cissell

M110

110 lb. Shipboard

Steam Heated

Laundry Dryer

SERVICE MANUAL

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*** INSTALLATION * SERVICE * PARTS * MAINTENANCE**

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PUBLISHED BY DIRECTION OF COMMANDER, NAVAL SHIPS SYSTEM COMMAND

MANM110 9/04

TECHNICAL MANUAL #S6162-CA-MMI-010
NSN: 3G3510-01-414-8819

D0185

IMPORTANT NOTICES—PLEASE READ

For optimum efficiency and safety, we recommend that you read the Manual before operating the equipment. Store this manual in a file or binder and keep for future reference.

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 liquids or vapors in the vicinity of this or any other appliance.

- WHAT TO DO IF YOU SMELL GAS

- **Do not try to light any appliances.**
- **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 the gas supplier, call the fire department.**

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

WARNING: In the event the user smells gas odor, instructions on what to do must be posted in a prominent location. This information can be obtained from the local gas supplier.

WARNING: Wear Safety Shoes to prevent injuries.

WARNING: Purchaser must post the following notice in a prominent location:

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

WARNING: A clothes dryer produces combustible lint and should be exhausted outside the building. The dryer and the area around the dryer should be kept free of lint.

WARNING: Be safe, before servicing machine, the main power should be shut off.

WARNING: To avoid fire hazard, do not dry articles containing foam rubber or similar texture materials. Do not put into this dryer flammable items such as baby bed mattresses, throw rugs,undergarments (brassieres, etc.) and other items which use rubber as padding or backing. Rubber easily oxidizes causing excessive heat and possible fire. These items should be air dried.

WARNING: Synthetic solvent fumes from drycleaning machines create acids when drawn through the dryer. These fumes cause rusting of painted parts, pitting of bright or plated parts, and completely removes the zinc from galvanized parts, such as the tumbler basket. If drycleaning machines are in the same area as the tumbler, the tumlbler's make-up air must come from a source free of solvent fumes.

WARNING: Do not operate without guards in place.

WARNING: Check the lint trap often and clean as needed but at least a minimum of once per day.

WARNING: Alterations to equipment may not be carried out without consulting with the factory and only by a qualified engineer or technician. Only **Cissell** parts may be used.

WARNING: Remove clothes from dryer as soon as it stops. This keeps wrinkles from setting in and reduces the possibility of spontaneous combustion.

WARNING: Be Safe - shut main electrical power and gas supply off externally before attempting service.

WARNING: Never use drycleaning solvents, gasoline, kerosene, or other flammable liquids in the dryer. ***FIRE AND EXPLOSION WILL OCCUR. NEVER PUT FABRICS TREATED WITH THESE LIQUIDS INTO THE DRYER. NEVER USE THESE LIQUIDS NEAR THE DRYER.***

WARNING: Never let children play near or operate the dryer. Serious injury could occur if a child should crawl inside and the dryer is turned on.

WARNING: Never tumble fiberglass materials in the dryer unless the labels say they are machine dryable. Glass fibers break and can remain in the dryer. These fibers cause skin irritation if they become mixed with other fabrics.

WARNING: Before operating gas ignition system - purge air from Natural Gas or Propane Gas Lines per manufacturer’s instructions..

CISSELL DRYER WARRANTY

The Cissell Manufacturing Company (Cissell) warrants all new equipment (and the original parts thereof) to be free from defects in material or workmanship for a period of two (2) years from the date of sale thereof to an original purchaser for use, except as hereinafter provided. With respect to non-durable parts normally requiring replacement in less than two (2) years due to normal wear and tear, and with respect to all new repair or replacement parts for Cissell equipment for which the two (2) year warranty period has expired, or for all new repair or replacement parts for equipment other than Cissell equipment, the warranty period is limited to ninety (90) days from date of sale. The warranty period on each new replacement part furnished by Cissell in fulfillment of the warranty on new equipment or parts shall be for the unexpired portion of the original warranty period on the part replaced.

With respect to electric motors, coin meters and other accessories furnished with the new equipment, but not manufactured by Cissell, the warranty is limited to that provided by the respective manufacturer.

Cissell's total liability arising out of the manufacture and sale of new equipment and parts, whether under the warranty or caused by Cissell's negligence or otherwise, shall be limited to Cissell repairing or replacing, at its option, any defective equipment or part returned f.o.b. Cissell's factory, transportation prepaid, within the applicable warranty period and found by Cissell to have been defective, and in no event shall Cissell be liable for damages of any kind, whether for any injury to persons or property or for any special or consequential damages. The liability of Cissell does not include furnishing (or paying for) any labor such as that required to service, remove or install; to diagnose troubles; to adjust, remove or replace defective equipment or a part; nor does it include any responsibility for transportation expense which is involved therein.

The warranty of Cissell is contingent upon installation and use of its equipment under normal operating conditions. The warranty is void on equipment or parts; that have been subjected to misuse, accident, or negligent damage; operated under loads, pressures, speeds, electrical connections, plumbing, or conditions other than those specified by Cissell; operated or repaired with other than genuine Cissell replacement parts; damaged by fire, flood, vandalism, or such other causes beyond the control of Cissell; altered or repaired in any way that effects the reliability or detracts from its performance, or; which have had the identification plate, or serial number, altered, defaced, or removed.

No defective equipment or part may be returned to Cissell for repair or replacement without prior written authorization from Cissell. Charges for unauthorized repairs will not be accepted or paid by Cissell.

CISSELL MAKES NO OTHER EXPRESS OR IMPLIED WARRANTY, STATUTORY OR OTHERWISE, CONCERNING THE EQUIPMENT OR PARTS INCLUDING, WITHOUT LIMITATION, A WARRANTY OF FITNESS FOR A PARTICULAR PURPOSE, OR A WARRANTY OF MERCHANTABILITY. THE WARRANTIES GIVEN ABOVE ARE EXPRESSLY IN LIEU OF ALL OTHER WARRANTIES, EXPRESS OR IMPLIED. CISSELL NEITHER ASSUMES, NOR AUTHORIZES ANY PERSON TO ASSUME FOR IT, ANY OTHER WARRANTY OR LIABILITY IN CONNECTION WITH THE MANUFACTURE, USE OR SALE OF ITS EQUIPMENT OR PARTS.

For warranty service, contact the Distributor from whom the Cissell equipment or part was purchased. If the Distributor cannot be reached, contact Cissell.

IDENTIFICATION NAMEPLATE

The Identification Nameplate is located on the rear wall of the dryer. It contains the dryer serial number, product number, model number, electrical specifications and other important data that may be needed when servicing and ordering parts, wiring diagrams, etc. Do not remove this nameplate.

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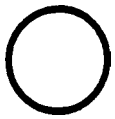
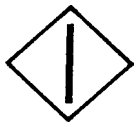
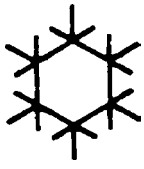
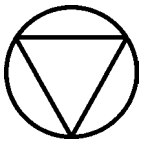
PAGE

SYMBOLS

The following symbols are used in this manual and/or on the machine. The numbers between () refer to the numbers on the machine surveys.

Symbol	Description	Part/Measurement
	**NOTE!**	
	**Hot! Do Not Touch** **Heiß! Nicht Beruhren** **Haute temperature! Ne pas toucher** **Caliente! no tocar**	
	**dangerous voltage** **tension dangereuse** **Gefährliche elektrische Spannung** **tension peligrosa**	
	**on** **marche** **Ein** **conectado**	
	**off** **arrêt** **Aus** **desconectado**	
	**start** **demarrage** **Start** **arranque de un movimiento**	
	**emission of heat in general** **êmission de chaleur en general** **Warmeabgabe allgemein** **emisión de calor**	
	**cooling** **refroidissement** **Kühlen** **enfriamiento**	

SYMBOLS

Symbol	Description	Part/Measurement
	**rotation in two directions** **rotation dans les deux sens** **Drehbewigung in zwei Richtungen** **movimiento rotativo en los dos sentidos**	
	**direction of rotation** **sens de mouvement continu de rotation** **Drehbewegung in Pfeilrichtung** **movimiento giratorio o rotatorio en el sentido de la flecha**	
	**End of Cycle**	
	**caution** **attention** **Achtung** **atencion; precaucion**	

CAUTION

PER PUBLIC LAW 91-596:

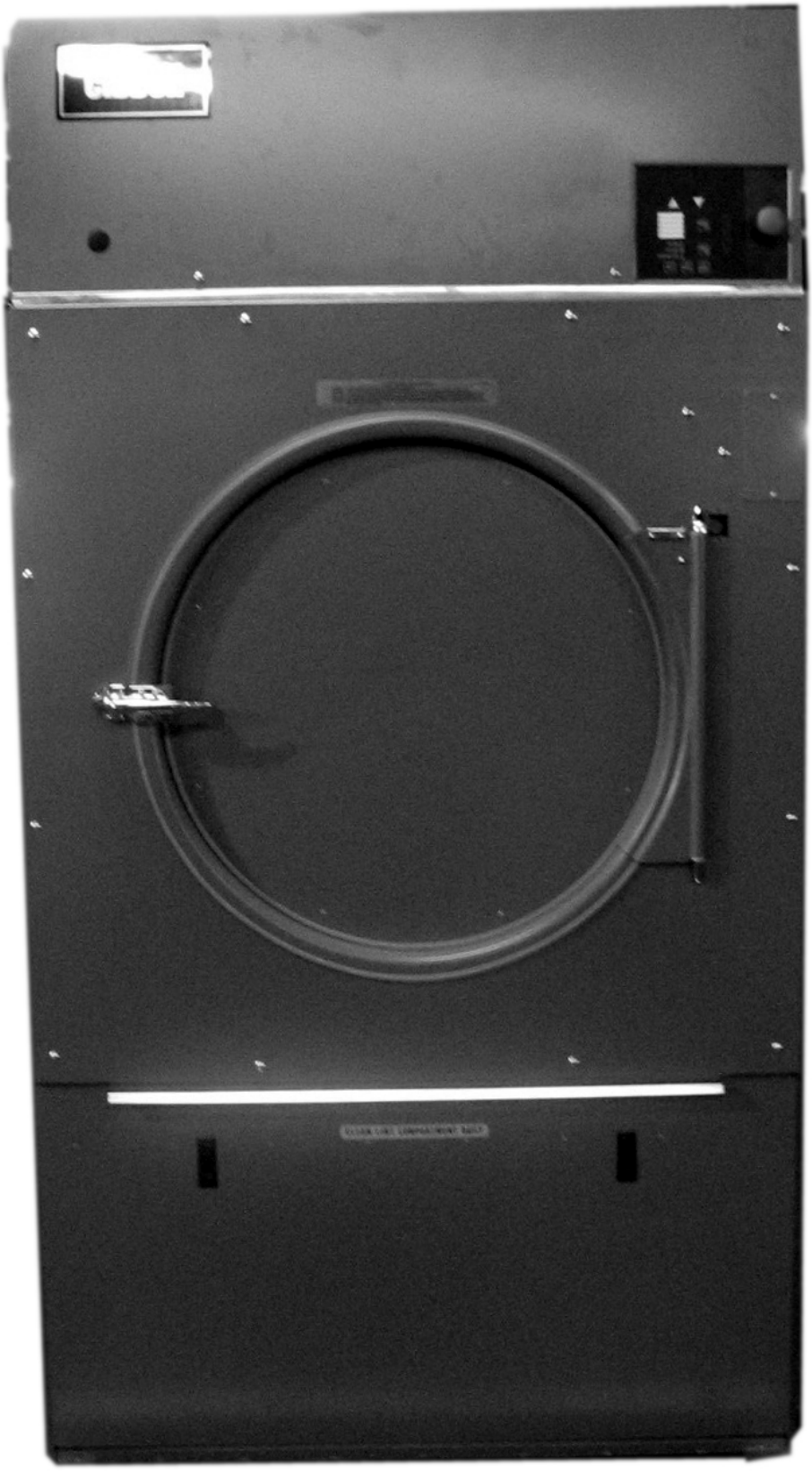
THE FOLLOWING LABELS ARE AFFIXED TO THE FRONT OR REAR OF ALL MACHINES;

A - TU3476 AIR SWITCH WARNING
B - D1A GROUND CONNECTION
C - TU10706 ROTATION - FAN
D - TU10701 BACK-DRAFT DAMPER
E - TU7855 WARNING - CAUTION
F - TU3475 EXHAUST DUCT WARNING
G - TU12811 CISSELL LOGO
H - TU7858 CLEAN LINT COMPARTMENT
I - TU9279 CHECK OIL LEVEL
J - TU6618 GOVERNMEMT RATING PLATE
K - F1116 RATING PLATE
L - TU8013 CISSELL LOGO

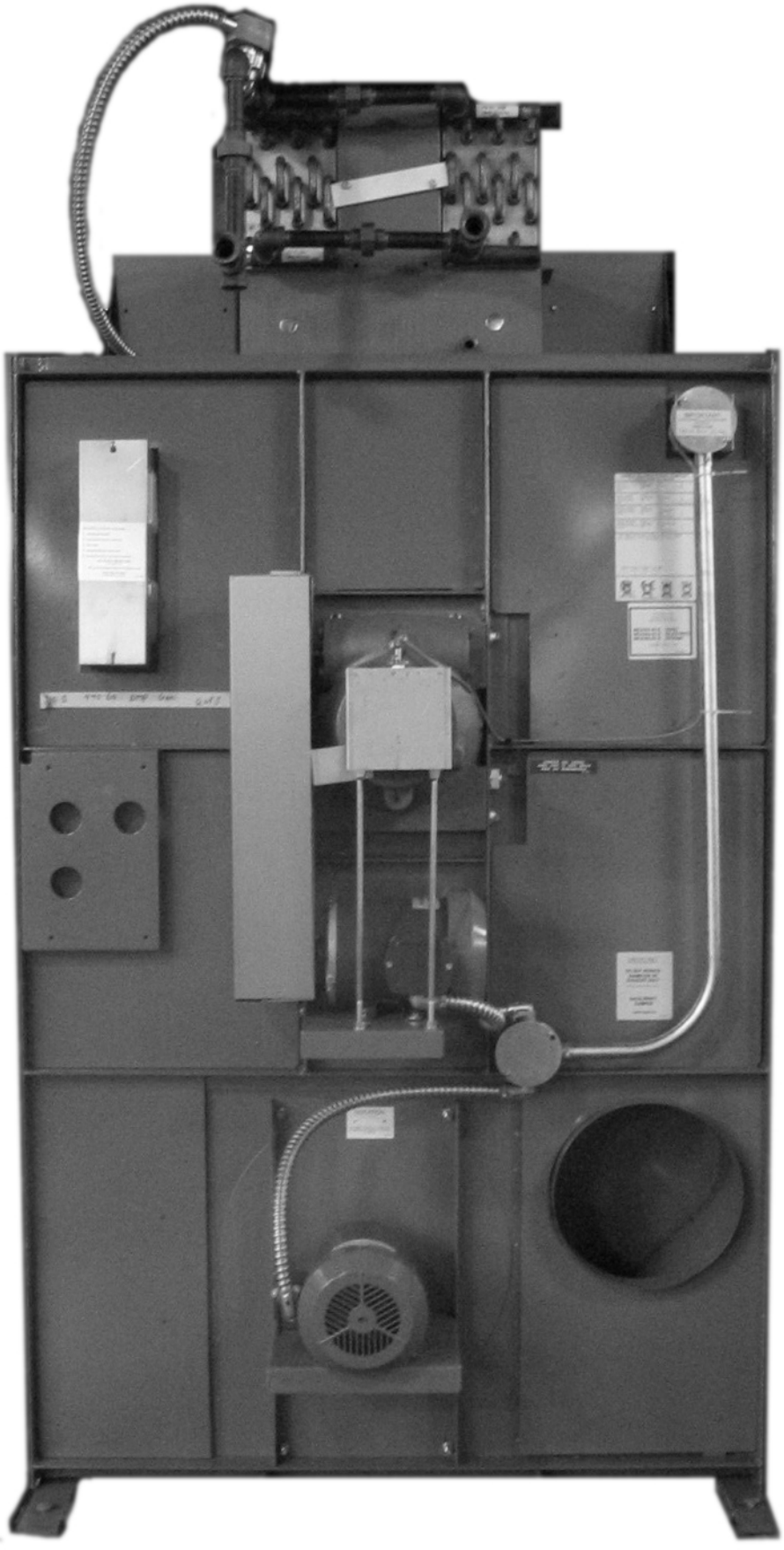
EXECUTIVE ORDER 12196:

EXECUTIVE ORDER 12196 EXEMPTS MILITARY PERSONNEL FROM COMPLIANCE WITH PUBLIC LAW 91-596

FRONT VIEW



REAR VIEW



110 Lbs. GOVERNMENT DRYER TEST RESULTS

DRYING EFFICIENCY (3.6.1)		
DRY CLOTHES WEIGHT Lb.		110
WET CLOTHES WEIGHT Lb.		165
DRY TIME (97% DRY) Min.		28
WATER REMOVAL Lb.		53
REMOVAL RATE Lbs/Min		1.89
MACHINE VOLTAGE Volts		440
STEAM PRESSURE PSI		100
REVERSING (3.6.2)		
REVERSALS/MINUTE		3
SHIPBOARD POWER (3.6.4)		
STEADY STATE VOLTAGE		PASS
POWER INTERRUPTION (4)		PASS
LEAKAGE CURRENT		PASS
POWER FACTOR	0.95	PASS
LOAD IMBALANCE	0.05	PASS
DIELECTRIC STRENGTH		PASS
OPERATIONAL TESTING (4.5.3.1)		
MANUAL TEMP SELECTION		
AT 185° F		180 F
AT 155° F		148 F
COOLDOWN PHASE OPERATION		
AT 135° F		139 F

SATURATED STEAM (3.6.6)		
NO LEAKAGE		PASS
SAFETY (3.9)		
EXHAUST TEMPERATURE		
BLOWER MOTOR FAIL		180° F
DRUM MOTOR FAIL		180° F
AIRFLOW RESTRICTED		180° F
ELECTRIC MOTORS (3.6.10)		
MOTOR AMPS	FAN	BASKET
RATING	2.9	1.9
MEASUREMENTS	2.53	1.09
	2.20	0.92
	2.40	1.18
AVERAGE	2.38	1.06

CISSELL MANUFACTURING CO.

TEST WITNESSED BY:

JOE STONE

Joseph 2. Stone

SIGNATURE

DATE: 10/27/92.

INTRODUCTION

M110 is a laundry tumbler/dryer designed for drying garments and intended primarily for shipboard use.

M110 is capable of drying up to 110 pounds (dry weight) of garments.

See page 11 for performance characteristics.

Specifications are on page 15.

Operating steam pressure should be 125 P.S.I. maximum and power should be 440 volts, 60 cycles, 3 phase.

A normal complement of wrenches and screw drivers plus a volt meter are needed for regular maintenance and testing.

Preparation for use and installation.

The construction of Cissell cabinet dryers permits installation side by side to save space. The dryer should be positioned for use of the least amount of exhaust ducting and elbows, and to allow free access to the rear of the dryer for ease of maintenance and repair. A good supply of intake "make-up" air, preferably from the out-of-doors, is needed, i.e., 4 to 6 times the area of the exhaust duct. The M110 machine requires a minimum of 3-1/4" square feet of intake "make-up" air. The "make-up" air source should be as close to the machine as possible. If the machine is located too far from the "make-up" air source, it may be necessary to add a booster fan to keep the efficiency of the dryer up to specification. Similarly, the exhaust may require a booster fan. If the ducting is too long or there are too many elbows in the system.

Ideally, the end of the exhaust duct would face down so that wind, rain, snow and sleet would not be allowed entry and would not flow down into the dryer. For multiple dryers with a single exhaust duct, refer to page 15 for increasing duct diameters to maintain efficiency.

The area selected for the dryer should be clean and level. If studs are to be used for holding down the machine, they should be placed first. Pilot holes should be drilled if bolts or screws are to be used.

During uncrating, care should be exercised so that panels and exhaust duct flanges are not dented or bent. The basket door should be opened and closed a few times to check for any closure problems. The corrugated paper blocks between the basket and the front panel and loose material such as the manual should then be removed. Remove any tape which may be used to secure dryer parts during shipment, and read all instruction tags and instruction manuals.

The uncrated dryer should be placed in position and leveled, then the dryer can be screwed or bolted in place. The steam supply line and the electrical lines can be connected.

PRINCIPLES OF OPERATION

A dryer is an air pump which draws "make-up" air from the out-of-doors, through the heater, pulls the heated air through the garments and then forces the air through the exhaust duct, back to the out-of-doors.

OPERATION

1. Open door until safety latch (which holds door open), is engaged.

2. Insert garments to be dried.

3. Release safety latch and close door.

4. Select desired program on DMP control. For additional information see manual.

5. Push "Start" button to start drying cycle.

6. If door is opened during drying cycle, to restart, close door and push "Start" button. Dryer will run out remaining time.

CONTROLS

The DMP control panel is located in the upper right corner of dryer. See the DMP manual for breakdown of DMP controls and functions

WARNING
THIS DRYER CONTAINS HI VOLTAGE
The "Emergency Stop" button does not disable the high voltage to/in the dryer. Disconnect the power to the dryer when performing service/ maintence.

MOVING AND STORAGE

Corrugated paper spacers (4) should be inserted (equally spaced) between the tumbler and the sweep sheet at the front of the dryer.
When storing the dryer, fluids should be drained, a loosely fitting dust cover draped over the dryer and it should be kept in a cool, dry place.

WARNINGS

Do not adjust the door handle latch for more than 5 pounds of opening force. Door must be openable from inside tumbler with no use of no more than 5 pounds of force without using the exterior door handle.

Do not store or use gasoline or other flammable vapors or liquids in the vicinity of the dryer.

CAUTION

The lint trap screen must be in place on the lint trap. Lint can accumulate in the exhaust ducting, leading to a fire hazard if a lint screen is not used. Lint accumulating in the exhaust duct can also lead to a loss in efficiency.

NOTE

Lint should be removed daily or more often if necessary to insure proper efficiency of the dryer. If the air flow is restricted because of excessive lint on the lint trap, the air switch may trip, causing steam to the coils to shut off, in turn causing loss of heat for drying. The dryer will not begin heating again until air can flow freely, which then allows the air switch to close the circuit.

The dryer and the exhaust ducting should be cleaned of lint periodically (every 6 months minimum is recommended).

SAFETY PRECAUTIONS

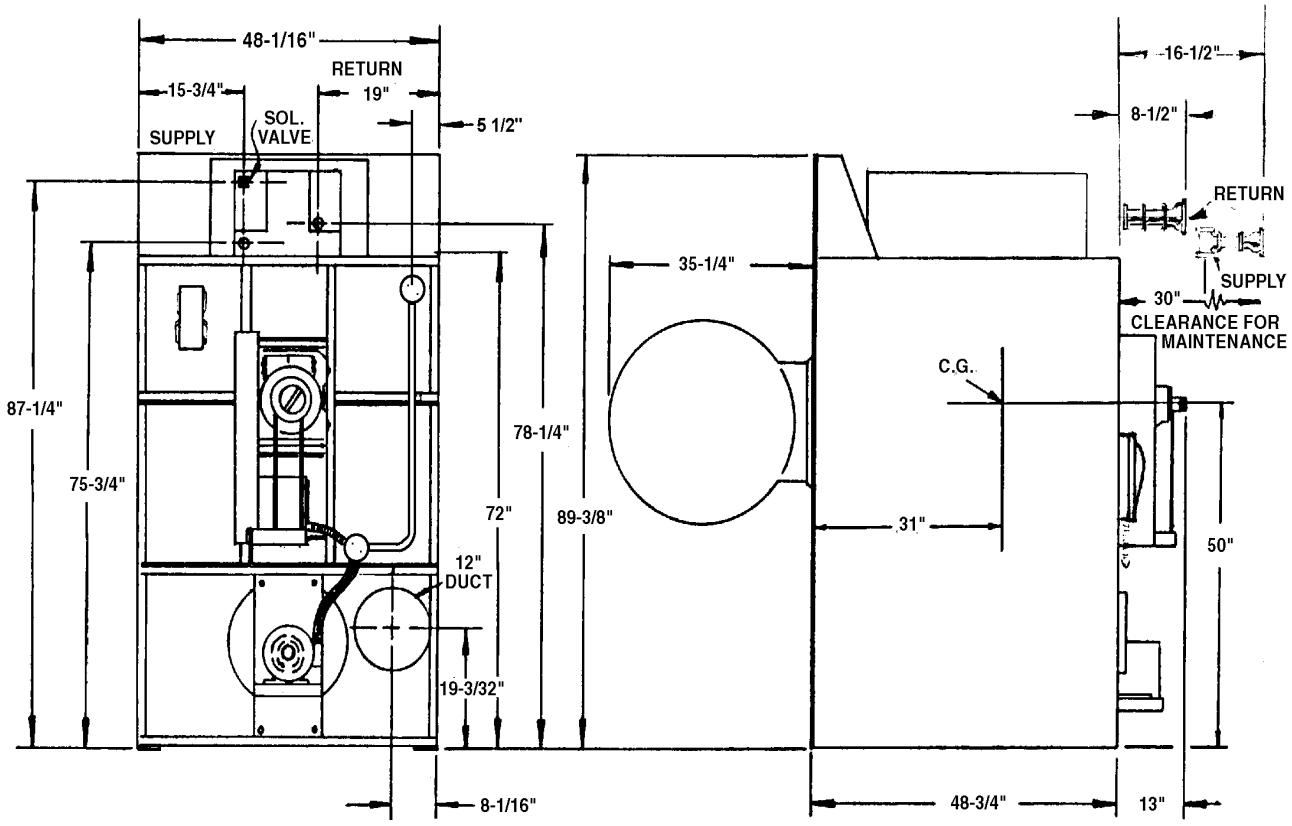
When connecting the 440 volt line to the machine, caution must be exercised. Power to the incoming line should be turned off. The grounding wire should be connected first. The power lines can then be connected and the exterior armor cover should be securely attached to the power disconnect box.

Steam line connections should be double checked for tightness in the joints. Steam can then be gradually allowed to enter the system, while the system is monitored for leaks.

SPECIFICATIONS

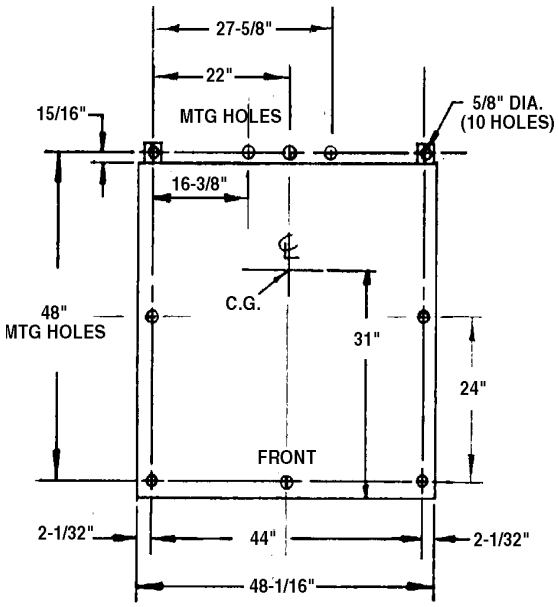
For 110-pound Cissell Steam-Heated Laundry Dryers

Floor Space	64” Deep x 49” Wide x 89-3/8” High
Door	33-3/8” Diameter
Basket	44” Dia. x 42” Deep
Basket Capacity (Dry Weight)	Approx. 110 pounds
Basket Motor	1 H.P.
Fan Motor	1-1/2 H.P.
Basket R.P.M.: Reversing	2.8 - 3.2 reversals per minute
Exhaust Duct	12” Dia.
Max. Air Displacement	2160 cu. ft. per min.
Recommended Operating Range	1700 - 2000 cfm
Net Weight (Approx.)	1490 lbs.
Domestic Shipping Weight, 1 crate (Approx.)	1985 lbs.
Export Shipping Weight, 1 box (Approx.)	2200 lbs.
Export Shipping Dimensions	97” L x 53” W x 78” H
Export Crating	232.7 cu. ft.
Operating Steam Pressure	125 p.s.i. max.
Boiler H.P. (w/normal load)	8.3
Heat Capacity	4-Coil
Steam Coils	(2) 40-1/2” L x 6” W x 10-1/4” H
Traps for Steam-Heating Coils	(2) 3/4”
Steam Supply Line	1”
Steam Return Line	1”
Electrical Specifications	440/60/3 with 24/60/1 Control Circuit



REAR VIEW

SIDE VIEW



STEAM SUPPLY (screwed connection)	**1”**
STEAM RETURN (screwed connection)	**1”**
NET WEIGHT	**1490 lbs.**
ELECTRICAL	**440, 60 cy. 3 ph.**
AMPS	**5**
BOILER H.P.	**8.3**

INSTALLATION/ELECTRICALCONNECTIONS

UNPACKING

Upon arrival of the equipment, any damage in shipment should be reported to the carrier immediately.

Upon locating permanent location of a unit, care should be taken in movement and placement of equipment.

See outline clearance diagrams for correct dimensions.

Remove all packing material such as: tape, manuals, skid, etc

Leveling: Use spirit level on top of dryer. Adjust leveling bolts on dryer (see adjustable leveling bolts in maintenance section).

Check voltage and amperes on rating plate before installing the dryer.

GENERAL INSTALLATION (ALL DRYERS)

The construction of the dryers permits installation side-by-side to save space or to provide a wall arrangement. Position dryer for the least amount of exhaust piping and elbows, and allow free access to the rear of dryer for future servicing of belts, pulleys and motors. Installation clearance from all combustable material is 12" ceiling clearance, 24" rear clearance, and 0" side clearance.

Before operating dryer, open basket door and remove blocking between front panel and basket. Read the instruction tags, owner's manual, warnings, etc.

IMPORTANT
Opening the clothes loading door deactivates the door switch to shut off the motors, fan, or steam. To restart the dryer, close the door and press in the push to start button.

IMPORTANT
This dryer is designed for a capacity maximum load. Overloading it will result in long drying times and damp spots on some clothes.

IMPORTANT
Maximum operating efficiency is dependent upon proper air cIrculation. The lint screen must be kept cleaned daily to insure proper air circulation throughout the dryer.

GENERAL INFORMATION

The dryer is so designed that when an operator opens the dryer door, the basket and exhaust fan stop. You can expect fast drying from the laundry dryer. Hot, dry air is properly and effectively moved through the basket and exhausted through a lint trap to the atmosphere. The dryer comes equipped with an inclined self-cleaning lint screen. In this system, lint accumulates on the underside of the screen until a blanket of lint will fall from the screen to the bottom of the dryer cabinet, and should be removed daily or as required, to prevent an over-accumulation.

INSTALLATION/ELECTRICALCONNECTIONS

DRYER "COOL-DOWN" CYCLE

Permanent press, durable press and other modern day fabrics require the care that your laundry dryers now provide. At the end of the drying cycle, a timed "Cool-Down" control automatically takes over and continues the rotation of the fan and basket without heat until the garment load reaches a safe cool temperature. This function is performed at the end of each drying cycle.

REPLACEMENT PARTS

Replacement parts for this dryer are available from your distributor or by contracting the factory at the address or phone number printed on the cover page of this manual.

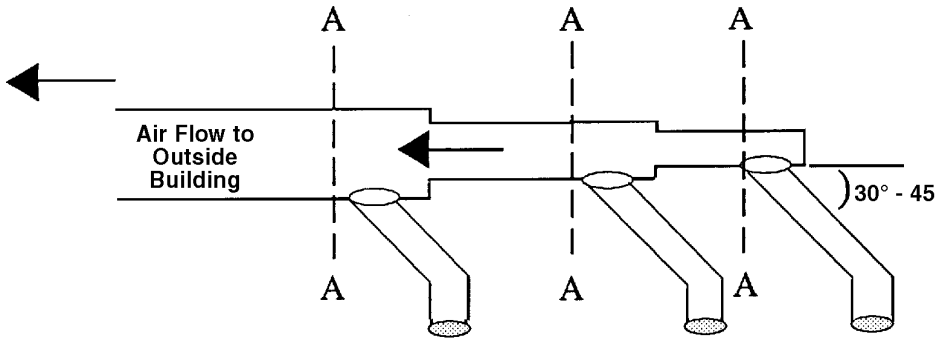
ELECTRICAL CONNECTIONS

DRYERS MUST BE ELECTRICALLY GROUNDED by a separate **14 GA** or larger wire from the grounding terminal within the rear junction box. In all cases, the grounding method must comply with standard shipboard procedures.

See the wiring diagram furnished with the dryer. A Cissell dryer is completely wired at the factory and it is only necessary for the electrician to connect the power leads to the wire connectors within the rear junction box at the rear of the dryer. **DO NOT** change wiring without consulting the factory as you may void the factory warranty. **DO NOT** connect the dryer to any voltage or current other than that specified on the tags placed on the power leads of the dryer.

EXHAUST INSTALLATION—MULTIPLE MANIFOLD DUCT

For Exhaust Duct less than 14 feet and 2 elbows equivalent and less than 0.3 inches static pressure.



DRYER EXHAUSTS

Area of section "A-A" must be equal to the sum of dryer exhaust pipes entering multiple exhaust pipe. (*See chart below.*)

MODELS: L28FD30, L28US30, L36FD30, L36UR30, L36CD36, L44FD42

No. of Dryers	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
Duct Diameter (in inches)	6	9	11	12	14	15	16	17	18	19	20	21	22	23	23	24	25	26	26	27	28	28	29	30
(in cm)	15	23	27	30	35	38	41	43	46	48	51	53	56	58	58	61	63	66	66	68	71	71	73	76

MODELS: L28CD30, L28UR30, L36CD30, L36UR30, L36CD36, L44FD42

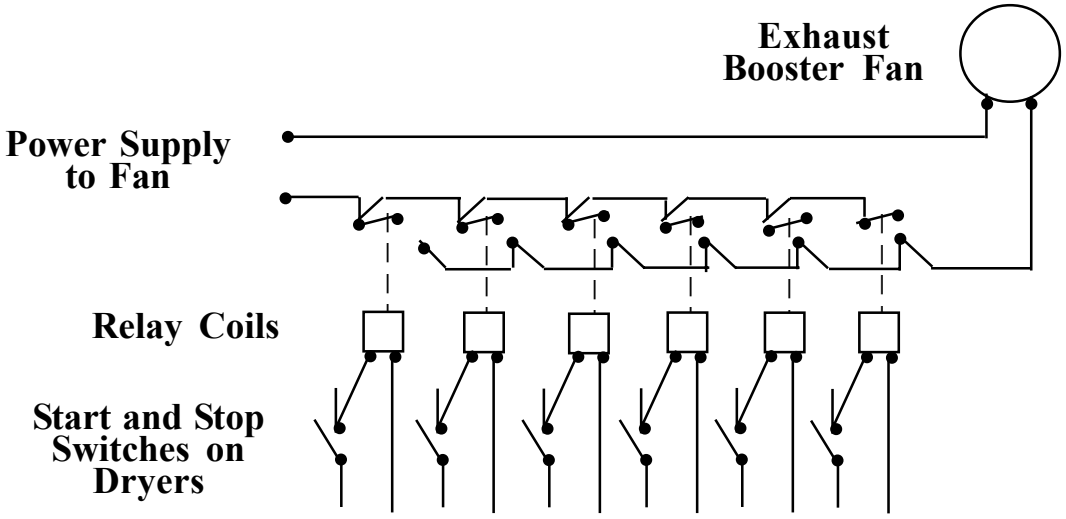
No. of Dryers	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
Duct Diameter (in inches)	8	12	14	16	18	20	22	23	24	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40
(in cm)	20	30	25	41	46	51	56	58	61	66	68	71	73	76	78	81	84	86	89	91	94	97	99	100

MODELS: L44CD42, L50CD42, M110

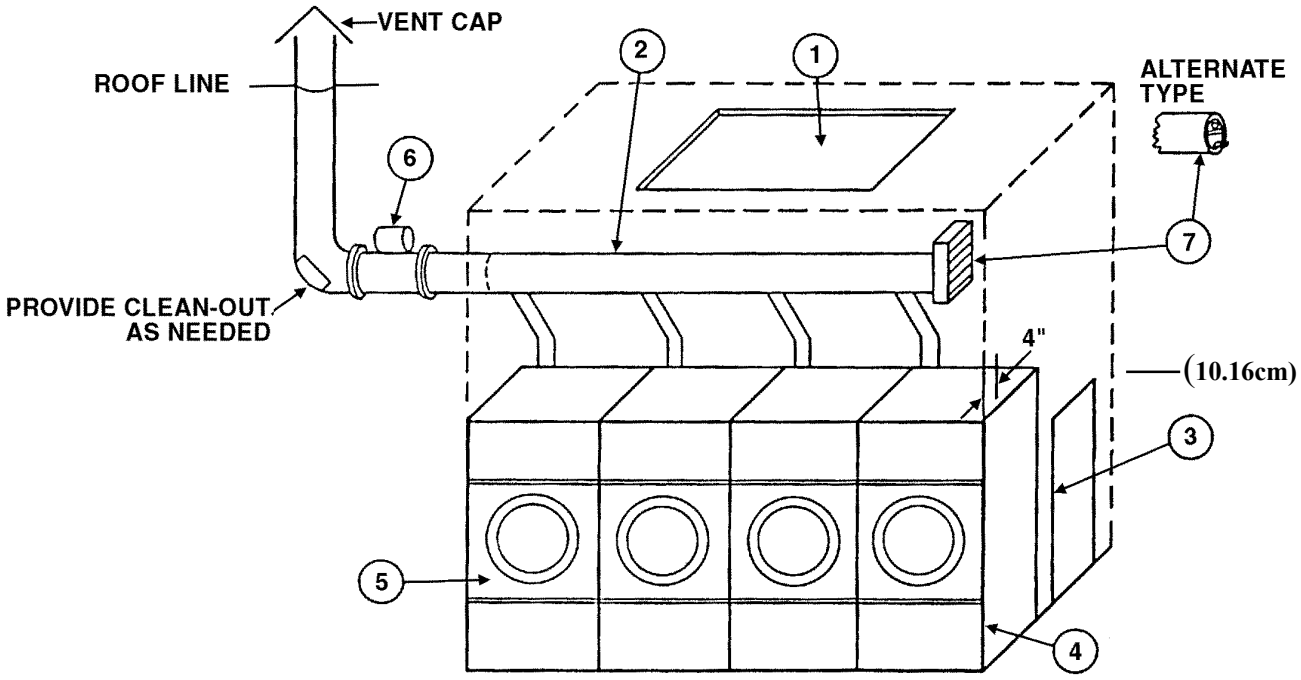
No. of Dryers	1	2	3	4	5	6	7	8	9	10	11	12
Duct Diameter (in inches)	12	17	21	24	27	30	32	34	36	38	40	42
(in cm)	30	43	53	61	68	76	81	86	91	97	100	106

AUTOMATIC ELECTRICAL CONTROL FOR EXHAUST FAN

For one or more dryers to start fan.



DRYER INSTALLATION WITH MULTIPLE EXHAUST (ILLUSTRATION)



DRYER INSTALLATION WITH MULTIPLE EXHAUST

For Exhaust Duct more than 14 feet and 2 elbows equivalent and more than 0.3 inches static pressure.

1. Make-up air from outside building may enter enclosure from top or side walls. Area of opening should be equal to 4-6 times the sum of dryer duct areas. Provide 1 sq. ft. for each 6 in. diameter; 2 sq. ft. for each 8 in. diameter; and 4 sq. ft. for each 12 in. diameter.

2. Use constant diameter duct with area equal to the sum of dryer duct areas.

   EXAMPLE: 6-8 in. diameter duct = 1-19.6 in. diameter duct in area. Use 20 in. diameter duct or diameter to match tube-axial fan.

3. Enclosure (plenum) with service door. This separates the dryer air from room comfort air. If dryers use room air instead of outside air, the heat loss can be another 25 BTU/HR for each cubic foot per minute (CFM) used.

   EXAMPLE: 110 lb. dryer, 2000 CFM = 50,000 BTU/HR loss.

4. Zero inches clearance to combustible material allowed on sides and at points within 4 inches of front on top.

5. Heat loss into laundry room from dryer fronts *only* is about 60 BTU/HR per square foot.

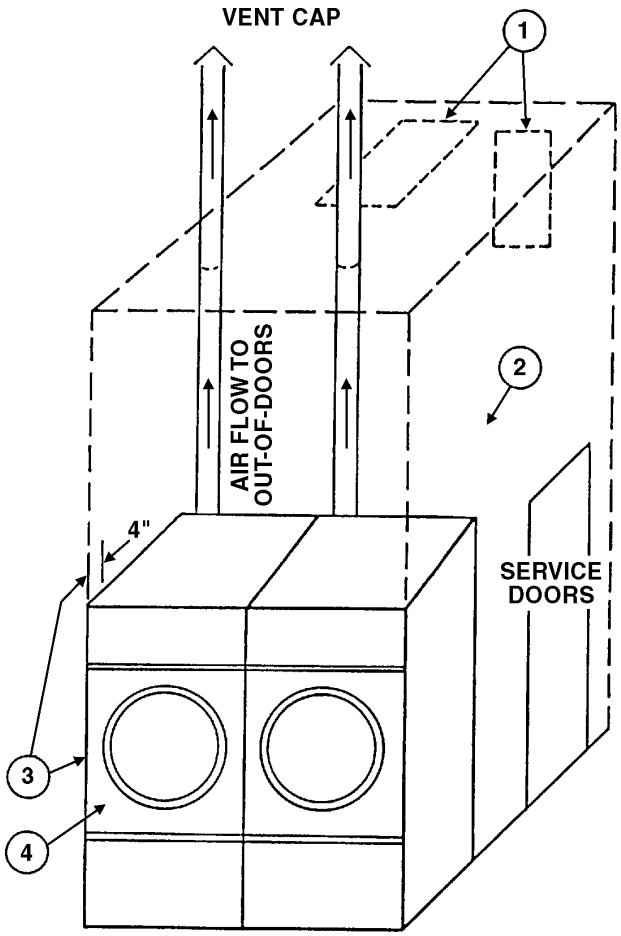
6. Flange mounted, belt driven tube-axial fan. **Fan must run when one or more dryers are running.** *See suggested Automatic Electrical Control Wiring Diagram on page 23.* Must meet local electrical codes. Fan air flow (CFM) is equal to sum of dryer air flows, but static pressure (SP) is dependent on length of pipe and number of elbows.

7. **Barometric Bypass Damper**—Adjust to *closed flutter position* with all dryers and exhaust fan running. **Must be located within enclosure.**

CAUTION
***Never* install hot water heaters or other gas appliances in the same room as dryers. *Never* install cooling exhaust fans in the same room as dryers.**

CAUTION
Never exhaust dryers with other types of equipment.

DRYER INSTALLATION WITH SEPARATE EXHAUST (PREFERRED)



DRYER INSTALLATION WITH SEPARATE EXHAUST (PREFERRED)

For Exhaust Duct less than 14 feet and 2 elbows equivalent and less than 0.3 inches static pressure.

NEVER exhaust the dryer into a chimney.

NEVER install wire mesh screen over the exhaust or make-up air area.

NEVER exhaust into a wall, ceiling, or concealed space.

1. Make-up air opening from outside the building may enter the enclosure from the top or side walls. Area of opening should be equal to 4-6 times the sum of dryer duct areas. Provide 1 sq. ft. for each 6 in. diameter; 2 sq. ft. for each 8 in. diameter; and 4 sq. ft. for each 12 in. diameter.
2. Enclosure (plenum) with service door. This separates the dryer air from the room comfort air. If dryers use room air instead of outside air, the heat loss can be another 25 BTU/HR for each cubic foot per minute (CFM) used.
   EXAMPLE: A 110 lb. dryer with 2000 CFM = heat loss of 50,000 BTU/HR.
3. Zero inches clearance to combustible material allowed on sides and at points within 4 inches of front on top.
4. Heat loss into laundry room from dryer fronts *only* is about 60 BTU/HR per square foot.

DRYER AIR FLOW INSTALLATION

Nothing is more important than air flow for the proper operation of a clothes dryer. A dryer is a pump which draws make-up air from the out-of-doors, through the heater, through the clothes and then forces the air through the exhaust duct back to the out-of-doors. Just as in a fluid water pump, there must be a fluid air flow to the inlet of the dryer, if there is to be the proper fluid air flow out of the exhaust duct.
In summary, there must be the proper size out-of-doors inlet air opening (4-6 times the combined areas of the air outlet) and an exhaust duct, size and length of which allows flow through the dryer with no more than 0.3 inches water column static pressure in the exhaust duct.
In some instances, special fans are required to supply make-up air, and/or boost exhaust fans are required for both regular and energy saving models.

FOR BEST DRYING:

1. Exhaust duct maximum length 14 feet of straight duct and maximum of two 90° bends.
2. Use 45° and 30° elbows wherever possible.
3. **Exhaust each dryer separately.**
4. **Do not** install wire mesh or other restrictions in the exhaust duct.
5. Use clean-outs in the exhaust duct and clean periodically when needed.
6. **Never** exceed 0.3 inches water column static pressure in the exhaust duct.
7. Inside surface of the duct **must be smooth**.
8. Recommend pop rivets for duct assembly.

FOR BEST DRYING:

1. Provide opening to the out-of-doors in accordance with the following:
   For each dryer—
   8 inches diameter exhaust requires 2 square feet make-up air.
   12 inches diameter exhaust requires 4 square feet make-up air.
2. Use barometric shutters in the inlet air opening to control air when dryers are not running.

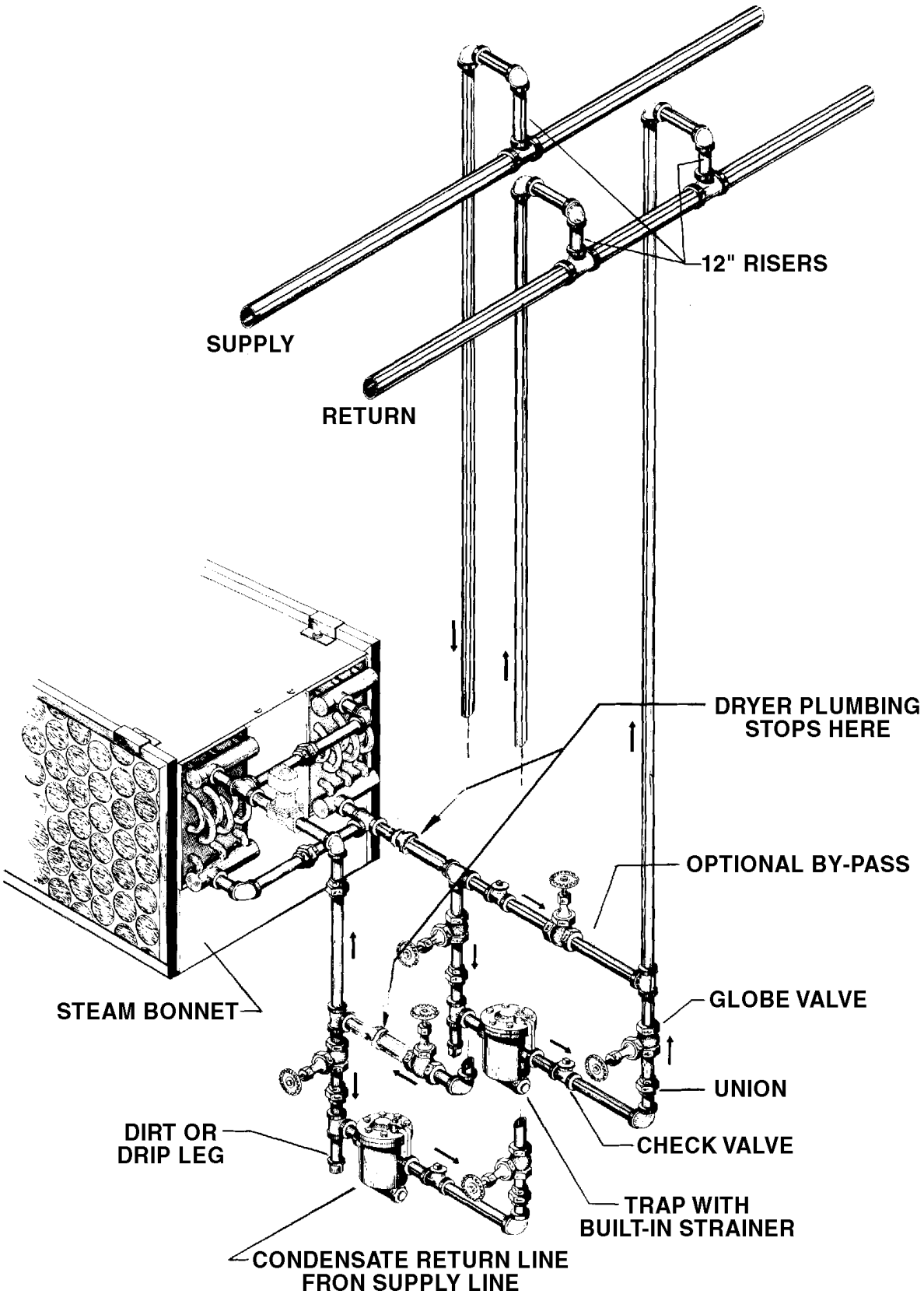
Other Recommendations

To assure compliance, consult local building code requirements.

Troubleshooting

Hot dryer surfaces, scorched clothes, slow drying, lint accumulations, or air switch malfunction are indicators of exhaust duct and/or make-up air problems.

INSTALLATION ILLUSTRATION



INSTRUCTIONS FOR STEAM CONNECTIONS

IMPORTANT: INSTALL STEAM PIPING IN ACCORDANCE WITH ALL LOCAL REGULATIONS AND REQUIREMENTS

SEE PIPING ILLUSTRATION

1. Set and anchor dryer in position. Machine should be level to assure proper steam circulation.

2. To prevent condensate draining from headers to dryer, piping should have a minimum riser 12" above each respective header as illustrated. Do not make steam connection to header with a horizontal or downwardly facing tee or elbow.

3. Whenever possible, horizontal runs of steam lines must drain, by gravity, to respective steam header. Water pockets, or an improperly drained steam header will provide wet steam, causing improper operation of dryer. If water pockets or improper drainage cannot be eliminated, install a by-pass trap to drain condensate from the low point in the steam supply header to the return.

4. In the steam supply line, a gate valve and a condensate return line is recommended. See steam piping illustration.

5. In the steam return line, a Globe valve, check valve, trap with built-in strainer and unions are recommended. If a by-pass line is installed, add two Globe valves and one check valve as illustrated. If steam is gravity-returned to boiler, omit trap but install check valve in return line near dryer.

6. Whenever possible, flush out any dirt or scale from dryer and pipe lines before installing traps and check valves. This will assure proper operation of trap when installed.

7. For successful operation of dryer, install trap 18" below coil and as near to dryer as possible. Inspect trap and check valve carefully for inlet and outlet marking and install according to manufacturers instructions.

STEAM PIPING RECOMMENDATIONS

1. Trap each dryer individually. Always keep the trap clean and in good working condition.

2. When dryer is on the end of a line of equipment extend headers at least 4 ft. beyond dryer. Install globe valve, union, check valve and by-pass trap at end of line. If gravity-return to boiler, omit trap.

3. Insulate steam supply and return lines as required to ensure that the exposed surface of the insulation does not exceed 125° F.

4. Keep dryer in good working condition. Repair or replace any worn or defective parts.

GENERAL MAINTENANCE

1. CLEAN LINT TRAP DAILY: Remove lint before starting day's operation. A clean lint trap will increase the efficiency of the dryer, as the moisture laden air will be exhausted to the atmosphere more quickly.

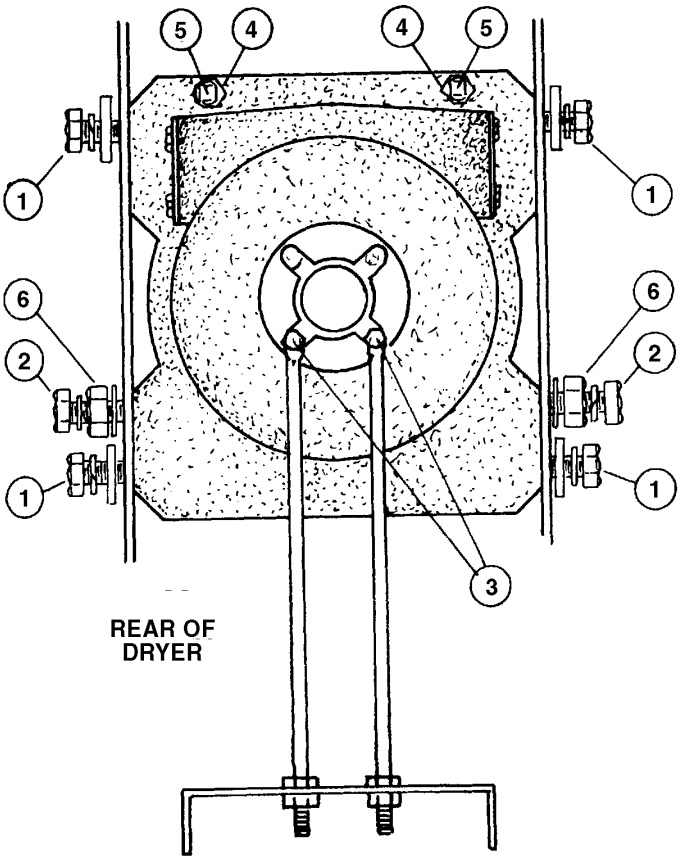
2. KEEP BASKET AND SWEEP SHEETS CLEAN: Check periodically and clean as often as required. The basket and sweep sheets within the dryer are easily accessible for cleaning by removing the front panel of the dryer. Take screws out of front panel, then lift panel off.

3. PULLEYS (SHEAVE) AND BELT: Keep belts clean. Oil and dirt will shorten the useful life of a belt. Never allow a belt to run against the belt guard. Check belts periodically for alignment. Pulley shafts must be parallel and the grooves must be in alignment. To align pulley, loosen set screw and slide pulley in or out to align up with the other pulley. Tighten set screw securely.

4. ELECTRIC MOTORS: Keep motors clean and dry.

5. GEAR REDUCER: Maintain oil level in gear reducer.

6. STEAM-HEATED DRYERS: Keep steam coils clean. Check periodically and clean as often as required. Remove lint and dirt accumulation from coil fins periodically, as dirty lint laden coil fins decrease the efficiency of steam-heated dryer.



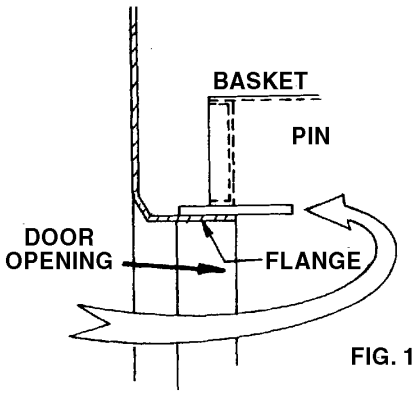


FIG. 1

INSTRUCTIONS FOR ALIGNING BASKETS ON CISSELL M110 DRYERS

1. Loosen bolts bumbers one (1) thru five (5).
2. Place pin “A” in position shown in Fig. 1 & 2.
3. Check pins “B” at position shown in Fig. 1 & 2 for equal clearance.
4. If pin “B” clearance is unequal, adjust at nut #6.
5. When clearance at pin “B” is correct, tighten bolts #1 in the following order, as viewed from rear of dryer, top right, bottom left, top left and bottom right.
6. Tighten bolts #5 until flush against back of dryer. Tighten lock nut #4 to secure bolt #5 in position.
7. Tighten bolts #2 and #3.
8. Remove pin “A” and check for proper clearance at points “A” and “B”. If clearance is incorrect, repeat the above steps.

NOTE: USE SHORT SECTIONS OF ROUND STEEL ROD FOR PINS OR DRILL BITS MAY BE USED IN PLACE OR ROUND ROD.

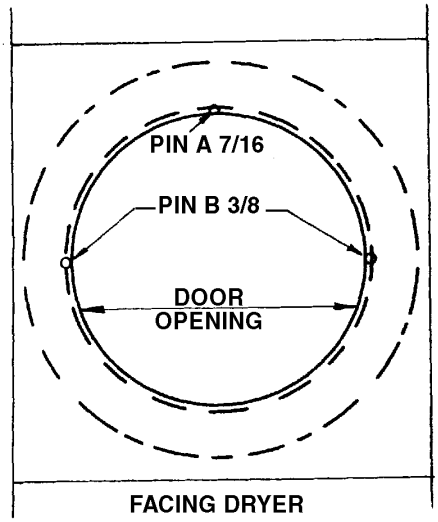
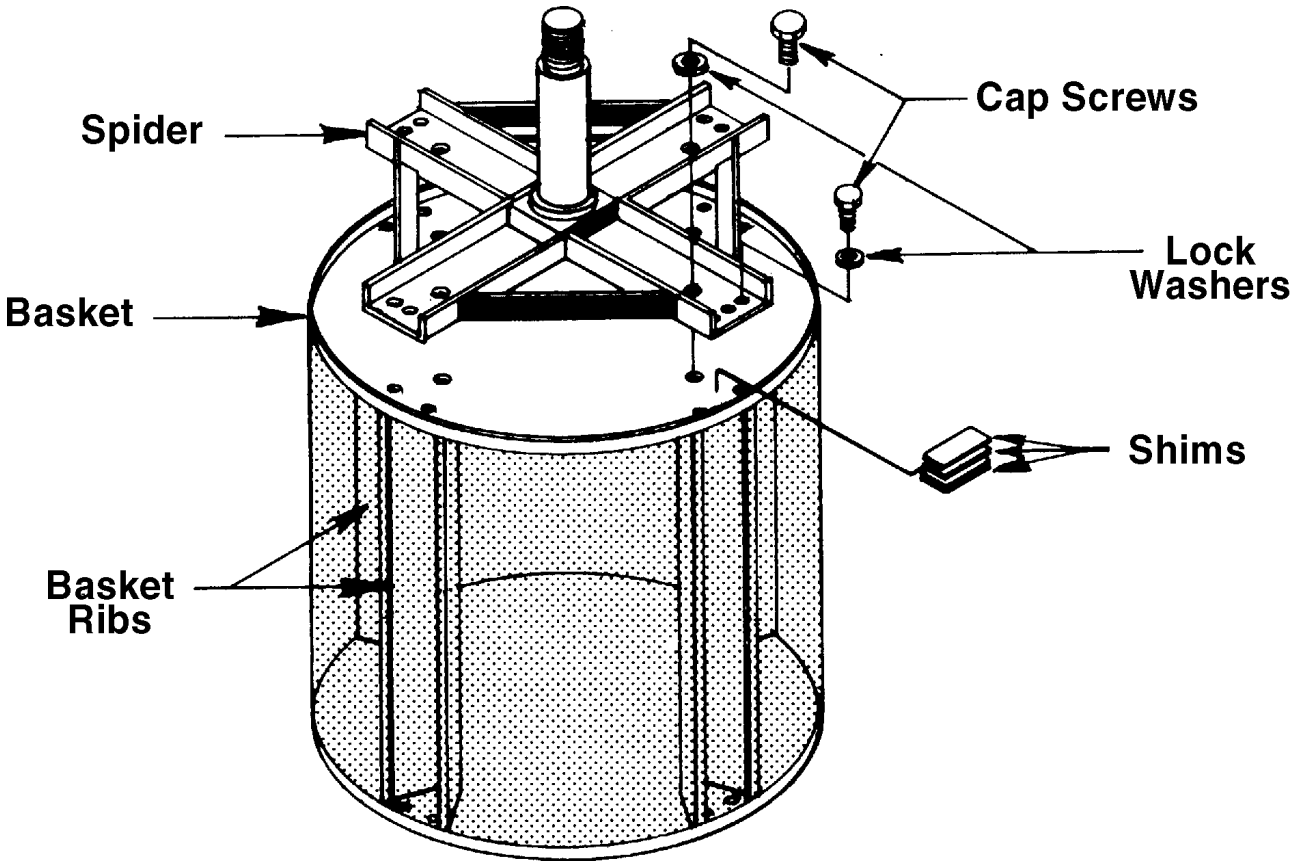


FIG. 2

SHIMMING THE BASKET AND SPIDER ASSEMBLY



This procedure is normally necessary when replacing either the basket or the spider assembly on any Cissell tumbler. The alignment of these two parts are crucial in assuring a true running basket.

A. Align the basket as per instructions in the manual.

B. Rotate the basket to determine where the most out of round point is (where the basket scrapes or comes closest closest to scraping the sweep sheet).

C. Mark this position and the nearest rib to this position.

D. Remove the basket (do not loosen the alignment bolts).

E. With the basket on the floor (spider up), place one or two shims between the spider leg and the back of the basket at the marked rib position. (See drawing).

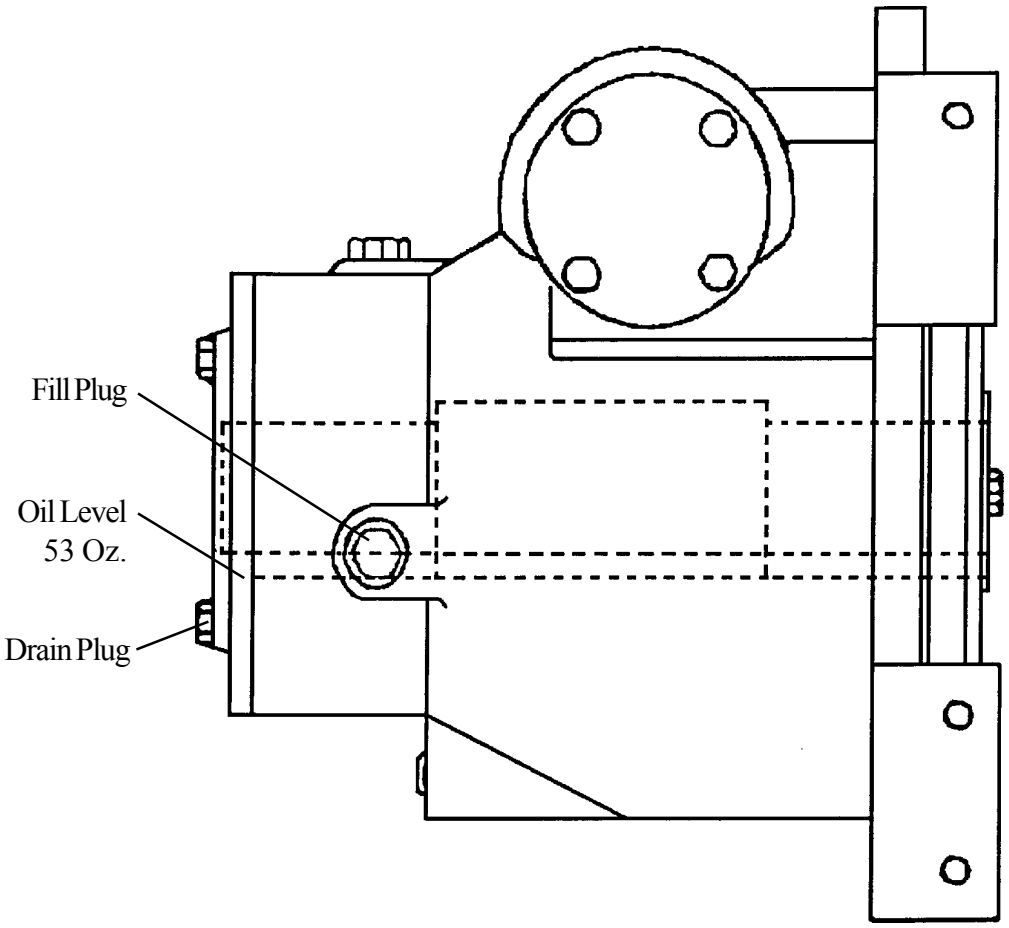
F. Re-insert spider and basket assembly and re-check cylinder.

G. If at this point, basket is still out of round, procedure must be repeated starting with step “B”.

H. Upon completion of the shimming process, re-alignment of basket is necessary.

NOTE: If the point mentioned in Step #B is between two ribs, both ribs might have to be shimmed.

GEAR REDUCER OPERATION AND MAINTENANCE



CHANGING OIL IN GEAR REDUCER

1. Level Gear Reducer as best as possible.
2. The proper oil level is the bottom of the fill plug hole.

Each Gear Reducer is filled with pints of Cissell TU3465 transmission oil before leaving the factory. Change oil once every 6 months.

The Large Roller Bearings, which support the worm gear and basket load, must operate in a preloaded condition, that is the worm gear must not have end play. The Gear Reducer is assembled at the factory to provide a 16 - 20 inch lb. pre-load on these bearings.

The Small Roller Bearings, which carry the worm must operate in a pre-loaded condition, that is, the worm must not have end play. The Gear Reducer is assembled at the factory to provide a 2 - 4 inch lb. pre-load on these bearings.

REMOVAL AND INSTALLATION OF SEALS ON GEAR REDUCER

CAUTION

Drain oil **before** removing seals; replace the NEW oil **after** installing new seals (See Cissell Gear Reducer Sheet).
Remove Gear Reducer from rear of dryer **before** removing seals.

TO REMOVE EXISTING FRONT AND REAR SEALS from front and rear caps on Gear Reducer:

Slip end of screwdriver under seal; using end of Gear Shaft as a fulcrum, force seal out. Repeat operation at several different places until seals are removed from gear shaft.

TO REMOVE EXISTING END SEAL AND END CAP from Gear Reducer:

Remove four cap screws and slip end cap and seal from worm gear. Tap seal out of cap from inside.
Clean inside of front, rear, and end caps. Spread permatex evenly over area to receive seal. Clean outside end of large and small gear shafts. Spread vasoline evenly over area to receive seal. Spread permatex evenly over outside rim area of seal. Spread vasoline evenly over inside rim area of seal.

TO INSTALL NEW FRONT AND REAR SEALS:

Hold front (and rear) seal tightly in place over gear shaft with rubber seal in. Run edge of thin, dull instrument (such as wooded spatula) carefully around rubber wiping edge of seal and chamfer end of gear shaft so that seal is evenly installed all around gear shaft. DO NOT INJURE RUBBER WIPING EDGE.

TO INSTALL NEW END SEAL:

Slip seal in end cap. Hold cap and seal tightly in place over small shaft with rubber seal in. Run edge of wooden spatula carefully around rubber wiping edge of end seal and chamfer end of small shaft so that seal is evenly installed all around edge of shaft. DO NOT INJURE RUBBER WIPING EDGE.

AFTER SEALS ARE EVENLY INSTALLED ALL AROUND EDGES OF SHAFTS:

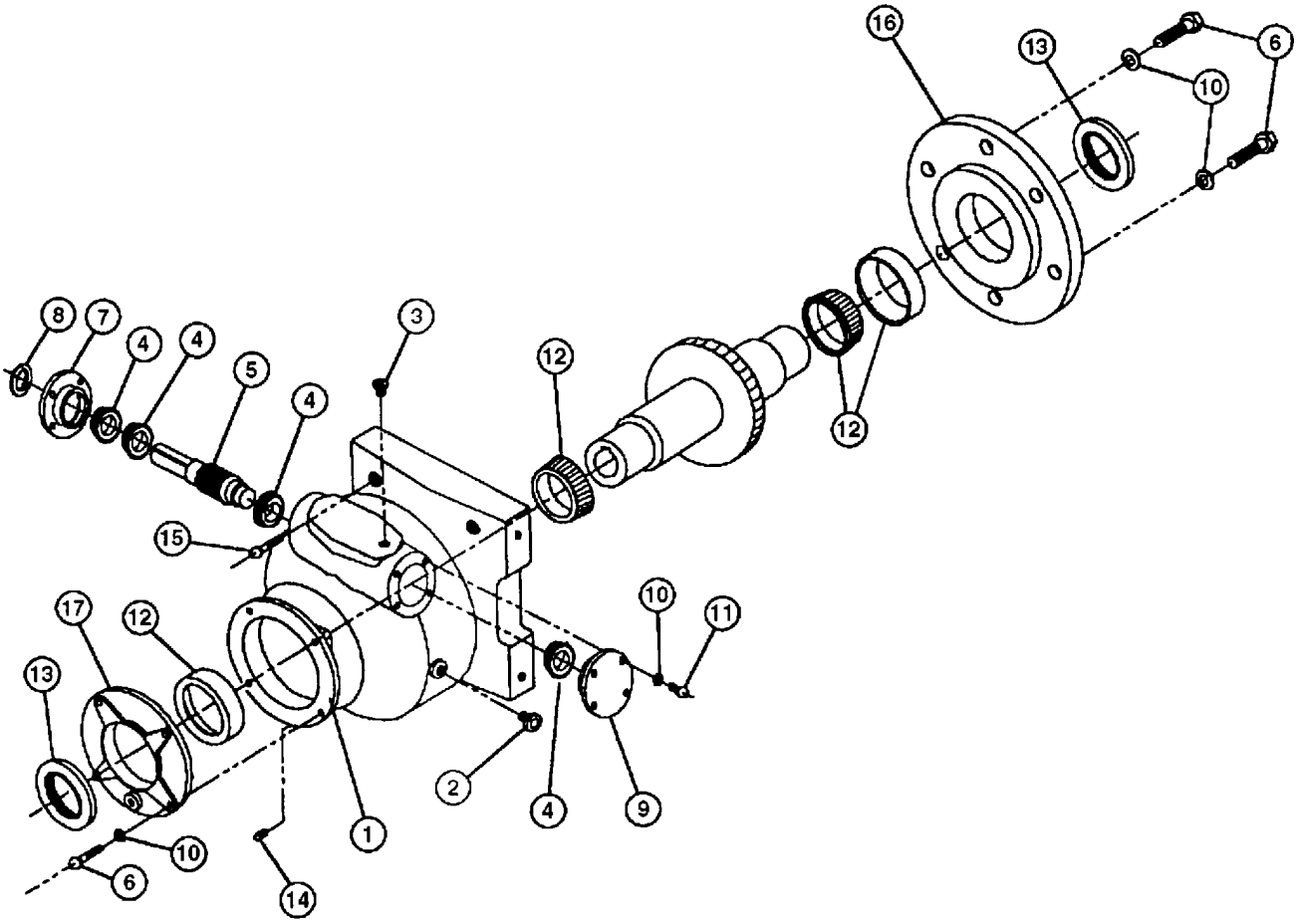
Place block of wood over front and rear seals and tap all around with a plastic faced mallet, until seal is flush into recess of front (or rear) cap.
Slip end seal and cap into position and tighten four bolts; then with a block of wood over end seal, gently tap with plastic faced mallet, until seal is flush into recess of end cap.

REINSTALL GEAR REDUCER ON REAR OF DRYER

IMPORTANT

While the sealing element or packing ring in a seal is not fragile, care must be taken to prevent damage to the wiping edge during mounting. Do not apply pressure to, nor hammer directly on, the sealing ring or spring; make sure that all mounting tools contact only the metal case of the seal.

PARTS—TM200—LARGE GEAR REDUCER WITH BRONZE TEETH



1	TM203	Housing	10	VSB134	3/8" Split Lockwasher (Pkg. of 6)
2	K474	Oil Level Plug Kit	11	TU3246	3/8" - 16 x 1" Cap Screw (Pkg. of 6)
3	TM119	1/4" Vent Plug	12	TM217	Large Bearing Cone & Cup
4	TM208	Small Bearing Cone & Cup	13	TM220	Large Klozure (Seal)
5	TM225	Worm & Worm Gear	14	TM221	1/4" Pipe Plug
6	IB139	3/8" - 16 x 1 1/4" Cap Screw	15	TU5312	3/8" x 3" Set Screw
7	TM205	Small Open End Cap	16	TM211	Large End Cap 10 1/2 Dia.
8	TM204	Small Klozure (Seal)	17	TM212	Small End Cap 6 3/4 Dia.
9	TM218	Small Closed End Cap			

TM225 Worm and Worm Gear Set (for TM200 ONLY) (only sold as set)

Not Illustrated—TU3465 one pint of Cissell Transmission Oil

MOTORS

BASKET MOTOR

CISSELL PART # : MTR303

GENERAL ELECTRIC PART # : 5K46PN4194Y

440V, 1 HP, 60 HZ, 3 PH, 1725 RPM.
56Z FR, 1.6 A, SFA = 1.8, SF = 1.15, AMB = 40 C.

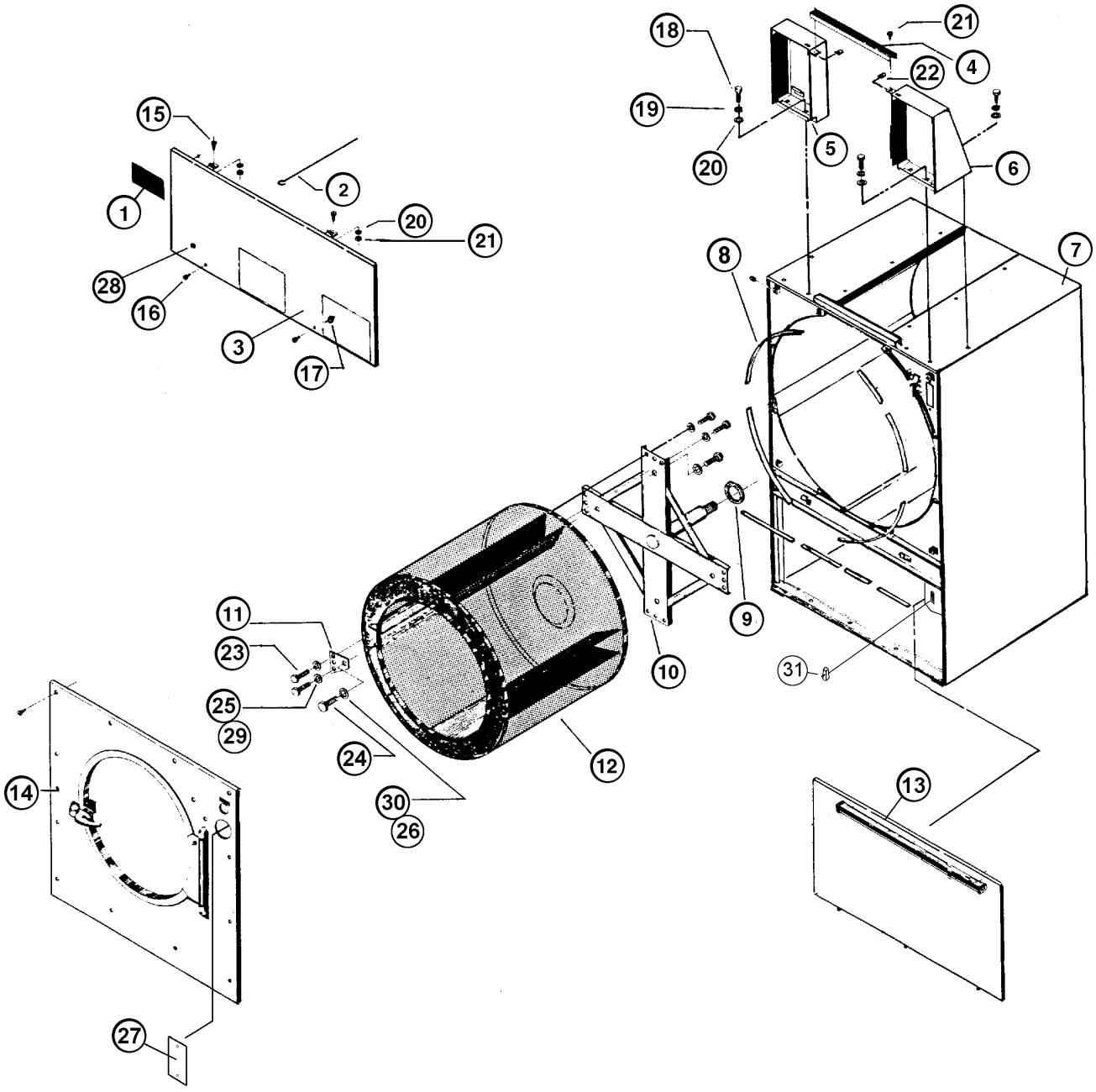
FAN MOTOR

CISSELL PART # : MTR304

GENERAL ELECTRIC PART # : 5K49TN8113Y

440V, 1-1/2 HP, 60 HZ, 3 PH, 1725 RPM.
145TZ FR, 2.4 A, SFA = 2.7, SF = 1.15, AMB = 40 C.

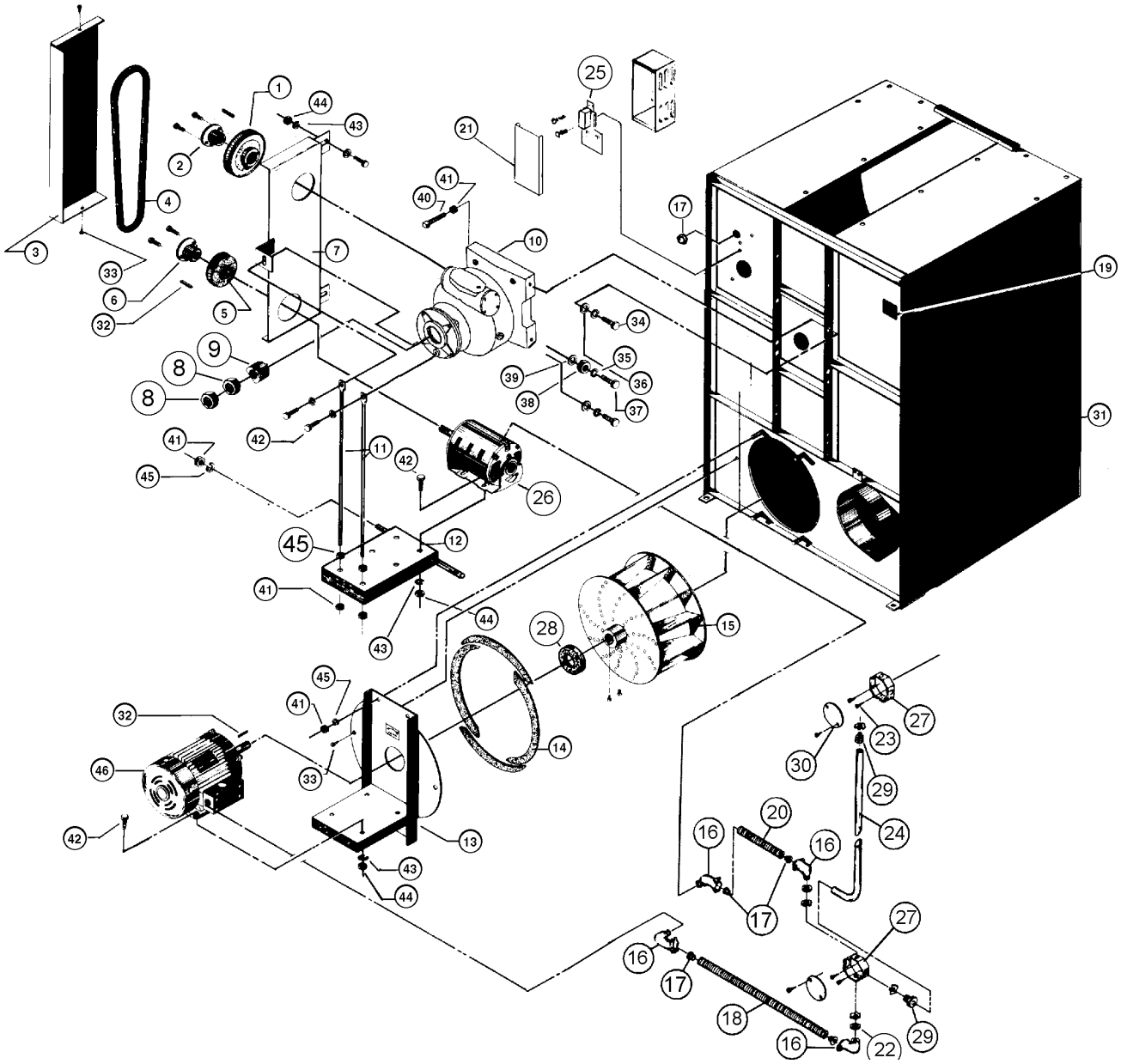
FRONT QUARTER PARTS (ILLUSTRATION)



FRONT QUARTER PARTS

Ref. No.	Part No.	Description
1	TU8013	Cissell Nameplate
2	TU5739	Support Arm
3	TU8095	Access Door
4	TU5674	Control Box Top Channel Brace
5	TU14126	Left Hand Control Box Weldment
6	TU9866	Right Hand Control Box Weldment
7	TU15947	Jacket, Insulated
8	430146179	Gasket, 13 feet needed
9	TU5290	Felt Seal
10	TU13339	Spider Assembly
11	TU5397	Outside Rib Plate
12	TU6469	Basket Welded Assembly
13	TU15943	Lint Door Assembly
14	TU13159	Front Panel & Door Assembly
15	TU3479	#10 - 32 x 7/16" Screw (Pkg of 6)
16	FG343	Screw Fastener
17	FG345	Retaining Washer
18	TU3246	3/8" - 16 x 1" Bolt (Pkg of 6)
19	VSB134	3/8" Lock Washer (Pkg of 12)
20	IB140	3/8" Cut Washer (Pkg of 12)
21	TU2793	#8 x 5/8" S.M.S.
22	TU7848	#14 Speed Nut (Pkg of 6)
23	TU2662	1/2" - 20 x 1-1/2" Cap Screw (Pkg of 6)
24	TU2664	5/8" - 18 x 1-1/2" Cap Screw (Pkg of 6)
25	OP251	1/2" Internal Tooth Lockwasher (Pkg of 12)
26	TU5801	5/8" Internal Tooth Lockwasher (Pkg of 6)
27	TU15525GG	Cover Plate, Front Panel
28	TU6811	Button, Plug, 1 3/16"
29	TU2831	Lock Washer, 1/2"
30	TU3418	Lock Washer, 5/8"
31	EA-11621-0	Switch, Lint Door

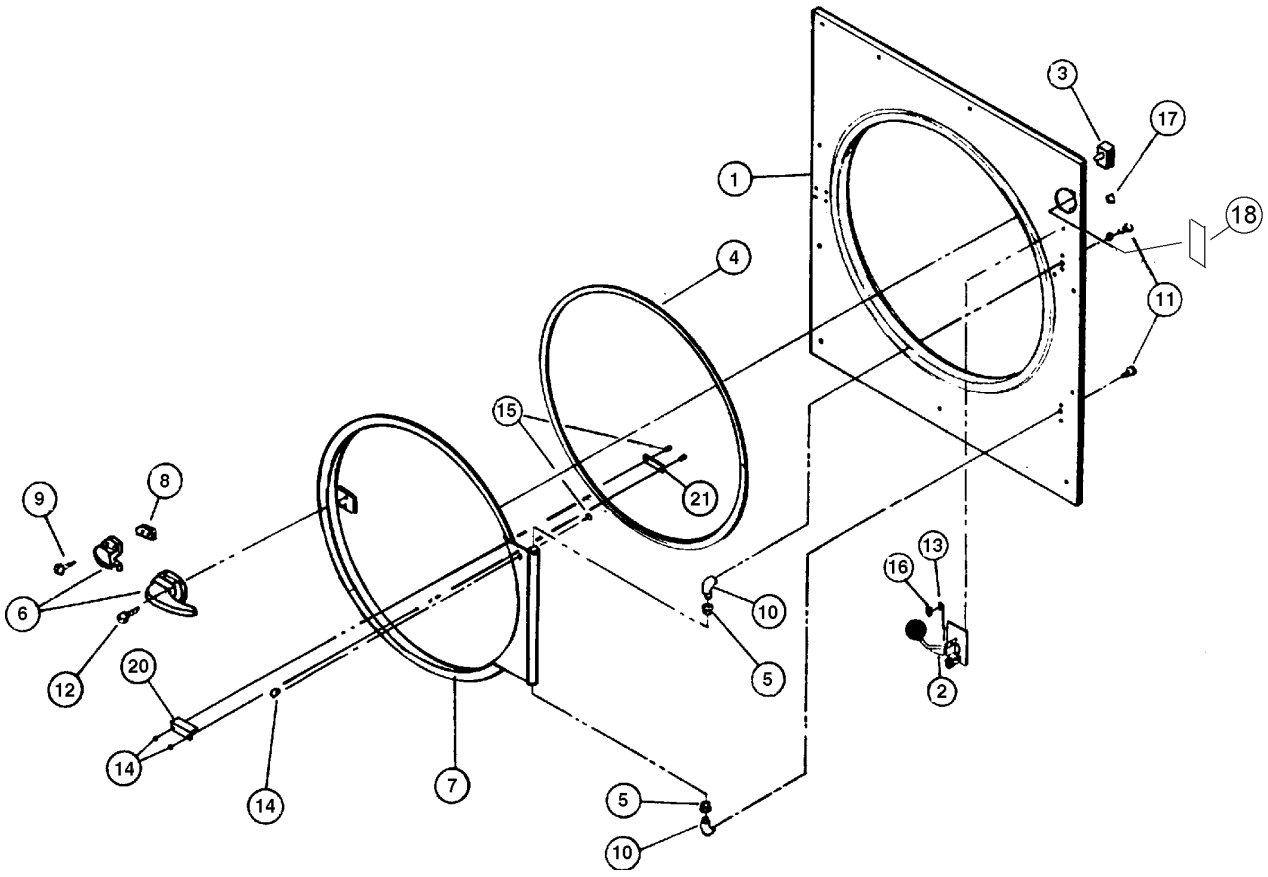
REAR QUARTER PARTS (ILLUSTRATION)



REAR QUARTER PARTS

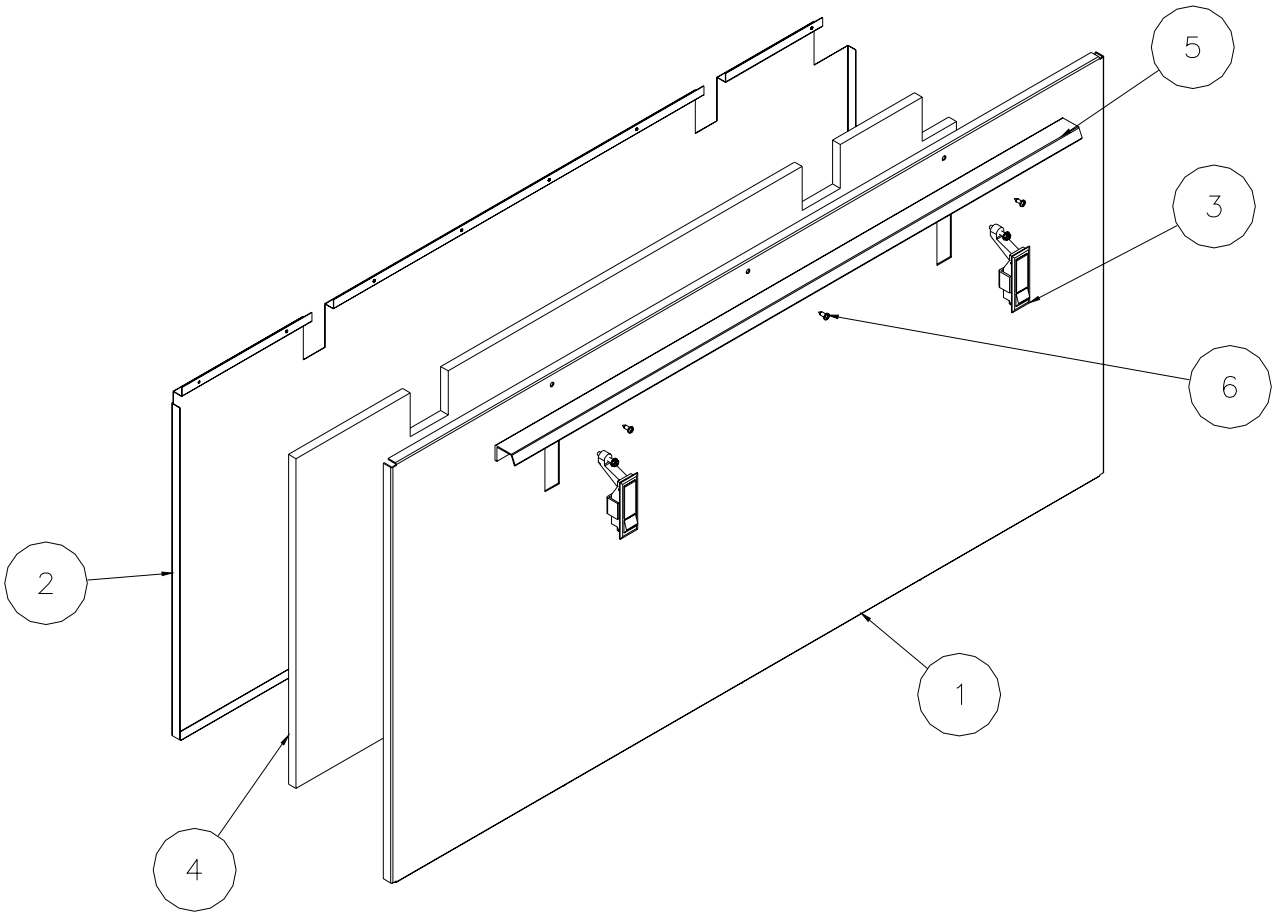
Ref. No.	Part No.	Description
1	TU3806	Gear Sheave
2	TU3807	Sheave Bushing
3	TU14092	Outside Belt Guard
4	TU2363	V-Belt
5	TU2832	Motor Sheave
6	TU2833	Sheave Bushing
7	TU9615	Belt Guard Welded Assembly
8	TU470	Large Hex Nut
9	TU6633	Washer, Basket Shaft
10	TM200	Gear Reducer (See Separate Page)
11	TU5328	Belt Adjusting Rod
12	TU4626	Basket Motor Mount Assembly
13	TU5658	Motor & Fan Mount Weldment
14	TU2473	Self-Sticking Gaskets
15	TU403	Fan Wheel
16	TU4791	90° Angle Connector
17	TU5431	Bushing, Red Sleeve
18	CFB2500	1/2"Greenfield Cable (Specify 25")
19	TU2887	Nameplate - Serial No. & Model
20	CFB1300	1/2" Greenfield Cable (Specify 13")
21	TUT176B	Air Switch Cover Right
22	TU4808	Nut, Lock, Conduit
23	TU7733	Screw, #8-32
24	TU13805	Top Motor Conduit
25	TU8206	Air Switch
26	MTR303	Basket Motor
27	500300644	Junction Box
28	TU108	Gasket
29	TU6032	3/4" Straight Conn.
30	SB170	Junction Box Cover
31	TU15947	Jacket, Insulated
32	TU4684	Key
33	M263	#8 x 3/8" S.M.S. (Pkg. of 12)
34	601602097	1/2" - 13 x 1-3/4" Hex Hd. Cap Scr. (Pkg. of 6)
35	TU2831	1/2" Split Lockwasher (Pkg. of 12)
36	TU1851	1/2" Flat Washer (Pkg. of 6)
37	TU2195	1/2" - 13 x 1-3/4" Hex Hd. Cap Scr. (Pkg. of 6)
38	TU455	Cam Adjustment Nut
39	TU1851	Washer, 9/16" Flat Thick (Pkg. of 6)
40	TU5312	3/8" - 16 x 3" Sq. Hd. Set Screw (Pkg. of 6)
41	TU4787	3/8" - 16 Hex Nut (Pkg. of 6)
42	TU5439	5/16" - 18 x 3/4" Hex Hd. Cap Screw (Pkg. of 6)
43	TU2814	5/16" Split Lockwasher (Pkg. of 12)
44	C249	5/16" - 18 Hex Nut (Pkg. of 6)
45	VSB134	3/8" Split Lockwasher (Pkg. of 12)
46	MTR304	Fan Motor

FRONT PANEL ASSEMBLY (ILLUSTRATION)



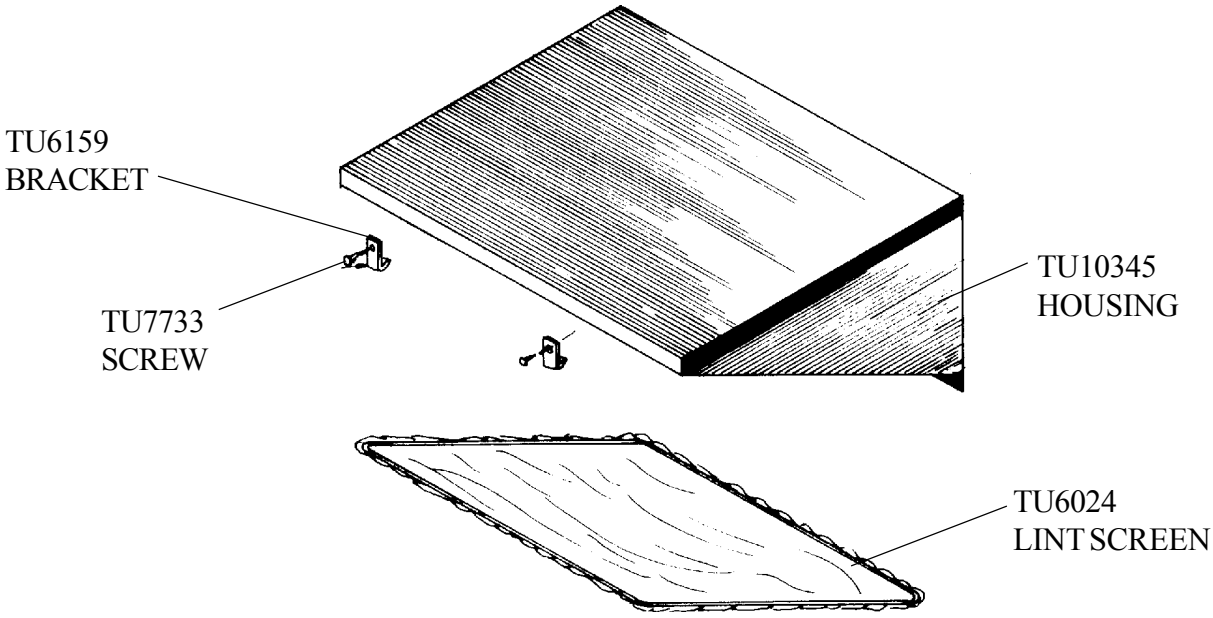
Ref. No.	Part No.	Description	Quantity
1	TU13157	Insulated Front Panel	1
2	TU11943	Right Hand Latch Assembly	1
3	FG140	Door Switch	1
4	TU5288	Basket Door Seal	1
5	PIF172	Delrin Bearing	2
6	TUA2319	Door Latch & Keeper	1
7	TU11630	Right Hand Door w/Insulation	1
8	TU5503	Door Latch Spacer	1
9	TU2687	#8 Screw W/Washer	4
10	TU2236	Hinge Posts	2
11	TU2836	5/16" - 18 x 1/2" Hex Cap Screw	2
12	TU2686	#8 - 32 x 3/8" Ph. Hd. Screw	4
13	F554	#8 Cut Washer	4
14	TU4840	Crown Nut	3
15	TU4839	10 - 32 Screw	3
16	AT383	8 - 32 x 1/2" Screw	4
17	TU10193	Bushing	1
18	TU15525GG	Plate, Cover	1

LINT DOOR ASSEMBLY

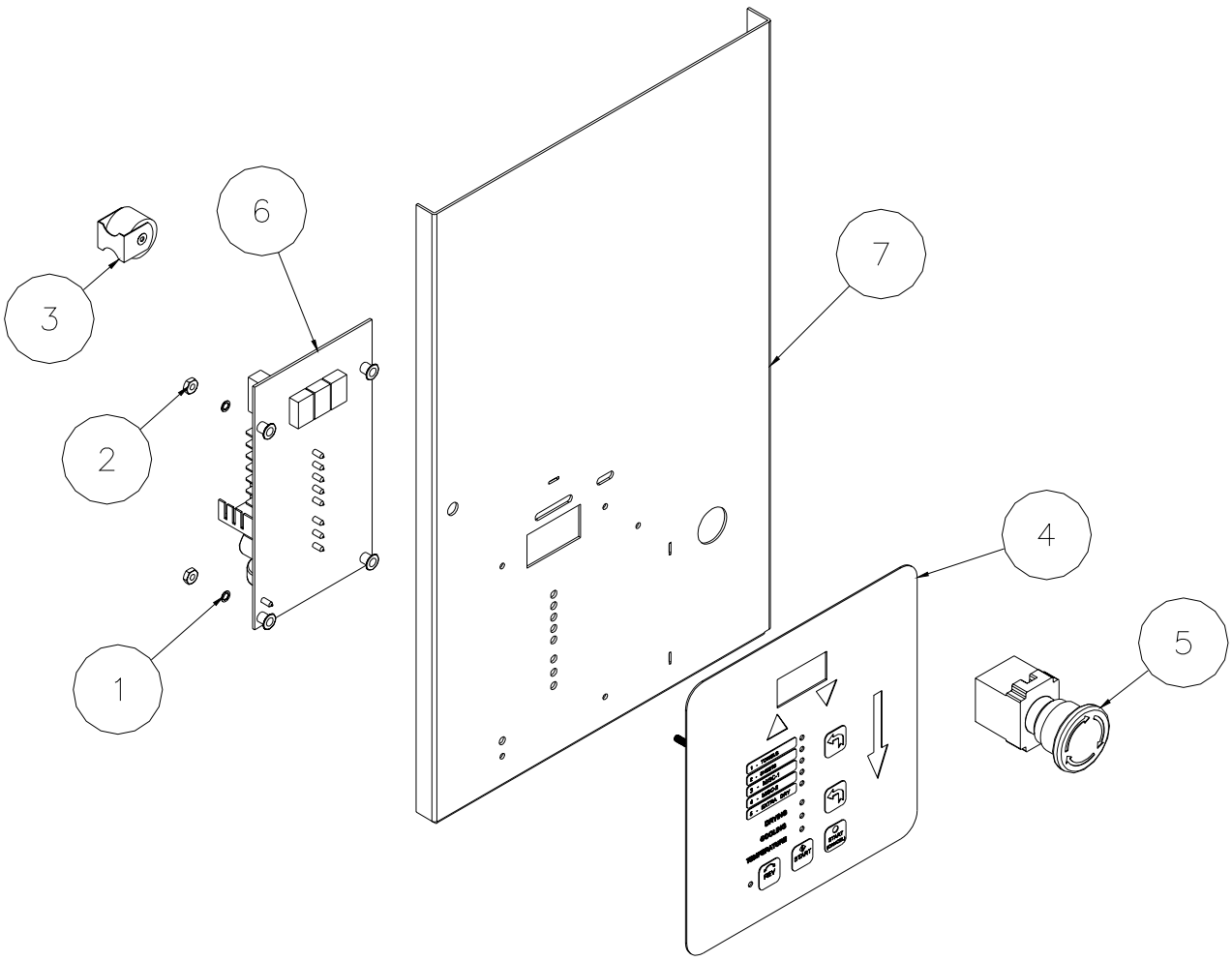


Ref. No.	Part No.	Description	Quantity
1	TU15939	Lint Door W/a	1
2	TU15944	Insulation Cover	1
3	LA-00123-0	Latch, Snap	2
4	TU15945	Insulation	1
5	TU7473	Handle	1
6	TU7733	Screw, #8 self drilling	3

SELF - CLEANING LINT TRAP

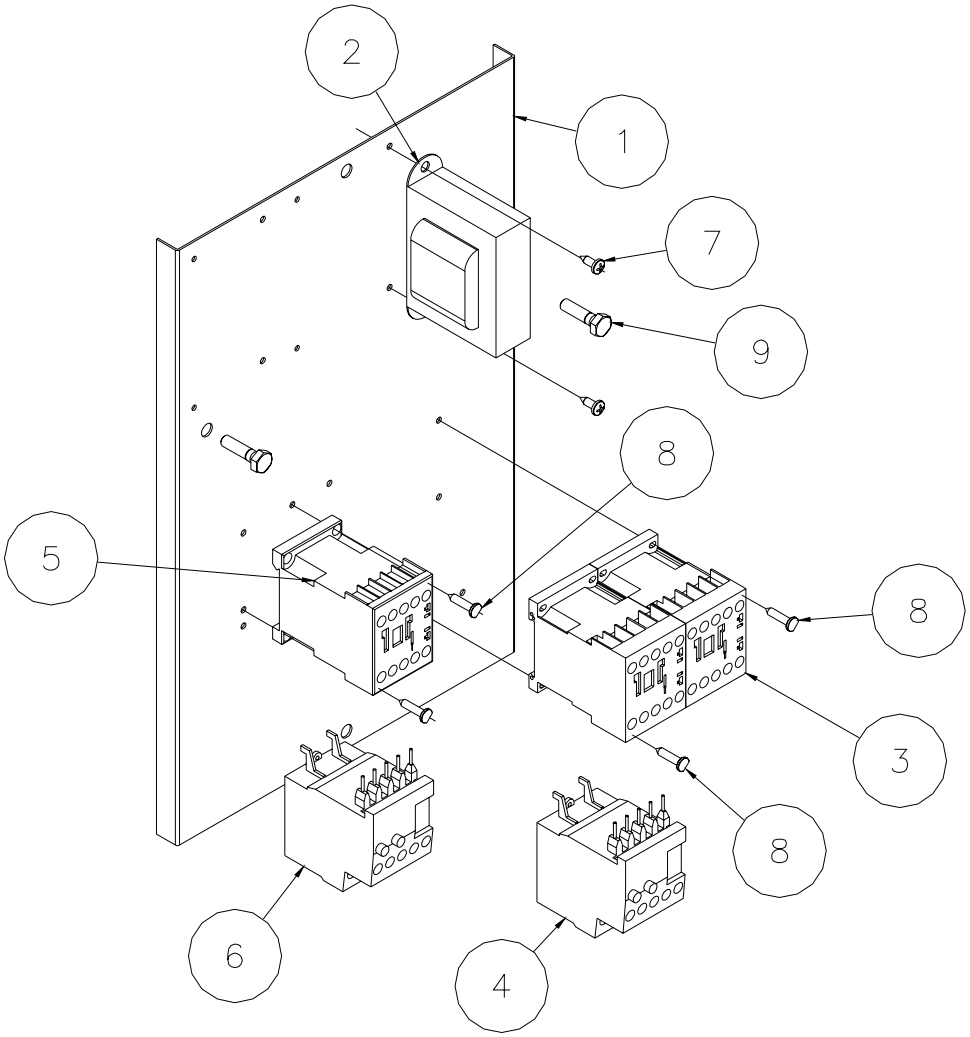


DMP CONTROL PANEL ASSEMBLY



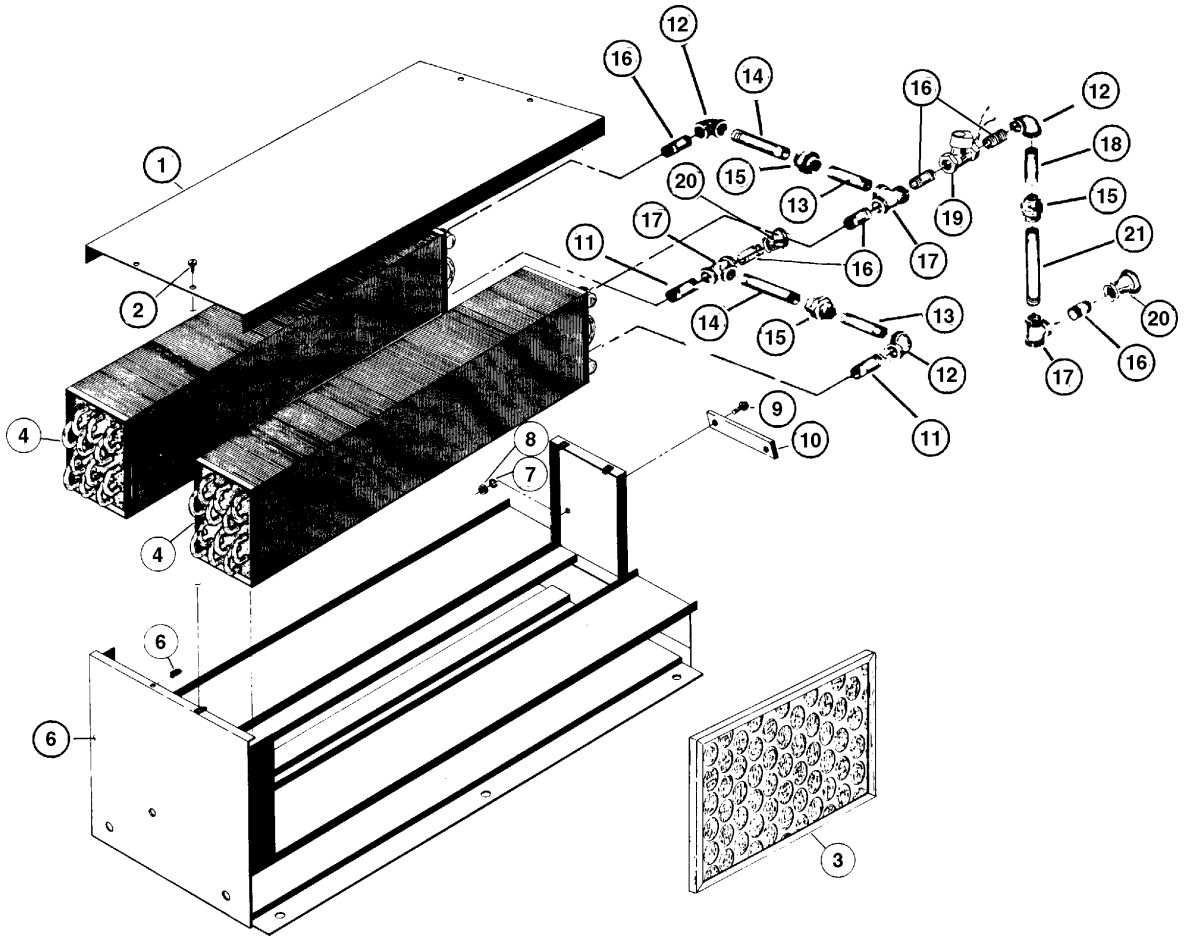
Ref. No.	Part No.	Description
1	M270	Washer, Lock #6
2	TU3400	Nut, Hex #6-32
3	TU14137	Buzzer, 24V Assembly
4	TU15184	Overlay, OPL DMP
5	TU14435	Button, E-stop
6	TU14404	Controller, DMP OPL
7	TU15940	Plate, Control Panel, DMP

REVERSING CONTROL PANEL ASSEMBLY



	Ref. No.	Part No.	Description
1	TU13700		Plate, Control Panel, DMP
2	TU13514		Transformer/24V/460V 60VA
3	EA-00685-0		Reversing Contactor
4	TU15891		Overload, 1.4-2.0 Amp
5	TU13516		Contactor, 24VAC
6	TU15592		Overload, 2.8-4.0 Amp
7	TU7733		#8 - 1/2" Self-Drill Screw
8	TU2973		#8 - 3/4" Self-Drill Screw
9	FG267		Bolt, 1/4-20 x 1 1/4" Lg.

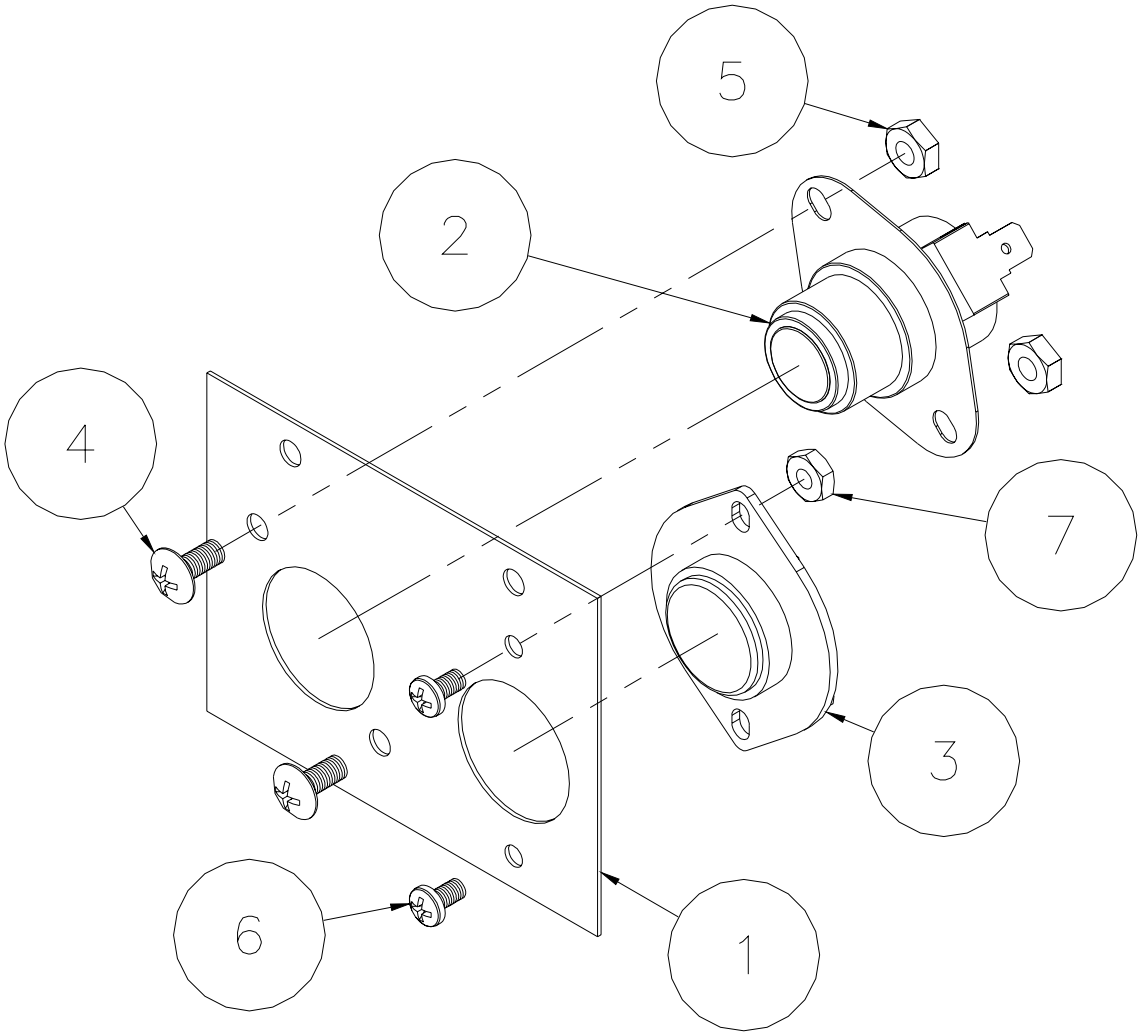
4-COIL LAUNDRY STEAM BONNET



TU15847 - 4-Coil Laundry Complete Bonnet with 24V. Solenoid Valve and without Static Steamer

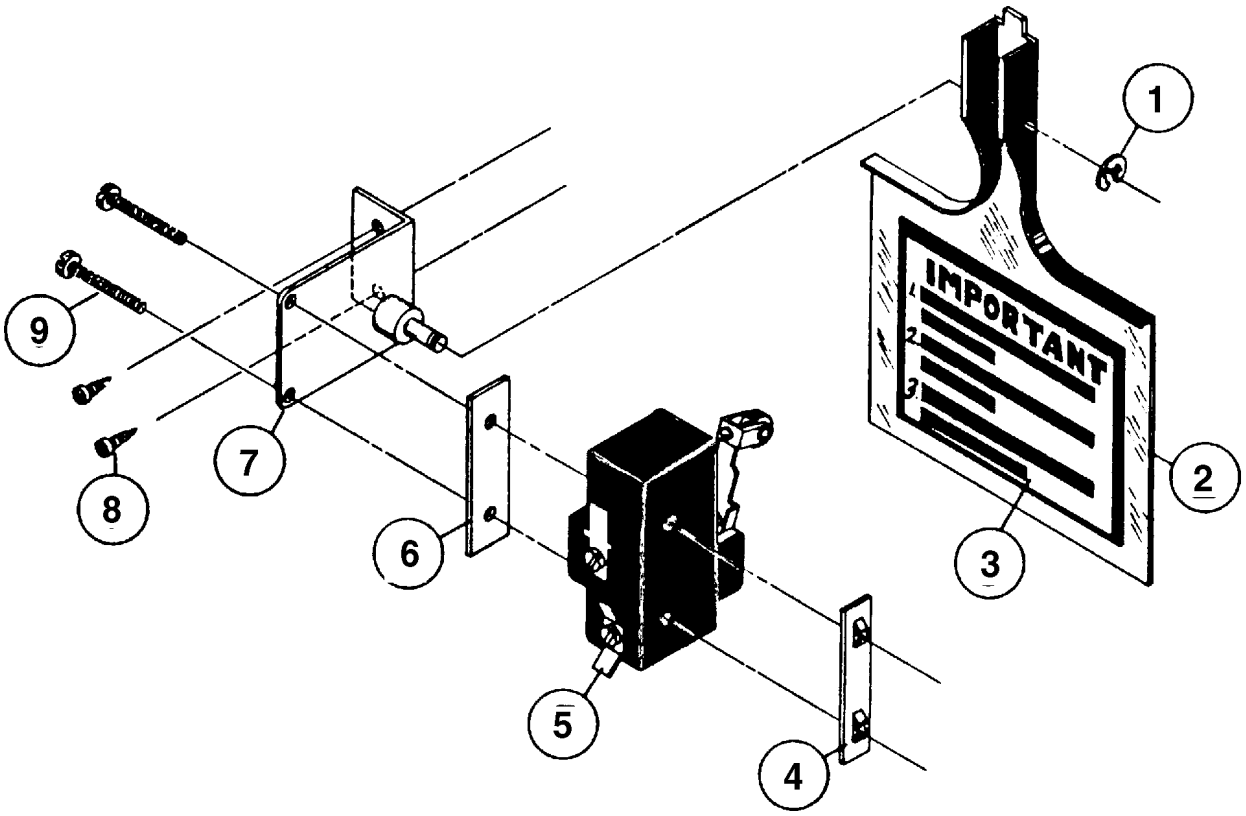
Ref. No.	Part No.	Description
1	TU7393	Top Plate
2	TU3209	#14 x 5/8" Sht. Mtl. Screw
3	TU6458	Air filter (4 req'd)
4	TU1699	Steam Coil (4 Coil)
5	LB74	#14 Speed Nut
6	TU8082	Bonnet Weldment
7	TU2846	1/4" Lockwasher
8	TU4934	1/4" - 20 x 7/16" Hex Nut
9	FB189	1/4" - 20 x 1" Hex Hd. Screw
10	TU5726	Rear Coil Holder
11	TU5914	3/4" x 3-1/2" Lg. Pipe
12	TU4605	3/4" Elbow
13	TU4620	3/4" x 4-1/2" Lg. Pipe
14	TU4610	3/4" x 5" Lg. Pipe
15	TU4600	3/4" Union
16	TU4608	3/4" x 2" Lg. Pipe
17	TU4597	3/4" Tee
18	TU4601	3/4" x 3" Lg. Pipe
19	TU13517	Solenoid Valve
20	TU2735	1" x 3/4" Reducer
21	TU4598	3/4" x 6" Lg. Pipe

DMP THERMOSTAT ASSEMBLY



Ref. No.	Part No.	Description
1	TU15537	Bracket, Thermostat, DMP
2	EA-00411-0	Switch, 220 Degree
3	TU11991	Thermistor
4	M262	#8 - 32 x 3/8” Truss Hd. Screw
5	TU3266	#8 - 32 Hex Nut
6	TU3624	#6 - 32 x 1/4” Screw
7	TU3400	#6 - 32 Hex Nut

AIR SWITCH ASSEMBLY - TU8206



Ref. No.	Part No.	Description
1	F888	"E" Ring
2	TU2463	Actuator Arm
3	TU3476	Air Switch Decal
4	TU1771	#6 Tinnerman Nut
5	TU8155	Air Switch
6	TU1770	Insulator
7	TU8171	Air Switch Bracket
8	TU7733	#8 - 18 x 1/2" Self-Drilling Screw
9	TU3219	#6 x 1" Round Head S.M.S.

AIR SWITCH ADJUSTMENT

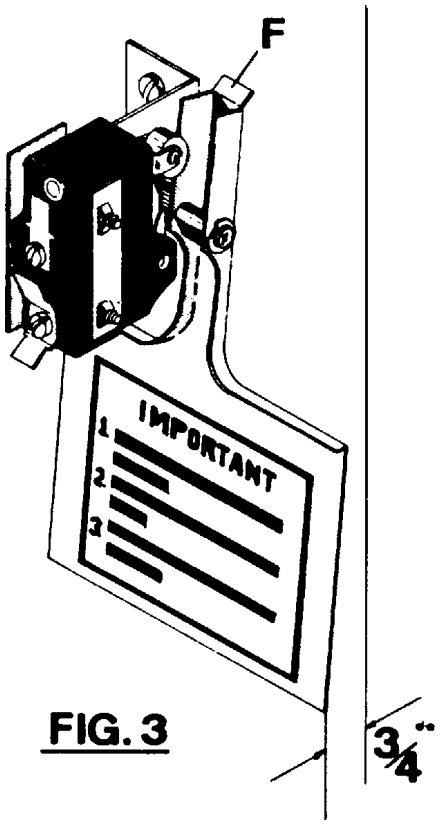


FIG. 3

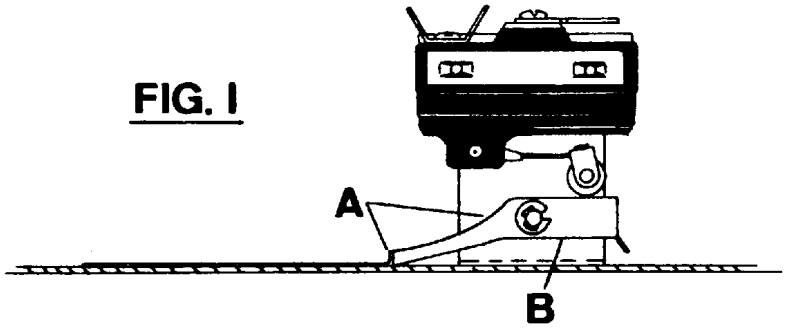


FIG. 1

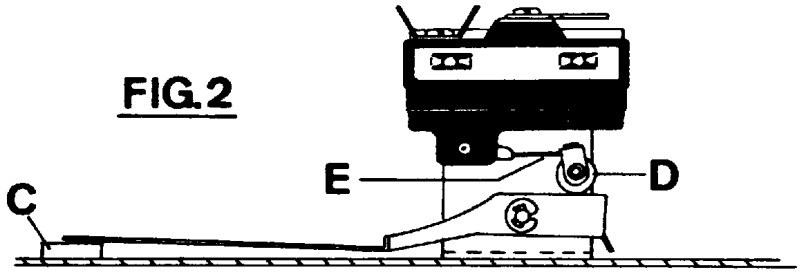


FIG. 2

1. Shut off current; disconnect leads and remove air switch.

2. Lay air switch assembly on flat surface. Adjust air blade at "A" (Fig. 1) so that air blade lays flat and surface "B" is parallel to the flat surface.

3. Place 3/8" x 5/8" spacer bar or equivalent "C" (Fig. 2) under air blade in position shown; hold switch mounting bracket firmly and adjust switch actuator "D" with needle nose pliers at "E" by twisting actuator right or left whichever is needed so that switch closes when end of air blade engages bar "C".

4. Maximum opening of air switch must be no greater than 3/4" (Fig. 3). Bend tab "F" in or out to maintain this dimension.

5. Re-install air switch assembly on rear of dryer.

6. Re-check operation of air blade. Switch must close before air blade engages face of opening and re-open before stop "F" engages.

TROUBLE SHOOTING CHART

TROUBLE	CAUSE	REMEDY
Dryer won't start	No power	Check fuses or circuit breakers, make sure main control switch is on.
	Incorrect voltage	Check power source. Voltage phase and frequency must be the same as specified on electrical rating plate.
	E-stop button engaged	Disengage E-stop button.
	Lint door open.	Close lint door.
	Loading door open.	Close loading door.
	Motor overloads tripped.	Push reset button on motor(s)
	External motor overloads tripped/ defective part (located on motor control panel).	Reset. Replace component.
	Loose wiring connections	Check wiring.
	Defective DMP control	Replace board.
Basket won't start/ reverse	DMP Control not programmed/set to reverse	Program/ set the DMP board. See manual.
	Motor overload tripped	Push reset button on motor.
	Defective reversing contactor	Replace component.
	Defective DMP control board.	Replace component.
Basket reverses too fast or slow	DMP control not programmed/set correctly	Decrease or increase dwell time. See DMP manual.
Fan motor doesn't run	Defective contactor	Replace component.
	Motor overload tripped.	Push reset button on motor.
	DMP board defective.	Replace component.
Dryer noisy or vibrating.	Fan out of balance.	Accidental damage to the fan blade can change the dynamic balance. Damaged fans should be replaced.
	Basket rubbing V-Belt sheaves.	Adjust basket clearances. Tighten set screws. Make sure sheaves are in proper alignment.
	Belt	Adjust belt tension.

TROUBLE SHOOTING CHART

TROUBLE	CAUSE	REMEDY
(Continued) Dryer noisy or vibrating.	Foreign objects.	Occasionally screws, nails, etc. will hang in the basket perforations and drag against the sweep sheets surrounding the basket. Such foreign objects should be removed immediately.
Dryer runs no heat. Steam solenoid valve does not open.	Air switch not operating.	Clean out lint compartment daily. Check back draft damper for foreign object, lint accumulation or anything that may preent the damper from opening. Check duct work for lint build up. Check exhaust outlet.
	Air switch out of adjustment.	See air switch adjustment sheet in service manual.
	Air switch defective.	Replace air switch.
	Temperture set to low.	Increase temperature setting.
	Safety thermostat tripped or defective.	Reset. Replace component.
	Steam Solenoid valve defective.	Replace component.
	DMP control defective.	Replace component.
Water in steam line	Steam piping installed incorrectly.	Check piping per steam installation instuctions.
	Trap not functioning.	Check trap for size and capacity. If dirty and sluggish - clean thoroughly and replace. Check return line for high back pressure, or another trap charging against the trap functioning improperly.
No steam going to steam valve	Trap installed incorrectly.	Check trap for inlet and outlet markings. Install trap according to markings.
	Steam trap blocked.	Remove and clean. Replace if defective.
	Supply line closed.	Open valves in supply and in the return lines.
	Check valve installed incorrectly.	Check for inlet and outlet markings on check valve, and invert if necessary.
	Strainer clogged.	Remove plug and blow down strainer or remove and clean throughly if heavily clogged.

TROUBLE SHOOTING CHART

TROUBLE	CAUSE	REMEDY
Dryer runs, steam passing through coil, dryer doesn't heat.	Inadequate venting. Inadequate makeup air.	Proper operation of steam dryers depends on air flow through the coils. Venting must be done with the least possible restriction. Make-up air opening of at least 350 square inches free area must be available in the vicinity of the dryer to replace the air being exhaused by the dryer.
	Lint trap blocked.	Lint traps must be kept clean.
	Coil filter dirty.	Clean. Replace.
	Coil fins clogged with lint.	Clean.
	Steam supply and return.	Must be properly installed and adequately sized. See piping installation sheet.

cissell
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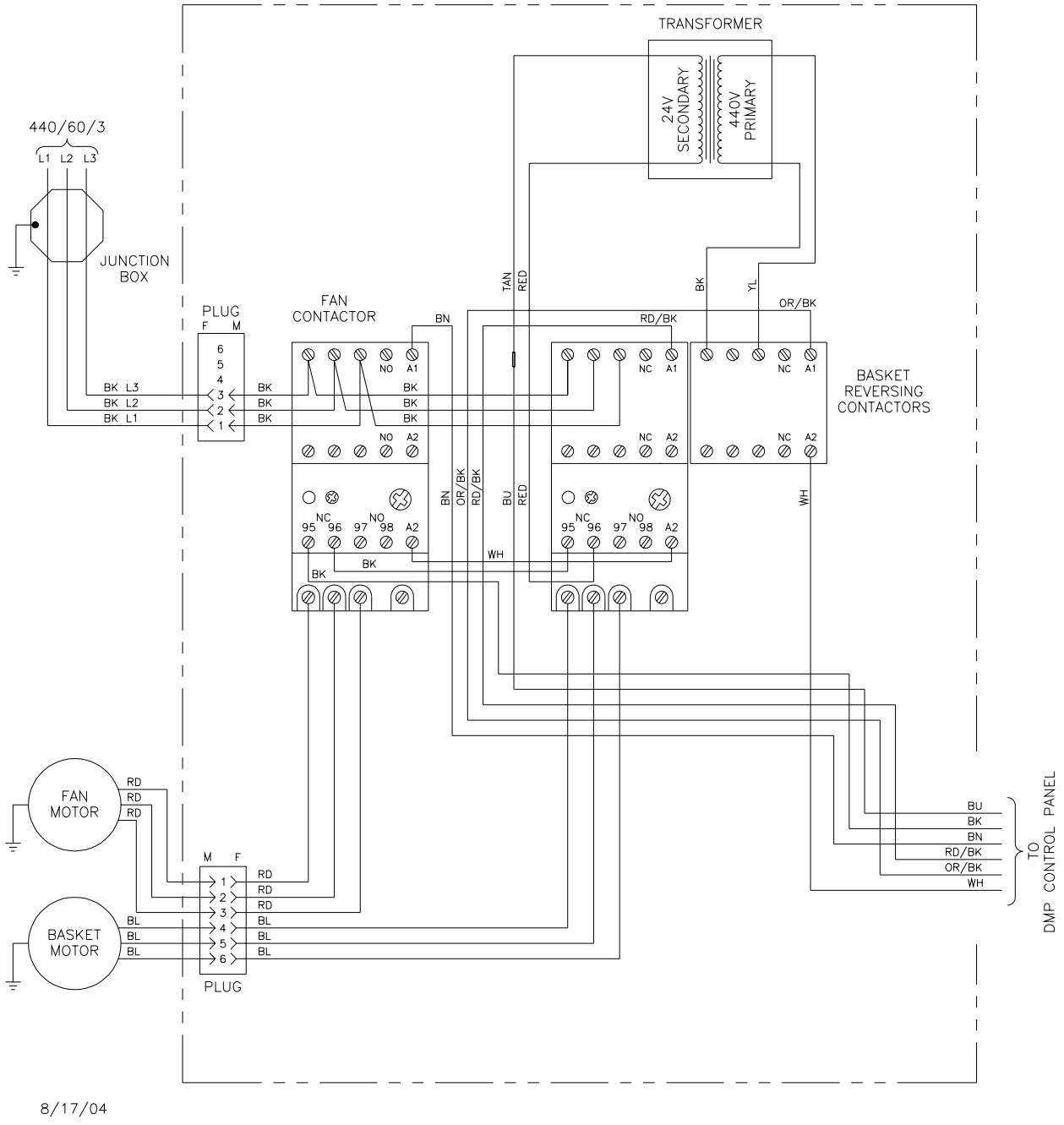
WIRING DIAGRAM

TWL2300

M110S
MOTOR CONTROL PANEL–REVERSING
440/60/3 WITH 24/60/1 CONTROLS



8/17/04

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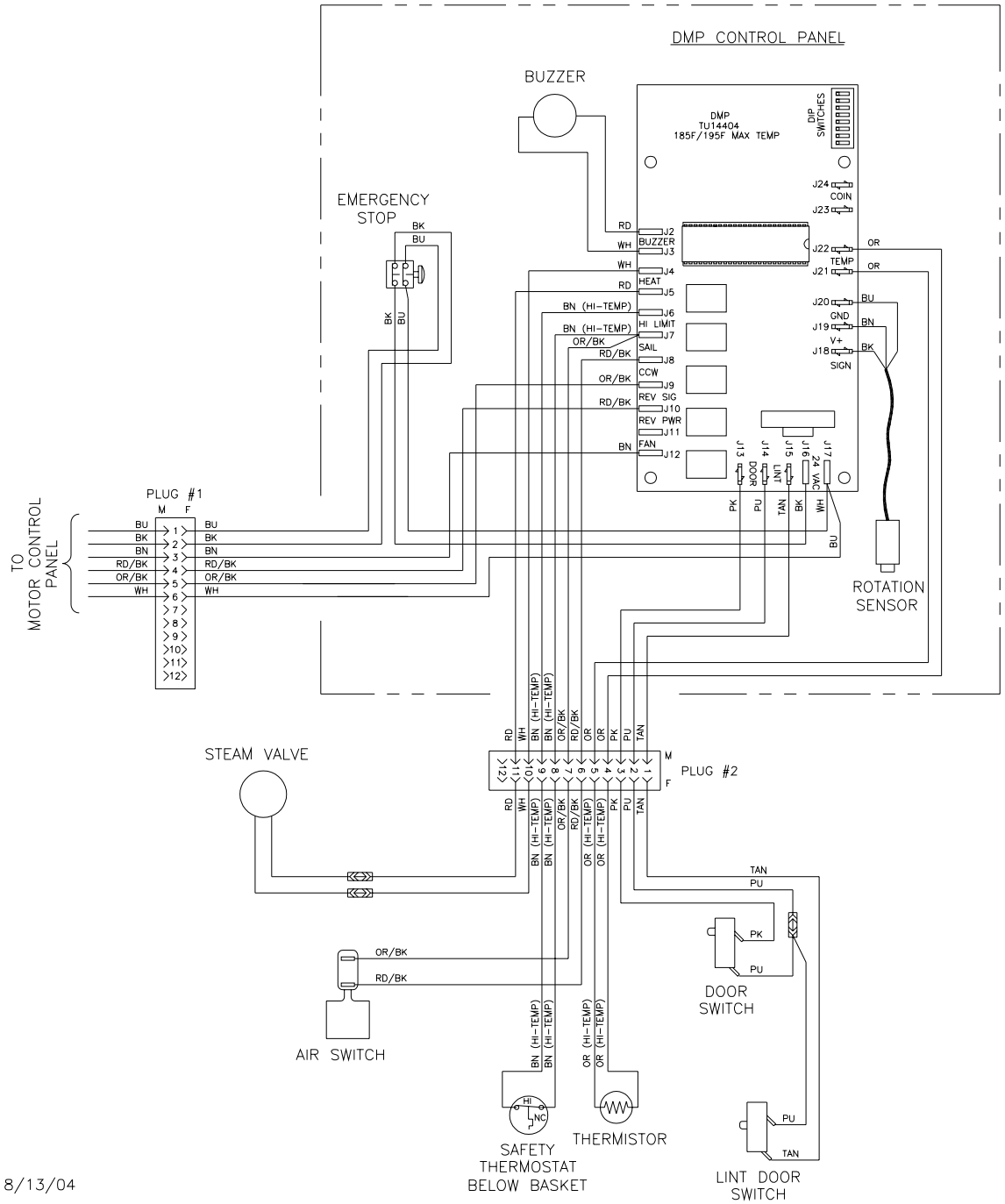
WIRING DIAGRAM

TWL2301

M110S
DMP CONTROL PANEL
440/60/3 WITH 24/60/1 CONTROLS



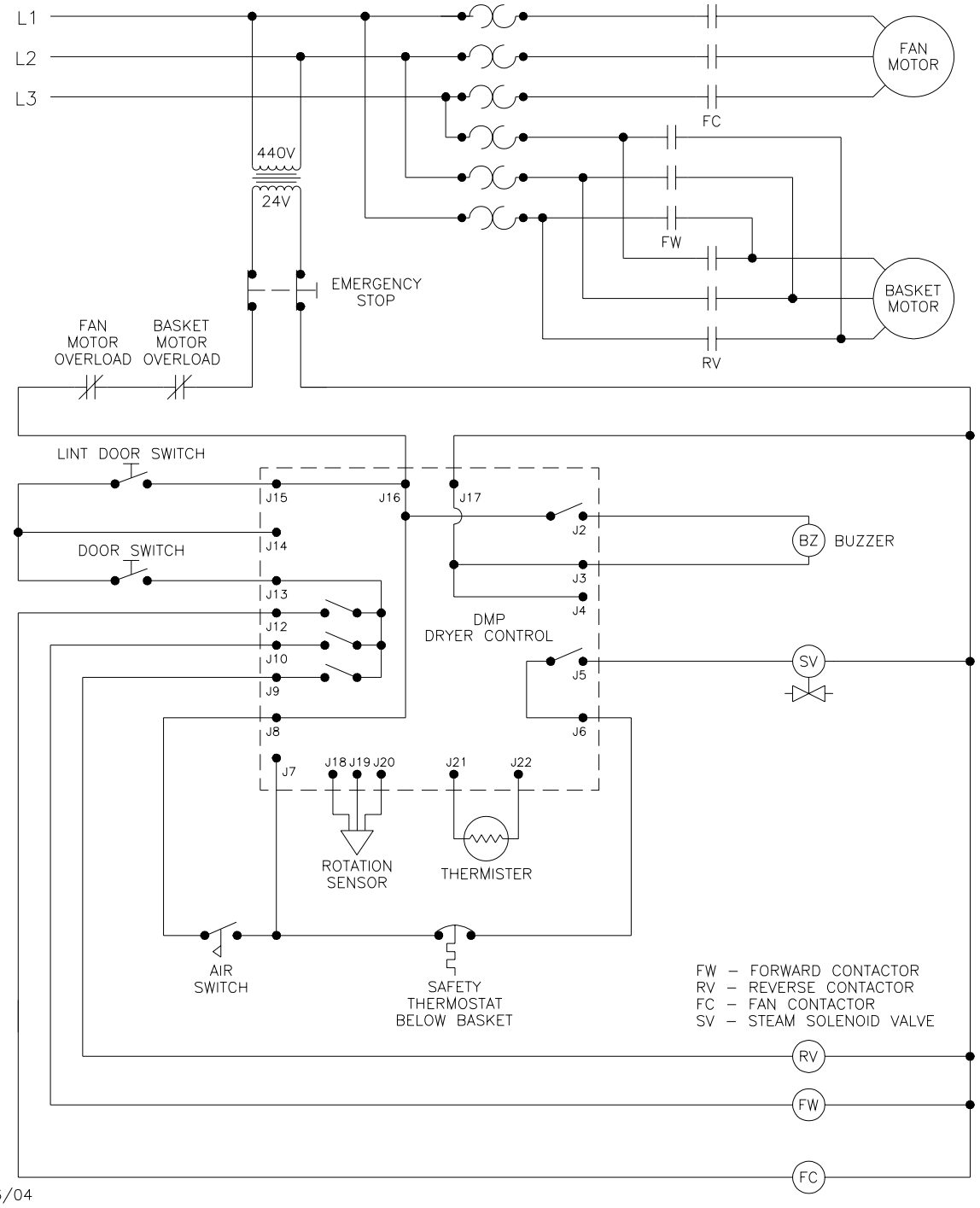
8/13/04

Cissell
LOUISVILLE, KENTUCKY

WIRING SCHEMATIC

SCHM011

M110S STEAM DRYER
DMP CONTROL, REVERSING
440 VOLTS, 60HZ., 3 PHASE W/24V CONTROLS



09/16/04

Diagnostic Microprocessor Control

DIAGNOSTIC MICROPROCESSOR CONTROL - FEATURES

Diagnostic Microprocessor Control (DMP)

1.0 General Operation

The Cissell Diagnostic Microprocessor Control (DMP) is designed to manage the drying and cooling cycles of the dryer. The controller is also programmed from the the factory with five different default programs as described below. The operator has the flexibility to select the time for the drying and cool down cycles and the drying temperature. The operator may also select either reversing or non-reversing basket action only if the dryer is equipped for reversing. The operator may also re-program the default programs. See paragragh 4.0.

Default Programs

Programs	Dry Time	Cool Time	Temp. Set Point	Reversing
1-TOWELS	40 Minutes	5 Minutes	185/195°F (85/91°C)	No
2-SHEETS	30 Minutes	5 Minutes	165°F (74°C)	Yes
3-MISC-1	30 Minutes	5 Minutes	150°F (66°C)	No
4-MISC-2	25 Minutes	5 Minutes	135°F (57°C)	Yes
5-EXTRA DRY	5 Minutes	2 Minutes	150°F (66°C)	No

Note: If an altered program is determined to be corrupted, the default program settings will be used.

2.0 Features

1. Drying time: 0-60 minutes
2. Cooling time: 2-60 minutes
3. LED display of cycle time, set temperature, and actual temperature
4 Thermistor controlled temperature
5. Safety tumble cycle
6. Buzzer for end of cycle, audible alarm
7. Reversing/Non-reversing selection
8. Five user programmable programs
9. RPM display - (when equipped with rotational sensor only)
10. Monitors the sail switch operation
11. Monitors the lint door switch operation
12. Monitors the thermistor for operation

The minimum drying time is 0 minutes, and the minimum cooling time is 2 minutes. The maximum drying or cooling time is 60 minutes. The drying temperature may be set from 100°F (38°C) to 185/ 195°F (85/91°C). The drying time, cooling time, or temperature may be modified during an operating cycle.

If it is necessary to reset the drying and cooling times for the current cycle, press STOP once to stop the dryer. Press STOP again to cancel the cycle.

If it is necessary to change programs during a current cycle, press STOP once to stop the dryer and press STOP again to cancel the current cycle

DIAGNOSTIC MICROPROCESSOR CONTROL (DMP)

3.0 DIP Switch Settings

The DMP has an 8-position DIP switch bank that is accessible from the back of the control board. By switching these DIP switches, it is possible for the operator to customize the display and some of the operating features of the dryer.

Switch #	Function	FACTORY SETTINGS (DEFAULT) OPL	
1	Dryer Type	OFF	OPL=Off
2	Temperature Units	OFF	°F=Off; °C=On
3	Local / Remote Reversing	ON	Local=On
4	Sail Switch	OFF	Enable=Off; Disable=On
5	Lint Door Switch	OFF	Enable=Off; Disable=On
6	Buzzer Timer	ON	(5 Sec=Off; Continuous=On)
7	Safety Tumble (OPL)	ON	Disable=Off; Enable=On
8	Programming	OFF	(Disable=Off; Enable=On)

Dip Switch Functions Explained

#1 Dryer Type: This DIP switch selects the type of dryer.

#2 Temperature Units: Selects °F or °C for the temperature display. Factory setting is for °F.

#3 Local/Remote Reversing: Preset at the factory.

#4 Sail Switch: Preset at the factory.

#5 Lint Door Switch: Preset at the factory; usually set for the lint door switch to be monitored.

#6 Buzzer Timer: This DIP switch determines the length of time that the end of cycle buzzer will remain on. “OFF” indicates that the buzzer will sound for 5 seconds when the drying cycle is completed. “ON” indicates that the buzzer will sound continuously until the “STOP” button is pressed, or the loading door is opened.

#7 Safety Tumble: If DIP Switch #1 is set for OPL, then DIP switch #7 in the “ON” position enables the safety tumble. DIP switch #7 in the“OFF” disables thethe safety tumble.

#8 Programming: This switch enables or disables the programming feature and should normally be in the “OFF” position.

DIAGNOSTIC MICROPROCESSOR CONTROL - FEATURES

4.0 Programming

4.1 Set Dip Switch #8 to the "ON" position.
4.2 Select the desired program number to change. The LED should be flashing.
4.3 Select DRY TIME. Set the time with the UP/DOWN arrows.
4.4 Select COOL TIME. Set the time with the UP/DOWN arrows.
4.5 Select TEMPERATURE. Set the temperature with the UP/DOWN arrows.
4.6 Select reversing REV (illuminated) or non-reversing REV (not illuminated). To change basket direction and dwell time, see section 6.0 *Reversing Operation.*
4.7 Press and hold the PROGRAM select button about 3 seconds until the LED stops flashing. The selected program number is now programmed. If the PROGRAM button is pressed for less than 3 seconds, the controller will cancel the program and display the next program's settings. If not programmed correctly, the display will flash "E2F" for 4 seconds, and the default settings will be used. Follow steps 4.2 through 4.7 to re-program any program number. When finished, set DIP Switch #8 to "OFF." The programs are now stored.
4.8 During the program mode, if the UP/DOWN arrows, REV, or DISPLAY button is not pressed within 10 seconds the default program settings will be used.

5.0 Temporary Re-Programming of Current Programs

5.1 The Drying Time, Cooling Time, Temperature, and Reversing Mode of a program currently in use may be modified simply by adjusting any or all of the program parameters for that program, as needed. Once a modification has been made the current program LED will flash indicating that it has been modified.
5.2 Use the UP/DOWN arrows to adjust program time.
5.3 Use the Display Select button to choose between Drying Time, Cooling Time, and Temperature. Then use the UP/DOWN arrows to adjust the times and temperature.
5.4 Toggle between reversing REV (illuminated) or non-reversing REV (not illuminated). * Only for dryers with the reversing option.
5.5 To cancel this temporary programming mode push the "STOP" button once to stop the current cycle and once more to cancel the modified program settings. The program will revert back to its original settings.

6.0 Reversing Operation

6.1 When the LOCAL reversing operation is selected, the reversing times are stored in the EEPROM which is located on the controller board. If the values stored are determined to be invalid the clockwise and counter-clockwise times will default to 60 seconds, and the dwell time will default to 4 seconds.
6.2 The reversing time program has the following sequence: (1) clockwise time, (2) dwell time, and (3) counter-clockwise time.
6.3 To program new reversing times DIP switches #3 and #8 must be on.
6.4 Press and hold the reverse button (REV) for 3 seconds to display the clockwise time.
6.5 Use the UP/DOWN arrows to set the clockwise time within the range of 30-120 seconds.
6.6 Press REV to display the dwell time.
6.7 Use the UP/DOWN arrows to change the dwell time within the range of 3-10 seconds.
6.8 Press the REV button to display the counter-clockwise time.
6.9 Use the UP/DOWN arrows to change the counter-clockwise time within the range of 30-120 seconds.
6.10 Press the REV button to save these settings and leave DIP Switch #3 in the "ON" position and flip DIP Switch #8 to the "OFF" position.

DIAGNOSTIC MICROPROCESSOR CONTROL - FEATURES

7.0 Rotation Sensor

The rotation sensor must “read” the key on the basket shaft. The sensor must be set approximately 1/4" from the key. Look for the light on the sensor to come on as the key passes the sensor; this is a correctly operating sensor. If no light appears either the sensor is out of range of the key or the sensor is bad. In addition, if the light stays on continuously then the sensor is too close to the shaft or the sensor is bad.

7.1 Safety Tumble/Anti-Wrinkle

At the end of the cooldown cycle, the dryer will stop and display “END.” The DMP control will automatically rotate the basket for 5 seconds every 2 minutes for a total of 20 minutes, until some function of the dryer is activated/deactivated by the user.

8.0 Operational Check for the Board Diagnostics

8.1 “dor” indicates that the loading door is open.
8.2 “ldr” indicates that the lint door is open.
8.3 Cycle the dryer to check if the buzzer activates.
8.4 “P-F” indicates that the thermistor is short circuited or open circuited.
8.5 Hold the sail switch shut for a few seconds during start up -- Display reads “FSS.” To clear the display, release the sail switch to normal operation, press STOP then press START.
8.6 Hold the sail switch open during operation for more than 3 seconds -- Display reads “FSS.” To clear the display, release the sail switch to normal operation, press STOP then press START.
8.7 “bbt” indicates a broken belt condition or a faulty rotation sensor. * Only available on dryers with the rotation sensor.
8.8 Hold the START button to display the drum RPM’s; the display will read “r##” where ## are the RPM’s. * Only avail able on dryers with the rotation sensor.
8.9 “cln” indicates that the lint door has not been opened within 10 hours of operation.
8.10 “cln” is displayed and the dryer will not start if the lint door has not been opened before 20 hours of operation.

9.0 Description of the OPL Control Panel *(See illustration on page 7)*

1. **START.** Starts or resumes the current program or cycle.

2. **STOP.** Temporarily halts the current cycle or cancels the current program.

3. **REVERSING/NON-REVERSING (REV).** Changes the selection between reversing and non-reversing dryer action.

3.1 **REVERSING LED.** Illuminated when set for reversing.

4. **UP/DOWN ARROWS.** Increases or decreases the value in the display. In conjunction with the DISPLAY button, these buttons are used to adjust the drying time, cooling time, temperature, clockwise time, dwell time, counter-clockwise time.

4.1 **DISPLAY.** Displays the drying time, cooling time, drying temperature, and diagnostic codes.

5. **DISPLAY SELECT.** Toggles the display between the drying time, cooling time, and temperature settings. Pressing the DISPLAY button for 3 seconds allows the user to display the drying cycle temperature.

5.1 **DRYING LED.** Illuminated when in the drying cycle.

(Description of OPL Control Panel Continued)

5.2 **COOLING LED.** Illuminated when in the cooling cycle, or when the display is currently showing the time for the cooling cycle.

5.3 **TEMPERATURE LED.** Illuminated when the display is showing the temperature setting.

6. **PROGRAM SELECT.** This button toggles through the five user programmable programs. Holding this button will save a program, as indicated in section 4.7.

6.1 **USER PROGRAM LEDS.** Illumination shows which user program is currently being displayed.

DIAGNOSTIC MICROPROCESSOR CONTROL DETAILS OF OPL CONTROL BOARD