procedures are for the S87D and basic DSI systems. On all installations, refer to the service instructions.

If Main Burner Does Not Come On With Call For Heat

1. Confirm the gas control knob is in the ON position.
2. Adjust thermostat several degrees above room temperature.
3. Using ac voltmeter, measure across MV terminals at gas control.
4. If voltage is incorrect or not present, check control circuit for proper operation.
5. If proper voltage is present, replace gas control.

Preliminary Checks for S87D Control Module

The following checks should be made before troubleshooting the system.

1. Check for power to the unit and the S87D. Voltage to the S87D should be between 20.5 and 28.5 Vac.
2. Check fuse on S87D control module and replace if blown.
3. Make certain that the manual shutoff valve in the supply line and the gas cock knob on the gas control valve are open.
4. Make certain that all wiring connections are clean and tight.
5. Make certain the S87D is not in safety lockout. De-energize the system by moving the thermostat set point below room temperature. Wait at least 30 seconds and reenergize the system by moving the thermostat set point 5°F (3°C) above room temperature. Return set point to normal temperature setting.

Section VI: Troubleshooting

6. Check ceramic insulator on flame sensor, spark igniter or igniter/sensor. A cracked insulator will allow current to leak to ground. Replace device if insulator is cracked.
7. Check the flame sensor and its mounting bracket. Correct the position if bent out of shape.
8. Review the S87D normal sequence of operation, see Section II, Startup & Checkout, Fig. 2.2.

S87 Component Checks

Spark Ignition Circuit

The step-up transformer in the S87D provides spark ignition at 30,000 volts (open circuit). To check the spark ignition circuit, proceed as follows.

1. Shut off gas supply to the gas control.
2. Disconnect the ignition cable at the S87D stud terminal to isolate the circuit from the spark igniter or igniter/sensor. Prepare a short jumper lead, using heavily insulated wire such as ignition cable.

CAUTION

In the next step, DO NOT allow fingers to touch either the stripped end of the jumper or the stud terminal. This is a very high voltage circuit and electrical shock can result.

3. Perform this test immediately upon energizing the system - before the S87D goes into safety lockout and interrupts the spark circuit. Touch one end of the jumper firmly to the S87D GND terminal. (DO NOT remove the existing ground lead.) Slowly move the other end of the jumper wire toward the stud terminal on the S87D to establish a spark. Pull the wire away from the stud and note the length of gap at which spark discontinues.
4. A spark length of 1/8 inch (3mm) or more indicates satisfactory voltage output. If no arc can be established or the maximum spark is less than 1/8 inch (3mm), and power to the S87D input terminals was proved, replace the S87D.

Ignition Cable

Check the electricity continuity of the ignition cable and make certain the cable is not in contact with metal surfaces. The total cable length should not exceed 3 ft. (0.9mm). A loose connection to the spark igniter or igniter/sensor may not conduct a flame signal even though spark ignition is satisfactory. Check connections to the stud terminal on the S87D and the boot

connection to the igniter/sensor. Make certain they are clean and tight.

Grounding Connections

A common ground is required for the burner, spark igniter or igniter/sensor mounting bracket and the GND (burner) terminal of the S87D. If ground is poor or erratic, safety shutdown may occur occasionally even though operation is normal at time of checkout. Therefore, if nuisance shutdowns have been reported, be sure to check ground connections.

Electric ground connections at the spark igniter or igniter/sensor and the S87D must be clean and tight. If leadwire is damaged or deteriorated, use only No. 14 or No. 18 gauge, moisture-resistant, thermoplastic insulated wire with 105°C (221°F) minimum rating as replacement.

Flame Sensor Circuit

The S87D provides ac power to the flame sensor which the burner flame rectifies to direct current. If the flame signal back to the S87D is less than 1.5 μ A dcm the system will lock out.

The output of the flame sensing circuit cannot be checked directly on the S87. Check the flame sensing circuit directly by checking the flame sensing current from the sensor to the S87 as follows.

1. Connect a meter (dc microammeter scale) in series with the flame signal ground wire as shown in Fig. 6.1. Use the????? Test Meter or equivalent. Disconnect the ground wire at the S87D. Connect the red (positive) meter lead to the free end of the ground wire. Connect the black (negative) meter lead to the quick-connect ground terminal on the S87.
2. Restart the system and read the meter. The flame sensor current must be at least 1.5 μ A or unsteady, see Low or Unsteady Flame Current section below.

If a flame is present at sensor and a reading of 0 μ A is obtained, check for a secondary ground connection to the 25V (GND) terminal. If secondary connection exists, temporarily remove connection and measure flame current.

Low or Unsteady Flame Current

If the current to the S87D flame circuit is less than 1.5 μ A or is unsteady - check the burner flame, flame sensor location and electrical connections as follows:

Section VI: Troubleshooting

Burner Flame

The flame sensor must be constantly immersed in flame. Check flame burner conditions as shown in Fig. 6.2.

Flame Sensor

The flame signal is best when about 1 inch (25 mm) of flame rod is immersed in the burner flame. A bent flame rod, bent mounting bracket or cracked ceramic insulator can affect flame signal. Replace flame sensor if necessary.

Electrical Connections and Shorts

Connections at the flame sensor must be clean and tight. If wiring needs replacement, use moisture-resistant No. 18 wire rated for continuous duty up to 105°C (221°F).

Fig. 6.1: S87D Flame Current Measurement

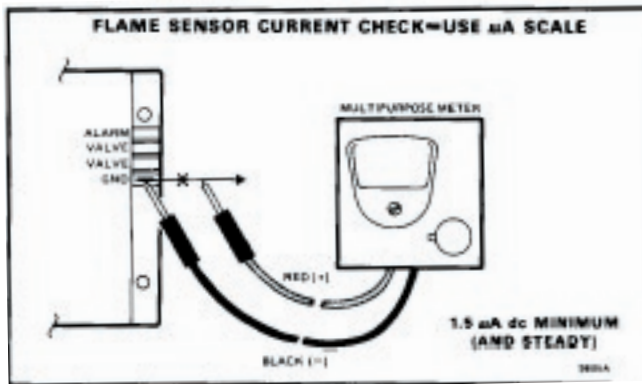
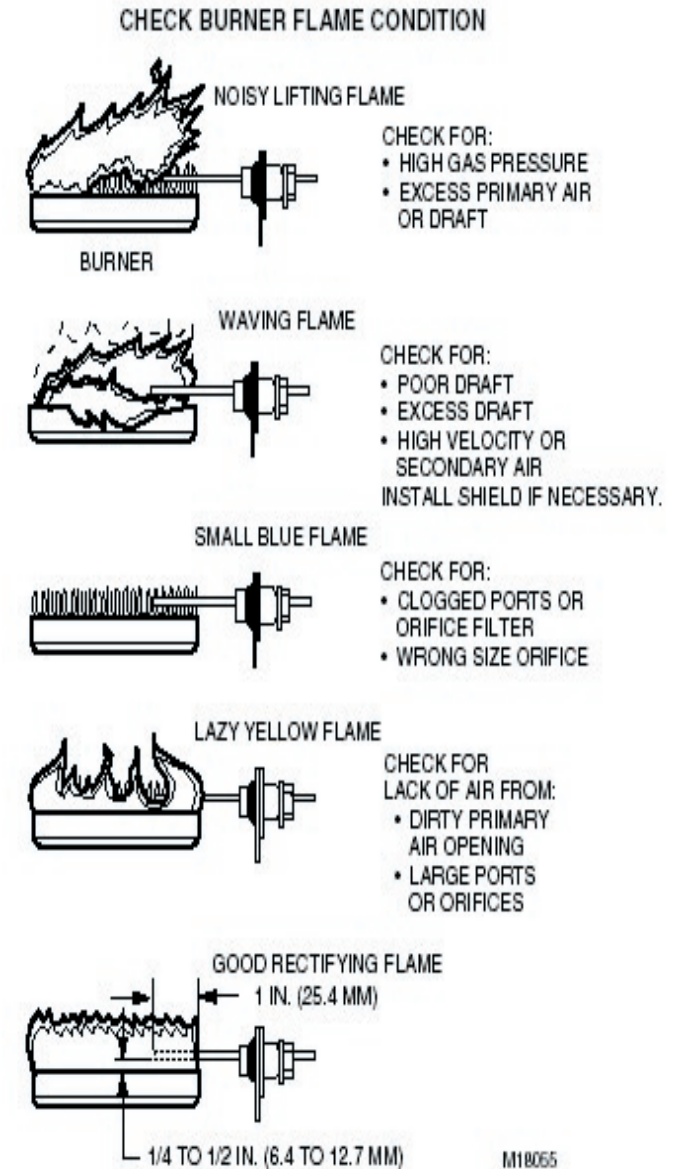
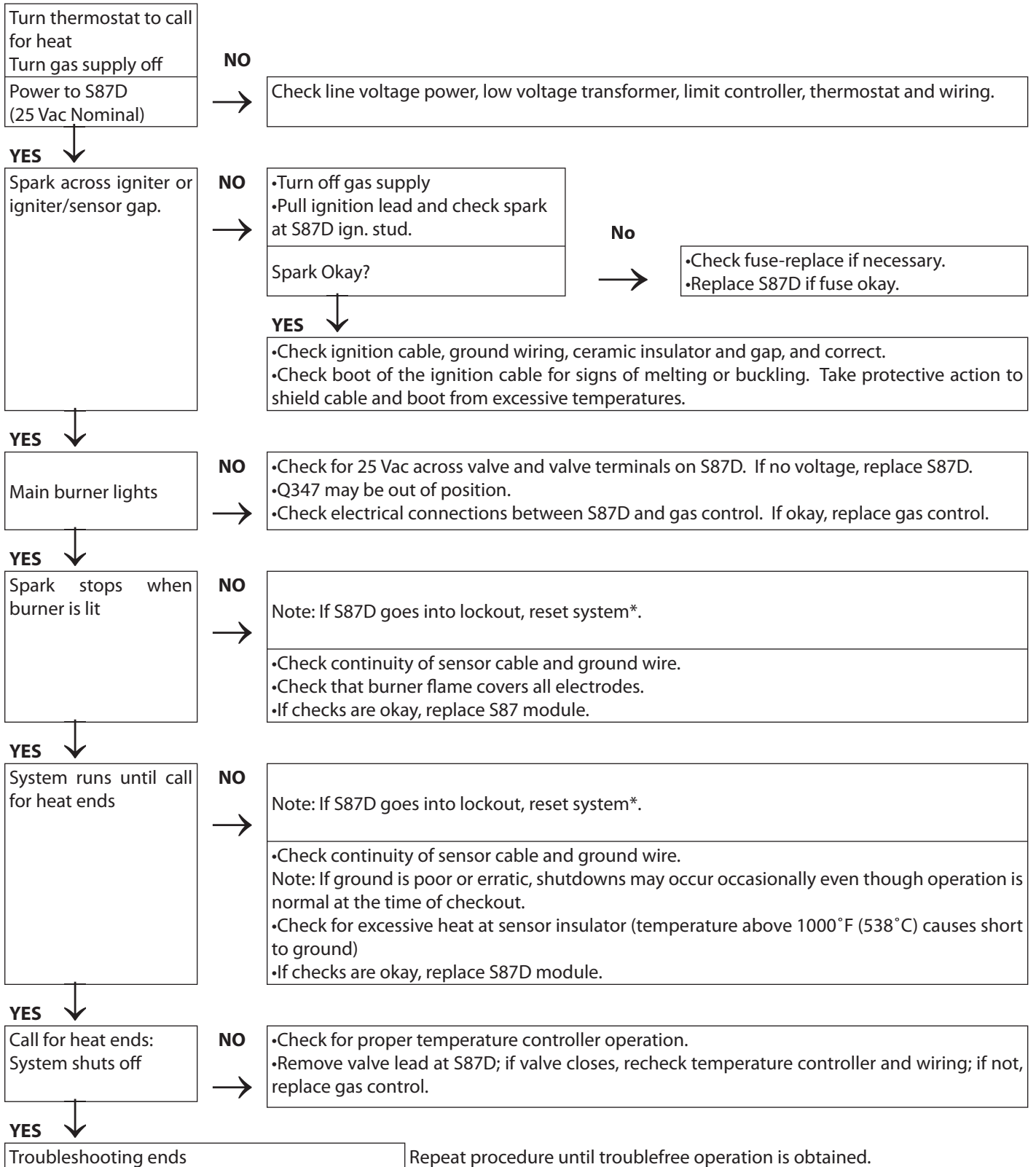


Fig. 6.2: Burner Flame Conditions



Section VI: Troubleshooting

START Note: Before troubleshooting, familiarize yourself with the start-up and checkout procedure.



*For S87D module, on a lockout an alarm circuit is completed to visually tell you of system shutdown.

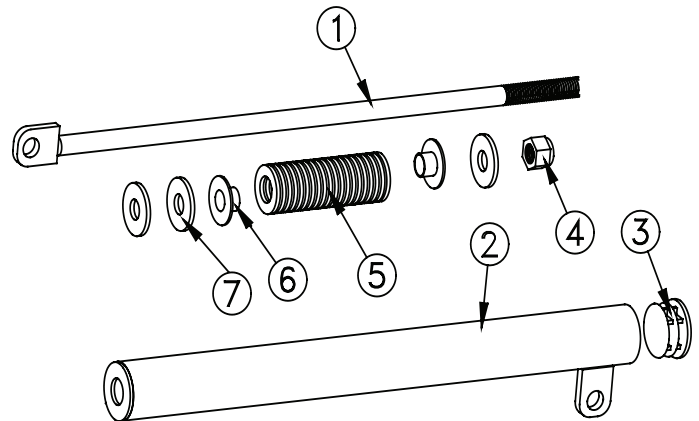
Section VII: Parts List

General Parts List

PART NO.	PART DESCRIPTION
407567-1	Thermostat primary 176° - 400°F
407568-1	Thermostat high limit 460°F
407793	Grommet thermostat shaft
407615	Rocker switch
407708	Igniter Q347A1004
431136	Transformer 120-24V
431138	Module, S87D DSI - 11 seconds
431139	Sensor Q354A1018 90 deg.
404307	Term, spark plug
407714	Indicator light amber 120V
407810	Indicator light red 120V
409166-18	Flexible gas hose 1/2 x 18
409267	Gas swivel 1/2"
430247	Gas shutoff valve (full port)
404539	U-shape burner
404544	Carry-over tube TGS-2430
404545	Carry-over tube TGS-2440
460102	Worm gear
460101	Trunnion gear - large
407531-01	Crank
450751	Bullet foot 1 5/8"
408693-001	Actuator assembly complete
430085	Tilt switch
404581-10	Orifice gas #53
406871-36	Orifice gas #36
401032	Knob, cover handle
401040	Star tolerance ring for knob
408551	Grease #2 clear Bel-Ray

Actuator Parts List & Assembly

Fig. 7.1: Actuator Assembly Diagram



1. Actuator rod
2. Actuator sleeve
3. Tube closure cap
4. Hex nut, self-locking
5. Spring 8"
6. Nylon shoulder washer
7. Nylon washer

ITEM NO.	PART DESCRIPTION	PART NO.
1	Actuator rod	404481-001
2	Actuator sleeve	404483-001
3	Tube closure cap	404485
4	Hex nut, self-locking	405591
5	Spring 8"	408531
6	Nylon shoulder washer	408506
7	Nylon washer	408505

For Your Use & Review

Installation Checklist

Proper operation of the Legion Gas-Fired Classic Tilting Skillet is dependent upon proper installation. Performing the following checks at the time of installation could avoid unnecessary service calls.

IMPORTANT: Recording the following information is necessary for your warranty to be valid.

Item	Reference Section	Verify Completion
1. Verify that specified clearances are met.	Installation Positioning the Unit	
2. Verify that ventilation hood requirements comply with all code requirements. It is the responsibility of the owner and/or installer to learn and comply with these codes.	Installation Positioning the Unit	
3. Verify the voltage requirements and electrical connections were checked.	Installation Electrical Connection	
4. Verify that a sediment trap and manual shut-off valve is installed in the gas supply line.	Installation Gas Connection	
5. Verify that the gas valve inlet and outlet readings were checked. Record the information on the following lines. The readings must be within the ranges specified in Fig. 1.3.	Installation Gas Connection	
6. Verify that actuators are adjusted to hold cover in proper position	Service & Maintenance 2. Actuator Maintenance and Adjustment	

Record Gas Supply Pressure Readings

All other equipment on the same gas supply line turned ON

All other equipment on the same gas supply line turned OFF

Inlet

Inlet

Outlet

Outlet

LEGION LIMITED WARRANTY AND EXTENDED WARRANTY COVERAGE

To Commerical Purchasers 02/01 (Domestic U.S. Sales Only)

	Legion equipment has been skillfully designed and manufactured, carefully inspected and packaged to meet rigid standards of excellence and is warranted to be free from defects in material and workmanship subject to the following limitations.		
<i>Users</i>	This warranty is limited to Legion equipment sold to the original commercial user (but not original equipment manufacturers), at the original place of installation, in the continental United States and Hawaii. Equipment must be registered within ten (10) days of installation. Damage incurred during shipment is to be reported to the carrier, and is not covered under this warranty.		
<i>Warranty Time Period</i>	This warranty is valid for twelve (12) months from installation (See "Users" regarding registration) or fifteen (15) months from ship date, whichever occurs first.		
<i>Exceptions</i>	Exceptions to standard warranty period are as follows: These parts will be covered for a period of 90 days from registration.		
	Draw-off valve stems Indicator lights	Fill faucets and spray heads Valve stem packing and seats	Teflon packing Sight glasses
<i>Installation</i>	Proper installation and installation verification is the responsibility of the owner-user and is not covered by this warranty. Many local codes exist, and it is the responsibility of the owner-user and installer to comply with these codes. Legion equipment is built to comply with applicable standards for manufacturers. Included among these approval agencies are: UL, NSF, ASME/National Board, CSA, AGA, CGA, ETL and others. Our program of constant product improvement makes it necessary for new or improved models to be submitted for testing by these various agencies as they are developed. Therefore, not all models bear the appropriate agency approval or certification at all times. Adjustments such as leveling, tightening of fasteners or utility connections (gas, electric, steam or water) normally associated with original installation are the responsibility of the owner-user or installer.		
<i>Authorized Agency</i>	Legion will replace or repair at no cost, F.O.B. plant of manufacture, any part of all equipment, which becomes defective due to material or factory workmanship within the warranty period. Legion agrees to pay for normal service rates required to repair or replace, at our option any part which proves to be defective in material or workmanship, during the labor warranty period. This warranty includes travel time not to exceed lesser of two (2) hours round-trip and mileage not to exceed 50 miles (150 miles round-trip).		
<i>Replacement Parts</i>	Warranty on all replacement parts which are replaced in the field by Legion Authorized Service Agencies will be limited to three (3) months on labor, six (6) months on materials (parts) effective from the date of installation.		
<i>Specific Exclusions</i>	<p>Freight damage.</p> <p>Equipment not properly registered within ten (10) days of installation.</p> <p>Equipment failure relating to improper installation. Examples are but not limited to: improper utility connection(s), improper utilities supply and problems due to ventilation.</p> <p>Equipment that has been modified, changed, or altered from its original shipped configuration, failure to use factory approved OEM replacement parts.</p> <p>Use of other than pure distilled water (free of chlorides) in self-contained kettles.</p> <p>Water damage to controls (electrical and mechanical) and other surfaces.</p> <p>Equipment that has not been properly maintained. Examples are but not limited to: adjustments to pilots and burners and damage from improper cleaning.</p> <p>Labor involved in moving adjacent objects to gain access to the equipment.</p> <p>Expendable parts such as bulbs, gaskets, washers, plastic knobs & handles, bag filters, scraper blades, fuses, vinyl spray hoses, cleaning brushes and care kits.</p> <p>Tampering, changing or adjusting any control equipment which was permanently set by the factory.</p> <p>Use of materials containing components harmful to stainless steel.</p> <p>Changes, alterations, or modifications to equipment or parts by the owner, user, installer or any third party.</p>		
<i>Claims Procedure</i>	<p>Claims of defects must be asserted by customer by written notice, accompanied by a description of the defect, proof of purchase, the delivery date and the date of installation, to Legion within ten (10) days after the defect is discovered but in no event beyond the applicable warranty time period. All claims under the Limited Warranty provided herein which are not made in accordance with the claims procedure set forth herein, are deemed waived and released by the customer. Following its receipt of such claim, Legion will notify customer whether customer must ship the defective part, freight prepaid, to Legion for repair or replacement, or whether repair or replacement will be accomplished on customer's premises.</p> <p>THE FOREGOING SHALL CONSTITUTE THE SOLE AND EXCLUSIVE REMEDY OF ORIGINAL PURCHASER AND THE FULL LIABILITY OF LEGION INDUSTRIES FOR ANY BREACH OF WARRANTY. THE FOREGOING IS EXCLUSIVE AND IN LIEU OF ALL OTHER WARRANTIES, WHETHER WRITTEN, ORAL, OR IMPLIED, INCLUDING ANY WARRANTY OF PERFORMANCE, MERCHANTABILITY, OR FITNESS FOR A PARTICULAR PURPOSE OR USE, AND SUPERSEDES AND EXCLUDES ANY ORAL OR OTHER WRITTEN WARRANTIES OR REPRESENTATIONS, NOT EXPRESSLY DESIGNATED IN WRITING AS A "WARRANTY" OR "GUARANTEE" OF LEGION INDUSTRIES MADE OR IMPLIED IN ANY MANUAL, LITERATURE, ADVERTISING BROCHURE OR OTHER MATERIALS OR MADE BY EMPLOYEES OR AGENTS OF LEGION. LEGION'S LIABILITY ON ANY CLAIM OF ANY KIND, INCLUDING NEGLIGENCE, WITH RESPECT TO THE GOODS OR SERVICES COVERED HEREUNDER, SHALL IN NO CASE EXCEED THE PRICE OF THE GOODS OR SERVICES, OR PART THEREOF, WHICH GIVES RISES TO THE CLAIM. IN NO EVENT SHALL LEGION INDUSTRIES BE LIABLE FOR SPECIAL, INCIDENTAL, OR CONSEQUENTIAL DAMAGES, OR ANY DAMAGES IN THE NATURE OF PENALTIES.</p>		
<i>Limited Extended Warranty Coverage</i>	The purchaser of a Limited Extended Warranty Contract extends the standard warranty coverage to the purchased period of time (one to two years) from the date of registration or date of shipment, whichever is sooner. An additional two years Parts and Labor Warranty can be purchased with each piece of Legion equipment for an additional 3% of the List Price per year. The 3% of list price charge will be the net invoice amount for each year of extended warranty purchased		

LEGION LIMITED WARRANTY AND EXTENDED WARRANTY COVERAGE

To Commerical Purchasers 02/01 (Canada Only)

	Legion equipment has been skillfully designed and manufactured, carefully inspected and packaged to meet rigid standards of excellence and is warranted to be free from defects in material and workmanship subject to the following limitations.		
<i>Users</i>	This warranty is limited to Legion equipment sold to the original commercial user (but not original equipment manufacturers), at the original place of installation, in Canada. Equipment must be registered within ten (10) days of installation. Damage incurred during shipment is to be reported to the carrier, and is not covered under this warranty.		
<i>Warranty Time Period</i>	This warranty is valid for twelve (12) months from installation (See "Users" regarding registration) or fifteen (15) months from ship date, whichever occurs first.		
<i>Exceptions</i>	Exceptions to standard warranty period are as follows: These parts will be covered for a period of 90 days from registration.		
	Draw-off valve stems Indicator lights	Fill faucets and spray heads Valve stem packing and seats	Teflon packing Sight glasses
<i>Installation</i>	Proper installation and installation verification is the responsibility of the owner-user and is not covered by this warranty. Many local codes exist, and it is the responsibility of the owner-user and installer to comply with these codes. Legion equipment is built to comply with applicable standards for manufacturers. Included among these approval agencies are: UL, NSF, ASME/National Board, CSA, AGA, CGA, ETL and others. Our program of constant product improvement makes it necessary for new or improved models to be submitted for testing by these various agencies as they are developed. Therefore, not all models bear the appropriate agency approval or certification at all times. Adjustments such as leveling, tightening of fasteners or utility connections (gas, electric, steam or water) normally associated with original installation are the responsibility of the owner-user or installer.		
<i>Authorized Agency</i>	Legion will replace or repair at no cost, F.O.B. plant of manufacture, any part of all equipment, which becomes defective due to material or factory workmanship within the warranty period. Legion agrees to pay for normal service rates required to repair or replace, at our option any part which proves to be defective in material or workmanship, during the labor warranty period. This warranty includes travel time not to exceed lesser of two (2) hours round-trip and mileage not to exceed 50 miles (150 miles round-trip).		
<i>Replacement Parts</i>	Warranty on all replacement parts which are replaced in the field by Legion Authorized Service Agencies will be limited to three (3) months on labor, six (6) months on materials (parts) effective from the date of installation.		
<i>Specific Exclusions</i>	<p>Freight damage.</p> <p>Equipment not properly registered within ten (10) days of installation.</p> <p>Equipment failure relating to improper installation. Examples are but not limited to: improper utility connection(s), improper utilities supply and problems due to ventilation.</p> <p>Equipment that has been modified, changed, or altered from its original shipped configuration, failure to use factory approved OEM replacement parts.</p> <p>Use of other than pure distilled water (free of chlorides) in self-contained kettles.</p> <p>Water damage to controls (electrical and mechanical) and other surfaces.</p> <p>Equipment that has not been properly maintained. Examples are but not limited to: adjustments to pilots and burners and damage from improper cleaning.</p> <p>Labor involved in moving adjacent objects to gain access to the equipment.</p> <p>Expendable parts such as bulbs, gaskets, washers, plastic knobs & handles, bag filters, scraper blades, fuses, vinyl spray hoses, cleaning brushes and care kits.</p> <p>Tampering, changing or adjusting any control equipment which was permanently set by the factory.</p> <p>Use of materials containing components harmful to stainless steel.</p> <p>Changes, alterations, or modifications to equipment or parts by the owner, user, installer or any third party.</p>		
<i>Claims Procedure</i>	<p>Claims of defects must be asserted by customer by written notice, accompanied by a description of the defect, proof of purchase, the delivery date and the date of installation, to Legion within ten (10) days after the defect is discovered but in no event beyond the applicable warranty time period. All claims under the Limited Warranty provided herein which are not made in accordance with the claims procedure set forth herein, are deemed waived and released by the customer. Following its receipt of such claim, Legion will notify customer whether customer must ship the defective part, freight prepaid, to Legion for repair or replacement, or whether repair or replacement will be accomplished on customer's premises.</p> <p>THE FOREGOING SHALL CONSTITUTE THE SOLE AND EXCLUSIVE REMEDY OF ORIGINAL PURCHASER AND THE FULL LIABILITY OF LEGION INDUSTRIES FOR ANY BREACH OF WARRANTY. THE FOREGOING IS EXCLUSIVE AND IN LIEU OF ALL OTHER WARRANTIES, WHETHER WRITTEN, ORAL, OR IMPLIED, INCLUDING ANY WARRANTY OF PERFORMANCE, MERCHANTABILITY, OR FITNESS FOR A PARTICULAR PURPOSE OR USE, AND SUPERSEDES AND EXCLUDES ANY ORAL OR OTHER WRITTEN WARRANTIES OR REPRESENTATIONS, NOT EXPRESSLY DESIGNATED IN WRITING AS A "WARRANTY" OR "GUARANTEE" OF LEGION INDUSTRIES MADE OR IMPLIED IN ANY MANUAL, LITERATURE, ADVERTISING BROCHURE OR OTHER MATERIALS OR MADE BY EMPLOYEES OR AGENTS OF LEGION. LEGION'S LIABILITY ON ANY CLAIM OF ANY KIND, INCLUDING NEGLIGENCE, WITH RESPECT TO THE GOODS OR SERVICES COVERED HEREUNDER, SHALL IN NO CASE EXCEED THE PRICE OF THE GOODS OR SERVICES, OR PART THEREOF, WHICH GIVES RISES TO THE CLAIM. IN NO EVENT SHALL LEGION INDUSTRIES BE LIABLE FOR SPECIAL, INCIDENTAL, OR CONSEQUENTIAL DAMAGES, OR ANY DAMAGES IN THE NATURE OF PENALTIES.</p>		
<i>Limited Extended Warranty Coverage</i>	The purchaser of a Limited Extended Warranty Contract extends the standard warranty coverage to the purchased period of time (one to two years) from the date of registration or date of shipment, whichever is sooner. An additional two years Parts and Labor Warranty can be purchased with each piece of Legion equipment for an additional 6% of the List Price per year. The 6% of list price charge will be the net invoice amount for each year of extended warranty purchased		

