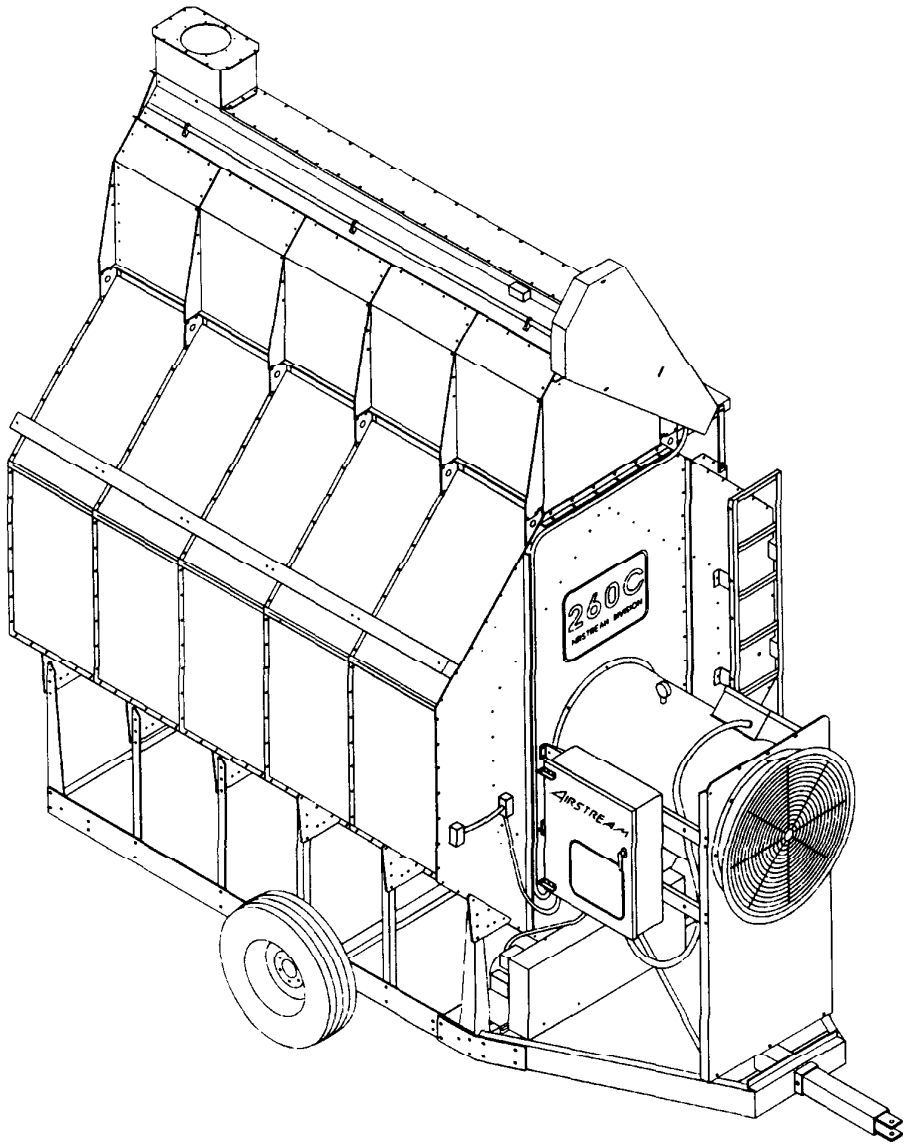
AIRSTREAM

SERVICE MANUAL



AIRSTREAM C-SERIES ONE-FAN GRAIN DRYERS

GSI
GRAIN SYSTEMS, INC.
ASSUMPTION, IL 62510 217/226-4421

PNEG-167C

SERVICE MANUAL

Thank you for choosing an AIRSTREAM C-Series Single-Fan grain dryer. These units are one of the finest grain dryers ever built and designed to give excellent performance and service for many years.

This manual describes the Service procedures for all standard production 210C, 260C, 340C, 400C dryers. These dryers are available for liquid propane or natural gas fuel supply with either single phase 230 volt, or three phase 220 or 440 volt electrical power.

WARRANTY

Grain Systems, Inc. warrants its products to be free of defects in material and workmanship. The only obligation of the manufacturer is to repair or replace components which have been submitted and found to be defective within 24 months after installation. If so found to be defective, the components will be repaired or replaced without charge, this consitituting and entirely fulfilling the warranty obligation. Grain Systems, Inc. assumes no liability for expenses incurred without written authorizations; in no event shall liability include special or consequential damages, or exceed the selling price of the product.

This warranty does not cover products or parts which have been damaged by negligent use, misuse, alteration or accident. Electric motors, tires, and other components supplied by outside manufacturers are warranted separately by those suppliers. This warranty is exclusive and in lieu of all other warranties, expressed or implied. Grain Systems, Inc. reserves the right to make design or specification changes at any time, without any contingent obligations to purchasers of products already sold.

All instructions shall be construed as recommendation only. Because of the many variable conditions in actual installation, Grain Systems, Inc. assumes no liability for results arising from the use of such recommendations. Any alteration in design or operation of any Grain Systems, Inc. product must be submitted and approved in writing by Grain Systems, Inc. before alteration is made.

SAFETY FIRST

GENERAL SAFETY STATEMENTS

Grain Systems, Inc.'s principle concern is your safety and the safety of others associated with grain handling equipment. This manual was written with this thought in mind. We want to keep you as a customer. This manual is to help you understand safe operating procedures and some problems which may be encountered by the operator and other personnel.

As owner and/or operator, it is your responsibility to know what requirements, hazards and precautions exist and inform all personnel associated with the equipment or in the area. Safety precautions may be required from the personnel. Avoid any alterations to the equipment. Such alterations may produce a very dangerous situation, where serious injury or death may occur.

SAFETY ALERT SYMBOL

The symbol shown below is used to call your attention to instructions concerning your personal safety. Watch for this symbol; it points out important safety precautions. It means "ATTENTION", "WARNING", "CAUTION", and "DANGER". Read the message that follows and be cautious to the possibility of personal injury or death.

WARNING!

BE ALERT Personel operating or working around dryer should read this manual. This manual must be delivered with equipment to its owner. Failure to read this manual and its safety instructions is a misuse of the equipment.

DANGER

Disconnect electricity before inspecting or servicing.

WILL CAUSE SERIOUS INJURY OR DEATH

Grain Systems, Inc. recommends that you contact your local power company and have a representative survey your installation so your wiring will be compatible with their system and so that you will have adequate power supplied to your unit.

SAFETY PRECAUTIONS

1. Read and understand the operating manual before trying to operate the dryer.
2. Never operate dryer while guards are removed.
3. Power supply should be OFF for service of electrical components. Use **CAUTION** in checking voltages or other procedures requiring power to be ON.
4. Check for gas leaks at all gas pipe connections, if any leaks are detected, do not operate dryer. Shut down and repair before further operation.
5. Never attempt to operate the dryer by jumping or otherwise bypassing any safety devices on the unit.
6. Set pressure regulator to avoid excessive gas pressure applied to burner during ignition and when burner is in operation. See chart for operating procedures. Do not exceed maximum recommended drying temperature.
7. Keep the dryer clean. Do not allow fine material to accumulate in the plenum chamber.
8. Keep auger drive belts tight enough to prevent slippage.
9. Use **CAUTION** in working around high speed fans, gas burners, augers, and auxiliary conveyors which **START AUTOMATICALLY.**
10. Do not operate in an area where combustible material will be drawn into the fan.
11. Before attempting to remove and reinstall any propellor, make certain to read the recommended procedure listed within the SERVICING section of the manual.
12. Be certain that capacities of auxiliary conveyors are matched to dryer auger capacities.
13. Clean grain is easier to dry. Fine material increases resistence to air flow and requires removal of extra moisture.

READ THESE INSTRUCTIONS BEFORE INSTALLATION AND OPERATION.
SAVE FOR FUTURE REFERENCE.

USE CAUTION IN OPERATION OF THIS EQUIPMENT

The design and manufacture of this dryer is directed toward operator safety. However, the very nature of a grain dryer having a gas burner, high voltage electrical equipment and high speed rotating parts does present a hazard to personnel which can not be completely safeguarded against without interfering with efficient operation and reasonable access to components.

Use extreme caution in working around high speed fans, gas-fired heater, augers and auxiliary conveyors which may start without warning when the dryer is operating on automatic control.

Continued safe, dependable operation of automatic equipment depends, to a great degree, upon the owner. For a safe and dependable drying system, follow the recommendations within this manual and make it a practice to regularly inspect the operation of the unit for any developing problems or unsafe conditions.

Take special note of the Safety Precautions listed above before attempting to operate the dryer.

KEEP THE DRYER CLEAN. Do not allow fine material to accumulate in the plenum chamber.

A CAREFUL OPERATOR IS THE BEST INSURANCE AGAINST AN ACCIDENT.

TABLE OF CONTENTS

1. SERVICE

SEASONAL INSPECTION AND SERVICE

The dryer is made of weather resistant material and is designed to require a minimun of service. However, each season we recommend the following items be checked before the unit is used. Replace any damaged or questionable parts. THESE CHECKS WILL HELP ELIMINATE POSSIBLE FAILURES AND ASSURE DEPENDABLE OPERATION OF THE EQUIPMENT WHEN IT IS NEEDED.

1. Shut-off electrical power. Open main Control Box and remove Fan-Heater Control Box cover and inspect for moisture, rodent damage, or accumulated foreign material. Remove any foreign material present. INSPECT FOR AND TIGHTEN ANY LOOSE TERMINAL CONNECTIONS. Replace any damaged or deteriorated wiring.

2. Check propellor for freedom of rotation and uniform tip clearance. It should also inspected for accumulated dirt and grain dust, ESPECIALLY INSIDE THE HUB, any additional weight can seriously affect the balance and result in harmful vibrations and shortened bearing life. For efficient fan performance, keep inside of the housing free of dirt build-up.

3. Check propellor for free side play. Any side play is an indication of defective motor bearings which should be replaced to prevent a complete motor failure. MAKE SURE MOTOR MOUNT BOLTS ARE TIGHT.

4. Motor bearings should be relubricated periodically, depending upon operating conditions. Under normal usage, it is desireable to have the motor cleaned and checked and the bearings repacked by an authorized service station every two to three seasons. If the unit is operated continuously through most of the year, this service should be performed each year.

   NOTE: If on site bearing relubrication is to be performed, see LUBRICATION INSTRUCTIONS FOR BALL BEARING MOTORS. Figure 1. To keep motor bearings properly lubricated and dispel any accumulation of moisture within the windings, the fan and auger motors should be operated for 15 to 30 minutes each month.

5. Remove and clean the gas line strainers. Make certain gas valves are closed and that gas is purged from the system before attempting disassembly.

6. Inspect the collector plate (at the top of the burner casting) and the burner cup for any accumulation of foreign material. Clean if required. Foreign material in the burner cup or casting will not burn out and will impair burner operation.

7. If required, inspect ignitor plug and clean the electrodes. Use an ignition point file to remove carbon and rust between the electrode surfaces. Ignitor gap should be about 1/8 inch.

LUBRICATION INSTRUCTIONS FOR BALL BEARING MOTORS (Figure 1)

SUGGESTED RELUBRICATION INTERVALS*		
Hours of Service per Year	**H.P. Range**	**Suggested Relube Interval**
5000	1/8 to 7 1/2 10 to 40 50 to 150	5 years 3 years 1 year
Continuous	1/8 to 7 1/2 10 to 40 50 to 150	1 year 3 years 9 months
Normal		
Applications		
Seasonal Service Motor is idle for 6 months or more	All	1 year (beginning of season)
Continuous high ambients, dirty or moist locations, high vibrations or where shaft end is hot (pumps-fans)	1/8 to 40 50 to 150	6 months 3 months

* The bearings have been lubricated at the factory, thus, no lubrication need be added before start-up.

SUGGESTED LUBRICANTS				
Insulation Class	**Consistency**	**Type**	**Grease**	**Frame Type**
A &B	Medium	Polyurea	Shell Dolium R	215T & smaller
A & B	Medium	Polyurea	Shell Dolium R	254 & larger
F & H	Medium	Polyurea	Shell Dolium R	All

PROCEDURE:

If motor is equipped with Alemite fitting, clean tip of fitting and apply grease gun. Use 1 to 2 full strokes on motors in NEMA215 frame and smaller. Use 2 to 3 strokes on NEMA254 thru NEMA365 frame. Use 3 to 4 strokes on NEMA404 frames and larger. On motors having drain plugs, remove grease drain plug and operate motor for 20 minutes before replacing drain plug.

On motors equipped with slotted head grease screw, remove screw and apply grease tube to hole. Insert 2 to 3 inch length of grease string into each hole on motors in NEMA frame and smaller. Insert 3 to 5 inch length on larger motors. On motors having grease drain plugs, remove plug and operate motor for 20 minutes before replacing drain plug.

8. Inspect flame sensor for possible damage or poor connections. Flame sensor wire must be in good condition.

9. Inspect and manually rotate the top auger paddle assembly. The paddle unit must rotate freely without any indication of sticking or binding.

10. Inspect the top auger and bottom auger drive lines for proper adjustment and condition. Readjust line tension, as required. See figure 2.

NOTE: All of the auger and meter roll bearings are lifetime lubricated and do not require service relubrication.

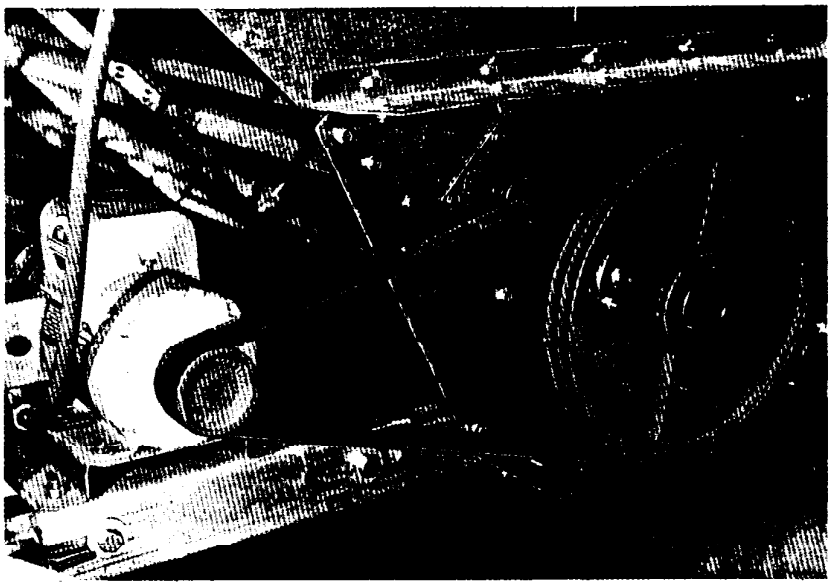


Figure 2

Bottom Auger Drive

11. Operate dryer clean-out levers and check clean-out hatch mechanism for proper operation. With hatch open, inspect for and remove any accumulation of dirt, fines, and foreign material from the bottom auger trough area.

NOTE: Do not allow high moisture material to collect within the trough area as it may adversly affect metal parts.

12. Inspect entire dryer for loose, worn, or damaged parts. Include check of auger flighting, meter rolls, and other internal parts. Check that temperature sensors within air plenum chamber are secured within insulated clamps and do not chafe on other metal parts.

13. Make sure all dryer guards and warning decals are securely installed. Make certain guards do not interfere with moving parts. If guards or warning decals are missing contact your dealer for a free replacement.

14. Test fire the dryer several weeks ahead of the drying season. Check for possible gas leaks. See TEST FIRING in operation manual for procedure.

2. FAN PROPELLOR REMOVAL AND INSTALLATION

The fan propellor is secured to the motor shaft by the use of a taper-lock bushing, motor shaft key, and three capscrews. Figure 3 shows a cut away sketch of the propellor and bushing installation.

CAUTION: Although the taper-lock method of retaining the propellor onto the motor shaft is simple, it is essential that the following points be read carefully and fully understood. Improper installation causing a loose flying propellor, can result in serious or fatal injury.

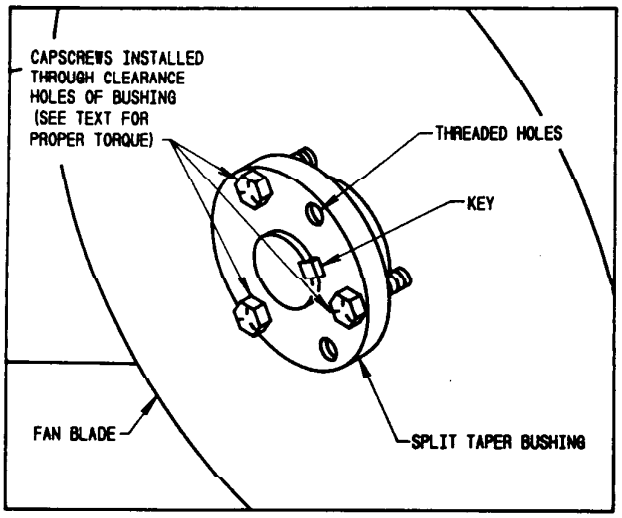


Figure 3

Fan Blade Installation

THREADED BUSHING HOLES:

The threaded holes within the bushing are provided for disassembly purposes only. See figure 3. Do not attempt to use these holes for reassembly. They will not allow the parts to lock onto the shaft thereby causing a hazardous operating condition.

CLEARANCE HOLES:

When reassembling parts, the capscrews must be installed through the untapped clearance holes as shown in Figure 3. This will cause the propellor to be pulled forward onto the tapered bushing, thus locking the parts securely onto the motor shaft. Refer to text for assembly details.

When fan servicing requires removal and installation of the propellor, make sure the propellor is removed and installed properly. Follow the recommended procedure that follows:

REMOVAL

1. Lock out the fan power supply and remove the fan guard and the venturi, as required on some models.

2. Remove the three capscrews from the clearance holes in the taper-lock bushing.
3. Install two grade 5 capscrews into the threaded holes in bushing and turn them by hand until they bottom against the front surface of the propellor.
4. Block propellor to prevent it from turning, and gradually turn the capscrews (up to 1/4 turn at a time) until the propellor breaks loose from the bushing and motor shaft, see figure 4. Carefully remove bushing and propellor. With the propellor free from the bushing, a wheel can be used to pull the bushing off of the motor shaft. Reattach bushing onto propellor to prevent the loss of parts.

NOTE: During manufacture, the propellor and bushing are balanced together and the blade is marked with two small dots to identify their original alignment position. Observe bushing and propellor to make sure they have alignment marks. Mark the alignment of the propellor and bushing, if required.

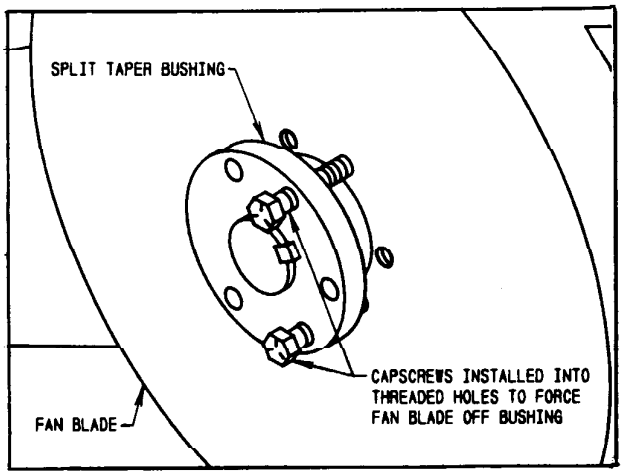


Figure 4

Fan Blade Removal

3. FAN MOTOR REMOVAL AND INSTALLATION

In the event of motor failure, remove the motor as described and take it to the nearest authorized service station. Authorized service stations are the only places which can provide possilbe motor warranty. Motor service and repair at other places will be at owner's expense.

If the service station determines motor failure to be caused by faulty material or workmanship within the warranty period, repair will be covered under the warranty. Motor failure caused by external sources will result in a charge to the owner for repair.

1. Make certain power is shut-off and locked out. Remove fan guard and propellor.
2. Remove cover from Fan-Heater Control Box and disconnect the motor lead wires from within the box.

   NOTE: Tag or otherwise identify wires for ease of re-assembly.
3. Remove motor mount bolts. If there are shims between the motor and its base, note their location so they may be properly installed during reassembly.
4. Disconnect the upper end of the motor conduit, then carefully pull the wires through the hole in Fan-Heater housing. Remove motor from the Fan-Heater unit with the conduit still attached. If motor requires service. take it to an authorized service station.
5. To re-install motor, slide onto motor base plate and replace shims (if required) between motor and base plate. Re-install motor mount bolts and washer, but do not fully tighten at this time.

   Re-install conduit and wires through hole in Fan-Heater housing and carefully connect all electrical wiring.

   Adjust position of motor by temporarily mounting fan blade on motor shaft. Rotate fan blade by hand, making the necessary adjustments so that the tip clearance between blade and housing is uniform. If required, remove the fan blade and fully tighten all four motor mounting bolts.

   NOTE: Make sure to install and tighten the propellor in accordance with earlier instructions.

4. HEATER PARTS REMOVAL AND INSTALLATION

Most of the heater parts can be removed by simply identifying any attached wiring and then disconnecting the obvious mounting parts:

1. **FLAME SENSOR:** Disconnect the slip-on connector and unscrew the flame sensor out of its mounting bracket.
2. **GAS SOLENOID VALVE COIL:** Unsnap either the plastic cap, or the metal clip, on the gas valve and slide the housing and coil off the valve stem and body. Do not energize the coil when it is removed, as the coil may become damaged due to excessive current flow.
3. **REGULATOR AND GAS SOLENOID VALVE (S):** The gas regulator and solenoid valve(s) are directional and must be connected as indicated by the markings near the port openings. Make sure gas is shut-off and purged from the system before removing parts.

   When installing a liquid gas solenoid valve on LP models, do not over-tighten the connection into the inlet side, as the inlet orifice may become partially blocked.
4. **MAIN GAS ORIFICE:** With fuel shut-off and gas purged from system, proceed as follows:

   A. Disconnect the plumbing support brackets from pipe train. Refer to Figure 5.

   B. Disconnect gas solenoid valve coils. Be sure to mark which one goes where.

   C. Lift pipe (with orifice, solenoid valve, and other parts attached) straight up and remove from Fan-Heater Housing. Orifice and other parts can now be removed from pipe train, if desired.
5. **REASSEMBLY:** To reassemble parts, reverse the disassembly procedure, noting the following special point:

   A. Make sure all parts are thoroughly cleaned and open.

   B. Use a dependable brand of high temperature pipe caulking compound when assembling gas connections. Apply only a light coating onto male threaded end of fittings.

   C. Solenoid valves and gas regulators are directional and must be properly installed. Do not attempt to connect gas solenoid valve by applying force to the valve core stem as it may ruin the unit.

   D. Make sure all electrical wires are properly connected. Refer to wiring diagrams.

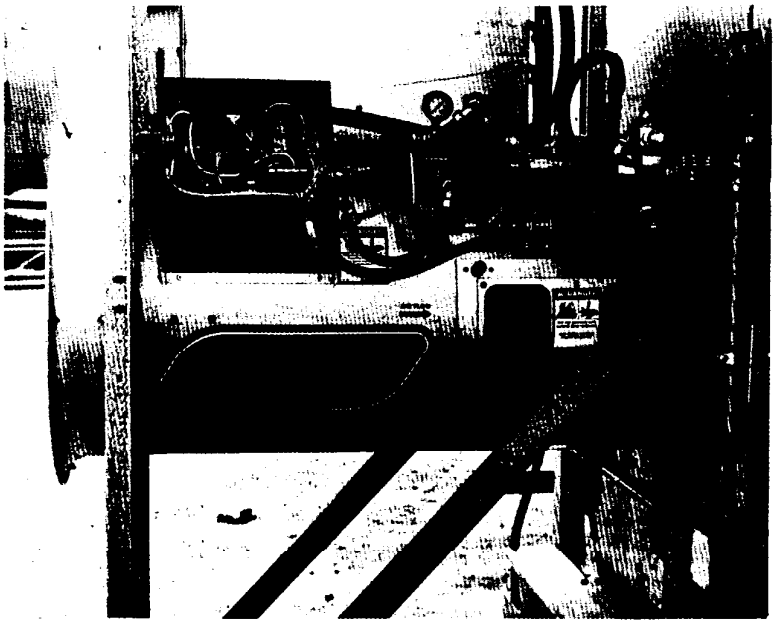
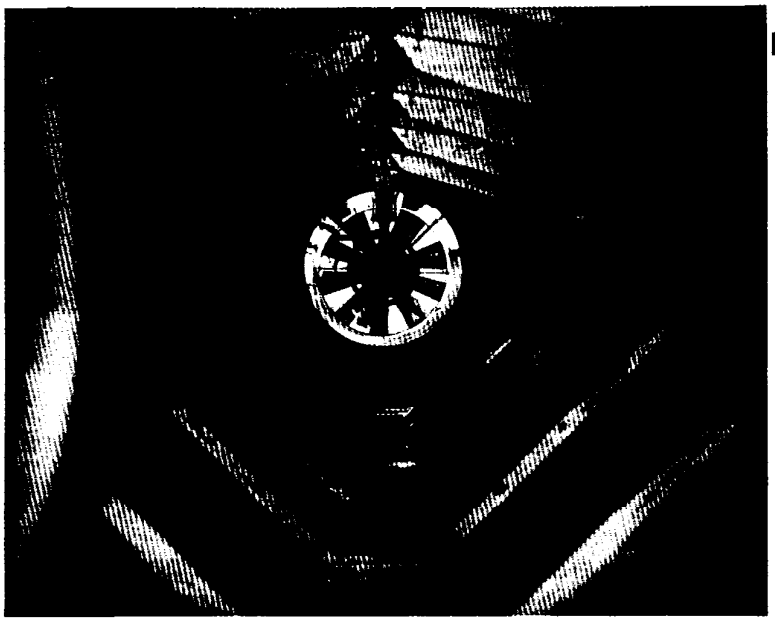


Figure 5

Fan Heater



Dryer Plenum

5. METERING ROLL SERVICING

DESCRIPTION AND OPERATION

This dryer is equipped with SCR metering roll drive assembly. The metering rolls are driven by a separate DC type electric motor. The speed of the motor is variable and is controlled by an electric SCR (silicon controlled rectifier) control within the Main Control Box.

MAIN CONTROLS

1. **SCR SPEED CONTROL-** The control unit dial on the front of the Control Box regulates the speed of the DC motor which drives the metering rolls.

   The markings on the scale from 0 to 999 represent the flow of grain past the metering rolls as a percent of the maximum grain discharge rate for the dryer. The maximum setting of 999 provides a maximum 100% discharge of 580 BPH for 210C, 720 BPH for 260C, 860 BPH for 340C, and 1960 BPH for 400C model dryers.

   NOTE: When the control is set to the maximum discharge rate (999), the metering roll speed should be 9.75 RPM and 17.5 on 400C.

2. **DC ELECTRIC MOTOR-** The 1/3 HP (3/4 HP on 400C) direct current (DC) motor provides the drive for the meter roll and is located on the front left-hand side of standard model dryers. The output shaft of the motor is connected directly to the gear box assembly.

   The DC motor requires no operational adjustment as it is completely controlled from the Control Box.

3. **SPEED REDUCER GEAR BOX-** The direct drive gear box provides the required speed reduction and transmits power to the metering rolls through a drive chain arrangement.

   The gear box does not require adjustment. The drive chain should also be periodically lubricated and retension as required.

4. **UNLOAD AUGER TIME DELAY RELAY-** This special relay is located within the Control Box. The relay is specially connected into the bottom auger system in such a manner it causes the unload auger (and any connected auxiliary unloading conveyors) to continue to operate for approximately 30 seconds after the metering rolls stop operating. This feature permits the cleanout of grain within the unloading equipment at the end of all discharge cycles.

5. In the event a foreign object becomes lodged in the metering rolls and jams the system, the following events would occur. The unloading auger would stay in motion; however, the metering roll drive would stop. The DC motor should stall out.

6. HOW TO DETERMINE METERING PROBLEM

To determine if the metering problem is caused by blockage, perform the following test with the power off. Remove the drive chain by loosening the motor mounting bolts. Refer to Figure 6 and place a pipe wrench on the hub of the roller chain sprocket of the left-hand metering roll at the drive end of the dryer and apply up to 100 ft. lbs. of force to attempt to rotate the roll toward the inside of the dryer. If the metering roll will turn, then repeat for right hand side. If meter roll will turn, it can be assumed that no blockage exists and that the problem is due to some other cause. Check for break in power train, chain, drive key, pin, etc.

CAUTION: Keep hands away from sprocket teeth to avoid injury that may result from chain backlash as a result of torsional build up in the system caused by the jam.

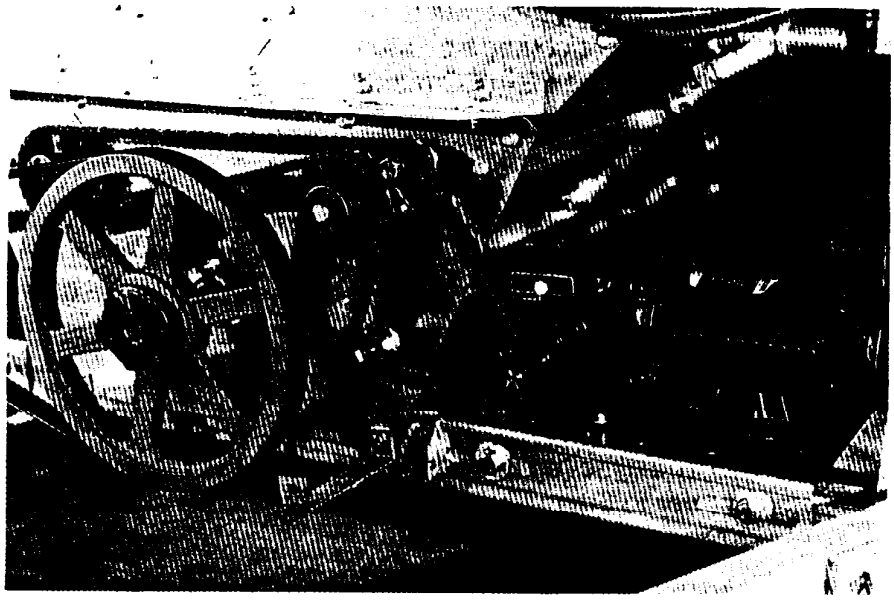


Figure 6
Meter Roll Drive

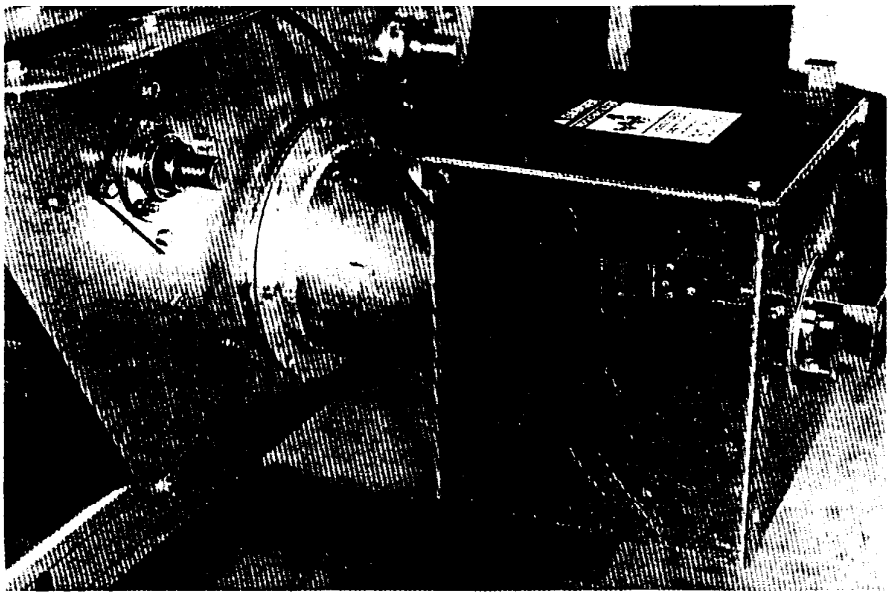


Figure 7
Auger Discharge With Switch

7. TO CLEAR JAMMED ROLLER

At this time, place a pipe wrench on the hub of the sprocket of the jammed metering roll and turn the roll, first backward and then forward several times in an attempt to dislodge the object and clear it through the roll. If this is not successful, have an assistant turn the metering roll and attempt to locate the jam by sound. Shut down the fan-heater and eliminate any other noise when making this check. Once the location is determined, access can be made to the roll from the outside by opening access door to remove foreign object (before opening doors see figure 8). The service tool must be inserted before opening doors. Before this can be done, swing open the plenum bottom closure panel. Insert service tool above meter roll.

SERVICE TOOL

THIS COLUMN CUT-OFF DAMPER IS DESIGNED TO INSERT THROUGH THE GRAIN COLUMN (FROM THE INSIDE OF THE DRYER) IMMEDIATELY ABOVE THE METER ROLL. THIS PERMITS OPENING OF THE METER ROLL ACCESS DOOR. FOR SERVICE OR INSPECTION WITHOUT UNLOADING DRYER THE PLENUM BOTTOM CLOSURE PANEL & METER ROLL ADJUST DAMPER MUST BE REMOVED PRIOR TO USING SERVICE TOOL.

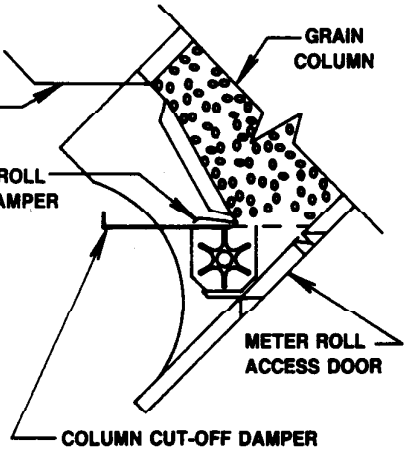
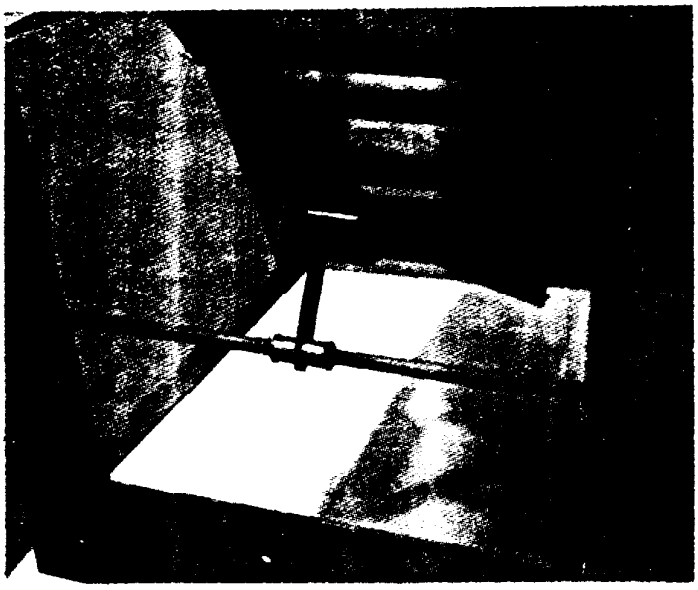


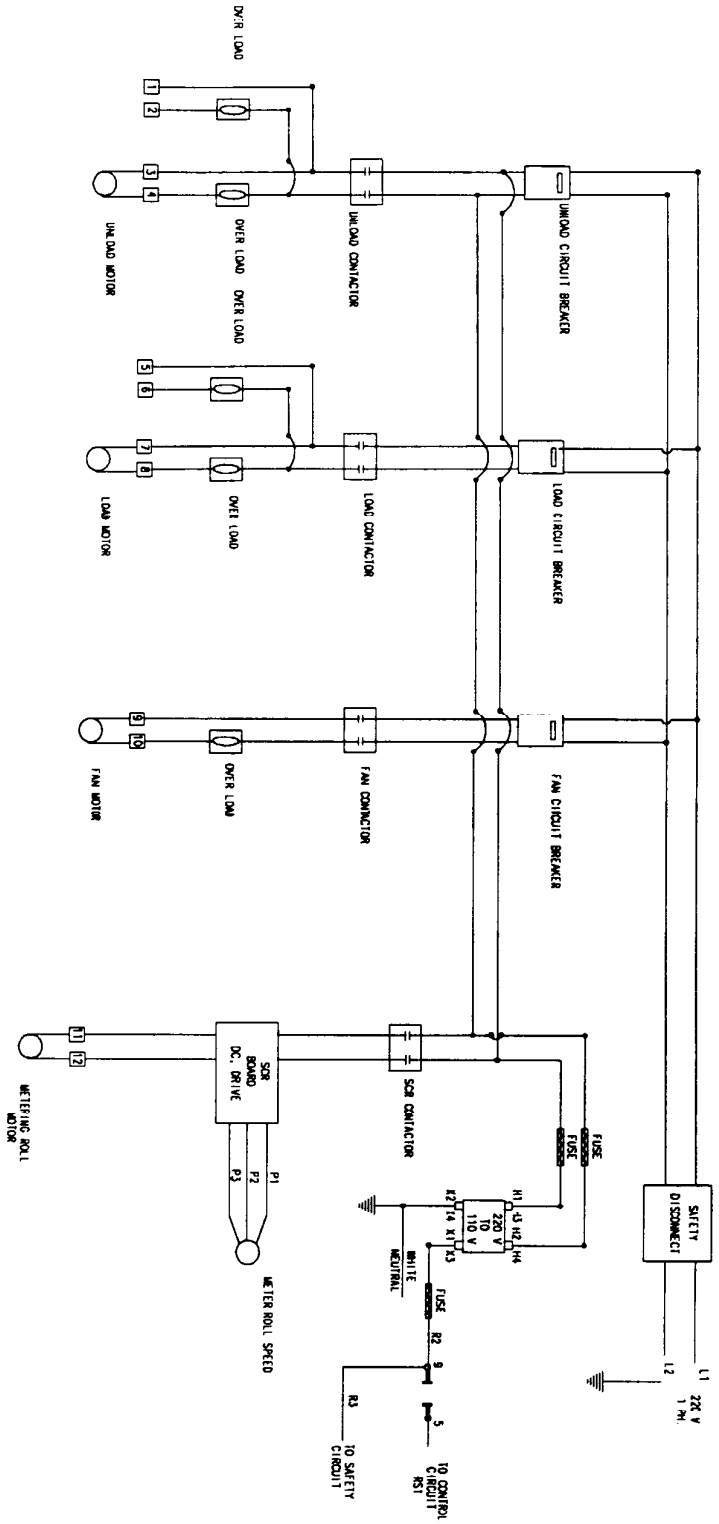
Figure 8 Service Tool Decal



Clean-Out Door Mechanism

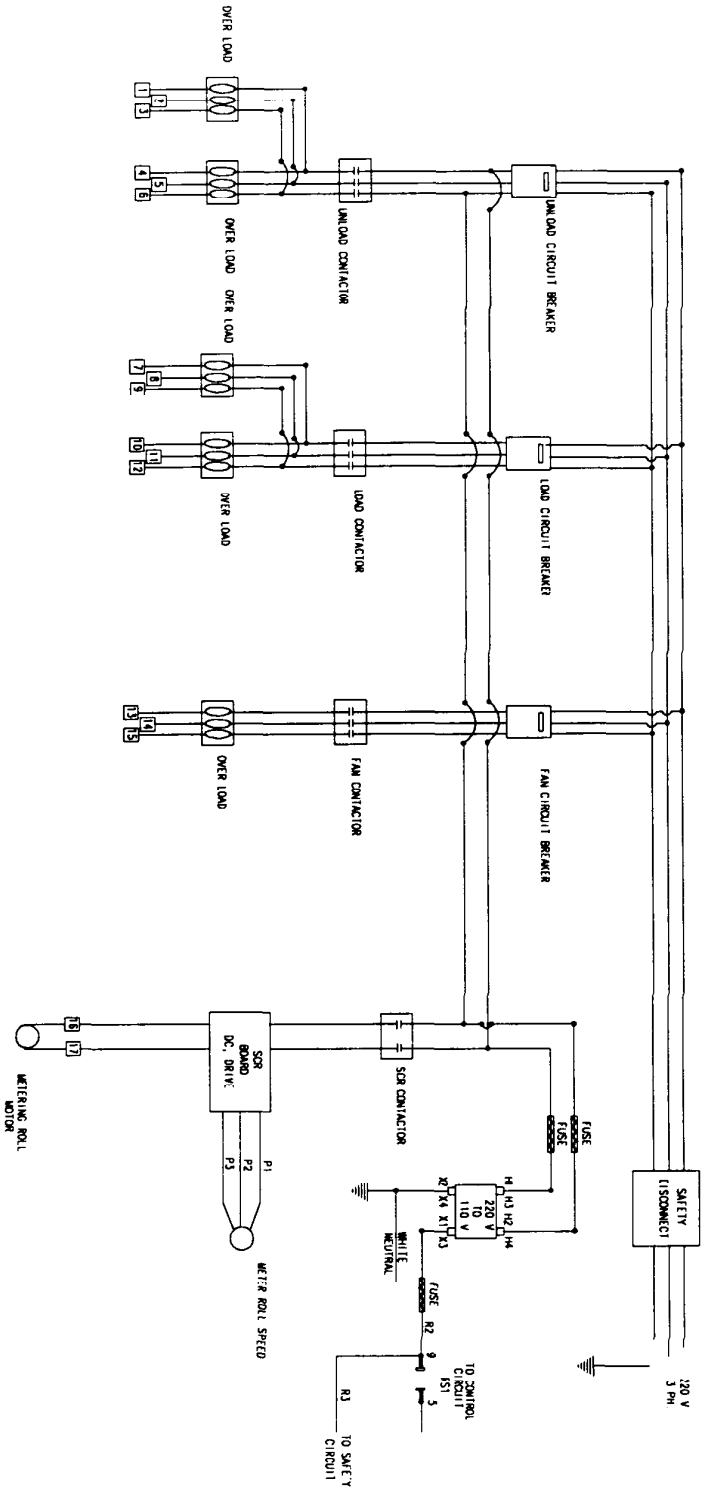
POWER WIRE CIRCUIT

(1 PH. 220 V.)



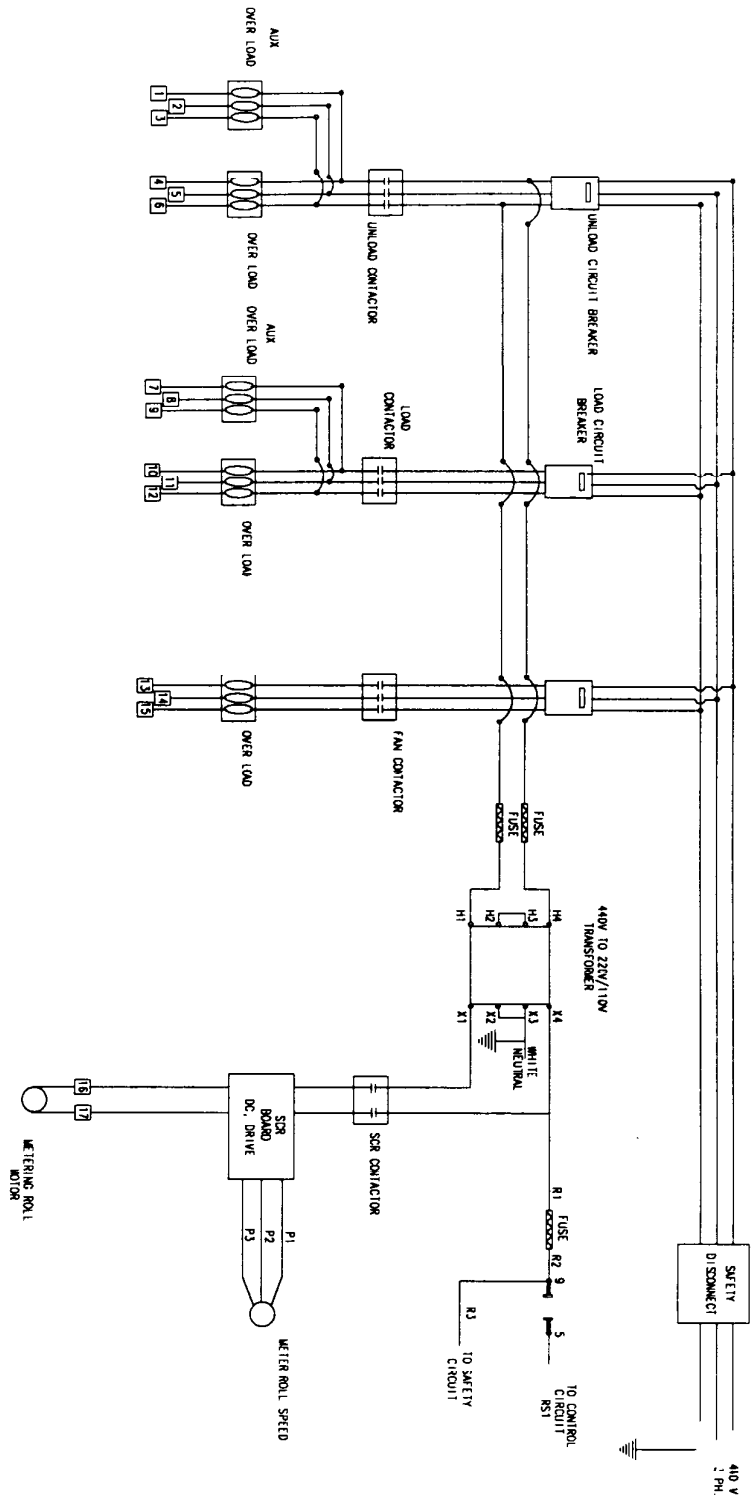
POWER WIRE CIRCUIT

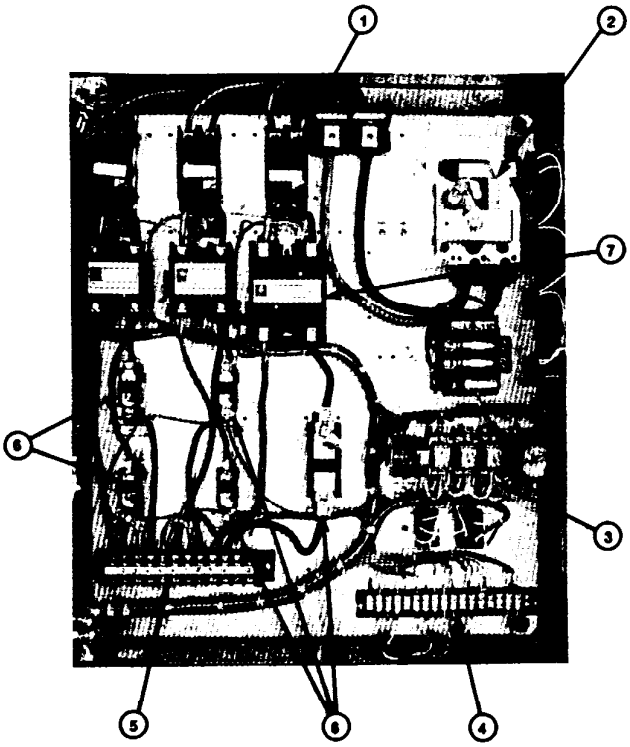
(3 PH. 220 V.)



POWER WIRE CIRCUIT

3 PH. 440V.

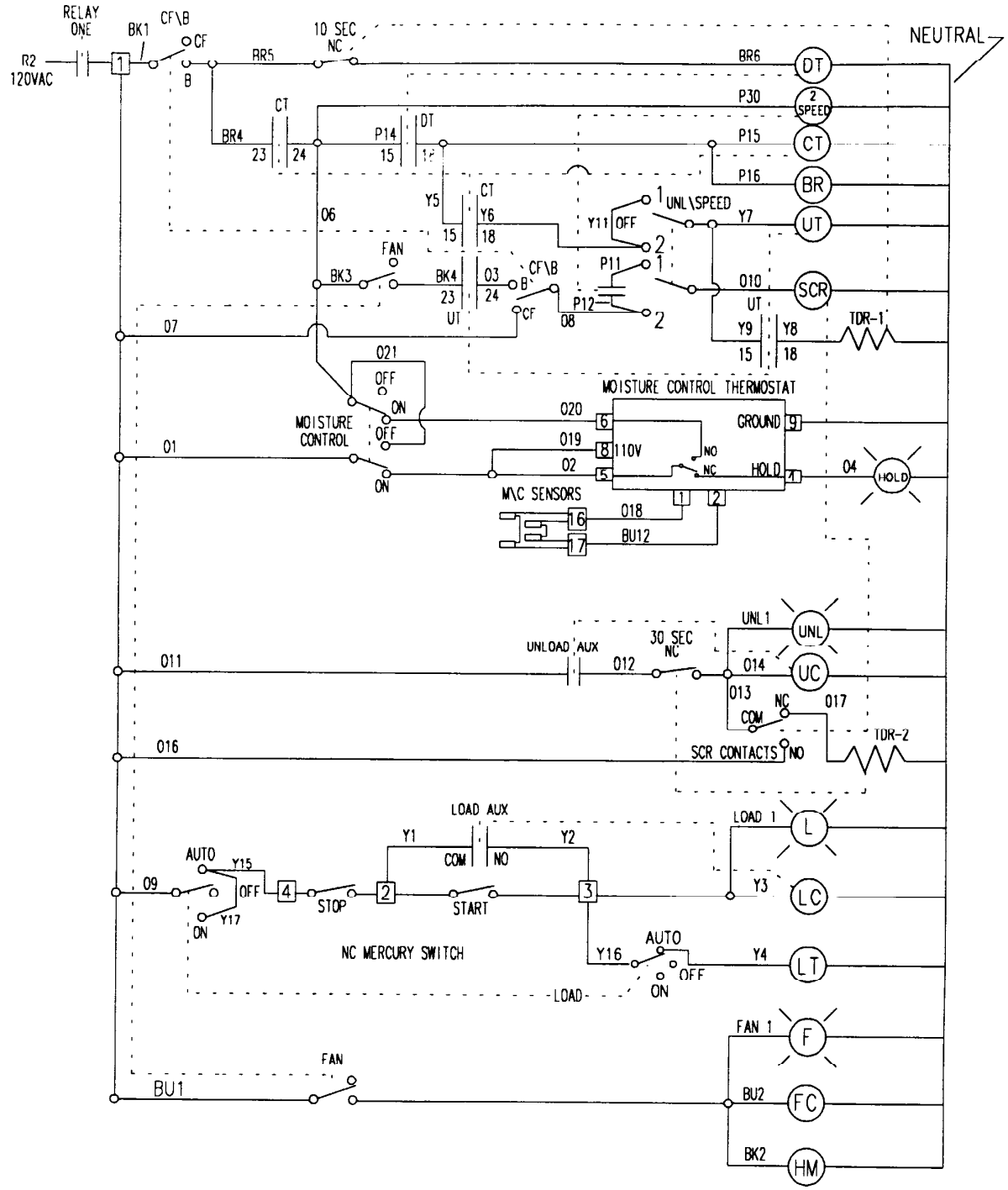




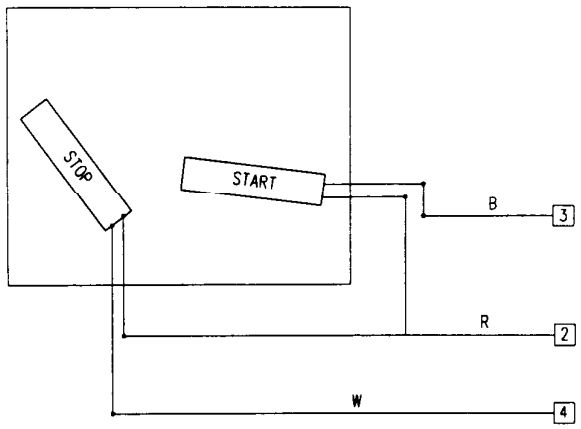
Control Box-Back Panel

1. Circuit Breakers
2. Safety Disconnect
3. R1 and Burner Relay
4. Control Terminal
5. Power Terminal
6. Overload Relays
7. Contactors

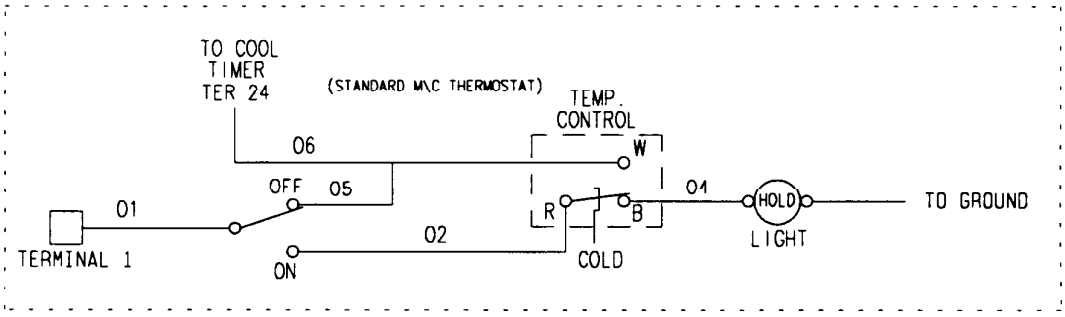
GENERAL CONTROL CIRCUIT



GENERAL CONTROL CIRCUIT



MERCURY SWITCH DETAIL



COLOR CODE

BK-BLACK
BR-BROWN
BU-BLUE
O-ORANGE
P-PURPLE
R-RED
W-WHITE
Y-YELLOW

ABBREVIATED TERMS

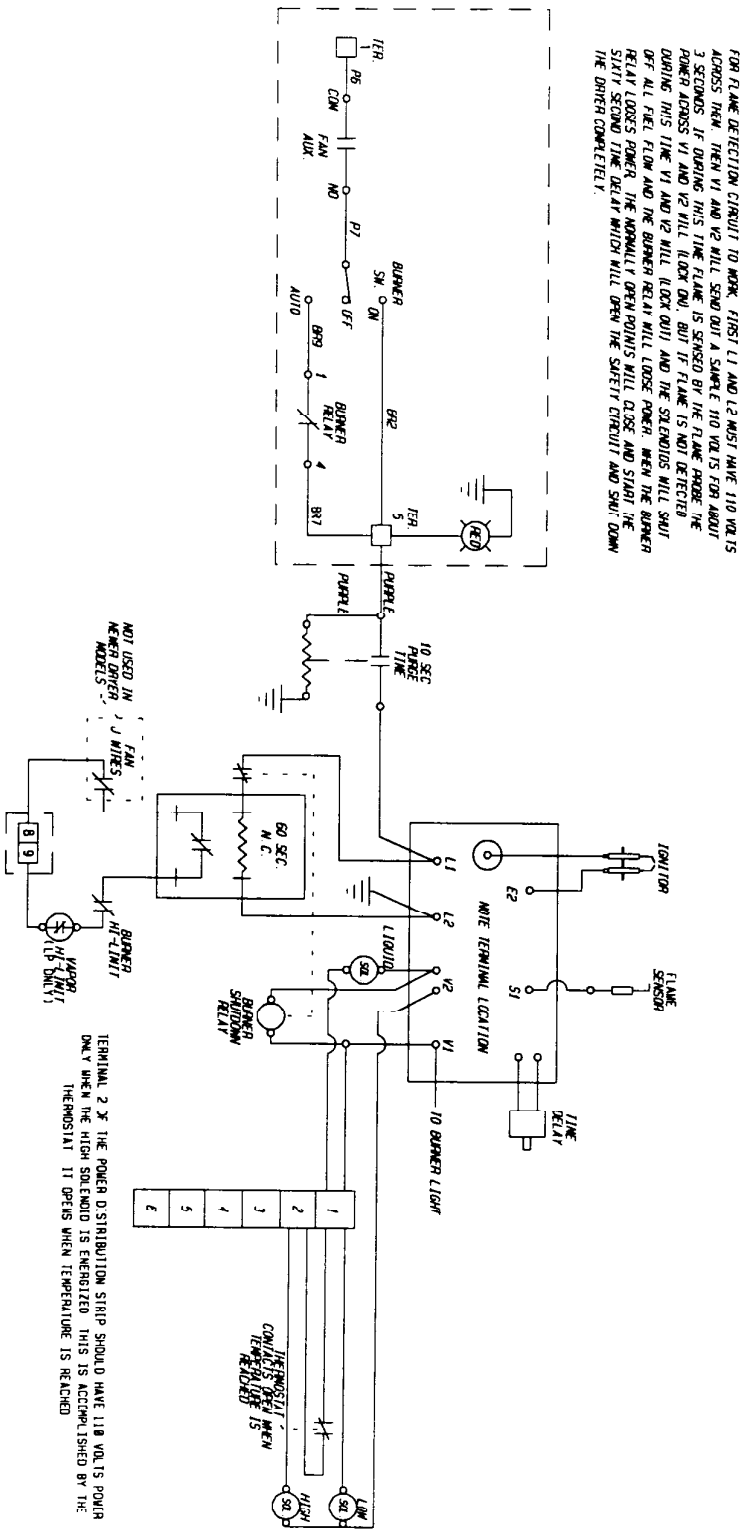
DT-DRY TIMER
CT-COOL TIMER
BR-BURNER RELAY
UT-UNLOAD TIMER
SCR-SCR COIL
2 SPEED-2 SPEED RELAY COIL
HOLD-HOLD LIGHT
TDR-1-10 SEC NC RELAY
UNL-UNLOAD
UC-UNLOAD COIL
LC-LOAD COIL
LT-LOAD TIMER
F-FAN
FC-FAN COIL
HM-HOUR METER
TDR-2-30 SEC NC RELAY
FR-FAN RELAY

TIMER CONTACT INFORMATION

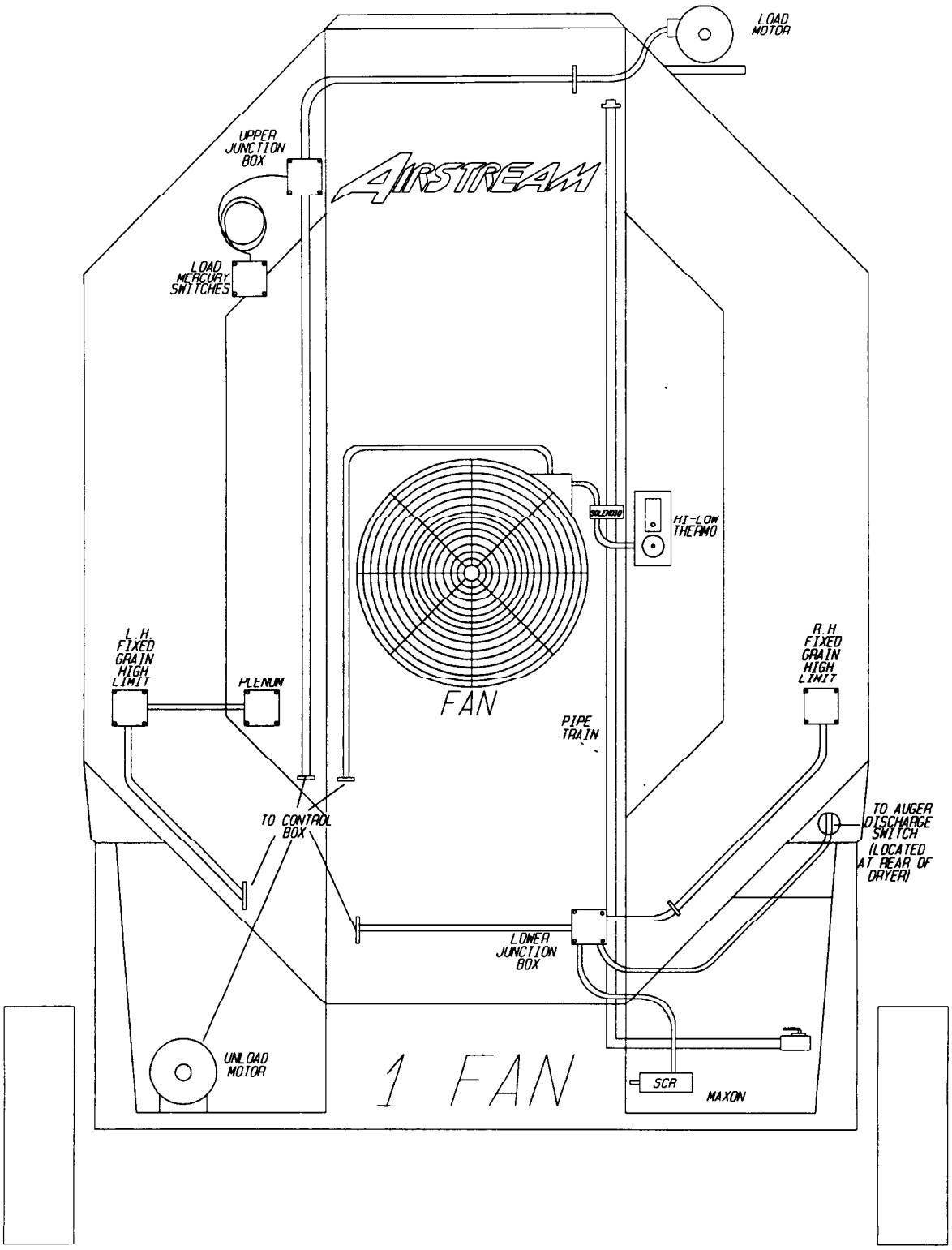
TERMINALS 23&24 CLOSE INSTANTLY WHEN POWER IS APPLIED TO TIMER

TERMINALS 15&18 CLOSE WHEN TIME HAS EXPIRED ON TIMER

BURNER CONTROL CIRCUIT



COMPONENT LOCATION



TROUBLE ANALYSIS PROCEDURE

A voltmeter is required for some of the following check-out procedures. Before performing any tests, make certain if the dryer power supply is 1 phase, 230 volt, or 3 phase, 230 volt.

The burner control circuit is 115 volts on all standard U.S. production dryers.

The general control circuit and safety circuit are 115 volt on all model dryers. When checking these circuits, measure voltage between the circuit test location and to ground.

Refer to wiring diagrams and parts list for identification of parts and electrical terminals.

CAUTION: When making high voltage tests with "live" circuits, be extremely careful. . . follow established safey practices. Turn power ON for testing only. DO NOT ATTEMPT TO MAKE THE DRYER OPERATE BY USING A JUMPER WIRE TO BY-PASS A DEFECTIVE COMPONENT.

PROBLEM:	POSSIBLE CAUSE:
CONTROL CIRCUIT NOT ENERGIZED- Panel light and shut-down indicator light OFF.	1. **POWER SUPPLY:** Check that MAIN POWER SUPPLY and CIRCUIT BREAKERS are turned ON. Also check for tripped circuit breaker. 2. **FUSES:** Check for blown 5 amp fuses. POWER CIRCUIT diagram for location and number used. 3. **OVERLOAD RELAY:** Check for a tripped overload relay. 4. **STOP OR START SWITCHES:** Check for a defective STOP or START switch. Also check switch wiring connections. 5. **R1 RELAY:** Check for a defective R1 relay, relay base, or faulty wiring connections.
CONTROL CIRCUIT NOT ENERGIZED- Panel light OFF with shut-down indicator light ON.	1. **FAN THERMAL OVERLOAD:** The fan thermal overload device is the self-resetting type and is located within the windings of 1 phase fan motors to indicate excessive motor temperature. If the thermal overload causes dryer shut-down, check for voltage supply problems, or for a detective motor. If this type of problem exists, do not continue restarting and operating the dryer, as it may cause the motor to burn out. 2. **BURNER LOCK-OUT:** Burner lock-out is provided by the lock-out breaker which is a part of the burner control located within the Fan-Heater Control Box. If this safety control operates, check for an interruption in the fuel supply, or for a defective or improperly located flame switch. 3. **BURNER HI-LIMIT THERMOSTAT:** The Burner Hi-Limit Thermostat is mounted on the fan housing and is a fast acting device which monitors the temperature within the rear end of the fan-heater housing. Most dryers are equipped with a manual reset type thermostat which must be reset by hand before the dryer can be restarted. If the Burner Hi-Limit causes shut-down, check for inadequate airflow, as caused by blockage at air inlet, or fan motor failure.

PROBLEM:	POSSIBLE CAUSE:
	NOTE: In the event the dryer shuts down, the back-draft currents of hot air passing through the housing may cause the Burner Hi-Limit to trip open. 4. **HI-LIMIT THERMOSTAT INDICATOR LIGHT FIXED (non-adjustable) GRAIN HI-LIMIT THERMOSTATS:** The Grain Hi-Limit thermostat is a fixed temperature, automatic self-resetting type and acts to monitor the temperature of the grain within the dryer columns. If the grain temperature becomes excessive (approx. 210°F), the thermostats will automatically shut down the dryer. The left-hand column thermostat is located within a handy box on the front L-H side of the dryer. The thermostat has a long sensor tube which extends almost the full length to the grain column. 5. **GRAIN HI-LIMIT THERMOSTAT INDICATOR LIGHT ADJUSTABLE:** The thermostat is located within the control box. The averaging probe runs in the right hand grain column. If the grain temperature exceeds the set limit, the dryer will shut down. 6. **LOAD TIMER INDICATOR LIGHT**: The load timer is located within the dryer Control Box and is designed to automatically stop the dryer if it does not refill with grain within the selected time setting of the timer knob. If the load timer causes shut down of the dryer, it normally indicates the wet grain supply was either reduced, interrupted, or exhausted, or that the timer was improperly adjusted. 7. **PLENUM HI-LIMIT THERMOSTAT INDICATOR LIGHT :** This thermostat is a fixed temperature, automatic self-resetting type, and acts to monitor the drying air temperature within the air plenum chamber of the dryer. If thermostat causes shut down of the dryer, it indicates excessive drying temperature, usually due to improper burner adjustment or blocked airflow within dryer perforations. 8. **IMPROPER LIGHT OPERATION SHUT-DOWN DETECTOR:** In the event of a malfunction within the detector, or poor wiring connections within its leads, the unit will not prevent the dryer from operating, but will cause only improper action or indicator light. lights. If the dryer shuts down due to any of the above listed items can be restarted again without any of the indicator lights coming ON, or if any lights stay "ON" when the dryer is operating. it indicates improper operation of the unit. If this condition occurs, it is possible to continue operating the dryer and delay repairing the detector unit until a convenient time. When

PROBLEM:	POSSIBLE CAUSE:
	defective coils or improper wiring. Replace valve or valve coil if valve will not open with proper voltage applied. b. Inspect for a defective high vapor thermostat (LP Models only). Replace thermostat if its circuit is open (without overheated vapor). 3. FUEL SUPPLY: Inspect gas line piping, fuel strainer, burner venturi and orifice for possible obstructions. Clean parts, as required. 4. Check for 115 volts across L1 and L2 and across V1 and V2 on Fenwal Board.
BURNER WILL NOT FIRE - but gauge shows gas pressure	1. **FENWAL BOARD**: Check board for spark by removing ignition wire from board and holding an insulated handle screwdriver against the output terminal and 1/4" away from the case. There should be a strong spark. Check board wiring connections. Replace the Fenwal Board, if required. make sure board is properly grounded to heater housing. 2. **IGNITOR:** Check that ignitor plug is properly gapped to 1/8" and has a strong spark. Inspect ignition wire and its connections. Make sure wire is not shrted or broken. Check ignitor for damaged electrodes or cracked insulator. Replace or clean and service ignitor, as required.
BURNER OPERATES - but will not cycle from Lo-Fire to Hi-Fire	1. Check for an excessive Lo-Fire gas adjustment setting. Observe pressure shown on guage and compare reading with recommended flow control valve pressure setting listed in this manual. Readjust Lo-Fire setting on flow control valve, if desired. 2. Check for improperly adjusted or defective Hi-Lo Fire thermostat control. Temporarily increase the temperature setting. If heater will still not cycle, check for problem in control cord wires, connections or thermostat. The control cord should be connected to the R and B, so the switch will open on temperature rise. If burner will cycle to Hi-Fire with control cord wires connected together, the thermostat is faulty. 3. Check for improperly connected or faulty Hi-Fire gas vapor solenoid valve. Correct any poor connections or defective wiring. If wiring appears proper, problem may be caused by a burned-out valve coil or defective valve. Replace Hi-Fire solenoid valve, or its coil, if defective.
BURNER OPERATES - but will not cycle from Hi-Fire to Lo-Fire	1. Check gas pressure reading on gauge. Problem may be due to insufficient gas regulator setting. Temporarily decrease the Hi-Lo Fire thermostat setting to verify that thermostat will function and cause the burner to cycle. If burner will cycle at reduced thermostat setting, it indicates that problem was due to insufficient heat to satisfy

PROBLEM:	POSSIBLE CAUSE:
	defective coils or improper wiring. Replace valve or valve coil if valve will not open with proper voltage applied. b. Inspect for a defective high vapor thermostat (LP Models only). Replace thermostat if its circuit is open (without overheated vapor). 3. FUEL SUPPLY: Inspect gas line piping, fuel strainer, burner venturi and orifice for possible obstructions. Clean parts, as required. 4. Check for 115 volts across L1 and L2 and across V1 and V2 on Fenwal Board.
BURNER WILL NOT FIRE - but gauge shows gas pressure	1. **FENWAL BOARD**: Check board for spark by removing ignition wire from board and holding an insulated handle screwdriver against the output terminal and 1/4" away from the case. There should be a strong spark. Check board wiring connections. Replace the Fenwal Board, if required. make sure board is properly grounded to heater housing. 2. **IGNITOR:** Check that ignitor plug is properly gapped to 1/8" and has a strong spark. Inspect ignition wire and its connections. Make sure wire is not shrted or broken. Check ignitor for damaged electrodes or cracked insulator. Replace or clean and service ignitor, as required.
BURNER OPERATES - but will not cycle from Lo-Fire to Hi-Fire	1. Check for an excessive Lo-Fire gas adjustment setting. Observe pressure shown on guage and compare reading with recommended flow control valve pressure setting listed in this manual. Readjust Lo-Fire setting on flow control valve, if desired. 2. Check for improperly adjusted or defective Hi-Lo Fire thermostat control. Temporarily increase the temperature setting. If heater will still not cycle, check for problem in control cord wires, connections or thermostat. The control cord should be connected to the R and B, so the switch will open on temperature rise. If burner will cycle to Hi-Fire with control cord wires connected together, the thermostat is faulty. 3. Check for improperly connected or faulty Hi-Fire gas vapor solenoid valve. Correct any poor connections or defective wiring. If wiring appears proper, problem may be caused by a burned-out valve coil or defective valve. Replace Hi-Fire solenoid valve, or its coil, if defective.
BURNER OPERATES - but will not cycle from Hi-Fire to Lo-Fire	1. Check gas pressure reading on gauge. Problem may be due to insufficient gas regulator setting. Temporarily decrease the Hi-Lo Fire thermostat setting to verify that thermostat will function and cause the burner to cycle. If burner will cycle at reduced thermostat setting, it indicates that problem was due to insufficient heat to satisfy

PROBLEM:	POSSIBLE CAUSE:
	the original thermostat setting and increase gas regulator setting for additional heat output. Do not exceed the maximum pressure listed in this manual. 2. Hi-Lo Fire thermostat control may be defective. If burner still will not cycle to Lo-Fire after decreasing the thermostat, the problem may be due to a broken or kinked thermostat sensor tube. Observe reading on thermometer. Replace control assembly if it cannot be set to cause its switch to go to the open circuit position with normally hot air plenum temperatures. 3. If burner continues to operate on Hi-Fire, check the Hi-Fire gas solenoid valve for a stuck or blocked open condition, or for reversed gas pipe connections. THE SOLENOID VALVE MUST NOT ALLOW GAS FLOW WHEN ITS COIL IS NOT ENERGIZED.
BURNER MAINTAINS DESIRED DRYING TEMPERATURE - but cycles from Hi-Fire to Off (without going into Lo-Fire)	1. Make sure the flow control valve is not set completely closed. Valve must be adjusted open to provide the proper Lo-Fire gas pressure listed in this manual. 2. Check Lo-Fire solenoid valve for proper operation.

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