



AD-120i

Service Manual

American Dryer Corporation

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Retain This Manual in a Safe Place for Future Reference

This product embodies advanced concepts in engineering, design, and safety. If this product is properly maintained, it will provide many years of safe, efficient, and trouble free operation.

Only qualified technicians should service this equipment.

OBSERVE ALL SAFETY PRECAUTIONS displayed on the equipment or specified in the installation manual included with the dryer.

The following "FOR YOUR SAFETY" caution must be posted near the dryer in a prominent location.

FOR YOUR SAFETY

Do not store or use gasoline or other flammable vapors and liquids in the vicinity of this or any other appliance.

POUR VOTRE SÉCURITÉ

Ne pas entreposer ni utiliser d'essence ni d'autres vapeurs ou liquides inflammables à proximité de cet appareil ou de tout autre appareil.

We have tried to make this manual as complete as possible and hope you will find it useful. The manufacturer reserves the right to make changes from time to time, without notice or obligation, in prices, specifications, colors, and material, and to change or discontinue models. The illustrations included in this manual may not depict your particular dryer exactly.

IMPORTANT

For your convenience, log the following information:

DATE OF PURCHASE _____ MODEL NO. AD-120i

RESELLER'S NAME _____

SERIAL NUMBER(S) _____

Replacement parts can be obtained from your reseller or the ADC factory. When ordering replacement parts from the factory, you can FAX your order to ADC at (508) 678-9447 or telephone your order directly to the ADC Parts Department at (508) 678-9000. Please specify the dryer model number and serial number in addition to the description and part number, so that your order is processed accurately and promptly.

The illustrations on the following pages may not depict your particular dryer exactly. The illustrations are a composite of the various dryer models. Be sure to check the descriptions of the parts thoroughly before ordering.

"IMPORTANT NOTE TO PURCHASER"

Information must be obtained from your local gas supplier on the instructions to be followed if the user smells gas. These instructions must be posted in a prominent location near the dryer.

IMPORTANT

You must disconnect and lockout the electric supply and the gas supply or the steam supply before any covers or guards are removed from the machine to allow access for cleaning, adjusting, installation, or testing of any equipment per OSHA standards.

Please observe all safety precautions displayed on the equipment and/or specified in the installation manual included with the dryer.

CAUTION

Dryer(s) should never be left unattended while in operation.

“Caution: Label all wires prior to disconnection when servicing controls. Wiring errors can cause improper operation.”

«Attention: Lor des opérations d'entretien des commandes étiqueter tous fils avant de les déconnecter. Toute erreur de câblage peut être une source de danger et de panne.»

WARNING

Children should not be allowed to play on or near the dryer(s). Children should be supervised if near dryer(s) in operation.

Under no circumstances should the dryer door switch(es), lint door/drawer switch(es), or heat safety circuit(s) ever be disabled.

The dryer must never be operated with any of the back guards, outer tops, or service panels removed. Personal injury or fire could result.

The dryer must never be operated without the lint filter/screen in place, even if an external lint collection system is used.

FOR YOUR SAFETY

Do not dry mop heads in the dryer. Do not use dryer in the presence of dry cleaning fumes.

The dryers must not be installed or stored in an area where it will be exposed to water and/or weather.

The wiring diagram for the dryer is located in the front electrical control box area.

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List of Acronyms

DSI	Direct Spark Ignition
in WC	Inches of Water Column
I/O	Input/Output
L.E.D.	Light Emitting Diode
L.P.	Liquid Propane
OSHA	Occupational Safety and Health Administration
S.A.F.E.	Sensor Activated Fire Extinguishing

Important Information

Safety Precautions

1. Do not store or use gasoline or other flammable vapors and liquids in the vicinity of this or any appliance.
2. Purchaser and user should consult the local gas supplier for proper instructions to be followed in the event the user smells gas. The instructions should be posted in a prominent location.
3. Dryers must be exhausted to the outdoors.
4. Although ADC produces a very versatile dryer, there are some articles that, due to fabric composition or cleaning method, should not be dried in it.

⚠ WARNING

Dry only water washed fabrics. Do not dry articles spotted or washed in dry cleaning solvents, a combustible detergent or "all purpose" cleaners. EXPLOSION COULD RESULT.

Do not dry rags or articles coated or contaminated with gasoline, kerosene, oil, paint, or wax. EXPLOSION COULD RESULT.

Do not dry mop heads. Contamination by wax or flammable solvents will create a fire hazard.

Do not use heat for drying articles that contain plastic, foam, sponge rubber, or similarly textured rubber materials. Drying in a heated tumbler may damage plastics or rubber and may be a fire hazard.

5. A program should be established for the inspection and cleaning of the lint in the burner area and exhaust ductwork. The frequency of inspection and cleaning can best be determined from experience at each location.

⚠ WARNING

THE COLLECTION OF LINT IN THE BURNER/OVEN AREA AND EXHAUST DUCTWORK CAN CREATE A POTENTIAL FIRE HAZARD.

6. For personal safety, the dryer must be electrically grounded in accordance with local codes and/or the National Electrical Code ANSI/NFPA NO. 70-LATEST EDITION or in Canada, the Canadian Electrical Codes Parts 1 & 2 CSA C22.1-1990 or LATEST EDITION.
7. Under no circumstances should the dryer door switch or heat circuit safety devices ever be disabled.

⚠ WARNING

PERSONAL INJURY OR FIRE COULD RESULT.

8. **READ AND FOLLOW all CAUTION AND DIRECTION LABELS ATTACHED TO THE DRYER.**

⚠ WARNING

Children should not be allowed to play on or near the dryer(s). Children should be supervised if near dryer(s) in operation.

Routine Maintenance

Cleaning

A program and/or schedule should be established for periodic inspection, cleaning, and removal of lint from various areas of the dryer, as well as throughout the ductwork system. The frequency of cleaning can best be determined from experience at each location. Maximum operating efficiency is dependent upon proper air circulation. The accumulation of lint can restrict this airflow. If the guidelines in this section are met, an ADC dryer will provide many years of efficient, trouble free, and most importantly safe operation.

⚠ WARNING

Lint from most fabrics is highly combustible. The accumulation of lint can create a potential fire hazard.

IMPORTANT: Dryer produces combustible lint and must be exhausted to the outdoors. Every 6 months, inspect the exhaust ducting and remove any lint build up.

Suggested Cleaning Schedule

Daily

Clean lint from the lint screen. Inspect and replace if torn.

90 Days

Remove lint accumulation from lint chamber thermostats and sensors. Remove lint from the motor air vents and surrounding area.

⚠ WARNING

TO AVOID THE HAZARD OF ELECTRICAL SHOCK, DISCONTINUE ELECTRICAL SUPPLY TO THE DRYER.

IMPORTANT: Lint accumulation will restrict internal motor airflow, causing overheating and irreparable motor damage. Motor failure due to lint accumulation will VOID THE WARRANTY.

120 Days

Remove lint from gas burner area with a dusting brush or vacuum cleaner attachment.

6 Months

Inspect and remove lint accumulation in the customer furnished exhaust ductwork system. Inspect exhaust draft dampers to ensure they are not binding. Inspect and remove all lint accumulation from in and around control box area including coin acceptors. Clean lint accumulation from around tumbler wrapper area.

IMPORTANT: THE ACCUMULATION OF LINT IN THE EXHAUST DUCTWORK CAN CREATE A POTENTIAL FIRE HAZARD.

As Required

In the cleaning and care of the cabinet, avoid using harsh abrasives. A product intended for the cleaning of appliances is recommended.

Adjustments

7 Days After Installation and Every 6 Months Thereafter

Inspect bolts, nuts, screws (bearing setscrews), nonpermanent gas connections, and grounding connections (unions, shutoff valves, and orifices). Motor and drive belts should be examined. Cracked or seriously frayed belts should be replaced. Tighten loose belts when necessary, and check belt alignment. Complete operational check of controls and valves. Complete operational check of all safety devices (door switches, sail switch, burner and lint chamber thermostats).

Lubrication

The motor bearings and the tumbler bearing are permanently lubricated, and no lubrication is necessary.

Installation Requirements

Installation should be performed by competent technicians in accordance with local and state codes. In the absence of these codes, the installation must conform to applicable American National Standards: ANSI Z223.1-LATEST EDITION (National Fuel Gas Code) or ANSI/NFPA NO. 70-LATEST EDITION (National Electrical Code) or in Canada, the installation must conform to applicable Canadian Standards: CAN/CGA-B149.1-M91 (Natural Gas) or CAN/CGA-B149.2-M91 (L.P. Gas) or LATEST EDITION (for General Installation and Gas Plumbing) or Canadian Electrical Codes Parts 1 & 2 CSA C22.1-1990 or LATEST EDITION (for Electrical Connections).

Enclosure, Air Supply, and Exhaust Requirements

NOTE: The following information is very brief and general. For a detailed description refer to the installation booklet for non-coin dryers.

Bulkheads and partitions around the dryer should be made of noncombustible materials. Allowances should be made for the opening and closing of the control door and lint door. Also, allowances should be made in the rear for ease of maintenance. (Refer to installation manual for recommended distances and minimum allowances required.)

When the dryer is operating, it draws in room air, heats it, passes the air through the tumbler, and exhausts it out the building. Therefore, the room air must be continually replenished from the outdoors. If the make-up air is inadequate, drying time and drying efficiency will be adversely affected. Ignition problems and sail switch "fluttering" problems on gas dryers may result, and you also could have premature motor failure from overheating. On electric dryers, premature electric element failure may result. Air supply must be given careful consideration to ensure proper performance of each dryer.

IMPORTANT: Make-up air must be provided from a source free of dry cleaning solvent fumes. Make-up air that is contaminated by dry cleaning solvent fumes will result in irreparable damage to the motors and other dryer components.

Exhaust ductwork should be designed and installed by a qualified professional. Improperly sized ductwork will create excessive back pressure, which will result in slow drying, increased use of energy, and shutdown of the burner by the airflow (sail) switch.

CAUTION: IMPROPERLY SIZED OR INSTALLED OR MAINTAINED (CLEANED) EXHAUST DUCTWORK CAN CREATE A POTENTIAL FIRE HAZARD.

Electrical and Gas Requirements

Electrical Requirements

It is your responsibility to have all electrical connections made by a properly licensed and competent electrician to assure that the electrical installation is adequate and conforms to local and state regulations or codes. In the absence of such codes, all electrical connections, materials, and workmanship must conform to the applicable requirements of the National Electrical Code ANSI/NFPA NO. 70-LATEST EDITION or in Canada, the Canadian Electrical Codes Parts 1 & 2 CSA C22.1-1990 or LATEST EDITION.

IMPORTANT: Failure to comply with these codes or ordinances, and the requirements stipulated in this manual, can result in personal injury or component failure.

It is your responsibility to have all plumbing connections made by a qualified professional to assure that the gas plumbing installation is adequate and conforms to local and state regulations or codes. In the absence of such codes, all plumbing connections, materials, and workmanship must conform to the applicable requirements of the National Fuel Gas Code ANSI Z223.1-LATEST EDITION, or in Canada, the Canadian Installation Codes CAN/CGA-B149.1-M91 (Natural Gas) or CAN/CGA-B149.2-M91 (L.P. Gas) or LATEST EDITION.

Gas Supply

The gas dryer installation must meet the American National Standard...National Fuel Gas Code ANSI Z223.1-LATEST EDITION, or in Canada, the Canadian Installation Codes CAN/CGA-B149.1 M91 (Natural Gas) or CAN/CGA-B149.2-M91 (L.P. Gas) or LATEST EDITION, as well as local codes and ordinances and must be done by a qualified professional.

NOTE: Undersized gas piping will result in ignition problems and slow drying and can create a safety hazard.

The dryer must be connected to the type of gas (natural or L.P.) indicated on the dryer data label. If this information does not agree with the type of gas available, do not operate the dryer. Contact the dealer who sold the dryer or contact ADC.

The gas input ratings shown on the dryer data label are for elevations up to 2,000 feet (609.6 meters), unless elevation requirements of over 2,000 feet (609.6 meters) were specified at the time the dryer order was placed with the factory. The adjustment for dryers in the field for elevations over 2,000 feet (609.6 meters) are made by changing the burner orifices. If this adjustment is necessary, contact the dealer who sold you the dryer or contact ADC.

NOTE: Any burner changes must be made by a qualified technician.

Operational Service Check Procedure

After performing any service or maintenance function, an operational check should be performed to ensure that all components are performing properly.

1. Make a complete operational check of all the operating controls to assure that the timing is correct, temperature selection switches are functioning, etc.
2. Make a complete operational check of all safety related circuits, door switch(es), hi-limit thermostat, sail switch, cycling thermostats, etc.
3. On gas models, gas pressure test should be taken at the gas valve pressure tap of each dryer to assure that the water column pressure is correct and consistent.

NOTE: Water column pressure requirements (measured at the gas valve pressure tap):

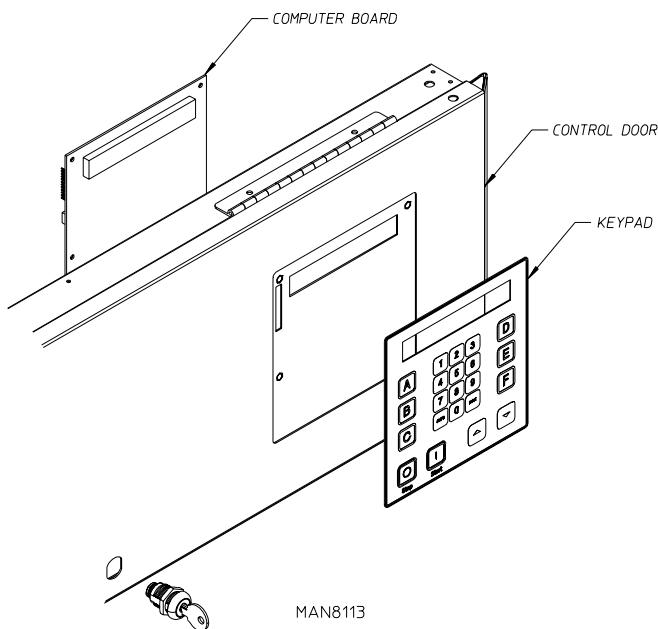
Natural Gas _____ 3.5 in WC (8.7 mb)
L.P. Gas _____ 10.5 in WC (26.1 mb)

4. The dryer should be operated through one (1) complete cycle to assure that no future adjustments are necessary and that all components are functioning properly.
5. For 3-phase (3Ø) motor models, check the electric service phase sequence while the dryer is operating. Check to see if the blower wheel is rotating in the proper direction. Looking from the front, the blower wheel should spin in the clockwise direction. If so, the phasing is correct. If the phasing is incorrect, reverse two (2) leads at connections L1, L2, L3 of power supply to the dryer.

Description of Parts

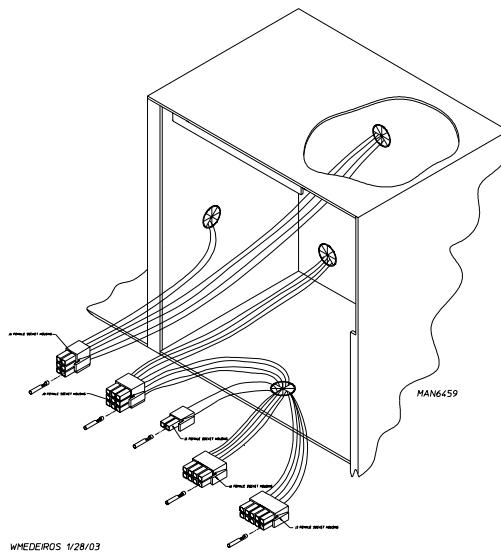
Control Panel (Microprocessor)

Opening the control panel will allow access to the computer board. The keypad inputs to the computer what temperature and program has been selected. The computer controls the entire operation of the dryer. It accepts inputs and gives outputs to various parts throughout the dryer.



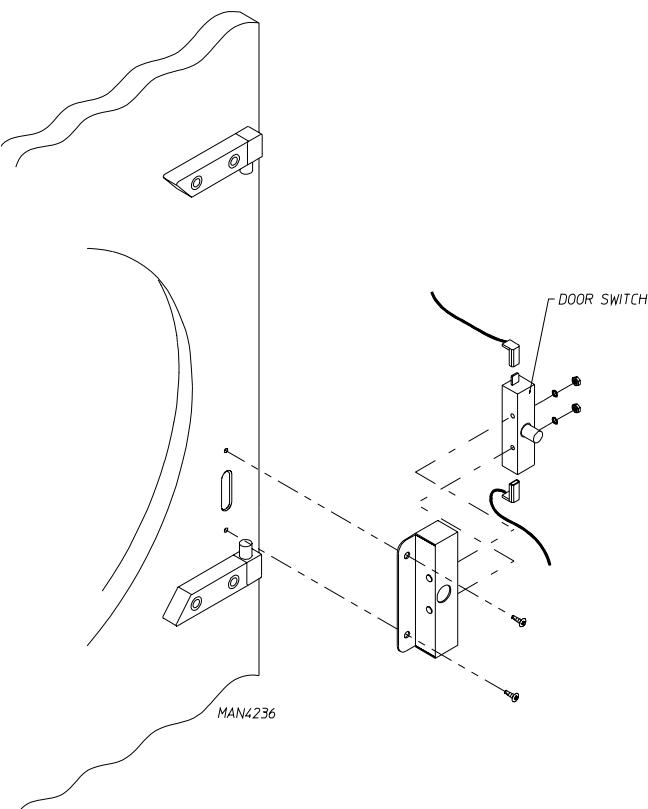
Control Box (Computer Controls)

The computer control box is made up of several computer harnesses. These harnesses provide input and output voltages to various devices throughout the dryer.



Main Door Switch

The main door switch is located behind the main door on the right hand side. When the main door is opened, the switch will also open, preventing the dryer from operating. The main door switch is a safety device and should never be disabled.

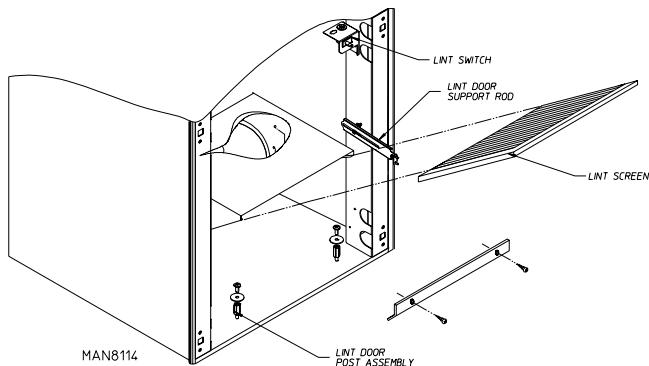


Lint Door Switch

The lint door switch is located in the lint compartment at the top right corner. The lint door switch ensures that the dryer will operate only when the lint door is completely closed. This is a safety device and should never be disabled.

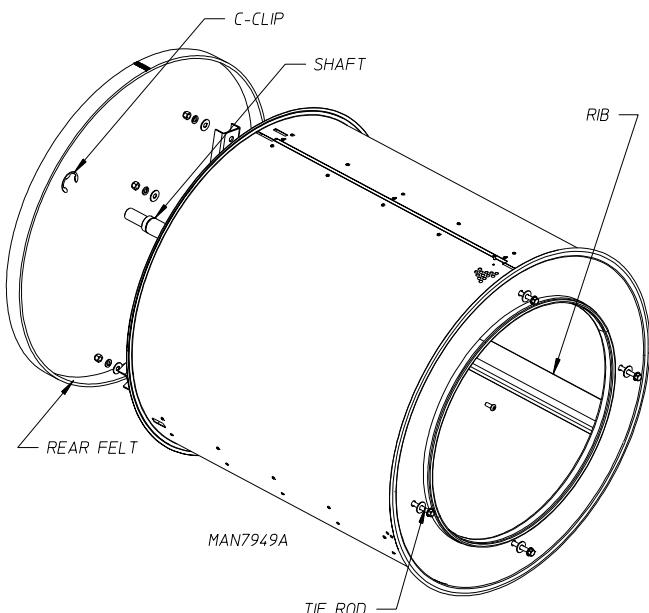
Lint Coop

The lint coop is the bottom portion of the dryer behind the lint door. Inside the lint coop is the lint screen which prevents lint from entering the exhaust system. The lint screen should be kept clean at all times. The lint screens should be cleaned on a daily basis. Lint screens with tears or holes should be replaced immediately.



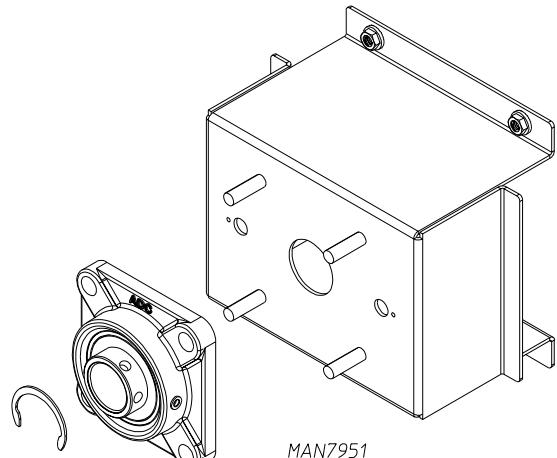
Tumbler

The tumbler consists of four (4) ribs, a shaft and a rear felt seal. The felt seal is used to keep the tumbler sealed to the rear panel. There are also tie rods, which run under each rib and secure the basket to the shaft.



Tumbler Bearing

The tumbler bearing is located (viewing from the rear of the dryer) approximately at the upper center of the dryer. The arrangement consists of a pulley, bearing platform, c-clip, and bearing, which serve to adjust, drive, and support the tumbler.

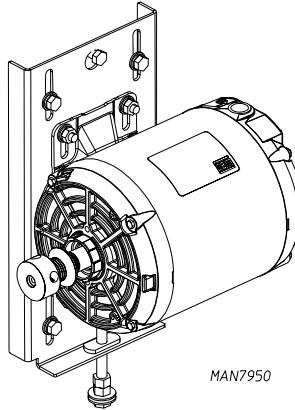


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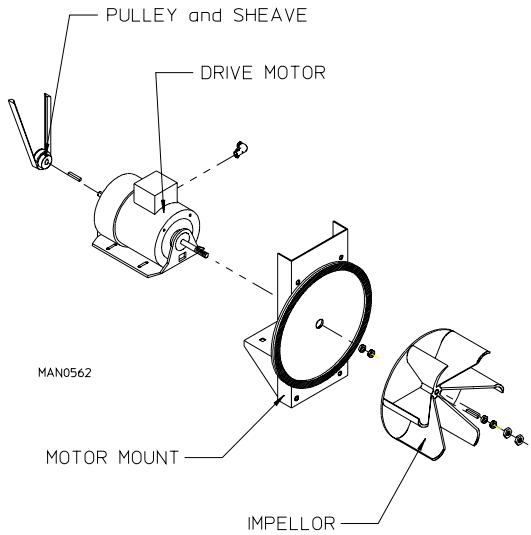
Drive Motor and Blower Motor

The drive motor is located at the back, lower left side of the dryer. It sits on an adjustable base, so that the motor can be easily adjusted up or down. The blower motor is connected to the impellor, a backward curved paddle wheel. The impellor provides airflow in the dryer. It creates a vacuum, which pulls the hot air from the burner into the tumbler through the lint screen and out the exhaust.

DRIVE MOTOR

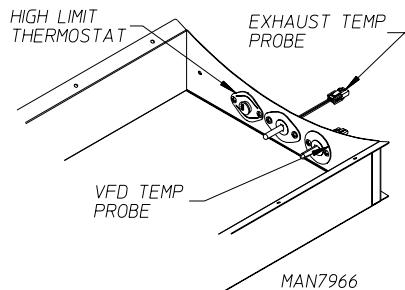


BLOWER MOTOR



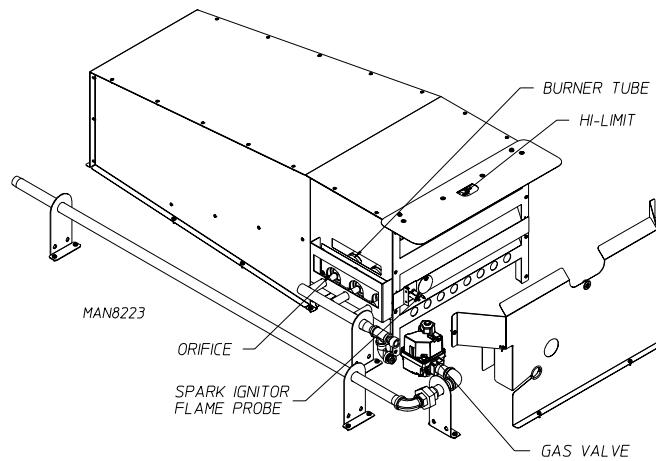
Temperature Sensor (Computer Controls)

The temperature sensor used, is a transducer that converts heat into microamps that the computer board then uses to calculate the temperature.



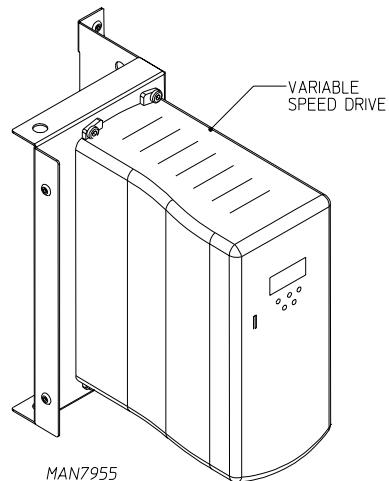
Gas Burner

Gas dryers are equipped with a gas burner located behind the control door. The gas burner assembly consists of the burner tubes, orifices (the orifices have a hole in them to allow gas to flow through. The hole size varies with different elevations, and different Btu), gas valve (which can be set up for natural gas or L.P. gas), spark ignitor, and flame probe.



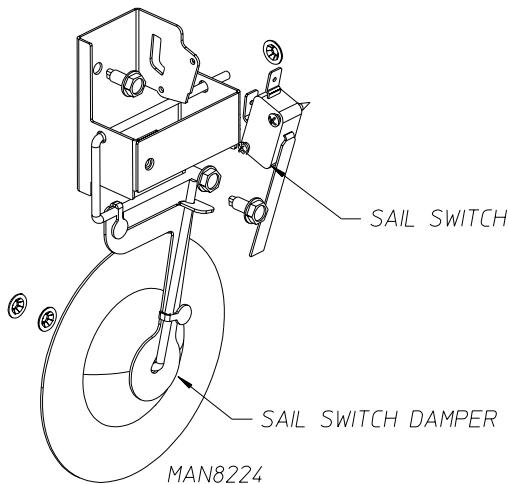
Variable Speed Drive

The dryer is equipped with a variable speed drive for the tumbler motor. The variable speed drive unit is located at the back of the machine just below the rear electrical panel. The variable speed drive has a temperature sensor, which monitors the temperature of the load and adjusts the speed of the motor to improve drying efficiency.



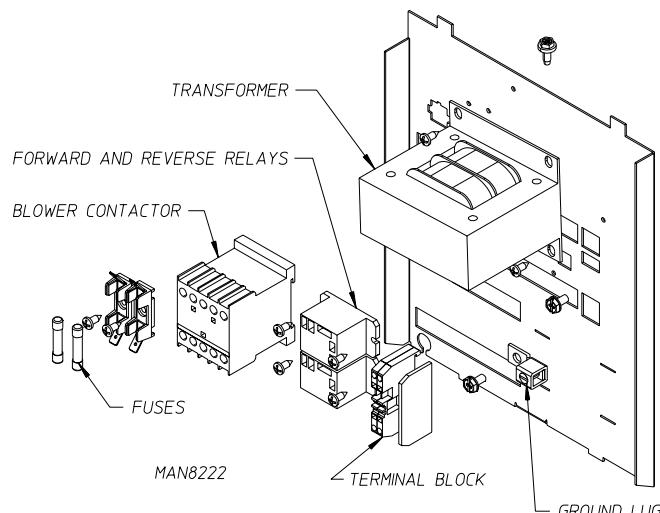
Sail Switch

The sail switch consists of a round damper plate on a lever arm, which acts like an actuator for a microswitch. When the air blower comes on, it draws air through the burner. This creates a negative pressure inside the burner box, and this negative pressure pulls in the round damper, which activates the sail switch. If there is improper airflow, the damper will not pull in, preventing the burner from coming on. Improper airflow can be caused by improperly designed exhaust ducting, where the duct run is too long or has too many sharp bends on it. It can also be caused by a lack of make-up air. The sail switch is located in the back of the dryer beside the burner inlet to the tumbler.



Rear Electrical Panel

This panel is located in the back of the dryer at the upper left hand corner. Mounted on this panel are the forward and reverse relays and blower contactor. The transformer steps down the incoming voltage to 24 VAC, to supply voltage to the computer and controls. There is also a fuse or fuses that protect the transformer and control circuits.



Servicing

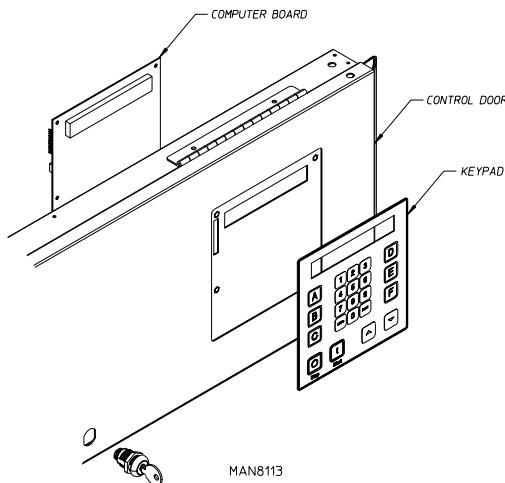
IMPORTANT: YOU MUST DISCONNECT AND LOCKOUT THE ELECTRIC SUPPLY AND THE GAS SUPPLY BEFORE ANY COVERS OR GUARDS ARE REMOVED FROM THE MACHINE TO ALLOW ACCESS FOR CLEANING, ADJUSTING, INSTALLATION, OR TESTING OF ANY EQUIPMENT PER OSHA STANDARDS.



The information provided in this section should not be misconstrued as a device for use by untrained persons making repairs. Service work should be performed by competent technicians in accordance with local, state, and federal codes. When contacting the factory for assistance, always have the dryer model number and serial number available.

CAUTION: Observe all safety precautions displayed on the dryer or specified in this manual before and while making repairs.

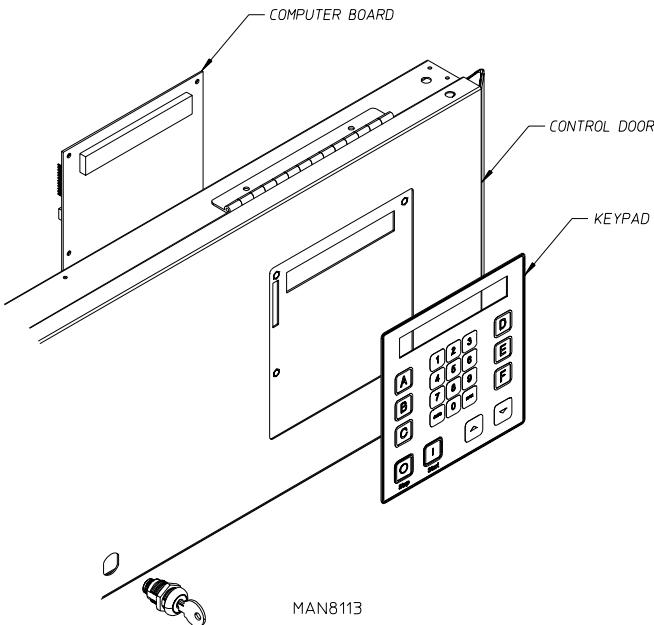
Before considering replacement, make sure that all connectors are in place and making proper contact. Check input voltages and temperature sensor. After replacing any parts, or performing adjustments or service, run through a complete cycle.



TO REPLACE COMPUTER

1. Discontinue power to the dryer.
2. Open control door.
3. Disconnect the J3, J4, J5, J6, and J8 harnesses from the rear of the computer by squeezing the top locking tab and pulling the connector straight back.
4. Disconnect the green ground wire and the purple wire from the computer.
5. Disconnect the keypad ribbon from the computer.
6. Remove the two (2) screws securing the computer to the control panel and remove computer from the panel, by pulling upwards on the corners.
7. Install the new computer by reversing this procedure.
8. Be sure to check or reset programs.

NOTE: Use caution when handling microprocessor controller. It can be easily damaged by static electricity.

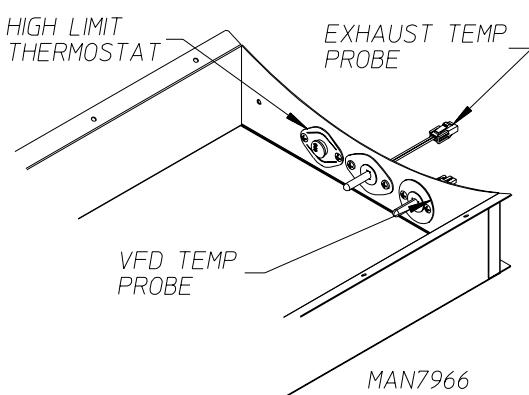


TO REPLACE KEYPAD (Refer to illustration above)

1. Discontinue power to the dryer.
2. Open the control door and unplug keypad ribbon from the computer board.
3. Peel the keypad from the front of the control door, taking care to avoid scratching the panel.
4. Clean any adhesive residue from the panel.
5. Peel off paper backing from new keypad.
6. Align the display window on the keypad, with the cutout in the control door and press in place.
7. Connect keypad ribbon to the board, close control door, and reconnect power to the dryer.
8. Test for operation by pressing each selection (A through F).

TO REPLACE COMPUTER TEMPERATURE SENSOR PROBES

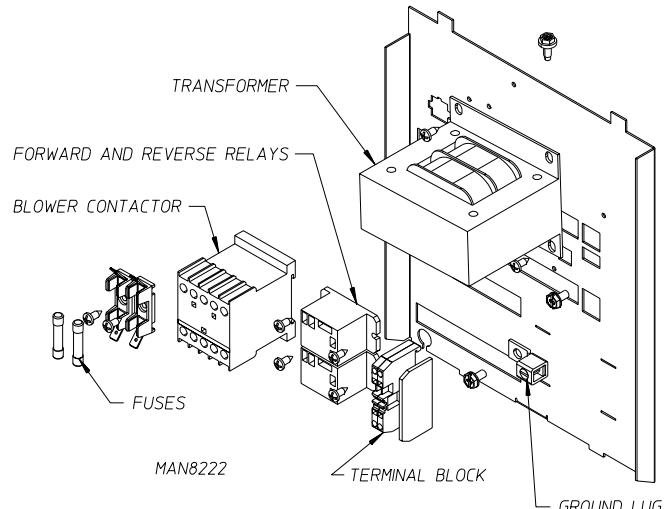
1. Discontinue power to the dryer.
2. Open lint door to gain access to sensors.
3. Remove the screws holding the sensor in place.



4. Disconnect sensor bracket harness connector.

5. Disassemble the sensor probe from the bracket assembly by removing the top push on fastener securing the probe to the bracket. Use a small screwdriver to slowly pry the fastener off.
6. Install new sensor probe assembly by reversing the procedure.
7. Reestablish power to dryer.

NOTE: If, when power is reestablished the computer display reads "exhaust probe fault", check for loose connection on the wiring.

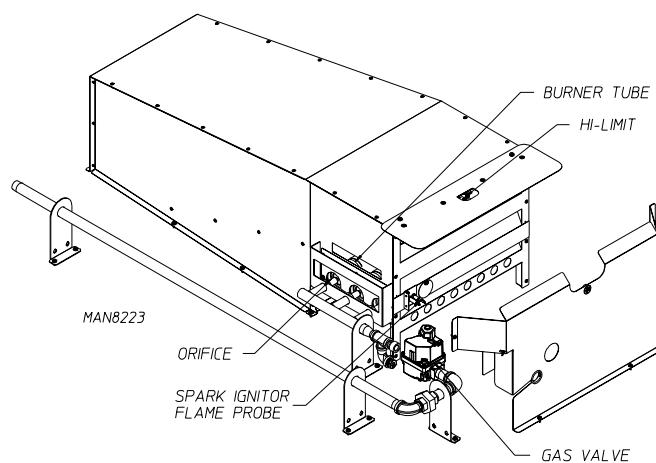


TO REPLACE BLOWER MOTOR CONTACTOR, 24 VAC

1. Discontinue power to the dryer.
2. Remove all wires from contactor (NOTE: make sure each wire is marked with location removed from).
3. Press down firmly on the contactor and shift towards the right, then pull contactor out.
4. Install the new contactor in reverse procedure.
5. Reestablish power to the dryer.

Burner Controls (Gas)

This illustration is typical of all gas burners, but they are not all exactly alike. Your particular model may have some differences.



TO REPLACE SPARK IGNITOR

1. Discontinue power to the dryer.
2. Disconnect high voltage connector from DSI module.
3. Disassemble ignitor from burner by removing the self-tapping screw.
4. Reverse procedure for installing the new ignitor probe.

NOTE: Before reestablishing power to the dryer, visually check the following: (refer to the illustration).

5. There should be a 1/8" gap (+/- 1/32) between the ignitor probe and the burner tube.
6. Do not wrap the red high voltage wire and flame-probe wire together. (Improper operation may result.) They may run along side each other.
7. Check to see that spark occurs on the open end of the burner tube and not the closed side. If this happens, adjust ignitor farther from the side of the tube.

TO REPLACE GAS VALVE

1. Discontinue power to the dryer.
2. Close shutoff valve in the gas supply line.
3. Disconnect the gas valve wiring.
4. Break union connection before gas valve.
5. Loosen and remove two (2) screws securing pipe bracket to the burner.
6. Remove gas valve/manifold assembly from the dryer.
7. Remove manifold from outlet of the gas valve.
8. Remove piping from valve.
9. Reverse procedure for installing the new gas valve.

⚠ WARNING

Test all connections for leaks by brushing on a soapy water solution (liquid detergent works well).

NEVER TEST FOR LEAKS WITH A FLAME!!!

TO REPLACE MAIN BURNER ORIFICE

1. Refer to "TO REPLACE GAS VALVE" and follow Step #1 through #6.
2. Unscrew main burner orifice and replace.

NOTE: Use extreme care when removing and replacing orifices. THESE ORIFICES ARE MADE OF BRASS, WHICH IS EASILY DAMAGED.

3. Reverse the removal procedure for reinstalling.

⚠ WARNING

Test all connections for leaks by brushing on a soapy water solution (liquid detergent works well).

NEVER TEST FOR LEAKS WITH A FLAME!!!

TO TEST AND ADJUST GAS (WATER COLUMN) PRESSURE

There are two (2) types of devices commonly used to measure water column pressure. They are spring/mechanical type gauges and manometers. The spring/mechanical type gauge is not recommended because it is easily damaged and not always accurate. A manometer is simply a glass or transparent plastic tube with a scale in inches, which when filled with water and pressure is applied, the water in the tube rises, showing the exact water column pressure.

NOTE: Manometers are available from the factory by ordering Part No. 122804.

1. To test gas water column pressure.

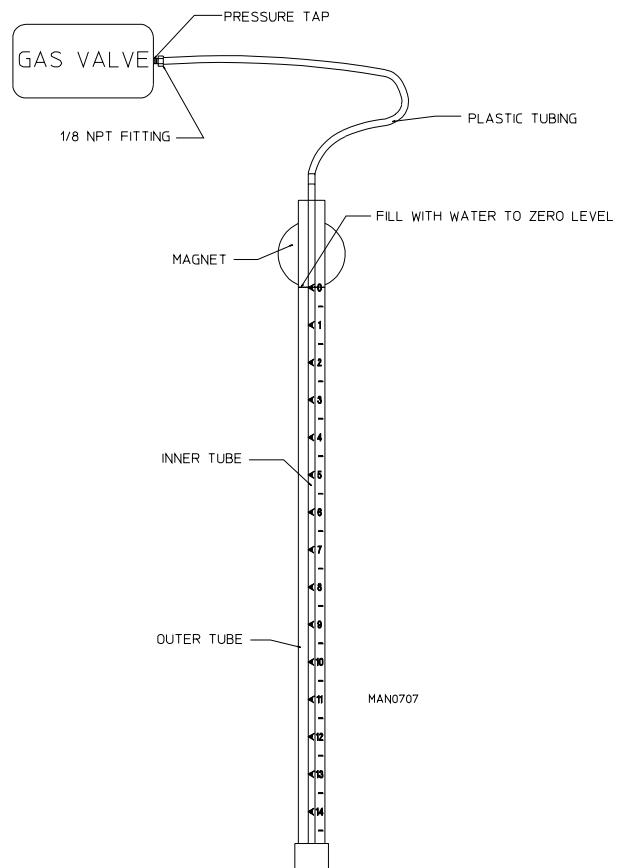
Connect water column test gauge connection to gas valve pressure tap (1/8" N.P.T.). This pressure tap is located on the outlet (downstream) side of the valve.

Start the dryer. With burner on, the correct water column reading in inches would be:

Natural Gas ____ 3.5 in WC (8.7 mb)
L.P. Gas ____ 10.5 in WC (26.1 mb)

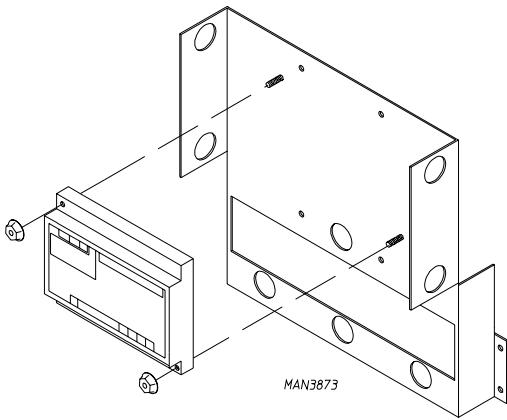
2. To adjust water column pressure for natural gas models, remove vent cap. Turn the slotted adjustment screw located on top of the valve next to the terminals. Turn clockwise to increase manifold pressure and counterclockwise to decrease. For L.P. gas models there is no regulator on valve.

NOTE: If correct water column pressure cannot be achieved, problem may be due to an undersized gas supply line, a faulty or underrated gas meter, etc.



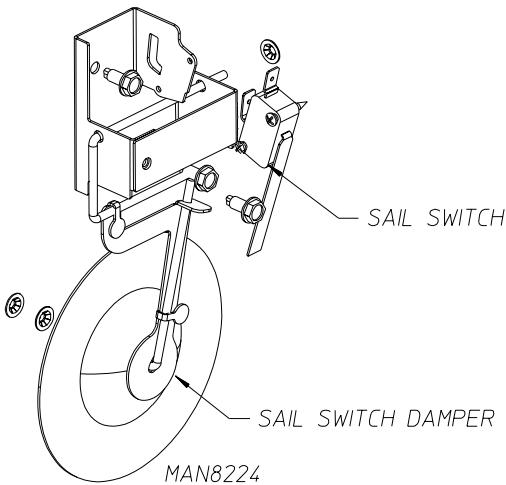
TO REPLACE DSI MODULE

1. Discontinue power to the dryer.
2. Remove the wires connected to the terminal strip at the top of the module, and wires connected on the side of the module.
3. Remove the high voltage wire from the module.
4. Remove the two (2) hex nuts securing the module to the module mounting bracket.
5. Replace module by reversing process.



TO REPLACE SAIL SWITCH

1. Discontinue power to the dryer.
2. Disconnect the two (2) wires from the switch.
3. Disassemble sail switch from mounting bracket by removing the two (2) screws securing the switch in place.
4. Reverse this procedure for installing the new sail switch. Adjust sail switch as described in the next section.



TO ADJUST SAIL SWITCH

1. Operate the installed dryer normally to verify that the heat system is fully operational.
2. Open the main dryer door.
3. Manually depress the door switch actuator.
4. While continuing to depress the door switch actuator, and with the door open, start the dryer.
5. If the heat system is not activated in 15-seconds, the sail switch is properly adjusted.
6. If the heat system is activated, the sail switch is improperly adjusted and must be readjusted by bending the actuator arm of the sail switch toward the front of the dryer. If the actuator arm is bent too far toward the front of the dryer, the dryer may not have heat when needed. After any adjustments of the sail switch, the above procedure must be repeated to verify proper operation.

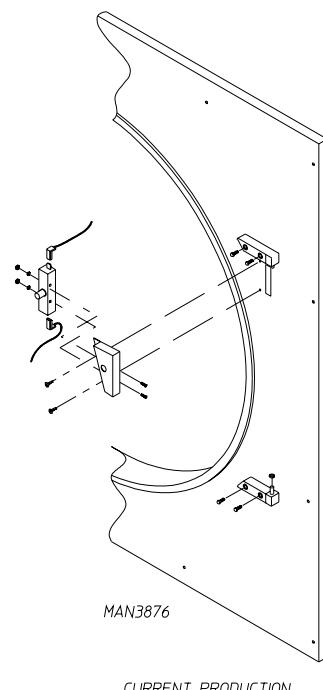
CAUTION: Do not disable this switch by taping or screwing sail switch damper to burner. Personal injury or fire could result.

Front Panel and Main Door Assemblies

TO REPLACE MAIN DOOR SWITCH

1. Discontinue power to the dryer.
2. Open the main door.
3. Remove the two (2) Phillips head screws holding the main door switch cover in place.
4. Remove the two (2) nuts and washers securing the switch to the door hinge, and take the switch off the two (2) clinch studs on the hinge.
5. Disconnect the two (2) wires on the door switch. Connect the new door switch to those two (2) wires.
6. Reverse this procedure for installing the new door switch.

IMPORTANT: Under no circumstances should the door switch be disabled.



CURRENT PRODUCTION

TO REPLACE MAIN DOOR ASSEMBLY

1. Remove screws holding main door upper hinge block.
2. Lift and remove door off of lower hinge block.
3. Reverse this procedure for reinstalling the new main door assembly.

TO INSTALL NEW MAIN DOOR GLASS

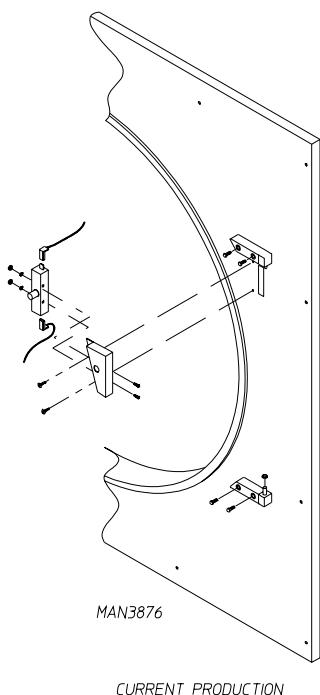
1. Remove main door assembly from the dryer (follow main door removal procedure).
2. Lay main door on a flat surface with front of door face down.
3. Remove glass and clean all old sealant off main door. This area must be completely cleaned for correct bonding.
4. Apply narrow bead of silicone all around main door area where glass will rest.
5. Install glass onto door/adhesive and slightly press glass in place.

IMPORTANT: Do not press hard or silicone thickness between the glass and door will be reduced resulting in poor bonding.

6. The door assembly should now be put in an area where it will not be disturbed for at least 24 hours. Depending on the conditions, the curing time of the adhesive is 24 to 36 hours.
7. After 24 hour curing period, install main door on dryer by reversing Step #1.

TO REPLACE FRONT PANEL

1. Discontinue power to the dryer.
2. Follow procedure for removal of main door assembly.
3. Open control (service) door and lint door.



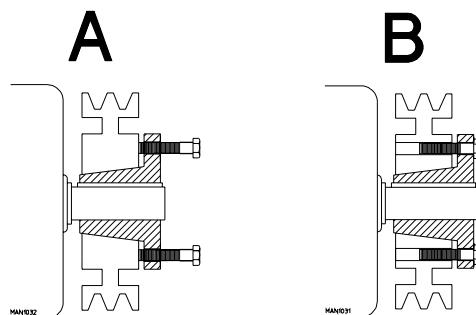
4. Remove the screws securing the front panel to the dryer at the top and bottom of the panel.
5. Gently remove the top right hand corner of the front panel assembly from the dryer.
6. Disconnect the main door switch harness at the connector.

IMPORTANT: When removing front panel assembly, be careful not to damage main door switch wires disconnected in Step #2.

7. Reverse this procedure for installing the new front panel.

TO REPLACE TUMBLER PULLEY

1. Loosen belt, then rotate pulley and roll belt out of the grooves.
2. Remove cap screws securing taper lock hub to pulley.
3. Insert cap screws in tapped removal holes and tighten evenly until bushing becomes loose in pulley. See figure "A".
4. Remove bushing, pulley, and key.



5. Assemble bushing and pulley as shown in figure "B". When cap screws are loosely inserted, bushing remains fully expanded to provide a sliding fit to the shaft.
6. Insert key on the shaft, then slide pulley to desired position with cap screw heads to the outside.
7. Tighten cap screws progressively. There remains a gap between the pulley hub and the flange of the bushing.

IMPORTANT: Tighten screws evenly and progressively. Never allow the pulley to be in contact with the flange of the bearing. This gap should measure from 1/8" to 1/4". Proper cap screw torque is 30 ft-lb (40.67 Nm), if greater tightening forces are applied, excess pressure will be created in the hub of the mounted pulley, which may cause it to crack.

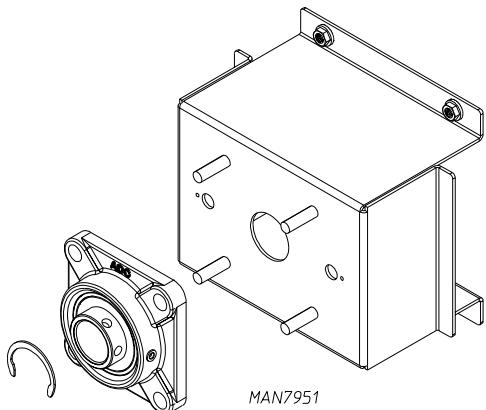
TO REPLACE THE TUMBLER BEARING

1. Remove the tumbler pulley (follow tumbler pulley removal procedure).
2. Remove the four (4) bolts securing the bearing to the plate.
3. Loosen Allen setscrews securing bearing to the shaft and remove C-clip from shaft.
4. Pull bearing off of shaft using a gear puller, if necessary.

NOTE: If any rust has developed, use an emery cloth to polish the shaft.

5. Reverse procedure for installing the new tumbler bearing.

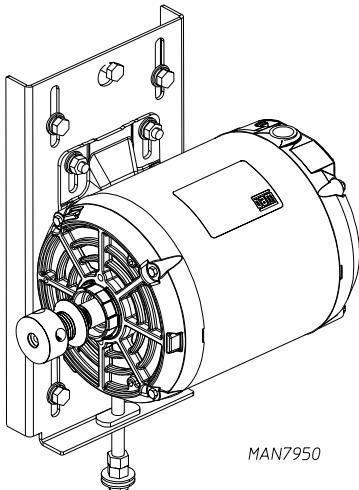
NOTE: Tighten bearing Allen screw from 80- to 90-inch pounds. Check alignment of pulleys before operating the dryer.



Drive Pulley

(Remove back guard to access assembly)

1. Remove the back guard.
2. Loosen belt then rotate pulley and roll belt out of the grooves.
3. Loosen setscrews and pull motor pulley out.



NOTE: If rust has developed on the shaft, use an emery cloth to polish the shaft.

4. Reverse procedure for installing the new drive pulley.

NOTE: Check tension and alignment of belt before operating the dryer.

TO REPLACE THE TUMBLER AND/OR TUMBLER SUPPORT

1. Discontinue power to the dryer.
2. Remove the tumbler pulley.
3. Remove the front panel assembly.
4. Loosen setscrews on rear tumbler bearing and remove C-clip.
5. Using a wheel puller, gently push the tumbler shaft towards the front through the tumbler bearing.

NOTE: An alternate method would be to place a block of wood on the end of the tumbler shaft and strike it with a heavy hammer. To prevent damage to the shaft, the wheel puller method is preferred.

6. Remove the tumbler and support through the front of the dryer.
7. Remove the bolt in the center of the tumbler back wall.
8. Loosen and remove the nuts and washers from the tumbler tie rods. Remove the rods.
9. After replacing either tumbler or tumbler support reassemble components into dryer by reversing Steps #1 through #4.
10. Check belt tension and alignment.
11. Replace the back guard and reestablish power to the dryer.

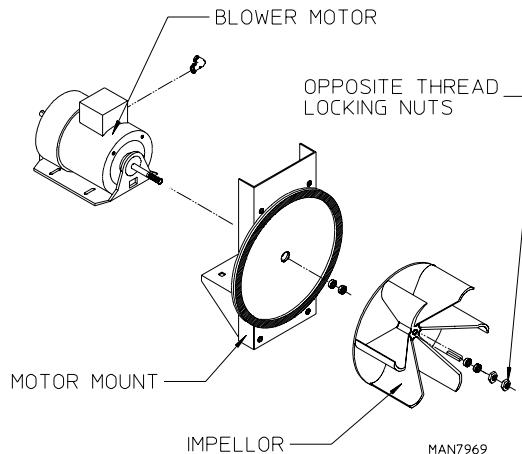
Motor

TO REPLACE DRIVE MOTOR

1. Discontinue power to the dryer.
2. Remove the drive belt.
3. Disconnect wiring harness from the motor.
4. Remove nuts and washers holding the motor mount to the rear of the dryer and pull motor mount away.
5. Remove the bolts holding the motor to the motor mount and replace it with a new motor.
6. Remove pulley from the old motor and install on the new motor.
7. Replace motor mount to the dryer.
8. Align and tension belt.

TO REPLACE BLOWER MOTOR

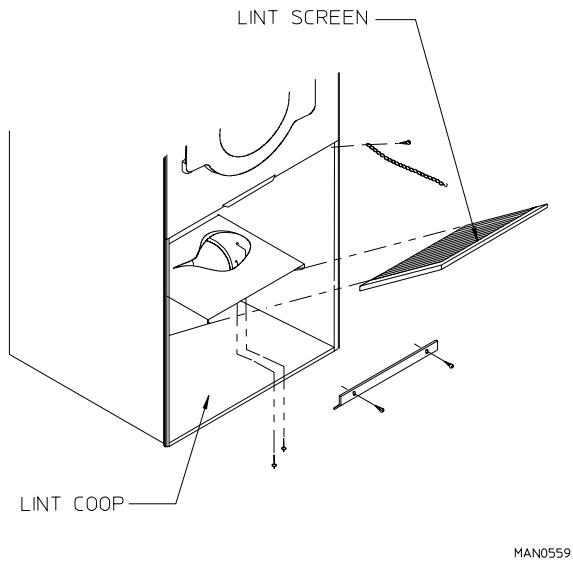
1. Discontinue power to the dryer.
2. Disconnect wiring harness from the motor.
3. Remove nuts and washers holding the motor mount to the rear of the dryer and pull motor mount away.
4. Remove the bolts holding the motor to the motor mount and replace it with a new motor.
5. Replace motor mount to the dryer.



Lint Drawer Screen

TO REPLACE LINT SCREEN

1. Open lint door and remove two screws holding lint screen retainer in place.
2. Remove the lint screen and inspect for rips or tears by sliding up and out of side tracks. Replace with new lint screen, if damaged.
3. Reverse procedure for installing the new lint bag.
4. Close the lint door.



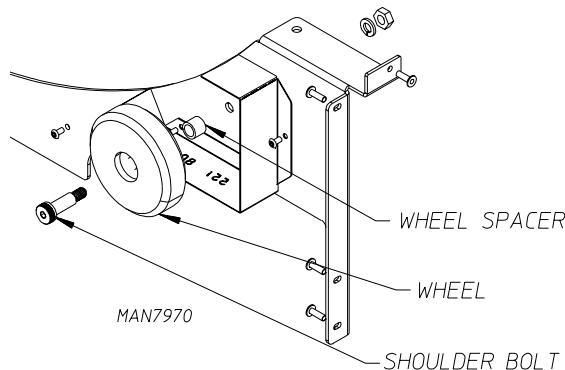
Front Support Rollers

TO REPLACE ROLLERS

1. Follow procedure "To Replace Front Panel Assembly".
2. Loosen and remove the bolt at the center of the wheel.
3. Remove wheel, belt and wheel spacer.
4. Slide bolt out of wheel.

NOTE: Do not lose brass wheel spacer.

5. Reverse procedure for installing new wheel.



Troubleshooting

The information provided will help isolate the most probable components associated with the difficulty described. The experienced technician realizes, however, that a loose connection or broken or shorted wire may be at fault where electrical components are concerned...not necessarily the suspect component itself.

Electrical parts should always be checked for failure before being returned to the factory.

The information provided should not be construed as a device for use by an untrained person in making repairs. Only properly licensed technicians should service the equipment.

Observe all safety precautions displayed on the equipment or specified in this manual while making repairs.

Phase 7 Non-Coin Microprocessor Controller (Computer) System Diagnostics

IMPORTANT: YOU MUST DISCONNECT AND LOCK OUT THE ELECTRIC SUPPLY AND THE GAS OR STEAM SUPPLY BEFORE ANY COVERS OR GUARDS ARE REMOVED FROM THE MACHINE, TO ALLOW ACCESS FOR CLEANING, ADJUSTING, INSTALLATION, OR TESTING OF ANY EQUIPMENT PER OSHA STANDARDS.

All major circuits, including the door, the Phase 7 non-coin microprocessor controller (computer) temperature sensor, and the heat and motor circuits are monitored. The Phase 7 non-coin microprocessor controller (computer) will inform the user, via the L.E.D. display of certain failure messages, along with L.E.D. indicators on the I/O board on the back panel of the front right control door.

Diagnostic (L.E.D. Display) Fault Messages

BURNER CONTROL FAULT – This routine monitors the gas return valve signal and compares it with the DSI purge time setting. If the gas return valve signal does not turn on before the DSI purge time expires, or if it turns on for less than 200 ms, the Phase 7 non-coin microprocessor controller (computer) will turn off the heat output, increase a counter, and wait the interpurge time before reattempting to ignite the burner. Once this fault condition occurs five (5) consecutive times, the Phase 7 non-coin microprocessor controller (computer) will interrupt the cycle and will display "BURNER CONTROL FAULT" and will go into a Fault Mode with a brief audio indication. If the tumbler temperature is above 100° F (38° C) at the time of the failure, the Phase 7 non-coin microprocessor controller (computer) will continue to display "BURNER CONTROL FAULT", while the dryer cools by running with no heat for 3 minutes or until the temperature drops below 100° F (38° C). If the tumbler temperature is below 100° F (38° C), or the 3 minutes expire, the Phase 7 non-coin microprocessor controller (computer) will shut off all outputs and will remain in Fault Mode until the dryer is addressed.

IGNITION FAULT – After the Phase 7 non-coin microprocessor controller (computer) receives a gas valve return for more than 200 ms signal within the DSI purge time, the Phase 7 non-coin microprocessor controller (computer) will begin a DSI proof time. The Phase 7 non-coin microprocessor controller (computer) will continue to recheck the gas valve return signal. If the signal is lost during the DSI proof time, the Phase 7 non-coin microprocessor controller (computer) will turn off the heat output and determine what the retry count is set at. If the retry count is greater than zero, the Phase 7 non-coin microprocessor controller (computer) will wait through the interpurge time and attempt to reignite the flame. If the failure condition occurs again, the Phase 7 non-coin microprocessor controller (computer) will retry until the retry count has been satisfied. Once the retry count has been satisfied, the Phase 7 non-coin microprocessor controller (computer) will interrupt the cycle and display “Ignition Fault” condition and go into a Fault Mode with a brief audio indication. If the tumbler temperature is above 100° F (38° C), the Phase 7 non-coin microprocessor controller (computer) will continue to display “Ignition Fault”, while the dryer cools by running with no heat for 3 minutes or until the temperature drops below 100° F (38° C). Once the tumbler temperature is below 100° F (38° C), or the 3 minutes expire, the Phase 7 non-coin microprocessor controller (computer) will shut off all outputs and will remain in Fault Mode until the dryer is addressed.

FLAME FAULT – After the Phase 7 non-coin microprocessor controller (computer) has verified that the gas valve signal was present throughout the DSI purge time and the DSI proof time, the Phase 7 non-coin microprocessor controller (computer) will continue to monitor the gas valve return signal. In the event that the gas valve return signal is lost anytime after the DSI proof time, the Phase 7 non-coin microprocessor controller (computer) will turn off the heat output and increase a counter. Once this fault condition occurs five (5) consecutive times, the Phase 7 non-coin microprocessor controller (computer) will interrupt the cycle, display “Flame Fault” condition, and go into a Fault Mode with a brief audio indication. If the tumbler temperature is above 100° F (38° C), the Phase 7 non-coin microprocessor controller (computer) will continue to display “Flame Fault”, while the dryer cools by running with no heat for 3 minutes or until the temperature drops below 100° F (38° C). Once the tumbler temperature is below 100° F (38° C), or the 3 minutes expire, the Phase 7 non-coin microprocessor controller (computer) will shut off all outputs and will remain in Fault Mode until the dryer is addressed.

BURNER PURGE FAULT – If the Phase 7 non-coin microprocessor controller (computer) detects the presence of the gas return signal before sending the heat signal out, the Phase 7 non-coin microprocessor controller (computer) will trigger a “Burner Purge Fault” condition and will go into Fault Mode with a brief audio indication. The dryer will run with no heat for 3 minutes or until the temperature drops below 100° F (38° C). Once the tumbler temperature is below 100° F (38° C), or the 3 minutes expire, the Phase 7 non-coin microprocessor controller (computer) will shut off all outputs and will remain in Fault Mode until the dryer is addressed.

BURNER HIGH-LIMIT FAULT – This routine monitors the burner high-limit switch. If the switch opens during the cycle while the heat is on, the dryer will display “Burner High-Limit Fault” and will go into Fault Mode with a brief audio indication. The Phase 7 non-coin microprocessor controller (computer) will check the tumbler temperature. If the exhaust probe temperature is above 100° F (38° C), the dryer will continue to display “Burner High Limit Fault”, while the dryer cools by running with no heat for 3 minutes or until the temperature drops below 100° F (38° C). Once the exhaust probe temperature is below 100° F (38° C), or the 3 minutes expire, the Phase 7 non-coin microprocessor controller (computer) will shut off all outputs and will remain in Fault Mode until the dryer is addressed.

CHECK CONTROL BOARD FUSE #2 – This routine identifies the opening of the main fuse (fuse 2) on the Phase 7 non-coin microprocessor controller (computer) board. If the fuse has opened, the Phase 7 non-coin microprocessor controller (computer) will not allow a cycle to begin and will display a “Check Control Board Fuse #2” condition. If the fuse has opened after the cycle has begun, it will still trigger the check main fuse fault. The dryer will shut off all outputs and will go into Fault Mode with a brief audio indication.

CLEAN LINT – This routine monitors the opening of the lint drawer switch and compares the time between openings to the Lint Cleaning Frequency Setting. This routine will first prompt the user to clean lint before locking out the dryer. Once the time between cleanings is equal to the Lint Cleaning Frequency Setting, the display will prompt the user to clean lint. The Lint Cleaning Frequency limits the amount of time the dryer will run before the Phase 7 non-coin microprocessor controller (computer) locks the dryer out for further use. If the lint drawer is not cleaned within 2 hours of run time, the Phase 7 non-coin microprocessor controller (computer) will be locked out.

EXHAUST HIGH-LIMIT FAULT – This routine monitors the tumbler safety over temperature switch. If the switch opens, the dryer will display “Exhaust High-Limit Fault” and will go into Fault Mode with a brief audio indication. If the tumbler temperature is above 100° F (38° C) the dryer will continue to display “Exhaust High-Limit Fault”, while the Phase 7 non-coin microprocessor controller (computer) cools by running with no heat for 3 minutes or until the temperature drops below 100° F (38° C). Once the tumbler temperature is below 100° F (38° C), or the 3 minutes expire, the Phase 7 non-coin microprocessor controller (computer) will shut off all outputs and will remain in Fault Mode until the dryer is addressed.

EXHAUST PROBE FAULT / AXIAL PROBE FAULT – This routine indicates a problem with the temperature sensor circuit. This error will trigger an “Exhaust Probe Fault or Axial Probe Fault” condition and will go into a Fault Mode with a brief audio indication. The dryer will run with no heat for 3 minutes. Once the 3 minutes expire, the Phase 7 non-coin microprocessor controller (computer) will shut off all outputs and will remain in Fault Mode until the dryer is addressed.

EXHAUST HIGH TEMP FAULT – This error routine indicates a problem with overheating. This error will initiate an “Exhaust High Temp Fault” condition and will go into Fault Mode with a brief audio indication. The Phase 7 non-coin microprocessor controller (computer) determines this error by monitoring the temperature sensor input to have a steady gradual increase in temperature to a known upper limit (the limit typically is 20° over the maximum allowed programmable set point). The dryer will run with no heat for 3 minutes or until the temperature drops below 100° F (38° C). Once the tumbler temperature is below 100° F (38° C), or 3 minutes expire, the Phase 7 non-coin microprocessor controller (computer) will shut off all outputs and remain in Fault Mode until the dryer is addressed.

LINT ACCESS OPEN – Indicates the lint drawer is open and needs to be closed.

MAIN DOOR OPENED – Indicates the main door is open when it should be closed.

MODEL ERROR, ENTER CORRECT MODEL – This routine monitors the inputs, such as the sail switch and gas valve. Steam dryers do not use a sail switch or valve input, and an electric dryer will not use a gas valve input. These signals allow the Phase 7 non-coin microprocessor controller (computer) to interpret what type of dryer it is controlling. The Phase 7 non-coin microprocessor controller (computer) determines what the expected dryer responses should be for that specific heat type dryer. Anytime a model fault is detected, the Phase 7 non-coin microprocessor controller (computer) will interrupt the cycle and will display “Model Error, Enter Correct Model–” and go into Fault Mode with a brief audio indication. If the tumbler temperature is above 100° F (38° C) at the time of the failure, the Phase 7 non-coin microprocessor controller (computer) will continue to display “Model Error, Enter Correct Model–” while the dryer cools by running with no heat for 3 minutes or until the temperature drops below 100° F (38° C). Once the tumbler temperature is below 100° F (38° C), or the 3 minutes expire, the Phase 7 non-coin microprocessor controller (computer) will shut off all outputs and will remain in Fault Mode until the dryer is addressed.

NOTE: If a model error occurs, the Phase 7 non-coin microprocessor controller (computer) will always default to the “gas” type for safety reasons. Also, the dryer will be stopped and forced into a restart condition to reevaluate all the expected responses.

ROTATION SENSOR FAULT – This routine monitors the pulses from the rotational sensor input. It basically times the dwell between signals. If the time between the pulses exceeds 10-seconds, the Phase 7 non-coin microprocessor controller (computer) will trigger a “Rotation Sensor Fault” condition and will go into Fault Mode with a brief audio indication. Depending on the model type, the dryer will run the fan with no heat for 3 minutes or until the temperature drops below 100° F (38° C) for GAS REVERSING, ELECTRIC REVERSING and STEAM REVERSING models. Once the tumbler temperature is below 100° F (38° C), or the 3 minutes expire, the Phase 7 non-coin microprocessor controller (computer) will shut off all outputs and remain in Fault Mode until the dryer is addressed. If the dryer model is a GAS NON-REVERSING, ELECTRIC NON-REVERSING or STEAM NON-REVERSING model, the Phase 7 non-coin microprocessor controller (computer) will immediately shut off all outputs, regardless of the tumbler temperature, and remain in Fault Mode until the dryer is addressed.

SAIL SWITCH CLOSED FAULT – This routine prevents the start-up of the dryer unless the sail switch is in the open position. If the sail switch is in the closed position prior to starting, the Phase 7 non-coin microprocessor controller (computer) will display “PLEASE WAIT START UP IN PROCESS” and will allow the Phase 7 non-coin microprocessor controller (computer) 10-seconds for the sail switch to open before faulting out on a “Sail Switch Closed Fault”. Once the dryer faults out on the “Sail Switch Closed Fault”, the dryer will not be allowed to start. This routine is also monitored at every start-up, including a start-up after being in Pause Mode. If the sail switch is in the closed position prior to starting from a Pause Mode, the Phase 7 non-coin microprocessor controller (computer) will display, “PLEASE WAIT RESTART IN PROCESS” and allow the Phase 7 non-coin microprocessor controller (computer) 10-seconds for the sail switch to open before faulting out on a “Sail Switch Closed Fault”. Again, once the dryer faults out on the “Sail Switch Closed Fault”, the dryer will not be allowed to start. Anytime the fault occurs, there will be an audio indication and start/restart will be prevented.

SAIL SWITCH OPEN FAULT – If the sail switch does not close within 8-seconds of starting or restarting a cycle, the Phase 7 non-coin microprocessor controller (computer) will display “Sail Switch Open Fault” condition. Or, if the sail switch opens during a cycle, the Phase 7 non-coin microprocessor controller (computer) will immediately shut off the heat output and monitor how long the sail switch is open for. If the sail switch is open for more than 30-seconds, the Phase 7 non-coin microprocessor controller (computer) will display “Sail Switch Open Fault” condition and go into Fault Mode with a brief audio indication. If the tumbler temperature is above 100° F (38° C), the Phase 7 non-coin microprocessor controller (computer) will continue to display “Open Sail Switch Fault” while the dryer cools by running with no heat for 3 minutes or until the temperature drops below 100° F (38° C). Once the tumbler temperature is below 100° F (38° C), or the 3 minutes expire, the Phase 7 non-coin microprocessor controller (computer) will shut off all outputs and remain in Fault Mode until the dryer is addressed.

S.A.F.E. SYSTEM ACTIVATED – Indicates that the Phase 7 non-coin microprocessor controller (computer) has detected a fire and is currently extinguishing the flame.

S.A.F.E. SYSTEM WAS ACTIVATED – Indicates that the Phase 7 non-coin microprocessor controller (computer) detected a fire and has extinguished the flame.

S.A.F.E. System Diagnostic Conditions

In the event that the Phase 7 non-coin microprocessor controller (computer) detects a fault in the S.A.F.E. system, the Phase 7 non-coin microprocessor controller (computer) will display the message “S.A.F.E. SYSTEM DISABLED ... READY”. To find the reason for the S.A.F.E. system disabling, press and hold the red “STOP/CLEAR” and green “START/ENTER” keys. Doing so will cause the Phase 7 non-coin microprocessor controller (computer) to display one (1) of the following diagnostic messages:

OPEN THERMISTOR PROBE – This message indicates that the S.A.F.E. system thermistor probe is either not connected or is damaged. If this condition is detected, the Phase 7 non-coin microprocessor controller (computer) will immediately enter S.A.F.E. SYSTEM DISABLED Mode.

SHORTED THERMISTOR PROBE – This message indicates that the S.A.F.E. system thermistor probe is damaged or the wiring is shorted. If this condition is detected, the Phase 7 non-coin microprocessor controller (computer) will immediately enter S.A.F.E. SYSTEM DISABLED Mode.

DISCONNECTED WATER VALVE – This indicates that the water valve is open or that it is not connected to the Phase 7 non-coin microprocessor controller (computer). If this condition is detected, the Phase 7 non-coin microprocessor controller (computer) will continue to monitor the condition for a period of 5 minutes before entering S.A.F.E. SYSTEM DISABLED Mode. Once the condition is corrected, the Phase 7 non-coin microprocessor controller (computer) will continue to monitor the condition for 1 minute before exiting S.A.F.E. SYSTEM DISABLED Mode.

SHORTED WATER VALVE – This indicates the water valve is shorted or the wiring to the valve is shorted. If this condition is detected, the Phase 7 non-coin microprocessor controller (computer) will continue to monitor the condition for a period of 5 minutes before entering S.A.F.E. SYSTEM DISABLED Mode. Once the condition is corrected, the Phase 7 non-coin microprocessor controller (computer) will continue to monitor the condition for 1 minute before exiting S.A.F.E. SYSTEM DISABLED Mode.

WATER NOT CONNECTED – This indicates that there is no water pressure at the water valve. This will occur if water is not connected to the dryer or if there is low water pressure in the water line coming to the dryer. This could also be a defective pressure switch or wiring to the pressure switch. If this condition is detected, the Phase 7 non-coin microprocessor controller (computer) will continue to monitor the condition for a period of 5 minutes before entering S.A.F.E. SYSTEM DISABLED Mode. Once the condition is corrected, the Phase 7 non-coin microprocessor controller (computer) will continue to monitor the condition for 1 minute before exiting S.A.F.E. SYSTEM DISABLED Mode.

I/O Board L.E.D.

INDICATORS

Inputs (Red L.E.D.)

1. **ESTOP** – This L.E.D. will indicate the status of the E-STOP. If the E-STOP has been pressed, then the L.E.D. is ON.
2. **GAS_V** – This L.E.D. will indicate the status of the gas valve. If the gas valve is open (ON), then the L.E.D. is ON.
3. **BRHL** – This L.E.D. will indicate the status of the burner high limit disk. If the disk is closed (temperature below 330° F [166° C]), then the L.E.D. is ON.
4. **SAIL** – This L.E.D. will indicate the status of the sail switch. If the switch is closed, then the L.E.D. is ON.
5. **EXHL** – This L.E.D. will indicate the status of the exhaust high limit disk. If the disk is closed (temperature below 225° F [107° C]), then the L.E.D. is ON.
6. **MAIN** – This L.E.D. will indicate the status of the main door. If the door is closed, then the L.E.D. is ON.
7. **LINT** – This L.E.D. will indicate the status of the lint drawer. If the drawer is closed, then the L.E.D. is ON.
8. **FUSE** – This L.E.D. will indicate the status of the Phase 7 non-coin microprocessor controller (computer) voltage. If the power on button is pressed (green button light is on), then the L.E.D. is ON.
9. **H₂O** – This L.E.D. will indicate the status of the water pressure switch on the S.A.F.E. system water line. If water pressure is present, then the L.E.D. is ON.

A. The display reads “Exhaust High Limit Fault”. (Refer to page 20)

The temperature in the tumbler is above 190° F (88° C) or follow Steps #1 through #3.

1. Check for voltage (24 VAC) at the computer on the J5 connector from pin 1 to ground. If no voltage is present, either you have a poor connection at the J5 connector or the computer board is faulty. If voltage (24 VAC) is present, proceed to Step #2.
2. Check for voltage at the exhaust high limit thermostat. If voltage is present at only one side the thermostat is open and needs to be replaced. If voltage is present at both sides, proceed to Step #3.
3. Check for voltage at the J5 connector pin 2 to ground. If no voltage is present, check for a loose wire between the J5 connector and thermostat. If voltage is present then the computer board is bad and needs to be replaced.

B. The display reads “Burner High Limit Fault”. (Refer to page 20)

1. Indicates the tumbler hi-limit has tripped.
2. Check for a block or restriction in the exhaust.
3. Make sure the exhaust is properly sized.
4. Make sure location has adequate make-up air.
5. Check for voltage (24 VAC) at the computer board J4 connector pin 3 red wire to ground. If no voltage (24 VAC), check for a loose connection or change the computer board. If voltage is present, proceed to Step #6.
6. Check for voltage at the burner high limit thermostat (the sail switch must be closed at time of test). If voltage is present at only one side the thermostat is open and needs to be replaced. If voltage is present at both sides, proceed to Step #7.
7. Check for voltage at the J4 connector pin 4 to ground. If no voltage is present, check for a loose wire between the J4 connector and thermostat. If voltage is present then the computer board is bad and needs to be replaced.

C. The display reads “Bad Exhaust Temp Probe”. (Refer to page 22)

1. Check for a loose connection or short between the computer J3 connector pins 1 and 2, and the pin connections 1 and 2 of P25 and J25 which lead to the temperature sensor probe.
2. If connections are fine, next change the temperature sensor probe.
3. If the display still reads “Bad Exhaust Temp Probe,” change the computer board.

D. The display reads “Sail Switch Open Fault”. (Refer to page 20)

1. The sail switch has opened while dryer is in the heating mode. Is the blower motor running normally? If not troubleshoot blower motor.
2. Check for block or restriction in the exhaust.

3. Make sure exhaust is sized properly.
4. Clean the lint screen.
5. Make sure all doors and access panels are closed and sealed well.

E. The display reads “Sail Switch Closed Fault”. (Refer to page 20)

1. Prior to start up, the sail switch is in the closed position. Is the switch stuck, if so free up the mechanism and check for moisture or broken components.
2. Check the sail switch and readjust accordingly.
3. Replace sail switch, if necessary.

F. The display reads “Burner Ignition Control Fault”. (Refer to page 20)

1. Check for 24 VAC at the DSI module across MV and GND during the ignition process. If no voltage, replace the DSI module. If voltage is present, check for 24 VAC at the gas valve on terminals 1 and 2. If no voltage, check for a loose connection on the wires going back to the DSI module. If voltage is present, proceed to Step #2.
2. Check for voltage at J4 connector pin 6 during the ignition process. If no voltage check for a loose connection between the gas valve and computer connection at J4. If voltage is present replace the computer board.

G. Tumbler will not rotate display reads “Rotation Fault”. (Refer to page 21)

1. Does the tumbler turn? If so check the list below, If not proceed to step two.
 - a. Rotational sensor is out of adjustment.
 - b. Rotational sensor magnet is missing or broke.
2. Check the list of items that will stop the tumbler from turning below.
 - a. Belt is broke, loose, or slipping
 - b. Check for fault codes on VFD.
 - c. Check for 24 VAC at the computer board J8 connector pin 8 brown wire to GND. If no voltage is present, check for a loose connection, if connection is good, replace computer. If voltage is present, proceed to next step.
3. Check for 24 VAC on the motor relay CR6 coil. If no voltage, check for a loose connection in the wire. If voltage is present, proceed to next step.
4. Check for 24 VAC on the motor relay CR6 at NO to ground. If no voltage, replace motor relay. If voltage is present, proceed to next step.
5. Check for +24V at B5 on the VFD and If present replace the VFD. If voltage is not present check for a loose connection between CR6 and the VFD.

H. Tumbler does not alter speed through drying cycle.

1. Look for fault codes on VFD. If no fault codes proceed to next step.
2. Check for loose connections on thermistor probe under drum.
3. Test resistance of thermistor probe. Probe should read roughly 175K ohms at room temperature.

I. Drive motor operates in forward mode, but does not reverse, blower motor runs. The display reads “Rotation Fault”.* (Refer to page 21)

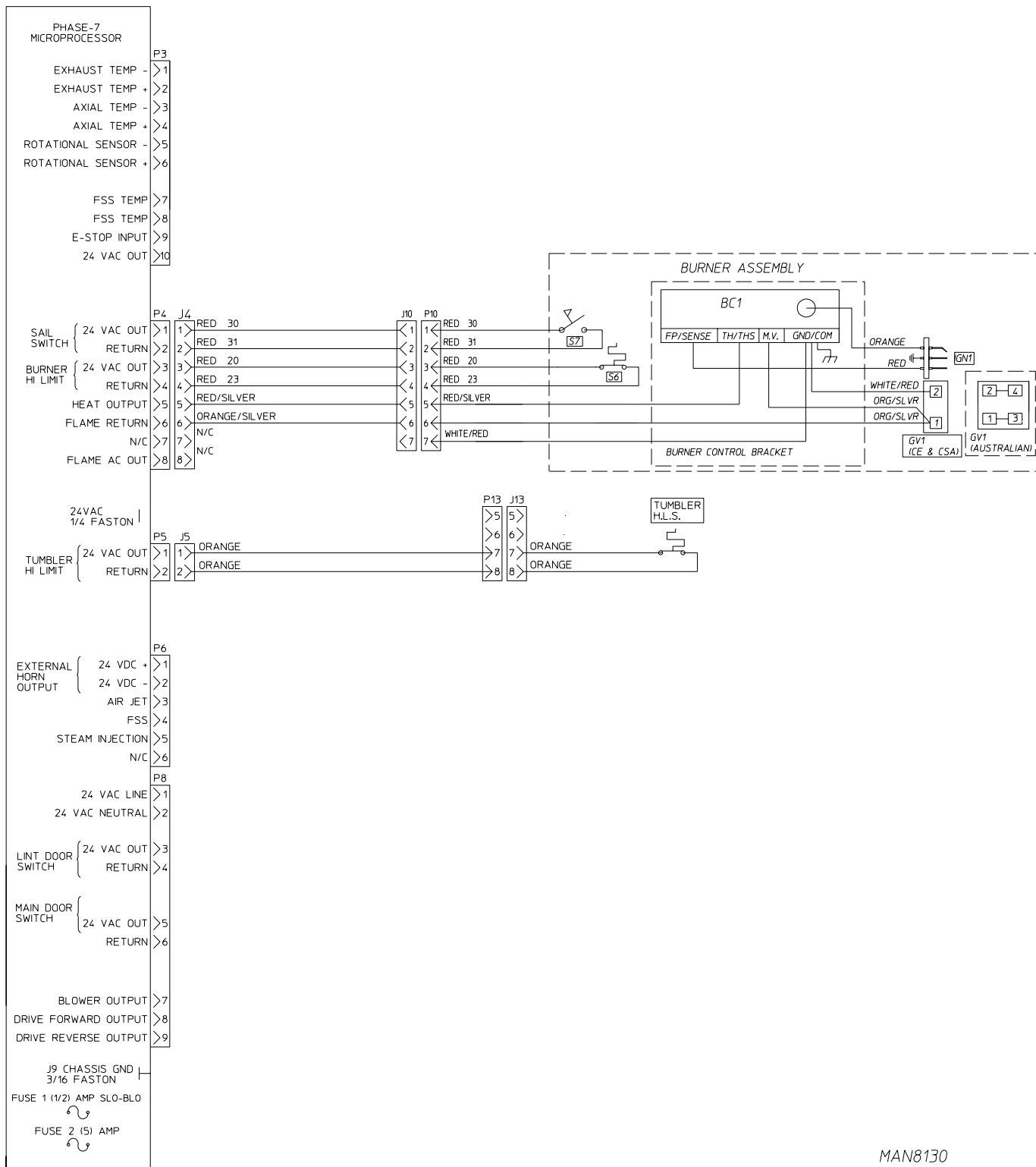
1. Possible causes:
 - a. Belt is loose or slipping.
 - b. Rotational sensor is out of adjustment.
 - c. Check for 24 VAC at the computer board J8 connector pin 9 gray wire to GND. If no voltage is present, check for a loose connection, if connection is good, replace computer. If voltage is present, proceed to next step.
2. Check for 24 VAC on the drive motor relay CR7 coil. If no voltage, check for a loose connection in the wire going back to the relay. If voltage is present, proceed to next step.
3. Check for proper voltage on NO to ground of the relay CR7. If no voltage, replace relay. If voltage is present, proceed to next step.
4. Check for fault codes on VFD.

J. The display reads “Cycle Paused, Main Door Open”. (Refer to page 22)

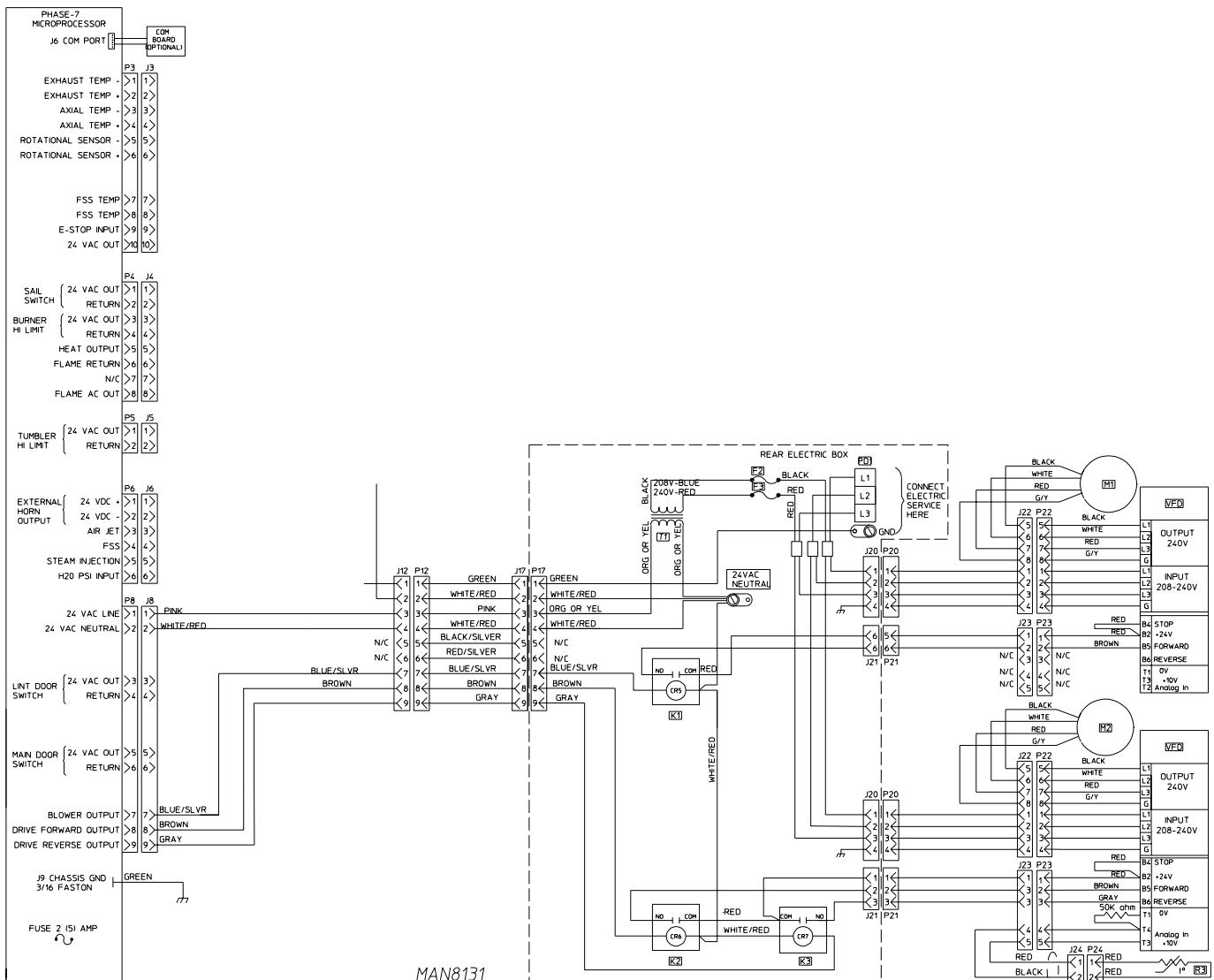
1. Make sure main door is closed.
2. Make sure main door has good contact with the main door switch.
3. Check for voltage (24 VAC) at the computer board J8 connector pin 5. If no voltage, check for a loose connection or change the computer board. If voltage is present, proceed to Step #4.
4. Check for voltage to the main door switch. If voltage is present check that the switch has continuity when depressed, if not replace switch. If switch has continuity proceed to Step #5.
5. Check for voltage (24 VAC) at the computer board J8 connector pin 6. If no voltage, check for a loose connection between the switch and the computer. If voltage is present change the computer board.

K. The display reads “Cycle Paused, Lint Access Open”. (Refer to page 22)

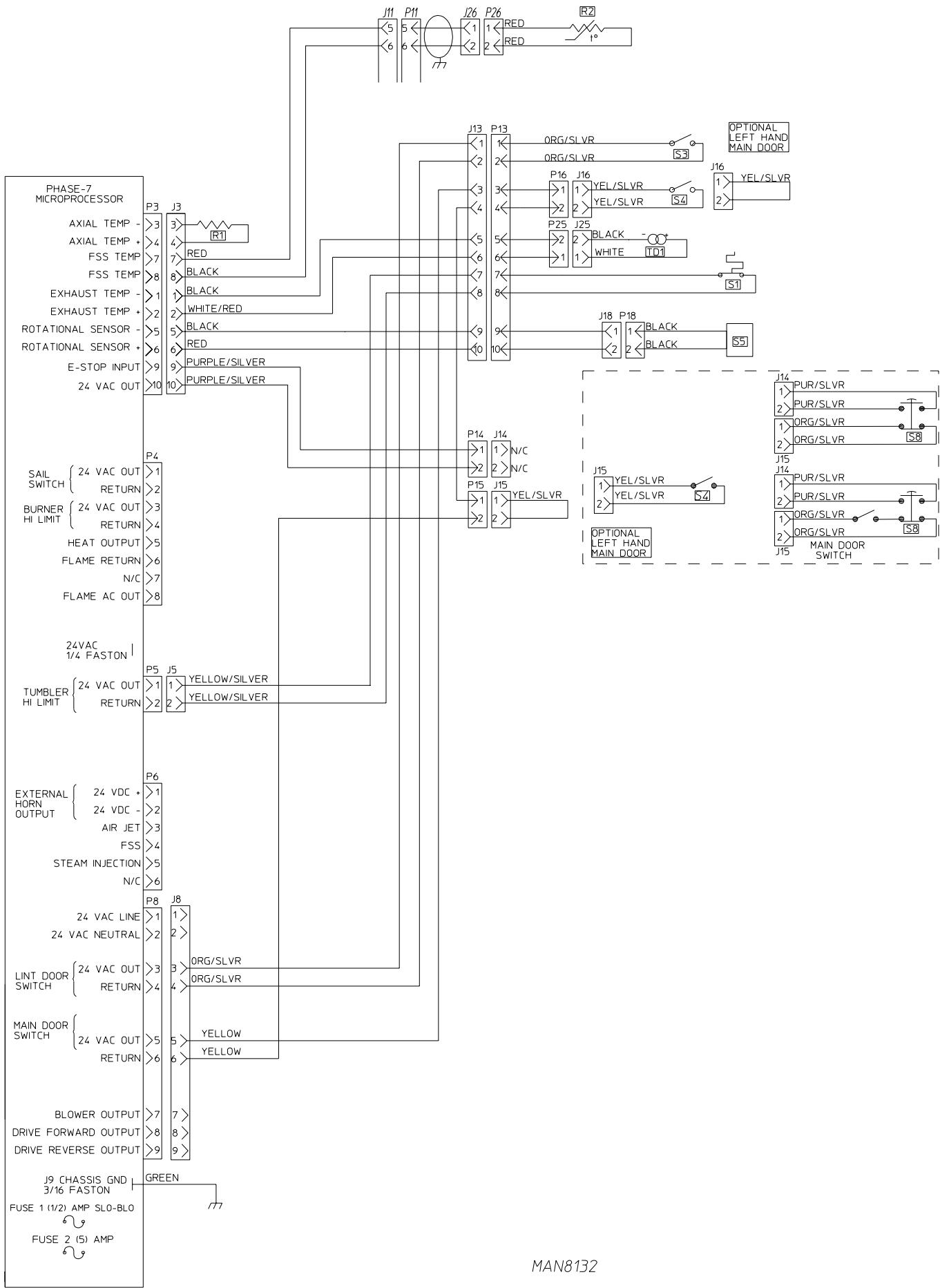
1. Make sure lint drawer is closed.
2. Make sure lint drawer has good contact with the switch.
3. Check for voltage (24 VAC) at the computer board J8 connector pin 3. If no voltage, check for a loose connection or change the computer board. If voltage is present, proceed to Step #4.
4. Check for voltage to the lint drawer switch. If voltage is present check that the switch has continuity when depressed, if not replace switch. If switch has continuity proceed to Step #5.
5. Check for voltage (24 VAC) at the computer board J8 connector pin 4. If no voltage, check for a loose connection between the switch and the computer. If voltage is present change the computer board.



MAN8130



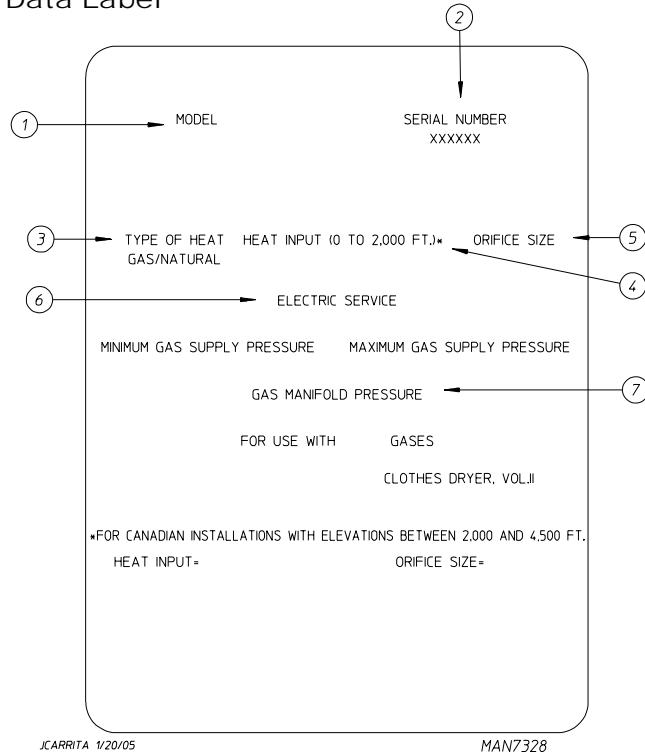
MAN8131



MAN8132

Data Label Information _____

Data Label



When contacting ADC, certain information is required to ensure proper service/parts information from ADC. This information is on the data label affixed to the left side panel/wall area behind the control door. When contacting ADC, please have the model number and serial number available.

- MODEL NUMBER** – This describes the style of dryer and type of heat (gas, electric, or steam).
- SERIAL NUMBER** – Allows the manufacturer to gather information on your particular dryer.
- TYPE OF HEAT** – This describes the type of heat for your particular dryer, gas (either natural gas or L.P. gas), electric, or steam.
- HEAT INPUT** (For Gas Dryers) – This describes the heat input in British thermal units per hour (Btu/hr) or kilowatts (kW).
- ORIFICE SIZE** (For Gas Dryers) – Gives the number drill size used.
- ELECTRIC SERVICE** – This describes the voltage and current rating for a particular model.
- GAS MANIFOLD PRESSURE** (For Gas Dryers) – This describes the manifold pressure taken at the gas valve tap.

Using A Manometer

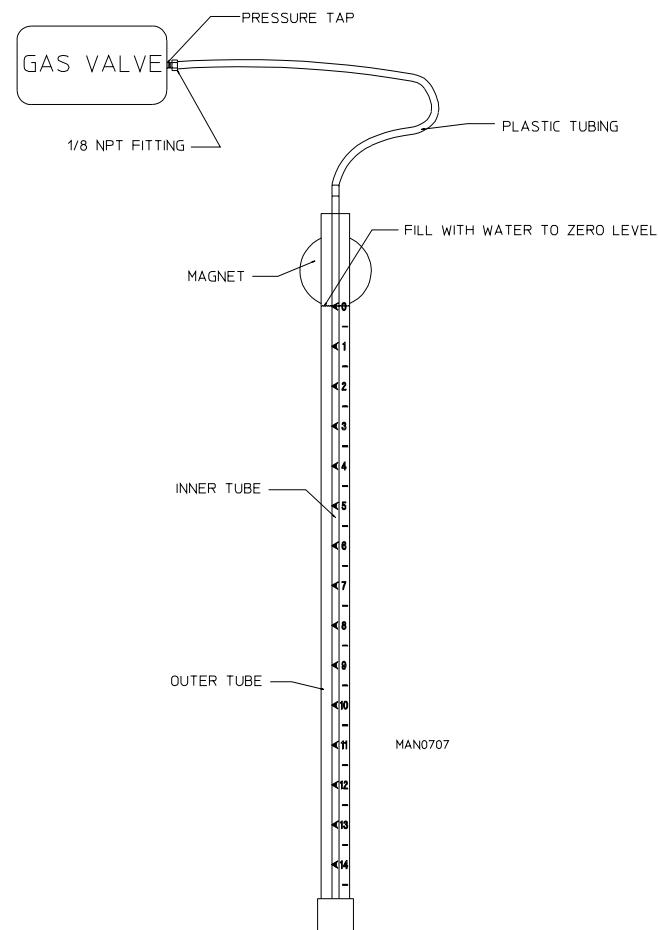
HOW TO USE A MANOMETER

- With dryer in nonoperating mode, remove plug on the gas valve pressure tap.
- Install 1/8" N.P.T. fitting supplied with the manometer.
- Attach plastic tubing to pressure tap fitting.
- Attach manometer to dryer using magnet.

NOTE: Place manometer in a position so that readings can be taken at eye level.

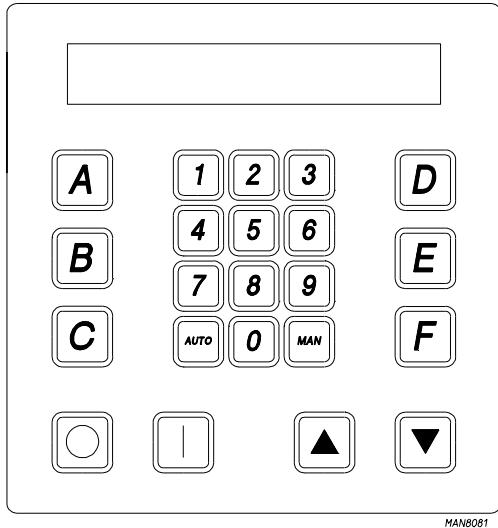
- Fill manometer as shown in illustration to the zero level.
- Start dryer. With burner on take a reading.
 - Read water level at the inner tube. Readings should be taken at eye level.
 - Correct readings should be:

Natural Gas	3.5 in WC (8.7 mb)
L.P. Gas	10.5 in WC (26.1 mb)
- If water column pressure is incorrect, refer to "TO ADJUST GAS PRESSURE."
- Reverse procedure for removing manometer.

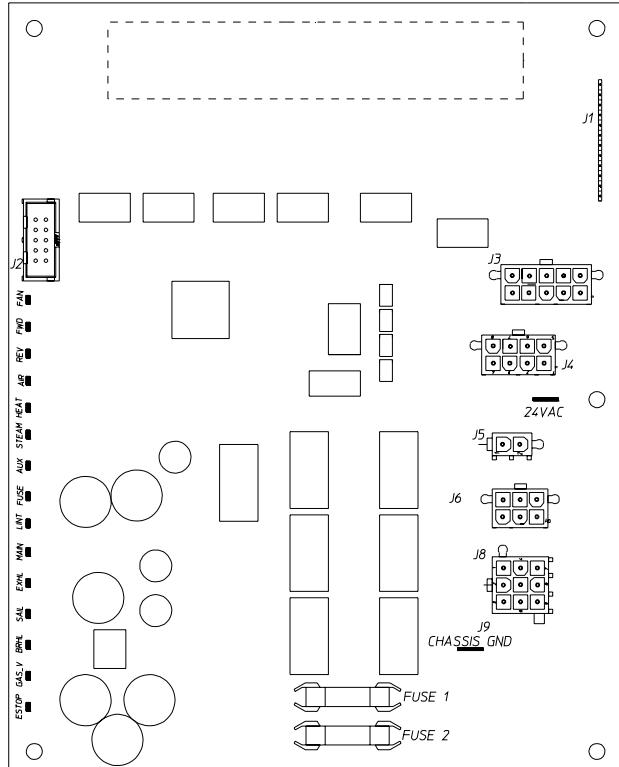


Keypad Layout

1. Dot Matrix Display
2. A-F Preprogrammed Cycles
3. Stop/Pause Button
4. Start Button
5. Increment Button
6. Decrement Button
7. One time Auto (Dryness level) and Manual (Timed) Cycle



NOTE: Fuse 1 is for computer power rated at 1/2-Amp. If fuse blows, it is a computer board fault. Fuse 2 is for 24V control power rated at 5-Amp. If fuse blows, it is a 24V control fault.



S.A.F.E. System Theory Of Operation

While the dryer is in an idle state or 20-seconds after the heat turns off, the Phase 7 control monitors the S.A.F.E. system probe located in the top of the tumbler chamber and records the minimum temperature. If the minimum recorded S.A.F.E. system probe temperature is no less than 120° F (48° C) and the control detects a 50° rise in temperature, this will be the trip point and the S.A.F.E. system routine will activate.

While a drying cycle is in process and the heat has turned on at least once, the Phase 7 control monitors the exhaust temperature transducer. If the drying cycle temperature set point is set greater than 160° F (71° C) and the control detects an exhaust temperature rise 25° F greater than set point, this will be the trip point and the S.A.F.E. system routine will activate. If set point is below 160° F (71° C) the trip point will be 185° F (85° C).

Once the S.A.F.E. system routine is activated, water will be injected into the tumbler chamber. Anytime water is being injected into the tumbler; the tumbler drive will turn the load for 1-second every 15-seconds. This process will continue for a minimum of 2 minutes. After 2 minutes has elapsed, the control will check if the temperature remained above trip point, if so water will remain on. The control will continue to check if temperature is above trip point every 30-seconds. If the water has been on for a constant 10 minutes, the water will be turned off regardless of the temperature. If the temperature has dropped below trip point, the control will turn off the water prior to 10 minutes.

System Reset

After the microprocessor determines that the situation is under control and shuts the water being injected into the tumbler off, the microprocessor display will read "S.A.F.E. System activated", and the horn/tone will sound until reset manually.

To reset the microprocessor once the control displays "S.A.F.E. System activated", press the red key on the keypad.

Non-Coin S.A.F.E. System Check Procedure

The operation of the water solenoid valve can be tested to ensure that the water supply system and valve are functional. Before attempting system check, be sure that all water supply shutoff valves to the dryer are in the OPEN position, and the dryer must be in the "READY" mode where no cycle is loaded or in progress.

The procedure is as follows:

1. Press and hold the RED STOP key (while in "READY" mode and no cycle in progress).
2. Press and hold the "A" key.
3. Water valve will open and water will be dispensed into tumbler area as long as both keys are held.

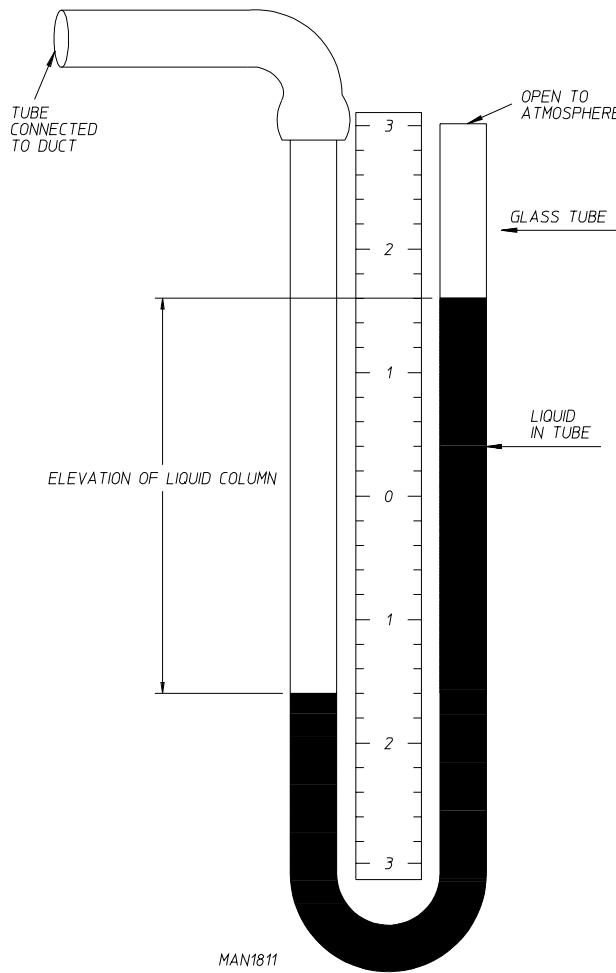
IMPORTANT: This is a test function only and the keys should be held and system activated for only a second or so, otherwise water will accumulate in various places in the dryer.

Static Pressure

The pressure of the air in sheet metal ducts is of great importance for safe and efficient operation of the dryer. The air pressures, as small as they are, have a large influence upon the performance of the dryer. There are three (3) pressures present within a duct. The velocity pressure, which is the pressure due to the moving stream of air, the static pressure, which is the outward push of the air against the walls of the duct, and the total pressure, which is the sum of the static and velocity pressures. Only the total and static pressures can be measured. The velocity pressure is then calculated from the difference between the two. The static pressure is the most influential and determining factor in the design of a dryer duct system. ADC recommends that the dryer exhaust duct static pressure not exceed 0.3 in WC (0.74 mb).

Gages used to measure such small air pressures utilize the elevation of a column of water. This form of gage is called a manometer. One form of this gage is known as a U-tube and is shown in **Illustration #1**. When one end of the tube is connected to the duct, the static (outward) pressure within the duct forces the water column to be depressed in one leg of the U-tube and up in the other. The elevation of the water column in **Illustration #1** is 3.2 inches (8 mb).

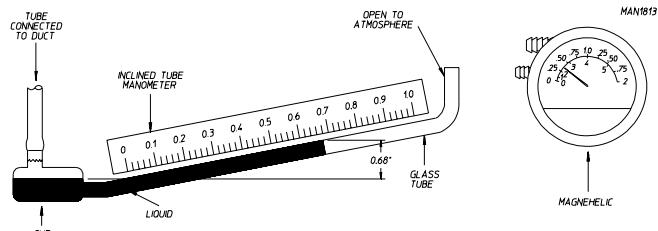
Illus. #1



Using a Magnehelic

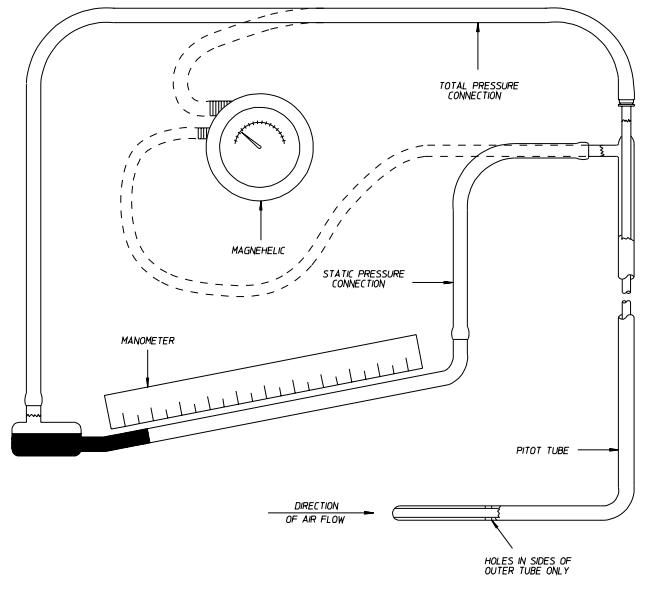
When measuring such small air pressures, the U-tube is often not accurate enough. Such small differences in pressure are most often measured by an inclined tube manometer or a Magnehelic pressure gage as shown in **Illustration #2**.

Illus. #2



For convenience and accuracy, an instrument known as a Pitot tube is used with the gage. The Pitot tube, as shown in **Illustration #3**, consists of two tubes – one within the other. The inner tube measures the total pressure alone, while the outer tube measures the static pressure alone.

Illus. #3

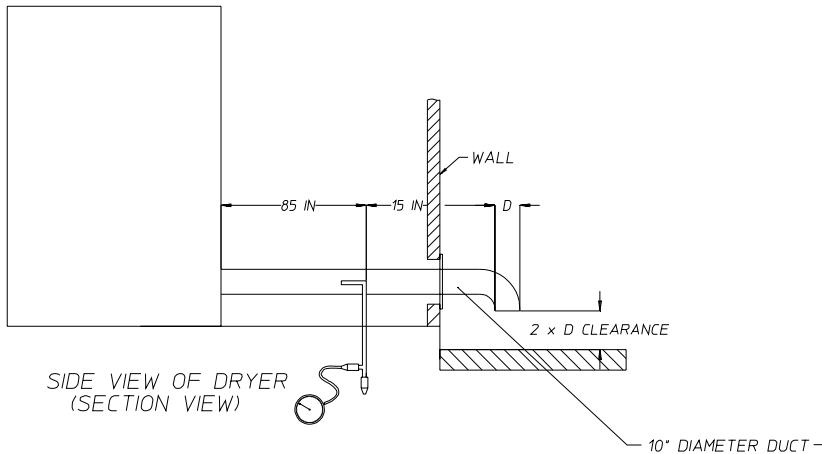


To obtain the most accurate static pressure readings of a dryer, the following guidelines should be conformed to. The reading should be taken in a straight section of duct, a minimum of ten (10) times the diameter of the duct (i.e. 10-inches [25.4 cm] diameter duct, a straight section 100-inches [254 cm] in length). The reading should be taken a minimum of 8-1/2 times the diameter upstream of the dryer or nearest elbow, and 1-1/2 times the diameter downstream of the Pitot tube. The following is an example showing the proper location to take a static pressure reading.

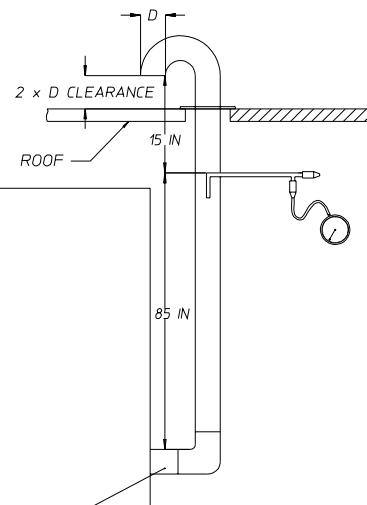
SINGLE DRYER VENTING

VERTICAL DUCTING

HORIZONTAL DUCTING



SIDE VIEW OF DRYER
(SECTION VIEW)



SIDE VIEW OF DRYER
(SECTION VIEW)

MAN2012

In designing a dryer exhaust duct system, it is not necessary to compute the friction loss of the ductwork. The friction loss (static pressure) is predetermined to not exceed 0.7 in WC (1.7 mb). This maximum allowable static pressure is the same for all model dryers and is calculated to provide maximum dryer efficiency. It is necessary to determine the total equivalent length of the duct system. The total equivalent length of the duct system is the actual length of the duct added to the equivalent length of all the fittings. The equivalent length of a fitting, is the length of straight duct of the same size as the fitting in which the friction losses are equal. Equivalent lengths must be determined for all elbows, as well as, any entries which may be incorporated into a common duct system for multiple dryers. The total equivalent length is then used with the total cfm exhaust rating of the dryer(s) to calculate the minimum round duct diameter. When designing a single common duct system for multiple dryers, each individual dryer exhaust duct enters the main common duct.

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