AD-310 Non-Tilting Installation / Operator's Manual

WARNING: For your safety the information in this manual must be followed to minimize the risk of fire or explosion or to prevent property damage, personal injury or loss of life.

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

WHAT TO DO IF YOU SMELL GAS

- Do not try to light any appliance.
- Do not touch any electrical switch; do not use any phone in your building.
- Clear the room, building or area of all occupants.
- Immediately call your gas supplier from a neighbor's phone. Follow the gas supplier's instructions.
- If you cannot reach your gas supplier, call the fire department.

Installation and service must be performed by a qualified installer, service agency or the gas supplier.

For replacement parts, contact the distributor from which the dryer was purchased or
American Dryer Corporation
88 Currant Road Fall River, MA 02720-4781
Telephone: (508) 678-9010 / Cable: AMDRY
Telex: 927520 AMDRY FRIV / Fax: (508) 678-9447

102894

ADC Part No. 112162

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.

Under **NO circumstances should the dryer door switch or the heat circuit devices ever be disabled.**

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 materials and to change or discontinue models.

Important

For your convenience, log the following information:

DATE OF PURCHASE _____ MODEL NO. AD-310 Non-Tilt

DISTRIBUTOR'S NAME _____

Serial No.(s) _____

_____

_____

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 **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 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 VAPORS 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/operators 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.

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SECTION I

IMPORTANT INFORMATION

A. RECEIVING AND HANDLING

The dryer is shipped in a protective stretch wrap cover with protective cardboard corners and top cover (or optional box) as a means of preventing damage in transit. Upon delivery, the dryer and/or protective packaging, and wooden skid **should be** visually inspected for shipping damage. If any damage whatsoever is noticed, inspect further before delivering carrier leaves.

Dryers damaged in shipment:

1. All dryers **should be** inspected upon receipt and before they are signed for.

2. If there is suspected damage or actual damage, the trucker's receipt **should be** so noted.

3. If the dryer is damaged beyond repair, it **should be** refused. Those dryers which were not damaged in a damaged shipment **should** be accepted, but the number received and number refused **must be** noted on the receipt.

4. If you determine that the dryer was damaged after the trucker has left your location, you should call the delivering carrier's freight terminal immediately and file a claim. The freight company considers this concealed damage. This type of freight claim is very difficult to get paid and becomes extremely difficult when more than a day or two passes after the freight was delivered. It is your responsibility to file freight claims. Dryers/parts damaged in transit cannot be claimed under warranty.

5. Freight claims are the responsibility of the consignee, and all claims **must be** filed at the receiving end. ADC assumes no responsibility for freight claims or damages.

6. If you need assistance in handling the situation, please contact the ADC traffic manager at (508) 678-9000.

IMPORTANT: The tumbler section of the dryer **must be** transported and handled in an upright position at all times.

B. SAFETY PRECAUTIONS

WARNING: For your safety, the information in this manual must be followed to minimize the risk of fire or explosion or to prevent property damage, personal injury, or loss of life.

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

1. **DO NOT** store or use gasoline or other flammable vapors and liquids in the vicinity of this or any other appliance.

2. Purchaser/user should consult the local gas supplier for proper instructions to be followed in the event the user smells gas. The instructions **should be** posted in a prominent location.

3. WHAT TO DO IF YOU SMELL GAS...

   A. **DO NOT** try to light any appliance.

   B. **DO NOT** touch any electrical switch.

   C. **DO NOT** use any phone in your building.

   D. Clear the room, building or area of all occupants.

   E. Immediately call your gas supplier from a neighbor's phone. Follow the gas supplier's instructions.

   F. If you cannot reach your gas supplier, call the fire department.

4. Installation and service **must be** performed by a qualified installer, service agency, or the gas supplier.

5. Dryer(s) **must be** exhausted to the outdoors.

6. Although ADC produces a very versatile machine, there are some articles that, due to fabric composition or cleaning method, should not be dried in it.

WARNING: Dry only water-washed fabrics. **DO NOT** dry articles spotted or washed in dry cleaning solvents, a combustible detergent, or "all purpose" cleaner. **EXPLOSION COULD RESULT.**

WARNING: **DO NOT** dry rags or articles coated or contaminated with gasoline, kerosene, oil, paint, wax. **EXPLOSION COULD RESULT.**

WARNING: **DO NOT** dry mop heads. Contamination by wax or flammable solvents will create a fire hazard.

WARNING: **DO NOT** use heat for drying articles that contain plastic, foam, sponge rubber, or similarly textured rubber-like materials. Drying in a heated basket (tumbler) may damage plastics or rubber and also may be a fire hazard.

7. A program **should be** established for the inspection and cleaning of the lint in the burner area, exhaust duct work, and inside the dryer. The frequency of inspection and cleaning can best be determined from experience at each location.

   WARNING: The collection of lint in the burner area and exhaust duct work can create a potential fire hazard.

8. For personal safety, the dryer must be electrically grounded in accordance with local codes and/or the National Electric Code ANSI/NFPA NO. 70-latest edition.

   NOTE: Failure to do so will VOID THE WARRANTY.

9. **Under no circumstances** should the dryer door switches, lint drawer switch, or heat circuit safety devices ever be disabled.

   WARNING: PERSONAL INJURY or FIRE COULD RESULT.

10. This dryer is not to be used in the presence of dry cleaning solvents or fumes.

11. Remove articles from the dryer as soon as the drying cycle has been completed.

    WARNING: Articles left in the dryer after the drying and cooling cycles have been completed can create a fire hazard.

12. **DO NOT** operate steam dryers with more than 125 PSI steam pressure. Excessive steam pressure can damage steam coil and/or harm personnel.

13. Replace leaking flexible steam hoses or other steam fixtures immediately. **Do not** operate dryer with leaking flexible hoses. Personal injury may result.

14. READ and FOLLOW ALL CAUTION and DIRECTION LABELS ATTACHED TO DRYER.

SECTION II

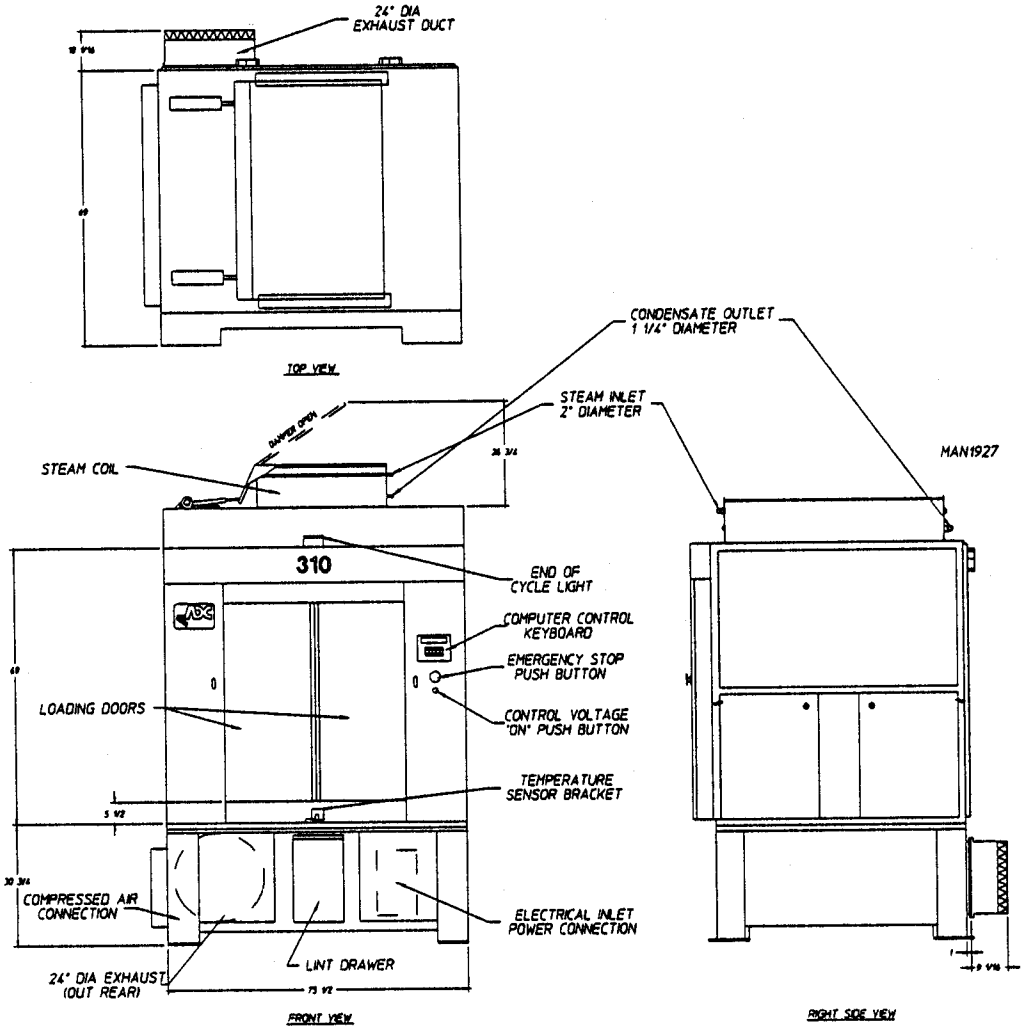
SPECIFICATIONS/COMPONENT IDENTIFICATION

A. SPECIFICATIONS (Gas and Steam Models)

MAXIMUM CAPACITY (DRY WEIGHT)		310 lbs.	141 kg
BASKET DIAMETER		62 1/2"	158.75 cm
BASKET DEPTH		60"	152.4 cm
BASKET MOTOR		5 HP	3.75 kw
DOOR OPENING		36 3/4"	93.34 cm x 109.6 cm
DOOR SILL HEIGHT		36 1/2"	92.71 cm
BASKET VOLUME		106 1/2 cu. ft.	3.02 cu. m.
GAS	VOLTAGE AVAILABLE	208-600v /3 Ø /3w / 4w/50 / 60 HZ	
	BLOWER MOTOR	15 HP	11.25 kw
	APPROX. WEIGHT (UNCRATED)	5,100 lbs.	2,138 kg.
	HEAT INPUT	1,125,000 btu/hr**	283,500 kcal/hr
	AIRFLOW	6,500 cfm	184.2 cmm
	INLET SIZE	1 1/2"	3.82 cm
STEAM	VOLTAGE AVAILABLE	208-600v / 3Ø /3w / 4w / 50 / 60 HZ	
	BLOWER MOTOR	25 HP	18.75 kw
	APPROX. WEIGHT (UNCRATED)	5,600 lbs.	2,545.5 kg
	AIRFLOW	8,500 cfm	240.7 cmm
	STEAM SUPPLY PIPE SIZE	2"	5.08 cm
	HEAT INPUT	35 bhp	
	OPERATING STEAM PRESSURE	125 PSI max	8.79 kg/sq cm
	CONDENSATE RETURN PIPE SIZE	1 1/4"	3.18 cm
	80 PSI COMPRESSED AIR	1/8" FPT	.318 cm

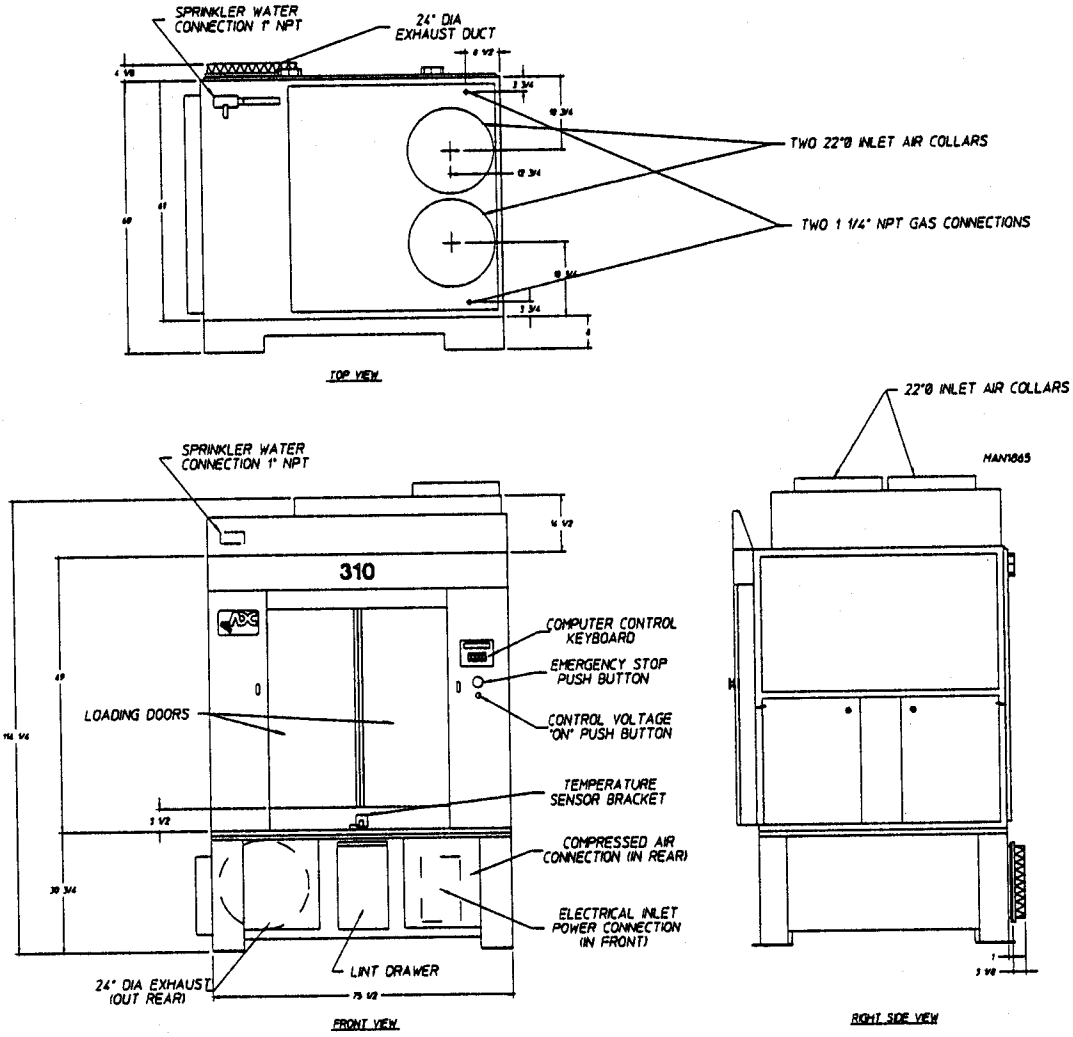
NOTES: **ADC** reserves the right to make changes in specifications at any time, without notice or obligation.

B. COMPONENT IDENTIFICATION / ADS - 310 NON TILT

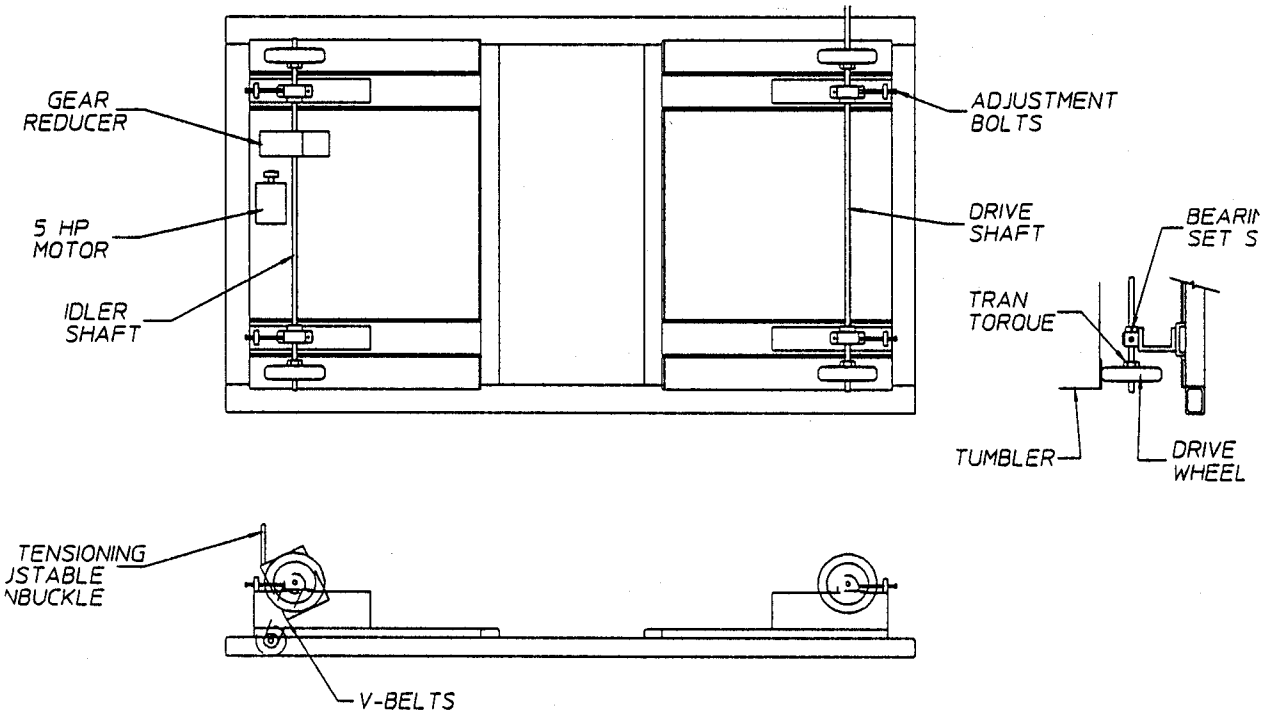


2.

ADG-310 NON-TILT WITH OPTIONAL SPRINKLER AND INLET AIR ADAPTER



3. AD - 310 TUMBLER DRIVE SYSTEM



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WHEN REPLACING A DRIVE WHEEL:

1. ALWAYS CHANGE BOTH WHEELS ON A SHAFT
2. MARK POSITION OF BEARINGS ON SUPPORTS. THIS WILL MAKE REASSEMBLY OF SHAFT AND CENTERING OF TUMBLER EASIER
3. SHOVE BLOCKS OF WOOD UNDER TUMBLER TO TAKE IT'S WEIGHT OFF OF DRIVE WHEELS
4. REMOVE BEARING HOLD DOWN BOLTS AND ADJUSTMENT BOLTS
5. SLIDE COMPLETE SHAFT ASSEMBLY OUT OF SIDE OF DRYER

SECTION III

INSTALLATION PROCEDURES

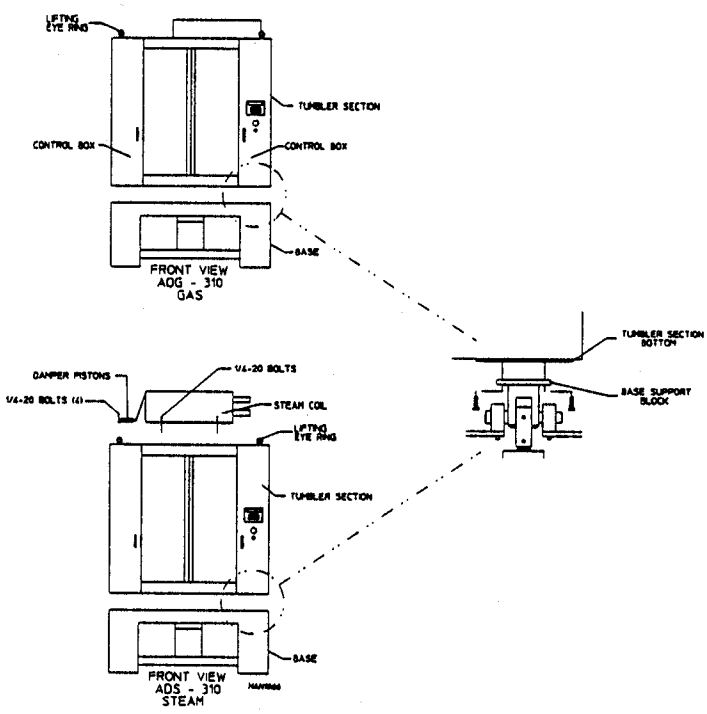
Installation in a proper location **should be** performed by competent technicians in accordance with local and state codes. In the absence of these codes, installation must conform to applicable American National Standards: National Fuel Gas Code ANSI.Z223.1-latest edition and/or National Electric Code ANSI/NFPA NO. 70-latest editionn

A. REASSEMBLY OF DRYER

> **IMPORTANT**: Always keep the tumbler section of the dryer in an upright position when moving it.

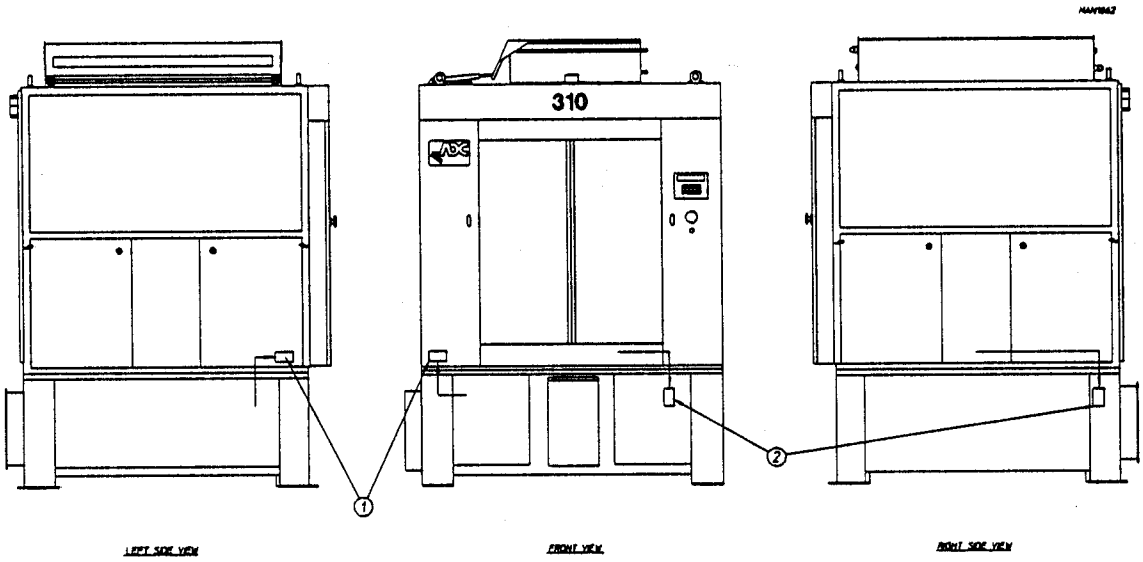
The ADG-310 (gas model dryer) can be shipped in two ways: as a complete unit fully assembled and ready for hookup or in two (2) pieces with the tumbler section separated from the base. At installation, the tumbler section will be lifted onto the base. Use cables through the eye bolts on top of the tumbler section for lifting. Use the (16) 1/2" bolts provided to rebolt the four support blocks to the bottom of the tumbler section.

The ADS-310 (steam model) can also be shipped with the middle frame separated from the base. In this case, follow the instructions for reassembly of the gas dryer. The steam dryer may also be shipped with the steam coil removed. If this is the case, lift the steam coil on top of the tumbler section, with the steam connection pipes facing the right side of the unit, and bolt the coil to the top of the tumbler section using the #1/4-20 bolts provided. There are three (3) panels that cover the front, right side, and rear of the steam coil. Fasten these in position.



ELECTRICAL RECONNECTION - ADS - 310 NON TILT

There are two electrical reconnections that have to be made upon re-assembly of the dryer.



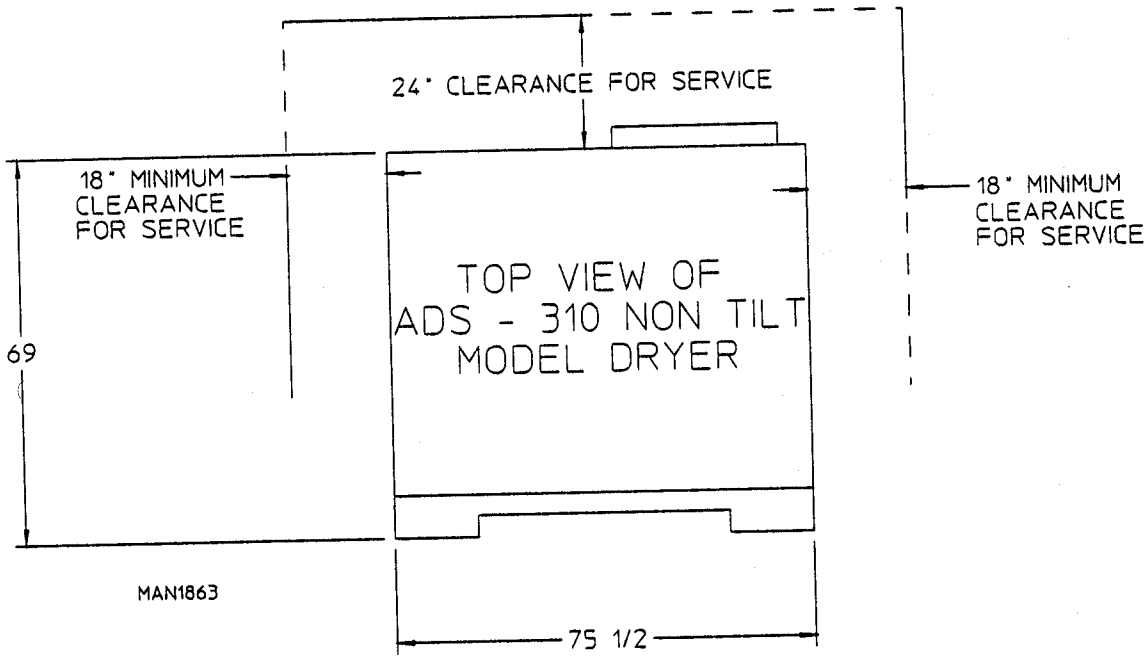
1.) Pull tumbler drive motor power cable up from the base and reconnect the four wires into the 2 x 4 junction box located at the front right of the tumbler section.

2.) Drop the control cable connector from the rear right of the tumbler section into the base. Reconnect the industrial grade plug.

B. LOCATION REQUIREMENTS

The model AD-310 dryer requires 18-inches of space on each side of the dryer and 24-inches of space behind the unit for ease of maintenance. A minimum of 12-inches **must be** allowed between the top of a gas dryer and the ceiling. A ceiling height of 120-inches is required for gas dryers, and a ceiling height of 130-inches is required for steam dryers. The dryer **must be** leveled for proper operation. If shimming is required, put metal shims which are the same size as the base feet under the base feet. The dryer **must be** lagged to the floor.

IMPORTANT: Dryer **should be** located where a minimum amount of exhaust duct will be necessary.



ADS-310 NON TILT CLEARANCE ALLOWANCE

C. FRESH AIR SUPPLY

When the dryer is operating, it draws in room air, heats it, passes this air through the basket (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. Ignition problems and sail switch "fluttering" problems may result, as well as premature motor failure from overheating.

Air supply (make-up air) **must be** given careful consideration to assure proper performance of each dryer. An unrestricted source of air is necessary for each dryer. An airflow of 6,500 cfm (cubic feet per minute) **must be** supplied to each gas dryer and 8,500 cfm (cubic feet per minute) **must be** supplied to each steam dryer. As a general rule, an unrestricted air entrance from the outdoors (atmosphere) of a minimum of 8 square feet is required for each gas dryer and a minimum of 10 square feet is required for each steam dryer.

To compensate for the use of registers or louvers used over the openings, this make-up air area **must be** increased by approximately thirty-three (33) percent. Make-up air openings should not be located in an area directly near where exhaust vents exit the building.

It is not necessary to have a separate make-up air opening for each dryer. Common make up air openings are acceptable. However, they **must be** set up in such a manner that the make-up air is distributed equally to all the dryers.

Allowances **must be** made for remote or constricting passageways or where dryers are located at excessive altitudes or predominantly low pressure areas.

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

NOTE: Component failure due to dry cleaning solvent fumes VOIDS WARRANTY.

D. EXHAUST REQUIREMENTS

1. General Exhaust Duct Work Information

Exhaust duct work **should be** designed and installed by a qualified professional. Improperly sized duct work will create excessive back pressure which results in slow drying, increased use of energy, over-heating of the dryer, and shutdown of the burner by the airflow (sail) switches, burner hi-limits, or basket (tumbler) hi-heat thermostats.

CAUTION: DRYER **MUST BE** EXHAUSTED TO THE OUTDOORS.

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

NOTE: THE AD -310 MUST BE INDEPENDENTLY EXHAUSTED. COMMON DUCT WORK IS NOT ACCEPTABLE.

The duct work **should be** laid out in such a way that the duct work travels as directly as possible to the outdoors with as few turns as possible. Dyer must be independently vented. Dryer common/trunk venting is not acceptable.

The shape of the duct is critical so long as the minimum cross section are is provided. It is suggested that the use of 90 degree turns in ducting be avoided; use 30 degree and/or 45 degree angles instead. The radius of the elbows should preferably be 1-1/2 times the diameter of the duct.

All duct work **should be** smooth inside with no projections from sheet metal screws or other obstructions which will collect lint. When adding ducts, the duct to be added should overlap the duct to which it is to be connected. All duct work joints **must be** taped to prevent moisture and lint from escaping into the building. Inspection doors **should be** installed at strategic points in the exhaust duct work for periodic inspection and clean-out of lint from the duct work.

IMPORTANT: Exhaust back pressure measured by a manometer in the exhaust duct **should not** exceed 0.3 inches of water column.

NOTE: Where the exhaust duct work passes through a wall, ceiling, or roof made of combustible materials, the opening **must be** 2 inches larger (all the way around) than the duct. The duct **must be** centered within this opening.

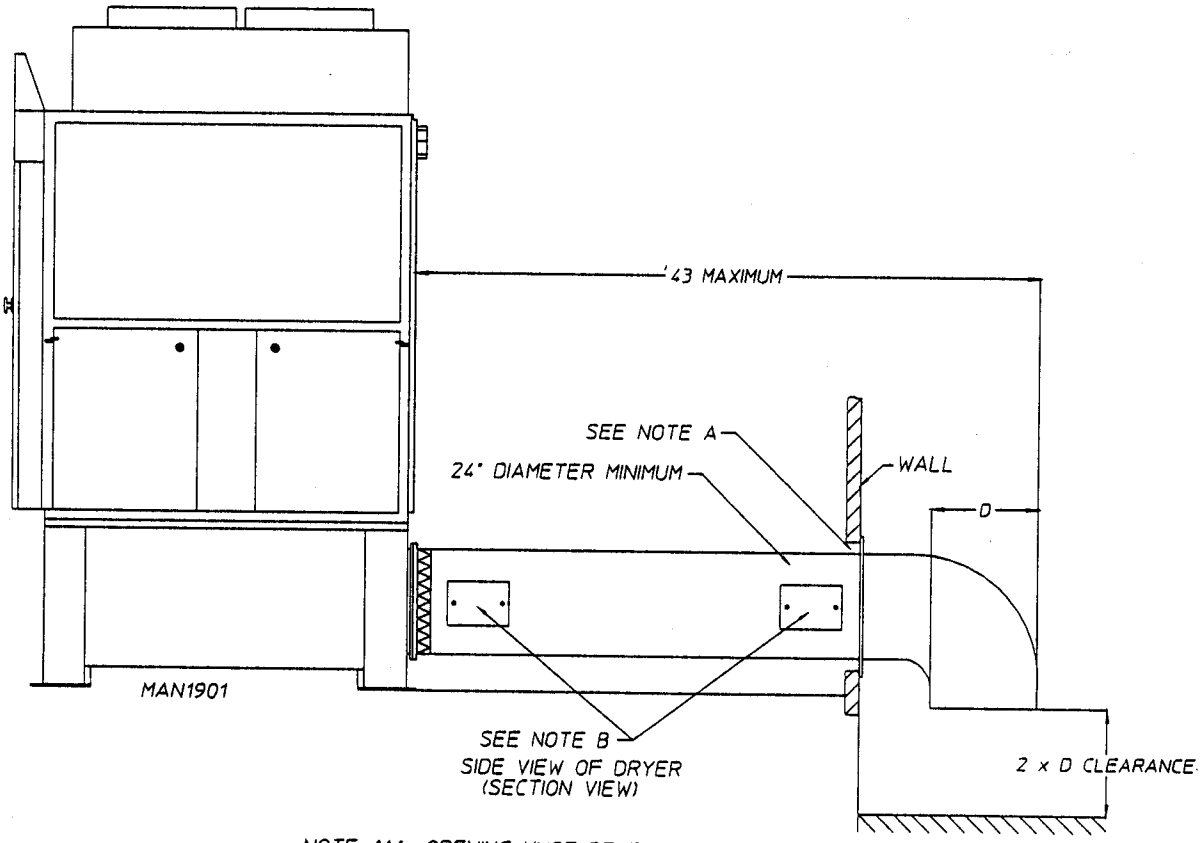
The internal dimensions of the dryer's rectangular exhaust vent duct work is 8 1/2 inches by 21-inches (20.3 cm x 50 cm). A transition piece to 24-inch diameter round is supplied. The location's exhaust duct must be at least 24-inches (mm) in diameter or for a rectanglular duct have a cross-sectional area of 452 inches (sq. cm) With the minimum size requirement (24-inch round duct or 452 square inch square duct) the duct work from the dryer to the outside exhaust outlet for a horizontal run with no more than one (1) elbow must be not exceed 43 feet (see illus. no. on page ...). For locations with more than one (1) elbow, the minimum exhaust size must be 28 inches. For a 28-inch round duct (615 square inch duct) the horizontal or vertical duct total run must not exceed 29 feet which includes the use of no more than three

(3) elbows (see illustrations 2 and 3 on page). Should more than the maximum number of elbows be used or if the run exceeds the maximum limits noted, a professional HVAC firm should be consulted for proper venting information.

IMPORTANT: FOR EXTENDED DUCT WORK RUNS OR WHERE MORE THAN THE SPECIFIED NUMBER OF ELBOWS ARE USED, A PROFESSIONAL HVAC FRIM SHOULD BE CONSULTED FOR PROPER VENTING INFORMATION.

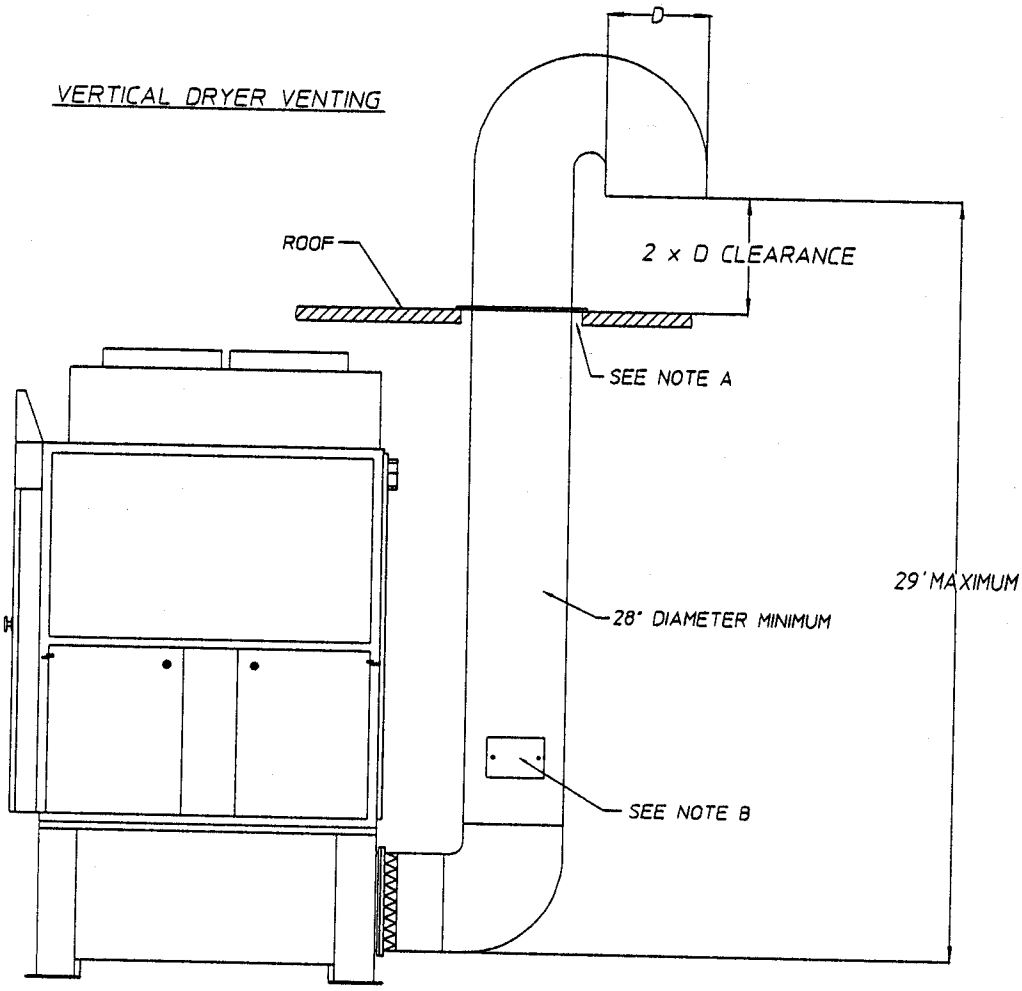
NOTES: FOR EXTENDED DUCT WORK RUNS, THE CROSS SECTIONAL AREA OF A DUCT CAN ONLY BE INCREASED TO AN EXTENT. IN SOME CASES THE ADDITION OF A BOOSTER FAN IN THE DUCT WORK MAY BE NECESSARY.

HORIZONTAL DRYER VENTING



NOTE: "A"- OPENING MUST BE TWO (2) INCHES LARGER THAN DUCT (ALL THE WAY AROUND) THE DUCT MUST BE CENTERED WITHIN THIS OPENING.
"B"- INSPECTION DOORS SHOULD BE INSTALLED AT STRATEGIC POINTS FOR PERIODIC INSPECTION AND CLEANING

VERTICAL DRYER VENTING



SIDE VIEW OF DRYER
(SECTION VIEW)

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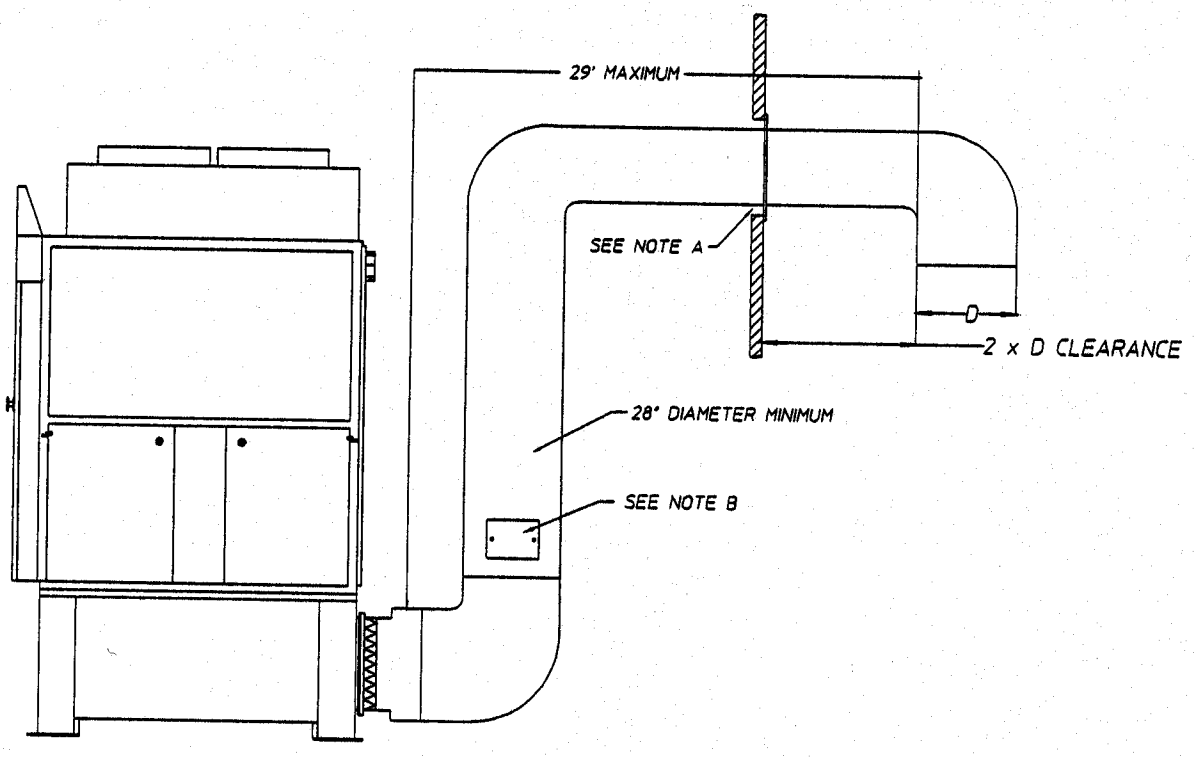
NOTE: "A"- OPENING MUST BE TWO (2) INCHES LARGER THAN DUCT (ALL THE WAY AROUND) THE DUCT MUST BE CENTERED WITHIN THIS OPENING
"B"- INSPECTION DOORS SHOULD BE INSTALLED AT STRATEGIC POINTS FOR PERIODIC INSPECTION AND CLEANING

VERTICAL/HOROZONTAL DRYER VENTING



SIDE VIEW OF DRYER
(SECTION VIEW)

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NOTE: 'A'- OPENING MUST BE TWO (2) INCHES LARGER THAN DUCT (ALL THE WAY AROUND). THE DUCT MUST BE CENTERED WITHIN THIS OPENING.

'B'- INSPECTION DOORS SHOULD BE INSTALLED AT STRATEGIC POINTS FOR PERIODIC INSPECTION AND CLEANING

2. Outside Duct Work Protection

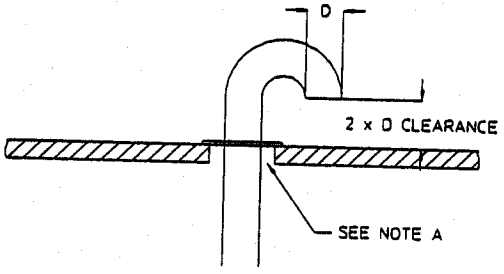
To protect the outside end of horizontal duct work from the weather, a 90° elbow bent downward **should be** installed where the exhaust exits the building. If the duct work travels using a 180° turn to point the opening downward. In either case, allow at least twice the diameter of the duct between the duct opening and the nearest obstruction.

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

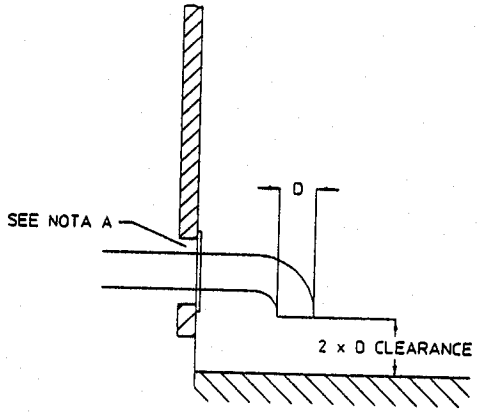
NOTE: EXHAUST BACK PRESSURE MEASURED BY A MANOMETER AT THE DRYER EXHAUST DUCT AREA MUST NOT EXCEED 0.3 INCHES OF WATER COLUMN.

NOTE: WHERE THE EXHAUST PASSES THROUGH A WALL, CEILING, OR ROOF MADE OF COMBUSTIBLE MATERIALS, THE OPENING MUST BE 2 INCHES LARGER (ALL THE WAY AROUND) THAN THE DUCT. THE DUCT MUST BE CENTERED WITHIN THIS OPENING.

VERTICAL DUCTING



HORIZONTAL DUCTING



NOTE 'A': OPENING MUST BE TWO (2) INCHES LARGER THAN DUCT (ALL THE WAY AROUND). THE DUCT MUST BE CENTERED WITHIN THIS OPENING

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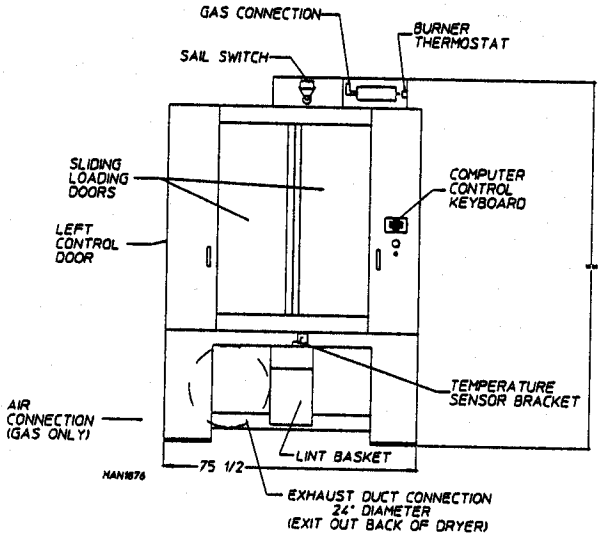
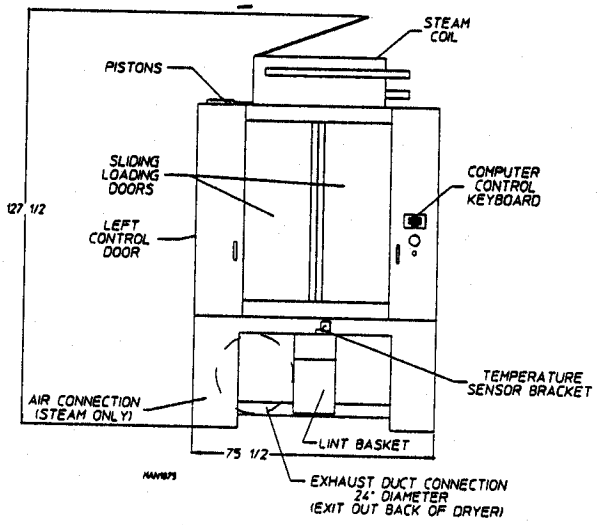
E. COMPRESSED AIR SUPPLY

A clean, dry, regulated supply of 80 psi compressed air **must be** supplied to the dryer. The connection size is 1/8-inch N.P.T. No air filtering or pressure regulating devices are provided with the dryer.

1. GAS DRYERS: The air line supply connection is made into the 1/8-inch N.P.T. port on the air jet solenoid valve which is located in the base of the dryer (see illustration below).



2. STEAM DRYERS: The air line supply connection is made into the 1/8-inch N.P.T. tee which is located in the base of the dryer (see illustration below).



F. ELECTRICAL INFORMATION

1. Electrical Requirements

It is your responsibility to have all electrical connections made by a properly licensed and competent electrician to assure that the electrical installation is adequate and conforms with local and state regulations or codes. In the absence of such codes, all electrical connections, material, and workmanship must conform to the applicable requirements of the national electrical code ANSI/NFPA NO. 70-latest edition.

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

NOTE: Component failure due to improper installation will VOID WARRANTY.

Each dryer **should be** connected to an independently protected branch circuit. The dryer **must be** connected with copper wire only. **Do not** use aluminum wire which could cause a fire hazard. The copper conductor wire/cable **must be** of proper ampacity and insulation in accordance with electric codes for making all service connections.

NOTE: The use of aluminum wire will VOID WARRANTY.

ADS-310, 25Hp & ADG-310, 15Hp Blower, Reversing, 3Ø Motor

Electrical Service Specifications (Per Dryer)

IMPORTANT: 208 VAC and 230/240 VAC are not the same. When ordering, specify exact voltage.

NOTES: A. Fuse ratings are dual element-time delay- current limiting, class RK1 or RK5 ONLY.
B. Circuit breakers are thermal magnetic (industrial) type ONLY. For others, calculate/verify correct breaker size according to appliance amp draw rating and type of breaker used.
C. Circuit breakers for 3Ø dryers **must be** 3-pole type.

SERVICE VOLTAGE	PHASE	WIRE SERVICE	APPROX. AMP DRAW		FUSING Dual Element Time Delay		CIRCUIT BREAKER	
208	3ø	3/4	67	97	100	150	100	150
230	3ø	3	59	85	90	125	100	125
380	3ø	3/4	43	62	60	90	80	100
416	3ø	3/4	40	57	60	80	80	90
460/480	3ø	3/4	30	43	50	60	60	80

ADC reserves the right to make changes in specifications at any time, without notice or obligation.

Contact factory for information not listed.
Specifications subject to change without notice.

WARNING: 208 VAC AND 230/240 VOLTS ARE NOT THE SAME. Any damage done to dryer components due to improper voltage connections will automatically VOID THE WARRANTY.

IMPORTANT: The dryer **must be** connected to the electrical supply shown on the data label that is affixed to the back of the dryer, at the upper right hand corner. In the case of 208 VAC or 230/240 VAC, the supply voltage must match the electric service specifications of the data label exactly.

3. ELECTRICAL CONNECTIONS

> **NOTE:** A wiring diagram is included with each dryer and is affixed to the panel inside the right side control cabinet.

The only electrical input connections to the dryer are the 3-phase (3ø) power leads (L, L2, and L3), GROUND, and in the case of 4 wire service, the neutral. These electrical connections are made at the power distribution block located in the junction box in the bases right front section.

> **NOTE:** A CIRCUIT SERVING EACH DRYER **MUST BE** PROVIDED.

4. GROUNDING

Grounding (earth) connections **must be** provided and installed in accordance with state and local codes. In the absence of these codes, grounding must conform to applicable requirements of the National Electric Code ANSI/NFPA NO. 70-latest edition. The ground connection may be to a proven earth ground at the location service panel.

> **NOTE:** A grounding connection (terminal lug) is provided in the dryer at the left side control cabinet.

For added personal safety, when possible, it is suggested that a separate ground wire (sized per local codes) be connected from the ground connection of the dryer to a grounded cold water pipe. **Do not** ground to a gas or hot water pipe. The grounded cold water pipe must have metal to metal connections all the way to electrical ground. If there are any non-metallic interruptions, such as a meter, pump, plastic, rubber, or other insulating connectors, they **must be** jumped out with no. 4 copper wire and securely clamped to bare metal at both ends.

> **IMPORTANT:** For personal safety and proper operation, the dryer **must be** grounded. For proper operation of the microprocessor (computer), an earth (zero) ground is required.

> **NOTE:** Grounding via metallic electrical conduit (pipe) **is not** recommended.

G. GAS INFORMATION

It is your responsibility to have all plumbing connections made by a qualified professional to assure that the gas plumbing installation is adequate and conforms with local and state regulations or codes. In the absence of such codes, all plumbing connections, material, and workmanship must conform to the applicable requirements of the National Fuel Gas Code ANSI Z223.1-latest edition.

> **IMPORTANT:** Failure to comply with these codes or ordinances, and/or the requirements stipulated in this manual, can result in personal injury and improper operation of the dryer.

The dryer and its individual shut-off valve **must be** disconnected from the gas supply piping system during any pressure testing of that system at test pressures in excess of 1/2 psig (3.5 kPa). The dryer **must be** isolated from the gas supply piping system by closing its individual manual shut-off valve during any pressure testing of the gas supply piping system at test pressures equal to or less than 1/2 psig (3.5 kPa).

> **IMPORTANT:** Failure to isolate or disconnect dryer from supply as noted can cause irreparable damage to the gas valves VOIDING WARRANTY.

> **WARNING:** FIRE OR EXPLOSION COULD RESULT.

1. GAS SUPPLY

The gas dryer installation must meet the American National Standard...National Fuel Gas Code Z223.1-latest edition, as well as local codes and ordinances and **must be** done by a qualified professional.

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

The dryer **must be** connected to the type of heat/gas indicated on the dryer data label affixed behind the right control box door. If this information does not agree with the type of gas available, do not operate dryer. Contact the distributor who sold the dryer or the ADC factory.

> **IMPORTANT:** Any burner changes or conversions **must be** made by a qualified professional.

The input ratings shown on the dryer data label are for elevations of 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 or conversion of dryers in the field for elevations over 2,000 feet are made by changing each burner orifice. If this conversion is necessary, contact the distributor who sold the dryer or contact the ADC factory.

2. TECHNICAL GAS DATA

a. GAS SPECIFICATIONS

	Type Of Gas	
	Natural	Liquid Propane
Manifold Pressure*	3.5 - 4.0 inches W.C.	10.5 - 11.0 inches W.C.
Inline Pressure	6.0 to 12.0 inches W.C.	11.0 inches W.C.

* Measured at gas valve pressure tap when the gas valve is on.

b. GAS CONNECTIONS

Run 2" pipe from the main gas header to the dryer. The gas connection size to the dryer is 1 1/2" N.P.T.

Inlet connection ---------- 1-1/2 inch N.P.T.
Inlet supply size ---------- 2 inch N.P.T. (minimum)

Btuh input (per dryer) ---- 1,125,000

1. NATURAL GAS

Regulation is controlled by the dryers gas valve internal regulator. Incoming supply pressure **must be** consistently between a minimum of 6.0 inches and a maximum of 12.0 inches water column pressure.

2. LIQUID PROPANE (L.P.) GAS

Dryers made for use with L.P. gas have the gas valve's internal pressure regulator blocked open so that the gas pressure **must be** regulated upstream of the dryer. The pressure measured at each gas valve pressure tap **must be** a consistent 11.0 inches water column. There is no regulator or regulation provided in an L.P. dryer. The water column pressure **must be** regulated at the source (L.P. tank) or external regulator/regulation **must be** added to each dryer.

3. PIPING/CONNECTIONS

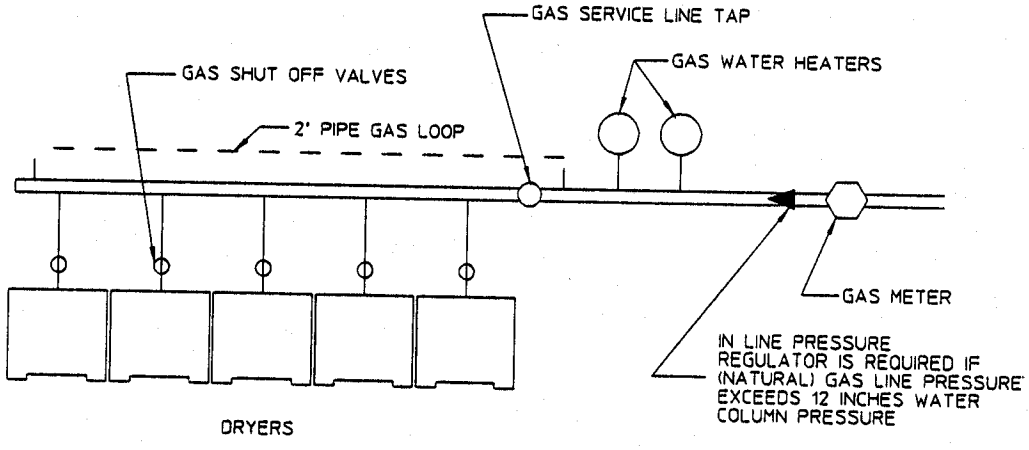
All components/materials must conform to national fuel gas code specifications. It is important that gas pressure regulators meet applicable pressure requirements and that gas meters be rated for the total amount of all the appliance Btu's being supplied.

The dryer is provided with a 1-1/2 inch N.P.T. inlet pipe connection extending out the top of the burner box. The minimum pipe size connection (supply line) to the dryer is 2 inch N.P.T. For ease of servicing, the gas supply line of each dryer **must have** its own shut-off valve.

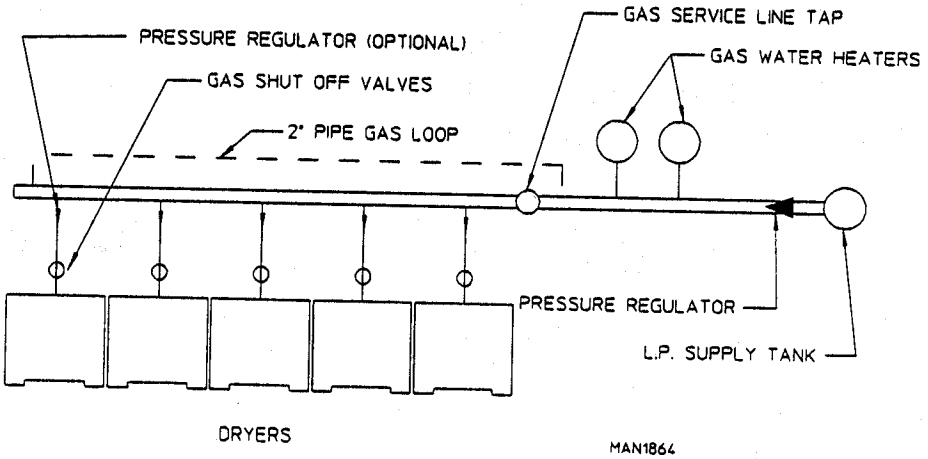
The size of the main gas supply line (header) will vary depending on the distance this line travels from the gas meter or, in the case of L.P. gas, the supply tank, other gas-operated appliances on the same supply line, etc. Specific information regarding supply line size should be determined by the gas supplier.

NOTE: Undersized gas supply piping can create a low or inconsistent pressure which will result in erratic operation of the burner ignition system.

TYPICAL NATURAL GAS INSTALLATION



TYPICAL L.P GAS INSTALLATION



Consistent gas pressure is essential at all gas connections. It is recommended that a 2 inch pipe gas loop be installed in the supply line serving a bank of dryers. An in-line pressure regulator **must be** installed in the gas supply line (header) if the (natural) gas pressure exceeds 12.0 inches of water column pressure.

IMPORTANT: A water column pressure of 4.0 inches for natural gas and 11.0 inches for L.P. dryers is required at both the gas valve pressure taps of each dryer for proper and safe operation.

A 1/8-inch N.P.T. plugged tap, accessible for a test gauge connection, **must be** installed in the main gas supply line immediately upstream of each dryer.

IMPORTANT: Pipe joint compounds that resist the action of natural and L.P. gases **must be** used.

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

WARNING: NEVER TEST FOR GAS LEAKS WITH A FLAME!!!

All components/materials must conform to National Fuel Gas Code Specifications ANSI Z223.1-latest edition. It is important that gas pressure regulators meet applicable pressure requirements, and gas meters be rated for the total amount of appliance Btu's being supplied.

IMPORTANT: The dryer and its individual shut-off valve **must be** disconnected from the gas supply piping system during any pressure testing of that system at test pressures in excess of 1/2 psig (3.5 kPa).

NOTE: The dryer **must be** isolated from the gas supply piping system by closing its individual manual shut off valve during any pressure testing of gas supply piping system at test pressures equal to or less than 1/2 psig (3.5 kPa).

H. STEAM INFORMATION

It is your responsibility to have all steam plumbing connections made by a qualified professional to assure that the installation is adequate and conforms with local and state regulations or codes.

> **IMPORTANT:** Failure to comply with the requirements stipulated in this manual can result in component failure which will VOID THE WARRANTY.

> **NOTE:** The ADS-310 is manufactured with a pneumatic (piston) damper system which requires an external supply of air (80 psi +/- 10 psi). See **Steam Damper Air System Connections Section H, item 3.**

1. STEAM REQUIREMENTS, HIGH PRESSURE

A. Inlet ---- 2-inch supply line connection.

B. Return - 2-inch return line connection.

Operating Steam Pressure, High Pressure		
Maximum	125 psig	8.79 kg/sq cm
Minimum	100 psig	7.03. kg/sq cm
Heat Input (Normal Load)	35 Bph	27 Bph
Consumption (Approximate)	1,153lbs/hr	362 kg/hr

2. INSTALLATION INSTRUCTIONS

To insure that an adequate supply of steam is provided, be sure that the steam and steam return lines are sized and laid out as stipulated in this manual. Inadequate steam and steam return lines or improper steam plumbing will result in poor performance and can cause component failure. Clean, dry steam must be provided to the dryer.

> **IMPORTANT:** Steam coil failure due to water hammer by wet steam VOIDS WARRANTY.

A. The pressure of the condensate in the steam supply will cause water hammer and subsequent heat exchanger (steam coil) failure. The steam supply connection into the main supply line must be made with a minimum 10-inch riser. This will prevent any condensate from draining towards the dryer.

B. The steam supply piping to the dryer must include a 12-inch rise along with a drip trap and check valve. This will prevent any condensate from entering the steam coil.

C. Flexible hoses or couplings **must be** used. The dryer vibrates slightly when it runs and this will cause the steam coil connections to crack if they are hard piped to the supply and return mains.

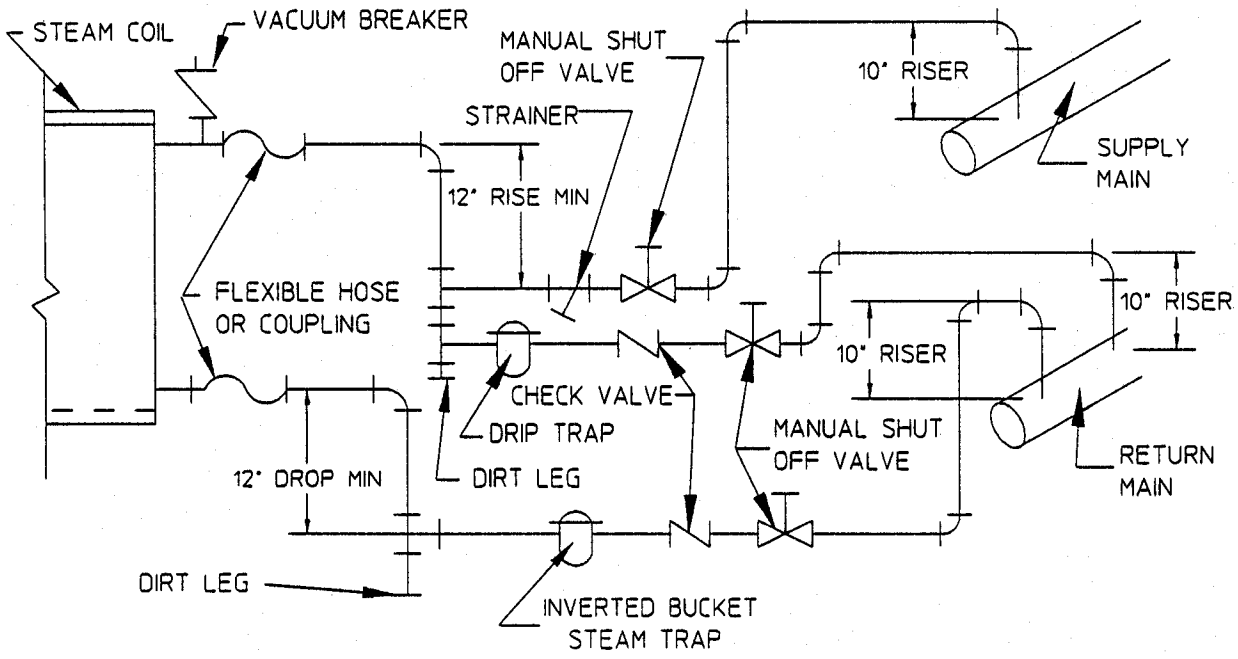
D. Shut-off valves for each dryer **should be** installed in the supply, return, and drip trap return lines. This will allow the dryer to be isolated from the supply and return mains if the dryer needs maintenance work.

E. Install an inverted bucket steam trap and check valve at least 12 inches below steam coil as close to the coil as possible.

F. A vacuum breaker **should be** installed in the piping. This will prevent the condensing steam from causing a vacuum inside the coil and possibly damaging the coil.

G. The supply and return lines **should be** insulated. This will save energy and provide for the safety of the operator and maintenance personnel.

H. Water pockets in the supply line, caused by low points, will provide wet steam to the coil possibly causing coil damage. All horizontal runs of steam supply piping should be pitched 1/4-inch for every one (1) foot back towards the steam supply header causing any condensate in the line to drain to the header. Install a bypass trap in any low point to eliminate wet steam.



STEAM DAMPER SYSTEM

MAN0582

3. STEAM DAMPER AIR SYSTEM CONNECTIONS

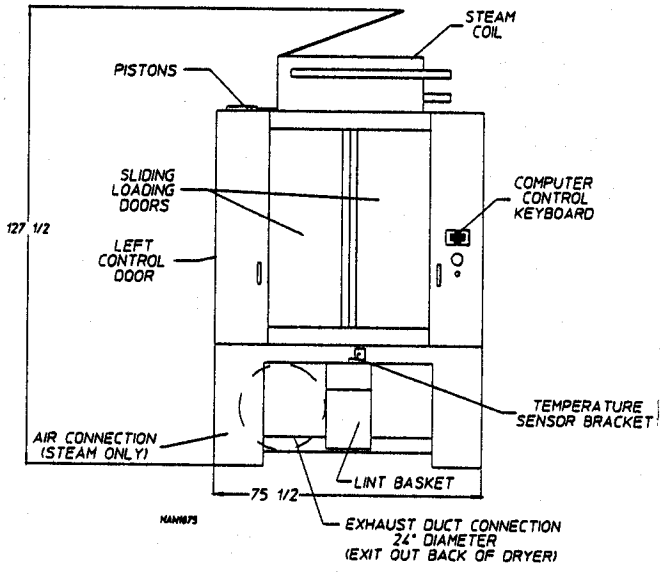
The ADS-310 is manufactured with a pneumatic (piston) damper system which requires an external supply of compressed air. The air connection is made at the base of the dryer.

A. AIR REQUIREMENTS

Compressed Air Supply	Air Pressure
Normal	80 psi
Minimum Supply	70 psi
Maximum Supply	90 psi

B. AIR CONNECTION

Air connection to system --- 1/8-inch N.P.T.



C. No air regulation is provided with the dryer. External regulation of 80 psi **must be** provided. It is suggested that a regulator/filter gauge arrangement be added to the compressed air line just before the dryer connection. This is necessary to insure that correct and clean air pressure is achieved.

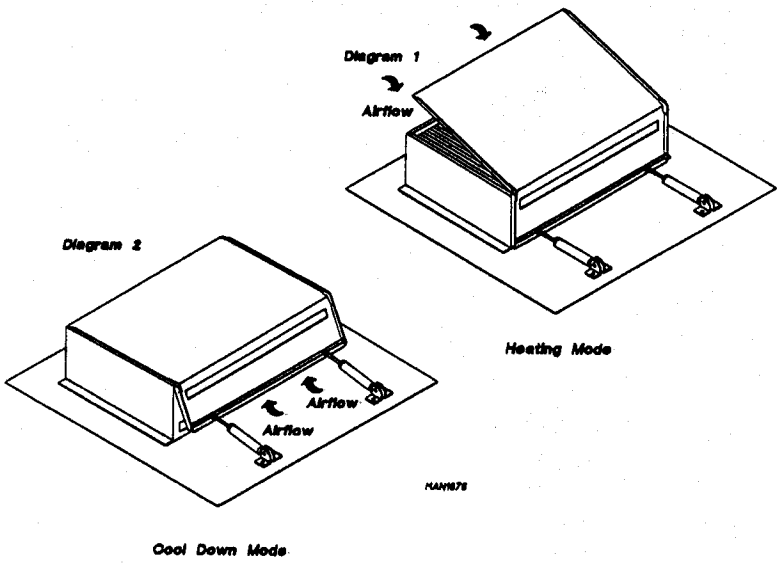
4. STEAM DAMPER SYSTEM OPERATION

The ADS-310 steam damper, as shown in the **illustration** on **page 27**, allows the coil to stay constantly charged eliminating repeated expansion and contraction. When the damper is opened, the air immediately passes through the already hot coil, providing instant heat to start the drying process. When the damper is closed, ambient air is drawn directly into the basket (tumbler), allowing a rapid cool down.

Diagram 1 shows the damper in the heating (open) mode, allowing heat into the basket (tumbler).

Diagram 2 shows the damper in the cool down (closed) mode, pulling ambient air directly into the basket (tumbler) without passing through the coils.

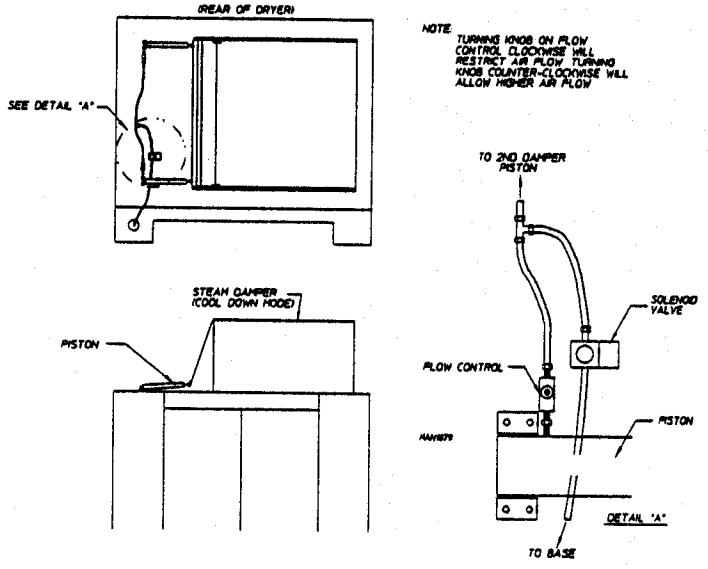
> NOTE: With the dryer off or with no air supply, the damper is in the cool down mode as shown in diagram 2.



5. STEAM DAMPER AIR PISTON (FLOW CONTROL) OPERATION ADJUSTMENT

Damper operation was tested and adjusted prior to shipping at 80 psi. If damper air adjustment is necessary, locate flow control valve and make necessary adjustments as noted below.

> NOTE: Adjust both flow control valves equally, so that both pistons operate at the same speed.



I. PREPARATION FOR OPERATION/START-UP

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 affixed behind the right control box door. In the case of 208 VAC or 230/240 VAC, the supply voltage **must match** the electric service exactly.

3. Gas Models — check to assure that the dryer is connected to the type of heat/gas indicated on the dryer data label.

4. Gas Models — the sail switch damper assemblies (2 one each burner) was installed and adjusted at the factory prior to shipping. However, each sail switch adjustment **must be** checked to assure that this important safety control is functioning.

5. Gas Models — be sure that all gas shut-off valves are in the open position.

6. Be sure all side and base panels are on the dryer.

7. Check all service doors to assure that they are closed and secured in place.

8. Be sure the lint drawer is securely in place.

> NOTE: Lint drawer **must be** all the way in place to activate safety switch otherwise the dryer will not start.

9. Rotate the basket (tumbler/drum) by hand to be sure it moves freely.

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

11. Check to insure air supply (80 psi) is connected to dryer.

12. Steam Models — check to insure all steam and condensate shut-off valves are open.

I. PREOPERATIONAL TESTS

All dryers are thoroughly tested and inspected before leaving the factory. However, a preoperational test **should be** performed before the dryer is publicly used. It is possible that adjustments have changed in transit or due to marginal location (installation) conditions.

1. Turn on electric power to dryer.

2. Make sure loading doors are closed and lint drawer is closed.

3. Microprocessor (computer) system operational test — to start dryer...

   A. Display will read "FILL."

   B. Press the "E" (preprogrammed) cycle key on the touch pad of the keyboard.

   C. Display will quickly read..."Ld30," "Lc04," and "F180" (unless special programs requested). These codes mean that the dryer is in the timed mode and will operate with heat of 180° F (fahrenheit) for 30 minutes drying time and have a 4 minute cool down period.

   D. Dryer will now start, and the display will read "Dr30" (dry mode for 30 minutes) and count down in minutes.

> **NOTE:** Dryer can be stopped at any time by opening main door or by pressing the "CLEAR/STOP" key. To restart dryer, press the "ENTER/START" key or preprogrammed cycle key (i.e., "E").

> **NOTE:** Pressing touch pad key "A," "B," "C," "D," and "F" will also start the dryer. The six (6) preprogrammed drying cycles ("A" through "F") have been stored in the microprocessor (computer's) memory. See the computer programming manual supplied with dryer for these pre-programmed cycles.

4. Check to insure that the basket (tumbler) starts in the clockwise (CW) direction. In addition, check the direction of blower motor to insure that it rotates in the counterclockwise (CCW) direction as viewed fromthe left side of the dryer. If it is, the phasing is correct. If the phasing is incorrect, reverse two (2) of the leads at L1, L2, or L3 of the power supply connections made to dryer.

> **IMPORTANT:** Dryer blower motor and impellor/fan shaft as viewed from the left side of the dryer must turn in the counterclockwise (CCW) direction, otherwise dryer efficiency will drastically be reduced, and premature component failure can result.

5. HEAT CIRCUIT OPERATIONAL TEST

A. GAS MODELS

1. When the dryer is first started (during initial start-up), the burners have a tendency not to ignite on the first attempt. This is because the gas supply piping is filled with air, so it may take a few minutes for this air to be purged from the lines.

2. The dryer is equipped with a direct spark ignition (DSI) system which has internal diagnostics. If ignition is not established after the first attempt, the heat circuit DSI module will lock out until it is manually reset. To reset the DSI system, open and close the loading doors and restart dryer (press "ENTER/START" key).

NOTE: During the purging period, check to be sure that all gas shut-off valves are open.

3. Once ignition is established, a gas pressure test **should be** taken at each gas valve pressure tap of each dryer to assure that the water column pressure is correct and consistent.

NOTE: Water column pressure requirements (measured at both gas valve pressure taps)...

NATURAL GAS ---------- 4.0 INCHES W.C.
L.P. GAS ---------- 11.0 INCHES W.C.

IMPORTANT: There is no regulator provided in an L.P. dryer. The water column pressure **must be** regulated at the source (L.P. tank), or an external regulator **must be** added to each dryer.

B. STEAM MODELS

1. Check to insure that steam damper is functioning properly.

6. Make a complete operational check of all safety-related circuits (i.e., lint drawer switch and sail switch on gas models).

7. A reversing basket (tumbler) dryer **should never** be operated with less than a 50 lb. load (dry weight). The size of the load will affect the coast-down and dwell (stop) times. The basket (tumbler) must come to a complete stop before starting in opposite direction. For automatic (mode) cycle only, the spin and stop times are not adjustable and have been preprogrammed into the microprocessor controller (computer) for a 2-minute spin time and a 5-second dwell (stop) time.

IMPORTANT: The dryer basket (tumbler) is treated with a protective coating. **ADC** suggests tumbling old clothes or material in the basket (tumbler) using a mild detergent to remove the protective coating.

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

9. Microprocessor (computer) programs/selections...

   A. Each microprocessor controller (computer) has been preprogrammed by the factory with the most commonly used parameter selections. If computer program changes are required, refer to the computer programming manual which was shipped with the dryer.

K. SHUTDOWN INSTRUCTIONS

In the case where the dryer is to be shut down (taken out of service) for a period of time, the following **MUST BE** performed:

1. Discontinue power to the dryer at the external disconnect switch or the crcuit breaker.

2. Disconnect heat supply:

   a. GAS MODELS... discontinue gas supply.

      1) **SHUT OFF** external gas supply at shut off valve.

      2) **SHUT OFF** internal gas supply shut off valve located in the gas valve train area.

   b. STEAM MODELS... discontinue steam supply tothe dryer at the external (location furnished) shut off valve.

SECTION IV

SERVICE/PARTS INFORMATION

A. SERVICE

1. Service **must be** performed by a qualified trained technician, service agency, or gas supplier. If service is required, contact the distributor from whom the ADC equipment was purchased. If the distributor cannot be contacted or is unknown, contact the ADC Service Department for a distributor in your area.

> NOTE: When contacting the ADC service department, be sure to give them the correct **model number** and **serial number** so that your inquiry is handled in an expeditious manner.

B. PARTS

1. Replacement parts **should be** purchased from the distributor from whom the ADC equipment was purchased. If the distributor cannot be contacted or is unknown, contact the ADC Parts Department for a distributor in your area. Parts may also be purchased directly from the factory by calling the ADC Parts Department at (508) 678-9010.

> NOTE: When ordering replacement parts from the ADC dealer or ADC factory, be sure to give them the correct **model number** and **serial number** so that your parts order can be processed in an expeditious manner.

SECTION V

WARRANTY INFORMATION

A. RETURNING WARRANTY CARD(S)

1. Before any dryer leaves the **ADC** factory test area, a warranty card (**ADC** P/N 112250) is placed in a plastic bag behind the right control door. These warranty cards are intended to serve the customer in two ways. First, when **ADC** receives the warranty card(s) back from a customer, we mail the appropriate parts manual (at no charge) to the address indicated on the returned card. Second, we record the individual installation date and warranty information to better serve you should you file a warranty claim.

    A. If a warranty card (**ADC** P/N 112250) did not come with your dryer, contact the **ADC** Warranty Department or Service Department at (508) 678-9000.

B. WARRANTY

For a copy of the **ADC** commercial warranty covering your particular dryer(s), contact the **ADC** distributor from whom you purchased the equipment and request dryer warranty form **ADC** Part Number 450199. If the distributor cannot be contacted or is unknown, warranty information can be obtained from the factory by contacting the **ADC** Warranty Department at (508) 678-9000.

> **NOTE:** Whenever contacting the **ADC** factory for warranty information, be sure to have the dryer's **model number** and **serial number** available so that your inquiry can be handled in an expeditious manner.

C. RETURNING WARRANTY PARTS

All dryer or parts warranty claims or inquires **should be** addressed to the **ADC** Warranty Parts Department. To expedite processing, the following procedures **must be** followed:

1. No parts are to be returned to **ADC** without prior written authorization ("Return Material Authorization") from the factory.

> **NOTE:** An R.M.A. ("Return Material Authorization") is valid for only sixty (60) days from date of issue.

a. The R.M.A. issued by the factory, as well as any other correspondence pertaining to the returned part(s), **must be** included inside the package with the failed merchandise.

2. Each part **must be** tagged with the following information:

   a. **Model number** and **serial number** of the dryer from which part was removed.

   b. Nature of failure (be specific).

   c. Date of dryer installation.

   d. Date of part failure.

   e. Specify whether the part(s) being returned is for a replacement, a credit, or a refund.

NOTE: If a part is marked for a credit or a refund, the invoice number covering the purchase of the replacement part must be provided.

NOTE: Warranty tags (**ADC** P/N 450064) are available at "no charge" from **ADC** upon request.

3. The company returning the part(s) must clearly note the complete company name and address on the outside of the package.

4. All returns **must be** properly packaged to insure that they are not damaged in transit. Damage claims are the responsibility of the shipper.

IMPORTANT: No replacements, credits, or refunds will be issued for merchandise damaged in transit.

5. All returns should be shipped to the **ADC** factory in such a manner that they are insured and a proof of delivery can be obtained by the sender.

6. Shipping charges are not the responsibility of ADC. All returns should be "prepaid" to the factory. Any "C.O.D." or "COLLECT" returns **will not be accepted**.

IMPORTANT: No replacements, credits, or refunds will be issued if the claim **cannot** be processed due to insufficient information. The party filing the claim will be notified in writing, either by "FAX" or "CERTIFIED MAIL - Return Receipt Requested," as to the information necessary to process the claim. If a reply is not received by the **ADC** Warranty Department within thirty (30) days from the FAX/letter date, then no replacement, credit, or refund will be issued, and the merchandise will be discarded.

SECTION VI

ROUTINE MAINTENANCE

A. CLEANING

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

> **WARNING:** LINT FROM MOST FABRICS IS HIGHLY COMBUSTIBLE. THE ACCUMULATION OF LINT CAN CREATE A POTENTIAL FIRE HAZARD.

> **WARNING:** KEEP DRYER AREA CLEAR AND FREE FROM COMBUSTIBLE MATERIALS, GASOLINE, AND OTHER FLAMMABLE VAPORS AND LIQUIDS.

> **NOTE:** Suggested time intervals shown are for average usage which is considered six (6) to eight (8) operational (running) hours per day.

SUGGESTED CLEANING SCHEDULE

AFTER EVERY LOAD

Clean the lint basket. A clogged lint basket will cause poor dryer performance. The lint basket is located in the lint drawer in the base of the dryer. Pull out the lint drawer, brush the lint off the lint basket, and remove the lint. Inspect lint screen and replace if torn.

WEEKLY

Open the hinged panels on each side of the basket (tumbler) section and remove any lint accumulation.

Slide the lint basket all the way out of the dryer and clean any lint accumulation off the temperature sensor bracket, which is located above the lint basket.

> **WARNING:** TO AVOID THE HAZARD OF ELECTRICAL SHOCK, DISCONTINUE ELECTRICAL SUPPLY TO THE DRYER.

MONTHLY

Apply a high-temperature grease to the four (4) 1-1/2-inch diameter tumbler drive shaft pillow block bearings. Use Shell Alvania #3 grease or equivalent.

Retighten set screws in the collars of the four (4) 1-1/2-inch diameter tumbler drive shaft bearings.

Clean lint accumulation from the gas burner area and the motors and bearings located in the base.

> NOTE: To prevent damage, avoid cleaning and/or touching ignitor/flame-probe assembly.

EVERY 6 MONTHS

Grease the two (2) 1-1/4-inch pillow block bearings and the two (2) 1-3/8-inch pillow block bearings located in the dryer's base. Use Shell Alvania #3 grease or equivalent.

Grease the two (2) motors in the base with Chevron SR #1-2 grease or equivalent unless otherwise stamped on the motor label.

Check V-belts for tightness and wear. Retighten or replace if required.

On steam dryers, clean steam coil fins. We suggest using compressed air and a vacuum cleaner with brush attachment.

> NOTE: When cleaning steam coil fins, be careful not to bend the fins. If fins are bent, straighten by using fin comb which is available from local air-conditioning supply houses.

Inspect and remove lint accumulation in customer furnished exhaust duct work system and from dryers internal exhaust ducting.

> WARNING: THE ACCUMULATION OF LINT IN THE EXHAUST DUCT WORK CAN CREATE A POTENTIAL FIRE HAZARD.

> WARNING: **DO NOT** OBSTRUCT THE FLOW OF COMBUSTION AND VENTILATION AIR. CHECK CUSTOMER-FURNISHED BACK DRAFT DAMPERS IN EXHAUST DUCT WORK. INSPECT AND REMOVE ANY LINT ACCUMULATION WHICH CAN CAUSE DAMPER TO BIND OR STICK.

> NOTE: When cleaning dryer cabinet(s), avoid using harsh abrasives. A product intended for the cleaning of appliances is recommended.

B. ADJUSTMENTS

7 DAYS AFTER INSTALLATION AND EVERY 6 MONTHS THEREAFTER

Inspect bolts, nuts, screws (bearing set screws), non-permanent gas connections (unions, shut-off valves, orifices, and grounding connections). Motor and drive belts **should be** examined. Cracked or seriously frayed belts should be replaced. Tighten loose V-belts when necessary. Complete operational check of controls and valves. Complete operational check of all safety devices (door switches, lint drawer switch, sail switch, burner and hi-limit thermostats).

SECTION VII

COMPONENT SYSTEM DESCRIPTIONS

A. BASKET/TUMBLER DRIVE SYSTEM

The basket (tumbler) is supported and driven by four (4) 11-inch diameter drive wheels. Two (2) of these wheels are attached to a 1-1/2-inch diameter idler shaft, while the other two (2) are attached to a 1-1/2-inch diameter drive shaft. Each of the wheels is fastened to the shafts by a keyless locking bushing. The trantorque is made up of three pieces: an inner collar, an outer sleeve, and a locking nut. The inner and outer elements have matching opposite tapers. As a result, when the nut is tightened, the trantorque contracts onto the shaft and expands into the drive wheel, locking the wheel onto the shaft. No key is required.

The idler and drive shafts are each supported by two (2) 1-1/2-inch diameter pillow block bearings. These bearings sit on slotted support channels and can be moved inward or outward by the adjustment bolts to raise or lower the basket (tumbler).

The drive system consists of a shaft mounted gear reducer two v-belts and 5 hp drive motor. Belt tension can be adjusted by tightening or loosening the geat reducer turn buckle.

B. BASKET/TUMBLER

The basket (tumbler) is made of 14-gauge stainless steel perforated panels, four (4) stainless steel ribs, and two (2) outer basket/tumbler rings made of rolled steel angle iron that has been turned on a lathe for smoothness. The basket (tumbler) is a completely welded assembly so the perforated panels are not removable.

C. AIR BLOWER DRIVE SYSTEM

The impellor (fan) used in the AD-310 dryer is a 18-1/4 inch diameter squirrel cage impellor (fan) wheel spins in a counterclockwise direction looking at the back of the blower housing.

The impellor/fan shaft is mounted in two pillow block bearings, and the shaft is driven by two (2) B-section V-belts connected to the blower motor.

The blower motor is mounted on an adjustable base. The motor position can be easily adjusted so that proper tension can be maintained on the V-belts.

D. SAFETY DEVICES

1. Load Door Switches

There are two (2) of these switches located under the main loading doors. These switches ensure that the doors are closed before the dryer can start. If the dryer is started when the load doors are open, the microprocessor controller (computer) L.E.D. display will show "door."

2. Lint Basket Switch

This switch ensures that the lint basket is closed before the dryer can start. This switch is located at the front of the dryer at the right side of the lint basket. If the lint basket is open when the dryer is started, then the microprocessor controller (computer) L.E.D. display will show "door."

3. Basket (tumbler) Hi-Limit Safety Thermostat

This disc temperature switch has a setting of 225° F. It is located below the basket (tumbler) on the temperature sensor bracket, along side the computer sensor, and is an automatic reset type of switch. Access to this switch is gained by sliding/pulling the lint basket completely out of the dryer.

This switch backs up the computer sensor and in case of a computer sensor malfunction will prevent the basket's (tumbler's) temperature from becoming excessive. If this switch trips, the gas flow to the burner box will be shut down; however, the basket (tumbler) will still rotate.

4. Burner Box Hi-Limit Safety Thermostat (Gas Dryers Only)

These disc temperature switches have a setting of 330° F. they are located on the right side of each burner box, and it is an automatic reset type of switch. This switch ensures that there is proper airflow through both burner boxes. Upon a low airflow condition, which may be caused by a clogged lint screen, excessively long or blocked exhaust duct, or improper make-up air, the temperature in the burner boxes will increase tripping these switches. This will shut off the gas flow to the burner boxes; however, the basket (tumbler) will still run.

5. Sail Switch (Gas Dryers Only)

The sail switches are located in the front and back of each burner box. 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 burners. This creates a negative pressure inside the burner boxes, and this negative pressure pulls in the round damper and activates the sail switches. If there is an improper (low) airflow through the dryer, the sail switch dampers will not pull in, preventing the heat from coming on.

Low airflow through the dryer will be caused by overly long or blocked exhaust ducting, lack of make-up air, or a clogged lint screen.

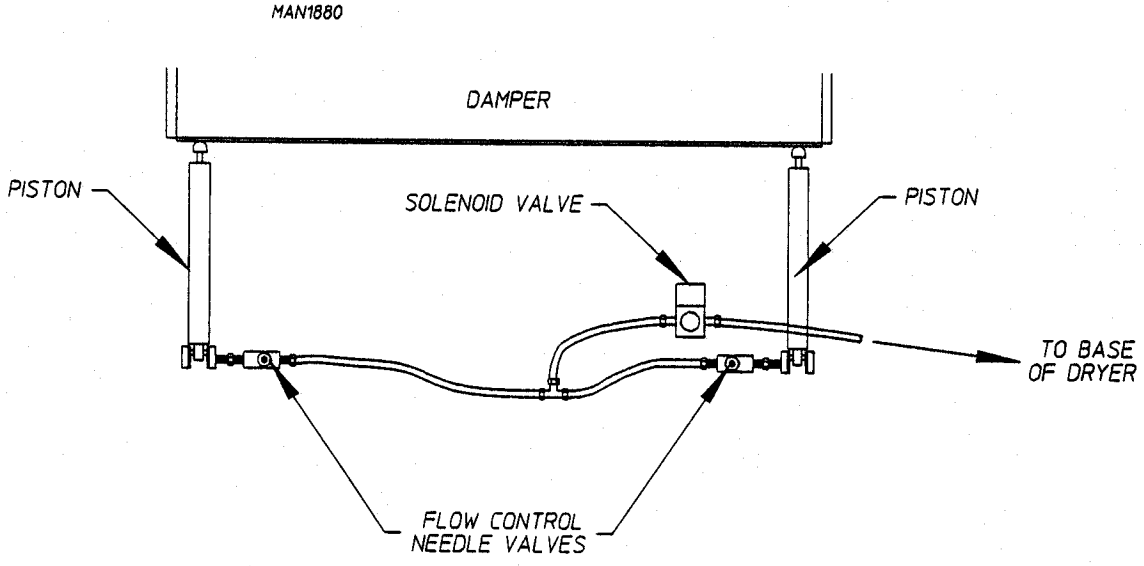
E. STEAM DAMPER ACTUATOR SYSTEM

This system consists of a hinged damper plate, two pneumatic pistons with a needle valves to control the speed of both pistons actuation, and 24-volt solenoid valve

On a call for heat, a 24-volt signal is applied to the 3-way/2-position solenoid valve. This signal switches the valve so that compressed air is sent to the pistons. The piston rods extend, pushing the hinged steam damper plate to the open position. This allows room air to be drawn through the hot steam coil and then through the basket (tumbler).

When the temperature set point has been reached, the 24-volt signal is removed from the solenoid valve, so that the solenoid valve blocks the air supply to the pistons and the air in the pistons is bled to the atmosphere. The spring in the pistons now retracts the piston rods, closing the steam damper. The steam damper plate now covers the steam coil and allows room air to bypass the coil before entering the basket (tumbler) for a rapid cool down.

The steam damper plate should open and close slowly and smoothly. This speed can be modulated by adjusting the needle valve knobs. Turning the knob clockwise restricts the compressed airflow and slows down the steam damper movement. Counterclockwise adjustment speeds up the steam damper motion. Upon completion of adjustment, tighten the needle valve's locking nut. Both piston rods must operate at the same speed.



NOTE: TURNING KNOB ON FLOW CONTROL CLOCKWISE WILL RESTRICT AIR FLOW. TURNING KNOB COUNTERCLOCKWISE WILL ALLOW HIGHER AIR FLOW.

SECTION VIII

TROUBLESHOOTING

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/shorted wire may be at fault where electrical components are concerned...not necessarily the suspected component itself. Electrical parts **should always be** checked for failure before being returned to the factory.

IMPORTANT: When replacing blown fuses, the replacement **must be** of the exact rating as the fuse being replaced. The information provided **should not** be misconstrued as a handbook for use by an untrained person in making repairs.

WARNING: ALL SERVICE AND TROUBLESHOOTING **SHOULD BE** PERFORMED BY A QUALIFIED PROFESSIONAL OR SERVICE AGENCY.

WARNING: WHILE MAKING REPAIRS, OBSERVE ALL SAFETY PRECAUTIONS DISPLAYED ON THE DRYER OR SPECIFIED IN THIS MANUAL.

A. No display

1. Emergency stop button pushed in.
2. Service panel fuses blown or tripped breaker
3. Blown E1 fuse 1 or E2 fuse 2
4. Failed microprocessor controller (computer)

B. Drive motor not operating (does not start)

* Microprocessor controller (computer) relay output indicator (either forward "FWD" or reverse "REV") is on

1. Blown drive motor contactor fuse(s)
2. Failed drive motor contactor
3. Failed drive motor

* Microprocessor controller (computer) relay output indicator (neither forward "FWD" or reverse "REV") go on

1. Failed microprocessor controller (computer)

C. Drive motor operates in one direction only...stops and restarts in same direction

* Appropriate microprocessor controller (computer) relay output indicator is on

1. Failed reversing contactor (relay)

* Appropriate microprocessor controller (computer) relay output indicator is off

1. Failed microprocessor controller (computer)

D. Drive motor operates okay for a few minutes and then either repeatedly or occasionally trips the overload protector

> NOTE: WHEN THE OVERLOAD PROTECTOR TRIPS, THE MICROPROCESSOR CONTROLLER (COMPUTER) L.E.D. DISPLAY WILL READ "door."

1. Motor is overheating

    a. Motor air vents clogged with lint

    b. Low voltage to motor

    c. Failed motor

    d. Basket (tumbler) is binding...check for an obstruction

    e. Failed gear reducer or tumbler bearings

    f. V-belts are too tight.

2. Failed overload protector

E. Impellor/fan motor not operating (does not start)

* Microprocessor controller (computer) "MTR" relay output indicator is on

1. Blown blower (impellor/fan) motor contactor fuse(s)

2. Failed blower (impellor/fan) motor contactor (relay)

3. Failed blower (impellor/fan) motor

* Microprocessor controller (computer) "MTR" relay output indicator is off

1. Failed microprocessor controller (computer)

F. Blower (impellor/fan) motor operates okay for a few minutes and then either repeatedly or occasionally trips the overload protector

> NOTE: WHEN THE OVERLOAD PROTECTOR TRIPS, THE MICROPROCESSOR CONTROLLER (COMPUTER) L.E.D. DISPLAY WILL READ "door."

1. Motor is overheating

    a. Motor air vents clogged with lint

    b. Low voltage to motor

    c. Failed motor

    d. Failed impellor/fan drive bearings

    e. V-belts are too tight.

2. Failed overload protector

G. Both drive motor and blower (impellor/fan) motor are not operating...microprocessor controller (computer) L.E.D. motor indicator dots and the "MTR" relay output and forward "FWD" or reverse "REV" L.E.D. indicators are on

1. Blown drive motor and blower motor fuses

2. Failed motors (both blower and drive)

H. Both drive motor and blower (impellor/fan) motor are not operating...microprocessor controller (computer) L.E.D. motor indicator dots and the "door" L.E.D. indicator are on but relay oputput L.E.D. indicators are off (microprocessor controller (computer) L.E.D. display does not read "door"

1. Failed microprocessor controller (computer)

J. Microprocessor controller (computer) L.E.D. display reads "dSFL" continuously and the buzzer (tone) sounds every 30 seconds

1. Fault in microprocessor heat sensing circuit

    a. Failed microprocessor temperature sensor

    b. Blown "dSFL" 1/8-amp fuse on the microprocessor controller (computer)

    c. Failed microprocessor controller (computer)

    d. Broken wire or connection somewhere between the microprocessor controller (computer) and the microprocessor temperature sensor

K. Microprocessor controller (computer) display reads "door" and the microprocessor controller "DOOR" L.E.D. indicator is off

1. Fault (open circuit) in main door/lint drawer switch circuit

    a. Lint drawer not closed all the way

    b. Lint drawer switch is out of proper adjustment

    c. Failed lint drawer switch

    d. One (1) of the main door switches has failed

    e. One (1) of the main door switch contact magnets is either missing or broken

    f. Failed door switch relay

    g. Broken wire/connection in main door or lint drawer switch circuit

2. Failed 24 VAC step down transformer

3. Drive and/or blower (impellor/fan) motor thermal overload reset has tripped

4. Blown 24 VAC control circuit fuse (fuse 3)

L. Microprocessor controller (computer) L.E.D. display reads "door" and the microprocessor controller "DOOR" L.E.D. indicator is on

1. Failed microprocessor controller (computer)

M. Microprocessor controller (computer) will not accept any keyboard (touchpad) entries, i.e., display reads "FILL" and when keyboard (touchpad) entries are selected, the display continues to read "FILL"

1. Failed keyboard label (touchpad) assembly

2. Failed microprocessor controller (computer)

N. Microprocessor controller (computer) will only accept certain keyboard (touchpad) entries

1. Failed keyboard label (touchpad) assembly

O. Microprocessor controller (computer) locks up and L.E.D. display reads erroneous message(s) or only partial segments

1. Transient power voltage (spikes)...disconnect power to dryer, wait one (1) minute and reestablish power to dryer. If problem is still evident:

a. Failed microprocessor controller (computer)

b. Failed keyboard label (touchpad) assembly

P. Dryer stops during a cycle, microprocessor controller (computer) buzzer (tone) sounds for 5 seconds, L.E.D. display reads "dSFL" for approximately 30 seconds and then returns to "FILL"

1. Loose connection somewhere between the microprocessor controller (computer) and the microprocessor temperature sensor

Q. Dryer stops during a cycle, microprocessor controller (computer) buzzer (tone) sounds for a few seconds, and then the microprocessor controller (computer) L.E.D. display returns to "FILL"

1. Loose connection somewhere in the main power circuit to the microprocessor controller (computer)

R. Microprocessor controller (computer) L.E.D. display reads "SEFL"

1. Microprocessor controller (computer) program (Program Location 2) is set incorrectly in the active mode ("Sen") where the dryer is not equipped with the optional rotation sensor... program must be set as "nSen"

2. Rotational sensor circuit failure...fault somewhere in the basket (tumbler) rotation or circuit

a. Basket (tumbler) not rotating

1) Broken basket (tumbler) drive V-belt(s)

2) Failure in drive motor circuit...refer to **sections B, C, and D** on **pages 45 and 46**

b. Bad rotation sensor

c. Broken wire or connection between rotation sensor and microprocessor controller (computer)

S. Microprocessor controller (computer) L.E.D. display reads "Hot"

1. Possible overheating condition...microprocessor controller (computer) has sensed a temperature which has exceeded 220° F

"Hot" display will not clear until temperature sensed has dropped to 220° F or lower and the microprocessor controller (computer) is manually reset by pressing the "CLEAR/STOP" key

W. No heat (STEAM MODELS ONLY)...both microprocessor controller (computer) L.E.D. heat indicator dot and the "HEAT" relay output L.E.D. are on

1. Fault in 225° hi-heat (limit) switch circuit or thermostat

2. No (external) compressed air to steam damper...80 PSI required

3. Failed steam damper 24 VAC pneumatic solenoid valve

4. Failed steam damper pistons

5. Steam damper stuck closed

X. Dryer operates but is taking too long to dry

1. Exhaust duct work run too long or is undersized...back pressure cannot exceed .3 inches W.C.

2. Restriction in duct work...check duct from dryer all the way to the outdoors

3. Low and/or inconsistent gas pressure (GAS MODELS ONLY)

4. Insufficient make-up air

5. Poor air/gas mixture at burner - yellow or poor flame pattern...adjust gas burner air adjustment shutters (GAS MODELS ONLY)

6. Lint drawer/screen not being cleaned on a regular basis or often enough

7. Extractors (washers) not performing properly

8. Sail switch is fluttering...restriction in exhaust (GAS MODELS ONLY).

9. Failed microprocessor controller (computer)...temperature calibration is inaccurate

10. Failed microprocessor temperature sensor...calibration is inaccurate

11. Failed burner hi-limit (GAS MODELS ONLY)

12. Failed 225° hi-limit (thermostat)

13. Steam damper system not functioning properly (STEAM MODELS ONLY)

    a. Steram damper sticking closed

    b. Leak in pneumatic system

Y. Excessive noise and/or vibration

1. Dryer not leveled properly

2. Impellor (fan) out of balance.

    a. Excessive lint build up on impellor (fan)...check air jet

    b. Failed impellor (fan)

3. Loose motor mount

4. Failed idler bearings and/or tumbler bearings

5. V-belt(s) either too tight or too loose

6. Tumbler drive wheels are worn or loose

7. Set screws of the tumbler drive shaft bearings are loose

8. Failed motor bearings

9. Drive wheel trantorque is loose

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