



NAPOLEON
GAS FIREPLACE

SERVICE MANUAL

TECHNICAL HELP LINE



1-888-721-TECH (8324)

PRODUCED & DISTRIBUTED BY
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SUGGESTED SERVICE PARTS LIST

Thermopile
Thermocouple
Gas Valves (Various)
Push-button igniter
Variable speed switch
Propane pilot orifice
Natural Gas Pilot orifice
Log Sets
Venturi Gasket
Miscellaneous Fasteners
On / off rocker switch
Various pilot assemblies

Main Burner Orifices - Natural Gas
Main Burner Orifices - Propane
A length of 1/4" OD Aluminum tubing
1/4" Compression Ferrules
Instruction Manuals
18 gauge Electrical wire - 125C rating
Marr connectors / Electrical connectore
Blower Kit
Mercury flame switch
Thermal switch (for blowers)
Spill switch

SUGGESTED INSTALLER'S TOOL KIT

Drop Sheet
Manometer / Pressure Gauge
Barb Tap 1/8 NPT
Multimeter (capable of DC Millivolts)
#s 1-60 Drills to measure orifices
Green, Red & Black Robertson Screw Drivers
Slotted Screw drivers
1/4" Hex Driver
5/16" Hex Driver
Adjustable wrench
Phillips Screw Drivers
Vice Grips
10" & 14" Pipe Wrench
Needlenose, Standard & Channel Lock Pliers
Matches / Lighter
Pipe / Thread Sealant
Flashlight
Jumper Wires
Gas Sniffer / Soap Solution
Stubby Screwdrivers
Flaring tool

Utility Knife
Hammer
Paper Towels
Windex
Aluminum Foil Tape
Exterior caulking
Black & Hi-Temp Red Silicone
Caulking Gun
Hi-Temp Touch-up Paint
Drill
Drill Bits 1/16" - 1/2"
Tube Cutter
Tin Snips
Rubber Gloves
Emory Cloth
Metal File
Wirestripper / Cutter
Teflon Tape
Open end wrenches
3/16" Hex key
Toothbrush / Paintbrush

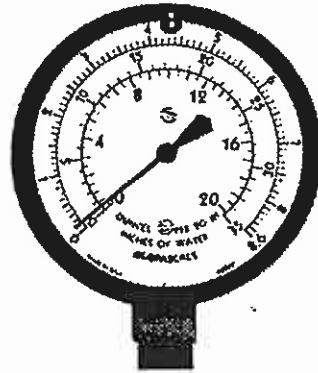


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GAS PRESSURE TEST KIT



**TEST FOR LEAKS
FOR LP OR NATURAL GAS
TEST SYSTEM PRESSURE
TEST PRESSURE AT APPLIANCE
2 1/2" EASY READ DIAL
BRASS PRESSURE TAP
0 - 20 OUNCES ON INNER READING
0 - 35 INCHES ON OUTER READING
30" OF SOFT HOSE
UNBREAKABLE BOX**

PRODUCT NUMBER: AC - 10389



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120 VOLT CIRCUITS

VARIABLE SPEED SWITCH

BLOWER

BLOWER WIRING

THERMAL DISC



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VARIABLE SPEED SWITCH TROUBLESHOOTING

PROBLEM	CAUSE	CURE
Blower will not come on.	Short circuit.	Tighten loose connection. Check for frayed wiring. Replace if required.
Blower runs on high only, cannot be turned off.	Wired in parallel.	Wire in series. Replace switch if necessary.
Hums.	Defective switch.	Replace switch.
Blower does not turn at low setting.	Variable speed switch requires calibration.	Turn calibration screw counter-clockwise until blower rotates on low.
	Wrong switch used, no calibration screw.	Replace switch with Wolf Steel part.
Blower noisy on low setting.	Variable speed switch requires calibration.	Adjust by turning calibration screw in appropriate direction



ISO 9002 CERTIFIED



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BLOWER TROUBLESHOOTING

PROBLEM	CAUSE	CURE
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BLOWER WILL NOT TURN	Burned out transformer circuit.	Replace blower.
-----------------------------	---------------------------------	-----------------

IMPELLER DOES NOT ROTATE FREELY	Bearings seized.	Clean & lubricate bearings.
		Replace if required.

BLOWER VIBRATES	Impeller dirty.	Clean impeller.
	Worn bearings.	Replace blower.
	Blower not tightened down.	Tighten wing nuts on blower housing.
	Blower assembly touching metal.	Install vibration pad.
	Objects and/or wire touching impeller.	Relocate wire, check for fraying, remove objects.
	Fireplace not level.	Level, using screws provided.



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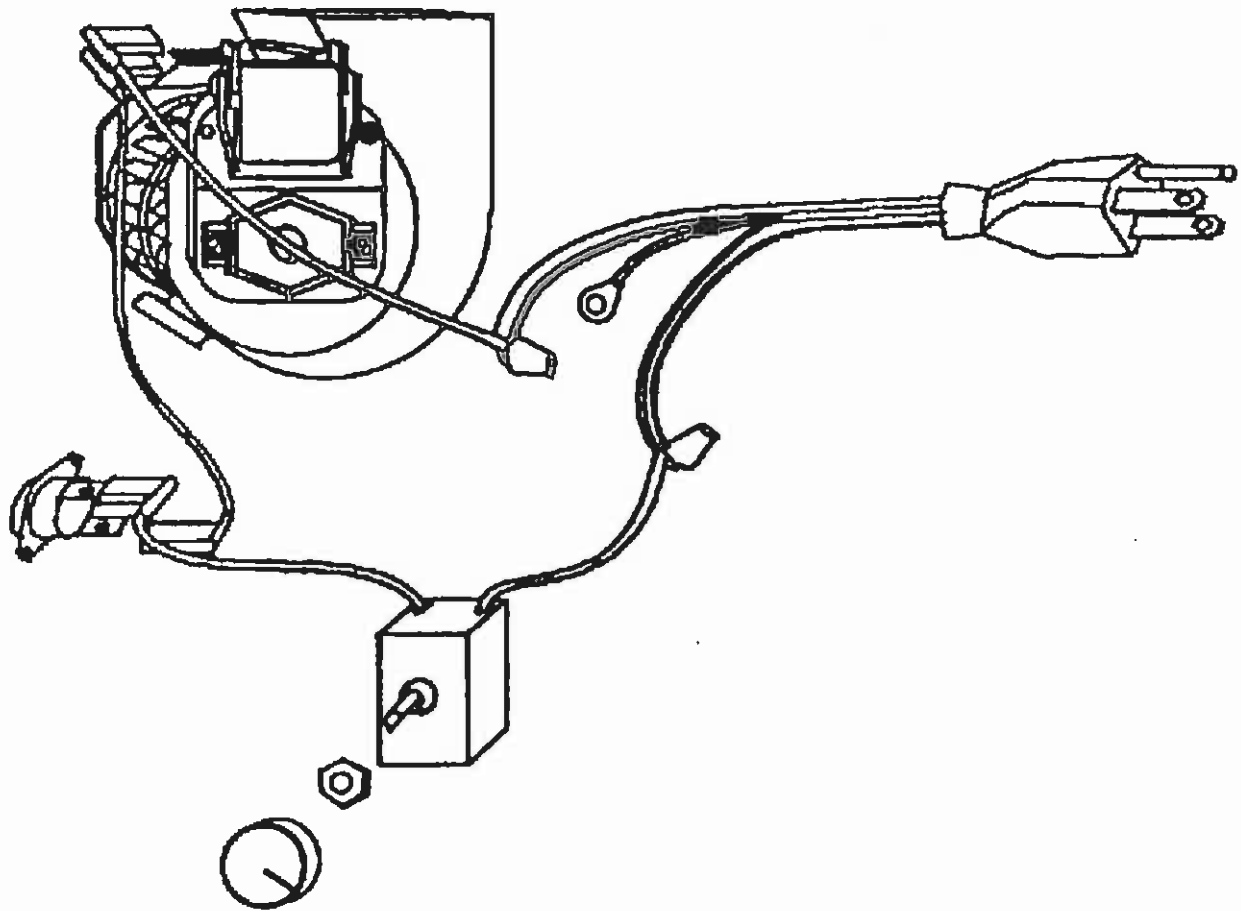
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BLOWER WIRING

(VARIABLE SPEED SWITCH & THERMODISC)



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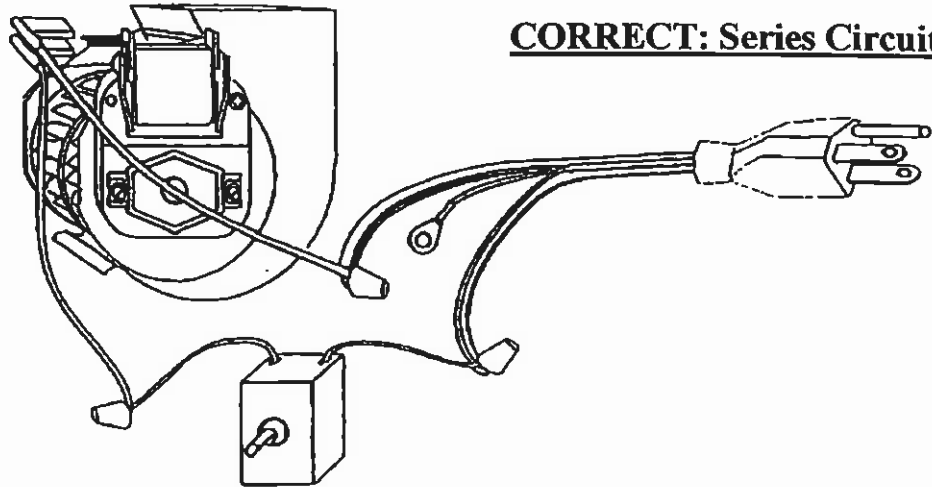
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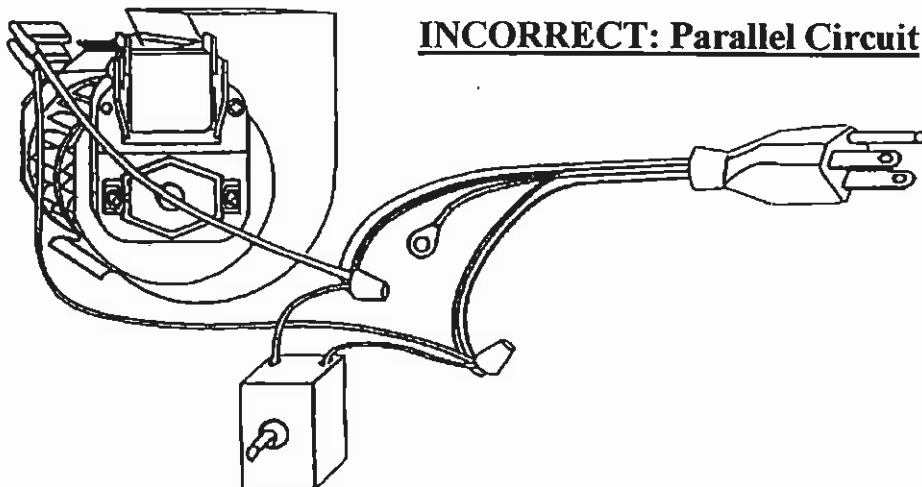
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BLOWER WIRING

(CORRECT & INCORRECT)



CORRECT: Series Circuit



INCORRECT: Parallel Circuit

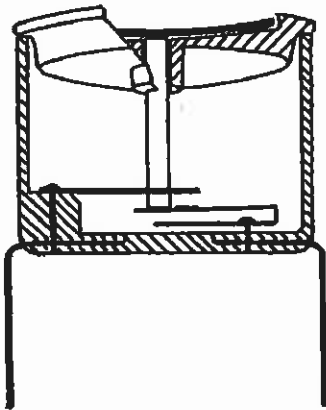
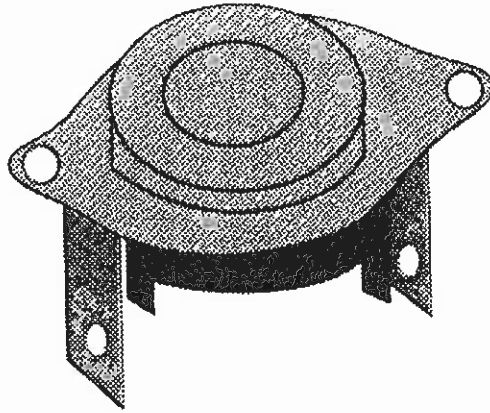


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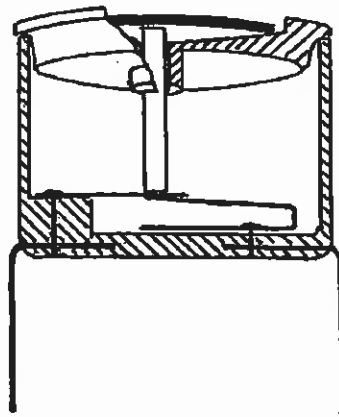
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THE THERMODISC



OPEN CIRCUIT



CLOSED CIRCUIT



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THERMODISC

TROUBLESHOOTING

PROBLEM	CAUSE	CURE
Blower will not come on when fireplace is hot and/or will not shut blower off when unit cools down.	Disc damaged during installation	Replace disc.
	Disc housing distorted	Loosen screws securing disc housing to fireplace. Tighten snugly, do not over tighten.
	Wiring frayed or cut causing a short circuit	Replace wiring.

THERMODISC TESTING

With disc installed in unit, use match or lighter to heat surface of disc. Disc should pop within 5 seconds. If disc does pop & blower does not come on, disc has a defect inside the housing. Replace the disc.

NOTE: Disc closes circuit at 120 degrees F and opens circuit at 100 degrees F



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MILLIVOLT CIRCUITS

THERMOCOUPLE / THERMOPILE

SPILL SWITCH

FLAME SWITCH

REMOTE SWITCHES

GAS VALVE

PUSH BUTTON IGNITOR



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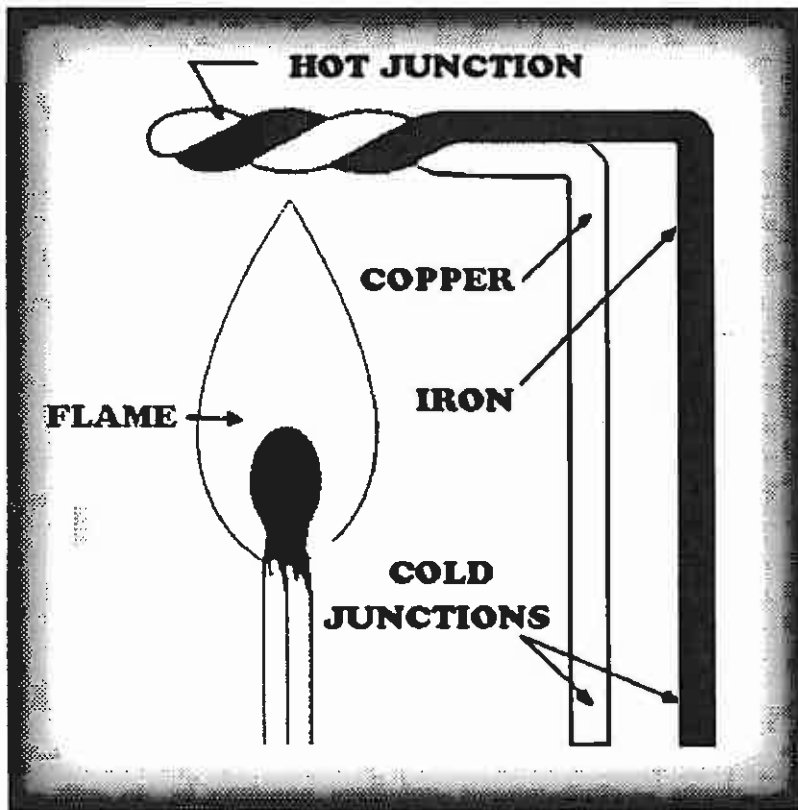


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THE THERMOPILE

The thermopile/thermocouple provides the millivolts to activate the safety valve. It also provides millivolts to activate the valve operator head. The valve operator head activates the flow of gas to the main burner.

To provide the maximum possible output, the temperature at the hot junction must be 400 degrees F higher than the temperature at the cold junction.



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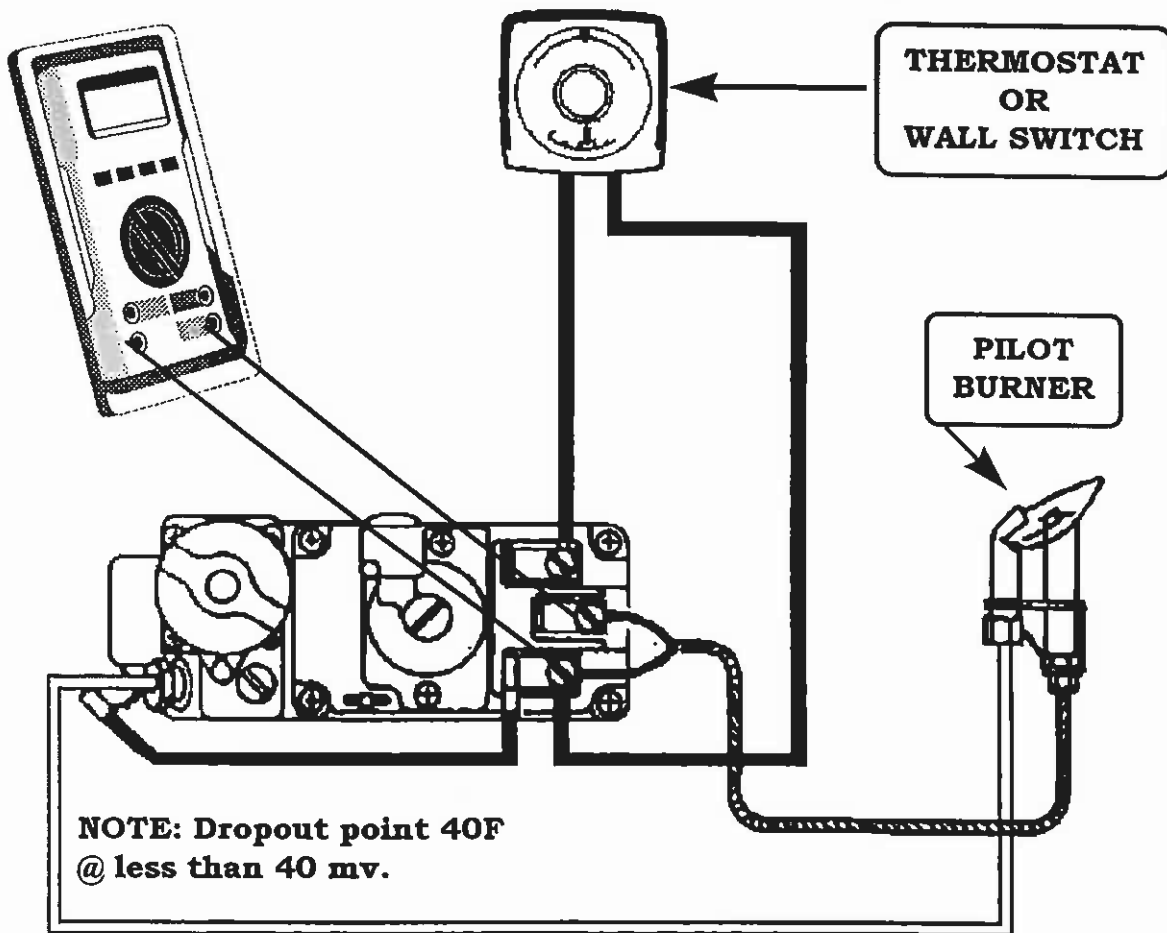
THERMOPILE VOLTAGE TEST

OPEN CIRCUIT TEST

1. Disconnect leads from terminals 1 & 2
2. Set meter to millivolts.
3. Connect meter leads to thermopile leads.
4. Reading should be 500 mv.

CLOSED CIRCUIT TEST

1. Connect leads from meter to terminals 1 & 2
2. Set meter to millivolts.
3. Turn main burner on.
4. Reading should be above 150 mv.



**SAME TEST PROCEDURE
APPLIES TO S.I.T. VALVE**



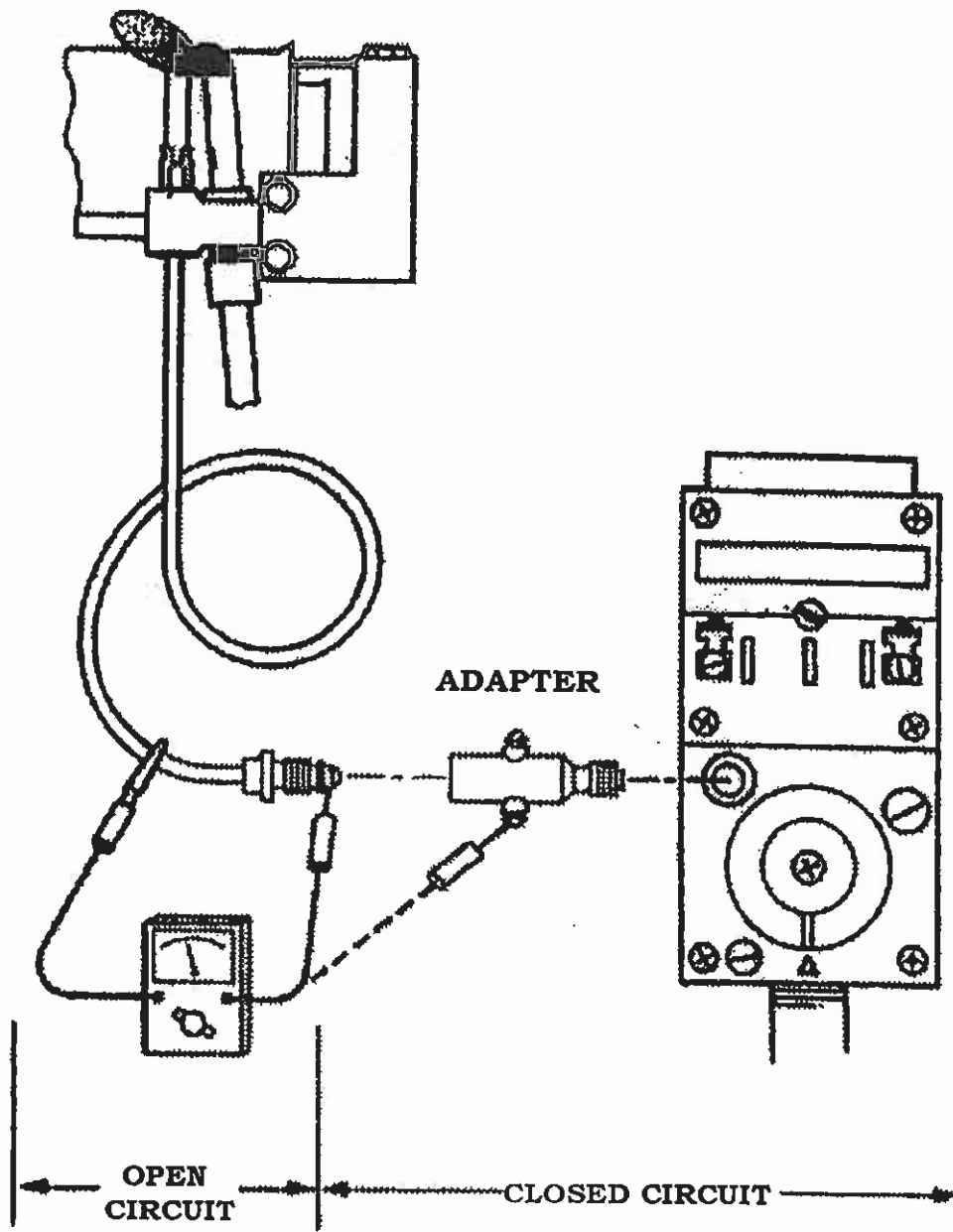
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THERMOCOUPLE VOLTAGE TEST



OPEN CIRCUIT = 20-30 mv
CLOSED CIRCUIT = 10-15 mv.



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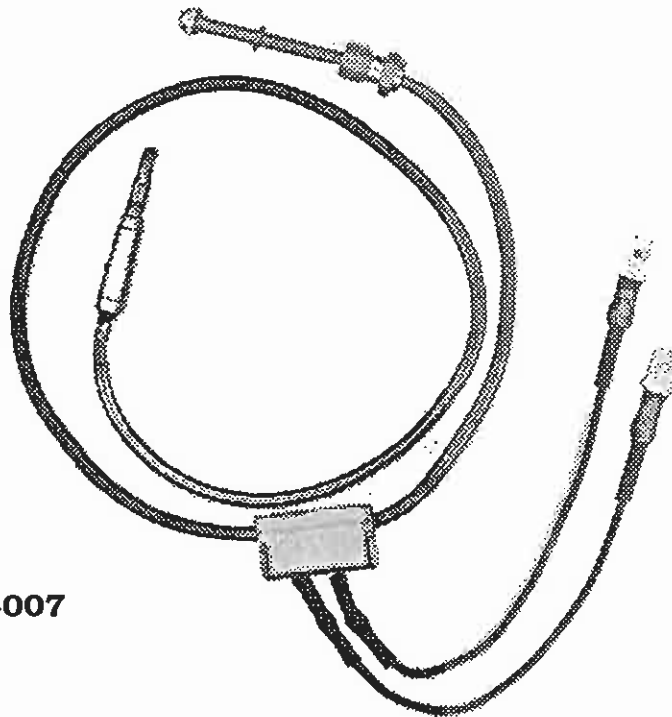
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**S.I.T. QUICK ACTING
THERMOCOUPLE
&
INTERRUPTER BLOCK
ASSEMBLY**



PART # WS-680-007

**Replaces interrupter block
on model GS-3500**



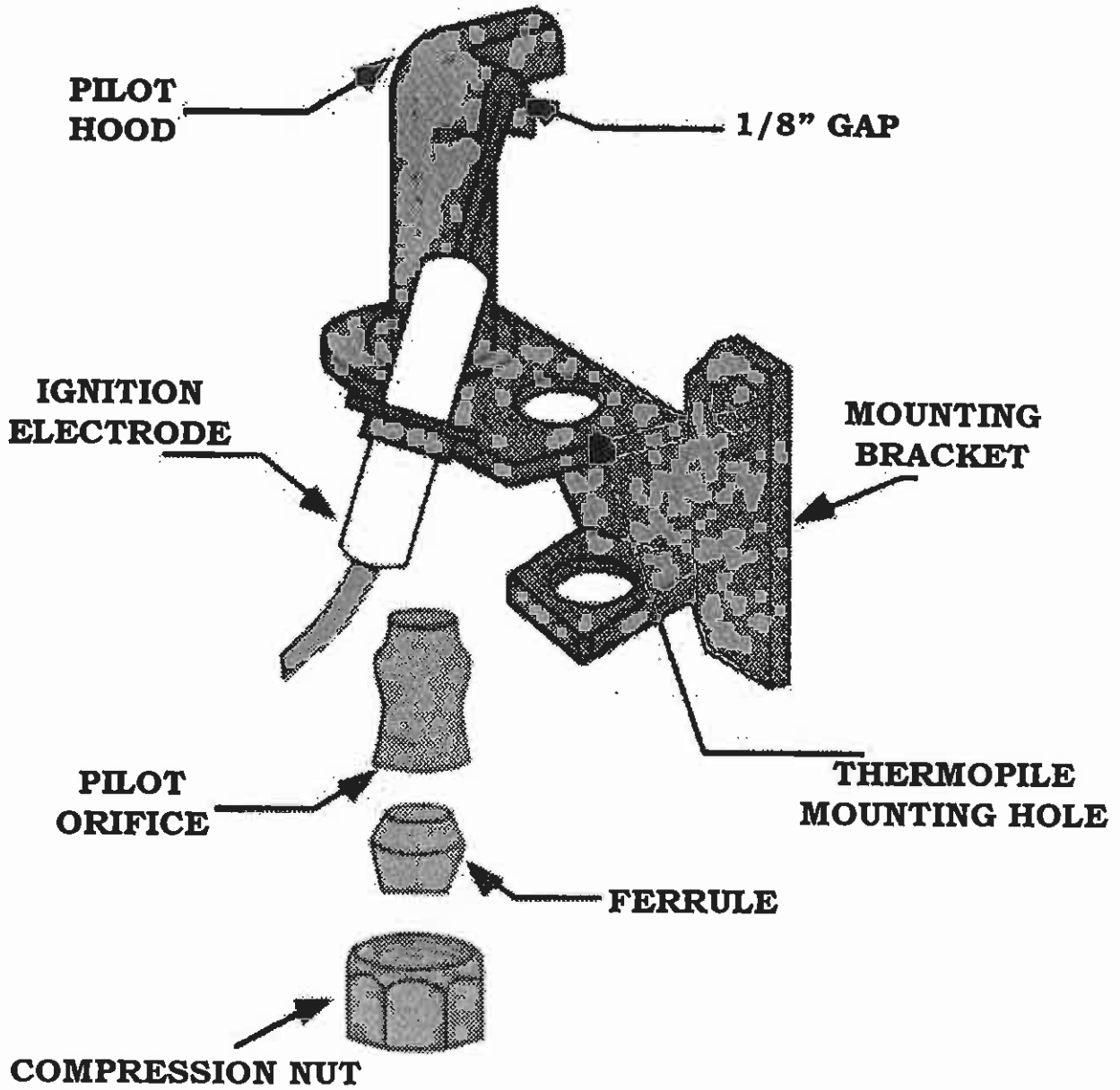
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PILOT ASSEMBLY



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S.I.T. CONTROLS

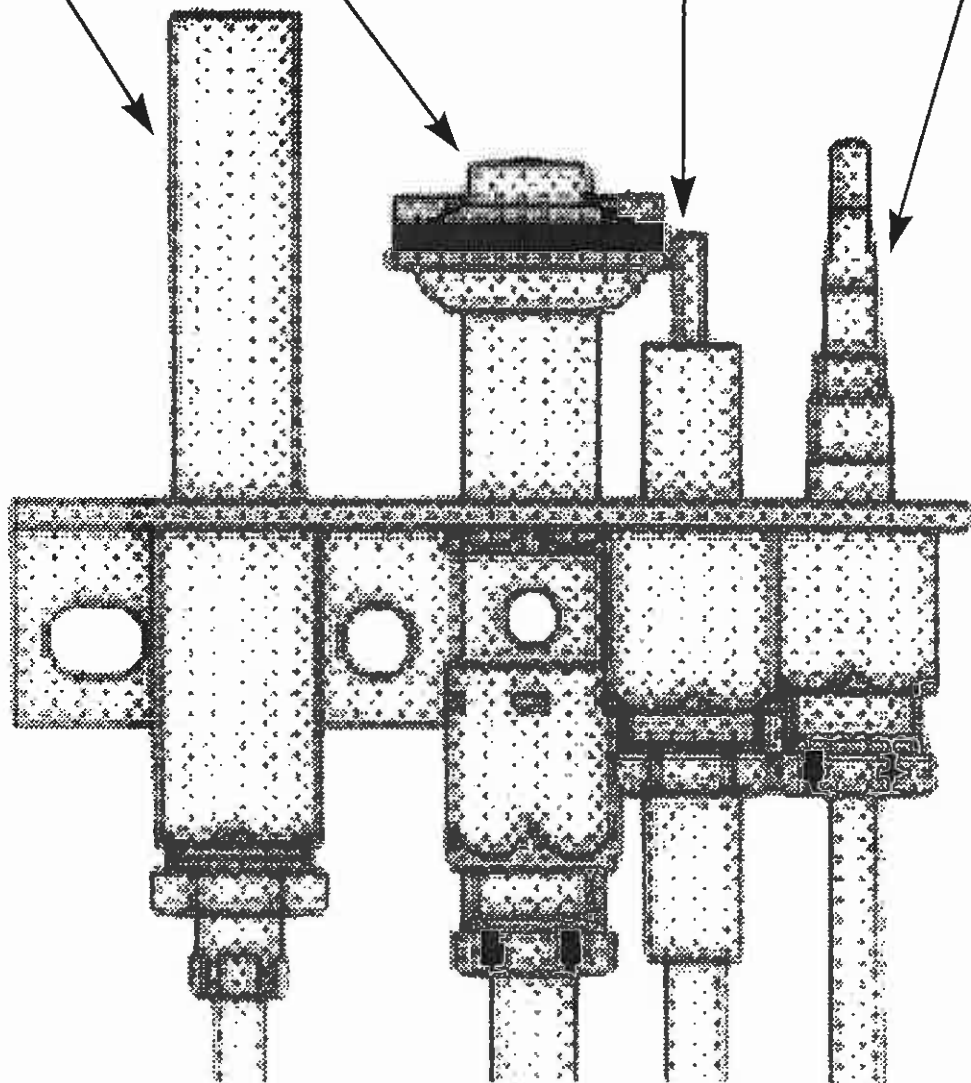
PILOT ASSEMBLY

THERMOPILE

PILOT FLAME
SPREADER

IGNITOR

QUICK ACTING
THERMOCOUPLE



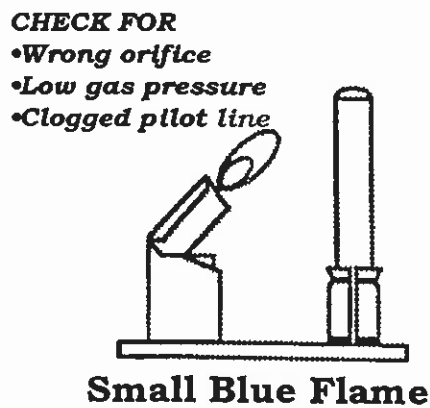
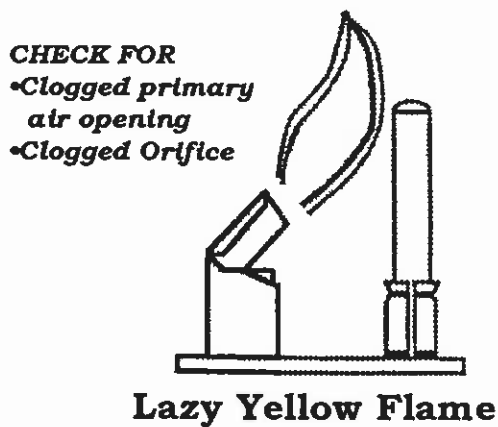
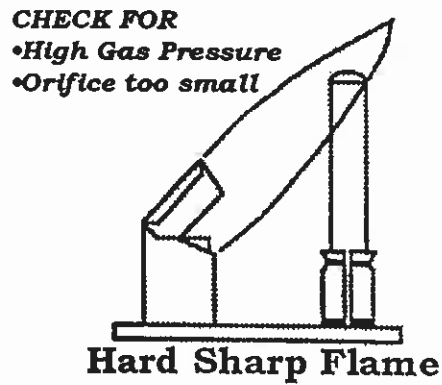
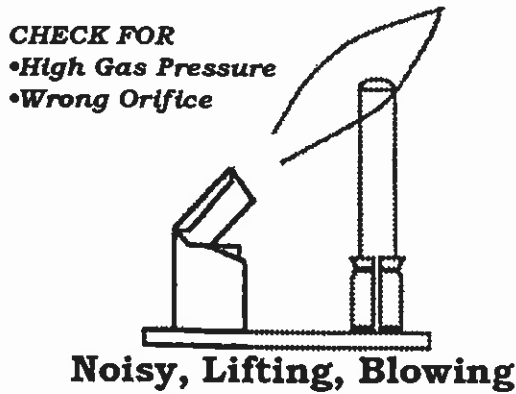
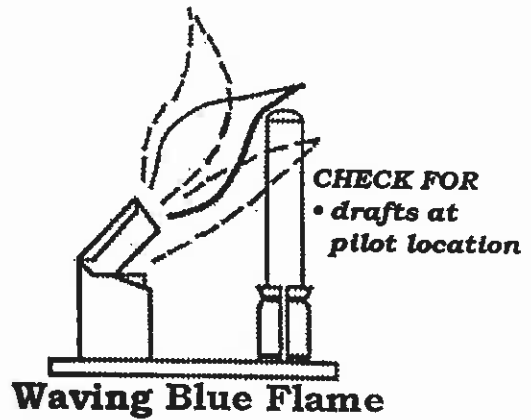
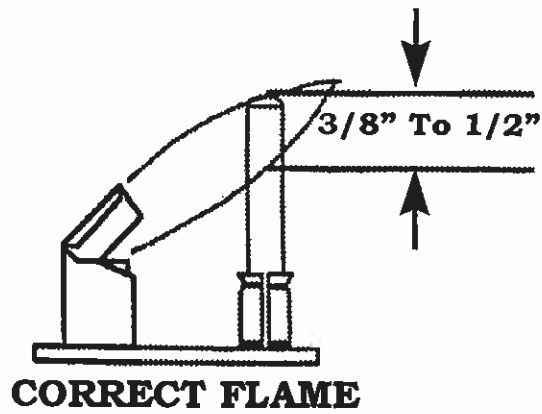
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PILOT FLAME PATTERN



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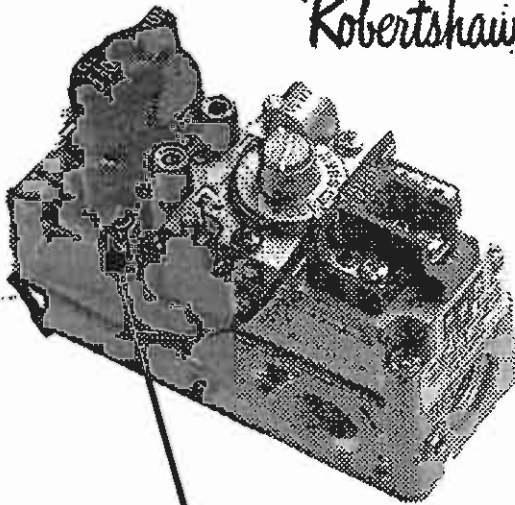
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PILOT ADJUSTMENT

Robertshaw 



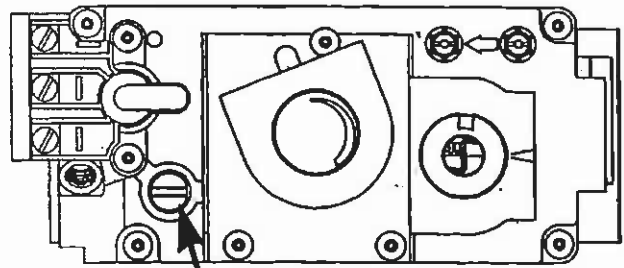
**PILOT ADJUSTMENT
PROTECTIVE CAP SCREW**

- 1/ Remove protective cap screw.
- 2/ Turn the pilot adjustment screw;
 - A) Clockwise reduces the pilot flame.
 - B/ Counter clockwise increases the pilot flame.



SIT 820 NOVA

- Turn the pilot adjustment screw;
- A) Clockwise reduces the pilot flame.
 - B/ Counter clockwise increases the pilot flame.



PILOT ADJUSTMENT SCREW



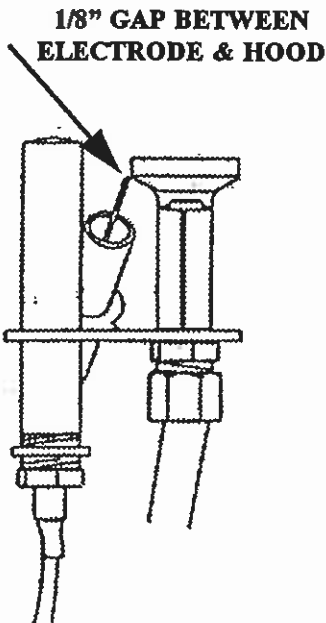
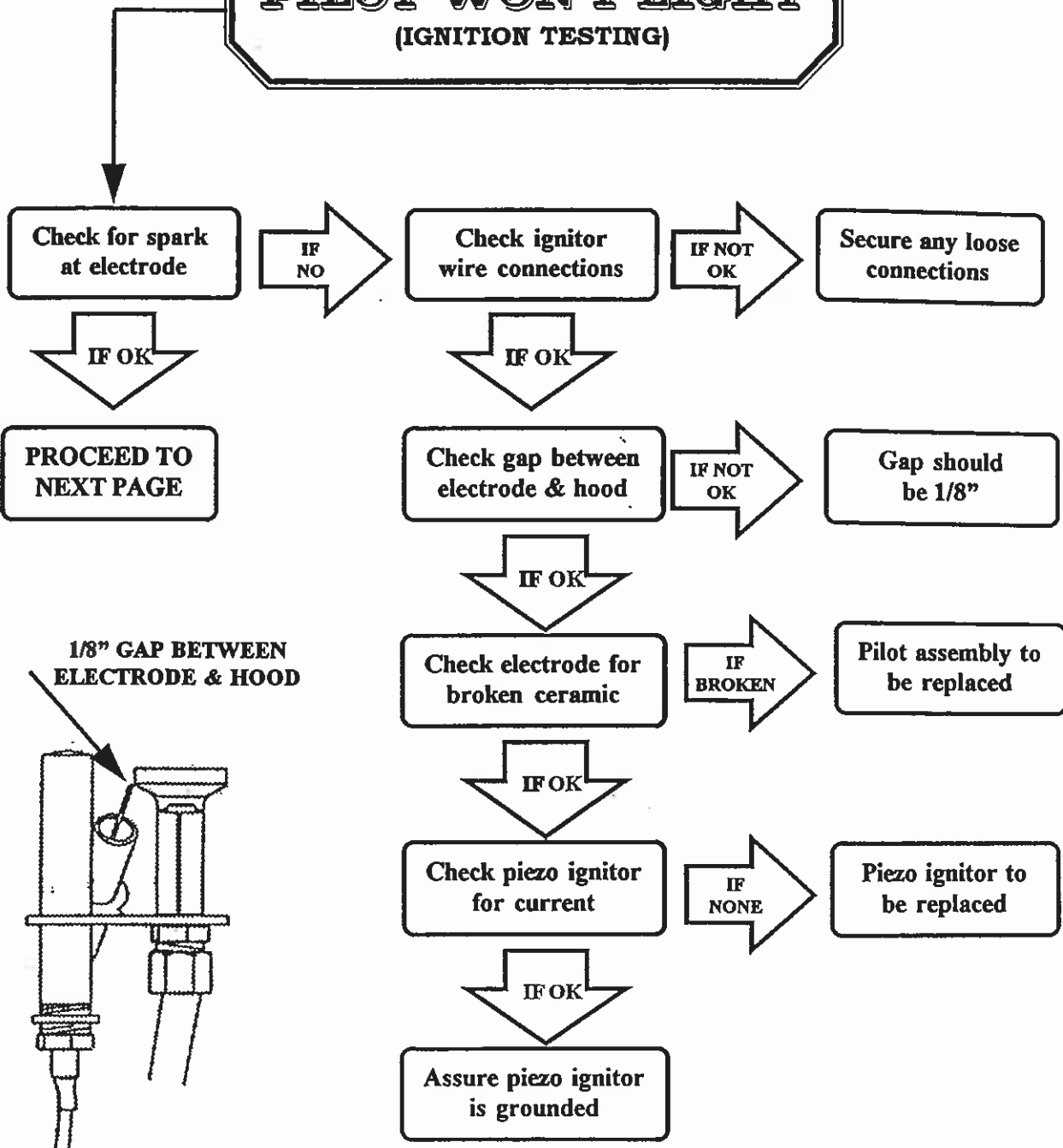
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PILOT WON'T LIGHT (IGNITION TESTING)



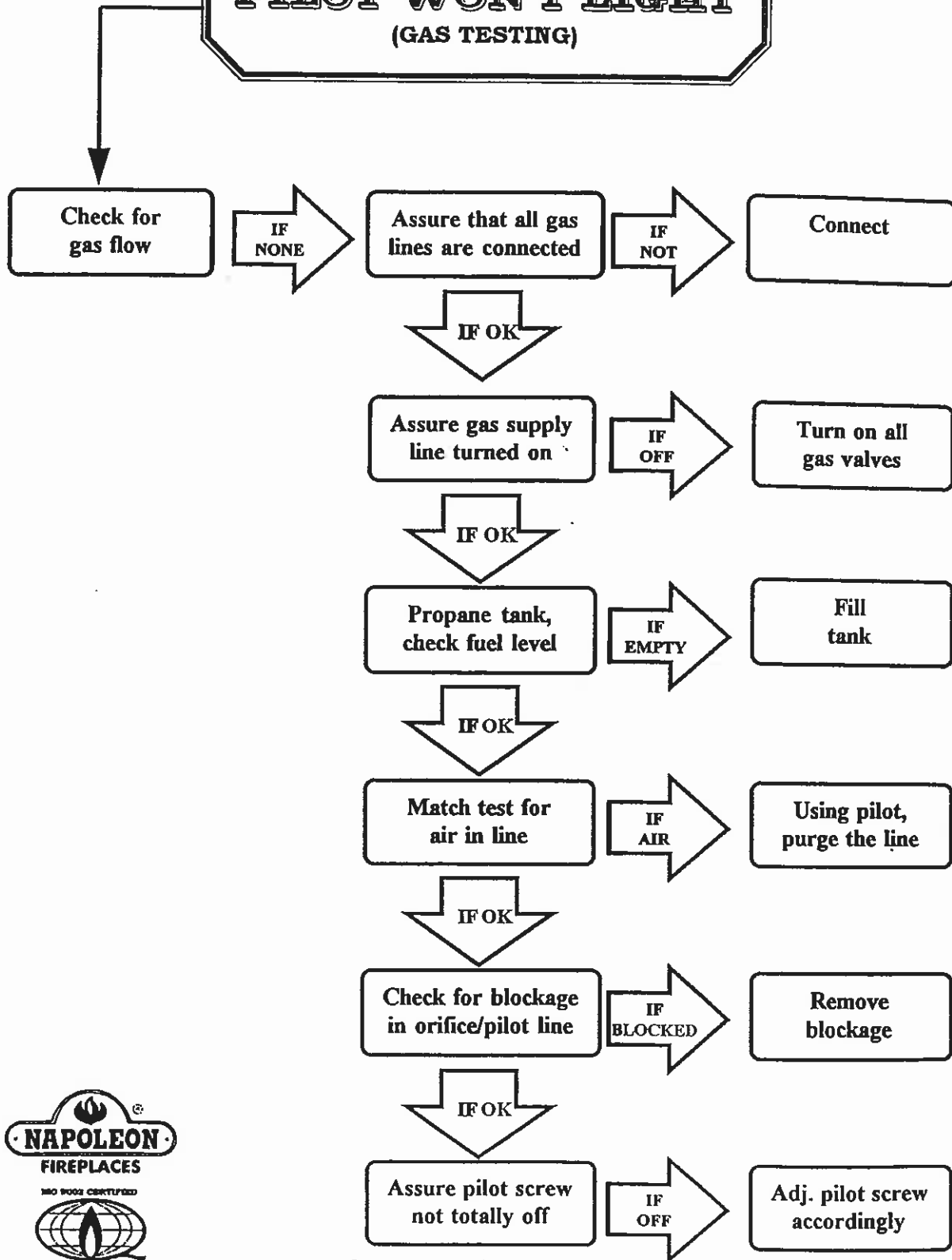
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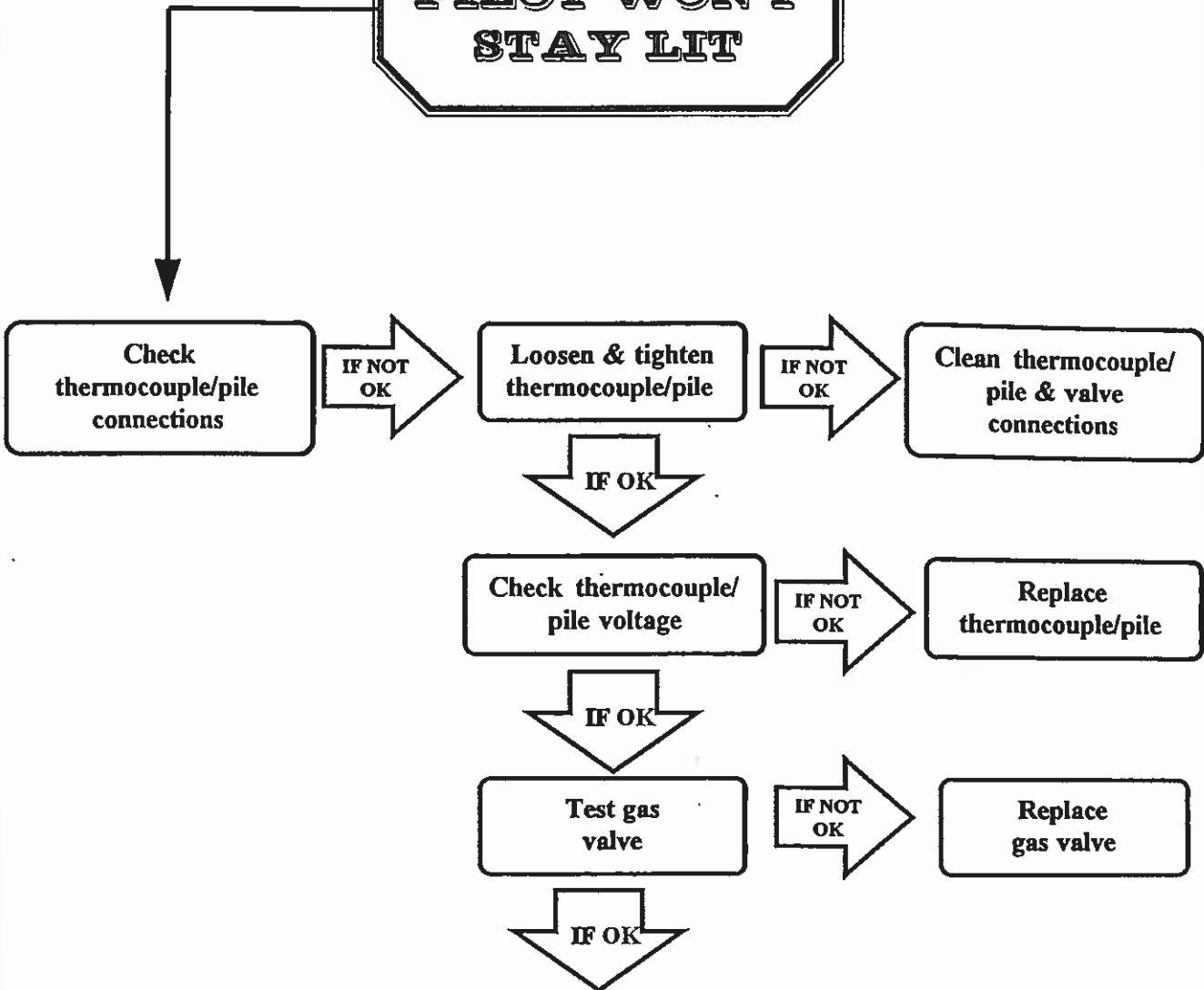
PILOT WON'T LIGHT (GAS TESTING)



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PILOT WON'T STAY LIT

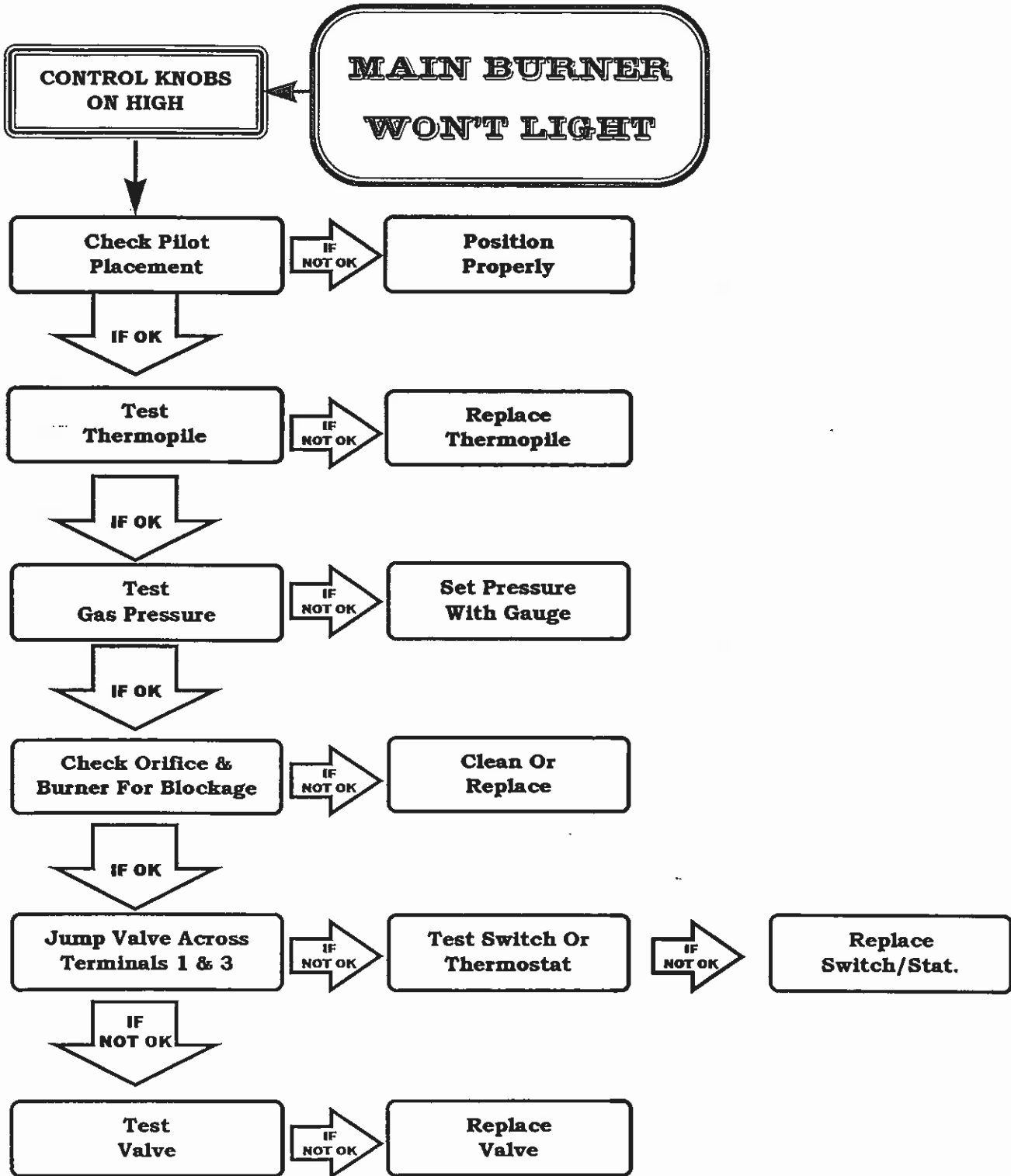


**FOR UNITS WITH SPILL SWITCHES,
PLEASE SEE "SPILL SWITCH"**



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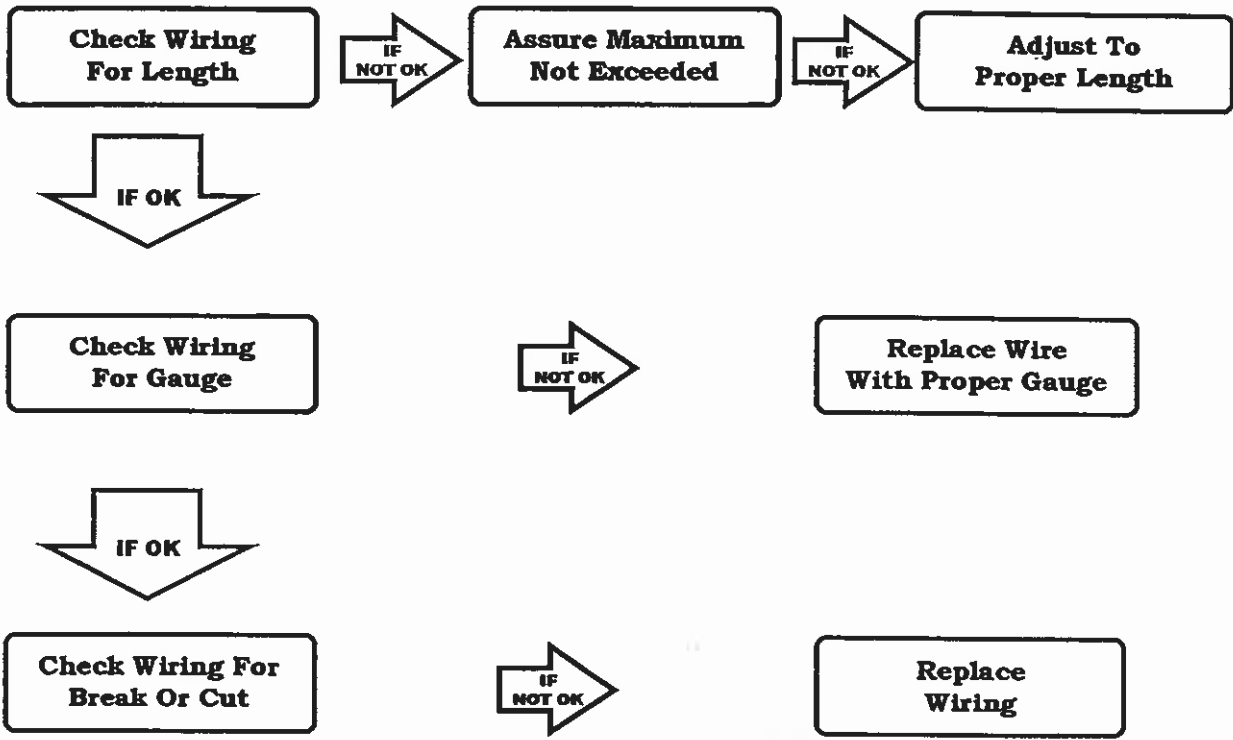
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**MAIN BURNER
SHUTS DOWN
(WIRING)
Thermostat / Switch**



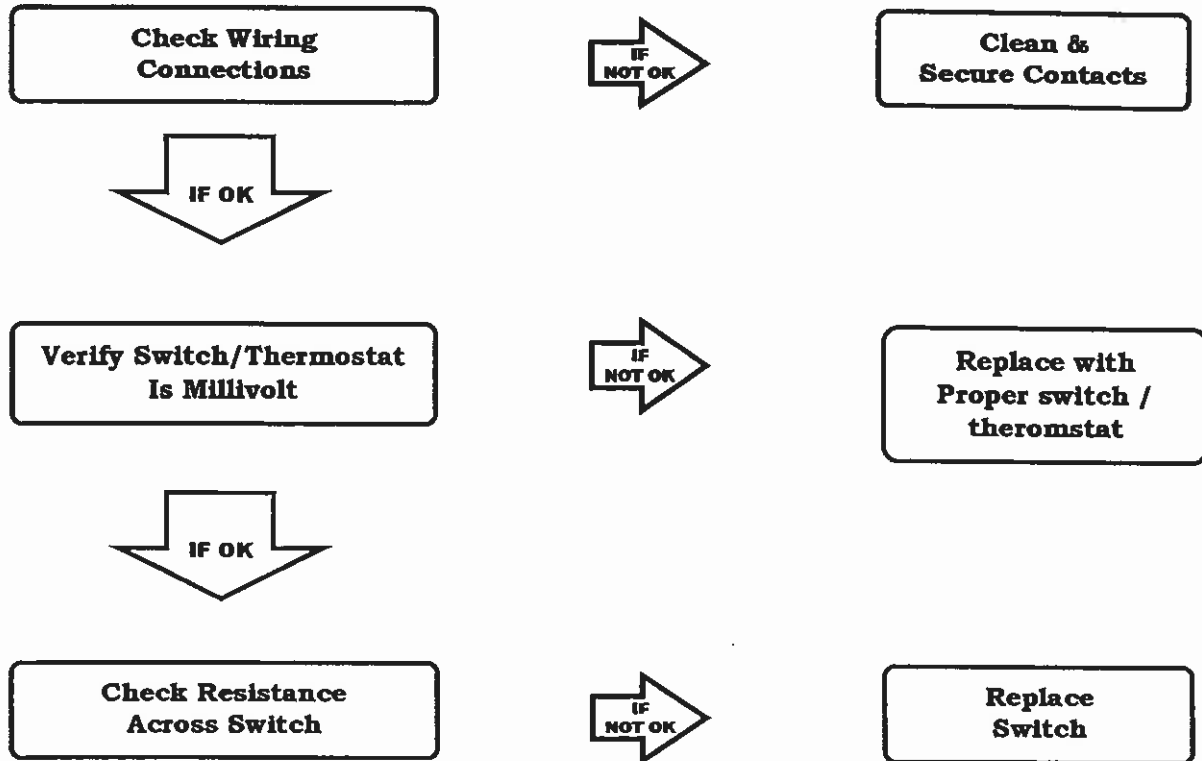
<u>WIRE SIZE</u>	<u>MAXIMUM LENGTH</u>
14 GA.	50 FT.
16 GA.	32 FT.
18 GA.	20 FT.



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**MAIN BURNER
SHUTS DOWN
Thermostat / Switch**



“NOTE”

IF WALL SWITCH / THERMOSTAT IS BEING BY-PASSED, YOU CANNOT COMPLETE THE CIRCUIT BY HOLDING THE WIRE LEADS TOGETHER. YOU MUST JUMP THE TERMINALS ON THE VALVE.



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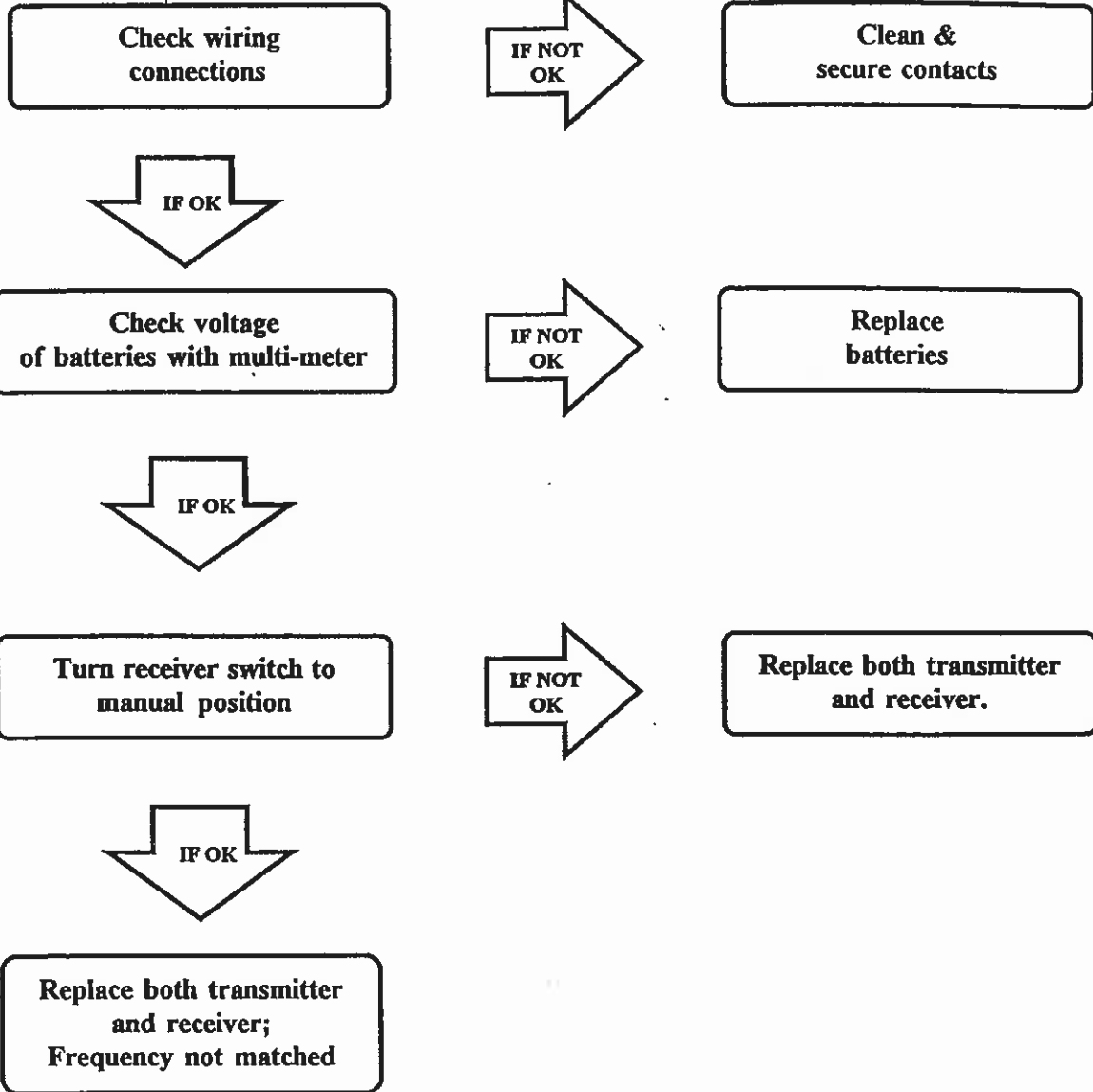


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**MAIN BURNER
SHUTS DOWN
(REMOTE CONTROL)**



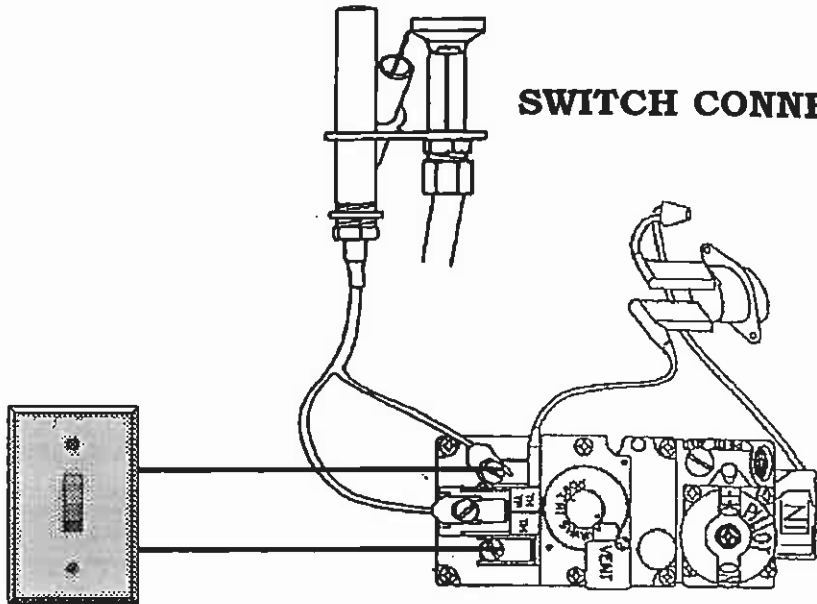
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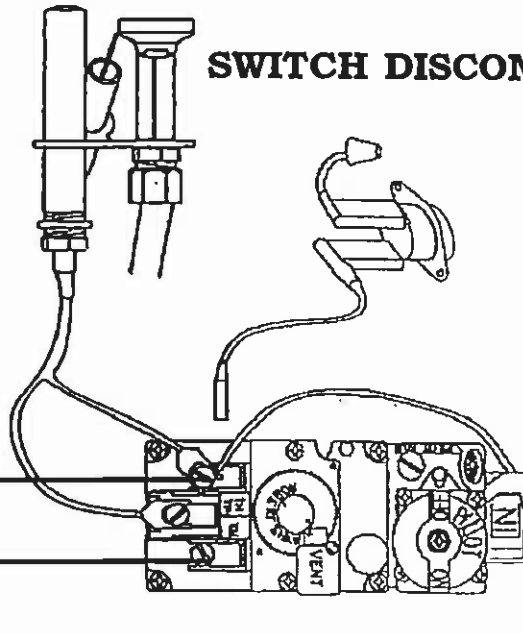
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SPILL SWITCH

SWITCH CONNECTED



SWITCH DISCONNECTED



**WALL SWITCH OR THERMOSTAT
(HAND HELD REMOTE OPTION)**



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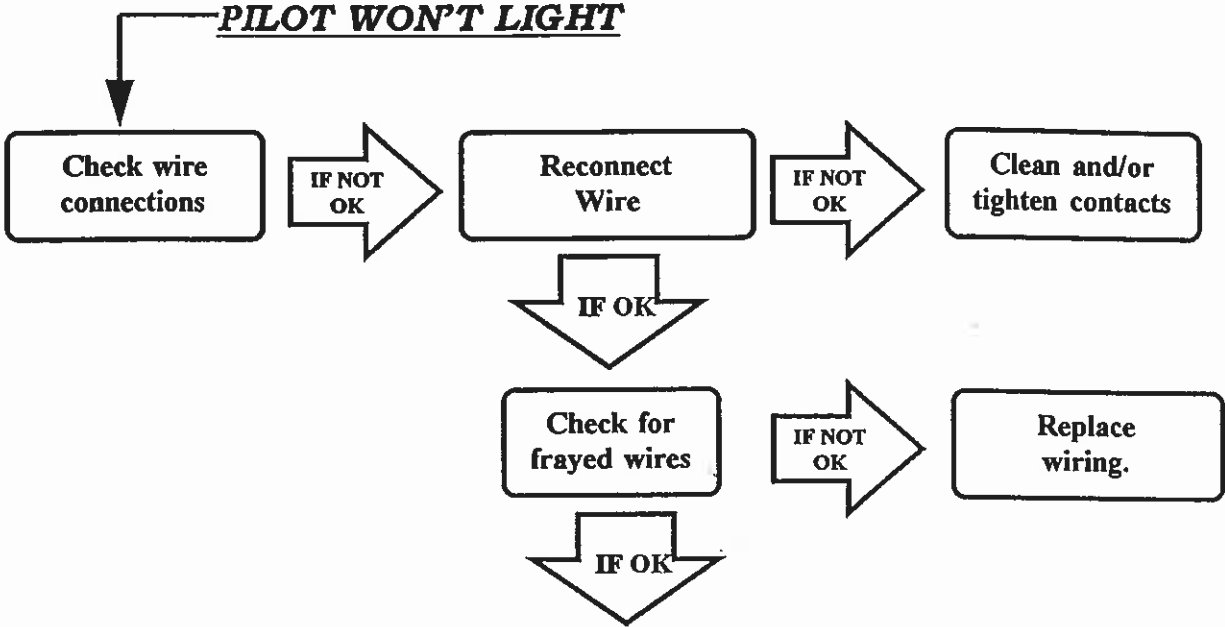


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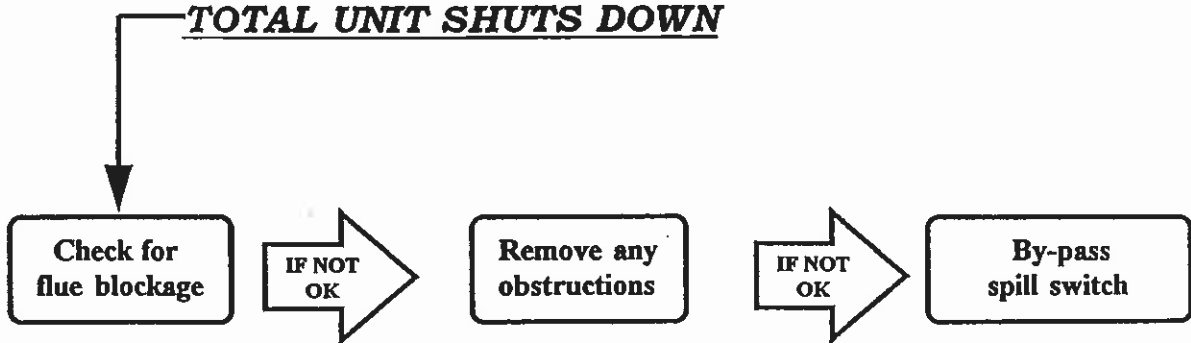
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SPILL SWITCH

PILOT WON'T LIGHT



TOTAL UNIT SHUTS DOWN



IF UNIT OPERATES WITH SPILL SWITCH BY-PASSED
REPLACE DEFECTIVE SPILL SWITCH.



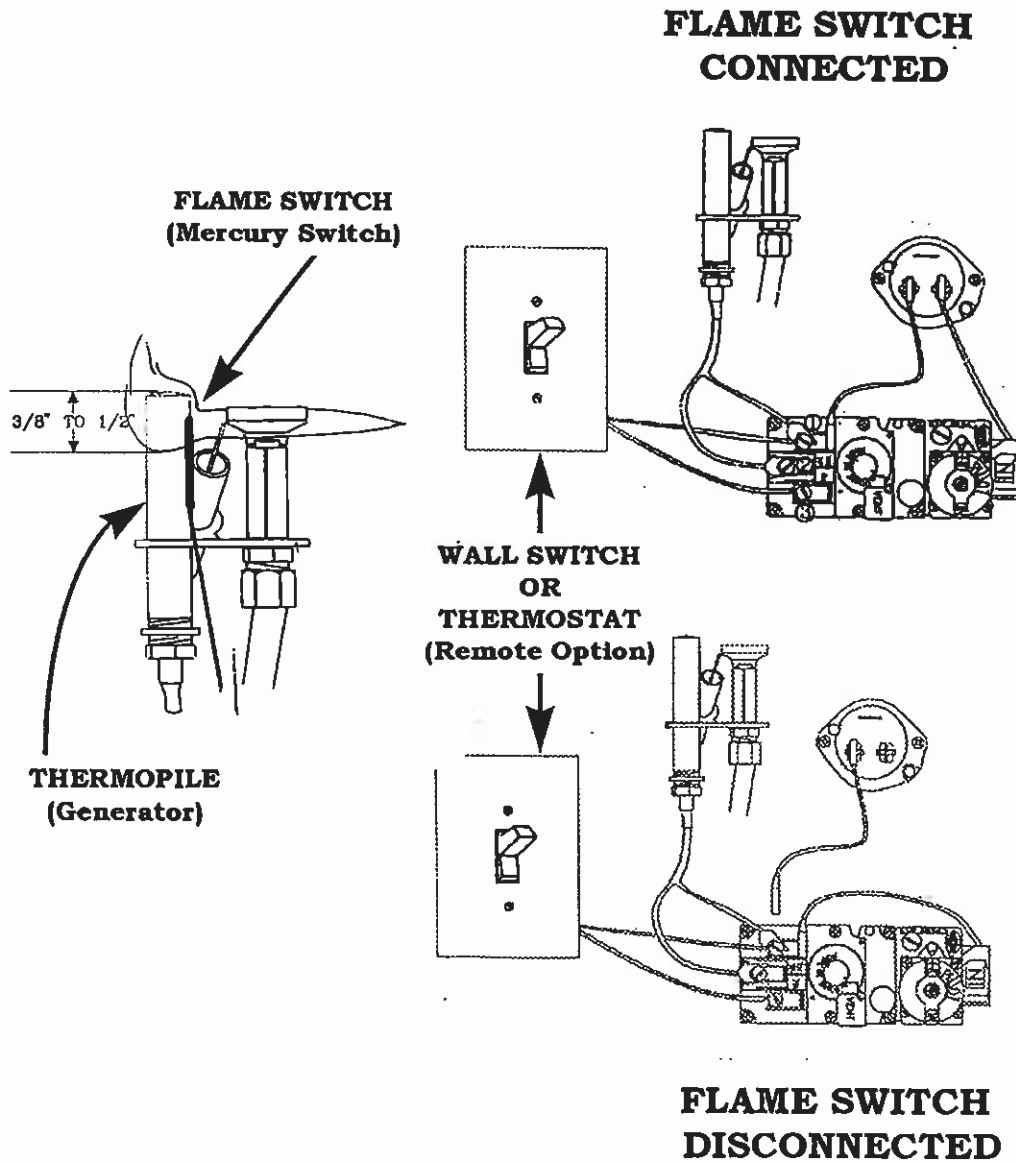
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SAFETY FLAME SWITCH

(OLDER DIRECT VENT MODELS)



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FLAME SWITCH / MERCURY SWITCH TROUBLESHOOTING

PROBLEM	CAUSE	CURE
FLAME SWITCH BULB NOT HOT ENOUGH (Pilot will not stay lit)	Bulb not located correctly	Locate bulb. Top 2/3 engulfed in flame.
	Pilot flame not large enough	Adjust pilot flame
PILOT FLAME LIFTS OFF BULB	Poor seal on door, relief doors or vent.	Insure tight seals.
	Improper venting installation.	Install venting as per installation instructions.
	Wind disrupting flame.	Install windsheild kit.
CHIRPING NOISE FROM SWITCH	Mercury in bulb is boiling.	Locate bulb correctly OR Adjust pilot flame.
DEFECTIVE FLAME SWITCH	Tube / bulb crushed or broken and/or poor switch contact.	Replace switch.

CAUTION: *Never* leave unit operating with flame switch by-passed.



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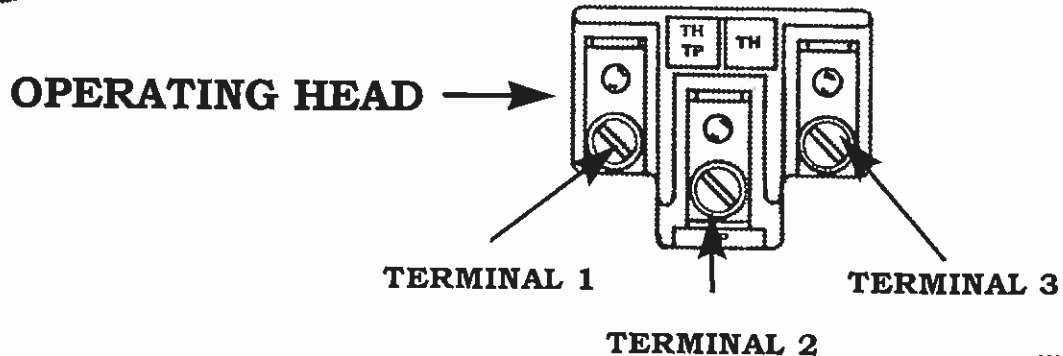
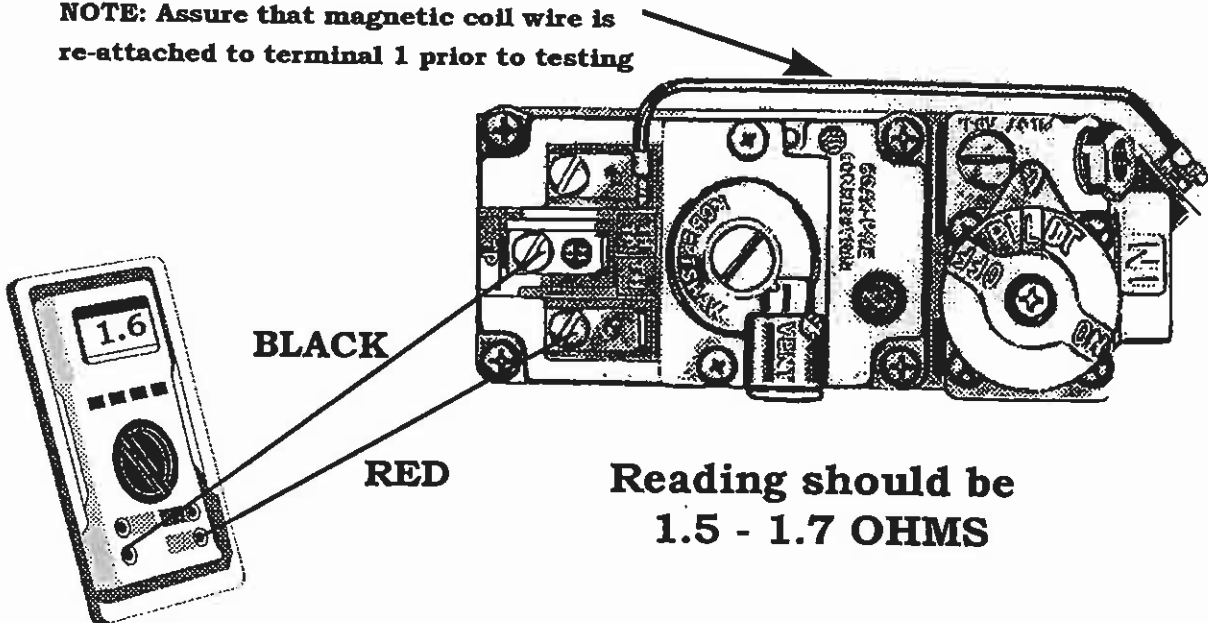


VALVE CHECK

(Resistance Of Millivolt Operator Coil)

1. Remove ALL WIRES from the valve operating head.
2. Use ohmmeter or multimeter set on OHMS setting.
3. Place black or ground lead from meter to "TP"
4. Place red lead from the meter to "TH"

NOTE: Assure that magnetic coil wire is re-attached to terminal 1 prior to testing



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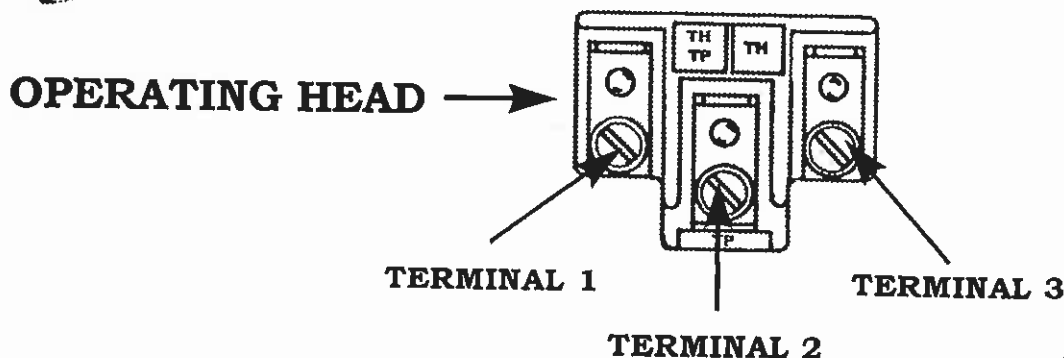
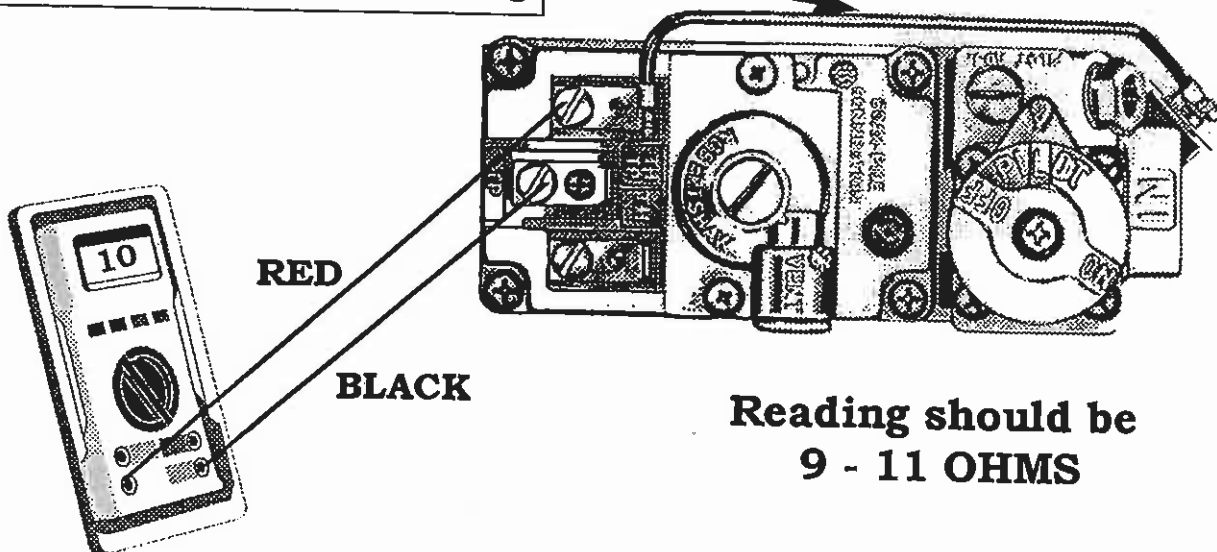


VALVE CHECK

(Resistance Of Millivolt MAGNET Coil)

1. Remove ALL WIRES from the valve operating head.
2. Use ohmmeter or multimeter set on OHMS setting.
3. Place black or ground lead from meter to "TP"
4. Place red lead from the meter to "TP / TH"

NOTE: Assure that magnetic coil wire is re-attached to terminal 1 prior to testing



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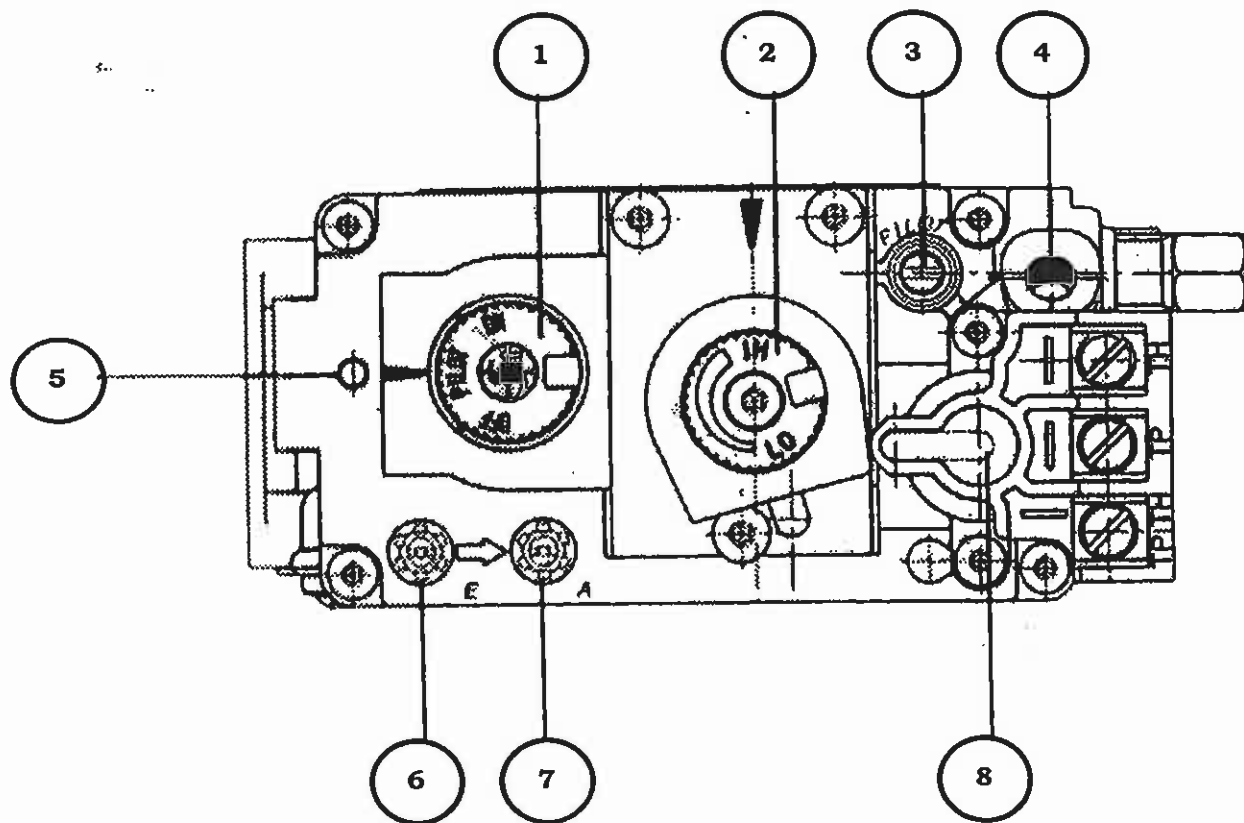
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WORLD RECOGNITION FOR QUALITY

SIT 820 NOVA

1. Gas cock knob
2. Manual HI-LO adjustment or pressure regulator adjustment.
3. Pilot adjustment.
4. Thermocouple connection.
5. Mounting for piezo & bracket.
6. Inlet pressure test point.
7. Outlet pressure test point.
8. Main operator.
9. Pilot outlet.
10. Main gas outlet.



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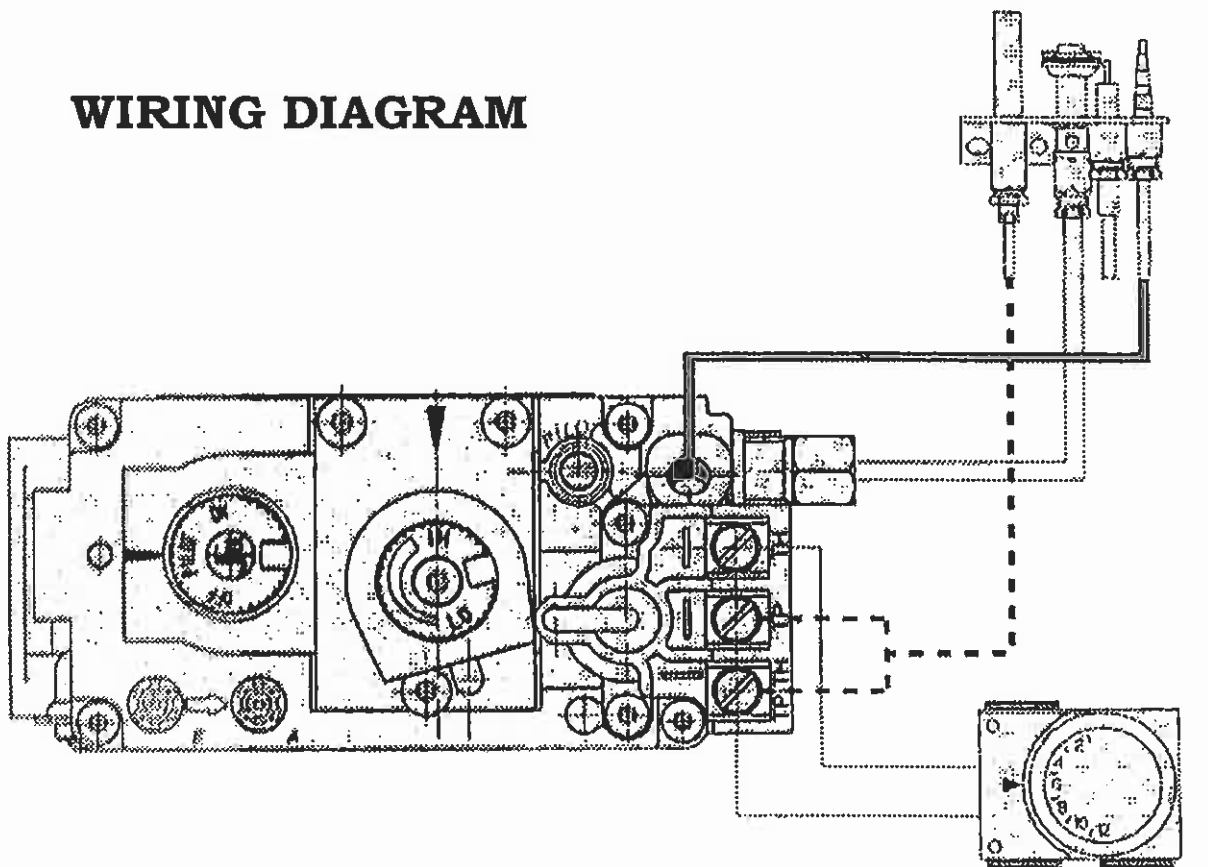


S.I.T. CONTROLS



SIT 820 NOVA

WIRING DIAGRAM



ROOM THERMOSTAT



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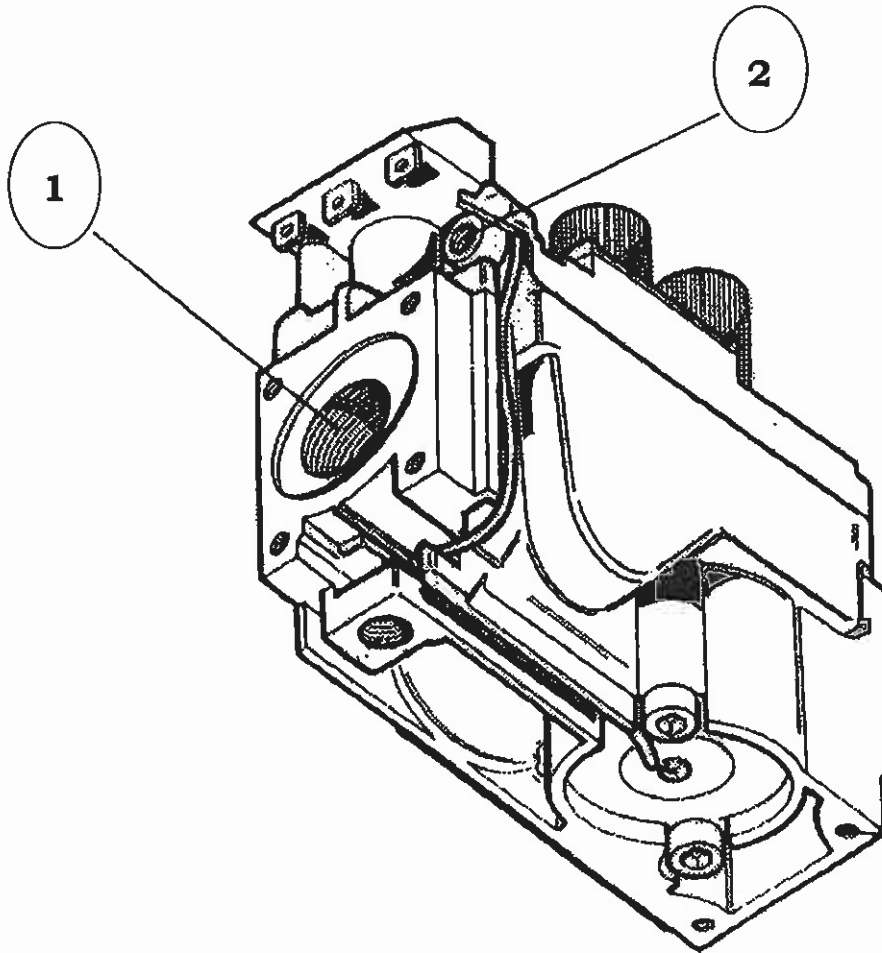
S.I.T. CONTROLS



SIT 820 NOVA

1. MAIN GAS OUTLET

2. PILOT OUTLET



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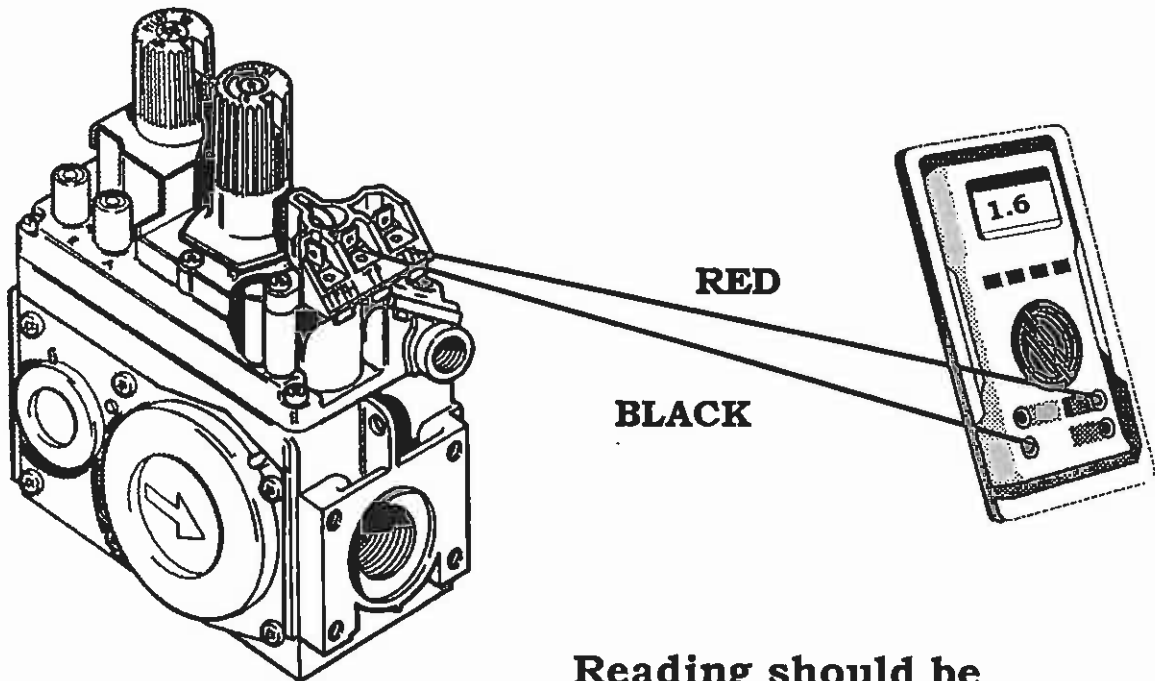
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S.I.T. CONTROLS

VALVE CHECK

(RESISTANCE OF MILLIVOLT OPERATOR COIL)

1. Remove ALL WIRES from the valve operating head.
2. Use ohmmeter or multimeter set on OHMS setting.
3. Place black or ground lead from meter to "TP"
4. Place red lead from the meter to "TH"



Reading should be
1.6 OHMS



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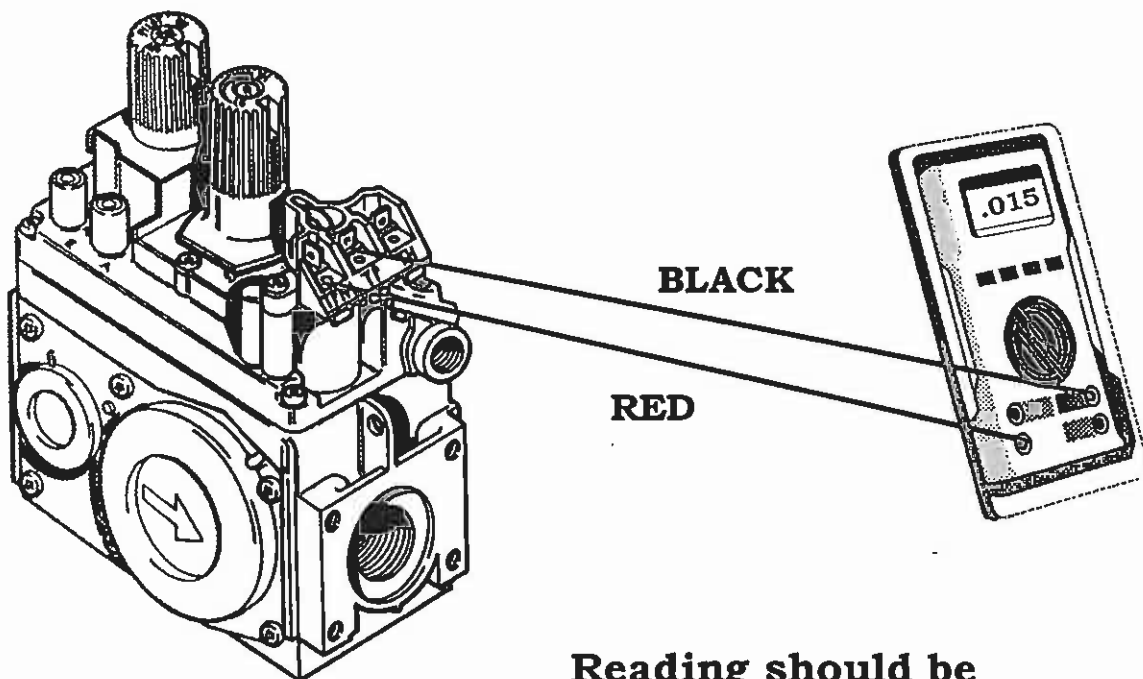


S.I.T. CONTROLS

VALVE CHECK

(RESISTANCE OF MILLIVOLT MAGNET COIL)

1. Remove ALL WIRES from the valve operating head.
2. Use ohmmeter or multimeter set on OHMS setting.
3. Place black or ground lead from meter to "TP"
4. Place red lead from the meter to "TH/TP"



Reading should be
.015 milliohms



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GAS VALVE - SIT
TROUBLESHOOTING - SELF MODULATING
MODELS 3500 & 3700

PROBLEM

SAFETY SWITCH ACTIVATED DUE TO GAS VALVE BEING ACCIDENTLY SHUT OFF WHILE ATTEMPTING TO TURN DOWN FLAME !

SOLUTION

DEPRESS KNOB. PUSHING THE KNOB IN ESTABLISHES A LOCK WHICH WILL NOT ALLOW THE VALVE TO ACCIDENTLY BE TURNED BEYOND THE PILOT SETTING.

PROBLEM

SAFETY LOCKING PIN BROKEN DUE TO VALVE KNOB BEING FORCED DURING SAFETY LOCK-OUT.

SOLUTION

REPLACE VALVE, THERE IS NOT A FIELD FIX TO THIS PROBLEM.

PROBLEM

ERRATIC MODULATING VALVE OPERATION DUE TO LOCATION OF UNIT.

SOLUTION

**TEMPERATURES AT BULB LOCATION ARE TOO COOL.
RELOCATE THERMOSTATIC BULB TO HIGHER LOCATION.**



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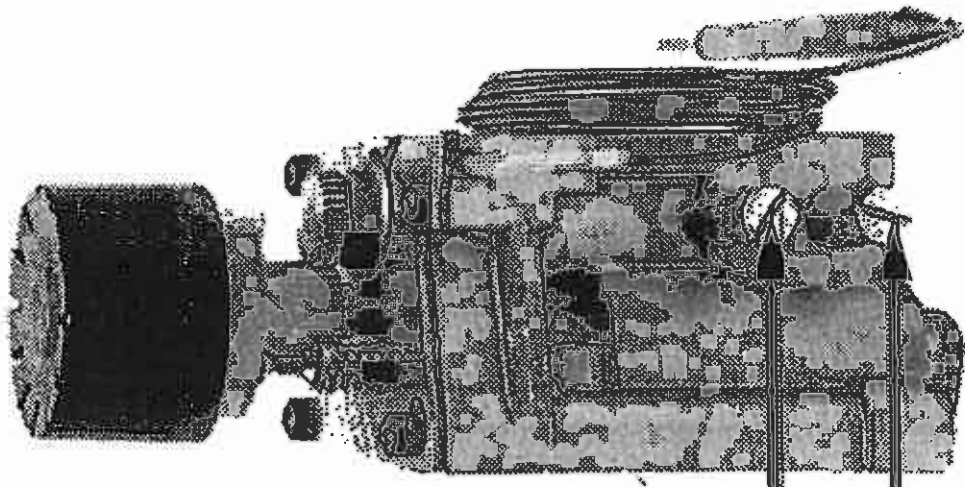
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SIT MODEL # 630 (SELF MODULATING)

PILOT ADJUSTMENT
SCREW



CONTROL KNOB

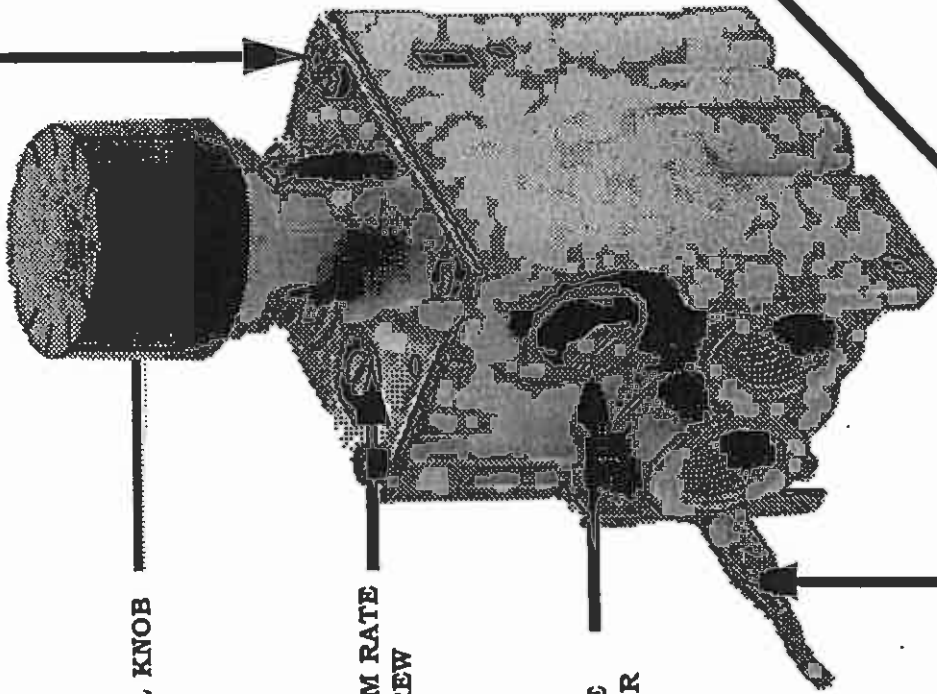
MINIMUM RATE
SCREW

PRESSURE
REGULATOR

INLET
PRESSURE
TEST POINT

OUTLET
PRESSURE
TEST POINT

TEMPERATURE
SENSING BULB



COMBUSTION AND VENTING

BURNERS

GAS PRESSURE

ORIFICES

VENTING PROBLEMS

VENTING APPLICATIONS



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COMBUSTION / BURNERS

TROUBLESHOOTING

PROBLEM	CAUSE	CURE
----------------	--------------	-------------

CARBON DEPOSITS	Logs positioned incorrectly	Position logs according to owners' manual.
	Improper air shutter opening.	Increase air shutter opening.
	Glass door not sealing properly.	Inspect and replace defective gasket & assure that door is installed according to owners' manual.

OVERFIRED FIREPLACE (Flame too large)	Wrong orifice	Replace with correct orifice size.
	Manifold pressure too high.	Adjust regulator pressure. (3.5" - Natural) (10" - Propane)

NOISY PILOT BURNER	Pilot gas pressure is too high.	Adjust pilot flame pressure.
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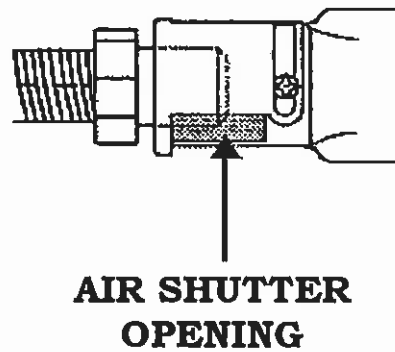
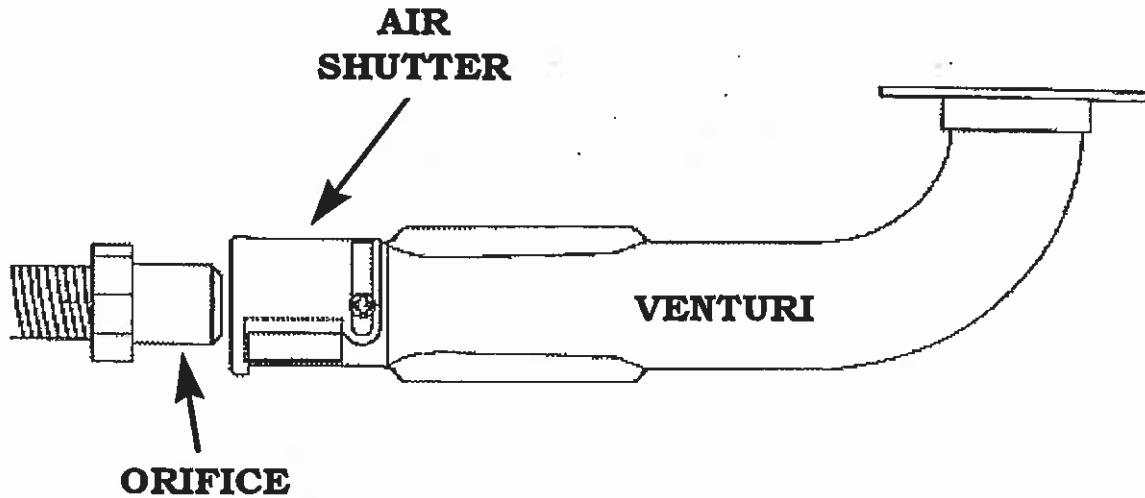
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VENTURI ADJUSTMENT



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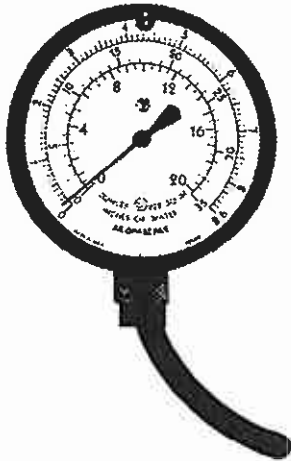
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PRESSURE TEST

NATURAL GAS = 3.5" W.C.
PROPANE = 10" W.C.



Test inlet / outlet pressure by turning screw counter-clockwise 2 or 3 turns and then place gauge tubing over test port.

INLET

OUTLET

To adjust, remove cap screw of pressure regulator, insert flat blade screwdriver, turn clockwise to increase, turn counter-clockwise to decrease.

WARNING: After taking pressure readings, be sure to turn screws clockwise firmly to reseal. Do not over-torque. Use an appropriate screwdriver with .150" X .030" blade.



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S.I.T. CONTROLS

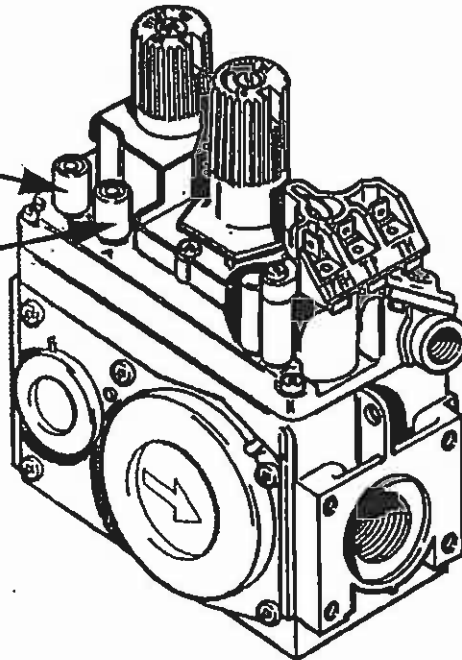
PRESSURE TEST



MANOMETER / PRESSURE GAUGE

INLET PRESSURE TEST POINT

OUTLET PRESSURE TEST POINT



1. Test inlet pressure by turning screw counter clockwise 2 or 3 turns & then place gauge tubing over test point.
2. Test outlet pressure by turning screw counter clockwise 2 or 3 turns & then place gauge tubing over test point.

NATURAL GAS = 3.5" W.C.
LP GAS = 10" W.C.

WARNING: After taking pressure readings, be sure to turn screws clockwise firmly to reseal. **DO NOT** over torque. Use an appropriate screwdriver with .150" X .030" blade.



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WORLD RECOGNITION FOR QUALITY

GAS PIPING

(A FEW REMINDERS)

- 1/ Always refer to supply pipe sizing chart in your gas code book.**
- 2/ You should always compensate to the next larger size when you have a borderline situation; especially on propane units due to pressure fluctuations.**
- 3/ In your piping calculations always assure that you have taken into consideration all appliances**
- 4/ There are some combination hot water/ central heating systems that have caused gas flow problems; a sudden drop in flow can occur during initial start-up of these appliances.**
- 5/ When piping for Propane; and Natural Gas may be available in the future, pipe size for Natural Gas.**



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ORIFICE CAPACITY TABLE

APPROXIMATE ORIFICE CAPACITY IN BTU PER HOUR

DRILL SIZE	NATURAL GAS @ 3.5" W.C.	PROPANE GAS @ 10" W.C.
60	4,650	13,000
59	4,900	13,750
58	5,150	14,450
57	5,400	15,150
56	6,300	17,600
55	7,900	22,000
54	8,800	24,750
53	10,400	28,800
52	11,750	33,000
51	13,000	36,700
50	14,250	40,000
49	15,500	43,500
48	16,750	47,200
47	17,900	50,200
46	19,000	53,500
45	19,500	55,000
44	21,500	60,050
43	23,000	-
42	25,250	-
41	26,750	-
40	27,800	-
39	28,600	-
38	29,900	-
37	31,100	-
36	33,000	-
35	35,000	-



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ORIFICE SIZES VENTURI SETTINGS

UNIT MODEL	BURNER ORIFICE		VENTURI SETTINGS	
	NATURAL	PROPANE	NATURAL	PROPANE
GS-3500	36	54	1/16	5/16
GSD-3700	36	54	3/16	1/4
GDS-50 (Front Burner)	34P	53P	3/16	3/16
GDS-50 (Rear Burner)	43P	57P	1/2	1/2
GI-2113	44	55T	1/16	1/16
GI-3600	42	54	1/16	3/16
GI-3014	36	54	1/16	5/16
GDI-50 (Front Burner)	34P	53P	3/16	3/16
GDI-50 (Rear Burner)	43P	57P	1/2	1/2

GD-17	47	56	1/16	1/8
GD-22	43	55T	1/16	1/8
GD-25	41	54	1/4	3/8
GD-27	38	52	1/16	1/4
GD-1800	47	59	5/16	FULL
GD-3200	36	55T	3/16	3/8
GD-40 (Main Burner)	36	54	3/16	3/8
GD-40 (Ember Burner)	55A	70	N/A	N/A
GD-45	30	49	1/4	3/8

3622 0 Clearance	44	55T	1/16	1/16
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VENTING
TROUBLESHOOTING
(Conventional Vented Units)

PROBLEM	CAUSE	CURE
SPILLAGE AND/OR DOWNDRAFT	Negative pressure in house.	TO TEST: Open door/ window. If unit vents properly, make-up air is required.



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DIRECT VENTING

TROUBLESHOOTING

PROBLEM	CAUSE	CURE
----------------	--------------	-------------

<p>LAZY YELLOW OR BLUE LIFTING FLAME</p> <p>OR</p> <p>CARBON DEPOSITS ON FIREBOX & GLASS</p> <p>OR</p> <p>UNSTABLE PILOT FLAME</p> <p>OR</p> <p>PILOT AND/OR MAIN BURNER DROPS OUT</p>	<p>Vent components not sealed.</p>	<p>Seal with high temp sealant.</p>
	<p>Vent has rise or dip.</p>	<p>Straighten vent; support every 3' & allow 1" rise per foot of run.</p>
	<p>Wall terminal mounted too low.</p>	<p>Raise terminal</p>
	<p>Glass door not sealing properly.</p>	<p>Inspect & replace defective gasket & assure that door is installed according to owners' manual.</p>
	<p>(VERTICAL RUN) 2nd storm collar not added.</p>	<p>Add 2nd collar as per owners' manual.</p>
	<p>(VERTICAL RUN) Terminal less than 16" above roof.</p>	<p>Raise terminal to allow space for both storm collars.</p>



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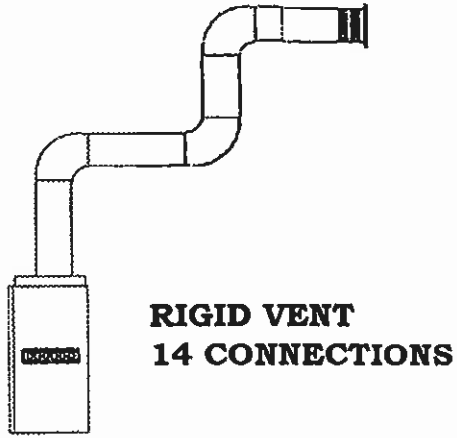
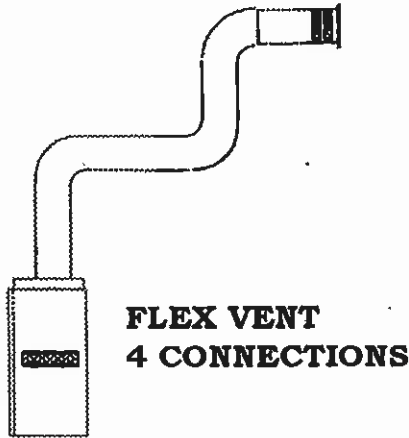


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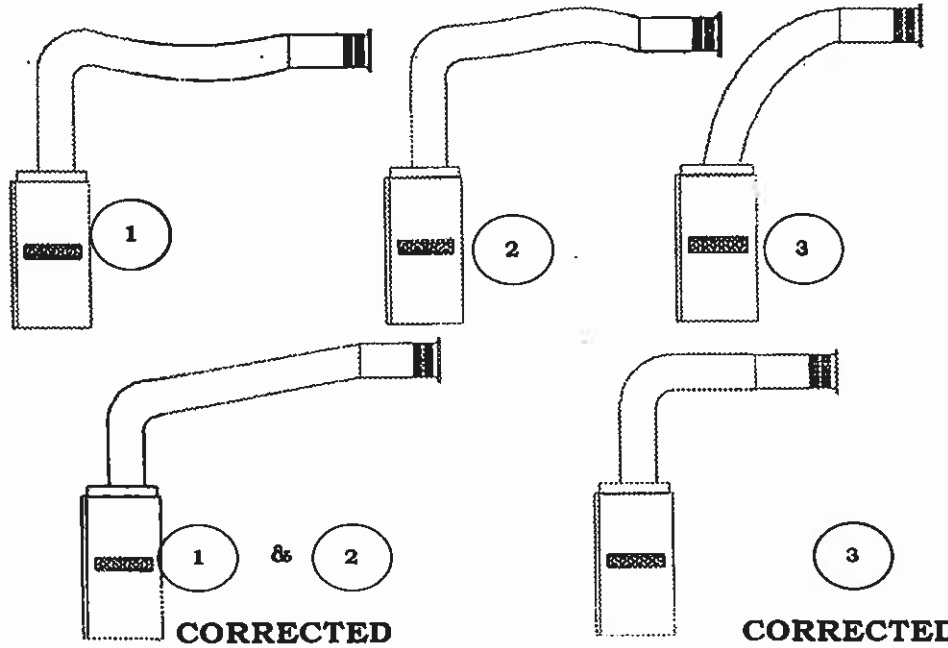
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VENTING FLEX VS RIGID



FLEX VENTING PROBLEMS

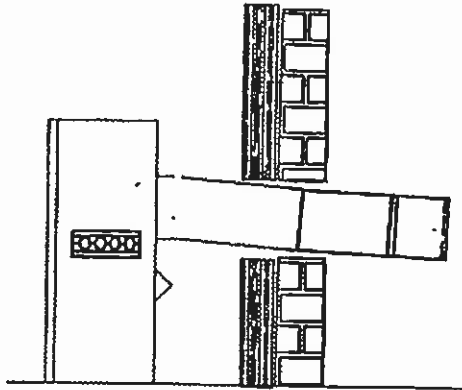


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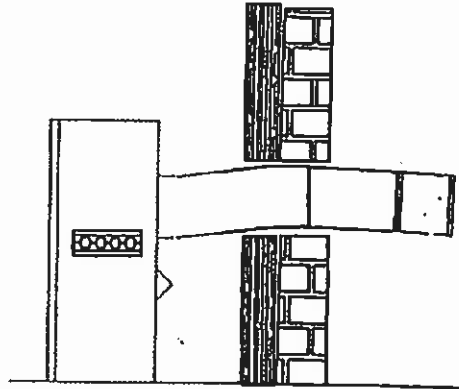
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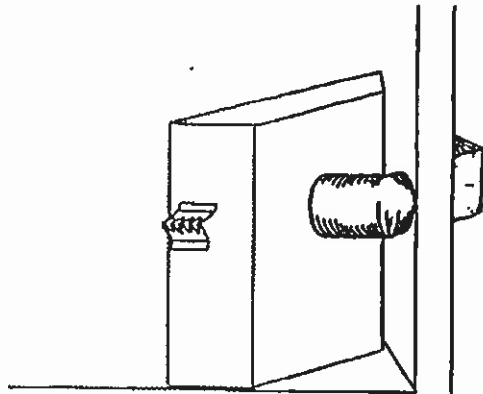
FLEX VENTING PROBLEMS



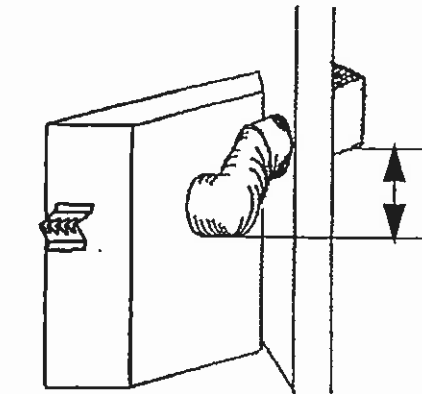
WRONG



CORRECTED



WRONG



CORRECTED

**MIN 6"
RISE**



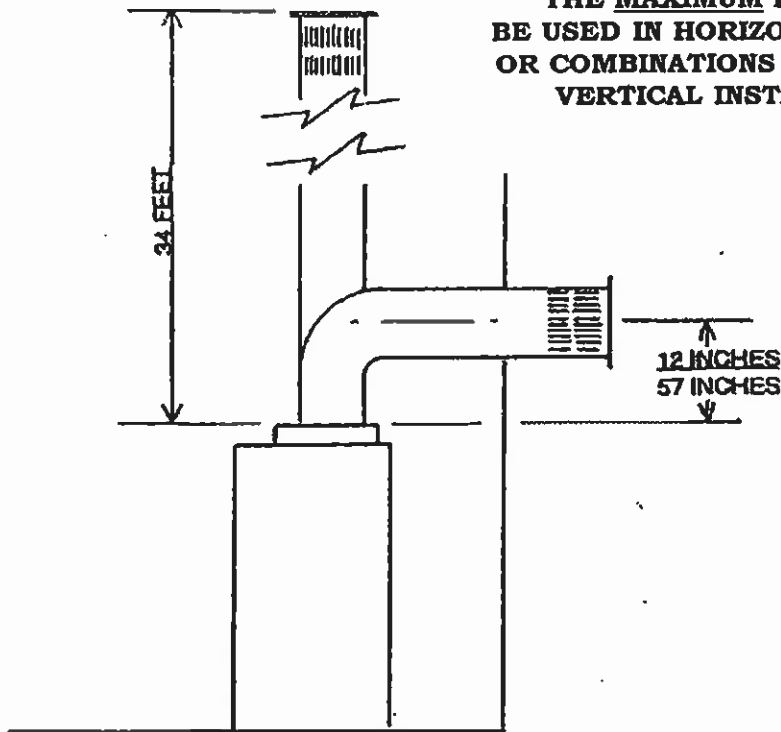
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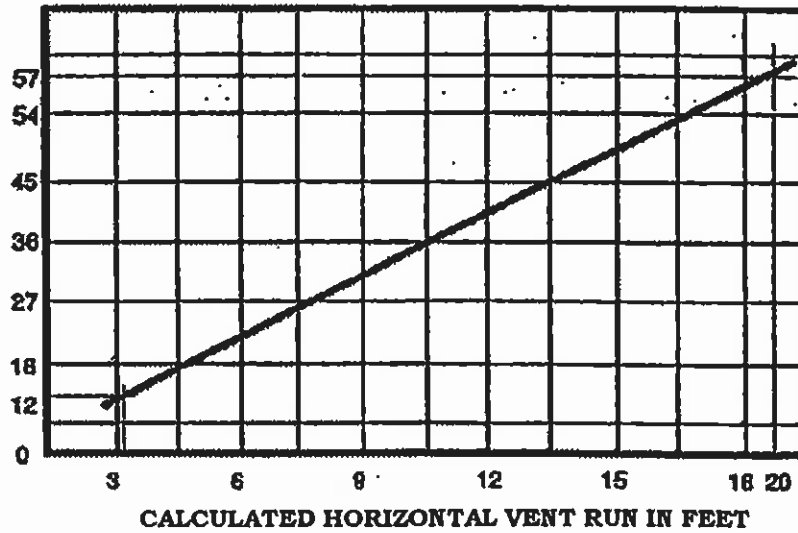
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VENTING CHART

THE MAXIMUM LENGTH THAT CAN BE USED IN HORIZONTAL INSTALLATIONS OR COMBINATIONS OF HORIZONTAL AND VERTICAL INSTALLATIONS IS 20'



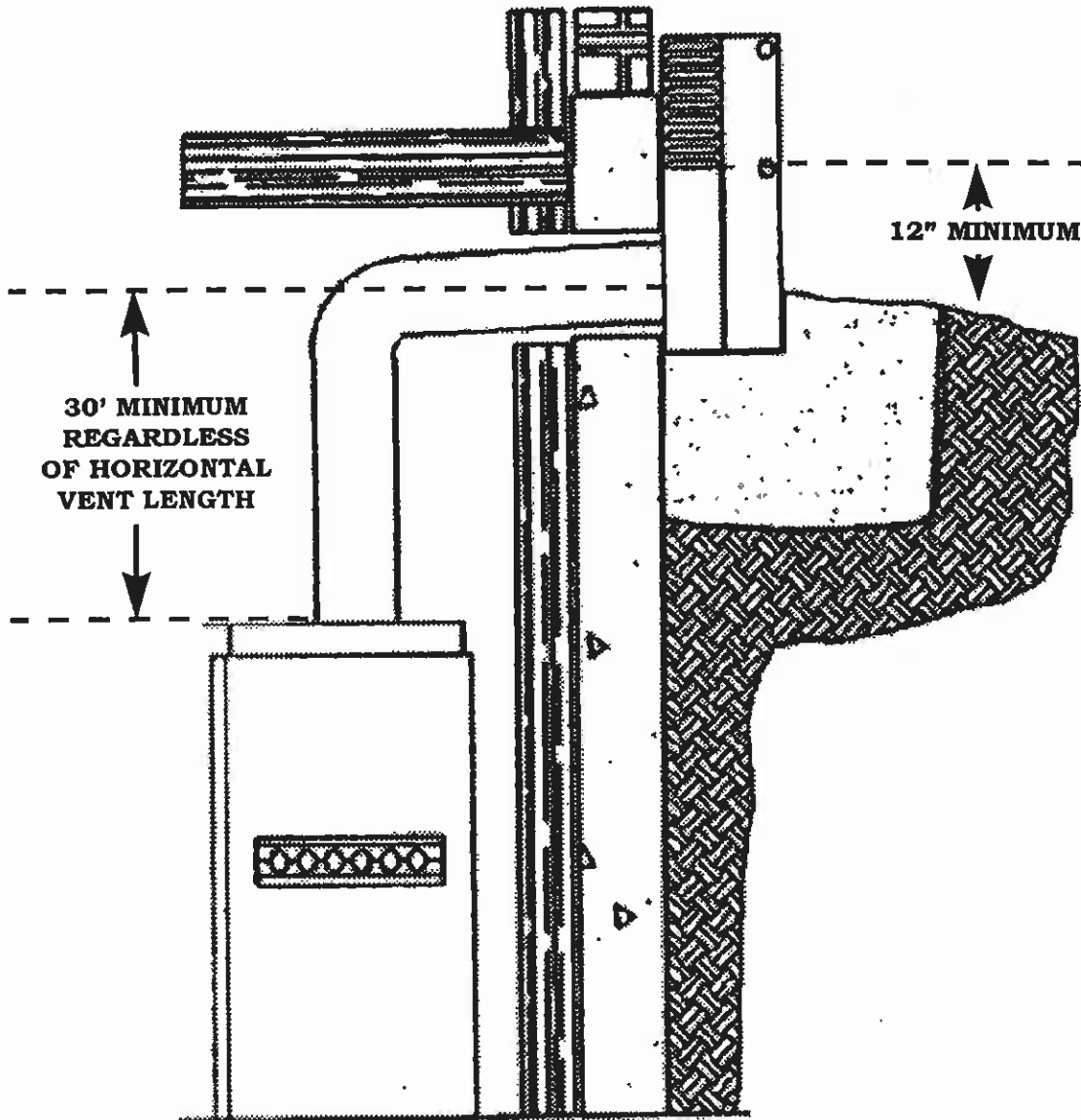
REQUIRED VERTICAL RISE FROM THE FIREPLACE TO THE FIRST ELBOW (INCHES)



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BELOW GRADE VENTING (DIRECT VENTS)



BELOW GRADE INSTALLATION
MAXIMUM 10' LENGTH
USE GD-201 PERISCOPE KIT

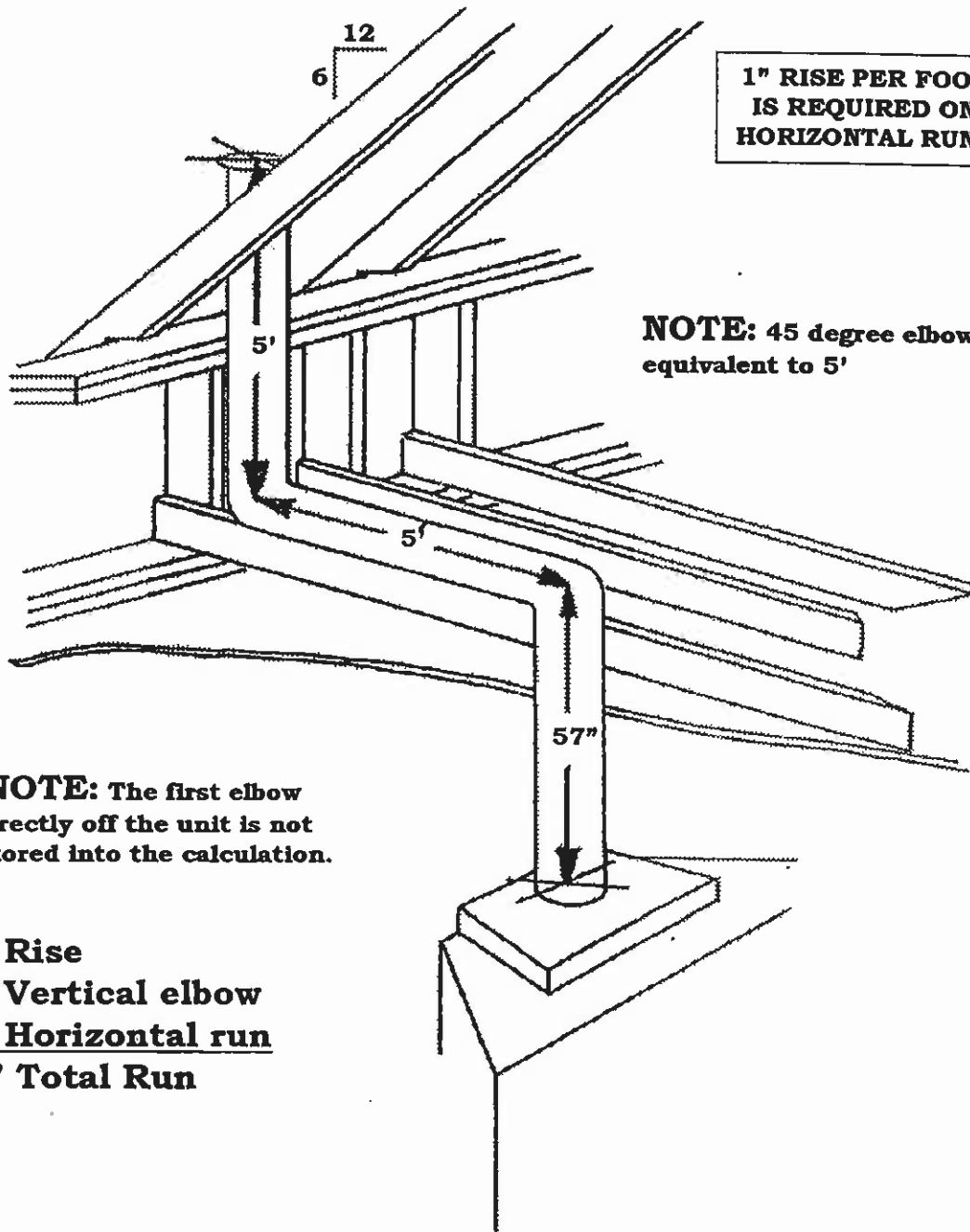


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HORIZONTAL & VERTICAL COMBINATION INSTALLATION EXAMPLE



**1" RISE PER FOOT
IS REQUIRED ON
HORIZONTAL RUNS**

**NOTE: 45 degree elbow is
equivalent to 5'**

**NOTE: The first elbow
directly off the unit is not
factored into the calculation.**

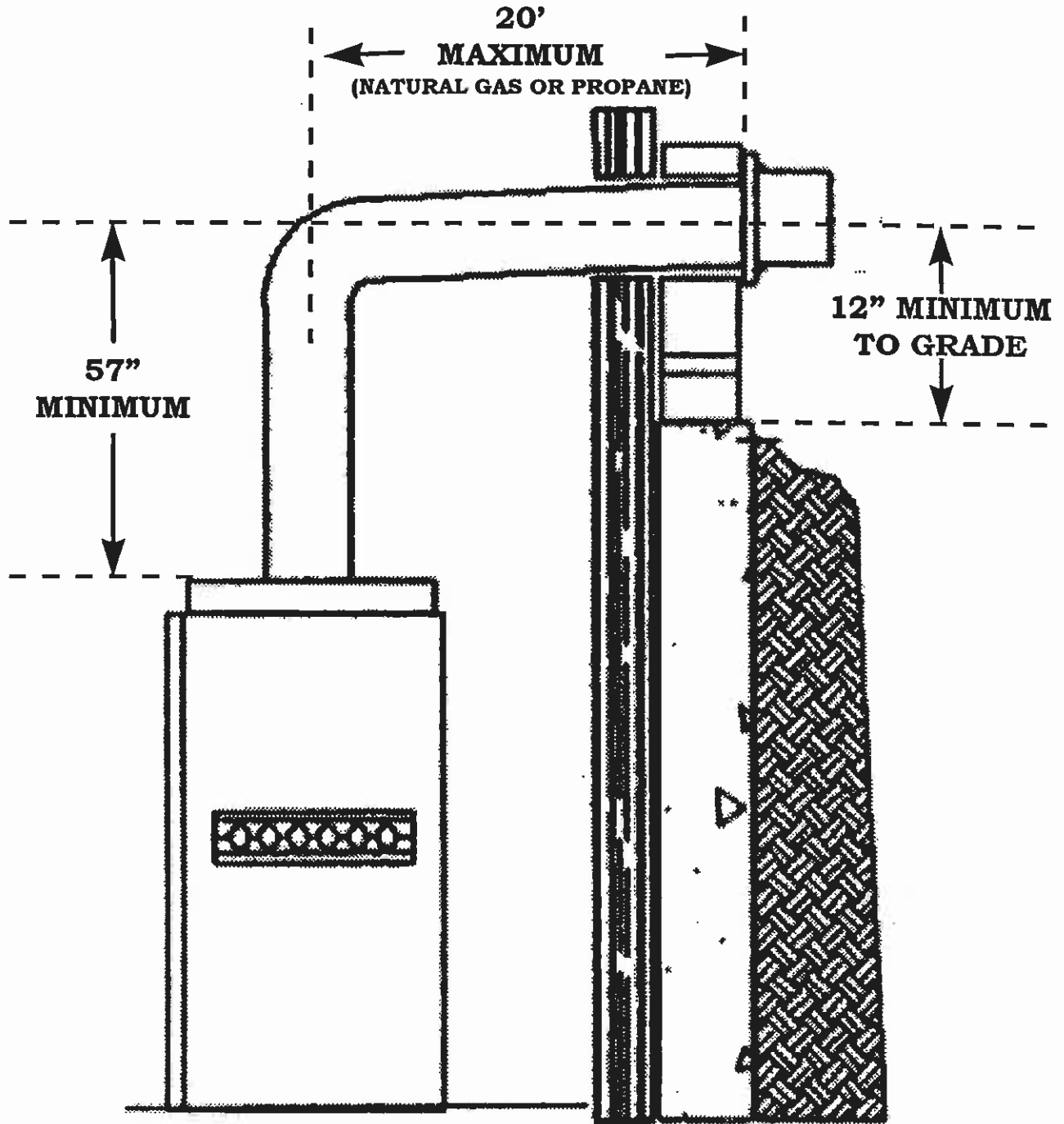
**5' Rise
10 Vertical elbow
5' Horizontal run
20' Total Run**



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MAXIMUM HORIZONTAL RUN



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MISCELLANEOUS

WHITE FILM ON GLASS:

During initial firing of fireplace, the paint, logs or lubricants from manufacturing process are being burned off and/or high humidity level in the house are the causes.

Clean the glass as required. If not cleaned almost immediately, this film will bake into the glass and will remain permanently. **KEL-KEM Gas Fireplace Glass Cleaner** is recommended.

GI-3600 UPDATE:

Unit is now being manufactured with a safety spill switch as a standard item on all models of the 3600.

SIMPSON DURA-VENT:

The following models are now approved with Simpson Dura-Vent and require "0" rise per foot on horizontal runs;

GDS-50 GDS3700 GD-17 GD-25 GD-27 GD-40 GD-45

NOTE: Model 3200 not approved but only requires 1/4" rise per foot using Napoleon supplied venting.



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WORLD RECOGNITION FOR QUALITY

PHAZER LOGS

(Retrofitting)

Phazer logs may be retrofitted into Napoleon units in the field.

- 1/ If using original burner, front log stand-offs must be flattened flush with burner.**
- 2/ Rear log must be mounted on brackets which are attached to rear wall. (Brackets must be ordered seperately).**
- 3/ In order to obtain proper flame pattern (flame through knot hole) the burner should be updated to new style; (Port holes are re-positioned and log securing screws are installed at factory).**
- 4/ Newly installed logs & embers must be installed according to installation instructions. (If not available, obtain from Napoleon).**

NOTE: Specify if logs are for a natural gas unit or a propane unit.



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CUSTOMER SERVICE

It costs six times more to attract a new customer than it does to keep an old one.

A typical dissatisfied customer will tell 8 to 10 people about their problem.

Seven of ten complaining customers will do business with you again if you resolve the complaint in their favor.

If you resolve a complaint on the spot, 95% will do business again.

Of those customers who quit, 68% do so because of an attitude of indifference by the company or a specific individual.

IN SUMMARY, ALL THESE FACTS SAY....

**CUSTOMER SATISFACTION
EQUALS SUCCESS.**



