ROTISSERIE

OPERATIONS AND SERVICE MANUAL

READ AND UNDERSTAND THIS OPERATIONS AND SERVICE MANUAL BEFORE USING THIS MACHINE. FAILURE TO FOLLOW OPERATING INSTRUCTIONS COULD RESULT IN PERSONAL INJURY OR DAMAGE TO THE EQUIPMENT.

KEEP THIS MANUAL IN A SAFE LOCATION FOR FUTURE REFERENCE

J&R MANUFACTURING
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⚠ ADVERTENCIA

Leer y comprender el Manual de operaciones y servicio antes de usar esta máquina.

El incumplimiento de las instrucciones de operación podría causar lesiones graves o daño al equipo.

⚠ WARNING

Read and understand operations and service manual before using this machine.

Failure to follow operating instructions could result in personal injury or damage to equipment.

Reorder No. 8980-02WHPS

⚠ ADVERTENCIA

Riesgo de explosión

1. Nunca utilizar químicos volátiles como líquido para encender carbón, gasolina, grasa, etc., para encender o ayudar a prender un fuego. Nunca utilizar gas (natural o propano). Utilizar únicamente leña o ayudas que sean sólidas (poco volátiles) para encender el fuego.
2. Siempre deberá "RETIRARSE" por lo menos un minuto antes de abrir cualquier puerta para evitar retrocesos de la llama.

⚠ WARNING

Explosion hazard

1. Never use volatile chemicals such as charcoal lighter fluid, gasoline, grease, etc. to start or aid fire. Never use gas (natural or propane). Use only kindling or safe (low volatility) solid fire starting aids.
2. Always "EVAC" for at least one minute before opening any door to avoid flashbacks.

Reorder No. 8980-01WHPS

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WARNINGS!

Disposal of Ashes

Ashes should be placed in a metal container with a tight-fitting lid. The closed container of ashes should be placed on a noncombustible floor or on the ground, well away from all combustible materials, pending final disposal. If the ashes are disposed of by burial in soil or otherwise locally dispersed, they should be retained in the closed container until all cinders have thoroughly cooled.

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Creosote – Formation and Need for Removal –

When wood is burned slowly, it produces tar and other organic vapors, which combine with expelled moisture to form creosote. The creosote vapors condense in the relatively cool chimney flue of a slow-burning fire. As a result, creosote residue accumulates on the flue lining. When ignited this creosote makes an extremely hot fire. The chimney connector and chimney should be inspected at least twice monthly during the heating season to determine if a creosote buildup has occurred. If creosote has accumulated it should be removed to reduce the risk of a chimney fire.

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Exhaust Hood Required

This unit MUST BE INSTALLED under a Class 1 exhaust hood with an approved fire suppression system

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DANGER-Risk of Fire or Explosion

Do not burn garbage, gasoline, drain oil or other flammable liquids

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WARNING-Risk of Fire

Do not operate with fuel loading doors or ash removal drawers open.
Do not store fuel or other combustible material within marked installation clearances.
Inspect and clean flues and chimney regularly

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CAUTION-Hot Surfaces

Keep children away
Do not touch during operation

ROTISSERIE

OPERATIONS AND SERVICE MANUAL

MANUFACTURED BY:

J & R MANUFACTURING

Rev.12-21

CONTENTS

INSTALLATION INSTRUCTIONS

SHIPPING

The Custom Rotisserie will be shipped fully assembled. The spits will be packed inside the cooking compartment.

HANDLING

The unit can be handled with a forklift with a 6,000 pound capacity. The extra capacity is necessary due to the size of the unit.

OPTIONAL DRAIN CONNECTION (Not applicable to all solid fuel fired units)

There is an optional drain connection on the left or right hand side of the unit. This drain is used for draining grease and/or water and for cleaning the cooking compartment. The unit's drain should be piped into a floor drain.

ELECTRICAL REQUIREMENTS

The unit requires a 115 volt, 1 phase, 15 amp electrical service. A switch or circuit breaker should be installed near the unit. It will be necessary during certain maintenance procedures to shut off the electrical supply. At these times, it is a good safety procedure to tag the switch to guard against someone re-energizing the circuit. Your electrician should extend a conduit from the unit's junction box to a 115 volt supply in your building using a grounded circuit. Please refer to your local electrical code for any other requirements. Connect at junction box only.

GAS PIPING (Not applicable to all solid fuel fired units)

Connect the gas supply (including a gas line supply valve) to the gas connection on the unit. Use a UL approved pipe joint compound. Check for leaks with a soap solution (do not use a flame). If there are no leaks, light any standing pilot burners by following the instructions on the gas safety valve. Turn on the burners and check all piping connections for leaks.

CLEARANCES: The installation must conform to the following min. clearances (inches):

From non-combustible walls:

Back and sides: 0
Front: 48

From combustible walls:

Back and sides: With no upper enclosure panels: 48
With upper enclosure panels: 2
Front: 48

The unit can only be installed on a non-combustible floor.

If this appliance is to be used with casters, please note the following:
The gas connection must be made with a connector that complies with the Standard for Connectors for Movable Gas Appliances, ANSI Z21.69: CSA 6.16, 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. Adequate means must be provided to limit the movement of the appliance without depending on the connector and quick-disconnect device or its associated piping to limit the appliance movement. Use the hole provided in the base frame of the unit to attach a movement limitation device (for example, a steel cable secured to the building structure).

VENTING INFORMATION

In all cases, it is imperative to obtain the approval of the AHJ (Authority Having Jurisdiction). This will typically be the mechanical inspection department of the local municipality's building inspection division and/or the local fire marshal.

A. Exhaust hoods should be Listed, Type 1 hoods with automatic fire suppression systems and conform to NFPA 96 requirements.

B. For Canopy-type commercial cooking hoods the inside edge thereof shall overhang or extend a horizontal distance of not less than six (6) inches beyond the edge of the cooking surface on all open sides, and the vertical distance between the lip of the hood and the cooking surface shall not exceed four (4) feet.

C. A grease duct serving a Type 1 Hood shall be constructed of at least 0.054 inch thick (No. 16 Manufacturer's Standard Gauge) steel or at least 0.043 inch thick stainless steel (No. 18 MSG). Duct enclosures for grease duct shall be constructed as the Building Code requires. Duct enclosures shall be of at least one-hour fire-resistive construction in all buildings and shall be of 2-hour fire-resistive construction in buildings with four or more stories.

D. Exhaust hood volume should be based on the specifications from the 2009 (or later) International Mechanical Code Section 507.

Notes :

1. Exhaust volume should be determined by the exhaust hood manufacturer based on their products listing and local code requirements. States such as California, Oregon, Washington, and Connecticut all have code driven maximum exhaust volumes for specific equipment. For example: California mandates that solid fuel exhaust hoods for a wall mounted application can use NO MORE than 385 cfm/lf for solid fuel.
2. Spark arrestor type filters are required **for solid fuel equipment.**
3. **A h**ood serving **our solid fuel** equipment must be dedicated to **our equipment** only **and must have its** own dedicated fire protection system.

OPERATING INSTRUCTIONS

PRIOR TO COOKING

Wash and clean all spits and forks thoroughly. Wipe down the interior of the unit.

If the unit has standing pilots, verify that all pilots are lit. If not, locate the safety valve associated with the pilot. Turn the arrow to Pilot and press down while an assistant holds a flame to the pilot light adjacent to the burner. The button should remain depressed at least 60 seconds to ensure lighting.

If the unit has a water pan, verify that there is at least ¼" of water in the bottom of the cooking compartment. This will greatly simplify cleaning the unit at the end of the day.

BUILDING A FIRE

Make sure that the exhaust hood is operating before building a fire.

For units with rear fire boxes, load the wood through the side fuel loading door making sure that it will not fall over the retainer grating and into the water of the cooking compartment. On some units wood is loaded below the spits from the front through the front fuel loading door(s).
Start the fire by using kindling or safe (low volatility) solid fire starting aids.

Never use charcoal lighter fluid, gasoline, grease, etc. or any volatile chemicals to start or aid the fire.

PROTECTING THE INFRARED BURNERS

If there is a solid fuel firebox under the rotisserie spits a shield is provided with the unit. If the infrareds are not in use and there is a fire below (even if it is just smoldering) the shield must be in place. Otherwise the infrareds will become clogged and rendered inoperative.

LOADING AND UNLOADING THE CHICKEN

Each spit has one end that has been rounded off and one end that is hex shaped. To install a spit, insert the rounded end of spit into the hexagonal spring loaded socket until the opposite end of the spit can be inserted into its opposing hexagonal socket. Make sure that each end is seated securely into its respective socket.

To unload the spits the procedure is reversed.

Never try to install or remove a spit while the rotisserie is turning. Never reach into the rotisserie area while it is moving. Serious injury may result.

There is an on/off switch for the rotisserie on the front of the unit, which can be used to stop the rotisseries motion so that a spit in front can be loaded or unloaded.

STARTING TO COOK

Before starting to cook it is necessary to turn on either the gas control knob (for standing pilots) or a switch where spark ignition is used.

The infrared heaters should all come on when the gas control knob is turned on. Visually verify that all the infrared burners are burning. If not, turn the gas control knob or the switch off. Wait 5 minutes before turning the gas back on. Verify that all the infrared burners are burning before proceeding to cook.

WARNING: Do not use the rotisserie unless all the infrared burners are operational.

END OF THE DAY CLEANUP

At the end of the day the unit should be cleaned to remove all grease. Where applicable this work is expedited by draining the water from the unit and cleaning with a commercial degreaser.

If grease is allowed to build up in the unit a grease fire may occur.

Wipe or wash down the upper works of the unit as needed and at the end of the day. However, care must be taken not to splash water or any fluid on the infrareds. They may still be hot and this could cause a burner face to crack.

The exhaust hood should operate at all times when the burners are in use or when wood is burning or smoldering. Ashes should be removed from the ash drawers. Remove the wood ashes from the unit. Place wood and coals into a tightly sealed metal container, which is stored in a safe location away from combustibles. Do not dump ashes into a dumpster until you are sure that no embers remain (sometimes they can remain live for several days).

OPERATING INSTRUCTIONS

COMBO BROILER – ALL SOLID FUEL MODELS

1. Place charcoal or wood fuel carefully onto the fuel grates and/or in the firebox. Make sure the exhaust hood is in operation. Ignite the fuel with kindling or a commercially available solid fire starting aid. When more fuel is required, carefully add it to the fuel bed by either raising the top (if movable) meat grating or opening one of the fuel loading doors (if the unit is so equipped). Only add the minimum fuel required for each cooking session (don't over stoke). If your unit has gas burners, turn the gas valve(s) on when needed after checking to be sure that the pilot flames are burning.

2. Adjust the cooking grates/or fuel grates (if applicable) to a suitable position for the type of cooking and for the state and size of the fire.

3. Keep all spits in place in the rotisserie at all times (even when empty) when the rotisserie is turning. Keep the tension on the non-springloaded side of the rotisserie adjusted, so that each time a spit "spoked turner" contacts the fixed arm, it only turns 120 degrees. It should not "spring" back or forward after separating from the arm. See Figure 1. If your rotisserie has the "star tuner" on the same side as the compression spring, you do not have to keep all spits in place at all times. If your rotisserie has no "star turner" it utilizes our "Spinnin-Spitz" design. In this case a concealed chain and sprocket assembly does all spit turning.

4. To install a spit, insert one end of the spit into the hexagonal spring loaded socket and push against the spring's tension until the opposite end of the spit can be inserted into the opposing hexagonal socket. Make sure each end is seated securely into its socket. Rotate the rotisserie to ensure that each spoked turner properly engages the fixed arm for the first revolution of the rotisserie. Thereafter, they will stay properly aligned as long as the tension is in adjustment (as described in item 3 above). To remove a spit, reverse the above procedure.

5. Remove ashes from the ash drawers daily. Discard them into a tightly sealed metal ash bin and don't dump stored ashes into a dumpster until you are <u>sure</u> that no embers remain (sometimes they can remain live for several days).

6. Wipe or wash down the upper works of the unit as needed and at the end of each cooking shift.

7. Never try to install or remove a spit while the rotisserie is turning – Never reach into the rotisserie area while it is turning – Never reach a part of your body into the fuel area or under a movable grate. Keep anything that might ignite away from the fire area (this especially includes clothing).

PREVENTIVE MAINTENANCE

DAILY

Keep the unit clean. Wipe off after each use and clean thoroughly at the end of the day. Do not splash water or any cleaner on or wipe the burners since water or a cleaner will damage the ceramic burner faces.

If applicable, remove all ashes and place in a tightly sealed metal container away from all combustibles. Dispose of ashes only after you are certain that no live coals remain.
If applicable, clean the pipe burner (log lighter) and ensure that no holes are plugged. Daily removal of ashes will reduce the need to clean the pipe burner.

Clean between the springs to remove grease buildup and any food residue. Lubricate the springs by spraying a food grade oil such as olive or vegetable oil onto the springs.

WEEKLY

Lubricate every bushing (associated with each spit drive-side socket) with a high temperature (rated to 450 degrees) grease with a Teflon additive via the grease fittings and a cartridge type automotive grease gun. One such grease is Super Lube (a cartridge is shipped out with each unit along with a grease gun). Note, some units manufactured between 2006 and 2010 do not have greased bushings so no lubrication is required. Units with greased bushings will have a lubrication access point on the front of the stainless steel guard over the drive-side rotisserie wheel. This access point will have a pivoting cover with a note to grease weekly.

MONTHLY

Bearings: Lubricate the rotisserie pillow block bearings with the same grease.

Chain: Lubricate the chains with the same grease and check their tension.

Flue: Clean the exit flue thoroughly. If this flue is not kept clean the accumulations of solids will corrode the flue, cause soot, and retard the exhaust flow through this flue.

Burners: Check the infrared burners for proper operation. They should burn with a bright orange or red color. Clean the orifices and venturi tubes if necessary (especially if any whistling noises are present or if there are blue or rolling flames).

If a burner face is damaged or a “popping” sound is heard, or if flames appear anywhere except below the ceramic faces, discontinue use of the infrareds immediately and call a service company.

EVERY 90 DAYS

Inspect the spit bushings and springs for wear or fatigue and replace if necessary. Check for refractory damage and arrange to patch if necessary. A service agency can perform these checks and can also perform a general check at this time.

TROUBLESHOOTING

ROTISSERIE

ROTISSERIE NOT TURNING

Is the access door completely closed? If not, a safety switch prevents the unit from operation.

Is the Motor Running?

YES – Then check the chain connection between the motor sprocket and the upper sprocket on the rotisserie shaft. If the chain is broken, then either repair the chain (usually with a master link) or replace the chain. If the chain is okay, then check the connector between the upper sprocket and the shaft. The upper sprocket is connected or secured to the shaft with a key and a keyway with a set screw.

NO – Check the electrical supply panel for a tripped circuit breaker. If tripped, then reset. Then check the motor overload contact assembly. This is located inside a gray electrical enclosure near the motor. Push the reset button to reset the motor. If the motor still does not turn, call a service technician to troubleshoot the wiring and the motor.

ROTISSERIE MOTION IS NOT SMOOTH

Make sure that the load on the rotisserie is balanced.

If equipped with star turners, check the tension on the star turners (see separate page which follows). New disc springs may be required.

If equipped with a planetary gear action, check the chain tension on the individual spits. There is an idler sprocket that can be used to take up slack in the chain.

If the motion still does not smooth out then replace the bushings on the drive side.

SPITS DO NOT SNAP INTO PLACE

Replace the compression springs.

TROUBLESHOOTING

INFRAREDS

INFRAREDS ARE PRODUCING A HIGH-PITCHED WHISTLING NOISE.

Deburr the infrared orifice with a scratch all or ice pick, or replace orifice.

INFRAREDS ARE NOT A BRIGHT ORANGE-RED COLOR

Check the ceramic face of the burner. If cracked, replace the infrared burner. Also check to verify that the gasket that seals the infrared is in place. If not, replace. Finally, if the holes in the ceramic appear to be clogged, blowing compressed air down the burner's venturi tube may clean the face.

Check gas pressure at the 1/3" plug taping in the gas manifold. For natural gas the minimum manifold gas pressure is 5" w.c., for LP gas it is 10" w.c.

If gas pressure is OK the main burner orifice may be partially clogged. Clean with a round toothpick so as not to damage the orifice.

A final possibility is that the burner is not receiving enough primary combustion air at the top of the unit through the expanded metal screen or there is not enough secondary combustion air at the burner face. Your hood installer should be consulted.

INPUT POLARITY

If a spark is present and the gas valve opens, but the system shuts down after the trial period, check input voltage at Terminals A (L1), normally black, and L2, normally white, for proper polarity. Terminal A (L1) should be the hot side of the line and L2 neutral.

IMPROPER GROUNDING

If a spark is present and the gas valve opens, but the system shuts down after the trial period, check to make sure the system is properly grounded to the burner and that the burner is properly grounded. This is the most common – and most easily avoided – problem you might face. Proper grounding is essential for the proof of flame safety device. If the system is not grounded to the burner, it cannot determine the presence of flame and will lock out. A restart will initiate the trial-for-ignition period, but the system will continue to go into lockout and the thermal reset timer will trip.

HIGH RESISTANCE

Check all terminals to make sure good contact is made. Clean any corrosion that might interfere with good electrical contact.

HIGH VOLTAGE MALFUNCTION

Remove the electrode from burner.

Check the spark gap and adjust to 1/8" ± 1/32".

Check the ceramic housing for cracks.

Check the electrode lead wires for cracks or breaks.

Check Terminals E1 and E2 for grounding (Local sensing). They should be no closer than 1/2" from metal objects, which can cause arcing to ground. If the electrode or electrode lead wires are faulty, replace the defective parts.

If remote sensing is used, be sure sensor wire is connected to S1, and the E2 terminal is grounded.

VALVE MALFUNCTION

If the board is powered and there is a spark during the trial-for-ignition period, but the valve will not open, check the valve for an open coil or other malfunctions. Also check the voltage rating of the valve (24, 120 or 240VAC) and the B(V1), V2 voltage of the Fenwal 05-14 being used. Use a voltage tester or voltmeter at Terminals B (V1) and V2. The voltage here should be the same as the valve. Refer to the manufacturer's specifications and replace either the valve or the Fenwal 05-14 so voltage ratings are compatible.

ERRATIC OPERATION

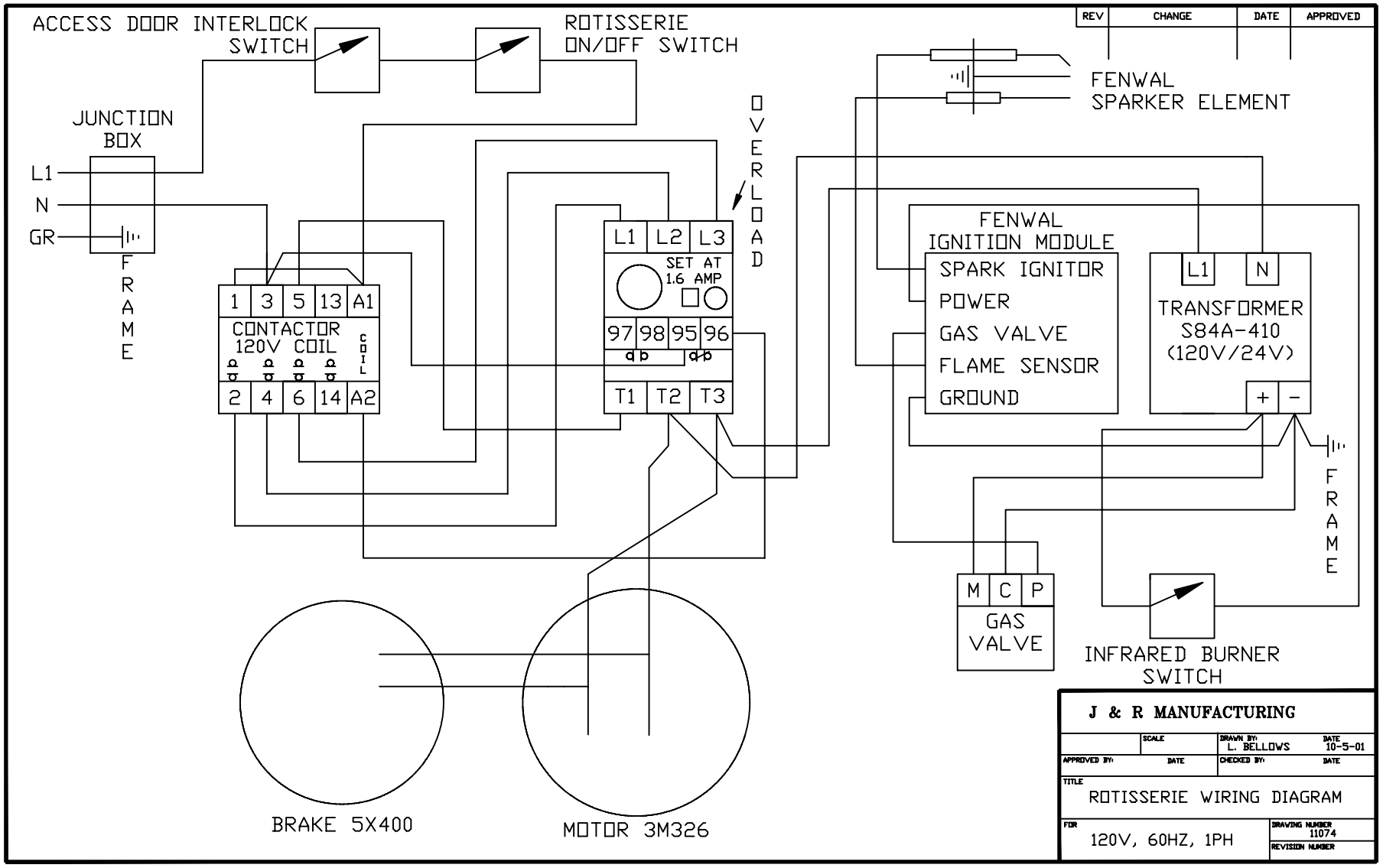
If the system operates properly for a while but randomly shuts down during the duty cycle, or won't operate during "cold" start, check the flame proving circuit with a DC microamp meter. Typical flame current is 2-20 microamps.

If you have low or marginal flame current, it is possible to get nuisance tripping of the thermal reset timer. If this is the case, you should relocate the electrodes or flame sensor into the flame to increase the flame current.

Ignitors that begin with the designation 05-142 are designed to be reset by switching the thermostat off rather than having to press the thermal reset timer button in the event of a lockout.

If the ignitor is switched off and on several times in succession, the thermal reset timer will trip, and it will have to be reset.

NOTE: If ignition is not achieved after the first two or three attempts, check to insure that the other components in the system are functioning correctly.


REV
CHANGE
DATE
APPROVED
ACCESS DOOR INTERLOCK SWITCH
ROTISSERIE ON/OFF SWITCH
FENWAL SPARKER ELEMENT
JUNCTION BOX
L1
N
GR
FRAME
OVERLOAD
L1 L2 L3
SET AT 1.6 AMP
97 98 95 96
T1 T2 T3
1 3 5 13 A1
CONTACTOR 120V COIL
COIL
2 4 6 14 A2
FENWAL IGNITION MODULE
SPARK IGNITOR
POWER
GAS VALVE
FLAME SENSOR
GROUND
L1 N
TRANSFORMER S84A-410 (120V/24V)
+ -
FRAME
M C P
GAS VALVE
INFRARED BURNER SWITCH
BRAKE 5X400
MOTOR 3M326
J & R MANUFACTURING
SCALE
DRAWN BY: L. BELLOWS
DATE 10-5-01
APPROVED BY:
DATE
CHECKED BY:
DATE
TITLE
ROTISSERIE WIRING DIAGRAM
FOR
120V, 60HZ, 1PH
DRAWING NUMBER 11074
REVISION NUMBER

SERIES 35-60

24 VAC Microprocessor-Based Direct Spark Ignition Control

35.60.03

FEATURES

- *24 VAC microprocessor based DSI control*
- *System diagnostic LED*
- *Automatic reset 1 hour after lockout**
- *Multiple tries for ignition*
- *Custom prepurge and interpurge timings***
- *Remote or local flame sensing*
- *Flame sense test pins*

APPLICATIONS

- *Gas Furnaces*
- *Boilers*
- *Water Heaters*
- *Commercial Cooking and other Similar Appliances*

DESCRIPTION

The Series 35-60 is a 24 VAC Microprocessor Based Direct Spark Ignition Control designed for use in all types of heating applications. The control utilizes a microprocessor to continually and safely, analyze and control the proper operation of the gas burner. Value added features such as LED diagnostics, automatic one hour reset, and flame current test pins highlight the controls benefits.

Agency Certifications

UL Component Recognized System.
Design certified to UL 372, file MH8817.
Software conforms to UL 1998 requirements.

Design certified to ANSI Z21.20, and EN 298
CAN/ CSA C22.2 No. 199-M89

CE Approved to EN 298:2003

*** US Versions Only**

**** Prepurge Time Cannot Exceed Interpurge Time on European Models**

SPECIFICATIONS

Input Power	Control: 18-30 VAC 50/60 Hz (Class 2 Transformer)
Input Current Drain	300 mA @ 24 VAC and gas valve relay energized (control only)
Gas Valve Rating	2.0A @ 24 VAC
Operating Temperature	-40ºF to +160ºF -40ºC to +71ºC
Flame Sensitivity	.7µA minimum
Flame Failure Response Time	0.8 seconds maximum
Types of Gases	Natural, LP, or manufactured
Spark Rate	Line frequency (50/60 sparks/ sec.)
Size (LxWxH)	5.69 x 3.94 x 1.87 inches (with cover) 14.45 x 10.0 x 4.75 cm (with cover)
Weight	8 ounces (nominal) 224 grams (nominal)
Enclosure	Gray (Noryl N-190) fire retardant plastic Integral standoffs optional
Moisture Resistance	Conformal coated to operate to 95% R.H. Care must be taken to protect module from direct exposure to water
Tries for ignition	One or three try versions available
Trial for ignition Periods	4.0, 7.0, 10.0, or 15.0 seconds standard Contact factory for other settings
Prepurge & Interpurge	None, 15, or 30 seconds depending on model. Without prepurge there is a one second delay before the first try for ignition
Edge Connect Version	Optional Edge connect model for replacement product

SEQUENCE OF OPERATION / FLAME RECOVERY/ SAFETY LOCKOUT

Start up - Heat Mode

When a call for heat is received from the thermostat supplying 24 volts to TH, the control will reset, perform a self check routine, flash the diagnostic LED, and a pre-purge delay begins. Following the pre-purge period the gas valve is energized and sparks commence for the trial for ignition period.

When flame is detected during the trial for ignition, sparks are shutoff immediately and the gas valve remains energized. The thermostat and main burner flame are constantly monitored to assure the system continues to operate properly. When the thermostat is satisfied and the demand for heat ends, the main valve is de-energized immediately.

Failure to Light - Lockout

SINGLE TRIAL MODEL
Should the main burner fail to light, or flame is not detected during the trial for ignition period, the control will go into lockout and the valve will be turned off immediately.

MULTI TRIAL MODEL
Should the main burner fail to light, or flame is not detected during the first trial for ignition period, the gas valve is de-energized and the control goes through an interpurge delay before another ignition attempt. The control will attempt two additional ignition trials before going into lockout and the valve relay will be de-energized immediately.

Recovery from lockout requires a manual reset by either resetting the thermostat for a period of 5 seconds.

If the thermostat is still calling for heat after one hour the control will automatically reset and attempt to ignite the burner again.

Flame Failure - Re-Ignition

If the established flame signal is lost while the burner is the control will respond within 0.8 seconds. The HV spark will be energized for a trial ignition period in an attempt to relight the burner. If the burner does not light the control will de-energize the gas valve. Multi-try models will make two more attempts to relight the burner. If the burner does not relight the control will go into lockout as noted above in “Failure to light”. If flame is re-established, normal operation resumes.

Recycle After Loss Of Flame

The option “recycle after loss of flame” may be selected as a special feature. With this option, upon loss of flame, the gas valve is de-energized and the control recycles its sequence of operation. Controls with no prepurge will begin with the first trial for ignition period. Multi-try models will allow three tries for ignition including interpurges. Controls with pre-purge delay will begin with pre-purge, allowing single or multiple trials for ignition depending on model. If burner relights, normal operation resumes, if burner does not relight, control will go into lockout as described in “failure to light”.

Fault Conditions

Error Mode	LED Indication
Internal Control Failure	Steady on
Flame with No Call for heat	2 flashes
Ignition Lockout	3 flashes

The LED will flash on for 1/4 second, then off for 1/4 second during a fault condition. The pause between fault codes is 3 seconds.

MOUNTING AND WIRING

The Series 35-60 is not position sensitive and can be mounted vertically or horizontally. The case may be mounted on any surface with #6 sheet metal screws.

WARNING: All wiring must be done in accordance with both local and national electrical code.

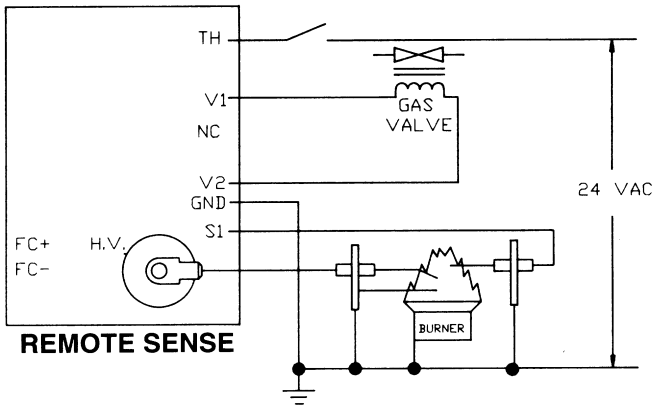
WARNING: The Series 35-60 uses voltages of shock hazard potential. Wiring and initial operation must be done by a qualified service technician.

The control must be secured in an area that will experience minimum vibration and remain below the maximum operating temperature of 160°F.

All connections should be made with UL approved 105°C rated 18 gauge, stranded, .054 thick insulated wire. Refer to wiring diagram when connecting the Series 35-60 to other components in the system.

TERMINAL DESIGNATIONS	
TH	Thermostat Input
GND	System Ground
V1	Valve Power
V2	Valve Ground
NC	Alarm (normally closed contact)
S1	Remote Flame Sensor
FC+, FC-	Flame Current Test Pins

CAUTION:
Label all wires prior to disconnection when servicing controls.
Wiring errors can cause improper and dangerous operation.
A functional checkout of a replacement control is recommended.



PROPER ELECTRODE LOCATION

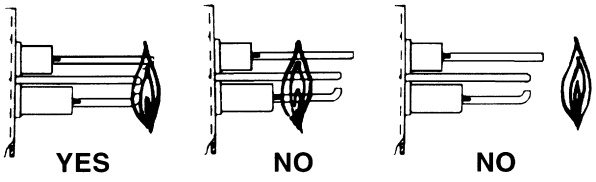
Proper location of the electrode assembly is important for optimum system performance. It is recommended that electrode assembly be mounted temporarily using clamps or other suitable means so that the system can be checked before permanently mounting the assembly. The electrode assembly should be located so that the tips are inside the flame envelope and about 1/2 inch (1 cm) above the base of the flame. See Figure 3.

CAUTIONS:

1. Ceramic insulators should not be in or close to the flame.
2. Electrode assemblies should not be adjusted or disassembled. Electrodes should have a gap spacing of 0.125± 0.031 in (3.12± 0.81 mm). If this spacing is not correct, the assembly must be replaced. Electrodes are NOT field adjustable.
3. Exceeding the temperature limits can cause nuisance lockouts and premature electrode failure.
4. Electrodes must be placed where they could not be exposed to the appliance user in normal operation.

Ignitor Location

Figure 3



WARNING:
Operation outside specifications could result in failure of the Fenwal product and other equipment with injury to people and property.

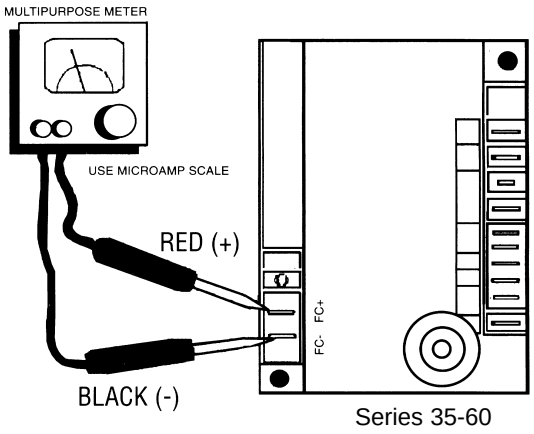
High Voltage Cable

Fenwal Part Number 05-129608-624 Suppression Cable (or equivalent) must be used for proper operation of control.

TROUBLESHOOTING GUIDE

SYMPTOM	RECOMMENDED ACTIONS
1. Dead	A. Miswired B. Transformer bad C. Fuse/Circuit breaker bad D. Bad control (check LED for steady on)
2. Thermostat on- no spark	A. Miswired B. Bad thermostat C. No voltage at terminal TH
3. Valve on, no spark	A. Shorted electrode B. Open HV cable C. Miswired D. Bad control
4. Spark on, no valve	A. Valve coil open B. Open valve wire C. Bad control (check voltage between V1 & V2)
5. Flame OK during TFI, no flame sense after TFI	A. Bad electrode B. Bad S1 or HV wire C. Poor ground at burner D. Poor flame (check flame current)

FLAME SENSOR CURRENT CHECK



Series 35-60

SERVICE CHECKS

Flame current is the current which passes through the flame from the sensor to ground. The minimum flame current necessary to keep the system from lockout is .7 microamps. To measure flame current, connect an analog DC microammeter to the FC-FC+ terminals per figure. Meter should read .7 uA or higher. If the meter reads below “0” on scale, meter leads are reversed. Disconnect power and reconnect meter leads for proper polarity.

WHITE-RODGERS

764-700 to 764-759

Dual Inlet Gas Pilot Safety Valve
(Thermocouple-Operated)

INSTALLATION INSTRUCTIONS

Operator: Save these instructions for future use!

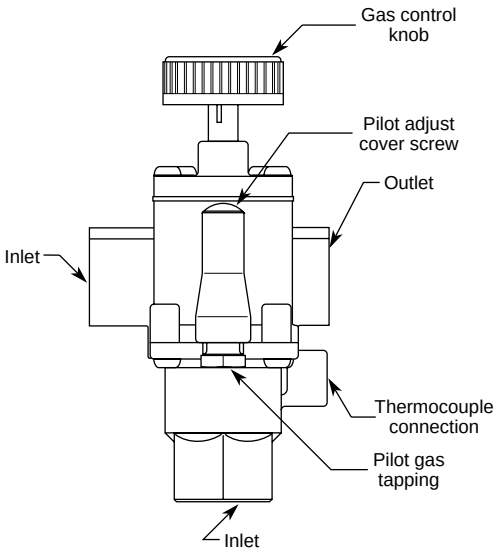
FAILURE TO READ AND FOLLOW ALL INSTRUCTIONS CAREFULLY BEFORE INSTALLING OR OPERATING THIS CONTROL COULD CAUSE PERSONAL INJURY AND/OR PROPERTY DAMAGE.

DESCRIPTION

Ideal for use on wall heaters, space heaters, consoles, etc., this gas pilot safety valve provides 100% shut-off of both pilot and main burner gas supply in the event of pilot flame failure. This valve is equipped with a 3-position gas control knob to provide for pilot lighting. This control also allows pilot flame adjustment.

If the pilot flame goes out during normal operation, or if there is insufficient pilot flame to provide proper thermocouple output, the safety valve will close, stopping the flow of all gas. This valve is designed for use on all domestic heating gases up to ½" PSI.

DUAL INLET
(NOTE: One inlet to be plugged)



SPECIFICATIONS

Capacity (for AGA natural gas at 1" drop):
- ⅜" x ⅜" size:
  - side inlet – 112,000 BTU/hr.
  - bottom inlet – 107,000 BTU/hr.
- ½" x ½" size:
  - side inlet – 124,000 BTU/hr.
  - bottom inlet – 118,000 BTU/hr.

Pilot connection: ¼" tubing

Pressure: ½" PSI maximum

Ambient Rating: -40°F to 250°F operating temperature

Mounting Position: Multipoise

Ignition Source: Pilot

Type of gas: Suitable for all domestic heating gases

Thermocouple: Use W.R. Type H06E

Accessories:

Item	Part No.
Replacement Knob	F42-0895
Stem Extender	F145-1111

Approvals: ANSI Z21.78 Combination Gas Control
CAN 1-6.4
CAN 1-9.1

⚠ CAUTION

DO NOT USE THESE GAS VALVES WITH UNVENTED APPLICATIONS.

WHITE-RODGERS DIVISION
EMERSON ELECTRIC CO.
9797 REAVIS ROAD
ST. LOUIS, MISSOURI 63123-5398

Printed in U.S.A.

PART NO. 37-5234E
Replaces 37-5234D
9502

INSTALLATION

These gas valves should be installed according to the following instructions. Check for gas leaks with a soap solution after completing installation.

⚠ CAUTION

Never use flame to detect leaks.

⚠ CAUTION

Do not leave unused inlet unplugged.

⚠ CAUTION

DO NOT USE THESE GAS VALVES WITH UNVENTED APPLICATIONS.

MAIN PIPING CONNECTIONS

1. Be sure the main gas supply is shut off before starting the installation. The gas valve may be installed in any position, but it should be located so that the gas control knob is easily accessible.
2. Direction of gas flow is indicated by the directional arrow on the outlet boss.
3. You should use new pipe, which has been properly chamfered and reamed. If you use old pipe, be sure it is clean and free of rust, scale, burrs, chips and old pipe joint compound.
4. If the side inlet is to be used, it is necessary to remove the plug and install it in the bottom inlet. This procedure requires a 5⁄16" Allen wrench. Be sure the end of the plug is free of burrs, chips, etc. Before installing plug, apply pipe joint compound (pipe dope) that is approved for all gases, only to the male threads of the plug. DO NOT apply compound to first two threads. Do not overtighten the plug.
5. Apply pipe joint compound (pipe dope) that is approved for all gases, only to the male threads of pipe joints. DO NOT apply compound to first two threads. Do not thread pipe too far.

NOTE

Applying pipe joint compound to pipe threads will prevent chips from passing onto internal valve parts, since the pipe joint compound will collect and retain chips that are formed as the pipe is threaded into the body.

6. If a vise or open-end wrench is used to hold the control while installing piping, do not tighten excessively, as this may damage the control.

PILOT GAS CONNECTION

Install the fitting into the pilot gas tapping, turning until finger-tight. Insert clean, deburred tubing all the way through the fitting. Holding the tubing securely, slowly tighten the fitting until a slight "give" is felt. Then tighten an additional 1½ turns.

THERMOCOUPLE

The thermocouple connector should be clean for good electrical contact. Run the thermocouple nut into the thermocouple connection as far as possible by hand. Then set the nut with ¼ to ½ additional turn using a small wrench. Do not overtighten.

Honeywell

VR8245 and VR8345 Universal Electronic Ignition Gas Controls

INSTALLATION INSTRUCTIONS

APPLICATION

The universal electronic ignition gas controls are used in gas-fired appliances with capacities up to 300 cu ft/hour at 1 inch wc pressure drop [8.5 cu m/hour at 0.25 kPa] for natural gas. These gas controls will operate with a direct spark (DSI), hot surface (HSI) or intermittent pilot ignition. The control includes a manual valve, two automatic operators, a pressure regulator, pilot adjustment, pilot plug, conduit cover and ignition adapter. Refer to the following list for the specifications.

SPECIFICATIONS

AMBIENT TEMPERATURE RANGE: -40° to 175°F [-40° to 79°C].

BODY PATTERN: Straight-through.

IGNITION ADAPTER: Configures device to operate with direct spark or hot surface ignition.

ELECTRICAL RATINGS:
Voltage and Frequency: 24 Vac, 60 Hz.
Current Draw: See Table 3.

CAPACITY: See Table 1.

Table 1. Gas Capacity.

Size (Inlet x Outlet)	Capacity (at 1 in. wc pressure drop)[a]	Minimum Regulated Capacity	Maximum Regulated Capacity
3/4 x 3/4	300 cu ft/hour [8.5 cu m/hour]	30 cu ft/hour [0.8 cu m/hour]	415 cu ft/hour [11.8 cu m/hour]
1/2 x 1/2	150 cu ft/hour [4.25 cu m/hour]	20 cu ft/hour [0.6 cu m/hour]	200 cu ft/hour [5.7 cu m/hour]

[a] Capacity based on 1000 Btu/cu ft, 0.64 specific gravity natural gas at 1 in. wc pressure drop [37.3 MJ/cu m, 0.64 specific gravity natural gas at 0.25 kPa pressure drop].

Use conversion factors in Table 2 to convert capacities for other gases.

Table 2. Gas Capacity Conversion Factors.

Gas	Specific Gravity	Multiply Listed Capacity By
Manufactured	0.60	0.516
Mixed	0.70	0.765
Propane	1.53	1.62

APPROVALS:
American Gas Association Design Certificate: L2025007.
Canadian Gas Association Design Certificate: L2025007.

PIPE ADAPTERS: Includes two 3/4 to 1/2 inch NPT bushings and one 1/2 to 3/8 inch NPT bushing.

CROSS REFERENCE: See Table 4 for cross reference information.

INSTALLATION

WHEN INSTALLING THIS PRODUCT...

1. Read these instructions carefully. Failure to follow them could damage the product or cause a hazardous condition.
2. Check the ratings given in the instructions and on the product to make sure the product is suitable for your application.
3. The installer must be a trained, experienced service technician.
4. After installation is complete, use these instructions to check out product operation.

⚠ WARNING

FIRE OR EXPLOSION HAZARD
CAN CAUSE PROPERTY DAMAGE, SEVERE INJURY, OR DEATH

Follow these warnings exactly:

1. Disconnect power supply before wiring to prevent electrical shock or equipment damage.
2. To avoid dangerous accumulation of fuel gas, turn off gas supply at the appliance service valve before starting installation, and perform Gas Leak Test after completion of installation.
3. When working with a system using intermittent pilot ignition, do not bend pilot tubing at gas control or pilot burner after compression fitting has been tightened because gas leakage at the connection can result.
4. Always install sediment trap in gas supply line to prevent contamination of gas control.
5. Do not force the gas control knob. Use only your hand to turn the gas control knob. Never use any tools. If the gas control knob will not operate by hand, call a qualified service technician to replace the gas control. Force or attempted repair can result in fire or explosion.

Table 3. Fuel Conversion Kits.

Valve	Size (Inlet and Outlet)	Pressure Regulator Type	Current Draw (A)	Conversion Kits	
				Natural Gas - LP	LP - Natural Gas
VR8245M	1/2 x 1/2	Standard	.5	393691	394588
VR8345H	3/4 x 3/4	Slow-Opening	.7	393691	394588
VR8345M	3/4 x 3/4	Standard	.7	393691	394588
VR8345Q	3/4 x 3/4	2-Stage	.9	396021	396025

Table 4. Cross Reference.

Universal Replacement	Cross Reference		
Universal Service Part	Honeywell	White-Rodgers	Robert-Shaw
VR8245M2530	VR8204A1201, VR8204A1219, VR8204A2001, VR8204A2175, VR8204A2803, VR8204A2076		
	VR8204M1075, VR8204M1091	36E01-204, 36E01-205, 36E01-206, 36E01-305, 36E93-304	722-079 (2000IPERHC)
	VR8205A2024	36G22-214	722-051 (2000DERHC)
	VR8205M1106, VR8205M2310, VR8205M2443	36E36-304, 36E22-214	720-079 (7200IPER), 720-080 (7200IPER-LP)
VR8345H4555	VR8305H4013, VR8305H4039, VR8205H1003		
	VR8204H1006, VR8304H4503	36E93-304	720-070 (7200IPER-S7C), 720-071 (7200IPER-S7C), 720-072 (7200IPER-S7C), 720-073 (7200IPER-LP-S7C)
		36E98-304, 36E24-214, 36E52-214	
VR8345M4302	VR8304M4002; VR8204A1201, VR8204A1219, VR8204A2001, VR8204A2175, VR8204A2803; VR8204M1075, VR8304M3509, VR8304M4507	36E01-204, 36E01-205, 36E01-206, 36E01-305, 36E93-304	722-079 (2000IPERHC)
	VR8305M4066, VR8305M4165, VR8305M4231, VR8305M3506	36C68-423, 36C74-413, 36G22-214	720-051 (7200DER), 722-051 (2000DERHC)
	VR8205M1106, VR8205M2310, VR8205M2443	36C68-423, 36E36-304, 36E22-214	720-079 (7200IPER), 720-080 (7200IPER-LP)

Table 4. Cross Reference. (Continued)

Universal Replacement	Cross Reference		
Universal Service Part	**Honeywell**	**White-Rodgers**	**Robert-Shaw**
VR8345Q4563	VR8205Q2555	36E54-214, 36G54-214	
	VR8304Q4511	36C76-406, 36C76-420, 36C76-463	
	VR8305Q4146, VR8305Q4500	36D13-208, 36D13-405	
		36E96-314,	720-082 (7200IPER2-4)

⚠ CAUTION

Never apply a jumper across or short the valve coil terminals. This can burn out the heat anticipator in the thermostat or damage the electronic intermittent pilot (IP) module.

IMPORTANT:

These gas controls are shipped with protective seals over inlet and outlet tappings. Do not remove seals until ready to connect piping.

Follow the appliance manufacturer instructions if available; otherwise, use the following instructions.

Converting Between Natural And LP Gas

⚠ WARNING

FIRE OR EXPLOSION HAZARD
CAN CAUSE PROPERTY DAMAGE, SEVERE INJURY, OR DEATH

Do not attempt to use a gas control set for natural gas on LP gas or a gas control set for LP gas on natural gas.

Convert standard-opening gas controls from natural gas to LP gas with the conversion kit included with this TRADELINE® gas control. For conversion kit part number, see Table 3.

Use Pipe Adapter to Solve Swing Radius Problems

In some field service applications, space limitations make it difficult or impossible to thread the gas control onto the gas supply pipe. This problem can be resolved for many installations by using a pipe adapter. Install the pipe adapter on the end of the supply pipe in place of the gas control by following the same precautions and instructions that are used for installing the gas control. After the pipe adapter is installed, attach the gas control to the adapter as outlined in the Install Pipe Adapters to Gas Control section.

NOTE: Using a pipe adapter increases the overall length of the gas control.

Install Pipe Adapter to Gas Control

Install adapter to gas control as follows:

Bushings

1. Remove seal over gas control inlet or outlet.
2. Apply moderate amount of good quality pipe compound to bushing, leaving two end threads bare. See Fig. 1.
3. Insert bushing in gas control and carefully thread pipe into the bushing until tight.

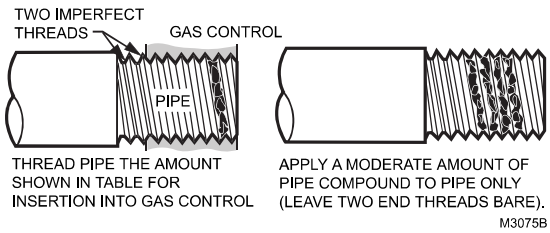


Fig. 1. Use moderate amount of pipe compound.

Location

Locate the combination gas control in the appliance vestibule on the gas manifold. In replacement applications, locate the gas control in the same location as the old control.

Do not locate the gas control where it can be affected by steam cleaning, high humidity, dripping water, corrosive chemicals, dust or grease accumulation, or excessive heat.

For proper operation, follow these guidelines:

- Locate gas control in a well-ventilated area.
- Mount gas control high enough above the cabinet bottom to avoid exposure to flooding or splashing water.
- Make sure the ambient temperature does not exceed the ambient temperature ratings for each component.
- Cover gas control when the appliance is cleaned with water, steam, or chemicals or to avoid dust and grease accumulation.
- Avoid locating gas control where exposure to corrosive chemical fumes or dripping water is possible.

Install Piping to Gas Control

All piping must comply with applicable codes and ordinances or with the National Fuel Gas Code (ANSI Z223.1 NFPA No. 54), whichever applies. Tubing installation must comply with approved standards and practices.

1. Use new, properly reamed pipe free from chips. If tubing is used, make sure the ends are square, deburred and clean. Make sure all tubing bends are smooth and without deformation.
2. Run pipe or tubing to the gas control. If tubing is used, obtain a tube-to-pipe coupling to connect the tubing to the gas control.
3. Install sediment trap in the supply line to the gas control. See Fig. 2.

Install Gas Control

1. This gas control can be mounted from 0 to 90 degrees in any direction from the vertical position of the gas control knob.
2. Mount the gas control so gas flow is in the direction of the arrow on the bottom of the gas control.
3. Thread pipe the amount shown in Table 5 for insertion into the gas control.

IMPORTANT:

Do not thread pipe too far. Valve distortion or malfunction can result when the pipe is inserted too deeply into the gas control.

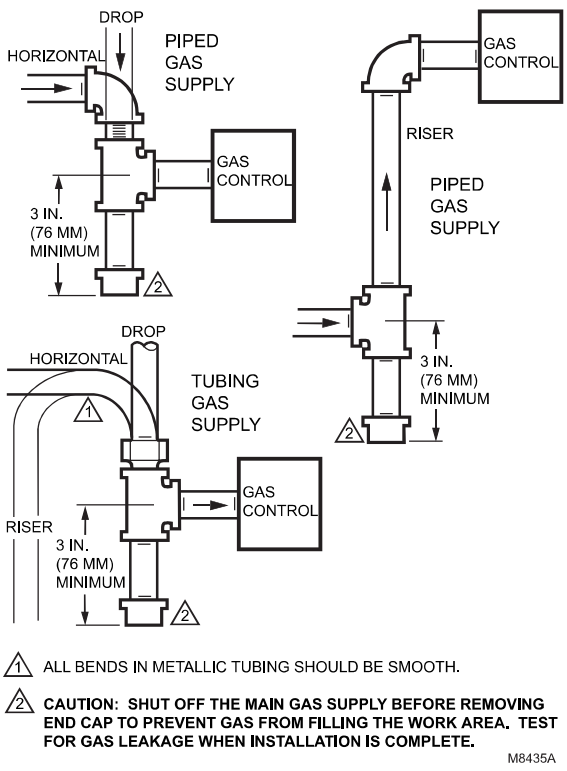


Fig. 2. Install sediment trap.

4. Apply a moderate amount of good quality pipe compound (do not use Teflon tape) to pipe only, leaving two end threads bare. See Fig. 1. On LP installations, use compound resistant to LP gas.
5. Remove seals over gas control inlet and outlet if necessary.
6. Connect pipe to gas control inlet and outlet. Use wrench on the square ends of the gas control. See Fig. 3 and 4.

Table 5. NPT Pipe Thread Length in in.

Pipe Size	Thread Pipe This Amount	Maximum Depth Pipe Can Be Inserted Into Control
3/8	9/16	3/8
1/2	3/4	1/2
3/4	13/16	3/4

When working with an intermittent pilot ignition system, go to Connect Pilot Gas Tubing section next. When installing on a hot surface or direct spark ignition system, go to the Wiring section.

WIRING

⚠ CAUTION

Disconnect power supply before making wiring connections to prevent electrical shock or equipment damage.

Follow the wiring instructions furnished by the appliance manufacturer, if available, or use the following general instructions. Where these instructions differ from the appliance manufacturer, follow the appliance manufacturer instructions.

All wiring, including insulated quick connect terminals, must comply with applicable electrical codes and ordinances.

1. Check the power supply rating on the gas control and make sure it matches the available supply. Install thermostat and other controls as required.
2. When the gas control is installed on a hot surface or direct spark ignition system, attach the wire adapter provided to the wiring terminals. See Fig. 7 for the wire terminal location.
3. Connect control circuit to gas control terminals. See Fig. 3 and 8, 9, or 10.
4. Adjust the thermostat heat anticipator to 0.7, the rating stamped on the valve operator.

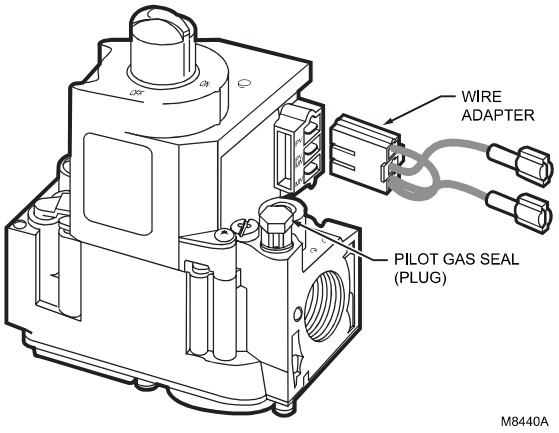


Fig. 7. Install wire adapter for hot surface or direct spark ignition systems. Pilot plug must be in the valve pilot opening.

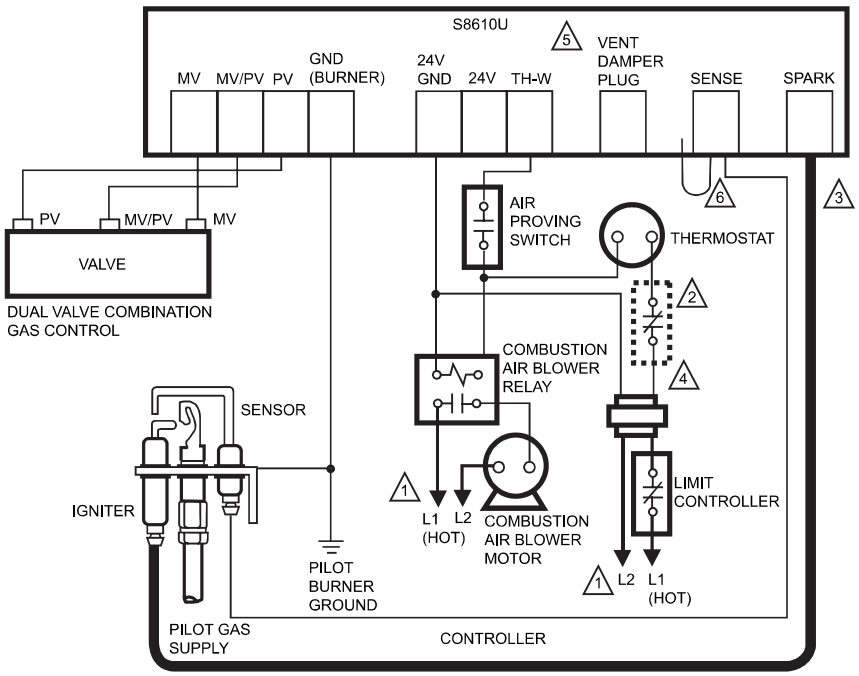


Fig. 8. VR8245M/VR8345M,H wiring connections in intermittent ignition system.

STARTUP AND CHECKOUT

⚠ WARNING

FIRE OR EXPLOSION HAZARD
CAN CAUSE PROPERTY DAMAGE, SEVERE INJURY, OR DEATH

1. Do not force the gas control knob. Use only your hand to turn the gas knob. Never use any tools.
2. If the gas control knob will not operate by hand, call a qualified service technician to replace the gas control.

Gas Control Knob Settings

The gas control knob operates differently in intermittent pilot, hot surface and direct spark ignition systems.

The gas control knob settings for an intermittent pilot system are as follows:

OFF: Prevents pilot and main burner gas flow.
ON: Permits gas to flow into the control body. Under control of the thermostat and intermittent pilot module, gas can flow to the pilot and main burner.

The gas control knob settings for hot surface or direct spark ignition systems are as follows:

OFF: Prevents main burner gas flow.
ON: Permits main burner gas flow. Under control of the thermostat and ignition module, gas can flow to the main burner.

NOTE: Gas controls are shipped with the gas control knob in the ON position.

Perform Gas Leak Test

⚠ WARNING

FIRE OR EXPLOSION HAZARD
CAN CAUSE PROPERTY DAMAGE, SEVERE INJURY, OR DEATH

Check for gas leaks with a rich soap and water solution anytime work is done on a gas control.

Gas Leak Test

1. Paint all pipe connections upstream of the gas control with a rich soap and water solution. Bubbles indicate a gas leak.
2. If a gas leak is detected, tighten the pipe connection.

⚠ CAUTION

Fire or explosion hazard.
Stand clear while lighting main burner to prevent injury caused from hidden gas leaks that could cause flashback in the appliance vestibule.

3. Turn on the system by rotating the gas control knob counterclockwise ↶ to ON.
4. Light the main burner by following the appliance manufacturer instructions or turning up the thermostat to call for heat.
5. With the main burner in operation, paint all pipe joints and gas control inlet and outlet with a rich soap and water solution.
6. If another gas leak is detected, tighten joints and pipe connections.
7. If gas leak cannot be stopped, turn the gas control knob clockwise ↷ to OFF.
8. Replace the leaking part.
9. Perform the gas leak test.

Adjust the Pilot Burner Flame (Intermittent Pilot Ignition only)

The pilot flame should envelop 3/8 to 1/2 in. [10 to 13 mm] of the igniter-sensor tip. See Fig. 12. To adjust the pilot flame:

1. Remove the pilot adjustment cover screw. Refer to Fig. 3.
2. Turn the inner adjustment screw clockwise ↷ to decrease or counterclockwise ↶ to increase pilot flame.
3. To prevent gas leakage, always replace the cover screw after adjustment.

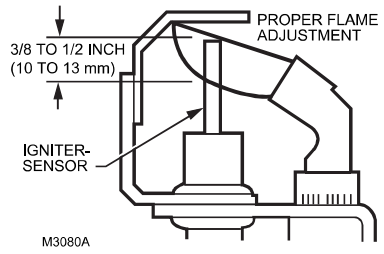


Fig. 12. Proper flame adjustment.

Check And Adjust Gas Input to Main Burner

⚠ CAUTION

Fire or explosion hazard.

1. Do not exceed the input rating stamped on the appliance nameplate, or manufacturer recommended burner orifice pressure for the size orifice(s) used. Make certain the primary air supply to the main burner is properly adjusted for complete combustion (refer to the appliance manufacturer instructions).
2. WHEN CHECKING GAS INPUT BY CLOCKING THE GAS METER:
   - Make sure that the only gas flow through the meter is that of the appliance being checked.
   - Make certain that other appliances are turned off with pilot burners extinguished (or deduct that gas consumption from the meter reading).
   - Convert the flow rate to Btuh as described in Gas Controls Handbook, form 70-2602, and compare to the Btuh input rating on the appliance nameplate.
3. WHEN CHECKING GAS INPUT WITH A MANOMETER (PRESSURE GAUGE):
   - To connect the manometer, be sure the gas control knob is in the OFF position before removing the outlet pressure tap plug.
   - When removing the manometer, turn the gas control knob back to OFF and replace the outlet pressure tap plug.
   - Shut off the gas supply at the appliance service valve, or at the gas tank for LP gas, before removing the outlet pressure tap plug and before disconnecting the manometer and replacing the outlet pressure tap plug.
   - Perform the Gas Leak Test at the outlet pressure tap plug.

Standard-Opening Pressure Regulator

1. The gas control outlet pressure should match the manifold pressure listed on the appliance nameplate.
2. With the main burner operating, check the gas control flow rate by using the meter clocking method or check the gas pressure using a manometer connected to the gas control outlet pressure tap. See Fig. 3.
3. If necessary, adjust the pressure regulator to match the appliance rating. Refer to Table 6 for the factory set nominal outlet pressures and adjustment setting ranges.
   a. Remove the pressure regulator adjustment cap screw.
   b. Using a screwdriver, turn the inner adjustment screw clockwise ↷ to increase or counterclockwise ↶ to decrease the main burner gas pressure.
   c. Always replace the cap screw and tighten firmly to safeguard proper operation.
4. If the desired outlet gas pressure or gas flow rate cannot be achieved by adjusting the gas control, check the gas control inlet pressure by using a manometer at the inlet pressure tap. If the inlet pressure is in the normal range (refer to Table 6 and 7), replace the gas control. Otherwise, take the necessary steps to provide proper gas pressure to the gas control.

Standard and Slow-Opening (H and M) Models

1. Carefully check the main burner lightoff. Make sure that the main burner lights smoothly and that all ports remain lit.
2. Check the full rate manifold pressure listed on the appliance nameplate. Gas control full rate outlet pressure should match this rating.
3. With main burner operating, check the control flow rate using the meter clocking method or check pressure using a manometer connected to the outlet pressure tap on the control. See Fig. 3.
4. If necessary, adjust the pressure regulator to match the appliance rating. See Table 6 and 7 for factory-set nominal outlet pressure and adjustment range.
   a. Remove the pressure regulator adjustment cap screw.
   b. Using a screwdriver, turn the inner adjustment screw (Fig. 3) clockwise ↷ to increase or counterclockwise ↶ to decrease the gas pressure to the burner.
   c. Always replace the cap screw and tighten firmly to prevent gas leakage.
5. If the desired outlet pressure or flow rate cannot be achieved by adjusting the gas control, check the gas control inlet pressure using a manometer at the inlet pressure tap of the gas control. If the inlet pressure is in the nominal range (see Table 6 and 7), replace the gas control. Otherwise, take the necessary steps to provide proper gas pressure to the control.

Two-Stage (Q) Models

Two-stage models require that you check and adjust both high and low pressure regulator settings. Two-stage appliance operating sequences vary. Consult the appliance manufacturer instructions for the specific operating sequence and regulator adjustment procedure for the appliance in which the control is installed.

1. Set appliance to operate on high.
2. Carefully check the main burner lightoff. Make sure that the main burner lights smoothly and that all ports remain lit.
3. Check the full rate (high) manifold pressure listed on the appliance nameplate for high pressure. The gas control full rate outlet pressure should match this rating.
4. With main burner operating, check the gas control flow rate using the meter clocking method or check pressure using a manometer connected to the outlet pressure tap on the gas control. See Fig. 3.
5. If necessary, adjust the high pressure regulator to match the appliance rating. See Table 6 and 7 for factory-set nominal outlet pressure and adjustment range.
   a. Remove the pressure regulator adjustment cap (Fig. 3).
   b. Using a screwdriver, turn the inner adjustment screw for HI pressure clockwise ↷ to increase or counterclockwise ↶ to decrease the gas pressure to the burner.
6. After high pressure has been checked, check low pressure regulation. Two-stage appliance operating sequences vary. Consult the appliance manufacturers instructions for the specific operating sequence and regulator adjustment procedure for the appliance in which the control is installed and for instructions on how to prevent the control from moving to high stage while checking the low pressure regulator setting.

7. Check the low rate manifold pressure listed on the appliance nameplate. Gas control low rate outlet pressure should match this rating.
8. With main burner operating, check the gas control flow rate as before (using the meter clocking method or check pressure using a manometer connected to the outlet pressure tap on the control).
9. If necessary, adjust the low pressure regulator to match the appliance rating. See Table 6 and 7 for factory-set nominal outlet pressure and adjustment range.
   a. Remove the pressure regulator adjustment cap (Fig. 3). Using a screwdriver, turn the inner adjustment screw for LO pressure clockwise ↷ to increase or counterclockwise ↶ to decrease the gas pressure to the burner.
10. Once high and low pressure have been checked and adjusted, replace pressure regulator adjustment cap. If the desired outlet pressure or flow rate cannot be achieved by adjusting the gas control, check the control inlet pressure using a manometer at the inlet pressure tap of the control. If the inlet pressure is in the nominal range (see Table 6 and 7), replace the gas control. Otherwise, take the necessary steps to provide proper gas pressure to the control.

Table 6. Pressure Regulator Specification Pressures for Standard-Opening Natural Gas.

Model Type	Type of Gas	Nominal Inlet Pressure Range	Factory Set Nominal Outlet Pressure		Setting Range	
			Step	Full Rate	Step	Full Rate
Standard, Slow	NAT	5.0 to 7.0	—	3.5	—	3.0 to 5.0
	LP	12.0 to 14.0	—	10.0	—	8.0 to 12.0
Step	NAT	5.0 to 7.0	0.9	3.5	None	0.7 to 1.7
	LP	12.0 to 14.0	2.2	10.0	None	1.4 to 5.5
Two-Stage	NAT	5.0 to 7.0	—	1.7 Low 3.5 High	—	0.9 to 3.0 Low[a] 3.0 to 5.0 High
	LP	121.0 to 14.0	—	4.9 Low 10.0 High	—	2.5 to 7.0 Low 8.0 to 11.0 High

[a] Low Fire setting range for VR8304Q 1/2 in. by 1/2 in. and 1/2 in. by 3.4 in. is 1.5 to 3.0 in. wc.

Table 7. Pressure Regulator Specification Pressures (kPa).

Model Type	Type of Gas	Nominal Inlet Pressure Range	Factory Set Nominal Outlet Pressure		Setting Range	
			Step	Full Rate	Step	Full Rate
Standard, Slow	NAT	1.2 to 1.7	—	0.9	—	0.7 to 1.2
	LP	2.9 to 3.9	—	2.5	—	2.0 to 3.0
Step	NAT	1.2 to 1.7	0.2	0.9	None	0.7 to 1.7
	LP	2.9 to 3.9	0.5	2.5	None	1.4 to 5.5
Two-Stage	NAT	1.2 to 1.7	—	0.48 Low 0.9 High	—	0.22 to 0.75 Low[a] 0.75 to 1.2 High
	LP	2.9 to 3.9	—	1.2 Low 2.5 High	—	0.6 to 1.8 Low 2.0 to 2.5 High

[a] Low Fire setting range for VR8304Q 1/2 in. by 1/2 in. and 1/2 in. by 3.4 in. is 0.37 to 0.75 kPa.

Check Safety Shutdown Performance

⚠ WARNING

FIRE OR EXPLOSION HAZARD
CAN CAUSE PROPERTY DAMAGE, SEVERE INJURY, OR DEATH
Perform the safety shutdown test any time work is done on a gas system.

NOTES: Read steps 1 through 7 below before starting and compare to the safety shutdown or safety lockout tests recommended for the intermittent pilot (IP), hot surface (HSI) or direct spark (DSI) module. When different, use the procedure recommended for the module.

1. Turn off gas supply.
2. Set the thermostat or controller above room temperature to call for heat.
3. • *Intermittent Pilot Ignition*—Watch for an ignition spark at pilot burner either immediately or following prepurge. See ignition module specifications.
   • *Hot Surface or Direct Spark Ignition*—Watch for an ignition spark or glow at hot surface igniter either immediately or following prepurge. See ignition module specifications.
4. If module has timed ignition, time the length of the igniter operation. See ignition module specifications.
5. • *Intermittent Pilot Ignition*—After the module locks out, turn on gas supply and make sure there is no gas flow to the pilot or main burner.

NOTE: With modules that continue spark until pilot lights or system is shut down manually, pilot should light when gas supply is turned on.

- *Hot Surface or Direct Spark Ignition*—After the module locks out, turn on gas supply and assure there is no gas flow to main burner.

6. Set the thermostat below room temperature and wait at least 45 seconds to reset system.
7. Operate system through one complete cycle to make sure all controls operate properly.

MAINTENANCE

⚠ WARNING

FIRE OR EXPLOSION HAZARD
CAN CAUSE PROPERTY DAMAGE, SEVERE INJURY, OR DEATH
Improper cleaning or reassembly can cause gas leakage. When cleaning, be sure that the control is reassembled properly and perform gas leak test.

Regular preventive maintenance is important in applications such as commercial cooking, agricultural and industrial operations that place a heavy load on system controls because:

- In many such applications, particularly commercial cooking, the equipment operates 100,000 to 200,000 cycles per year. Such heavy cycling can wear out the gas control in one to two years.
- Exposure to water, dirt, chemicals and heat can damage the gas control and shut down the control system.

The maintenance program should include regular checkout of the gas control; see Startup and Checkout section. To check out the control system, see the appliance manufacturer literature. Maintenance frequency must be determined individually for each application. Some considerations are:

- *Cycling frequency*. Appliances that may cycle 100,000 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 environments can cause the gas control to deteriorate more rapidly, the system should be checked more often.

NOTE: If the gas control will be exposed to high ammonia conditions, e.g., those used in greenhouses or animal barns, contact your Honeywell sales representative to request a gas control with corrosion resistant construction.

The gas control should be replaced if:

- It does not perform properly during checkout or troubleshooting.
- The gas control knob is hard to turn or push down.
- The gas control is likely to have operated for more than 200,000 cycles.

SERVICE

⚠ 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 or repair can damage the gas control.

⚠ CAUTION

Do not apply a jumper across or short the valve coil terminals. Doing so can burn out the heat anticipator in the thermostat or damage the ignition module.

If Main Burner Will Not Come On With Call For Heat

1. Make sure the gas control knob is in the ON position.
2. Adjust thermostat several degrees above room temperature.
3. Using an ac voltmeter, check for voltage at gas control.
   - *Intermittent Pilot Ignition*—If pilot lights, measure voltage across MV/PV and MV. If pilot does not light, measure across MV/PV and PV before safety lockout occurs.
   - *Hot Surface or Direct Spark Ignition*—Measure voltage across MV terminals at gas control.
4. If voltage is not present, check control circuit for pro-per operation.
5. If proper control circuit voltage is present, replace gas control.

Instructions To The Homeowner (For Your Safety, Read Before Operating)

⚠ WARNING

FIRE OR EXPLOSION HAZARD
CAN CAUSE PROPERTY DAMAGE, SEVERE INJURY, OR DEATH

Follow these warnings exactly:

1. Pilot/main burner flame is lit automatically. Do not light the pilot/main burner flame manually.
2. Before lighting appliance, smell around the appliance for gas. Be sure to smell next to the floor because LP gas is heavier than air.
3. IF YOU SMELL GAS:
   - Turn off the gas supply at the appliance service valve. On LP gas systems, turn off gas supply at the gas tank.
   - Do not light any appliances in the house.
   - Do not touch electrical switches or use phone.
   - Leave the building and use a neighbor's phone to call your gas supplier.
   - If you cannot reach your gas supplier, call the fire department.
4. Do not force the gas control knob. Use only your hand to push down or turn the gas control knob. Never use any tools. If the gas control knob will not operate by hand, call a qualified service technician to replace the gas control. Force or attempted repair can result in a fire or explosion.
5. Call a qualified service technician to replace the gas control if it has been flooded with water.
6. Replace the gas control in the event of any physical damage, tampering, bent terminals, missing or broken parts, stripped threads, or evidence of exposure to heat.

IMPORTANT:

Follow the operating instructions provided by the manufacturer of your heating appliance. The information below will be of assistance in a typical gas control application, but the specific controls used and the procedures outlined by the manufacturer or your appliance may differ and require special instructions.

To Turn On The Appliance

Stop: Read the warnings on page 8.

The pilot/main burner flame is lit automatically. *Do not attempt to manually light the pilot.* If the appliance does not turn on when the thermostat is set several degrees above room temperature, follow these instructions:

1. Set the thermostat to its lowest setting to reset the safety control.
2. Disconnect all electric power to the appliance.
3. Remove the gas control access panel.
4. Push in the gas control knob slightly and turn clockwise ↷ to OFF.
5. Wait five minutes to clear out any unburned gas. If you then smell gas, STOP! Follow step 3 of the Warning in the Instructions To The Homeowner section. If you do not smell gas, continue with the next step.
6. Turn the gas control knob counterclockwise ↶ to ON.
7. Replace the gas control access panel.
8. Reconnect all electric power to the appliance.
9. Set the thermostat to the desired setting.
10. If the appliance does not turn on, set the gas control knob to OFF and contact a qualified service technician for assistance.

Turning Off The Appliance

VACATION SHUTDOWN—Set the thermostat to the desired room temperature while you are away.

COMPLETE SHUTDOWN—Push in the gas control knob slightly and turn clockwise ↷ to OFF. Do not force. Appliance will completely shut off. Follow the Instructions to the Homeowner above to resume normal operation.

Automation and Control Solutions

Honeywell International Inc.
1985 Douglas Drive North
Golden Valley, MN 55422
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Honeywell Limited-Honeywell Limitée
35 Dynamic Drive
Toronto, Ontario M1V 4Z9

Honeywell

69-2013 M.S. 08-06

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WHITE-RODGERS

36E93-304

Delay-Opening Combination Gas Valve

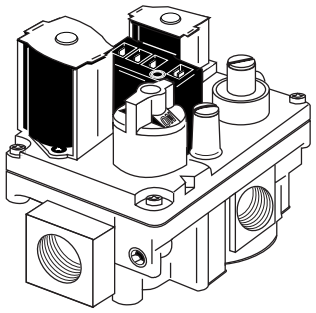
INSTALLATION INSTRUCTIONS

Operator: Save these instructions for future use!

FAILURE TO READ AND FOLLOW ALL INSTRUCTIONS CAREFULLY BEFORE INSTALLING OR OPERATING THIS CONTROL COULD CAUSE PERSONAL INJURY AND/OR PROPERTY DAMAGE.

DESCRIPTION

The 36E93-304 combination gas valve is designed for intermittent ignition system applications. The valve is equipped with a redundant solenoid valve that controls gas flow to the pilot and main burners, a main valve that controls gas flow to the main burner, a pressure regulator to maintain a constant outlet pressure, and a two-position gas cock knob for manual gas shut-off.



SPECIFICATIONS

Type of Gas: Natural gas
LP gas (use conversion kit)

Pressure Regulator Setting:
Nat. Gas – 2.5 to 5.0" W.C.
LP Gas – 7.0 to 12.0" W.C.

Ambient Temperature:
-40° to 175°F

Pressure Rating: 14" W.C. (½ PSI) max.

Voltage: 24 VAC

Frequency: 50/60 Hz

PIPE SIZES/CAPACITIES

Pipe Sizes Available (inches)	Capacity (BTU/hr) at 1" pressure drop across valve	
	AGA Std. Nat. Gas (1,000 BTU/cu. ft.)	LP Gas (2,500 BTU/cu. ft.)
⅜" x ⅜" NPT any combination	75,000	121,500
⅜" x ¾" NPT straight through	75,000	121,500
½" x ⅜" NPT any combination	100,000	162,000
½" x ½" NPT any combination	140,000	226,800
½" x ¾" NPT straight through	140,000	226,800

MOUNTING POSITIONS:
Upright, or 0° to 90° from upright

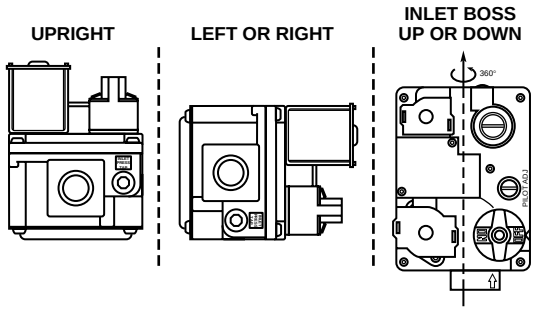


Figure 1. Gas valve mounting positions

CONTENTS

WHITE-RODGERS DIVISION
EMERSON ELECTRIC CO.
9797 REAVIS ROAD
ST. LOUIS, MISSOURI 63123-5398

Printed in U.S.A.

PART NO. 37-5291C
Replaces 37-5291B
9615

DO NOT BEGIN INSTALLATION UNTIL YOU READ THE FOLLOWING PRECAUTIONS.

⚠ WARNING

If you do not follow these instructions exactly, a fire or explosion may result, causing property damage, personal injury or loss of life.

1. **Failure to turn off electric or main gas supply to heating system could cause personal injury and/or property damage by shock, gas suffocation, fire, and/or explosion.**
2. **Do not use this control on circuits exceeding specified voltage. Higher voltage will damage the control and may cause shock or fire hazard.**
3. **NEVER USE FLAME OR ANY KIND OF SPARK TO CHECK FOR GAS LEAKS–COULD CAUSE FIRE AND/OR EXPLOSION.**
4. **DO NOT USE WIRE JUMPER on pilot systems, such as standing pilot, proven pilot, or spark-to-pilot ignition–a fire and/or explosion may result.**
5. **Do not use a control set for natural gas with LP gas, or a control set for LP gas with natural gas. Personal injury and/or property damage, gas suffocation, fire, and/or explosion may result.**

⚠ CAUTION

1. **Do not short out terminals on gas valve or primary control to test. Short or incorrect wiring can cause equipment damage, property damage, and/or personal injury.**
2. **This control is not intended for use in locations where it may come in direct contact with water. Suitable protection must be provided to shield the control from exposure to water (dripping, spraying, rain, etc.).**

1. Turn off electrical power to the system at the fuse box or circuit breaker. Also turn off the main gas supply.
2. If replacing an existing valve, disconnect all plumbing and electrical connections from the old control.
3. The control may be installed in any position, except upside down. The arrow on the bottom plate indicates the direction of gas flow through the valve.
4. You should use new pipe that is properly chamfered, reamed, and free of burrs and chips. If you are using old pipe, be sure it is clean and free of rust, scale, burrs, chips, and old pipe joint compound.
5. Apply pipe joint compound (pipe dope) or teflon tape **that is approved for all gases, only to the male threads of the pipe joints. DO NOT** apply compound or teflon tape to the first two threads (see fig. 3 for typical piping connections).
6. If you are using a vise or open-end wrench to hold the valve while installing piping, do not tighten excessively, as this may damage the valve.
7. See **SYSTEM WIRING** when making electrical connections. After all gas and electrical connections are completed, turn gas on and check for gas leaks with leak detection solution or soap suds. Bubbles forming indicate a leak. **SHUT OFF GAS AND FIX ALL LEAKS IMMEDIATELY.**

PILOT GAS CONNECTION

These valves are shipped with the pilot outlet plugged. For installations requiring pilot gas, remove the plug and use the fitting packed separately with the control.

Install the fitting into the pilot gas tapping, turning until finger-tight (see fig. 2). Insert clean, deburred tubing all the way through the fitting. Hold the tubing securely in place and slowly tighten the fitting until you feel a slight "give". Then tighten the fitting an additional 1½ turns.

See **ADJUSTMENT** section (page 5) and fig. 6 for pilot set up.

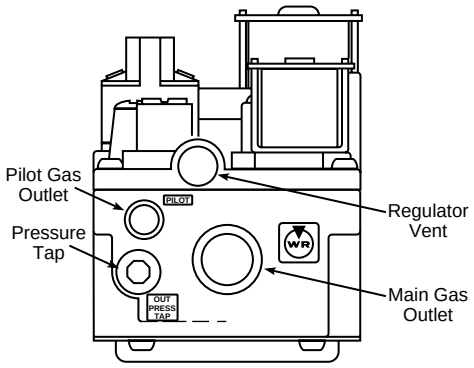


Figure 2

NOTE

All piping must comply with local codes, ordinances, and/or national fuel gas codes.

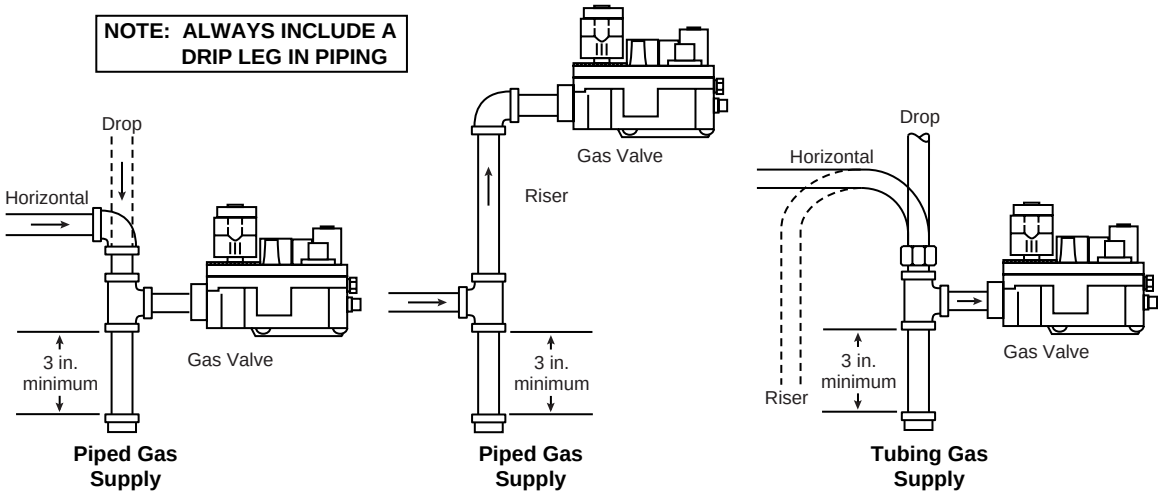


Figure 3. Typical gas valve piping

SYSTEM WIRING

REFER TO AND FOLLOW THE APPLIANCE MANUFACTURER'S WIRING DIAGRAM. REFER TO FIG. 4 FOR TERMINAL IDENTIFICATION.

NOTE

All wiring should be installed in accordance with local and national electrical codes and ordinances.

Always check that the electrical power supply used agrees with the voltage and frequency shown on the gas control.

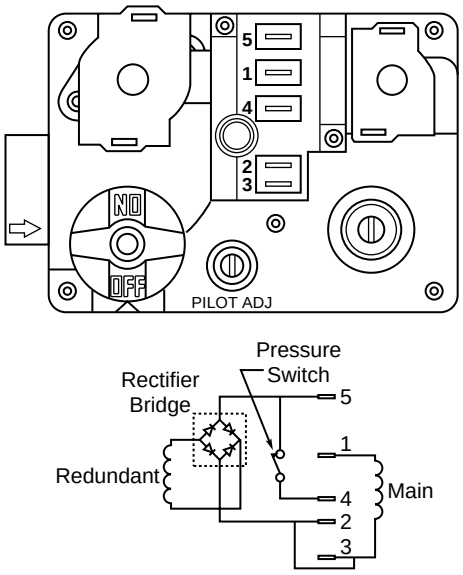


Figure 4. Gas valve wiring diagram

MANUAL VALVE KNOB

The manual valve knob is a two-position (ON-OFF) type. To turn manual valve **on**, rotate knob clockwise or counterclockwise to line up the word **ON** on the knob with the indicator on the cover casting (see fig. 5). To turn manual valve **off**, rotate knob clockwise or counterclockwise to line up the word **OFF** on the knob with the indicator on the cover casting.

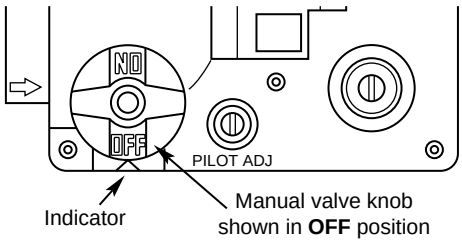


Figure 5. Manual gas valve knob

PILOT GAS ADJUSTMENT

These controls are factory preset to provide proper pilot gas flow for most applications. If additional adjustment is necessary, follow these steps.

1. Turn off all electrical power to the system before making any adjustments.
2. Remove the pilot adjust cover screw and gasket to expose the adjusting screw (see fig. 6). Turn the adjusting screw **clockwise to reduce pilot flame**, or **counterclockwise to increase pilot flame**.
3. Replace the gasket and pilot adjust cover screw and tighten securely.
4. Restore power to the system.

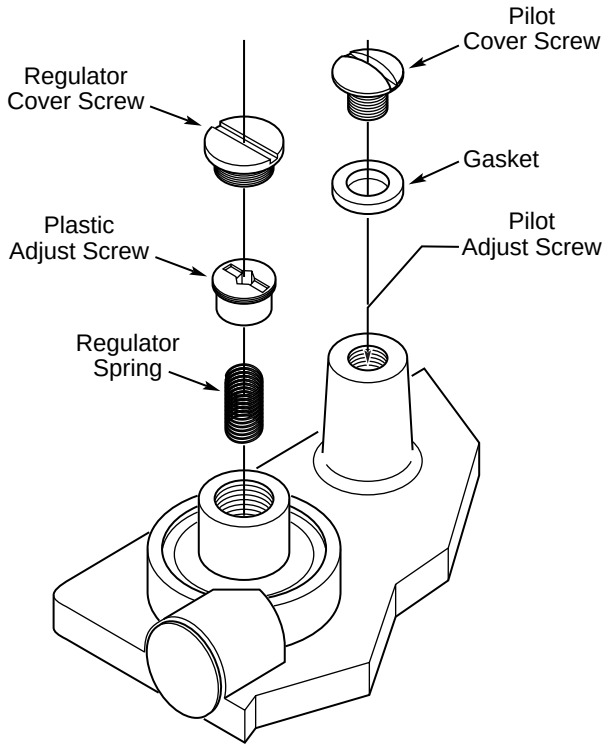


Figure 6

PRESSURE REGULATOR ADJUSTMENT

These controls are shipped from the factory with the regulator set for 3.5" W.C. (natural gas, full flow). Consult the appliance rating plate to ensure burner manifold pressure should be 3.5" W.C. If another outlet pressure is required, follow these steps.

If a valve has been factory-adjusted for the 2.5 to 5 inches W.C. range, it cannot be field-adjusted outside that range. This is also true for valves adjusted to the 7.5 to 12 inches W.C. range for LP gas.

1. Turn off all electrical power to the system.
2. Attach a manometer to the outlet pressure tap of the valve.
3. Turn on system power and energize valve.
4. Remove regulator cover screw and turn regulator adjust screw **clockwise to increase pressure**, or **counterclockwise to decrease pressure** (see fig. 6). Always adjust regulator to provide the correct pressure according to the original equipment manufacturer's specifications listed on the appliance rating plate.
5. Replace regulator cover screw and tighten securely.

LIGHTING INSTRUCTIONS

FOR YOUR SAFETY READ BEFORE OPERATING

⚠ WARNING **If you do not follow these instructions exactly, a fire or explosion may result causing property damage, personal injury or loss of life.**

A. This appliance is equipped with an intermittent ignition device which automatically lights the appliance. Do **not** try to light the pilot by hand.

B. **BEFORE OPERATING** smell all around the appliance area for gas. Be sure to smell next to the floor because some gas is heavier than air and will settle on the floor.

FOR YOUR SAFETY

"WHAT TO DO IF YOU SMELL GAS"

- **Do not try to light any appliance.**
- **Do not touch any electrical switch; do not use any phone in your building.**
- **Immediately call your gas supplier from a neighbor's phone. Follow the gas supplier's instructions.**
- **If you cannot reach your gas supplier, call the fire department.**

C. Use only your hand to turn the gas control knob. **Never use tools**. If the knob will not turn by hand, don't try to repair it, call a qualified service technician. Force or attempted repair may result in a fire or explosion.

D. Do not use this appliance if any part has been under water. Immediately call a qualified service technician to inspect the appliance and to replace any part of the control system and any gas control which has been under water.

OPERATING INSTRUCTIONS

1. **STOP!** Read the safety information above on this label.
2. Set the thermostat to lowest setting.
3. Turn off all electric power to the appliance.
4. This appliance is equipped with an ignition device which automatically lights the pilot. Do **not** try to light the pilot by hand.
5. Remove control access panel.
6. Turn gas control knob clockwise to "OFF."
7. Wait five (5) minutes to clear out any gas. If you then smell gas, STOP! Follow "B" in the safety information above on this label. If you don't smell gas, go to the next step.
8. Turn gas control knob counterclockwise to "ON."
9. Replace control access panel.
10. Turn on all electric power to the appliance.
11. Set thermostat to desired setting.
12. If the appliance will not operate, follow the instructions "To Turn Off Gas To Appliance" and call your service technician or gas supplier.

TO TURN OFF GAS TO APPLIANCE

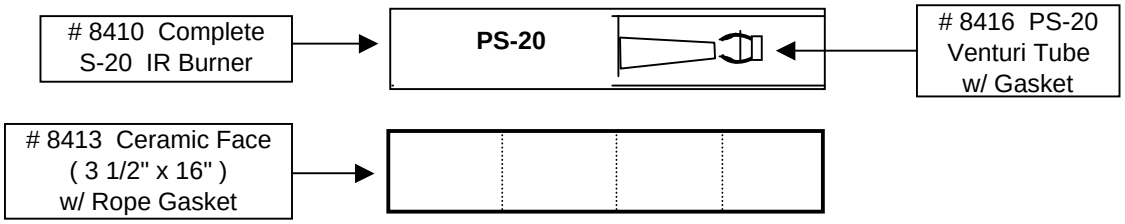
1. Set the thermostat to lowest setting.
2. Turn off all electric power to the appliance if service is to be performed.
3. Remove control access panel.
4. Turn gas control knob clockwise to "OFF." **Do not force**.
5. Replace control access panel.

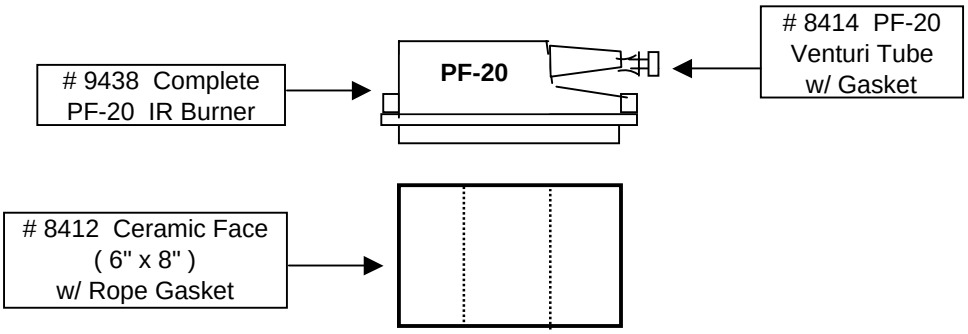
If you need more information about this product, you may write to us at::

WHITE-RODGERS DIVISION, Emerson Electric Co.
9797 Reavis Road
St. Louis, MO 63123-5398

PARTS

ROTISSERIE
PF-20 & PS-20
INFRARED BURNERS





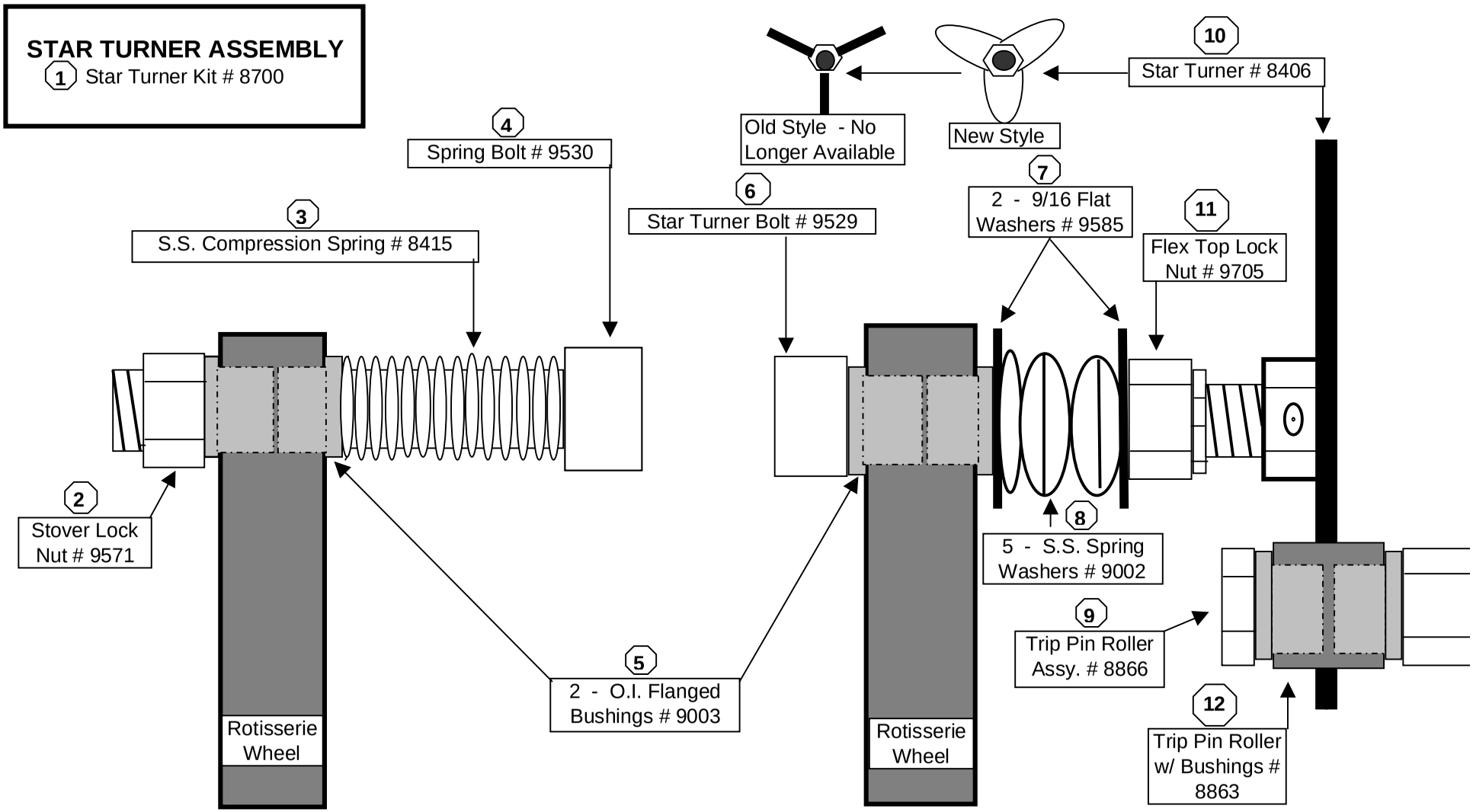
8207	**PS-20 Rope Gasket**
8208	**PF-20 Rope Gasket**
8408	**Venturi Gasket**
8418	**PS-20 Orifice Holder**
9551	**PF-20 Orifice Holder**
8421	**Nat'l. Gas Orifice # 49**
8417-56	**LP Gas Orifice # 56**
8417-57	**LP Gas Orifice # 57**
8417-58	**LP Gas Orifice # 58**
8225	**PF-20 Burner Screen Set (Covers 5 Burners)**

Drawing # 21MB

STAR TURNER ASSEMBLY*

Reference #	Part Number	Item Description
Drawing # 10MB		
1	8700	Star Turner Kit - All The Hardware To Do One Spit
2	9571	5/8 Stover Lock Nut - For Spring Bolt
3	8415	5/8 S.S. Compression Spring
4	9530	5/8 Spring Bolt - Spring Loaded Side
5	9003	5/8 O.I. Flanged Bushing - 2 Per Bolt
6	9529	Star Turner Bolt - Drive Side
7	9585	9/16 Flat Washer - 2 Per Spit
8	9002	5/8 S.S. Spring Washer - 5 Per Spit
9	8866	Trip Pin Roller Assembly
10	8406	Star Turner
11	9705	5/8 Flex Top Lock Nut - For Star Turner Bolt
12	8863	Trip Pin Roller w/ Bushings
No Shown	9405	7/8" Q.D. Bushing - Main Shaft
No Shown	8309	1 1/4" Q.D. Bushing - Main Shaft
No Shown	9037	7/8" Or 1 1/4" Main Rotisserie Shaft
No Shown	9422	# 40 - 24 Tooth Sprocket - Main Shaft
No Shown	8284	4 RPM Gearmotor
No Shown	8721	# 40 - 15 Tooth Sprocket - Motor Output Shaft
No Shown	8724	5/8" Q.D. Bushing - For 4 RPM Motor w/ # 40 Chain
No Shown	8276	Motor Mount
No Shown	9716	4RPM Motor Base Plate
No Shown	8215	7/8" Flanged Mount Bearing - Main Shaft
No Shown	8409	1 1/4" Flanged Mount Bearing - Main Shat
No Shown	9518	1/4-28 x 45 Grease Fitting
Not Shown	9826	1/4" Sq. Key For Shaft

* Some Older Units Have 1/2" Star Turners Instead Of 5/8" - Call The Parts Department With The Serial Number For More Info 800 - 527 - 4831 Ext. 111



Drawing # 10MB

PARTS DETAIL: Chain Drive

(SN 12000-12489)

Reference #	Part Number	Item Description
Drawings # 11MB 12MB,13MB,14MB		
1	**9004**	**Spinnin' Spitz Wheel Bushing Kit - All The Hardware To Do One Spit**
2	**9571**	**5/8 Stover Lock Nut**
3	**8415**	**5/8 S.S. Compression Spring**
4	**9003**	**5/8 O.I. Flanged Bushing - 2 Per Bolt**
4	**9832**	**Graphited Bushing (Replacement For # 9003 - One Per Bolt - No Greasing Needed)**
4	**9762**	**5/8 O.I. Flanged Bushing - Longer**
5	**9530**	**5/8 Spring Bolt - Spring Loaded Side**
6	**9562**	**5/8 Keyed Socket Cap Bolt - Drive Side**
7	**9517**	**Grease Fitting**
8	**9011**	**5/8 Bronze Bushing w/ Grease Hole**
9	**8310**	**14 Tooth Sprocket**
10	**9585**	**9/16 Flat Washer**
11	**9706**	**Tension Sprocket w/ Bushing**
12	**9794**	**Chain Tension Sprocket Assy.**
13	**9543**	**Inch Series Sealed Bearing**
14	**9402**	**# 40 Master Link**
14	**8212**	**# 60 Master Link**
15	**8214**	**# 40 Roller Chain (Priced By The Foot)**
15	**9403**	**# 60 Roller Chain (Priced By The Foot)**
16	**8718**	**Stationary Sprocket**
17	**9544**	**1 1/4 Sintered Bronze Bearing**
17	**9815**	**1 15/16 Sintered Bronze Bearing**
18	**9087**	**# 40 - 36 Tooth Sprocket - Main Shaft**
18	**9500**	**# 40 - 54 Tooth Sprocket - Main Shaft**
18	**9723**	**# 40 - 60 Tooth Sprocket - Main Shaft**

PARTS DETAIL: Chain Drive

(SN 12000-12489)

18	9805	# 60 - 60 Tooth Sprocket - Main Shaft
19	9037	1 1/4" Main Rotisserie Shaft
19	9809	1 15/16" Main Rotisserie Shaft
20	8206	1 1/4" Q.D. Bushing - Main Shaft
20	8307	1 15/16" Q.D. Bushing - Main Shaft
21	9518	1/4-28 x 45 Grease Fitting
22	8409	1 1/4" Flanged Mount Bearing - Main Shaft
23	8203	1 15/16" Pillow Block Bearing - Main Shaft
24	9814	1/8 PFT x 45 Grease Fitting
Not Shown	9572	3/16" Sq. Key For Keyed Socket Cap Bolt
Not Shown	8216	# 40 Offset / Half Link
Not Shown	9826	1/4" Sq. Key For 1 1/4" Shaft
Not Shown	9827	1/2" Sq. Key For 1 15/16" Shaft
Not Shown	8284	4 RPM Gearmotor
Not Shown	8313	Motor Brake - 4 RPM
Not Shown	8326	5.4 RPM Gearmotor
Not Shown	8303	Motor Brake - 5.4 RPM
Not Shown	8721	# 40 - 15 Tooth Sprocket - Motor Output Shaft
Not Shown	8306	# 60 - 14 Tooth Sprocket - Motor Output Shaft
Not Shown	8724	5/8" Q.D. Bushing - For 4 RPM Motor w/ # 40 Chain
Not Shown	9179	3/4" Q.D. Bushing - For 5.4 RPM Motor w/ # 40 Chain
Not Shown	9407	3/4" Q.D. Bushing - For 5.4 RPM Motor w/ # 60 Chain
Not Shown	8276	Motor Mount
Not Shown	9716	4RPM Motor Base Plate

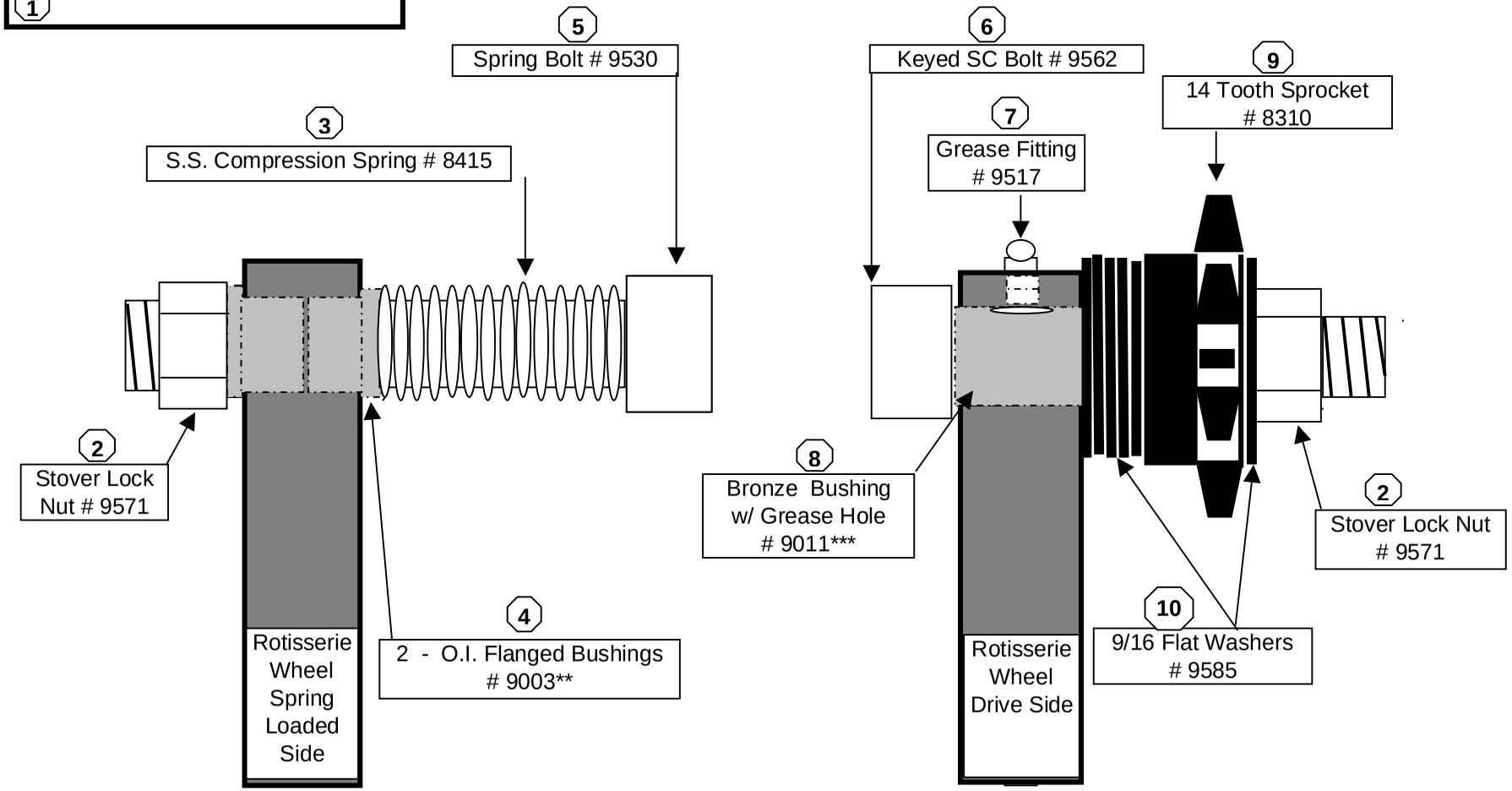
Please Call With The Rotisserie S/N To Insure Correct Parts

1-800-527-4831 Ext. 111

SPIT HOLDER ASSEMBLY

(Chain Drive S/N 12000 - 12489 *)

Wheel Bushing Kit # 9004



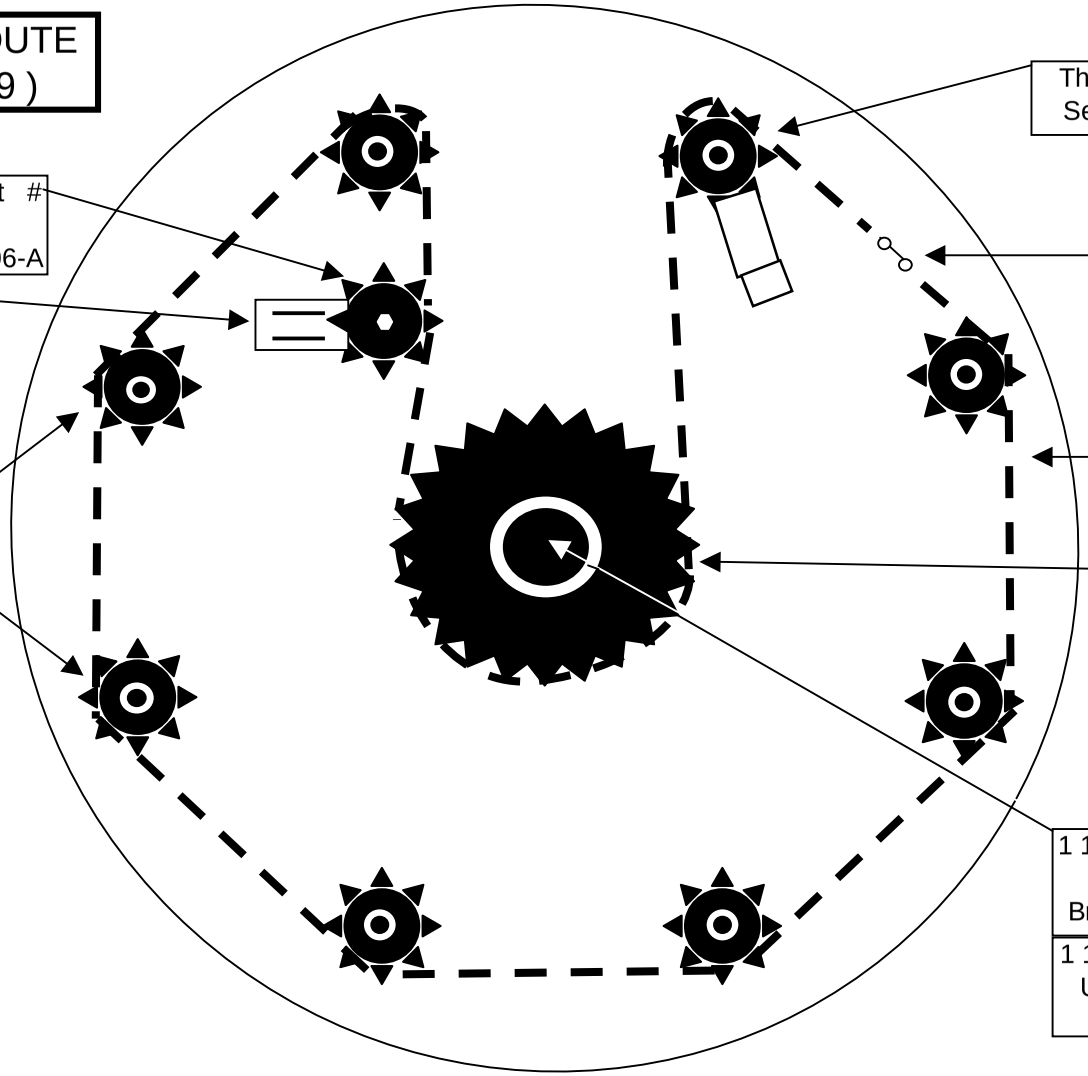
* Some Bigger Rotisseries (Over 5' Wide) May Have Different Parts - Call With Serial Number For More Info.

** Some Rotisseries May Have Just One Longer O.I. Flanged Bushing # 9762.

*** Some Rotisseries May Have Two O.I. Flanged Bushings # 9003 Or Can Be Replaced w/One #9832

Drawing # 11MB

CHAIN DRIVE CHAIN ROUTE
(S/N 12000 - S/N 12489)



11 Tension Sprocket # 9706 w/ Bushing # 9706-A

12 Chain Tension Sprocket Assy. # 9794

9 14 Tooth Spit Sprockets # 8310

13 This Sprocket Has An Inch Series Sealed Bearing Behind It. # 9543

14 # 40 Master Link # 9402

15 # 40 Roller Chain # 8214

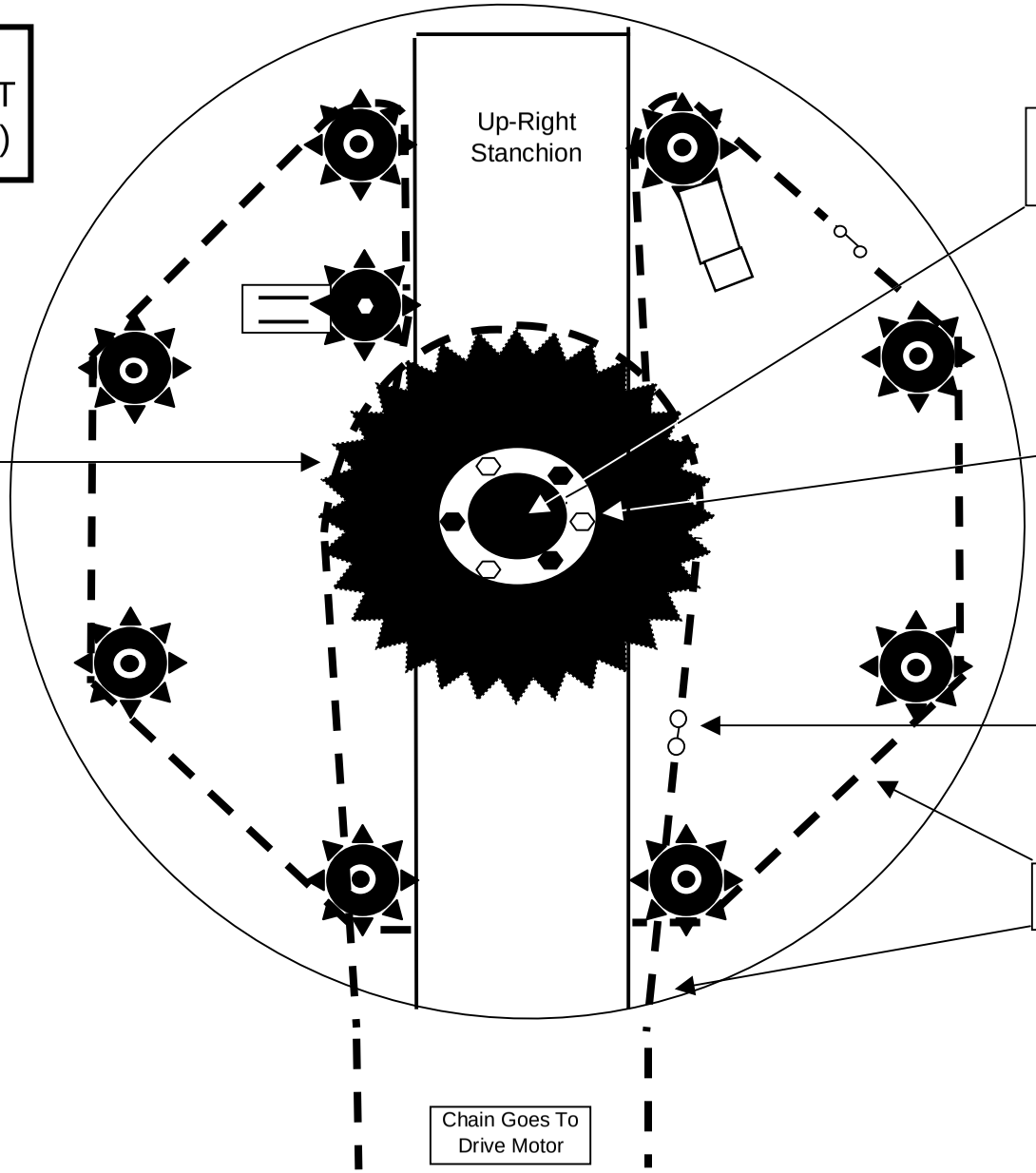
16 Stationary Sprocket # 8718

17 1 1/4" Main Shaft Shown w/ Sintered Bronze Bearing # 9544

1 15/16" Main Shaft Will Use Sintered Bronze Bushing # 9815

Drawing # 12MB

CHAIN DRIVE
MAIN SHAFT SPROCKET
(S/N 12000 - S/N 12489)



19
Main Shaft
1 1/4" - # 9037
1 15/16" - # 9809

20
Q. D. Bushing
1 1/4" - # 8206
1 15/16" - # 8307

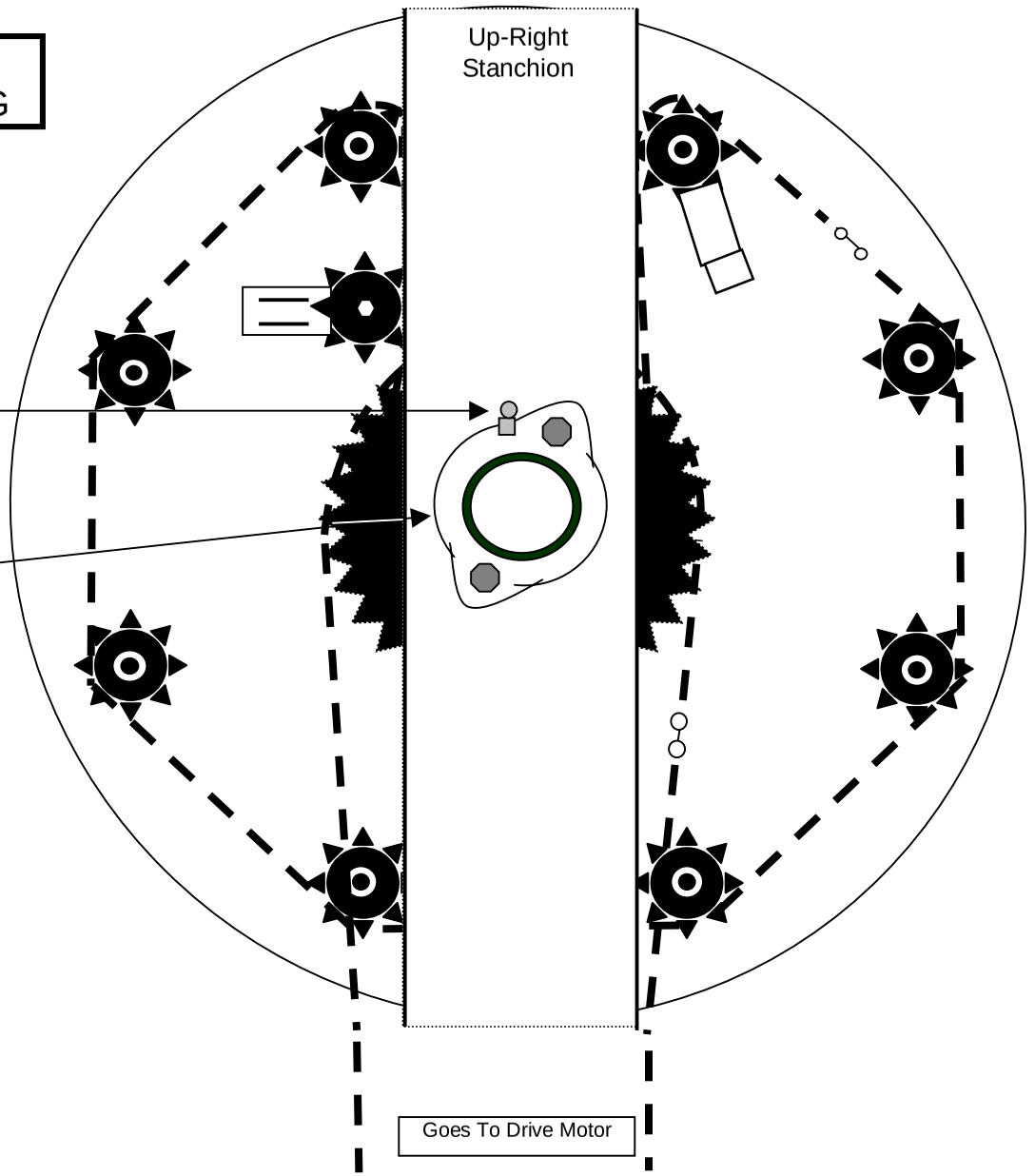
18
Main Drive Sprocket
#40-36T - # 9087
#40-54T - # 9500
#40-60T - # 9723
#60-60T - # 9805

14
40 Master Link # 9402
60 Master Link # 8212

15
40 Roller Chain # 8214
60 Roller Chain # 9403

Drawing #13MB

CHAIN DRIVE
MAIN SHAFT BEARING

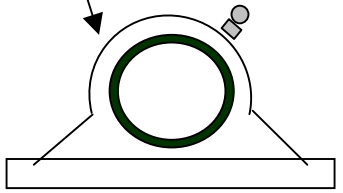


21
Grease Fitting
1/4-28 X 45
9518

22
1 1/4" Flanged Mount
Bearing # 8409

23
1 15/16"
Pillow Block
Bearing # 8203

24
1/8 PTF x 45
Grease Fitting
9814



Drawing # 14MB

PARTS DETAIL: Gear Drive

(SN12490-12699)

Reference #	Part Number	Item Description
Drawings # 15MB, 16MB,17MB,18MB		
1	**9807**	**Wheel Bushing Kit - (All The Hardware To Do One Spit)**
2	**9571**	**5/8 Stover Lock Nut**
3	**8415**	**5/8 S.S. Compression Spring**
4	**9762**	**5/8 O.I. Flanged Bushing - Longer**
5	**9530**	**5/8 Spring Bolt - Spring Loaded Side**
6	**9806**	**9/16 S.S. Flat Washer**
7	**9003**	**5/8 O.I. Flanged Bushing - 2 Per Bolt - Drive Side**
7	**9708**	**2" Long Graphited Bushing - Drive Side**
7	**9832**	**Graphited Bushing (Replacement For # 9003-One Per Bolt-No Greasing Needed)**
8	**9562**	**5/8 Keyed Socket Cap Bolt - Drive Side**
9	**9517**	**Grease Fitting**
10	**9721**	**9 Tooth Sprocket**
11	**9585**	**9/16 Flat Washer**
12	**9810**	**4 Spit Stationary Gear**
12	**9811**	**6 Spit Stationary Gear**
12	**9812-84/9812-97**	**8 Spit Stationary Gear**
13	**9544**	**1 1/4 Sintered Bronze Bearing**
13	**9815**	**1 15/16 Sintered Bronze Bearing**
14	**9518**	**1/4-28 x 45 Grease Fitting**
15	**8409**	**1 1/4" Flanged Mount Bearing - Main Shaft**
15	**9839**	**1 15/16" Flanged Mount Bearing - Main Shaft**
16	**8203**	**1 15/16" Pillow Block Bearing - Main Shaft**
17	**9814**	**1/8 PFT x 45 Grease Fitting**
18	**9723**	**# 40 - 60 Tooth Sprocket - Main Shaft**
18	**9834**	**# 40 - 70 Tooth Sprocket - Main Shaft**
18	**9805**	**# 60 - 60 Tooth Sprocket - Main Shaft**

PARTS DETAIL: Gear Drive

(SN12490-12699)

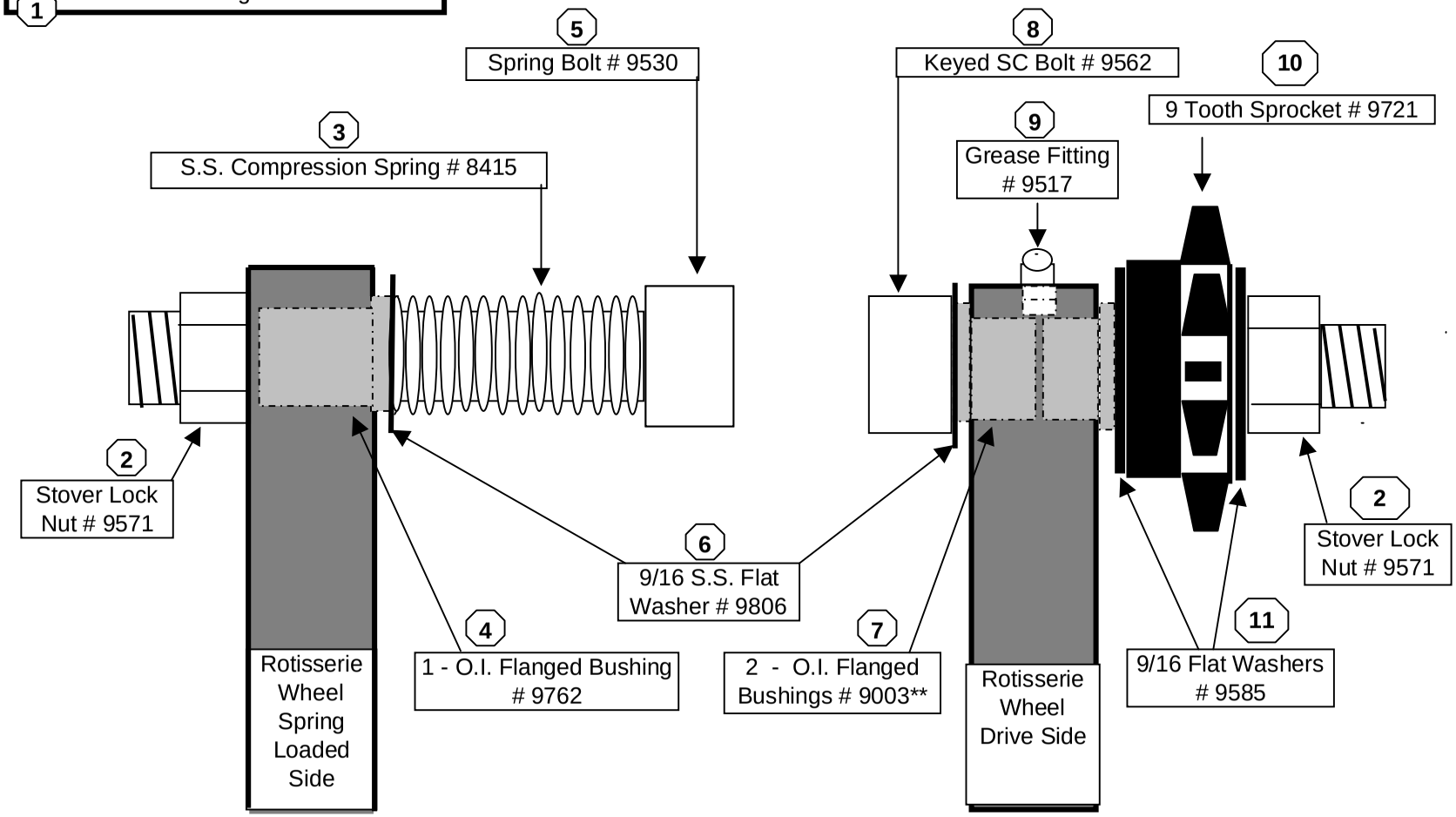
19	9037	1 1/4" Main Rotisserie Shaft
19	9809	1 15/16" Main Rotisserie Shaft
20	8206	1 1/4" Q.D. Bushing - Main Shaft w/ Sprocket #9723
20	9776	1 1/4" Q.D. Bushing - Main Shaft w/ Sprocket #9834
20	9838	1 15/16" Q.D. Bushing - Main Shaft w/Sprocket #9834
20	8307	1 15/16" Q.D. Bushing - Main Shaft w/Sprocket #9805
21	9402	# 40 Master Link
21	8212	# 60 Master Link
22	8214	# 40 Roller Chain (Priced By The Foot)
22	9403	# 60 Roller Chain (Priced By The Foot)
Not Shown	9572	3/16" Sq. Key For Keyed Socket Cap Bolt
Not Shown	9826	1/4" Sq. Key For 1 1/4" Shaft
Not Shown	9827	1/2" Sq. Key For 1 15/16" Shaft
Not Shown	8216	# 40 Offset / Half Link
Not Shown	8284	4 RPM Gearmotor
Not Shown	8326	5.4 RPM Gearmotor
Not Shown	8721	# 40 - 15 Tooth Sprocket - Motor Output Shaft
Not Shown	8306	# 60 - 14 Tooth Sprocket - Motor Output Shaft
Not Shown	8724	5/8" Q.D. Bushing - For 4 RPM Motor w/ # 40 Chain
Not Shown	9179	3/4" Q.D. Bushing - For 5.4 RPM Motor w/ # 40 Chain
Not Shown	9407	3/4" Q.D. Bushing - For 5.4 RPM Motor w/ # 60 Chain
Not Shown	8276	Motor Mount
Not Shown	9716	4RPM Motor Base Plate

Please Call With The Rotisserie S/N To Insure Correct Parts
1-800-527-4831 Ext. 111

SPIT HOLDER ASSEMBLY

(Gear Drive S/N 12490 - 12699 *)

Wheel Bushing Kit # 9807

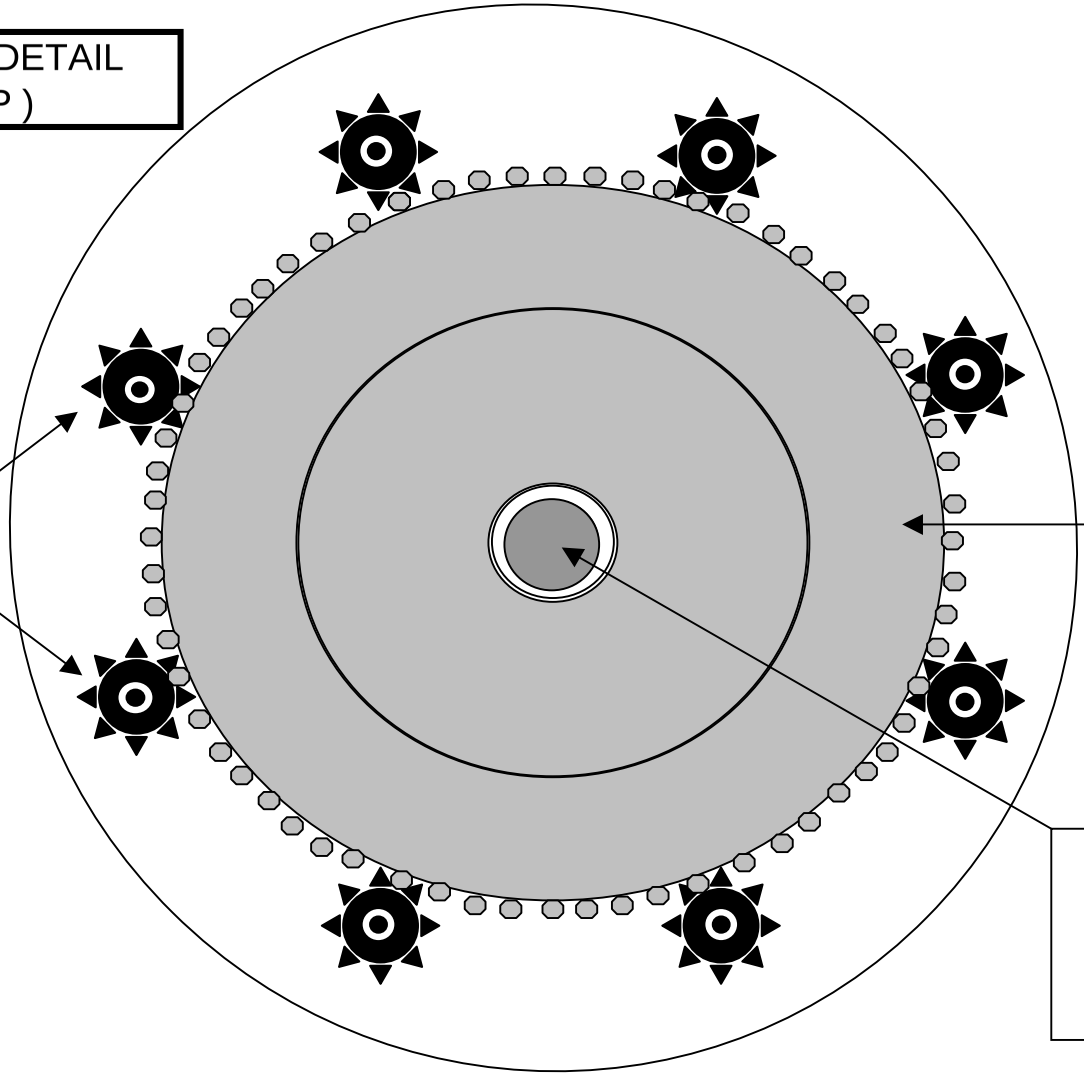


* Some Bigger Rotisseries (Over 5' Wide) May Have Different Parts - Call With Serial Number For More Info.

** Can Be Replaced w/ One # 9832 Graphited Bushing Used On S/N 12681 & Up (Some Units May Have A Longer 2" Bushing #9708

Drawing # 15MB

STATIONARY GEAR DETAIL
(S/N 12490 & UP)



10

9 Tooth Spit Sprockets # 9721

12

Stationary Gear
4 Spit # 9810 6
Spit # 9811 8
Spit # 9812-84
8 Spit # 9812-97 (
8 Spit Shown)

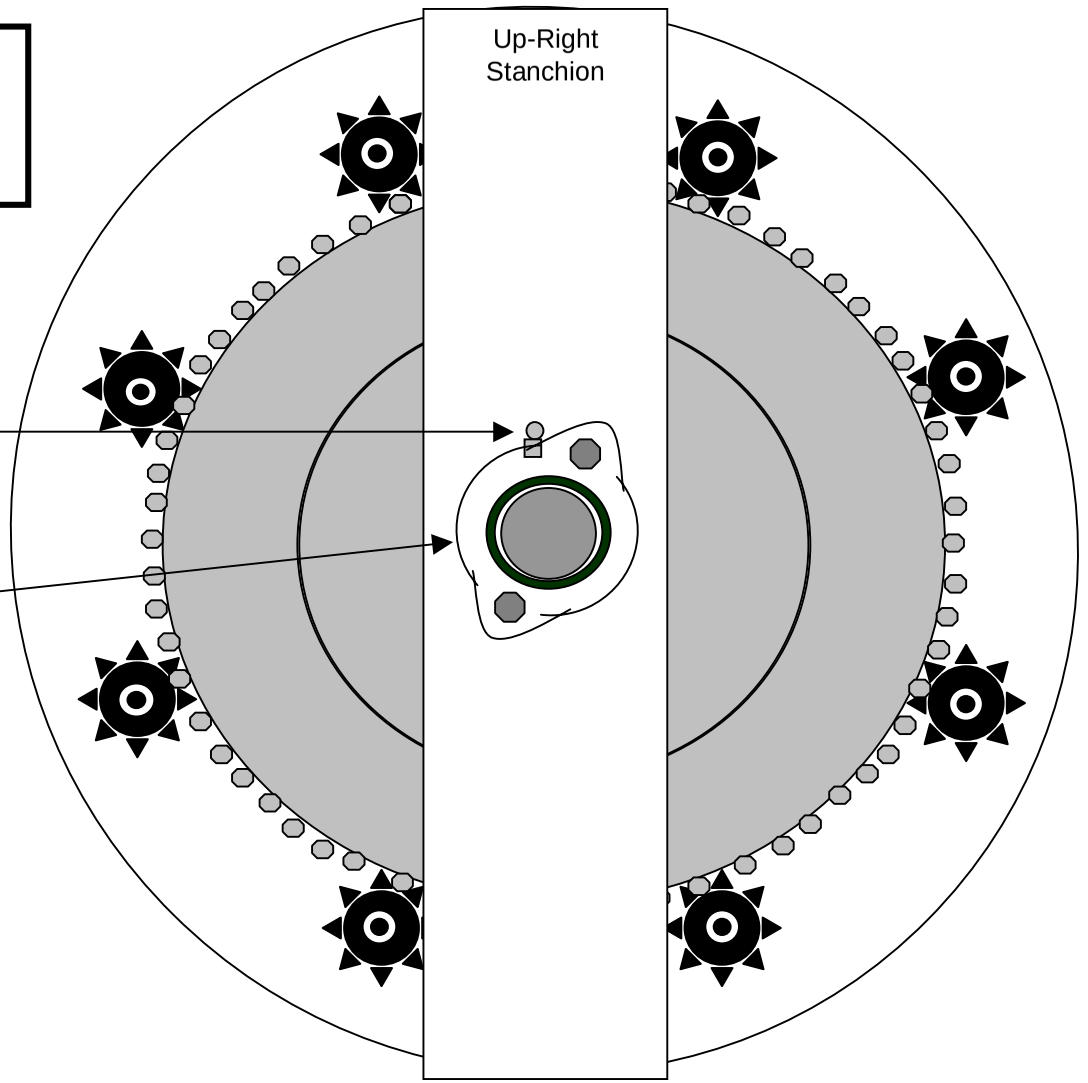
13

1 1/4" Main Shaft
Shown w/ Sintered
Bronze Bearing # 9544
1 15/16" Main Shaft
Will Use Sintered
Bronze Bushing #9815

Drawing # 16MB

MAIN SHAFT BEARING DETAIL

For Gear Drive And Chain Drive
(Gear Drive Shown)



14

Grease Fitting
1/4-28 X 45
9518

15

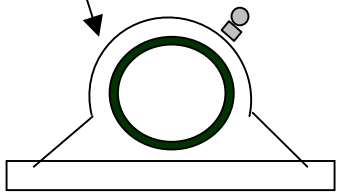
1 1/4" Flanged Mount
Bearing # 8409
1 15/16" Flanged Mount
Bearing # 9839

16

1 15/16" Pillow
Block Bearing
8203

17

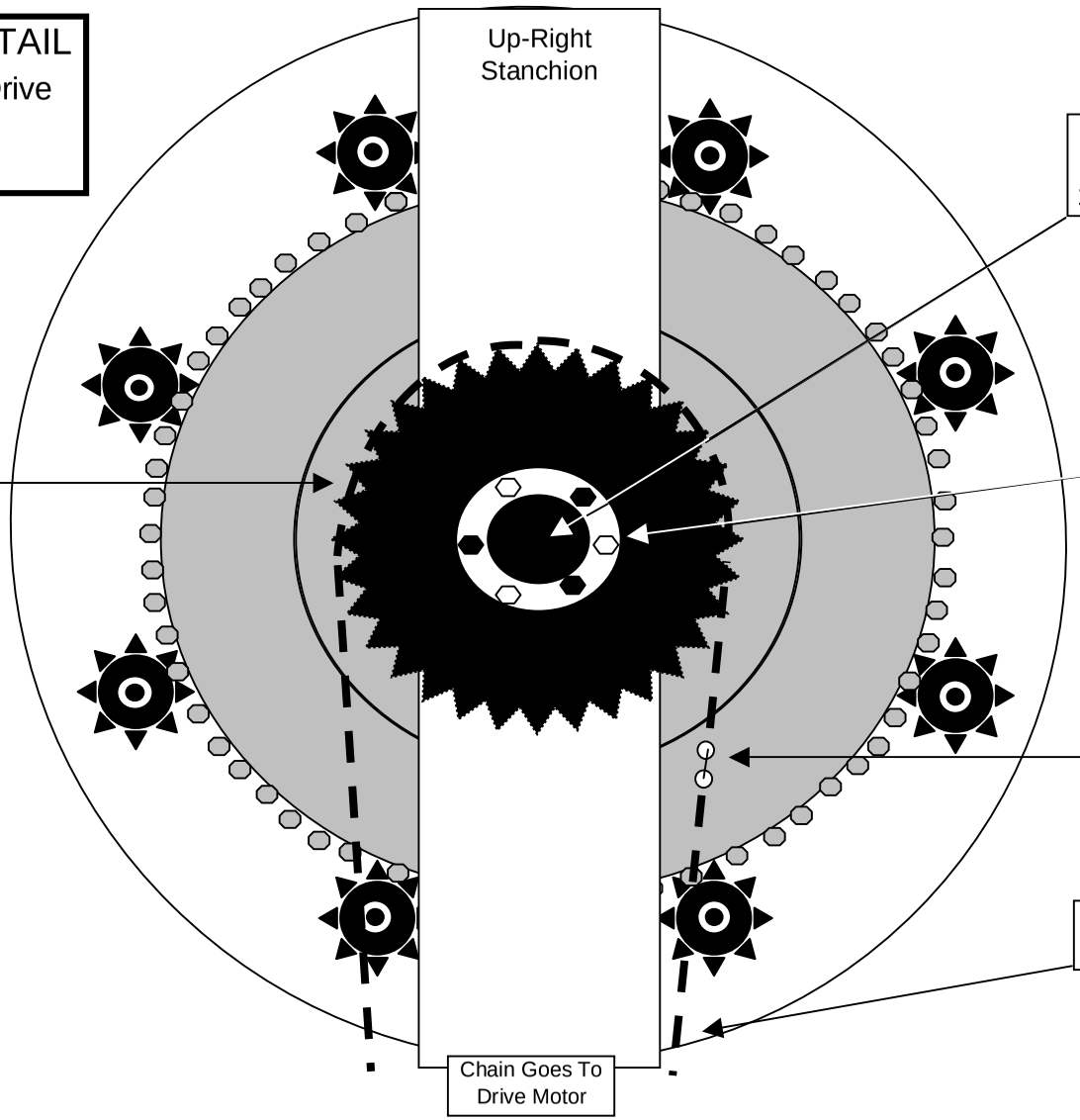
1/8 PTF x 45
Grease Fitting
9814



Drawing # 17MB

DRIVEN SPROCKET DETAIL

For Gear Drive and Chain Drive
(Gear Drive Shown)



18
Main Drive Sprocket
#40-60T - # 9723
#40-70T - # 9834
#60-60T - # 9805

19
Main Shaft
1 1/4" - # 9037
1 15/16" - # 9809

20
Q. D. Bushing
1 1/4" - # 8206
or # 9776
1 15/16" - # 8307
or # 9838

21
40 Master Link # 9402
60 Master Link # 8212

22
40 Roller Chain # 8214
60 Roller Chain # 9403

Drawing # 18MB

PARTS DETAIL: Gear Drive

(SN 12722 Up)

Reference #	Part Number	Item Description
Drawings # 25MB, 16MB,17MB,18MB		
1	**9842**	**Spinnin' Spitz Wheel Bushing Kit -**
		(All The Hardware To Do One Spit)
2	**9571**	**5/8 Stover Lock Nut**
3	**8415**	**5/8 S.S. Compression Spring**
4	**9762**	**5/8 O.I. Flanged Bushing 1" - Drive Side**
5	**9530**	**5/8 Spring Bolt - Spring Loaded Side**
6	**9806**	**9/16 S.S. Flat Washer**
7	**9808**	**Graphited Bushing 2" - Drive Side**
8	**9833**	**5/8 Keyed Socket Cap Bolt - Drive Side**
10	**9721**	**9 Tooth Sprocket**
11	**9840**	**5/8" Spacer / Shaft Collar**
11	**9810**	**4 Spit Stationary Gear**
11	**9811**	**6 Spit Stationary Gear**
11	**9812**	**8 Spit Stationary Gear**
12	**9585**	**9/16 Flat Washer**
13	**9797**	**Lynch Pin**
13	**9544**	**1 1/4 Sintered Bronze Bearing**
13	**9815**	**1 15/16 Sintered Bronze Bearing**
14	**9518**	**1/4-28 x 45 Grease Fitting**
15	**8409**	**1 1/4" Flanged Mount Bearing - Main Shaft**
15	**9839**	**1 15/16" Flanged Mount Bearing - Main Shaft**
16	**8203**	**1 15/16" Pillow Block Bearing - Main Shaft**
17	**9814**	**1/8 PFT x 45 Grease Fitting**
18	**9723**	**# 40 - 60 Tooth Sprocket - Main Shaft**
18	**9834**	**# 40 - 70 Tooth Sprocket - Main Shaft**

PARTS DETAIL: Gear Drive

(SN 12722 Up)

18	9805	# 60 - 60 Tooth Sprocket - Main Shaft
19	9037	1 1/4" Main Rotisserie Shaft
19	9809	1 15/16" Main Rotisserie Shaft
20	8206	1 1/4" Q.D. Bushing - Main Shaft w/ Sprocket #9723
20	9776	1 1/4" Q.D. Bushing - Main Shaft w/ Sprocket #9834
20	9838	1 15/16" Q.D. Bushing - Main Shaft w/Sprocket #9834
20	8307	1 15/16" Q.D. Bushing - Main Shaft w/Sprocket #9805
21	9402	# 40 Master Link
21	8212	# 60 Master Link
22	8214	# 40 Roller Chain (Priced By The Foot)
22	9403	# 60 Roller Chain (Priced By The Foot)
Not Shown	9572	3/16" Sq. Key For Keyed Socket Cap Bolt
Not Shown	9826	1/4" Sq. Key For 1 1/4" Shaft
Not Shown	9827	1/2" Sq. Key For 1 15/16" Shaft
Not Shown	8216	# 40 Offset / Half Link
Not Shown	8284	4 RPM Gearmotor
Not Shown	8326	5.4 RPM Gearmotor
Not Shown	8721	# 40 - 15 Tooth Sprocket - Motor Output Shaft
Not Shown	8306	# 60 - 14 Tooth Sprocket - Motor Output Shaft
Not Shown	8724	5/8" Q.D. Bushing - For 4 RPM Motor w/ # 40 Chain
Not Shown	9179	3/4" Q.D. Bushing - For 5.4 RPM Motor w/ # 40 Chain
Not Shown	9407	3/4" Q.D. Bushing - For 5.4 RPM Motor w/ # 60 Chain
Not Shown	8276	Motor Mount
Not Shown	9716	4RPM Motor Base Plate

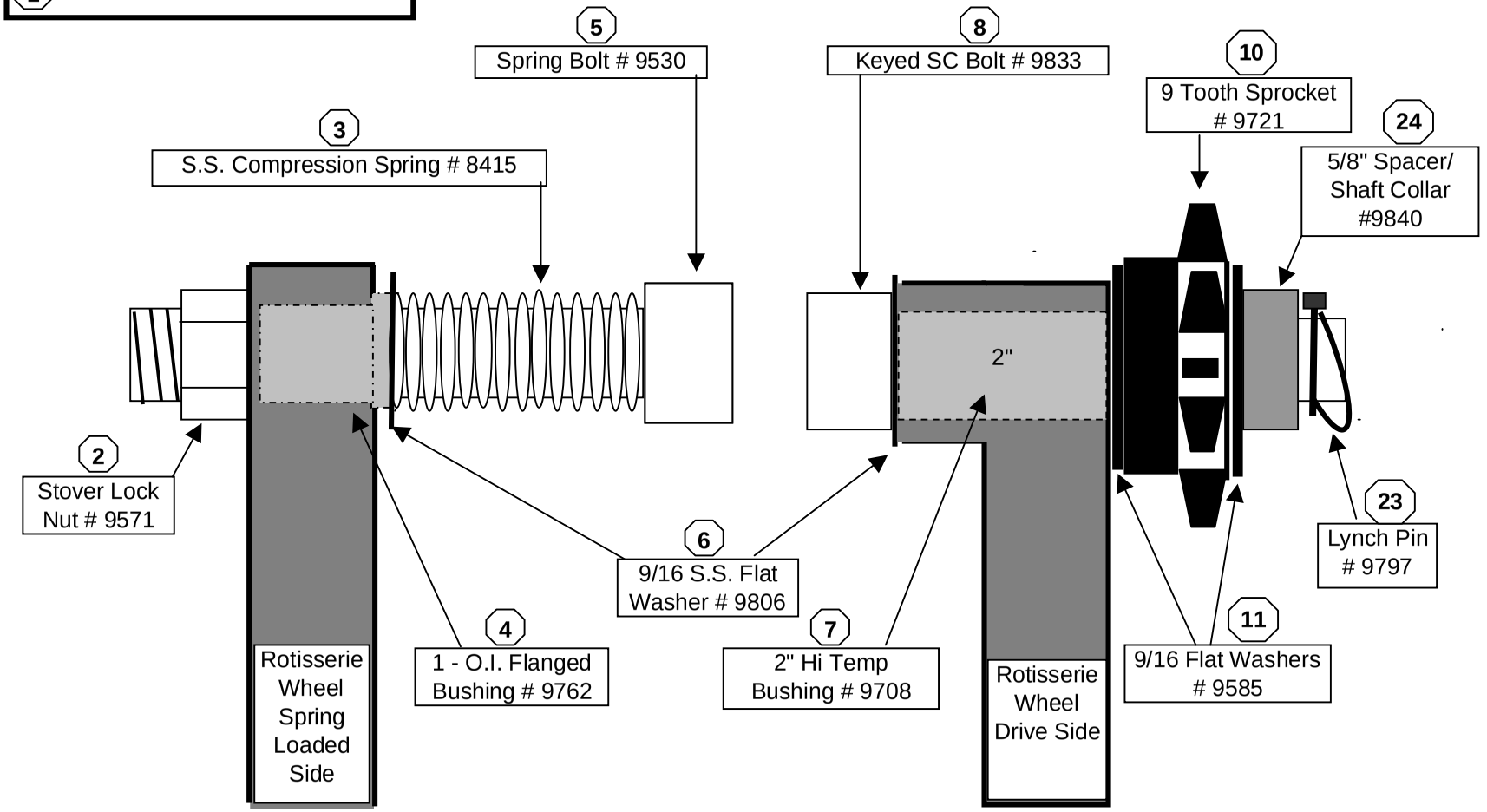
Please Call With The Rotisserie S/N To Insure Correct Parts

1-800-527-4831 Ext. 111

SPIT HOLDER ASSEMBLY

(Gear Drive S/N 12722 & Up *)

Wheel Bushing Kit # 9842



* Some bigger Rotisseries (over 5' Wide) may have different parts - Field varify Serial Number. Call for more information.

Drawing # 25MB

Revised
04-01-2017

WARRANTY

J & R MANUFACTURING warrants its equipment against defective parts and workmanship under normal use and when installed in accordance with manufacturer's recommendations for a period (after date of shipment*) of twelve (12) months on parts and ninety (90) days on labor with the following provisions:

1. This warranty does not apply if problems or claims are the result of: (a) damage in transit (equipment becomes owner's property upon shipment from factory and owner must file claim with transport company); (b) misuse, neglect, improper maintenance, and or unauthorized alterations to equipment; (c) improper installation of exhaust stacks, air supply, and extraneous exhaust systems; (d) improper voltage hook-up; (e) wind, rain, hail, fire and acts of God.

2. In-warranty replacement parts will be credited only upon receipt and inspection of defective parts at the factory. All shipping charges are the responsibility of the owner, but, at the discretion of J&R Manufacturing, ground shipping charges may be waived or credited.

3. Labor to remove, replace, or repair defects under this warranty must be authorized by factory. Premium time (overtime) and travel time are not included in the warranty.

4. Sales, excise, and other taxes, food loss, and down-time are not covered under this warranty.

5. The removal of manufacturer's nameplate(s) voids the warranty.

It is the aim of J & R Manufacturing to build the finest equipment possible and to facilitate quick solutions to all problems that might arise with the lowest expense possible to the user(s). To help us achieve this goal, please follow these procedures:

1. Telephone our service department at 972-289-0801 at the first sign of a problem. Have ready the Model and Serial Number of your equipment.

2. Cooperate with our Service Department by making certain visual checks as requested. Most problems are quick and easy to pinpoint and resolve.

3. In the event it is necessary to use a service company, the factory will contact its authorized service agency. If no authorized service agency is available, please recommend a service company. The use of a service company not specifically authorized by our Service Department at factory headquarters may invalidate this warranty.

* or provable start up date, whichever is later (start up must be within 12 months of ship date)