AD-575
Service Manual

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041891

ADC Part No. 450105

Retain This Manual In A Safe Place For Future Reference

American Dryer Corporation products embody 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 properly licensed technicians should service this equipment.

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

WARNING: UNDER NO CIRCUMSTANCES should the door switch or the heat circuit devices ever be disabled.

WARNING: The dryer must never be operated with any of the back guards, outer tops, or service panels removed. PERSONAL INJURY or FIRE COULD RESULT.

We have tried to make this manual as complete as possible and hope you will find it useful. **ADC** 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.

Important

For your convenience, log the following information:

DATE OF PURCHASE _____ **MODEL NO.** **AD-575**

DISTRIBUTORS NAME _____

Serial Number(s) _____

_____

_____

Replacement parts can be obtained from your distributor 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 orders directly to the **ADC** Parts Department at (508) 678-9010. 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.

INSTRUCTIONS TO BE FOLLOWED IN THE EVENT THE USER SMELLS GAS MUST BE POSTED IN A PROMINENT LOCATION. THE INSTRUCTIONS TO BE POSTED SHALL BE OBTAINED FROM THE LOCAL GAS SUPPLIER.

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 (Occupational Safety and Health Administration) **STANDARDS.**

FOR YOUR SAFETY

DO NOT STORE OR USE GASOLINE OR OTHER FLAMMABLE VAPOR AND LIQUIDS IN THE VICINITY OF THIS OR ANY OTHER APPLIANCE.

DO NOT DRY MOP HEADS IN THE DRYER.

DO NOT USE DRYER IN THE PRESENCE OF DRY CLEANING FUMES.

WARNING

CHILDREN SHOULD NOT BE ALLOWED TO PLAY ON OR IN THE DRYER(S).

CHILDREN SHOULD BE SUPERVISED IF NEAR DRYER(S) IN OPERATION.

CAUTION

DRYER(S) SHOULD NEVER BE LEFT UNATTENDED WHILE IN OPERATION.

IMPORTANT

PLEASE OBSERVE ALL SAFETY PRECAUTIONS displayed on the equipment and/or specified in the installation/operator's manual included with the dryer.

Dryer(s) **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.

Replacement parts can be ordered from your distributor 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 orders directly to the ADC Parts Department at (508) 678-9010. Please specify the dryer model number and serial number in addition to the part description and part number, so that your order is processed accurately and promptly.

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TABLE OF CONTENTS

SECTION I

Installation

A. Reassembly of Dryer

ALWAYS KEEP DRYER IN UPRIGHT POSITION WHEN MOVING IT.

The ADG-575 (gas model) can be shipped two (2) separate ways: as a complete unit fully assembled and ready for hookup or with the middle frame separated from the dryer base. At installation, the middle frame will be lifted onto the base and fastened together with the six (6) 3/8-16 bolts which are provided.

The ADS-575 (steam model) can also be shipped in the same manner as the ADG-575. However, if the unit is shipped with the middle frame fastened to the base, more often than not, the steam coil is removed from the top of the dryer so that it will fit inside enclosed trucks. If the coil has been removed, then at installation, the coil will be repositioned on top of the dryer and rebolted with the 3/8-16 bolts provided. In addition, the steam damper piston must be attached.

First, attach the piston bracket on the top left of the dryer with the two (2) #10 TEK screws supplied. Second, attach the piston between the piston bracket and the steam coil housing (top right of dryer). Next, reconnect wiring to microswitch on the piston bracket.

B. Location of Dryer

The AD-575 model dryer is designed so that mostly all of the servicing can be done from the front and rear of the dryer. On the gas model, a minimum of 18 inches should be provided between the right side of the dryer (burner side) and any obstruction. The left side requires no clearance. On the steam model, no clearance is required on the sides. At least two (2) feet of space should be left behind the dryer to allow for servicing access.

Although no clearance is required to certain panels as mentioned previously, a minimum of 18 inches is recommended between the sides of this unit and any obstruction for ease of servicing.

The dryer must be lagged to the floor.

It is very important to mount the dryer in a level position. If the dryer needs to be shimmed, use shims that are the same size as the dryer's base foot.

C. Service Connections

1. Electrical

The electrical power supply connection to the dryer is made into the electrical box which is located in the front of the dryer's base. To get into the box, remove its screw-on cover. Connect the supply power wires into the power distribution block which is located at the lower center of the box's left side.

The power distribution block has three (3) poles for connecting the three (3) lines of 3-phase power. If the dryer was built to run on 3-phase/4-wire power, connect the neutral wire into the 3-position terminal block located above the power distribution block.

Before turning on power to the dryer, measure the supply voltage to ensure that it matches the dryer's specified input voltage. This input voltage is marked on the aluminum data tag, located on the inner right wall of the dryer's right-hand control box. Supplying the wrong voltage or low voltage will result in serious damage to the dryer or lead to poor dryer performance. A fused disconnect switch for the supply power must be provided near the dryer.

Model	Supply Voltage	Minimum Disconnect Switch Fuse Rating	Approx. Amp Draw
ADG-575 Gas Dryer	208V, 3Ph, 60Hz	45 Amps	27 Amps
	230V, 3Ph, 60Hz	40 Amps	24 Amps
	380V, 3Ph, 50Hz	30 Amps	15 Amps
	460V, 3Ph, 60Hz	20 Amps	11 Amps
ADS-575 Steam Dryer	208V, 3Ph, 60Hz	60 Amps	33 Amps
	230V, 3Ph, 60Hz	45 Amps	25 Amps
	380V, 3Ph, 50Hz	35 Amps	19 Amps
	460V, 3Ph, 60Hz	30 Amps	15 Amps

SIZE THE SAFETY DISCONNECT SWITCH AND THE POWER SUPPLY WIRES PER THE AMP RATINGS LISTED UNDER THE MINIMUM DISCONNECT SWITCH FUSE RATING COLUMN OF THE ABOVE CHART. Do not use the dryer's approximate amp draw to size wiring and fusing.

Electrical connections should be made by qualified personnel only.

Install dryer per all relevant electrical codes.

Dryer must be electrically grounded for proper operation. Ground each dryer individually. A copper or brass

stake driven into the ground is the best grounding method.

CAUTION: USE ONLY COPPER CABLE FOR ELECTRICAL HOOKUP. USE OF ALUMINUM CABLE WILL VOID YOUR WARRANTY.

2. Exhaust Air Ducting

Plant ducting must be kept as short as possible and the number of bends must be kept to a minimum. Avoid 90-degree bends if possible, and use 45-degree bends in their place. The radius of all elbows should be at least 1-1/2 times the duct diameter. The end of the duct which exits the building must be protected from the weather. For ducts which exit a side wall, use a 90-degree elbow to face the duct downward. For ducts which exit a roof, use a 180-degree elbow to also face the duct downward. Leave at least twice the duct's diameter (or if rectangular duct is used, leave twice the largest dimension on the duct face) as clearance to the nearest obstruction.

Clean-out doors must be provided in the plant's exhaust ducting so that any lint buildup can be removed.

The internal dimensions of the rectangular vent on the dryer are 6-5/8" by 16-1/8". Do not use the dryer's rectangular exhaust to size the plant's exhaust ducting. The plant duct must have a larger cross sectional area. The plant ducting must be sized as indicated below.

Minimum Diameter of Round Exhaust Duct	Minimum Cross Sectional Area of Rectangular Exhaust Duct
16-inch Diameter (406mm)	201 sq in (1296 sq cm)

If the plant's exhaust ducting has more than one 90-degree elbow and is longer than 20 feet, run 18-inch diameter ducting. Avoid using screws on any objects which will protrude inside the exhaust ducting and catch lint.

An extremely long run of exhaust ducting or exhaust ducting with many turns in it will result in reduced airflow through the dryer, causing poor dryer performance. If this is the case, an auxiliary fan may have to be installed to boost the exhaust airflow.

CAUTION: IMPROPERLY SIZED OR INSTALLED EXHAUST DUCT WORK CAN CREATE A POTENTIAL FIRE HAZARD.

IMPORTANT: DO NOT USE SCREENS OR CAPS ON THE OUTSIDE OPENING OF THE EXHAUST DUCT WORK.

3. Gas Hookup (gas dryers only)

The 1-inch MPT gas inlet connection is located to the rear of the dryer on the upper left-hand side of the dryer (viewing from the rear). The dryer must be connected to the type of heat/gas indicated on the dryer data label located in the right-hand control cabinet. If this information does not agree with the type of gas available, contact the distributor who sold the equipment or the factory.

NOTE: Undersized gas piping will result in ignition problems, slow drying, and increased use of energy and can create a safety hazard.

The gas input ratings shown on the dryer data label are for elevations up to 2,000 feet, unless elevation requirements of over 2,000 feet 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 are made by changing the burner orifices. If this adjustment is necessary, contact the distributor who sold the dryer or contact the factory.

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

For natural gas, the supply pressure delivered to the dryer must be 7 inches water column minimum and 13 inches water column maximum. If the supply pressure is higher than 13 inches water column, then an external pressure regulator must be installed in the supply line to reduce the gas pressure below 13 inches water column. The pressure supplied from the gas valve on the dryer to the burner will be 3.5 inches water column.

Dryers manufactured for use with liquid petroleum (L.P. gas) have no pressure regulator or means of regulation built into the dryer. Regulation must be provided at the gas supply (L.P. tank), or in the case where another gas appliance of a higher required gas pressure is on the same supply line, separate regulators (vented to the outdoors) serving each dryer should be provided.

The pressure delivered to L.P. gas dryers must be 10.5 inches to 11 inches water column.

NOTE: Gas connections should be made by qualified personnel only.

If more than one dryer is being fed by the same gas supply line, then a 3/4-inch pipe gas loop should be

installed from a point downstream of the last unit to a point upstream of the first unit being supplied. This will equalize the pressure throughout the supply line.

WARNING: TEST ALL CONNECTIONS FOR LEAKS BY BRUSHING ON A SOAPY WATER SOLUTION (liquid detergent also works well). NEVER TEST FOR GAS LEAKS WITH A FLAME.

4. Steam Hookup (steam dryers only)

The steam inlet connection of the steam coil is 1-1/2" MPT, and the condensate outlet connection is 3/4" MPT. The working steam pressure of the dryer is 125 psi. Supplying a lower steam pressure to the dryer will result in slower drying times.

When steam mains are lower than steam coil, pitch supply and return lines downward to main pipes.

When steam return runs overhead, a check valve must be installed after main trap.

It is good practice, and you will save energy by insulating the steam supply piping.

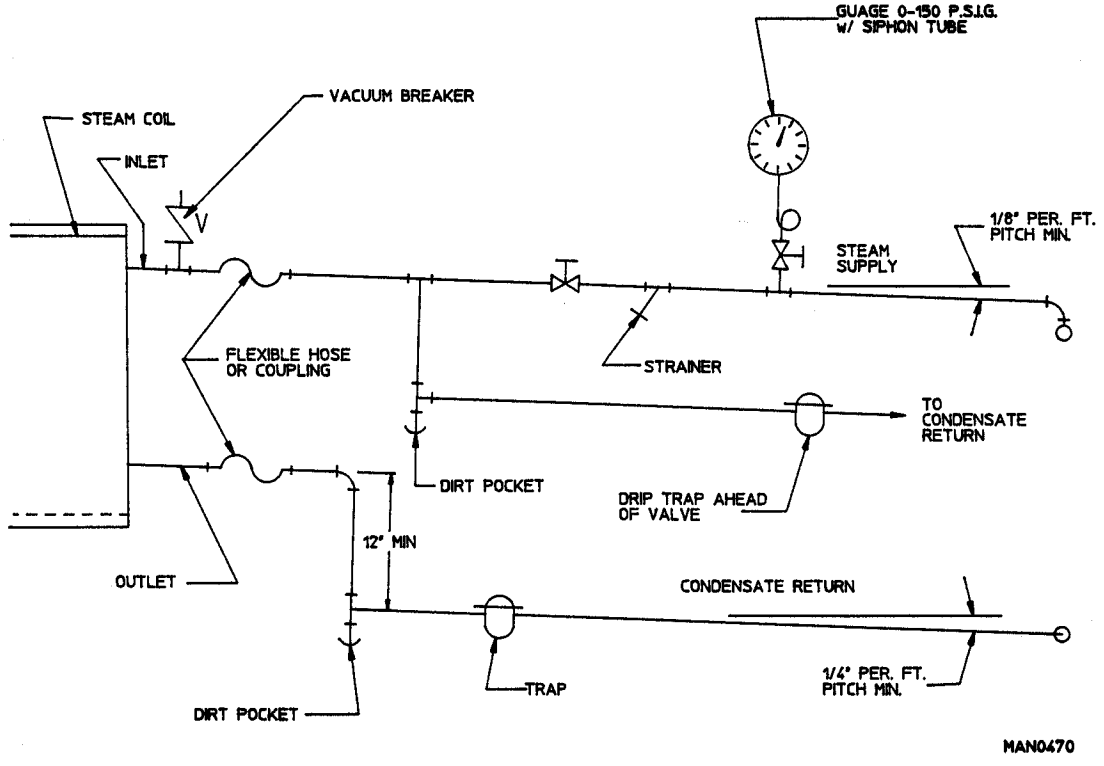
This unit is not equipped with a steam valve. It utilizes an air damper bypass system and a continuously charged coil. With this system, the coil will always be energized and hot. Upon a call for heat, a damper slides out from underneath the steam coil, allowing the air to pass through the coil. When the temperature in the dryer is satisfied, the damper will slide back underneath the coil directing cool room air directly into the tumbler, bypassing the coil. With this system, heat and cooling are provided instantaneously; and consequently, there is a direct reduction in drying time and energy usage. In addition, the life of the steam coil will be extended because it is not constantly heating up and cooling down.

NOTE: No electrically operated steam valve is supplied, and none should be installed.

5. Air Intake

When the dryer is operating, it draws in room air, heats it, passes this air through the tumbler, and exhausts it out of 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. You may have ignition problems and sail switch "fluttering" problems on gas dryers, and you also could have premature motor failures from overheating.

For the AD-575, an opening to the outdoors of at least five (5) square feet is required.



SUGGESTED STEAM COIL PIPING ARRANGEMENT

If the opening to the outdoors is going to be louvered, increase the size of the opening by 25 percent. A sufficiently sized opening to an outside air source must be provided to assure an adequate supply of air for proper gas combustion and efficient drying. The opening should be positioned within a few yards from the rear air entrance of the dryer. The air entrance to the dryer must be free of any obstructions closer than the rear wall of the belt guard. Inadequate air supply and exhaust facilities can result in improper operation of the gas burner, excessive temperatures, poor drying performance, premature failure of controls, damage to materials being dried, and reduced fire safety margins. Do not obstruct flow of combustion and ventilating air of dryer. Do not disable thermostat or airflow controls. Determine the cause(s), and make the proper corrections.

D. Preparation for Operation

The following items should be checked before attempting to operate the dryer:

1. Read and follow all caution, warning, and direction

labels attached to the dryer.

2. Check incoming supply voltage to be sure that it is the same as indicated on the dryer data label located in the right-hand control cabinet.

3. Check to assure that the dryer is connected to the type of heat/gas indicated on the dryer data label.

4. The sail switch damper assembly is installed on gas dryers and pre-adjusted at the factory prior to dryer shipment. However, the sail switch adjustment must be checked to assure that this important safety control is functioning.

5. Check bolts, nuts, screws, terminals, and fittings for security.

6. Be sure all gas shut-off valves are in the open position.

7. Be sure all back guard panels and service box covers have been replaced.

8. Rotate the tumbler (drum) by hand to be sure it moves freely.

E. Preoperational Test

All dryers are thoroughly tested and inspected before leaving the factory. However, a preoperational test should be taken before the dryer is publicly used. It is possible that adjustments have changed in transit.

1. Turn on electric power to dryer.

2. Refer to the operating instructions for starting your particular model dryer.

3. Start dryer. Using a "high heat" selection, accumulate about 20 minutes of time.

4. Remove air from the gas line. Run the dryer about 5 minutes. If the burner does not ignite during these 5 minutes, turn the dryer off and wait a few minutes.

NOTE: The dryer has a safety device (flame sensor) which shuts off the gas if the burner does not ignite in a short time. Wait a few minutes for this safety device to reset.

During this waiting period, check to be sure all gas shut-off valves are open.

5. Make a complete operational check of all the operating controls to assure that the timing is correct, temperature selection switches are functioning, etc.

6. Make a complete operational check of all safety related circuits - door switch(es), hi-limit thermostat, sail switch, cycling thermostats, etc.

7. A 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:

Natural Gas - 3.5 inches W.C.

L.P. Gas - 11.0 inches W.C.

8. If computer program changes are required, refer to the Phase 4 OPL "Introduction" section of the accompanying manual.

9. The dryer should be operated through one complete cycle to assure that no further adjustments are necessary and that all components are functioning properly.

10. Check the electric service phase sequence. While the dryer is operating, check to see if the fan is rotating in the counter-clockwise direction (when viewed from the motor end). If so, the phasing is correct. If the fan rotates clockwise, the phasing is incorrect. Correct by reversing two (2) leads at connections L1, L2, or L3 of power supply to the dryer.

SECTION II

Component/System Descriptions

This section gives a description of all the mechanical and electrical components and systems.

A. Tumbler (Basket)

The basket is made of heavy gauge stainless steel, perforated panels, four (4) stainless steel ribs, and two (2) outer basket rings made of rolled structural steel channel. The basket is a completely welded assembly, and the perforated panels are not removable.

B. Tumbler (Basket) Support System

The basket sits on four (4) rubber roller wheels which support the basket and also drive it. Two (2) of these wheels are on the basket drive shaft. This drive shaft is connected to the 3 HP basket drive motor by two (2) sets of V-belts and pulleys. The other two (2) wheels are on the basket idler shaft. This shaft simply supports half of the weight of the basket. Each shaft is 1-1/2 inches in diameter and sits in two (2) pillow block bearings. The position of the bearings (and so, the position of the basket) can be adjusted by loosening the two (2) bearing hold-down boots and adjusting the position of the bearings by loosening or tightening the 1/2-13 bearing adjustment screws.

C. Tumbler (Basket) Drive System

The 3 HP basket drive motor is located in the base at the rear of the dryer. It sits on an adjustable base so that the motor can be easily adjusted to the left or right in order to tighten or loosen the V-belts. The speed-reducing idler shaft which is located next to the drive motor is supported on two (2) pillow block bearings. Each bearing can be adjusted forward and backward by tightening or loosening the adjustment screws located to the left of each pillow block bearing. This allows you to keep the proper tension on the V-belts.

The drive motor is started through a reversing magnetic starter which is located in the high voltage electrical box.

D. Drive Motor "Soft Start"

An extremely important component in the basket drive system is the reduced voltage soft start motor control.

This is a fully solid-state electrical device which feeds a reduced voltage to the drive motor upon startup so the motor will start slowly and build up gradually to full speed. This makes for a very smooth or "soft" start. It also increases the life of the drive components (roller wheels, belts, etc.) because of the reduction in the starting torque which is a result of the slower startup. A second benefit of the soft start is the reduction in starting average surge. This device is mounted inside the high voltage electrical box, which is located on the dryer's base.

1. Soft Start Adjustments

There are two (2) adjustments which can be altered to change the "softness" of the soft start. These are located on the top left of the soft start and are labeled "initial torq 1" and "start time 1."

The initial torq 1 adjustment screw controls the amount of starting voltage delivered to the motor. This should be set so that the drive motor shaft will start to spin as soon as voltage is applied to the motor. The basket must be fully loaded when making this adjustment.

The start time 1 adjustment screw controls the "ramp up" time to full running voltage. This should be adjusted to give a smooth increase in motor speed.

The adjustments have been made at the factory and should not have to be adjusted in the field.

Because the initial torque adjustment is set with the basket fully loaded, when running the dryer with the basket empty or with a very light load, the basket may "bounce" on the roller wheels, causing a rumbling noise at startup. If you keep getting the rumbling noise when running the dryer with the basket loaded, you will want to lower the initial torque (initial starting voltage).

There are two (2) other adjustment screws in the soft start. The PFC voltage and line voltage limiter adjustments have been factory set and do not have to be field adjusted.

For more detailed information and a complete adjustment procedure for the four (4) adjustment screws, refer to the soft start adjustment instructions in the technical data section at the end of this manual.

E. Air Blower and Motor

This unit is located in the base of the dryer. The

impellor is a backward curved paddle wheel which is directly connected to the shaft of the blower motor. Gas dryers have a 3 HP blower motor for 60Hz machines, and all steam dryers as well as 50Hz gas dryers have a 5 HP motor. These motors contain sealed bearings that do not have to be lubricated.

The blower motor is started by a non-reversing magnetic starter which is located in the high voltage electrical box. The blower motor also has an internal thermal protection switch.

F. Gas Burner

Gas-heated dryers are equipped with a gas burner assembly located (viewing from front) on the top right-hand side of the dryer. This assembly consists of three (3) burner tubes, gas valve, ignitor, sail switch, and hi-limit thermostat. The inlet piping enters through the rear of the dryer on the right-hand side and runs to the front of the dryers where the gas valve is located.

G. High Voltage Electrical Box

This box is located in the base at the front of the dryer. The magnetic starters for both the basket drive motor and the blower motor are located here. Each starter is equipped with resettable overload heaters. Each of these motors is also protected by Slo Blo cartridge fuses which are located in this box.

The soft start device and the control voltage transformer are also located in this box. You can get access to these devices from the front of the dryer by removing the front base panel.

H. Load Door (Right and Left)

The load door is made up of two (2) horizontally sliding doors. Both doors ride on a linear slide located at the top of the door and roller wheels located at the bottom of the door. Both doors are insulated with 1/2-inch insulation so they remain cool when the dryer is in use.

The two (2) doors are held together by a 1-1/8 wide by 1/4 thick by 44-inch long magnetic strip located on the left door. Both doors are opened manually by pulling them apart.

I. Control Boxes

There are two (2) 14-inch wide by 3-1/2 deep by 52-5/8 high boxes on each side of the load doors on the front of the

dryer. Each box has its own door which is hinged and latched.

Opening the right control door reveals the electric control components and the computer which is located on the back of the door. On steam models, opening the left control door reveals the control mechanisms for the steam damper assembly. In the lower back of each box is a clean-out access panel so you can clean any lint accumulation inside the dryer.

J. Lint Drawer

The lint drawer is a pull out type, and it is located in the base on the left front leg. Simply grab the lint drawer handle, slide out the drawer, brush off the lint, and slide the drawer back in.

The lint screen must be kept clean in order for the dryer to function properly.

K. Safety Devices

1. Door Switches

There are two (2) door switches located in the middle front of the dryer just above the load doors. When either of the load doors open, the corresponding switch will also open, preventing the dryer from operating. See the parts manual for detailed assembly.

2. Sail Switch (Gas Dryers Only)

The sail switch is located in the front top right-hand corner of the dryer next to the gas valve. A sail switch consists of a round damper plate on a lever arm which is in contact with an electric switch. When the air blower comes on, it draws air through the gas burner. This creates a negative pressure inside the burner box, and this negative pressure pulls in the round damper and activates the sail switch. If there is an improper (low) airflow through the dryer, the sail switch damper will not pull in, preventing the burners 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 in it. It can also be caused by lack of make-up air.

3. Hi-Limit (Gas Dryers Only)

A hi-limit thermostat is located at each gas burner. This is an automatically reset disc-type thermostat set at

330° Fahrenheit. If the flame in the burner should get too hot, this thermostat will shut off both burners. This is generally caused by low airflow through the dryer.

4. Automatic Reset Thermostat

This is located inside the dryer on the left-hand side above the lint drawer. This thermostat senses the heated air after it has passed through the basket. If the air temperature gets too hot, the thermostat will shut off the burners. The dryer will not heat up until the air temperature cools down. At this time, the thermostat will automatically reset. The basket and blower motors will run, but the dryer will not heat.

SECTION III

Troubleshooting (General)

The information provided will help isolate the most probable component(s) 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 misconstrued 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.

	Trouble		Possible Cause
A.	Load door will not open or close.	1.	Door slide in upper door track assembly jammed or broken.
B.	No display on computer.	1.	Open circuit breaker switch or blown fuse.
		2.	Bad wiring connection.
		3.	Line voltage.
		4.	Faulty computer controller.
C.	Computer will not accept keypad entries.	1.	Keypad strip is not plugged into computer securely.
		2.	Keypad is defective.
		3.	Faulty computer controller.
D.	Dryer will not start, but computer display indicators are on.	1.	One of the door switches is maladjusted or broken.

		2. Faulty motor.
		3. Faulty temperature sensor circuit.
E.	Drive motor runs, burner is on, but tumbler (basket) will not turn.	1. Broken, damaged, or loose V-belt.
		2. Belts are contaminated (oil, grease, etc.).
		3. Loose or broken pulley.
F.	Drive and blower motors start, computer display heat indicators are on, but ignition sequence will not begin. (gas machines only)	1. Lint coop automatic safety thermostat (225°) is defective.
		2. Sail switch is out of adjustment, defective, or sail switch damper is not closing due to back pressure created by a restriction in the exhaust system.
		3. Defective burner hi-limit (330°) safety thermostat.
		4. Defective ignitor/probe assembly or probe is maladjusted.
		5. Defective ignition (DSI) module.
		6. Faulty gas valve.
		7. Faulty computer controller.
G.	Dryer operates, probe sparks, but gas does not flow. (gas machines only)	1. Dryer gas shut-off valve is closed.
		2. Defective gas valve (open coil in valve)
		3. Bad wiring connection from DSI module to gas

		valve (Check voltage at gas valve.)
		4. Bad DSI module.
H.	Dryer operates, probe sparks, but there is no ignition even though gas is evident. (gas machines only)	1. Gas pressure is too low. Check manifold pressure and take necessary corrective action.
		2. Defective gas valve.
		3. Ignitor/probe out of adjustment. Not within gas flow.
		4. Lint buildup in burner tubes.
I.	Dryer operates but is taking too long to dry.	1. An inadequate exhaust duct work system.
		2. Restriction in exhaust system.
		3. Insufficient make-up air.
		4. Poor housekeeping . . . dirty or clogged lint screen.
		5. Extractors are not performing properly.
		6. An exceptionally cold/ humid or low barometric pressure atmosphere.
		7. The supply gas may have a low heating value. Check with local gas supplier. (gas machines only)
		8. Faulty temperature sensor. (temperature calibration is incorrect)
		9. Faulty computer controller. (temperature calibration is incorrect)

J.	Thermal overload, for drive motor is tripping.	1. Either an exceptionally low or high voltage supply. 2. Motor bearing failure. 3. Bearing failure in drive system. 4. Basket drive wheel failure, resulting in jammed basket. 5. Motor vents are blocked with lint. 6. Defective motor. 7. Insufficient make-up air.
K.	Thermal overload, for fan motor is tripping.	1. Either an exceptionally low or high voltage supply. 2. Motor bearing failure. 3. Motor vents are blocked with lint. 4. Defective motor. 5. Out of balance fan. 6. Insufficient make-up air.
L.	Dryer is cycling on burner hi-limit safety thermostat. (gas machines only)	1. Insufficient exhaust duct work size or restriction in exhaust system. 2. Insufficient make-up air. 3. Lint screen needs cleaning. 4. Damaged impellor (fan). 5. Faulty computer controller.
M.	Display reads "dSFL," dryer sensor circuit failure.	1. Faulty microprocessor temperature sensor probe.

		2. Open circuit in either one of two (2) wires leading from sensor probe to computer. a. Connection at sensor bracket assembly connector. b. Connection at computer harness connector.
		3. Faulty computer controller.
N.	Dryer does not start. Display reads "door."	1. Door is open.
		2. Open circuit in either one of the two (2) gray wires leading from the door switch to the computer.
		3. Open circuit in lint drawer switch leading to computer.
O.	There is excessive vibration coming from the tumbler (basket).	1. Drive wheels are failing.
		2. Basket is out of adjustment.
P.	Drive wheels are wearing excessively, unevenly, or have flat spots.	1. Defective drive wheels.
		2. Wheel set screws are loose and wheels are floating on shaft.
		3. Clutch plate assembly set screws are loose and floating.
		4. Drive motor soft start control is out of adjustment.
		5. Idler or drive shaft is out of adjustment.

SECTION IV

Troubleshooting (Electrical)

The information provided will help isolate the most probable component(s) 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 misconstrued 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.

Refer to the "Glossary of Abbreviations" on page 45 for a listing of abbreviations as they pertain to this section.

Symptoms and Action to be Taken

A. Dryer will not start.

Is LED display in a "no display" condition?

Yes: See (1.) No Display Condition
No: See (2.) LED Display Lights

1. No Display Condition

a. Check line voltage. Check voltage across L1, L2, L3. Is there line voltage?

Yes: Service okay.
No: Check main fuses or circuit breakers.

b. Check voltage at transformer XFMR1. Check voltage X_A to X_B (see table 3 for voltage) Is there voltage?

Yes: XFMR1 okay.
No: Bad XFMR1.

c. Check voltage at TB1,A to TB1,B. Is there voltage?

Yes: Wires okay.
No: Bad wire or connection from XFMR1 to TB1,A or TB1,B

d. Check voltage from TB3,7 to TB3,6. Is there voltage?

Yes: Wire okay.
No: Check fuse 7, fuse block 3. Is fuse okay?

Yes: Bad wire or connection from TB1,A or TB1,B to TB3,7 or TB3,6.
No: Replace fuse.

e. Check MC 15-position connector by disconnecting it and locating numbers 5 and 7. Check for voltage across holes 5 and 7. Is there voltage?

Yes: 1) MC 15-position connector terminals and MC controller terminals are not mating properly.

2) Bad wire or connection from TB3,7 or TB3,6.

No: 1) Check for voltage across MC connector hole 5 and TB3,6.

If no voltage, problem is a break in the wire or connection from hole 5 to TB3,7.

2) Check for voltage across MC connector hole 7 and TB3,7.

If no voltage, problem is a break in the wire or connection from hole 7 to TB3,6.

2. LED Display Lights

a. Does LED display read "FILL"?

Yes: Start dryer.
No: Default codes -

door: Keyboard entry was made while main door was open

or

fault in D.C. door switch circuit.

dsfl: Fault in MC temperature sensing circuit.

Temp: Heat default condition. To cancel, press clear/stop key. If condition persists, there is a problem with dryer heating unit or circuits to heating unit.

b. Does LED display read drying mode (dr<u>xx</u>)?

No: MC is bad.
Yes: Do LED indicator dots come on?

Yes: See [1)] Check A.C. door switch.
No: See [2)] Check D.C. door switch.

1) With doors closed, check A.C. door switch circuit.

a) Check voltage from fuse block 3,A to TB3,6. Is there voltage?

Yes: Wire okay.
No: Bad wire or connection from TB1,A to FB3,A.

b) Check voltage from FB3,B to TB3,6. Is there voltage?

Yes: Fuse okay.
No: Blown fuse or connection on fuse block 3.

c) Check voltage from TB2,5 to TB3,6. Is there voltage?

Yes: Wire okay.
No: Bad wire or connection from TB2,5 to FB3,B.

d) With doors closed, check voltage from TB3,5 to TB3,6. Is there voltage?

Yes: Door Switch okay.
No: (1) Bad wire or connection from switch to TB3,5 or bad switch.
(2) Check lint door switch.

2) Check D.C. door switch. Open door. Close door switches by pushing in plunger.

a) Check +5 VDC across gray wires #146

and #147 at switch terminals. Is there D.C. voltage?

Yes: Bad switch.
No: Switch okay.

b) With door open, check D.C. voltage across in line connectors 1LC1 and 1LC2. Is there voltage?

Yes: Wires okay.
No: (1) Bad wire or connection from MC.
(2) Bad MC.
(3) Check lint door switch.

c) Check MC controller pins on computer. Remove 15-position MC connector, locate MC controller pins 10 and 11. Check D.C. voltage across pins 10 and 11. Is there D.C. voltage?

Yes: MC is okay. 15-Position connector and MC pins not mating properly.
No: MC is bad.

B. Drive motor does not run, forward mode. Blower motor runs.

Is first indicator dot on the left on?

No: Defective computer.
Yes: 1. Check MC relay voltage at TB3,4 to TB3,6. Is there voltage?

Yes: MC is okay.
No: a. Bad wire or connection from TB3,4 to MC 15-pin connector.
b. 15-Pin connector not mating to MC board properly.
c. MC is defective.

2. Check arc suppressor board ASB. Check voltage at ASB terminal AS3 to TB1,B. Is there voltage?

Yes: Wire to board is okay.
No: Bad wire #261 or connection from TB3,4.

3. Check voltage at ASB terminal BS2 to TB1,B. Is there voltage?

Yes: Board is okay.
No: Bad board.

4. Check voltage at STRTR2, NC21 to TB1,B. Is there voltage?

   Yes: Wire and connections to STRTR2, NC21.
   No: Bad wire or connection to STRTR2, NC21.

5. Check voltage from STRTR2, NC22 to TB1,B. Is there voltage?

   Yes: STRTR2 NC contacts are okay.
   No: Bad contacts. Replace interlocks.

6. Check voltage at STRTR3,A1 to TB1,B. Is there voltage?

   Yes: Check voltage across STRTR3 terminals 1L1 to 2T1, 3L2 to 4T2, 5L3 to 6T3. Is there voltage at all points?

      Yes: Interlock is bad.
      No: Interlock is okay.

   No: Bad wire or connection from TB1,B to STRTR3, A1.

7. Check overloads OL1, OL2. Check voltage across OL2 terminals 95 and 96. Is there voltage?

   Yes: OL2 is open.
   No: OL2 is okay.

8. Check voltage across OL1 terminals 95 and 96. Is there voltage?

   Yes: OL1 is open.
   No: OL1 is okay.

9. Check induction motor controller clutch (CLTCH). Check for line voltage across CLTCH terminals T1, T2, T3. Is there line voltage?

   Yes: CLTCH is okay.
   No: CLTCH is bad.

10. Check voltage at motor. Check line voltage across L1, L2, L3. Is there line voltage?

   Yes: Motor is bad.
   No: Bad MC. Bad wire or connection from CLTCH to motor.

C. Drive motor does not run, reverse mode (CCW).

Is second indicator dot from left on?

No: Defective computer.
Yes: 1. Check MC relay voltage at TB3,3 to TB3,6. Is there voltage?

Yes: MC is okay.
No: a. Bad wire or connection from TB3,3 to MC 15-pin connector.
b. 15-Pin connector not mating to MC board properly.
c. MC is defective.

2. Check voltage at arc suppressor board (ASB) terminals AS2 to TB1,B. Is there voltage?

Yes: Wire to board is okay.
No: Bad wires #256, 257 or connection from TB3,3 to AS2.

3. Check voltage at ASB terminal BS2 to TB1,B. Is there voltage?

Yes: ASB is okay.
No: ASB is bad.

4. Check voltage at STRTR3,NC21 to TB1,B. Is there voltage?

Yes: Wire #258 is okay.
No: Bad wire or connection from ASB, BS2 to STRTR3,NC21.

5. Check voltage at STRTR3,NC22 to TB1,B. Is there voltage?

Yes: STRTR3,NC22,21 contacts are okay.
No: Interlock is bad.

6. Check voltage at STRTR2 terminal A1 to TB1,B. Is there voltage?

Yes: Wire #254 is okay.
No: Bad wire or connection from STRTR3,NC22 to STRTR2,A1.

7. Check voltage across STRTR2 terminals 1L1 to 2T1, 3L2 to 4T2, 5L3 to 6T3. Is there voltage across all points?

Yes: Bad interlock.
No: Interlock is okay.

8. Check overloads OL1, OL2. (See "Check overloads" in "Drive motor does not run, forward mode." section.)

9. Check induction motor controller clutch (CLTCH). (See "Check induction motor controller clutch" in "Drive motor does not run, forward mode." section.

10. Check voltage at motor. Check line voltage across L1, L2, L3. Is there voltage?

    Yes: Bad motor.
    No: Bad wires or connections from CLTCH to motor.

D. Blower motor does not run. Drive motor runs.

1. Check MC relay voltage at TB3,2 to TB3,6. Is there voltage?

    Yes: MC is okay.
    No:
    a. Bad wire or connection from TB3,2 to MC 15-pin connector.
    b. 15-Pin connector not mating properly to MC board.
    c. MC is defective.

2. Check voltage at arc suppressor board (ASB) terminal AS1 to TB1,B. Is there voltage?

    Yes: Wire #265 is okay.
    No: Bad wire or connection from TB3,2 to ASB,AS1.

3. Check voltage at ASB terminal BS1 to TB1,B. Is there voltage?

    Yes: ASB is okay.
    No: Bad ASB.

4. Check voltage at STRTR1 terminal A1 to TB1,B. Is there voltage?

    Yes: Wire #266 is okay.
    No: Bad wire or connection from ASB,AS1 to STRTR1,A1.

5. Check voltage across STRTR1 terminals 1L1 to 2T1, 3L2 to 4T2, 5L3 to 6T3. Is there voltage at all points?

    Yes: Bad STRTR1 relay.
    No: STRTR1 relay is okay.

6. Check overloads OL1, OL2. (See "Check overloads OL1, OL2." in "Drive motor does not run, forward mode.")

7. Check line voltage at motor L1, L2, L3. Is there line voltage?

   Yes: Bad motor.
   No: Bad wire or connection from OL1 to blower motor (MTR2).

E. Steam Damper System (Models Mfd. Prior to March 1, 1990)

STEAM ONLY

This particular damper system consists of a motor and lead screw, which drive a damper plate back and forth to control heat. Before doing any electrical checks, proceed by doing a visual check of the following:

- Are the lead screw and nut jammed?
- Is foreign matter obstructing lead screw operation?
- Are damper blade rollers being obstructed?
- Is steam coil opening clean?

CAUTION: STEAM COIL MAY BE HOT.

1. No heat condition. Is third indicator dot from left on?

   No: Defective computer.
   Yes: Computer okay.

   a. Check steam coils. Are they hot?

      Yes: Steam is okay.
      No: Check boiler.

      Check fuses, fuse block 4 (FB4), fuses 9, 10, 11

   b. Check voltage at HLS2,A to TB3,6. Is there voltage?

      Yes: HLS2 is okay.
      No: 1) Bad wire or connection from TB3,7 to HLS2,B.
      2) Check connection at J2,4.
      3) HLS2 is defective.

c. Check voltage at TB2,2 to TB3,6. Is there voltage?

Yes: Wires #153 and #155 are okay.
No: 1) Bad wire or connection from HLS2,A through TB2,2.
2) Check connection at J2,1.

d. Check voltage at TB2,7 to TB3,6. Is there voltage?

Yes: MC heat relay is okay.
No: 1) Bad connection from HI through HO to TB2,7.
2) Defective MC.

e. Check voltage at relay (RB1) terminals C, to TB3,6. Is there voltage?

Yes: Wire and connections from TB3,7 to RB1,C okay.
No: Bad wire or connection from TB3,7 to RB1,C.

f. Check voltage at TB2,3 to TB4,6. Is there voltage?

Yes: Wire #312 is okay.
No: Bad wire or connection from RB1,NO through TB2,3

g. Check voltage at TB4,4 to TB4,6. Is there voltage?

Yes: Wires #308, 325, 327 are okay.
No: Check voltage at spade connector SC1. Is there voltage?

Yes: Wires #325 and #308 are okay.
No: Bad wire or connection from TB2,3 through J2,10 to SC1.

h. Check damper switch LS1. If the damper has moved from the right position (no heat) to the left position (heat) and is fully open, LS1 will be open. The relay contacts (RB1) will be in the C,NC position.

i. Check voltage across LS1 terminals C,NC. Is there voltage:

Yes: Switch is okay.
No: Bad switch or connection from TB4,4 through LS1,C.

j. Other than fully open (left) or fully closed (right), LS1 and LS2 will be closed.

Check voltage across LS1,C,NC. Is there voltage?

Yes: Switch is bad.
No: Switch is okay.

NOTE: To check motor relays and motor circuit, the damper must be in the traveling condition.

k. Check voltage at arc suppressor board (ASB2) terminal AS2 to TB4,6. Is there voltage?

Yes: Wire #305 is okay.
No: Bad wire or connection from TB4,3 to ASB2,AS2.

l. Check voltage at ASB2,BS2 to TB4,6. Is there voltage?

Yes: ASB2 is okay.
No: ASB2 is bad.

m. Check voltage at STRTR4,A1. Is there voltage?

Yes: Wire #303 is okay.
No: Bad wire or connection from ASB2,BS2 to STRTR4,A1.

n. Check STRTR4 coil. Disconnect wires 302 and 303 from STRTR4 terminals A2 and A1. With ohm meter, check continuity through the coil. Is there continuity?

Yes: Coil okay.
No: Bad coil.

Reconnect wires 302 and 303.

o. Check relay contacts with damper in traveling position. Check voltage across STRTR4 and STRTR5. Check voltage from fuse block 4 (FB4), fuse 11, wire #88 to wire #94 on damper motor relay. Is there voltage?

Yes: Relay contacts open. Bad relay.
No: Relay okay.

p. Check voltage from fuse block 4 (FB4), fuse 10, wire #87 to wire #93 on damper motor relay. Is there voltage?

Yes: Relay contacts open. Bad relay.
No: Relay okay.

q. Check voltage from fuse block 4 (FB4), fuse 9, wire #86 to wire #92 on damper motor relay. Is there voltage?

Yes: Relay contacts open. Bad relay.
No: Relay okay.

r. Check line voltage at motor. Check line voltage across wires 92, 93, 94. Is there line voltage?

Yes: Bad motor or connection from relay to motor.
No: Motor okay.

2. No heat condition with third indicator dot from left off.

a. Check temperature sensor high-limit HLS2. Check voltage at HLS2,B to TB3,6. Is there voltage?

Yes: Wire #156 and 154 okay.
No: Bad wire or connection from TB3,7 through HLS2,B

b. Check voltage at HLS2,A to TB3,6. Is there voltage?

Yes: HLS2 okay.
No: HLS2 bad.

c. Check voltage across relay (RB1) terminals C,NO. Is there voltage?

Yes: Relay okay.
No: Bad wire #313 or connection from TB3,7 through relay terminal C or bad relay.

d. Check voltage at TB2,4 to TB3,6. Is there voltage?

Yes: Wire #314 okay.
No: Bad wire or connection from RB1,NC through TB2,4.

e. Check voltage at TB4,5 to TB3,6. Is there voltage?

Yes: Wires #309, 326, 328 okay.

No: Check voltage at spade connector SC2. Is there voltage?

Yes: Wire #326 and 309 okay.
No: Bad wire or connection from TB2,4 through SC2.

f. Check damper switch LS2. If the damper has moved from the left position (heat) to the right position (no heat) and is fully closed, LS2 will be open. The relay contacts (RB1) will be in the C,NC position. Check voltage across LS2 terminals C,NC. Is there voltage?

No: Switch okay.
Yes: Bad switch or connection from TB4,4 through LS1C.

g. Other than fully open (left) or fully closed (right), LS1 and LS2 will be closed. Check voltage across LS2 C,NC. Is there voltage?

Yes: Switch is bad.
No: Switch okay.

h. To check the motor relays and motor circuit, the damper must be in the traveling condition. Check voltage at arc suppressor board (ASB2) terminal AS1 to TB3,6. Is there voltage?

Yes: Wire #304 okay.
No: Bad wire or connection from TB4,2 through ASB2, AS1.

i. Check voltage at ASB2, BS1 to TB4,6. Is there voltage?

Yes: ASB2 okay.
No: Bad ASB2.

j. Check voltage at STRTR5 A1???. Is there voltage?

Yes: Wire #301 okay.
No: Bad connection or wire from ASB2, BS1??? through STRTR5 A1???

k. Disconnect wires 300 and 301 from STRTR5 terminals A2 and A1. With ohm meter, check continuity through the coil. Is there continuity?

Yes: Coil okay.

No: Bad coil.

Reconnect wires 300 and 301.

l. Check relay contacts with damper in traveling position. Check voltage across STRTR4 and STRTR5. Check voltage from fuse block 4 (FB4), fuse 11, wire #88 to wire #94 on damper motor relay. Is there voltage?

Yes: Relay contacts open. Bad relay.
No: Relay okay.

m. Check voltage from fuse block 4 (FB4), fuse 10, wire #87 to wire #93 on damper motor relay. Is there voltage?

Yes: Relay contacts open. Bad relay.
No: Relay okay.

n. Check voltage from fuse block 4 (FB4), fuse 9, wire #86 to wire #92 on damper motor relay. Is there voltage?

Yes: Relay contacts open. Bad relay.
No: Relay okay.

o. Check line voltage at motor. Check line voltage across wires 92, 93, 94. Is there <u>line voltage</u>?

Yes: Bad motor or connection from relay to motor.
No: Motor okay.

F. Steam Damper System (Models Mfd. As of March 1, 1990)

<u>STEAM ONLY</u>

There are two (2) types of steam dampers manufactured as of March 1, 1990. Electrically, they are the same and should be checked the same way. Before doing any electrical check, proceed with the following instructions. Refer to mechanical servicing for details on your particular model.

- Check to see if there is enough air pressure.
- Check for any obstructions preventing proper operation.
- Check to see if damper blade rollers are being obstructed.

- Check to see if steam coil opening is clean.

CAUTION: STEAM COIL MAY BE HOT.

1. "No heat" damper is closed. Position is to the right of center. Is third indicator dot from the left on?

   No: See section A.1. "No Display Condition" (page 24).
   Yes: Check voltage from HLS2,B to TB3,6. Is there voltage:

      No: Bad wire or connection from TB3,7 to HLS2,10.
      Yes: a. Check voltage across HLS2,A,B. Is there voltage?

         Yes: HLS2 is open. It is open because of high heat temperature or it is faulty. Check airflow, lint basket, and exhaust. If HLS2 is faulty, replace it.
         No: HLS2 is okay.

         b. Check voltage from TB2,2 to TB3,6. Is there voltage?

            Yes: Connections and wire #153 are okay.
            No: Bad wire or connection from HLS2,A to TB2,2.

         c. Check voltage from TB2,7 to TB3,6. Is there voltage?

            Yes: Connections and wires #202 and 203 are okay.
            No: If indicator dot is on, then connector??? is faulty or connection from TB2,2 to TB2,7 is bad.

         d. Check voltage from wire #330 at fuse 9 to TB3,6. Is there voltage?

            Yes: Connections and wire #330 okay.
            No: Bad connection or wire from TB2,7 to fuse 9.

e. Check voltage at wire #331 fuse 9. Is there voltage?

Yes: Fuse is okay.
No: Check fuse. If bad, replace.

f. Check voltage across in-line connectors at heat solenoid. In-line connectors are enclosed in wire sleeve. Is there voltage?

Yes: In-line connection is okay.
No: In-line connection is bad.

g. Check continuity through heat solenoid with ohm meter. Is there continuity?

Yes: Heat solenoid is okay.
No: Heat solenoid is bad. Replace it.

2. Too much heat, damper open, position to the left of center. Proceed with electrical diagnosis as in "No Heat" (page 38).

G. Optional Sprinkler System

The sprinkler system consists of the following additional components:

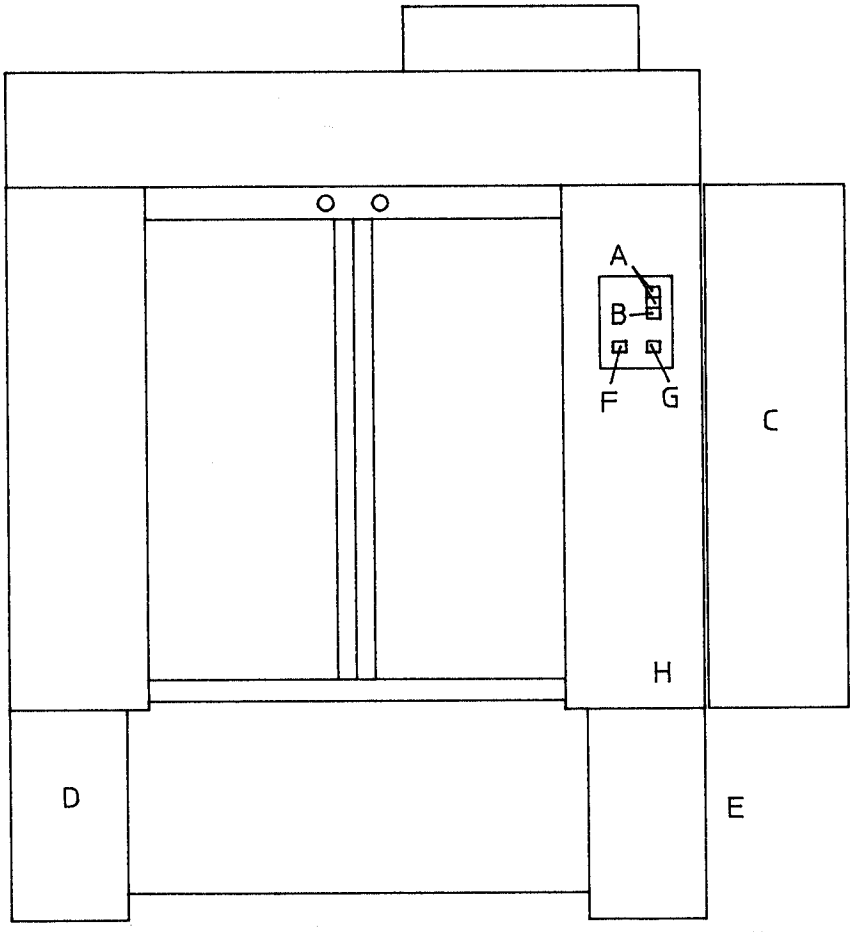
- Two (2) 115V Dual Relays
- PB/Ind Bracket
- Solid State Buzzer
- Hi-Limit Switch (L-290)
- Sprinkler Valve Solenoid
- Terminal Block TB2
- Terminal Block TB3
- J2 Connector
- Sprinkler System Switch (mounted on PB/Ind. Bracket)
- 110V Pilot Light (mounted on PB/Ind. Bracket)

1. Check Safety Switches - temperature sensor high limit (HLS), sail switch, and burner hi-limit (HLS1). These are energized through the sprinkler relay CR2 terminals C and NC. If there is no heat,

check wire contacts C and NC on relay CR2. Check voltage across C and NC. Is there voltage?

Yes: Relay is bad.
No: Relay is okay. (See "No Heat Condition" on page 37.)

A - RELAYS
B - PB/IND/BRACKET
C - SOLID STATE BUZZER
D - HIGH LIMIT SWITCH
E - SPRINKLER VALVE SOLENOID
F - TB2
G - TB3
H - J2 CONNECTOR



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2. Voltage and Continuity Check

CAUTION: SHUT OFF WATER BEFORE TROUBLESHOOTING SPRINKLER SYSTEM.

SHUT OFF POWER BEFORE CHECKING CONTINUITY.

a. Check voltage from J2 (wire #354) to TB3,6. Is there voltage?

Yes: Wire #354 is okay.
No: Bad wire or connection.

b. Check Voltage from HLS3,A to TB3,6. Is there voltage?

Yes: Wire #355 is okay.
No: Bad wire or connection.

c. Check voltage at J2 (wire #356) to TB3,6. Is there voltage?

Yes: HLS3 is okay.
No: Bad wire or connection. HLS3 is bad.

d. Check voltage from CR1 terminal L1 to TB3,6. Is there voltage?

Yes: HLS3 is okay.
No: Bad wire or connection. HLS3 is bad.

e. Remove from HLS3 terminals A and B wire #355 and #356. With ohm meter, continuity check HLS3. Is there continuity?

Yes: HLS3 is okay.
No: HLS3 is bad.

f. Check voltage across relay, CR1, terminals C and NC. Is there voltage?

Yes: CR1 is okay.
No: CR1 is bad.

g. Check voltage across relay, CR2, terminals C and NO. Is there voltage?

Yes: CR2 is bad or bad connections.
No: CR2 is okay.

h. Check buzzer and indicator light. Disconnect terminal L1 from relay CR1. Does buzzer sound?

Yes: Buzzer is okay.
No: Bad connection or buzzer.

i. Does indicator light come on?

Yes: Indicator light is okay.
No: Bad connection or indicator light.

j. To check buzzer continuity, shut off power. Disconnect buzzer terminals, wire #369 and #370, from buzzer. Check buzzer for continuity using ohm meter. Is there continuity?

Yes: Buzzer is okay. Bad wire or connections.
No: Bad buzzer.

k. To check indicator light continuity, shut off power. Disconnect sprinkler valve solenoid terminals, wire #364 and #365, from wolenoid valve coil. Check continuity through solenoid valve coil. Is there continuity?

Yes: Coil is okay. Valve is bad.
No: Bad coil.

l. To check push button, shut off power. Disconnect push button terminals, wire #360 and #361. Push push button to ensure contacts are engaging. Check continuity through push button with contacts closed. Is there continuity?

Yes: Push button is okay.
No: Bad push button.

m. Check continuity with push button contacts open. Is there continuity?

Yes: Bad push button.
No: Push button okay.

H. GAS ONLY

1. No Heat Condition

a. Temperature Sensor Circuit.

1) Does LED display read "DSFL?"

Yes: a) Check temperature sensor wiring at connector J2 for poor connection.
b) Check temperature sensor wire for continuity from J2 to 15-pin MC connector.
c) Check for grounded temperature sensor wire. Use ohm meter to check wires from 15-pin MC connector to J2 to chassis for ground.
d) Replace temperature sensor.

No: Temperature sensor circuit okay.

b. Heat Circuit.

1) Is LED heat dot (third dot from left) on?

No: Defective computer.
Yes: Computer is okay.

a) Check sail switch. With dryer running, push in sail switch lever arm. Does burner come on?

Yes: Sail switch okay.
No: Check sail switch for continuity with ohm meter.

Shut off power, remove either terminal from sail switch, and push in sail switch plunger. Is there continuity?

Yes: Sail switch okay.
No: Replace sail switch.

b) Check voltage at wire #156, TB3,7 to TB3,6. Is there voltage?

Yes: Wire and connections okay.
No: Bad wire or connection at TB3,7.

c) Check voltage at connector J2,4 wire #156 to TB3,6. Is there voltage?

Yes: Wire and connection okay.
No: Bad wire or connection from TB3,7 to J2,4.

d) Check voltage at connector J2,1 to TB3,6. Is there voltage?

Yes: HLS2 circuit and HLS2 okay.
No: (1) Check HLS2 for open circuit with ohm meter across HLS2,A and B. Disconnect either terminal before checking. Is there continuity?

Yes: HLS2 okay.
No: Replace HLS2.

(2) Check wire #154 to HLS2B and wire #153 from HLS2A to J2 connector for open wire or bad connections.

e) Check voltage at TB2,2 to TB3,6. Is there voltage?

Yes: Wire #155 and connections from

J2,1 to TB2,2 okay.
No: Bad wire or connection.

f) Check voltage at HLS1,B to dryer chassis. Is there voltage?

Yes: Wire #158 and 160 okay.
No: (1) Check red butt connector in sail switch housing for bad connection.
(2) Check connections at wire #158 TB2 and wire #160 at HLS1,B.

g) Check voltage at HLS1,A to dryer chassis. Is there voltage?

Yes: HLS1 okay.
No: Replace HLS1.

h) See a) "Check Sail Switch."

i) Check voltage at TB2,3 to TB3,6. Is there voltage?

Yes: Heat circuit to XFMR2 is okay.
No: Bad wire or connection from sail switch common, wire #157 to TB2,3.

j) Check voltage at TB2,4. Is there voltage?

Yes: XFMR2 okay.
No: (1) Bad wire or connection from XFMR2 to TB2,4.
(2) Defective XFMR2.

k) Check voltage at DSI module terminal TH. Is there voltage?

Yes: (1) HO relay on computer board okay.
(2) Wire and connections to DSI "TH" terminal okay.
No: Bad DSI module.

l) Check voltage at gas valve. Check voltage across GV1,GV2. Is there voltage?

Yes: Valve okay.
No: (1) Bad wires or connection

from DSI module to valve.

(2) Bad valve.

m) Check DSI module. Check for spark burst at the ignitor. Ignitor will burst a maximum of four (4) times. If flame is not verified after four (4) ignitor bursts, the DSI indicator light will blink and gas valve will shut down.

GLOSSARY OF ABBREVIATIONS

The abbreviations listed below represent a composite of the reference (ref.) names that appear in TABLE 1, located in the bottom right-hand corner on the wiring diagram. A wiring diagram is affixed to each dryer, beneath the control panel assembly, inside the right control door.

Ref. Name	Description
ASB	Arc Suppressor Board
AUX	Auxiliary Block
BC	Burner Control
CLTCH	Clutch, Soft Start
DS	Door Switch
FB	Fuse Block
FU	Fuse
GL	Ground Lug
GV	Gas Valve
HLS1	Hi-Limit Switch (330°)
HLS2	Hi-Limit Switch (225° auto. thermostat)
IG/FP	Ignitor/Flame Probe
INT	Interlock, Mechanical
KBD	Keyboard, Microcomputer (microprocessor)
LS	Limit Switch
MC	Microcomputer (microprocessor)
MTR1	Motor, Tumbler (basket)
MTR2	Motor, Blower
MTR3	Motor, Damper
OL	Overload
PDB	Power Distribution Block
RB	Relay Board
SS	Sail Switch
STRTR	Starter
TB	Terminal Block
TS	Temperature Sensor
XFMR	Transformer

SECTION V

Servicing

Introduction

All electrical/mechanical service or repairs should be made with the electrical power to the dryer disconnected (power off).

WARNING: PERSONAL INJURY COULD RESULT.

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

When contacting the factory for assistance, always have the dryer model and serial numbers available.

CAUTION: OBSERVE ALL SAFETY PRECAUTIONS DISPLAYED ON THE DRYER OR SPECIFIED IN THIS MANUAL BEFORE AND WHILE MAKING REPAIRS.

A. Computer Controls

1. To Replace Computer

a. Discontinue power to dryer.

b. Disconnect main power harness from rear of computer by squeezing locking tabs and pulling connector straight back.

c. Disconnect the green ground wire from the computer.

d. Disconnect the two (2) wires from the HI and HO terminals of the computer.

e. Disconnect keyboard ribbon from computer.

f. Remove the four (4) hex nuts securing the computer to the control door and remove the computer.

g. Install new computer by reversing this procedure.

h. Reestablish power to dryer.

2. To Replace Keyboard Label Assembly

a. Discontinue power to dryer.

b. Unplug keyboard ribbon from rear of computer.

c. Slowly peel off and remove keyboard label assembly from control door.

d. Peel paper backing off new keyboard label assembly.

e. Holding the new keyboard label assembly close to the control door, insert the keyboard ribbon through the rectangular slot in the control door. Align label assembly into position and gently press into place.

f. Connect keyboard ribbon to computer.

g. Reestablish power to dryer.

B. Ignition Controls (Gas Models Only)

1. To Replace Ignitor/Probe Assembly

a. Discontinue power to the dryer.

b. Remove the triangular cover over the right-hand control box on the front panel.

c. Remove the uppermost burner deflector on the right-hand side of the dryer (viewed from front). This is the bracket which houses the hi-limit thermostat.

d. Disconnect the three (3) wires to the ignitor/probe assembly. The hi-voltage wire (insulated with rubber) and the flame sensor wire (braided red wire) connect to the ignition (DSI) module in the right-hand control box. The ground wire (green) is attached to the ignition control panel (also located in the right-hand control box).

e. Remove the two (2) screws securing the ignitor bracket in the oven and remove the probe.

f. Install new probe assembly by reversing procedure.

g. Reestablish power to dryer.

2. To Replace DSI Module

   a. Discontinue power to the dryer.

   b. Remove the wires connected to the terminal strip at the bottom of the module.

   c. Remove the four (4) screws securing the module to the ignition control panel.

   d. Replace module by reversing procedure.

   e. Reestablish power to dryer.

3. To Replace the Ignition Transformer

   a. Discontinue power to the dryer.

   b. Cut and remove the plastic wire wraps around the harness that contains the transformer wires.

   c. Disconnect the wires from the transformer at the terminal block and the ignition control module.

   NOTE: Identify location of each wire for correct reinstallation.

   d. Remove the screws which secure the transformer to the ignition control panel.

   e. Replace transformer by reversing procedure.

   f. Reestablish power to dryer.

4. To Replace Gas Valve

   a. Discontinue power to the dryer.

   b. Shut off gas supply at manual shut-off valve prior to dryer gas piping.

   c. Separate gas piping downstream of manual shutoff just prior to dryer gas piping.

      1) Remove the triangular cover plate above the right control box and the plate directly underneath by removing the screws.

   d. Disconnect gas valve wiring.

NOTE: Identify location of each wire for correct reinstallation.

e. Remove the two (2) pipe brackets which secure the gas pipe to the side of the dryer.

f. Pull the gas train assembly toward the front of the dryer until the four (4) ports on the gas manifold clear the burner tubes.

g. Tilt the open end of the gas piping up until you are able to angle the gas train assembly out of the dryer.

h. Remove the gas manifold from the gas train.

i. Remove the piping on either side of the gas valve.

j. Reverse procedure for installing new gas valve.

CAUTION: A proper pipe joint sealant must be used at all pipe connections.

WARNING: TEST ALL CONNECTIONS FOR LEAKS BY BRUSHING ON A SOAPY WATER SOLUTION. (liquid detergent also works well) NEVER TEST FOR LEAKS WITH A FLAME.

k. Reestablish power to dryer.

5. To Replace Main Burner Orifices

a. Refer to "replace gas valve" and follow steps "a" through "h."

b. Unscrew main burner orifices and replace.

NOTE: Use extreme care when removing and replacing orifices. These orifices are made of brass and are easily damaged.

c. Reverse the removal procedure for reinstalling.

WARNING: TEST ALL CONNECTIONS FOR LEAKS BY BRUSHING ON A SOAPY WATER SOLUTION. (liquid detergent also works well) NEVER TEST FOR LEAKS WITH A FLAME.

6. To Replace Burner Tubes

a. Refer to "Replace Gas Valve" and follow steps "a" through "h."

b. Remove the screws securing the front flanges of the burner tubes to the oven.

c. Remove the screws securing the upper burner tube support plate (small cover plate directly above front flanges of tubes) and remove this plate.

d. Remove the uppermost oven baffle located on right side of dryer when viewed from front. This baffle contains the hi-limit thermostat.

e. Slide the tubes forward slightly and then angle out the side of the oven.

f. Replace by reversing procedure.

WARNING: TEST ALL CONNECTIONS FOR LEAKS BY BRUSHING ON A SOAPY WATER SOLUTION. (liquid detergent also works well) NEVER TEST FOR LEAKS WITH A FLAME.

7. 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 is not always accurate. A manometer is simply a glass or transparent plastic tube with a scale in inches. 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 number 122804.

a. To test gas water column (W.C.) pressure:

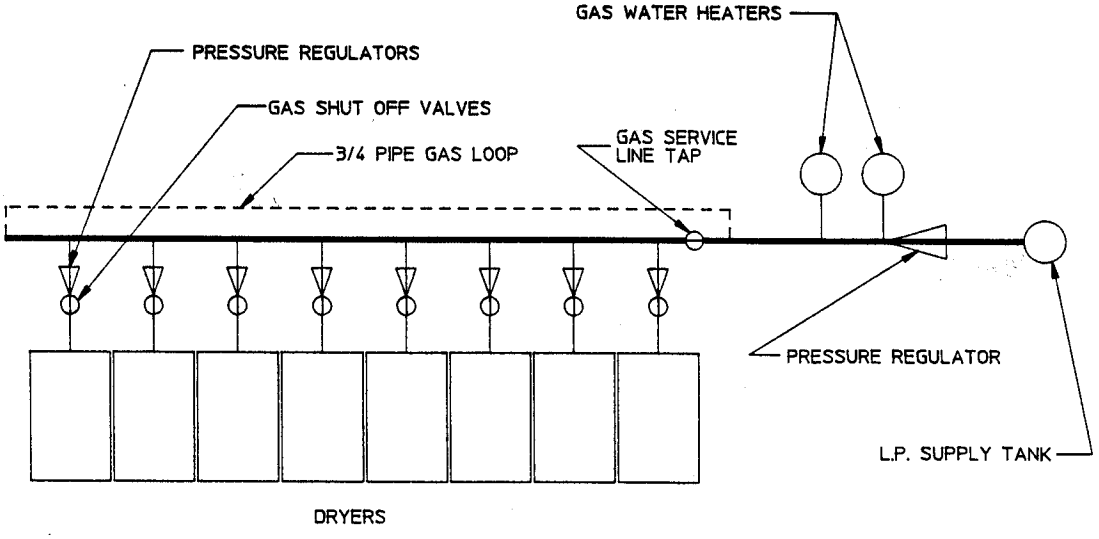
1) Connect water column test gauge connection to gas valve pressure tap (1/8" N.P.T.). This pressure tap is located on the outlet (downstream) side of the valve.

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

Natural Gas - 3.5 Inches W.C.
L.P. Gas - 11.0 Inches W.C.

b. To adjust water column pressure:

1) 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.



TYPICAL L.P. GAS INSTALLATION

8. To Convert from Natural to L.P. Gas

Parts required for conversion: L.P. Kit P/N 880492 (For butane gas or elevations over 2,000 feet, contact the factory.)

a. Refer to "Replace Gas Valve" and follow steps "a" through "h."

b. Remove the four (4) screws which secure the top valve assembly. This assembly contains the regulator adjustment screw and the terminal connections.

c. Replace the top valve assembly with the L.P. version.

d. Unscrew main burner orifices and replace with L.P. orifices.

NOTE: Use extreme care when removing and replacing orifices. These orifices are made of brass and are easily damaged.

e. Reverse the procedure for reinstalling valve assembly to dryer.

WARNING: TEST ALL CONNECTIONS FOR LEAKS BY BRUSHING ON A SOAPY WATER SOLUTION. (liquid detergent also works well) NEVER TEST FOR LEAKS WITH A FLAME.

C. Thermostats

1. Burner Hi-Limit (330°) Thermostat

This thermostat is located on the left side of the burner and is an important safety device serving as an added protection against failure of the air sail switch to open in the event of motor failure or reduced draft condition.

IMPORTANT: UNDER NO CIRCUMSTANCES SHOULD HEAT CIRCUIT SAFETY DEVICES EVER BE DISABLED.

To Replace Burner Hi-Limit (330°) Thermostat

a. Discontinue power to dryer.

b. Disconnect wires from hi-limit thermostat.

c. Disassemble hi-limit thermostat by removing the two (2) mounting screws and nuts.

d. Reverse this procedure for installing hi-limit thermostat.

e. Reestablish power to dryer.

2. Lint Compartment Hi-Heat Protector (225°) Thermostat

This thermostat is located directly above the blower housing (fan housing) underneath the dryer. As a safety device, this thermostat will open (shut off) the heating unit circuit if an excessive temperature occurs. The dryer motor will remain on even if this thermostat is open.

IMPORTANT: UNDER NO CIRCUMSTANCES SHOULD HEAT SAFETY DEVICES EVER BE DISABLED.

To Replace Lint Compartment Hi-Heat Protector (225°) Thermostat

a. Discontinue power to dryer.

b. Remove the ten (10) 1/4"-20 bolts that secure the base skirt to the front of the dryer and locate thermostat.

c. Disconnect the two (2) orange wires from the thermostat.

d. Disassemble thermostat by removing the two (2) mounting screws and nuts.

e. Reverse this procedure for installing hi-heat protector thermostat.

f. Reestablish power to dryer.

3. To Replace Temperature Sensor Probe

a. Discontinue power to dryer.

b. Remove the ten (10) 1/4"-20 bolts that secure the base skirt to the front of the dryer and locate the temperature sensor probe. The probe is located directly above the blower housing next to the hi-heat protector (225°) thermostat.

c. Disconnect sensor bracket harness connector.

d. Loosen and remove the locknut on the compression fitting which secures the sensor and remove the sensor.

e. Using a new sleeve, install new sensor probe by reversing procedure.

f. Reestablish power to dryer.

D. Sail Switch Assembly

The sail switch is a heat circuit safety device which controls the burner circuit only. When the dryer is operating and there is proper airflow, the sail switch damper pulls in and closes the sail switch. Providing all the other heat-related circuits are functioning properly, ignition should now be established. If an improper airflow occurs, the sail switch damper will be released and the circuit will open. On the model AD-575, the sail switch is located under the oven bonnet on the top right-hand side of the dryer.

IMPORTANT: UNDER NO CIRCUMSTANCES SHOULD HEAT CIRCUIT SAFETY DEVICES EVER BE DISABLED.

1. To Replace Sail Switch Assembly

a. Discontinue power to dryer.

b. Remove the 1/4"-20 bolts securing the oven

bonnet to the top of the dryer and remove the bonnet. The sail switch will be exposed.

c. Remove the two (2) screws which hold the sail switch box cover to the sail switch box.

d. Disconnect the two (2) wires from the switch.

e. Disassemble sail switch from mounting bracket by removing the two (2) screws securing switch in place.

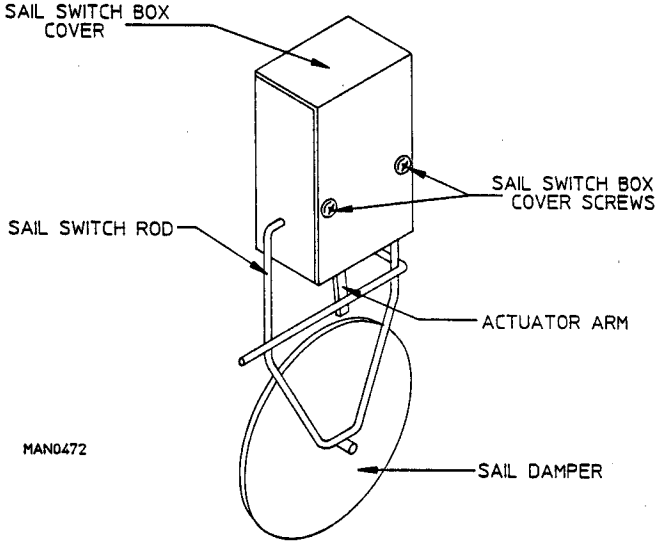
f. Reverse this procedure for installing new sail switch. (See the following section on "Adjusting the Sail Switch.")

g. Reestablish power to dryer.

2. To Adjust Sail Switch

The oven bonnet must be in place to perform this adjustment. With the dryer operating at a high temperature setting, pull the sail switch damper away from the burner. The sail switch should open and extinguish the burner. Let the sail switch damper return to the burner wall. The sail switch should close to restart the burner ignition cycle. If the sail switch circuit does not operate as described, bend the actuator arm of the sail switch accordingly until proper operation is achieved. To check proper "open" position of sail switch, open main door, manually depress main door switch(es), and start dryer. With the main door open and the dryer operating, the sail switch circuit should be open, and the burner should not come on.

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



E. Main Door Upper Track Assembly

The main door upper track assembly is located above the front sliding doors and runs between the left- and the right-hand cabinet.

1. To Replace Main Door Slides

a. Discontinue power to dryer.

b. Open the right- and left-hand control box doors.

c. There are six (6) 1/4"-20 bolts which secure the track assembly to the control boxes - three (3) in each box. Two (2) are located at the top back wall of each box, and one (1) at the inside top wall. Remove these bolts.

d. In the right-hand control box, there are four (4) wires entering the box in the upper left-hand corner - two (2) yellow and two (2) gray. Separate these wires from the harness to which they are bound, disconnect the yellow wires from the terminal block, and separate the gray wires at the in-line connectors.

e. Remove the six (6) Phillips head screws which secure the track brackets to the main doors.

f. Remove the triangular cover plate over the right-hand control box by removing the two (2) Phillips head screws.

g. Lift the track up and off the dryer. Be certain to feed the wires through the hole in the control box so they do not get damaged.

h. Lay the track face down and locate the door slides.

i. Remove the screws which secure the door slides to the track assembly. (These screws extend through the assembly into the front supporting bar.) It will be necessary to slide the track brackets back and forth to align the slots in the slides with the mounting screws.

j. With the slides removed, locate the slots in the slides that allow access to the heads of the screws which fasten the track brackets to the slides and remove the screws.

k. Replace by reversing procedure.

NOTE: Use Loc-Tite or equivalent on the screws securing the track brackets to the slides and on the screws securing the slides to the track assembly.

l. Reestablish power to dryer.

2. To Replace Door Switches

a. Discontinue power to dryer.

b. Locate the door switch bracket positioned directly above the main doors in the center of the main door track assembly. (Rectangular bracket secured with four (4) Phillips head screws).

c. Remove the four (4) Phillips head screws which secure the bracket to the main door track assembly.

d. Angle the bracket with the door switches out of the assembly.

e. Disconnect the wires from the switches.

NOTE: Identify location of each wire for correct reinstallation.

f. Loosen and remove the nuts which secure the switches to the bracket.

g. Replace by reversing procedure.

h. Reestablish power to dryer.

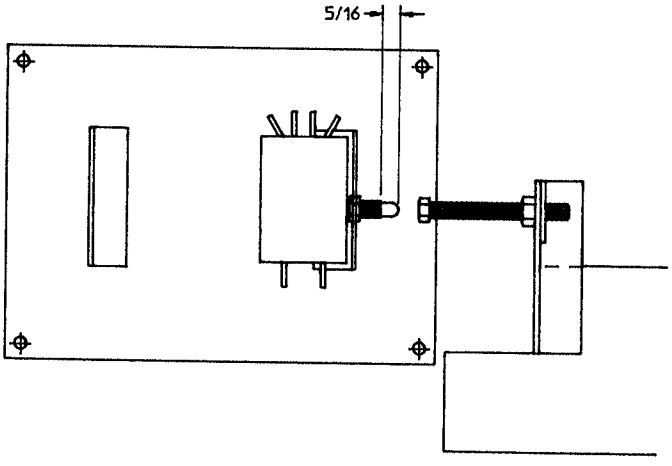
3. To Adjust Door Switches

a. Discontinue power to dryer.

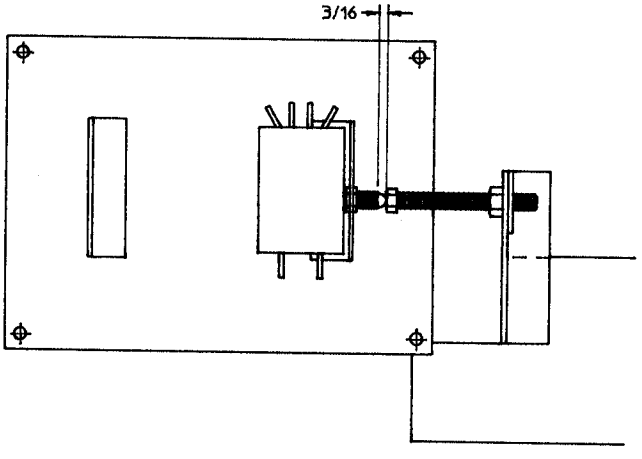
b. Remove the two (2) black hole plugs on either side of the door switch bracket.

c. Inspect adjustment of switches according to the illustration.

d. If switches require adjustment, open the doors slightly until the lock nut on the adjustment bolt aligns with the holes in the track assembly.



BEFORE



AFTER

e. Loosen the lock nut and turn the bolt in or out, depending on whether less or more adjustment is required.

f. Reinstall hole plugs.

g. Reestablish power to dryer.

F. To Remove Main Door

The main door for the model AD-575 consists of two (2) halves which slide independently and can be easily removed.

1. Remove the three (3) Phillips head screws at the bottom of each door section.

2. Remove the three (3) Phillips head screws at the top of each door section being careful to support the door, AS IT WILL BE UNSECURED AT THIS POINT.

3. Slide the upper track bracket out of the way and tilt the top of the door forward for removal.

4. Replace by reversing procedure.

G. Tumbler (Basket) Drive System Assembly

The drive motor (which will be covered in a later section) is located on the base of the dryer. V-belts run underneath the basket from the drive motor pulley to a pulley on the speed-reducing shaft. On the opposite end of the shaft is another pulley and another set of V-belts. These belts run between the speed reducing shaft and the pulley on the drive shaft and are located on the back of the dryer directly underneath the belt guard.

The drive shaft extends from underneath the belt guard, through the back panel, and all the way through the dryer to a point just short of the front panel. There are two (2) 8-inch diameter basket drive wheels on this shaft. All shafts are supported by two (2) pillow block bearings seated on channel iron bearing mounts.

On the opposite side of the dryer is a basket idler shaft. This shaft is contained within the cabinet of the dryer and also has two (2) 8-inch diameter basket drive wheels. In addition, there are two (2) clutch plate assemblies on this shaft which consist of a friction plate, a steel back-up plate, and a steel collar on each assembly.

The four (4) drive wheels support the basket, rotate it, and determine the horizontal and vertical basket position. The clutch plate assemblies guide the basket and prevent basket movement from back to front.

There is more than one way to access the drive components inside the cabinet. The easiest way is to remove the left and right side panels. If this is not possible, there are cover plates and a door on the front and back of the dryer. To access the front plates, open the right and left control box doors. Locate the large cutouts in the bottom rear of the boxes, and the plates can be seen directly underneath. Remove the four (4) screws which secure each plate, and the plates can be removed, allowing access.

To access the rear of the dryer, open the hinged door on the right-hand corner (viewed from the rear). For the left side, the belt guard must be removed, along with the V-belts, the drive shaft pulley, and the cover plates directly under the pulley. This will allow access to the drive components internal to the cabinet.

1. To Replace Tumbler (Basket) Drive Wheels and/or Clutch Plate Assemblies

   a. Discontinue power to dryer.

   b. Remove right and left side panels or remove front panel cover plates as described in previous section.

   c. Wedge wooden blocks underneath the rolled channels on the basket to take the pressure off the wheels.

   d. Remove the belt guard and proceed by removing the pulley from the drive shaft that extends out through the cabinet.

   e. Remove the cover plates located behind the pulley that was removed in step "e."

   f. On the left-hand side of the machine (looking from the front) scribe a line on the bearing mounts welded to the frame at the base of the bearings. This is to locate the bearings at reassembly to assist in adjusting the wheels.

   g. Loosen the lock nut and back off the bearing adjust bolt at each bearing on the left side.

   h. Loosen the bolts securing the bearings to the bearing mount.

   i. Slide the shaft, wheels, and bearings back, making sure the weight of the basket is on the wooden blocks and not the wheels.

j. Remove the bearing bolts and lift the entire shaft assembly from the dryer.

k. Loosen the set screws on the wheels of the shaft and slide the wheels off the shaft. Remove the clutch plate assemblies if necessary. Leave the bearings on the shaft.

l. Clean any rust or buildup off the shaft with emery cloth.

m. Slide a wheel on each end of the shaft with the hubs facing the ends of the shaft. Do not tighten on shaft yet.

n. Put the assembly back in the dryer and align the bearings at the scribe marks on the bearing mounts.

o. Bolt the bearings down and turn the bearing adjust bolts in until they touch the bearings.

p. Center the basket within the cabinet of the dryer from front to back and locate the wheels directly in the center of the channel. Tighten the set screws to secure the wheels to the shaft.

q. Move the clutch plate assemblies towards the sides of the channels leaving approximately a 1/16-inch space between the channels and the clutch plates (see drawing). Tighten the set screws to secure the clutch plate assemblies to the shaft. The left side is now complete.

r. Remove the right side shaft assembly in the same manner as the left.

s. Remove and replace the wheels. <u>There will not be any clutch plates for this side</u>.

t. Replace the shaft assembly, align the wheels in the center of the channel, and tighten all components into place.

u. Replace the cover plates on the rear panel, along with the pulley, V-belts, and belt guard.

v. Remove wooden blocks from underneath the basket.

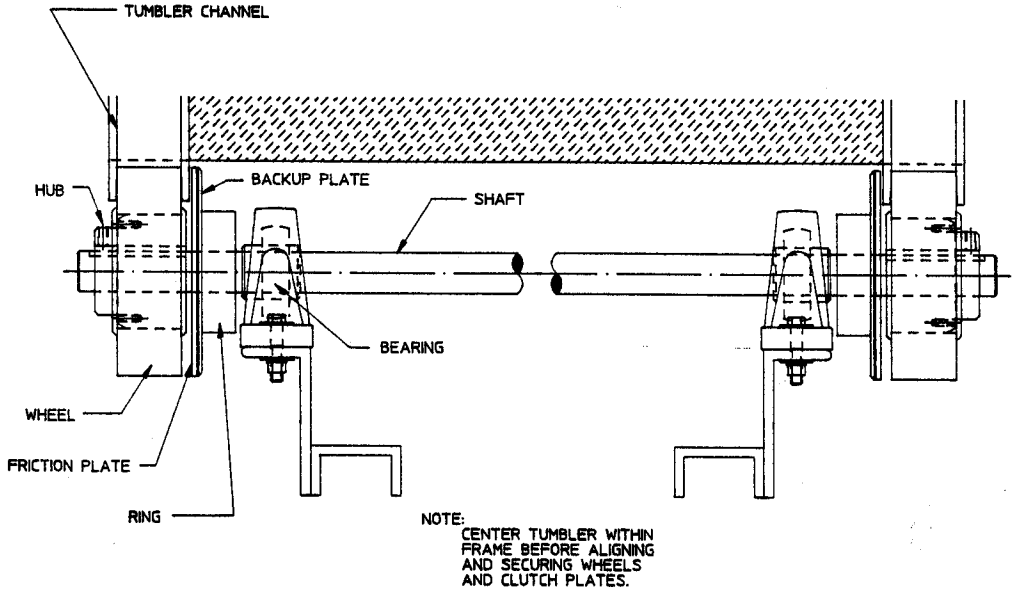
w. Return power to dryer and run dryer. Observe wheels and check all alignments.

x. Replace side panels using only one bolt on each of the four sides.

y. Run dryer with heat for a few hours, then remove the side panels and retighten all set screws.

z. Reassemble all remaining parts.

aa. Reestablish power to dryer.



2. Speed-Reducing Shaft Assembly and V-Belts

This assembly is located on the base of the dryer next to the drive motor in the rear. The purpose of this assembly is to reduce the rpm of the drive system to achieve the proper basket rpm.

To Replace Speed-Reducing Shaft Assembly and V-Belts

a. Discontinue power to dryer.

b. Remove the screws which secure the belt guard to the dryer and remove the guard.

c. Loosen the lock nuts on the horizontal bearing adjustment bolts, and back out the bolts.

d. Loosen the bearing bolts and slide the assembly over, removing the tension from the belts.

e. Remove the V-belts. (If V-belt replacement is all that is required, replace V-belts at this point and reverse procedure to reassemble.)

f. Remove the bearing bolts and remove the speed-reducing shaft assembly.

g. Remove the pulleys and bearings and replace defective components.

h. Reverse procedure to reassemble.

i. Reestablish power to dryer.

3. To Replace Pulleys

a. Follow steps for "Replace Speed-Reducing Shaft Assembly and V-Belts" steps "a" through "e."

b. Remove the set screw over the key (if applicable) for the pulley that is being replaced.

c. Remove the three (3) bolts which secure the center bushing into the pulley.

d. Thread the same bolts into the three (3) threaded bushing holes and turn until they snug against the pulley.

e. Turn each bolt a few revolutions at a time until the pulley breaks free from the bushing.

f. Remove and replace.

g. Reverse procedure to reassemble.

NOTE: When tightening bolts, snug all three (3) first and then alternately tighten each one one-half turn until tight.

H. Tumbler (Basket) Assembly

1. Tumbler (Basket) Alignment (Horizontal and Vertical)

a. Discontinue power to dryer.

b. Remove right and left side panels or remove front panel cover plates through front panel control box cutouts.

c. Remove belt guard.

d. Remove pulley from drive shaft (if necessary).

e. Remove cover plates located behind the pulley that was removed in previous step (if necessary).

f. All four (4) basket shaft bearing mounts have horizontal adjustment bolts which seat on the base of the bearings. Loosen the lock nuts on these adjustment bolts.

g. To raise the basket straight up, turn all four (4) adjustment bolts the same number of turns clockwise. To lower the basket straight down, turn all four (4) bolts the same number of turns counterclockwise.

h. Reverse procedure to reassemble.

NOTE: Adjust basket so that the distance between the inside surface of the basket and the front panel flange (rolled 1-1/4"x1-1/4" angle iron welded to front panel and extends over inside edge of basket) is as even as possible 360 degrees around.

CAUTION: When adjusting a shaft, turn the horizontal adjustment bolts on both bearings the same number of turns so that the shaft is not cocked.

i. Reestablish power to dryer.

I. Blower Motor Mount Assembly

1. To Replace Motor Mount Assembly

a. Discontinue power to dryer.

b. Remove front base skirt on front of dryer.

c. Disconnect wiring harness from motor.

1) Remove motor service cover.

2) Disconnect external power leads connected to internal motor terminals/wiring.

3) Loosen nut in BX connector and remove wiring harness from motor.

d. Remove the four (4) nuts holding motor mount to dryer and remove motor mount assembly.

e. Replace by reversing procedure.

f. Reestablish power to dryer.

2. To Replace Motor

a. Follow steps "a" through "d" from "Replace Motor Mount Assembly."

b. Remove the two (2) jam nuts on motor shaft (left-hand thread, turn clockwise) and work impellor and key free from motor shaft.

c. Remove the four (4) hex bolts holding motor to mount and remove motor.

d. Remove BX connector from old motor and install it on new motor.

e. Reassemble by reversing removal procedure.

3. To Replace Impellor (Fan)

a. Follow steps "a" through "d" from "Replace Motor Mount Assembly."

b. Remove the two (2) jam nuts on motor shaft (left-hand thread, turn clockwise) and work impellor and key free from motor shaft.

c. Reassemble by reversing removal procedure.

J. Drive Motor Mount Assembly

1. To Replace Drive Motor

a. Discontinue power to dryer.

b. Loosen the four (4) bolts which secure the motor to the motor base.

c. Turn the motor base adjustment bolt clockwise to remove the tension on the inner V-belts.

d. Remove the inner V-belts.

e. Disconnect wiring harness from motor.

1) Remove motor service cover.

2) Disconnect external power leads connected to internal motor terminals/wiring.

3) Loosen nut in BX connector and remove wiring harness from motor.

f. Remove the four (4) nuts that hold the motor to

the motor base and remove motor.

g. Remove pulley from motor.

h. Reassemble by reversing procedure.

i. Reestablish power to dryer.

2. To Replace Motor Base

a. Follow steps "a" through "f" in "Replace Drive Motor."

b. Remove the four (4) nuts and bolts that secure motor base to dryer and remove base.

c. Reassemble by reversing procedure.

3. To Adjust Motor Base

a. Loosen the four (4) nuts that hold the motor to the motor base.

b. Turn motor base adjustment bolt clockwise to decrease the tension on inner V-belts and counterclockwise to increase the tension.

c. After desired tension is achieved, retighten the four (4) nuts that secure motor to motor base.

K. Lint Drawer and Lint Screen

The lint drawer is located on the lower left corner on the front of the dryer. Simply slide the drawer out to access the screen.

1. To Clean or Replace Lint Screen

a. Slide lint drawer out.

b. Grasp lint screen frame and remove from drawer.

c. Clean lint from screen.

d. Replace by reversing procedure for removal.

L. Motorized Steam Damper System
(Models manufactured prior to March 1, 1990)

This system consists of a steam coil, steam coil housing, damper shaft, damper motor, damper plate, microswitches, and damper controls.

This system is basically an air bypass system. The damper plate slides from one position to the other, directing the airflow either through the steam coil or through a free air opening in the top of the dryer. Two (2) microswitches are positioned on top of the dryer to sense the forward and back damper plate positions. For a more thorough description, refer to "Steam Hookup" in the installation section of this manual.

1. To Replace Steam Coil

   a. Discontinue power to dryer.

   b. At a manual shutoff, discontinue steam to dryer.

   c. Allow all steam piping and coil to cool.

   d. Remove external steam piping from the steam coil.

   e. Remove the bolts that secure steam coil screen to housing and remove.

   f. Remove the bolts that secure coil cover to housing and remove.

   g. With a forklift, carefully slide coil out of housing, being certain not to damage anything.

   h. Replace by reversing procedure.

   i. Reestablish power to dryer.

2. To Replace Steam Damper Drive Motor

   a. Discontinue power to dryer.

   b. Loosen the set screws which secure damper shaft to motor.

   c. Loosen the nuts which secure motor to top of dryer.

   d. Disconnect wiring harness from motor.
      1) Remove motor service cover.

      2) Disconnect external power leads connected to internal motor terminals/wiring.

      3) Detatch harness from motor.

   e. Replace by reversing procedure.

f. Reestablish power to dryer.

3. To Replace Steam Damper Drive Shaft

a. Follow steps "a" through "c" on "Replace Steam Damper Drive Motor."

b. Loosen the set screws that secure the damper shaft to the bearing in the steam coil housing.

c. Remove shaft and reassemble in reverse order to removal procedure.

IMPORTANT: Be certain to grease the new shaft with a high temperature graphite-impregnated grease.

4. To Replace Steam Damper Microswitch

a. Discontinue power to dryer.

b. Remove cover from microswitch.

c. Disconnect wires from microswitch terminals.

NOTE: Identify wires for correct reinstallation.

d. Loosen the harness connector screws on the bottom of the switch.

e. Remove the screws which secure the switch to the dryer.

f. Remove the switch lever arm.

g. Remove the harness connector.

h. Replace by reversing procedure.

IMPORTANT: Adjust switch lever arm so that the damper does not over-travel and jam.

i. Reestablish power to dryer.

5. Maintenance

a. Regularly clean the top of the dryer to keep contaminants off the wheels on which the damper rides and wipe the cylinder down with a clean, dry rag.

b. Maintain oil in the lubricator. Use SAE 10/90 SSU detergent lubricating oil - Mobil DTE Light or equivalent.

c. The ideal operating pressure is 80 psi. However, this may be adjusted up or down slightly to find the smoothest operation.

d. The damper should not "slam" when it reaches the end of the travel. If this occurs, adjust the flow controls as indicated below.

1) The switch (solenoid valve) located on the cylinder support assembly has two (2) flow control adjustment screws located on the air inlet side of the switch.

2) If the cylinder is sliding too fast and slamming at the end of the travel, the flow controls must be turned clockwise to restrict the flow.

3) If the cylinder is sliding too slow or stopping, it may be necessary to turn the flow controls counterclockwise to increase the flow. However, the cylinder adjustment should also be checked if this problem exists.

e. There are two (2) screws that hold the cover plate to the carriage on the bottom of the cylinder (flat head screws). These screws should not be tight. They are to only be threaded in enough to make contact with the carriage cover and hold it closed. If they are tightened down, the carriage will not slide.

f. Do not attempt to fill or replenish the oil in the bowl while the lubricator is under air pressure. Turn off the air supply and bleed the pressure from the unit first.

g. Adjust the oil flow by turning the adjustment screw on top of the lubricator. Turn clockwise to decrease the flow and counterclockwise to increase the flow. The oil should feed slowly from the lubricator into the pneumatic system.

M. Steam Damper Assembly (Models Mfd. As of March 1, 1990)

1. Lateral Adjustment of Cylinder

a. Discontinue air pressure to the dryer.

b. Bleed the air from the system at the regulator.

c. Loosen the two (2) bolts that secure the

cylinder support assembly to the top of the dryer.

d. Slide the damper back and forth locating a position for the cylinder support assembly where the damper stays centered in relation to the steam coil assembly throughout the entire stroke. Be certain there is no binding.

e. Retighten the two (2) bolts loosened in step "c."

f. Reestablish air pressure to the dryer.

2. Vertical Adjustment of Cylinder

a. Discontinue air pressure to the dryer.

b. Bleed the air from the system.

c. Loosen the two (2) nuts that secure the adjustable bracket at the forward end of the cylinder.

d. Loosen the two (2) screws (nutted on back of cylinder support assembly) that secure the adjustment bracket at the rear end of the cylinder.

e. Slide the damper all the way out from under the steam coil.

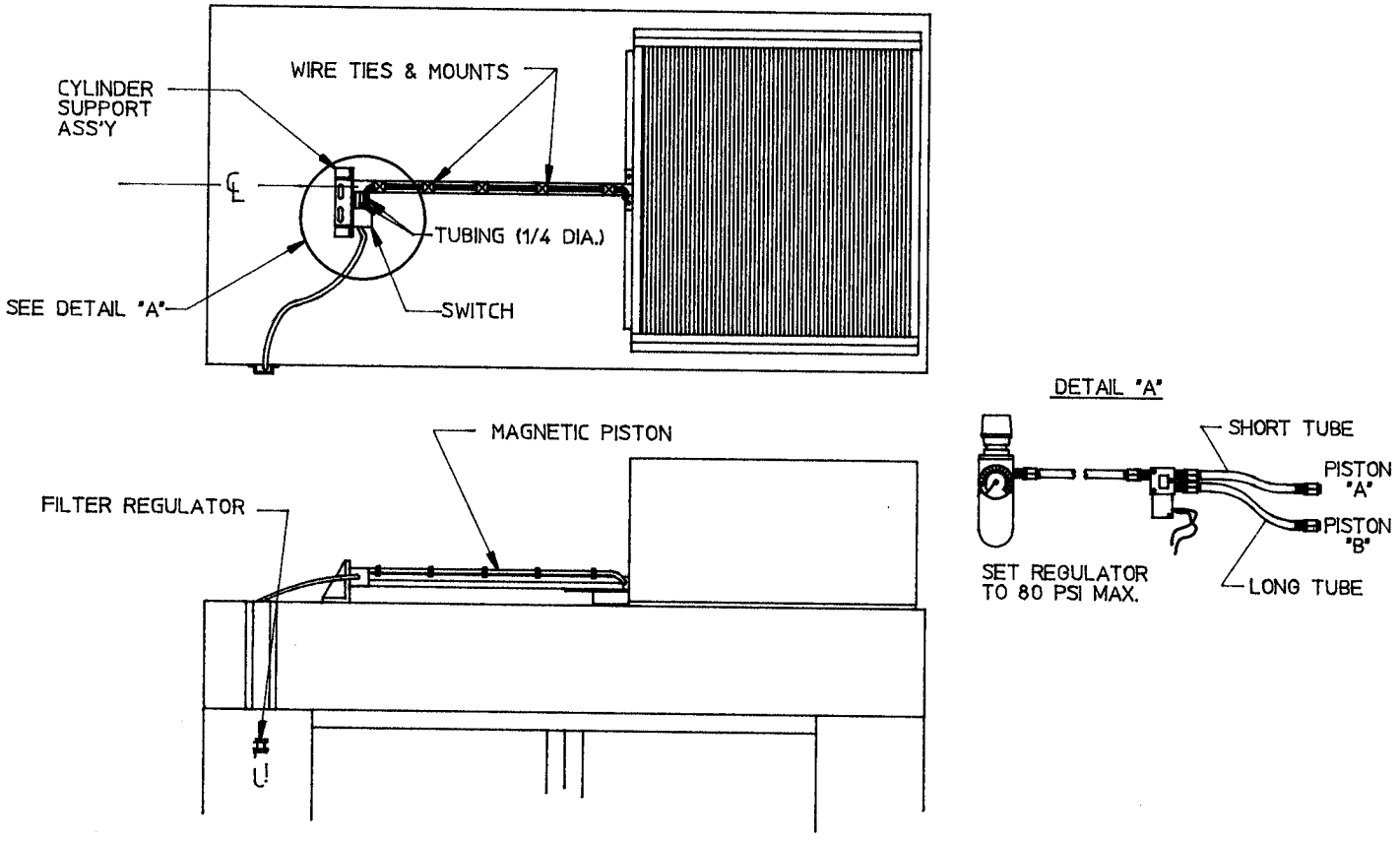
f. Retighten the screws at the rear end of the cylinder.

g. Slide the damper back and forth a few times the full travel of the cylinder.

h. Find the highest point that the forward adjustment bracket reaches. Retighten the nuts at that point.

i. Again, slide the damper plate back and forth, making sure there is no binding. If the damper appears to slide too tightly, it may be necessary to relocate the forward or rear adjustment bracket slightly to find the ideal position.

j. Reestablish air pressure to the dryer.



3. Maintenance

   a. Regularly clean the top of the dryer to keep contaminants off the wheels on which the damper rides and wipe the cylinder down with a clean, dry rag.

   b. Maintain oil in the lubricator. Use SAE 10/90 SSU detergent lubricating oil - Mobil DTE Light or equivalent.

   c. The ideal operating pressure is 80 psi. However, this may be adjusted up or down slightly to find the smoothest operation.

   d. The damper should not "slam" when it reaches the end of the travel. If this occurs, adjust the flow controls as indicated below.

1) The switch (solenoid valve) located on the cylinder support assembly has two (2) flow control adjustment screws located on the air inlet side of the switch.

2) If the cylinder is sliding too fast and slamming at the end of the travel, the flow controls must be turned clockwise to restrict the flow.

3) If the cylinder is sliding too slow or stopping, it may be necessary to turn the flow controls counterclockwise to increase the flow. However, the cylinder adjustment should also be checked if this problem exists.

e. There are two (2) screws that hold the cover plate to the carriage on the bottom of the cylinder (flat head screws). These screws should not be tight. They are to only be threaded in enough to make contact with the carriage cover and hold it closed. If they are tightened down, the carriage will not slide.

f. Do not attempt to fill or replenish the oil in the bowl while the lubricator is under air pressure. Turn off the air supply and bleed the pressure from the unit first.

g. Adjust the oil flow by turning the adjustment screw on top of the lubricator. Turn clockwise to decrease the flow and counterclockwise to increase the flow. The oil should feed slowly from the lubricator into the pneumatic system.

N. Steam Damper Assembly (Models Mfd. As of October 29, 1990)

1. Maintenance

a. The ideal operating pressure is 80 psi. However, this may be adjusted up or down slightly to find the smoothest operation.

b. The damper should not "slam" when the cylinder reaches the end of its stroke. If this occurs, adjust the flow control as indicated below.

1) The flow control is located just before the air inlet port of the cylinder. The flow control adjustment knob is located on side.

2) If the cylinder is extending and/or retracting too slowly or stopping, it may be necessary to turn the flow control counterclockwise to increase the flow.

3) If the cylinder is extending and/or retracting too fast and the damper is slamming at the end of the cylinder stroke, it may be necessary to turn the flow control clockwise to restrict flow.

SECTION VI

Routine Maintenance

AFTER EVERY LOAD

Clean lint screen. A clogged lint screen will cause poor dryer performance. The lint screen is located in the left leg of the base. Pull out the lint drawer, remove the screen, and clean off the lint.

WEEKLY

Open the hinged access door at the rear of the dryer and remove any accessible lint. Use a vacuum cleaner if necessary. Inspect the temperature sensor and remove any lint.

BI-WEEKLY

Clean lint accumulation from drive and blower motors.

Remove lint buildup from steam coil lint screen (steam dryers only).

MONTHLY

Remove access covers on front panel located behind right and left control cabinet. Remove all lint.

Clean burner area completely. Blow out burner tubes with compressed air.

Clean lint accumulation from electrical box and motors.

Check V-belts. Retighten if required.

Apply a high temperature grease to the zirc fittings which feed the basket shaft pillow block bearings.

EVERY SIX MONTHS

Grease basket drive motor with Chevron SR#1-2 grease or equivalent, unless otherwise stamped on the motor label.

Grease the two (2) 1-1/4-inch speed-reducing drive bearings.

Clean lint accumulation from plant exhaust duct.

Check electrical service and grounding connections for any looseness which may have been caused by vibration.

SECTION VII

Drive System Soft Start

The soft start mechanism is simply a voltage-limiting device. Therefore, to be capable of seeing just what is happening, connect the leads of a voltmeter to connections T2 and T3, as shown in Figure 1 (page 73).

Initial starting voltage should be 60 to 65 percent of motor nameplate voltage. Soft start time should be approximately 5 to 7 seconds, as indicated in Figure 2 (page 73).

The starting torque is dependent on the instantaneous RPM of the motor, which is directly proportional to the voltage the motor receives, as shown in Figure 3 (page 74), where the motor is rated at 460V and 1,750 RPM.

If the starting voltage is too low, the motor will not have enough torque to turn the basket. Therefore, it is important that the starting voltage be high enough to turn the basket and that the total starting time be short enough to reduce the chance of overloading the system and blowing fuses.

The 60 to 65 percent of nameplate voltage for starting voltage and the 5- to 7-second soft start time were developed by testing with full loads at 90 percent saturation and empty. Therefore, any dryer adjusted as stated will operate properly with any size load up to the rated capacity.

Figure 4 (page 74) indicates the difference in the starting voltage necessary in various size loads between empty and full.

The instructions for making the adjustments are on pages 75 and 76.

FIG. 1

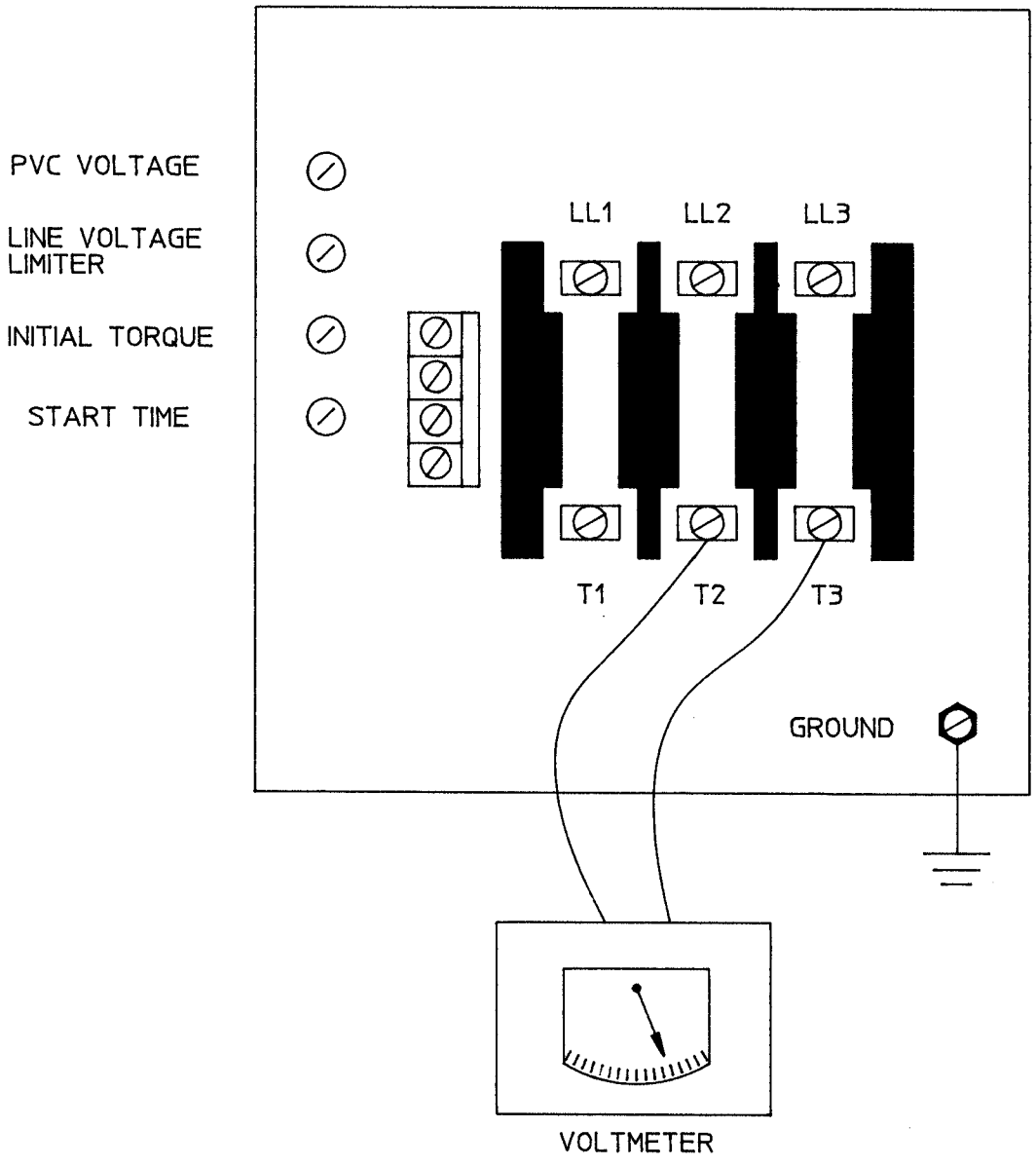


FIG. 2

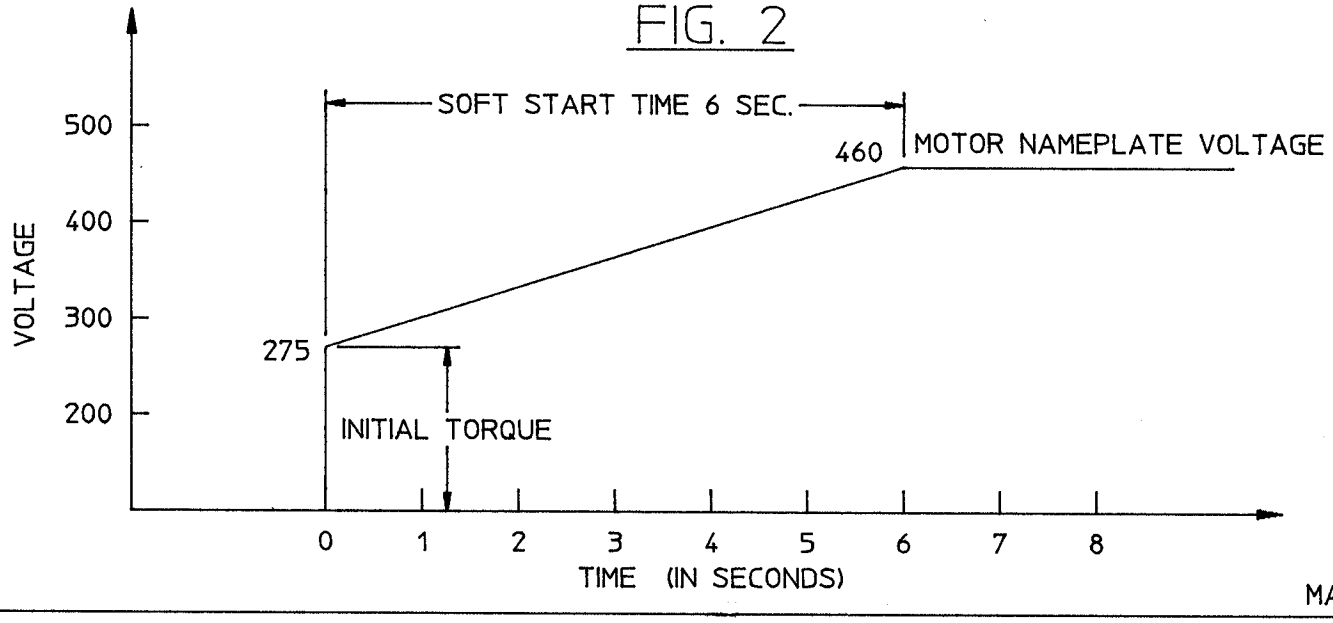


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FIG. 3

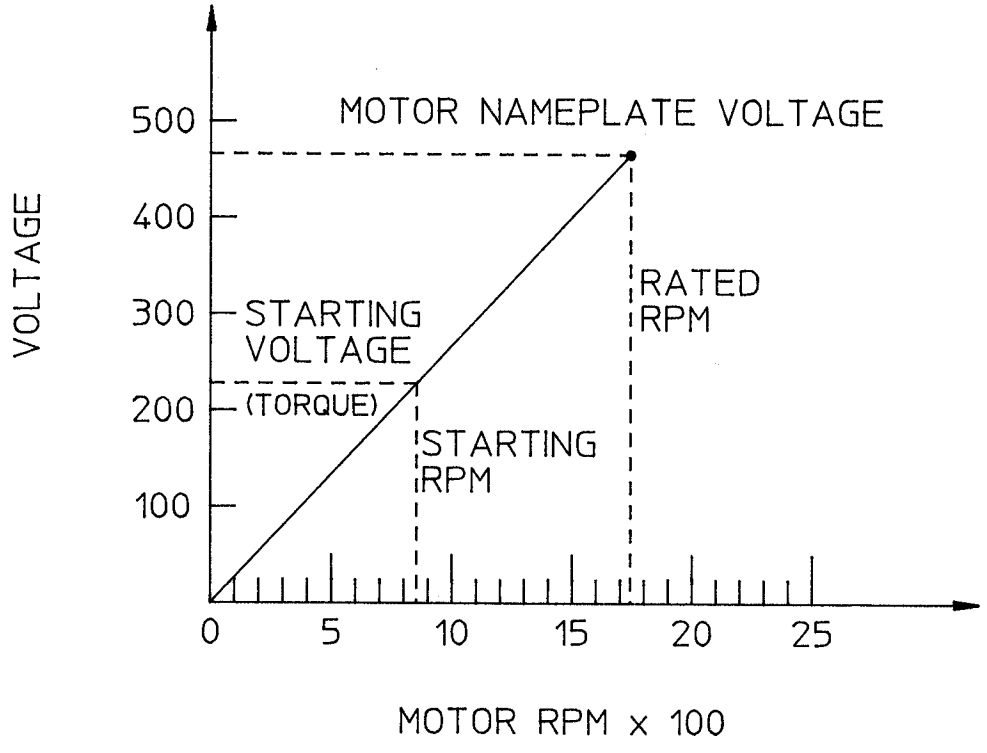
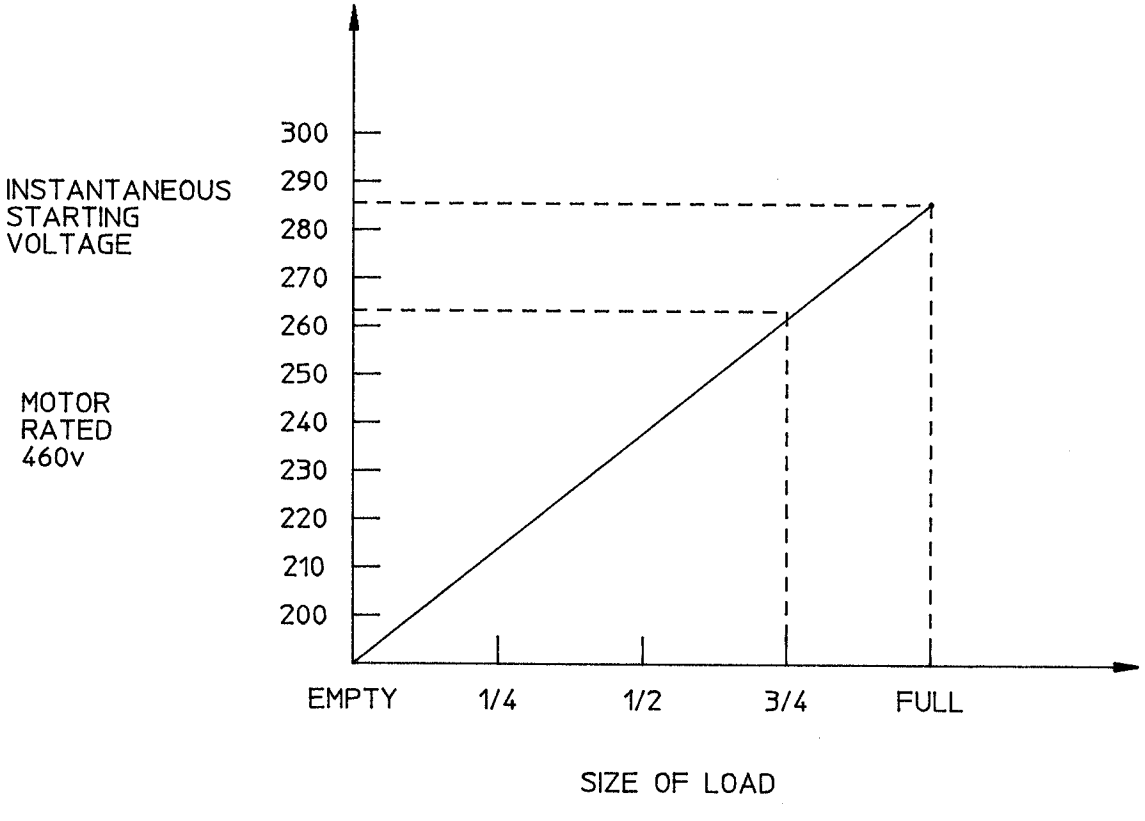

VOLTAGE
500
400
300
200
100
MOTOR NAMEPLATE VOLTAGE
STARTING
VOLTAGE
(TORQUE)
STARTING
RPM
RATED
RPM
0
5
10
15
20
25
MOTOR RPM x 100

FIG. 4


INSTANTANEOUS
STARTING
VOLTAGE
MOTOR
RATED
460v
300
290
280
270
260
250
240
230
220
210
200
EMPTY
1/4
1/2
3/4
FULL
SIZE OF LOAD

Adjustments for Reduced Voltage Soft Start Controllers

This procedure to be used with all SERIES 25 control styles.

To properly adjust a soft start controller to give a satisfactory start, two characteristics of the motor and load must be considered. The frictional load determines the amount of torque required to break-away or obtain initial movement of the motor and load. A system with a high frictional load will require a higher setting of the START TORQUE adjustment than a system with little or no frictional load. Second, the amount of inertia in the system will determine the START TIME adjustment setting. Generally, systems with low inertia will require a long START TIME adjustment to give a satisfactory start, whereas, systems with high inertia may need only a very short START TIME. The softest possible start will occur when the start time adjustment is set to maximum and the initial torque adjustment is set at the point where the motor just starts the load moving when power is first applied.

START TORQUE Adjustment

The START TORQUE adjustment is factory preset for maximum torque (maximum starting voltage).

1. Rotate the START TIME adjustment fully clockwise so that the longest starting time is obtained.

2. Rotate the START TORQUE adjustment to midrange on the dial which will lower the starting torque.

3. Start the motor. If more or less torque is desired, turn off the power, and rotate the START TORQUE adjustment in the appropriate direction until an acceptable soft start is obtained.

START TIME Adjustment

The START TIME adjustment range is 1/2 to 30 seconds. The higher the value of the START TORQUE, the shorter the duration of the overall time period.

1. During the START TORQUE adjustment process, the START TIME was adjusted

for the longest start possible. If a shorter time is required, rotate the adjustment counterclockwise.

2. Start the motor and determine if the soft start is acceptable. If not, continue to rotate the START TIME adjustment until an acceptable start is obtained.

Adjustment of Dual Ramp Controls

When dual ramp soft-start is used, Ramp 2 START TIME and Ramp 2 START TORQUE are adjusted in the same way as described above. Before attempting to adjust Ramp 2, check to make sure that the Ramp 2 connection has been selected.

Adjustments for Reduced Voltage Soft-Stop (Ramp Down)

This procedure to be used with all SERIES 25 control styles.

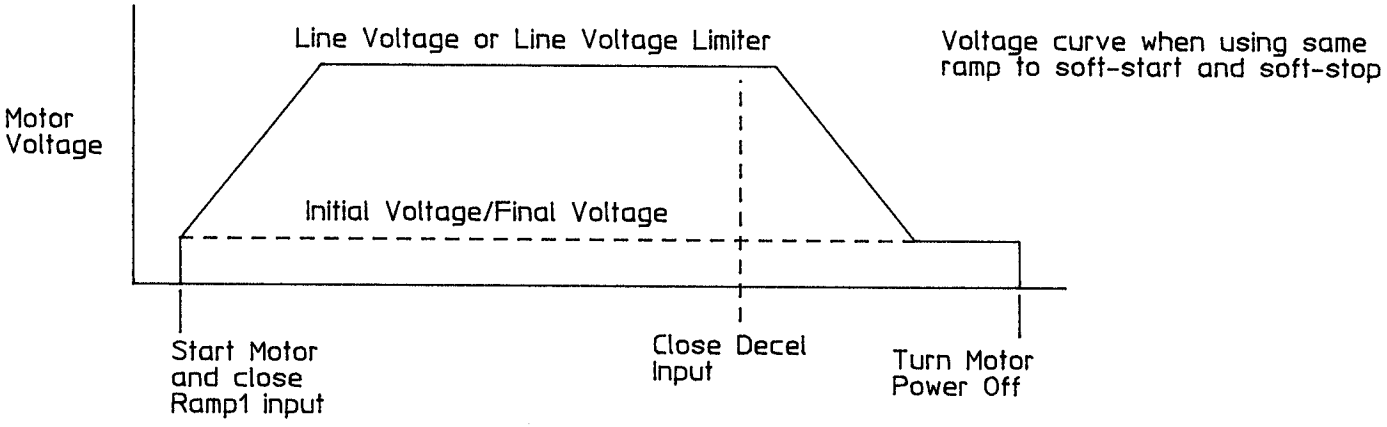
There are two (2) ways the control can be used to achieve a soft-stop.

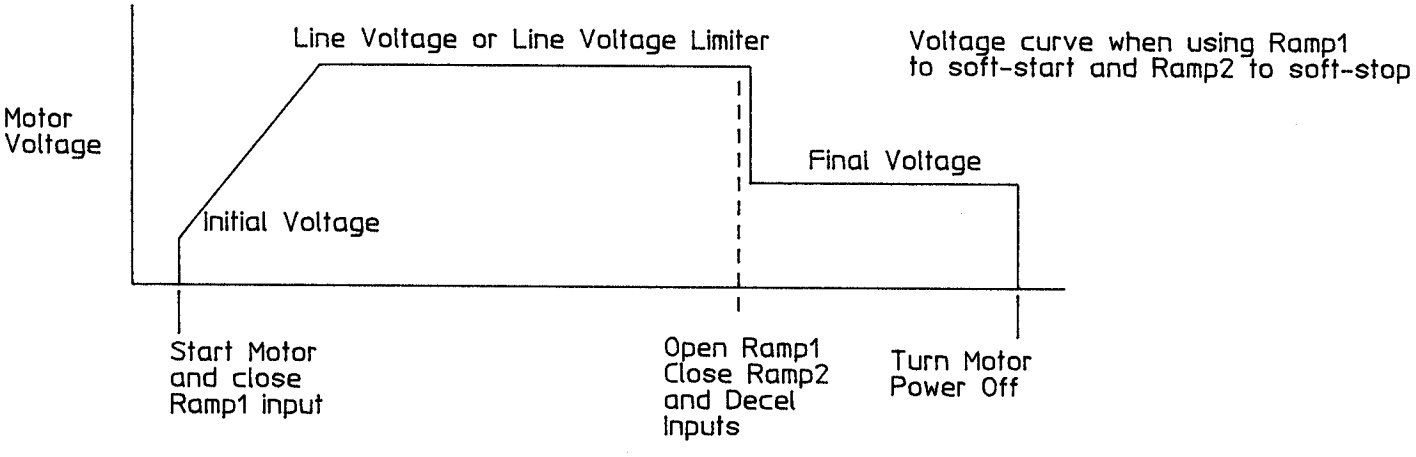
Normally, when a maintained closure is made between terminals Decel and Common, the control voltage to the motor will begin to ramp down from running voltage to the initial voltage value and will take the same amount of time to ramp down as it did to ramp up. (Start Time and Stop Time are the same and use the same adjustment; Initial Torque and Final Torque are the same and use the same adjustment.)

An alternate method to performing a soft-start and soft-stop is to start the motor using the Ramp 1 adjustments and stop the motor using a combination of the Ramp 2 adjustments and Decel.

With either method, it may be necessary to automatically turn off the motor power.

The following illustrations indicate how each method works.


Line Voltage or Line Voltage Limiter
Voltage curve when using same ramp to soft-start and soft-stop
Motor Voltage
Initial Voltage/Final Voltage
Start Motor and close Ramp1 input
Close Decel input
Turn Motor Power Off


Line Voltage or Line Voltage Limiter
Voltage curve when using Ramp1 to soft-start and Ramp2 to soft-stop
Motor Voltage
Final Voltage
Initial Voltage
Start Motor and close Ramp1 input
Open Ramp1 Close Ramp2 and Decel Inputs
Turn Motor Power Off

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