

ROOM THERMOSTAT: Regulates operation of burner to maintain set temperature.

Locate the thermostat where it will sense the natural air circulation within the building usually on an inside wall of a room at a height of five (5) ft. (1.5m) above the floor. Place it where, at all times, it will reflect the average room temperature.

It is not recommended that a thermostat be installed on an outside wall, in front of a fireplace or at the base of an open stairwell.

When the current draw cannot be determined accurately by the above method, measure the current with an ampere meter using the 1 AMP scale. Connect the meter leads in series with one of the thermostat leads for the accurate reading. By adding the primary control current to the gas valve current, the result is the anticipator setting. (Example: .2 + .6 = .8 amps)

LIMIT CONTROL

Limits temperature that may develop in a warm air furnace or hot water boiler and limits pressure in a steam boiler.

Locate limit control where it will quickly be affected by temperature or pressure of the furnace or boiler.

1.) WARM AIR

Located on furnace plenum.

2.) HOT WATER

For gravity forced circulation; locate on vertical flow pipe directly above boiler if the control is a surface or clamp type. Immersion types should be on top or upper part of front boiler section.

3.) STEAM

Located at top of boiler. Recommendations of the control manufacturer should be followed. Also, the heating plant should be checked out to be sure all of the controls are operating properly.

INSTALLING GAS PIPING

It is recommended that a separate line be run from the meter to the burner in accordance with table 2.

TABLE 2

IRON PIPE SIZES FOR NATURAL					
Burner Firing Rate In BTUH	Feet (m) of Pipe from Meter to Burner				
	10 (3)	20 (6)	30 (9)	40 (12)	50 (15)
50,000	1/2" (.01)	1/2" (.01)	3/4" (.02)	3/4" (.02)	3/4" (.02)
100,000	3/4" (.02)	3/4" (.02)	3/4" (.02)	3/4" (.02)	1" (.02)
150,000	3/4" (.02)	1" (.02)	1" (.02)	1" (.02)	1-1/4" (.03)
200,000	3/4" (.02)	1" (.02)	1" (.02)	1" (.02)	1-1/4" (.03)
250,000	1" (.02)	1" (.02)	1-1/4" (.03)	1-1/4" (.03)	1-1/4" (.03)
300,000	1" (.02)	1-1/4" (.03)	1-1/4" (.03)	1-1/4" (.03)	1-1/4" (.03)
350,000	1" (.02)	1-1/4" (.03)	1-1/4" (.03)	1-1/4" (.03)	1-1/4" (.03)
400,000	1" (.02)	1-1/4" (.03)	1-1/4" (.03)	1-1/4" (.03)	1-1/4" (.03)
600,000	1 1/4" (.03)	1 1/2" (.03)	1 1/2" (.03)	1 1/2" (.03)	1 1/2" (.03)
800,000	1 1/4" (.03)	1 1/2" (.03)	1 1/2" (.03)	2" (.03)	2" (.03)

Minimum and Maximum inlet supply pressures are as follows:

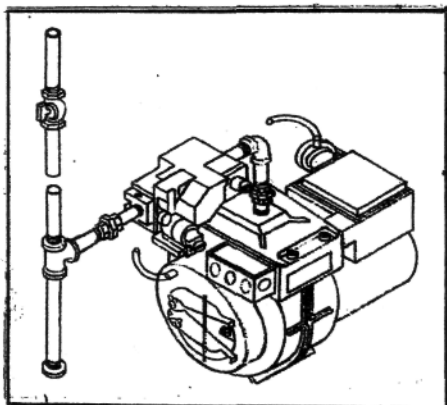
Natural gas - 5.5" w.c. (1.37kPa) - 10.5" w.c. (2.61kPa).

Propane (LP) gas - 10" w.c. (2.49kPa) - 14" w.c. (3.48kPa).

The pipe diameter may be reduced one size if propane (LP) gas is used. Use steel pipe and Malleable iron fittings for gas service lines. Provide rigid supports for the pipe. If pipe size must be reduced use reducing couplings only. Avoid the use of reducing bushings. Remove all burrs and inspect the pipe for dirt or other foreign material.

A manual main gas shutoff valve is to be installed approximately 5 feet (1.5m) above the floor level. A tee is located on the vertical drop at an appropriate level to attach the burner gas valve. The gas line extends down to the floor with a cap on the end (See figure 5). Connect the gas pipe to the burner manifold with a ground joint union. Pipe dope that is resistant to the action of LP gases must be used. Be sure to provide a 1/8 inch (.32cm) NPT plugged tapping accessible for test gauge connection immediately upstream of the gas supply connection to the conversion burner.

FIGURE 5 - PIPING CONNECTION



The appliance and its individual shutoff valve must be disconnected from the gas supply piping system during any pressure testing of that system at test pressures in excess of 1/2 PSIG (3.45kPa).

The appliance must be isolated from the gas supply piping system by closing its individual manual shutoff valve during any pressure testing of the gas supply piping at tests pressures equal to or less than 1/2 PSIG (3.45kPa).

WARNING: Explosion Hazard! the control can malfunction if it gets wet. Never try to use one that has been - replace it.

Never use a match or open flame for leak detection. Only use soap solution.

Coal Fired (See Figure 1)

A 16 gage steel plate backed with 2 inches (5.1cm) of fire brick should be installed over the ash pit opening. A 4-1/2 inch (11.5cm) diameter hole should be provided for the burner. The tip of the burner should be pulled back 1 inch (2.54cm) from inside the surface of the fire brick.

All openings which may leak air into the combustion chamber must be sealed with furnace cement or other means. Do not use asbestos.

Oil fired Furnaces - Boilers (See figure 1)

When installing in blast tube openings most oil burner openings have mounting lugs that will fit the gas burner mounting flange.

All openings which may leak air into the combustion chamber must be sealed with furnace cement or other permanent means. Do not use asbestos.

CHECK-OUT PROCEDURE BEFORE LIGHTING

Preliminary Steps

Be sure all valves are closed. Turn on electric power and gas meter. Check all joints for gas leaks using a soap solution. Note: care must be taken to prevent wetting the electronic components during the leak test.

WARNING: Explosion Hazard- The control can malfunction if it gets wet. Never try to use a control that has been wet- replace it.

It is important to purge the gas line on a long supply line. Loosen the union figure 5 on page 14 and allow the air to escape into the atmosphere until gas starts flowing, then tighten the union.

LIGHTING INSTRUCTIONS

1. Make certain that the gas valve is turned on. Air band if used should be set at zero and air shutter open to position 2 or less.
2. If the control locks out, turn the main power supply switch off and back on. This action resets the control and another purge cycle can be performed if desired.
3. Burner should now light off if the gas line has been purged. Note: there is a 4 second trail for ignition. If burner does not light off, reset control by repeating step 2.
4. The gas input for natural gas can be determined by timing the gas meter. To vary the gas input install the nearest size orifice then adjust the pressure regulator up or down for exact input desired. The manifold pressure is to be measured at the pressure tap on the gas valve.
5. Adjust the combustion air shutters (and band when required) until good combustion is obtained. Note: always use combustion test equipment when setting burner. Check CO₂ and CO with instruments to obtain the following recommended values:

GAS	MIN. CO ₂ /O ₂ %	MAX. CO ₂ /O ₂ %	CO MAX. PPM
Natural	8.5/6.0	10.5/2.5	100
LPG	10.5/5.1	12.0/2.8	100

6. Gross Flue Gas Temperatures: 350 F (175 C) minimum in outside chimney with three exposed walls. 300 F (147 C) , minimum for a chimney centrally located within the structure. If the gross stack temperature exceeds 550 F to 600 F, the appliance may be over-fired or the heat exchanger surfaces may be partially blocked. Recheck the input and inspect the appliance.
7. To determine the firing rate accurately,

measure the time required for 1 cu.ft. to be consumed. Use the following formula to calculate BTU/HR

$$3600 \times \text{Btu/cu.ft.} \times 20 = 180,000 \text{ Btu/hr}$$

EXAMPLE: $3600 \times 1000 \times 20 = 180,000$

Btu/hr (nat gas)

For subsequent normal operation starting procedure refer to instruction plate mounted on burner.

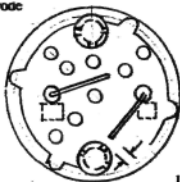
BURNER CONTROL SYSTEM SEQUENCE OF OPERATION

1. Thermostat contacts close.
2. Step down transformer (120V to 24V) energizes coil in motor relay and motor starts.
3. When motor approaches full RPM, the pressure switch contact closes, supplying 24 volts to the primary control.
4. After 35 seconds time delay, 20 or more volts are supplied to the primary control.
5. The contacts in relay close, supplying 120 volts to the ignition transformer.
6. Arc is immediately established and 20 or more volts supplied to gas valve.
7. The gas valve opens and flame is immediately established.
8. As soon as flame is established and 3 or more microamps signal is sent back to the primary control, the ignition relay drops out, killing the ignition arc. If the flame cannot be proven by the signal strength in 4 seconds, the control goes to lock out and turns both the ignition and gas valve off. The burner motor will continue to operate during lockout, if the thermostat or controlling circuit is calling for burner operation.

ELECTRODE SETTING SPECIFICATION

Flame Sensing Electrode

Burner Plate
& Pipe Capes

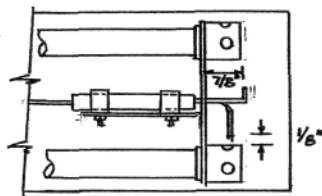


Ignition Electrode

1/8" over
opening in pipe cap

End View

Locking Nut



Side View

NOTE: Install the burner head assembly into the air tube in this position only. The ignition electrode will always be in the lower right hand area, as shown.

ORIFICE CHANGEOUT

The Orifice is located behind the ground joint union provided between the burner manifold flange and the gas valve. To change orifice do the following:

1. Shut off gas at manual main valve.
2. Disconnect union nut (see Fig. 6)
3. Remove right half of union from pipe.
4. Install the desired orifice inside of union and reinstall on pipe.

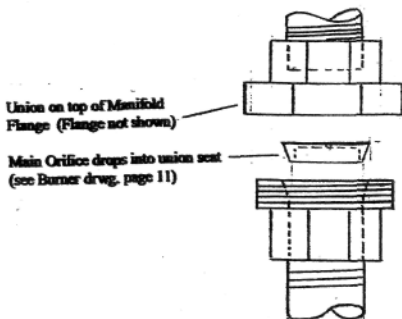
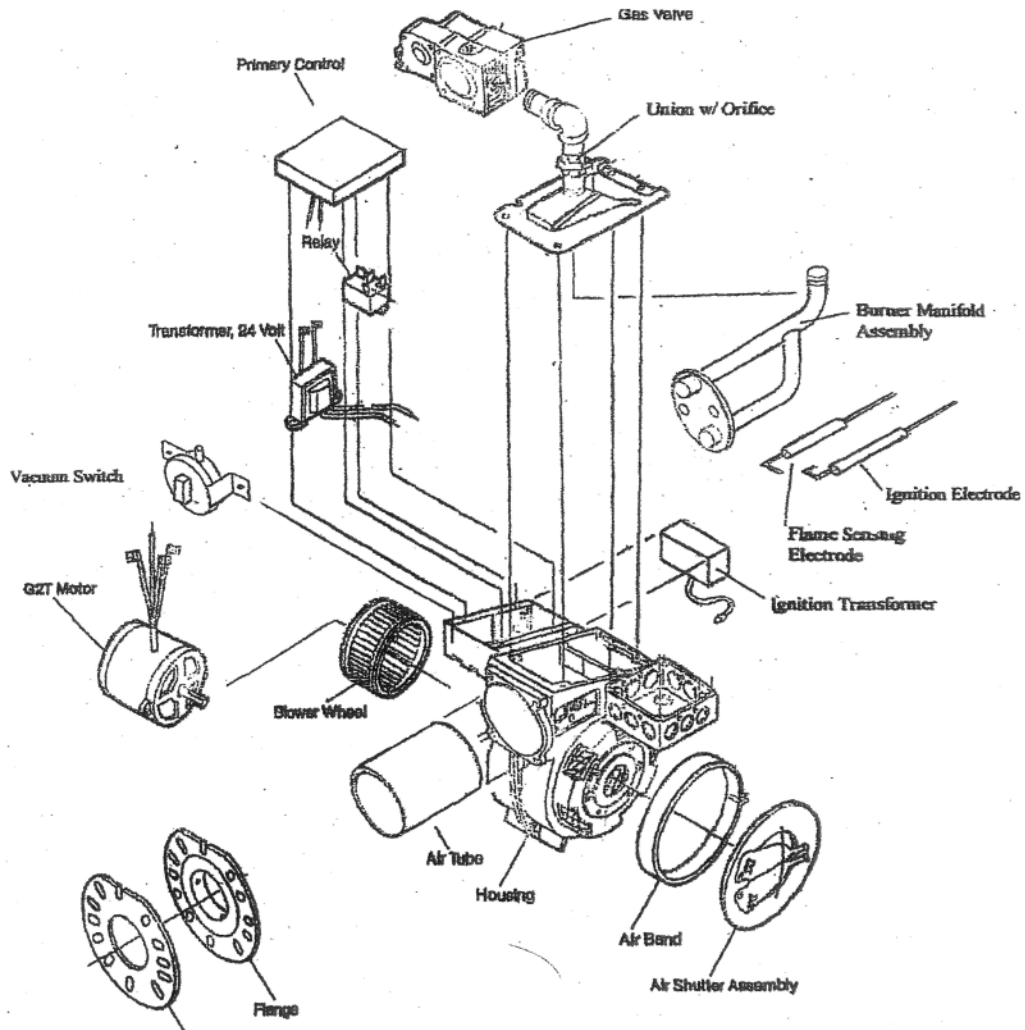


FIGURE 6

MAINTENANCE INSTRUCTION

1. A qualified gas service agency must be contacted for service for malfunction of burner or appliance.
2. The burner motor bearings require lubrication annually. Apply a few drops of #20 weight non-detergent oil each bearing lubrication tube.
3. Observe the burner flame occasionally, if yellow smoky tips are noticed, call your service agency and have the burner serviced.
4. Keep all materials, combustibles or otherwise, at least 2 feet away from the heating appliance. Do not store gasoline or other flammable vapors or liquids in the room where the heating appliance is located.
5. Combustion and ventilation air openings must not be blocked off for any reason or obstructed by materials. During the routine servicing of the burner, the service agency should make sure that all lint, dust or other foreign materials thoroughly cleaned from the burner head assembly and the blower wheel.



MODEL G2T PARTS LIST **MODELS G2T-300, G2T-600 & G2T-850**

PART NUMBER	DESCRIPTION
3884	Air Band
51084-A	Air Shutter Assembly
510760S4BK	Air Tube, 8" (20.3 cm)
2383	Blower Wheel, G2T 6- 1/4" x 3- 7/16"
51067050	Ignition Electrode
51096050	Flame Sensing Electrode
31191A	Electrode Clamp
7585-A	Mounting Flange
3885-A	Flange Gasket
71019-3 (300)	Gas Valve
71019-6 (600)	
71019-8 (850)	
71019-4LP (400LP)	
71019-8LP (850LP)	
51074	Housing Assembly
31182	Manifold Mounting Plate Gasket
21082-A	Motor
31195 (SEE TABLE)	Orifice
7681-A	Burner Manifold Assembly
RSS-495078	Air Proving Switch
21087	Ignition Transformer
21066	Transformer 24 Volt
71011	Relay
71025U	Primary Control

Rate with Natural Gas

Burner - Model #	Orifice Size	Gas Pressure in Inches Water Column											
		.5	1.0	1.5	2.0	2.5	3.0	3.5	4.0	4.5	5.0	5.5	6.5
G2T-300	.312	80,000	100,000	130,000	140,000	160,000	185,000	205,000	215,000	225,000	235,000	245,000	265,000
G2T-600	.525			335,000	375,000	390,000	450,000	485,000	515,000	542,000	585,000		
G2T-850	.593							585,000		640,000		747,000	780,000

G - 2 TROUBLE SHOOTING GUIDE

Before beginning these trouble shooting procedures, **ALWAYS** observe the following basic guidelines:

1. Check the electrical line voltage at the burner wiring box connections for a nominal 120 volts AC. **CAUTION:** When testing electrical equipment **ALWAYS** follow standard electrical safety procedures.

2. Make sure the thermostat or other controlling device is calling for burner operation.

3. Check the inlet gas pressure to verify that you have adequate pressure at the gas valve. Make sure there are no "air locks" or gas leaks in the piping system. Turn the manual valve to the "ON" position.

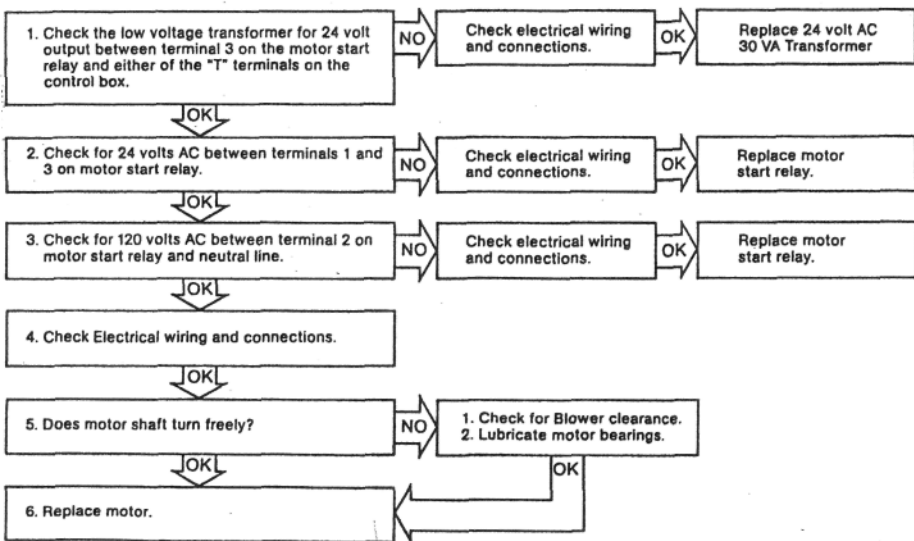
4. To successfully service the G-2 power gas burner, you need these test instruments:

- a. An Oxygen or Carbon Dioxide analyzer.
- b. A CO (Carbon Monoxide) test kit.
- c. A flue gas stack thermometer.
- d. A draft gauge. Scale should read $+ .10"$ to $-.25"$ W.C. ($+ .02$ kPa to $-.06$ kPa).
- e. A volt/ohm/milliampere multimeter that is capable of reading 24 volts AC, 120 volts AC and up to 20 microamperes DC.
- f. A manometer capable of reading up to $15"$ W.C. (3.7 kPa).

5. Be familiar with the G-2 Installation Manual. Wiring diagrams and burner operation data are found in the Manual as well as on the burner control box and nameplate.

CAUTION: Be certain that the manual gas valve and the burner power supply switch are turned off before removing any part for servicing.

MOTOR DOES NOT START



IGNITION ARC ESTABLISHED - NO FLAME

1. Reset Control - Motor starts - Completes 35-45 second prepurge cycle. Ignition arcs for four seconds. No flame is established. Control locks out after four second trial for ignition period.
NOTE: The burner motor will continue to operate during the lock out mode when the thermostat circuit is calling for burner operation.

2. Check for correct orifice/air setting relationship.

JOKL

In order for the following functional tests to be made, the control must be reset and the tests monitored during the four second trial for ignition period that occurs at the END of the prepurge cycle.

3. Check for 24 volts AC at gas valve terminals.

NO

Check electrical wiring and connections. Be sure leads are on correct gas valve terminals.

OK

Replace electronic primary control.

4. Make sure leads are on the correct gas valve terminals.

JOKL

5. Check for correct manifold regulated pressure.

JNOL

6. Replace gas valve.

NO IGNITION ARC ESTABLISHED

1. Reset Control - Motor starts - Completes 35-45 second prepurge cycle.
 - Gas valve opens, regulating adequate gas pressure.
 - No flame established - Primary control locks out after (4) four seconds trial for ignition period.

In order for the following functional tests to be made, the control must be reset and the tests monitored during the 4 second trial for ignition that occurs at the end of the prepurge cycle.

2. Check for 120 volts AC between the neutral line and the junction of the blue primary control lead and the black ignition transformer lead.

NO

Check electrical wiring and connections.

JOKL

3. Check electrical wiring and connections.

JOKL

4. Check high voltage lead and connection to ignition electrode rod.

JOKL

5. Inspect ignition electrode for cracked insulator and correct spark gap. (Typically 3/32" (.24cm).

JOKL

6. Replace ignition transformer.

Check the flame sensing circuit for (1) grounded flamerod. (2) Damage to flamerod lead insulation. NOTE: Make sure that the flamerod circuit and/or primary control is moisture-free.

JOKL

Replace electronic primary control.

NO IGNITION - NO GAS VALVE OPERATION

1. Reset Control - Motor starts - After 35-45 second prepurge cycle, motor continues to run but flame is not established.

In order to perform the following functional tests, the primary control must be reset and the tests monitored during the 4 second trial for ignition period that occurs at the end of the prepurge cycle.

2. Check for 24 volts AC at the 25 volt primary control input terminals.

NO

3. Check for 24 volts AC between the yellow centrifugal switch lead at the timer terminal and the yellow/red-striped lead at the primary control input terminal.

NO

4. Check electrical wiring and connections.

OK

Replace motor - The centrifugal switch is defective.

LOSES FLAME DURING CYCLE - CONTROL LOCKS OUT ON SAFETY

1. Reset Control • Completes 35-45 second prepurge cycle.
• Flame is established
• Sometimes the control locks out before the thermostat or controlling circuit is satisfied.

2. Disconnect flamerod lead from primary control. Connect (+) positive lead (DC Microampere Meter) to the primary control terminal. Connect the (-) negative microampere meter lead to the flamerod lead terminal.

3. Reset control, after prepurge cycle, flame is established. A stable microampere current of 3 or more is required for dependable operation.

NO

4. Microampere reading is less than 3 or unstable.

Probable cause of erratic lockout:

1. Flame proving circuit grounded by moisture.
2. Damaged insulation on flamerod lead or loose terminal.
3. Flamerod improperly positioned in flame.
4. Poor ground path to primary control.
5. Defective primary control.

Probable causes:

1. Extremely poor combustion level.
2. Flamerod improperly positioned in flame.
3. Defective primary control.

BURNER CYCLES ERRATICALLY

1. Check for proper thermostat installation and location.

OK

2. Check thermostat heat anticipator for correct setting.

OK

3. Check low voltage circuit for bad wiring, electrical connections and/or switches.

OK

4. Check line voltage circuit for bad wiring, electrical connections and/or switches.

NO

Set anticipator to correct value if adjustable type. If proper setting cannot be made, replace with compatible thermostat.

If the thermostat wires are not terminated on the burner control box "T" terminals, and these terminals are JUMPED, you must then determine what the correct anticipator setting is by inspecting the controlling device at the point where the thermostat wires terminate. Typically, this information can be found on the body or cover of the controlling device.

NOTE: When the thermostat wires terminate on the G2 primary control box "T" terminal, the heat anticipator setting value for the G2 burner is determined by adding the primary control current to the gas valve current. The result is the anticipator setting. (Example: $.2 + .6 = .8$ amps.)

When the current draw cannot be determined accurately by the above method, measure the current with an ampere meter using the 1 amp scale. Connect the meter leads in series with one of the thermostat leads for the accurate reading.

HOW TO OBTAIN WARRANTY

The Adams statement of burner warranty is outlined below. Warranty on the component parts (motors, gas valves, transformers and controls) is determined by the specific manufacturer's date code covering the component.

The manufacturers of component parts used on the burner have established service agencies and distributors for handling warranty for their manufacture. The use of these local agencies offers a convenient source of parts and also saves the cost and delay of returning defective parts to us.

When local agencies are not available, however, defective parts may be returned directly to Adams.

LIMITED WARRANTY

Adams Manufacturing Co. (Adams) warrants its products and components to be free from defects due to faulty workmanship or defective materials at the time of shipment and under normal use and service for twelve (12) months from date of installation by a qualified installer or eighteen (18) months from date of manufacturing, whichever date occurs first. This LIMITED WARRANTY does not extend or apply to Adams products, or any component thereof, which has been misused, neglected, improperly installed or otherwise abused. Equipment which is defective in material or workmanship and which is removed within the specific time period will be repaired or replaced as follows:

- (1) Components, controls, motors & transformers should be returned to an authorized distributor.
- (2) Products determined to be covered under this LIMITED WARRANTY by Adams shall be either repaired or replaced at Adams' sole option.
- (3) Adams is not responsible for any labor cost for removal and replacement of said products and equipment associated therewith.
- (4) Controls, motors & transformers, other components which are so repaired will carry this limited warranty equal to the unexpired portion of the original products LIMITED WARRANTY.
- (5) If inspection by Adams does not disclose any defects covered by this LIMITED WARRANTY, the product will be repaired or replaced at the expense of the customer and Adams' regular charges will apply.

THE FORGOING STATES THE SOLE AND EXCLUSIVE REMEDY FOR ANY BREACH OF WARRANTY OR FOR ANY OTHER CLAIM BASED ON ANY DEFECT IN, OR NON-PERFORMANCE OF, THE PRODUCTS, WHETHER SOUNDING IN CONTRACT, WARRANTY OR NEGLIGENCE. NO OTHER WARRANTY, WHETHER EXPRESSED OR IMPLIED, INCLUDING ANY WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE, SHALL EXIST IN CONNECTION WITH THE SALE OR USE OF SUCH PRODUCTS AND IN NO EVENT WILL ADAMS BE LIABLE FOR ANY INCIDENTAL OR CONSEQUENTIAL DAMAGES OF ANY NATURE. Adams neither assumes nor authorizes any persons to assume for Adams any other liability or obligation in connection with the sale of these products.