


CISSELL 70 SERVICE
lb. MANUAL

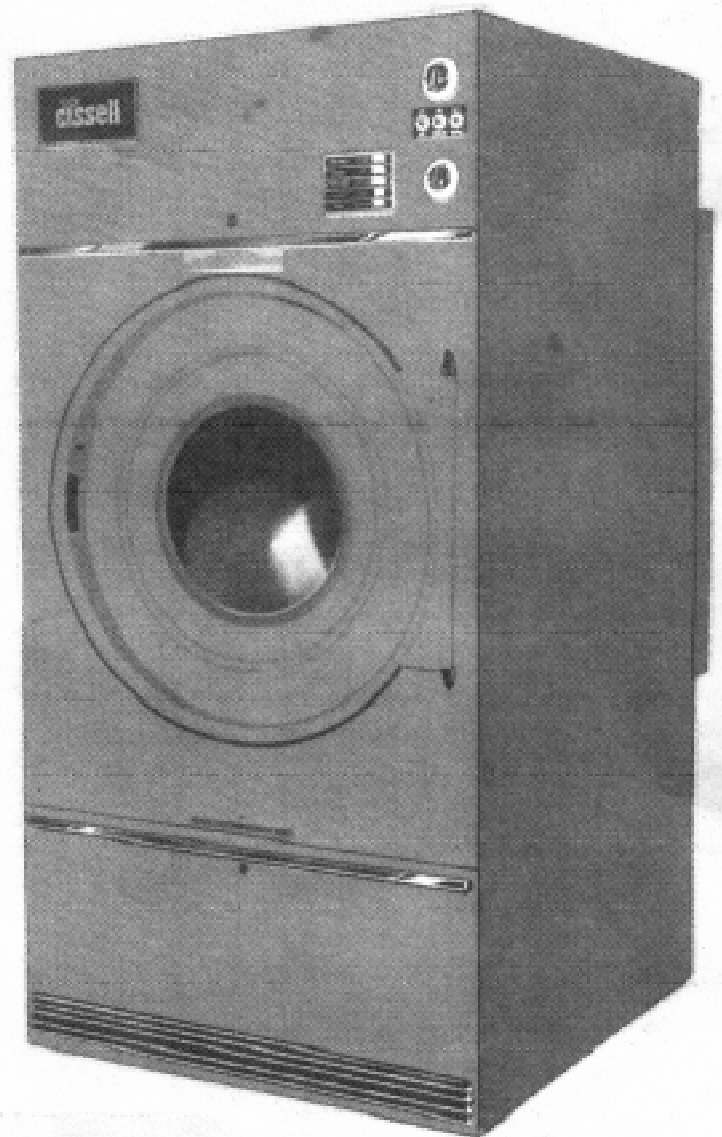
C, F, R, K- MODELS LAUNDRY DRYERS

GAS FIRED

**ENERGY SAVER
GAS FIRED**

ELECTRIC HEATED

**Installation
Operation
Trouble Analysis
Maintenance
Illustrated Parts**



Cissell Manufacturing Company

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9670 AB WINSCHOTEN
THE NETHERLANDS

MAN16

100 1/93 B&K

"Ask Your Distributor"

Printed in U.S.A.

- WARNING:** The Dryer Must Be Used Only For Water Washed Fabrics.
- WARNING:** To Avoid Fire Hazard, Do Not Dry Articles Containing Foam Rubber Or Similarly Textured Rubber-like Materials.
- CAUTION:** A Clothes Dryer Produces Combustible Lint And Should Be Exhausted Outside.
- CAUTION:** A Clothes Dryer Produces Combustible Lint And The Area Around The Clothes Dryer Should Be Kept Free Of Lint.
- CAUTION:** Remove Clothes From Dryer As Soon As It Stops. This Keeps Wrinkles From Setting In And Reduces The Possibility Of Spontaneous Combustion.

CAUTION!
FOR YOUR SAFETY

DO NOT STORE OR USE GASOLINE OR OTHER FLAMMABLE VAPORS AND LIQUIDS IN THE VICINITY OF THIS OR ANY OTHER APPLIANCE. NOTE! THE PURCHASER TO POST THE CAUTION IN A PROMINENT LOCATION.

For optimum efficiency and safety, we recommend that you read the owner's manual before operating your Cissell commercial clothes dryer.

RETAIN THIS MANUAL FOR FUTURE REFERENCE. STORE MANUAL IN A FILE OR BINDER.

INSTRUCTIONS TO BE FOLLOWED IN THE EVENT THE USER SMELLS GAS MUST BE POSTED IN A PROMINENT LOCATION. INFORMATION TO BE POSTED CAN BE OBTAINED BY CONSULTING THE LOCAL GAS SUPPLIER.

CAUTION

"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 A PADDING OR BACKING." RUBBER EASILY OXIDIZES CAUSING EXCESSIVE HEAT AND POSSIBLE FIRE. FLAMMABLE ITEMS SHOULD BE AIR DRIED.

DO NOT DRY ITEMS CONTAINING FOAM RUBBER OR ANY RUBBER-LIKE MATERIALS IN THIS DRYER.

RUBBER EASILY OXIDIZES CAUSING EXCESSIVE HEAT AND POSSIBLE FIRE. ALL ITEMS CONTAINING RUBBER SHOULD BE AIR DRIED.

CAUTION

Synthetic solvent fumes from drycleaning machines create acids when drawn through the dryer. These acid fumes cause rusting of painted parts, pitting of bright plated parts and completely removes the zinc from galvanized metal parts, such as the tumbler basket.

If the drycleaning machines are in the same area as the tumbler, then the tumbler make-up air must come from a source free of solvent fumes.

NOTE

BE SAFE - SHUT MAIN POWER OFF EXTERNALLY TO MACHINE BEFORE SERVICING.

WARRANTY

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 one (1) year 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 one (1) year due to normal wear and tear, including, but not limited to, cloth goods, valve discs, hoses and iron cords, and with respect to all new repair or replacement parts for Cissell equipment for which the one (1) 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, effaced, 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.

REPLACEMENTS PARTS ARE AVAILABLE FROM DISTRIBUTORS OR:



CISSELL
MANUFACTURING COMPANY
831 South First Street
Louisville, KY 40203

Pacific Coast Office:
4823 W. Jefferson Blvd.
Los Angeles, CA 90016

Foreign Distributors
write Export Dept.
Cable Code "Cissell"

See additional Cissell
Specification Sheets for
information on other dryers.

Consult Cissell Price List
for complete prices and
ordering information.

EUROPEAN HEADQUARTERS: PANTEX-CISSELL B.V.

P.O. BOX 53, 9670 AB WINSCHOTEN, HOLLAND

TELEX 53535

TABLE OF CONTENTS - 70 LB. DRYER

INSTALLATION & GENERAL INFORMATION	PAGE
CISSELL Dryers Model Numbers	5
Unpacking & General Installation	6
General Information & Electrical Connections	7
Outline Drawings - C & K Models.	8
Specifications - C & K Models.	9
Outline Drawings - F & R Models.	10
Specifications - F & R Models.	11
Gas Piping Information	12-14
Exhaust Duct Installation.	15-18
Burner Air Inlet Shutters Adjustment	19
 OPERATION	
Two Timer Models Operating Instructions.	20-21
Prompter Control Board Switches.	22
Setting Switches on Prompter Control Board	23
Set-Up Procedure for Prompter.	24
Prompter Operating Instructions.	25
Rules for Safe Operation	26
Service Savers	27
 TROUBLE SHOOTING	
Prompter Dryer Diagnostic Board.	28
Motor Trouble.	29
Noises, Dryer Runs but No Heat	30-31
Main Burners, Dryer Too Hot.	32
Basket Does Not Reverse.	33
Safety Features.	33
 NORTON SILICON CARBIDE IGNITION SYSTEM	
Operation.	34-36
Wiring Diagrams.	37-38
Testing & Trouble Shooting	39-41

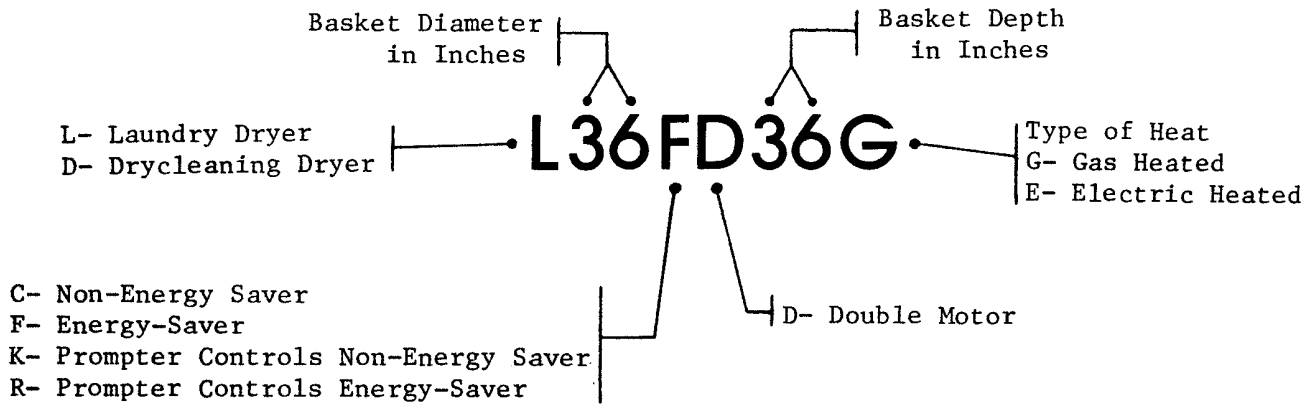
MAINTENANCE	PAGE
Lint Trap, Basket, Sweep Sheets, Gear Reducer	42
Pulleys, Belts, Motors, Bearings.	42
Leveling Bolts, Burners, Check-Ups.	42
Basket Alignment.	43
Basket Shimming	44
Air Switch Adjustment	45
Reversing Control Timer Instructions.	46
Gear Reducer, General Information	47
Gear Reducer, Replacing the Seals	48

ILLUSTRATED PARTS

Front View - Exploded Parts	49-50
Rear View - Exploded Parts.	51-52
Prompter Basket & Sensor Assembly	53
Front Panel & Door Assembly	54
Reversing Control Box Assembly.	55
Reversing Timer Parts	56
Thermostat Assembly - C & F Models.	57
Thermistor Assembly - K & R Models.	58
Access Door & Control Panel Assembly - C & F Models	59
Access Door & Control Panel Assembly - K & R Models	60
Duct Work Parts & Air Switch Assembly	61
Small Gear Reducer.	62
Gas Bonnet & Burner Assembly - C & K Models	63
Gas Bonnet & Burner Assembly - F & R Models	64
Electric Bonnet Complete Assembly	65
Electric Heating Specifications	66

CISSELL DRYERS MODEL NUMBERS

The model number of your Cissell Dryer is very important. It tells the size and type of dryer as detailed below. Refer to this number in all correspondence and when ordering parts. Also refer to the serial number, voltage, hertz, and phase as marked on the rating plate located on the rear of the dryer.



The 70 Lb. Cissell Dryers may be identified by the following list of model numbers. Throughout this manual, dryers may be referred to as 70 Lb. C model, K model, etc.

LIST OF 70 LB. DRYER MODEL NUMBERS

L36CD36E	L36FD36E
L36CD36G	L36FD36G
L36KD36E	L36RD36E
L36KD36G	L36RD36G

UNPACKING

All Cissell dryers are packed in a protective (heavy-duty) plastic bag.

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: tapes, manuals, skid, etc. On gear reducer models, remove screw from air vent and cork from oil reserve well.

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 Cissell 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 0" ceiling clearance, 0" rear clearance, and 0" side clearance.

Before operating dryer, open basket door and remove blocking between front panel and basket. Read all instruction tags, etc.

IMPORTANT: Opening the clothes loading door de-activates the door switch to shut off the motors, fan, gas, steam, or electric element. To restart the dryer, close the door and press in the push to start button for approximately 2 seconds.

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 clean daily to insure proper air circulation throughout the dryer.

IMPORTANT: The reversing models are equipped with basket reversing switches. The switch gives the operator the option of a clockwise or counter clockwise direction.

IMPORTANT: Provide adequate clearance for air opening into the combustion chamber

GENERAL INFORMATION

The Cissell Dryer is so designed that when an operator opens the dryer door, the basket and exhaust fan stops. You can expect fast drying from a Cissell Laundry Dryer. Hot, dry air is properly and effectively moved through basket and exhausted through a lint trap to atmosphere. The Cissell Dryer comes equipped with an inclined self-cleaning lint screen. In this system, lint accumulates on the underside of the screen until a blanket approximately 1/4" thick is formed. This 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.

CISSELL "THERM-O-COOL" DRYERS

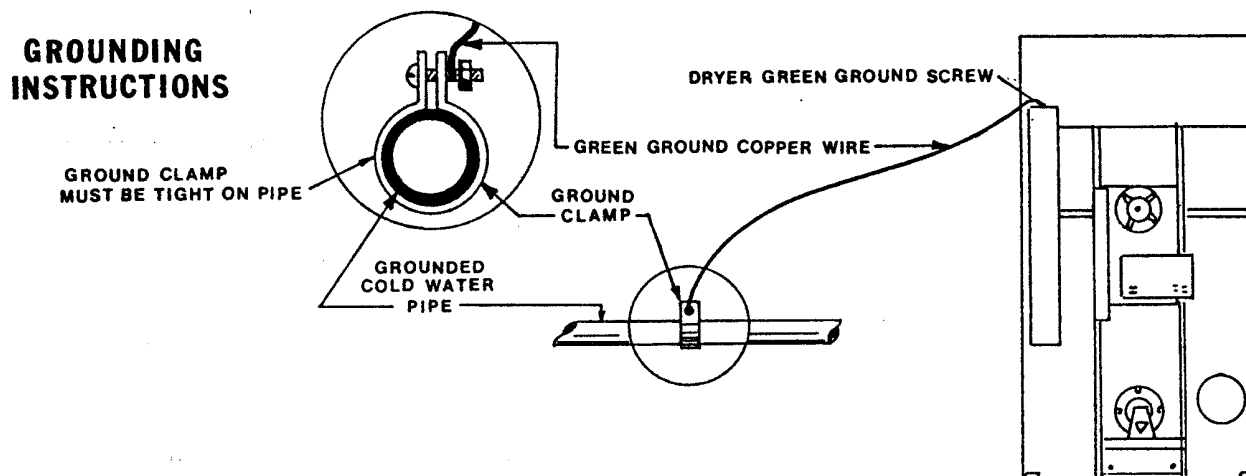
Permanent press, durable press, and other modern day fabrics require the care that your Cissell Therm-O-Cool Laundry Dryers now provide.

At the end of the drying cycle, determined by the time and temperature; single timer, a thermostatic 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, and because it's controlled by the heat retained in the garments after the normal drying period, its time can extend from one minute up to five minutes. The therm-o-cool cycle is never too long or too short. Always the exact minimum time required to reduce the temperature of the garment load to a safe and cooling handling temperature.

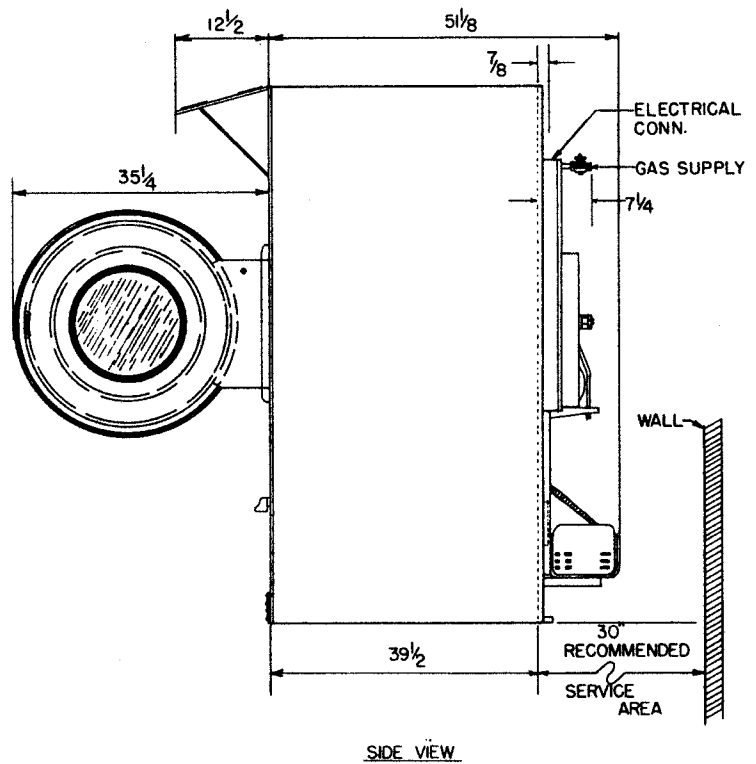
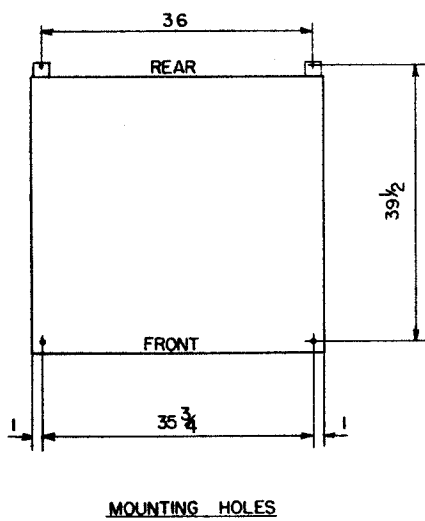
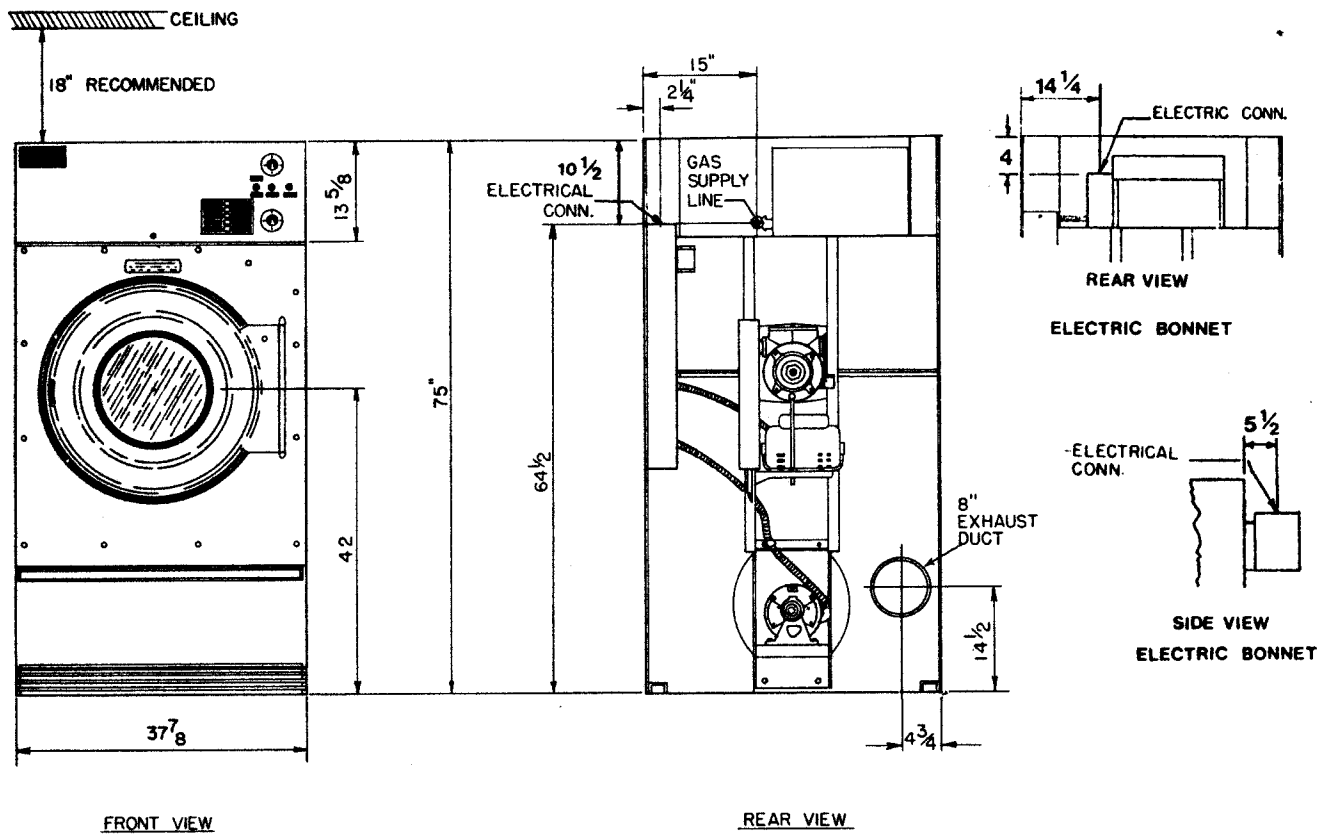
ELECTRICAL CONNECTIONS

Dryers must be electrically grounded - by a separate #14 or larger green wire from the grounding terminal within the service connection box to a cold water pipe, or through the fourth green wire properly grounded and connected to the grounding terminal. In all cases, the grounding method must comply with local electrical code requirements; or in the absence of local codes, with the National Electrical Code as ANSI/NFPA No. 70-1984.

See wiring diagram furnished with dryer. Your 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 service connection box on the rear of the dryer. Do not change wiring without consulting factory as you may void the factory warranty. Do not connect the dryer to any voltage or current other than that specified on the dryer rating plate. (Wiring diagram is located on rear wall of dryer).



70 lb. Dryer - Gas & Electric Heated - Model L36CD36 & L36KD36



ALL DIMENSIONS GIVEN IN INCHES ± 1/4

GENERAL SPECIFICATIONS - MODEL L36CD36
& L36KD36

Basket Load Capacity	70 lbs. (31.5 kg) Dryweight
Floor Space	75" (191 cm) High x 38" (96 cm) Wide x 51" (130 cm) Deep
Basket Size	36" (92 cm) Diameter x 36" Deep-21 cu. ft. (.63 M ³)
Exhaust Duct	8" Dia. (20 cm)
Motor Sizes	Fan-1/3 H.P.; Basket-1 H.P.
Maximum Air Displacement	1000 C.F.M. (29 M ³ /Min.)
Recommended Operating Range	788-913 C.F.M. (22-27 M ³ /Min.)
Net Weight (approximate)	600 lbs. (270 kg)
Domestic Shipping Weight (carton)	670 lbs. (302 kg)
Export Shipping Weight (Box)	1140 lbs. (513 kg)
Export Shipping Dimensions	83" (208 cm) L x 45" (113 cm) W x 61" (153 cm)H
Export Crating	131.8 Cu. Ft. (3.95 M ³)
Basket R.P.M.	Reversing 40-3.2 Reversals per minute Non-Rev. 40

GAS FIRED MODEL

Gas Supply	3/4" Pipe Connection (1.91 cm)
Gas Pressure Regulator (Natural Gas)	Set at 3.5" Water Column (8.9 cm)
*B.T.U. Input (4 Burners)	170,000 BTU/Hr. (Natural Gas) 170,000 BTU/Hr. (L.P. Gases)
Electronic Ignition	Silicon Carbide Gas Ignition System
Drying Time (Approximate)	70 lbs. Dryweight (Indian Head) 70% Moisture Retention - 38 Min.

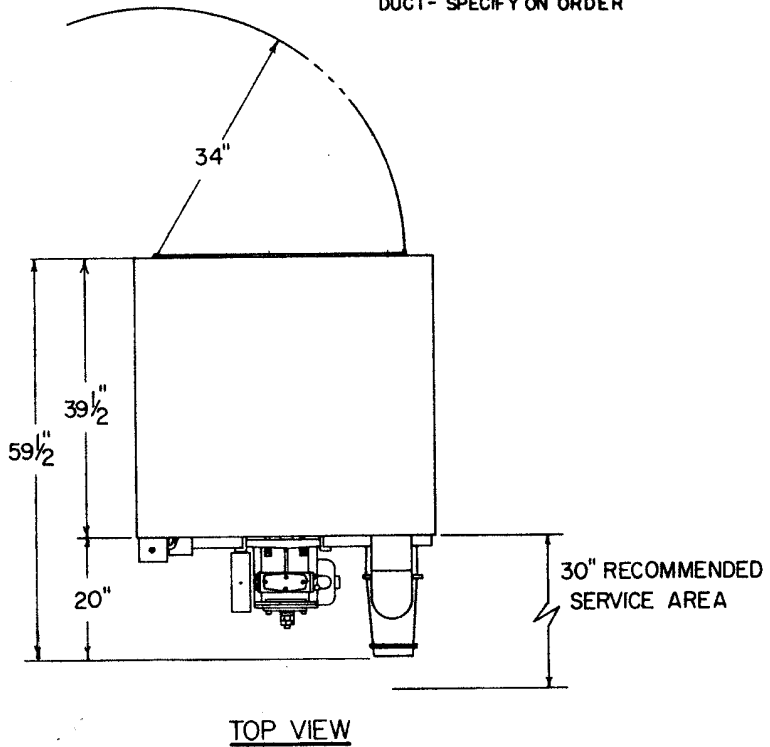
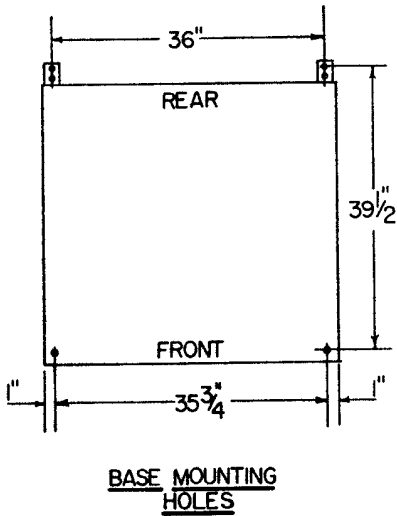
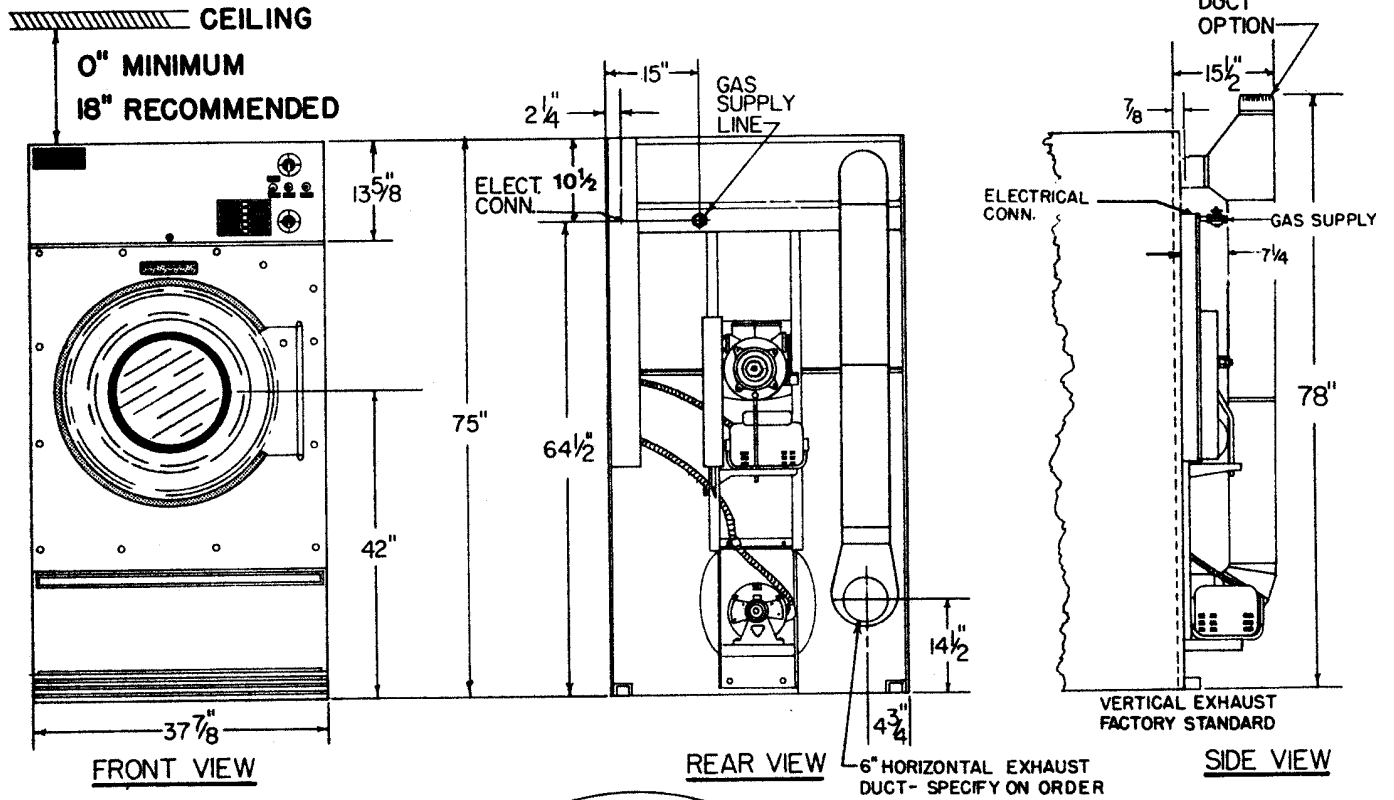
ELECTRIC HEATED MODEL

Heater Input	40 Kilowatts/Hour
Total Heater Current	See Page 65
Drying Time (Approximate)	70 lbs. Dryweight (Indian Head) 70% Moisture Retention - 38 Min.

*Input ratings as shown are for elevations up to 2000 ft. (610 M).
For higher elevations, ratings should be reduced 4% for each 1000 ft. (305 M) above sea level.

Electrical wiring to dryer must conform to local electrical code requirements.

70 lb. Dryer - Gas Heated - Model L36FD36 & L36RD36



ALL DIMENSIONS GIVEN IN INCHES ± 1/4

SPECIFICATIONS - ENERGY SAVER MODEL - L36FD36G
& L36RD36G

Basket Load Capacity	70 lbs. (31.5 kg) Dryweight
Floor Space.	78" (195 cm) H x 59½" (149 cm)D x 38" (96cm) W
Basket Size.	36" (92 cm) Diameter x 36" Deep -21 Cu.Ft.(.63M ³)
Exhaust Duct	6" Dia. (15 cm)
Motor Sizes.	Fan - 1/3 H.P.; Basket - 1 H.P.
*B.T.U. Input (3 Burners)	130,000 BTU/Hour Natural and Liquid Petroleum Gases
Maximum Air Displacement	536 C.F.M.(15.2 M ³ /Min.)
Recommended Operating Range.	436-536 C.F.M.(12-15 M ³ /Min.)
Gas Supply	3/4" Pipe Connection (1.91 cm)
Gas Pressure Regulator (Natural Gas)	Set at 3.5" (8.9 cm) Water Column
Manifold Pressure (L.P. Gas)	11" (28cm) Water Column
Drying Time (Approximate).	70 lbs. Dryweight (Indian Head), 70% Moisture Retention - 38 min.
Net Weight (Approximate)	675 lbs. (306 kg)
Domestic Shipping Weight (Approx.)	725 lbs. (329 kg) 1 Carton
Export Shipping Weight (Approx.)	1215 lbs. (551 kg) 1 Box
Export Crating	131.8 Cu. Ft. (3.95 M ³)
Export Shipping Dimensions	83" (208 cm) L x 45" (113 cm) W x 61" (153cm) H.
Basket R.P.M..	Reversing 40-3.2 Reversals per minute Non-Rev. 40

MOTORS USED - ALL 70 LB. DRYERS

<u>Motor No.</u>	<u>Voltage</u>	<u>Hz.</u>	<u>Ph.</u>	<u>Basket/Fan</u>	<u>H.P.</u>	<u>Amps</u>	<u>R.P.M.</u>
MTR203	115/200/230	60	1	B	1	10.4/5.2	1725
MTR212	200/230/460	60	3	B	1	3.8/1.9	1725
MTR206	110/220	50	1	B	1	12/6	1425
MTR208	208-220/440	50	3	B	1	4.8/2.4	1425
MTR104	200/400	50	3	B	3/4	3.4/1.7	1500
MTR101	575	60	3	B	1	1.7	1725
MTR209	115/208-230	60	1	F	1/3	5.2/2.6	1725
MTR218	208/220/440	50/60	3	F	1/3	1.7/.85	1425/1725
MTR141	220	50	1	F	1/3	2.8	1425
MTR184	240/415	50	3	F	1/3	1.6/.9	1425
MTR36	575	60	3	F	1/3	1.7	1725
MTR232	208/220/440	50	3	F	1/3	1.5/.75	1425

*Input ratings as shown are for elevations up to 2000 ft. (610 M).
For higher elevations, ratings should be reduced 4% for each 1000 ft.
(305 m) above sea level.

Electrical wiring to dryer must conform to local electrical code requirements.

GAS PIPING INFORMATION

Check gas rating plate for type of gas to equip the dryer.

Check for altitude elevation of the dryer.

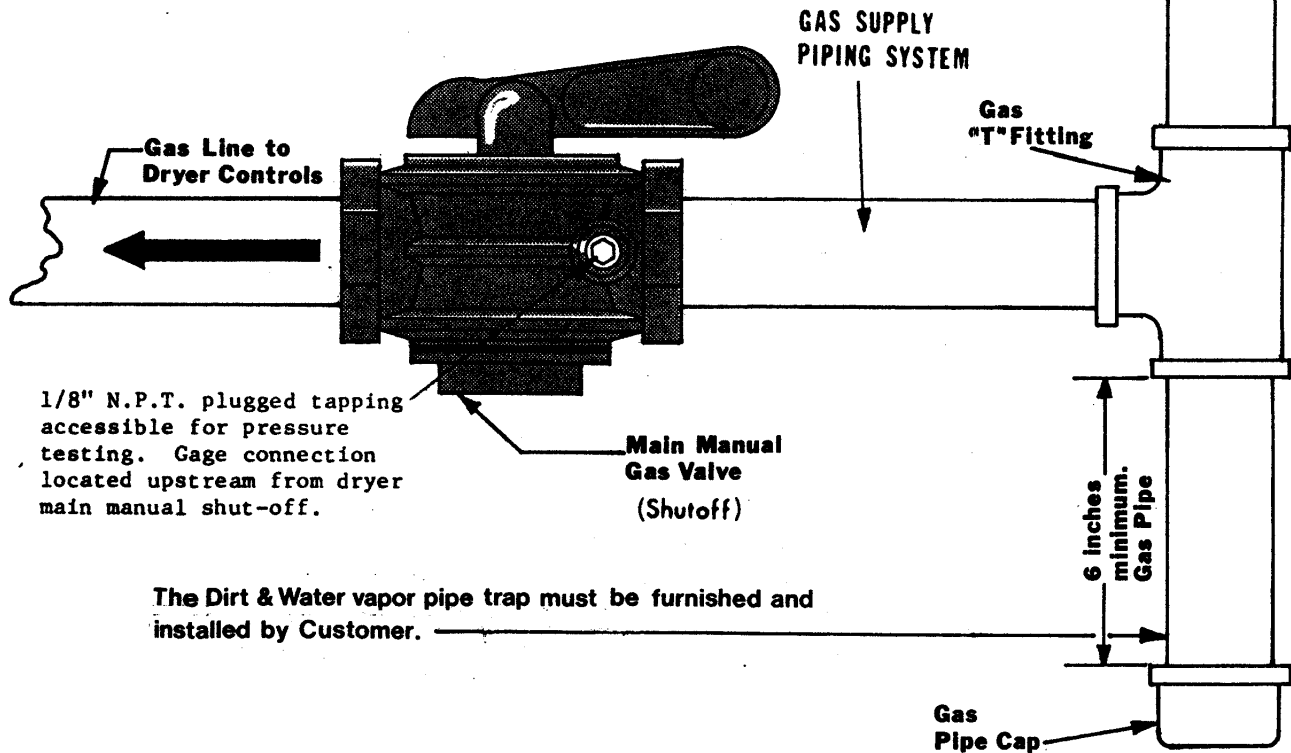
Check utility for proper installation of gas supply line and gas pressure.
NATURAL GAS ONLY.

Check the gas pressure inlet supply to dryer, 12 inches W.C. Pressure maximum.
Check the manifold pressure 3.5 inches W.C. Pressure inside the dryer.

CAUTION: Low gas pressure and intermittent gas will cause gas ignition problems. This will cause inadequate in drying of the clothes load.

The dryer and it's individual shutoff valve must be disconnected from the gas supply piping system during any pressure testing of that system at test pressures in excess of $\frac{1}{2}$ psig.

The dryer must be isolated from the gas supply piping system by closing it's individual manual shutoff valve during any pressure testing of the gas supply piping system at test pressures equal to or less than $\frac{1}{2}$ psig.



GAS PIPE SIZE FOR 1000 BTU NATURAL GAS AT 7" W.C. PRESSURE

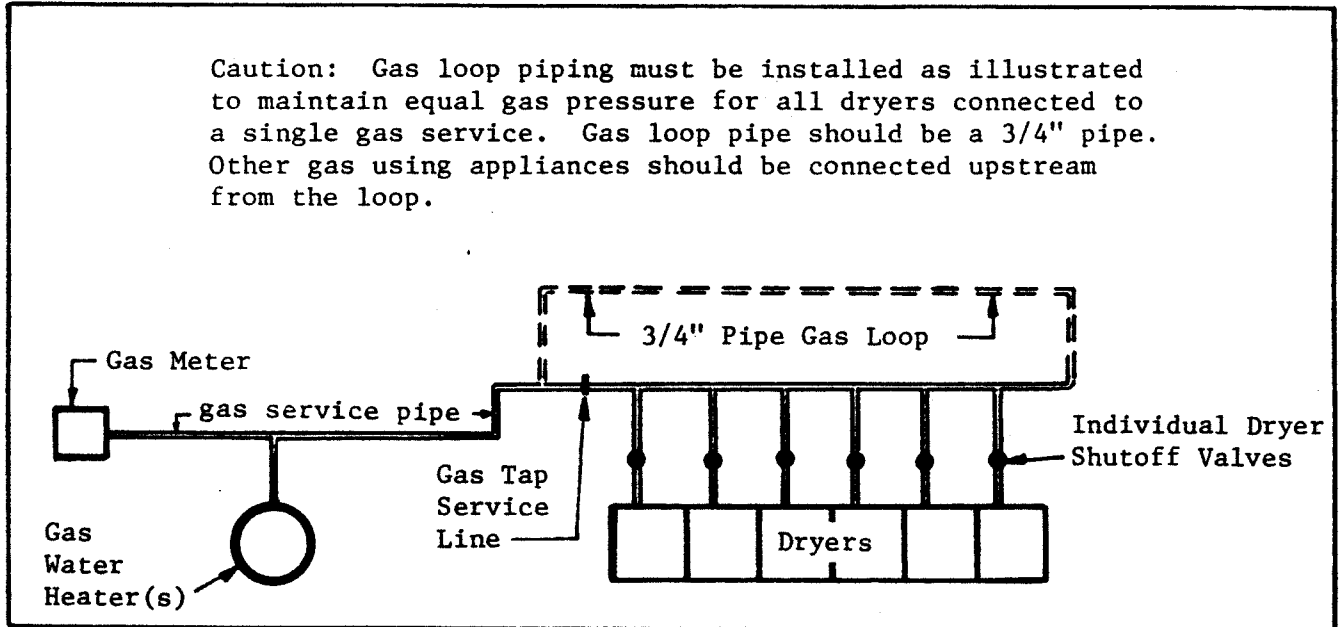
TOTAL BTU/HR (for L.P. gas correct total BTU/HR below by multiplying by .6)	In figuring total length of pipe, make allowance for tees and elbows.					
	25 Ft.	50 Ft.	75 Ft.	100 Ft.	125 Ft.	150 Ft.
60,000	3/4	3/4	3/4	3/4	3/4	3/4
80,000	3/4	3/4	3/4	1	1	1
100,000	3/4	3/4	1	1	1	1
120,000	3/4	1	1	1	1	1
140,000	3/4	1	1	1	1	1 1/2
160,000	3/4	1	1	1 1/2	1 1/2	1 1/2
180,000	1	1	1	1 1/2	1 1/2	1 1/2
200,000	1	1	1 1/2	1 1/2	1 1/2	1 1/2
300,000	1	1 1/2	1 1/2	1 1/2	1 1/2	1 1/2
400,000	1 1/2	1 1/2	1 1/2	1 1/2	1 1/2	2
500,000	1 1/2	1 1/2	1 1/2	2	2	2
600,000	1 1/2	1 1/2	2	2	2	2
700,000	1 1/2	2	2	2	2	2 1/2
800,000	1 1/2	2	2	2	2 1/2	2 1/2
900,000	2	2	2	2 1/2	2 1/2	2 1/2
1,000,000	2	2	2	2 1/2	2 1/2	2 1/2
1,100,000	2	2	2 1/2	2 1/2	2 1/2	2 1/2
1,200,000	2	2	2 1/2	2 1/2	2 1/2	2 1/2
1,300,000	2	2 1/2	2 1/2	2 1/2	2 1/2	3
1,400,000	2	2 1/2	2 1/2	2 1/2	3	3
1,500,000	2	2 1/2	2 1/2	2 1/2	3	3
1,600,000	2	2 1/2	2 1/2	3	3	3
1,700,000	2	2 1/2	2 1/2	3	3	3
1,800,000	2 1/2	2 1/2	3	3	3	3
1,900,000	2 1/2	2 1/2	3	3	3	3
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3,200,000	3	3	3 1/2	3 1/2	3 1/2	4
3,400,000	3	3 1/2	3 1/2	3 1/2	4	4
3,600,000	3	3 1/2	3 1/2	3 1/2	4	4
3,800,000	3	3 1/2	3 1/2	4	4	4
4,000,000	3	3 1/2	3 1/2	4	4	4

GAS PIPING INSTALLATION

The installation must conform with local codes or, in the absence of local codes, with the National Fuel Gas Code, ANSI Z223.1-1984.

GAS SERVICE INSTALLATION INFORMATION

The size of the gas service pipe is dependant upon many variables, such as tees, lengths, etc. Specific pipe size should be obtained from the gas supplier. Refer to the "Gas Pipe Size" chart in this manual for general gas pipe size information.



WARNING: If the dryer is to be connected to liquified petroleum (L.P.) gas, a vent to the outdoors must be provided.

DRYER INSTALLATION WITH SEPARATE EXHAUST (PREFERRED)

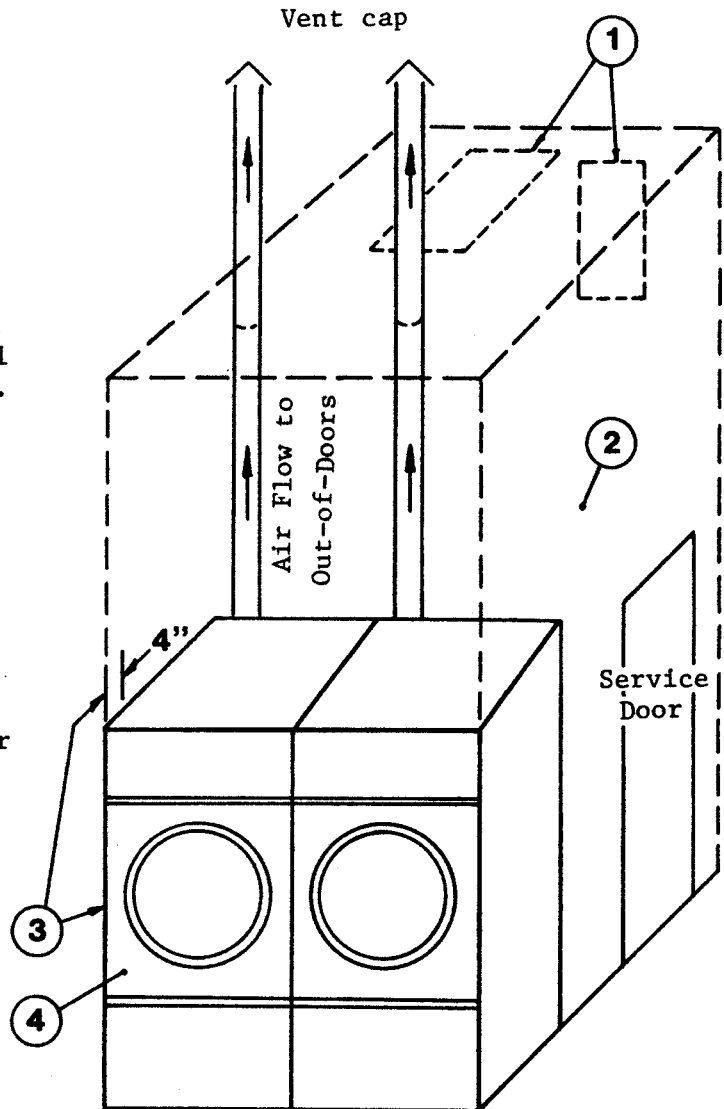
For ductwork less than 14 ft. and 2 elbows equivalent and less than 0.3 in. static pressure.

Never exhaust the dryer into a chimney.

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

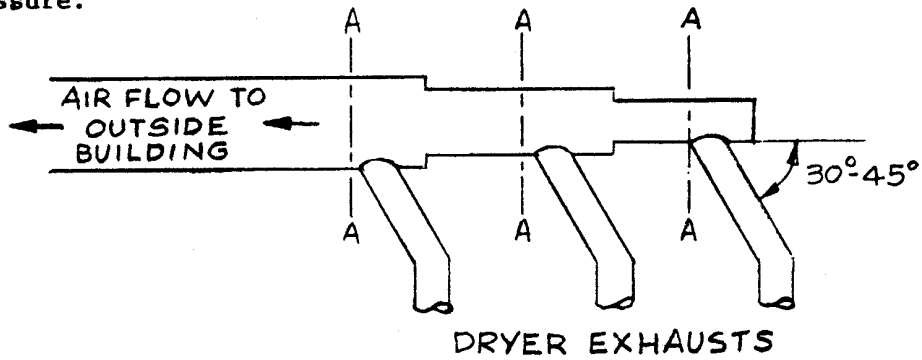
Never exhaust into a wall, ceiling, or concealed space.

- ① Make-Up Air opening from outside the building may enter the enclosure from the top or side walls. The area of the opening should be equal to 4 to 6 times the sum of the 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, additional heat loss can be another 25 B.T.U./hr. for each cubic foot per minute (CFM) used. Example: a 110 lb. dryer with 2000 CFM = heat loss of 50,000 B.T.U./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 front panels is about 60 B.T.U./hr. per square foot.



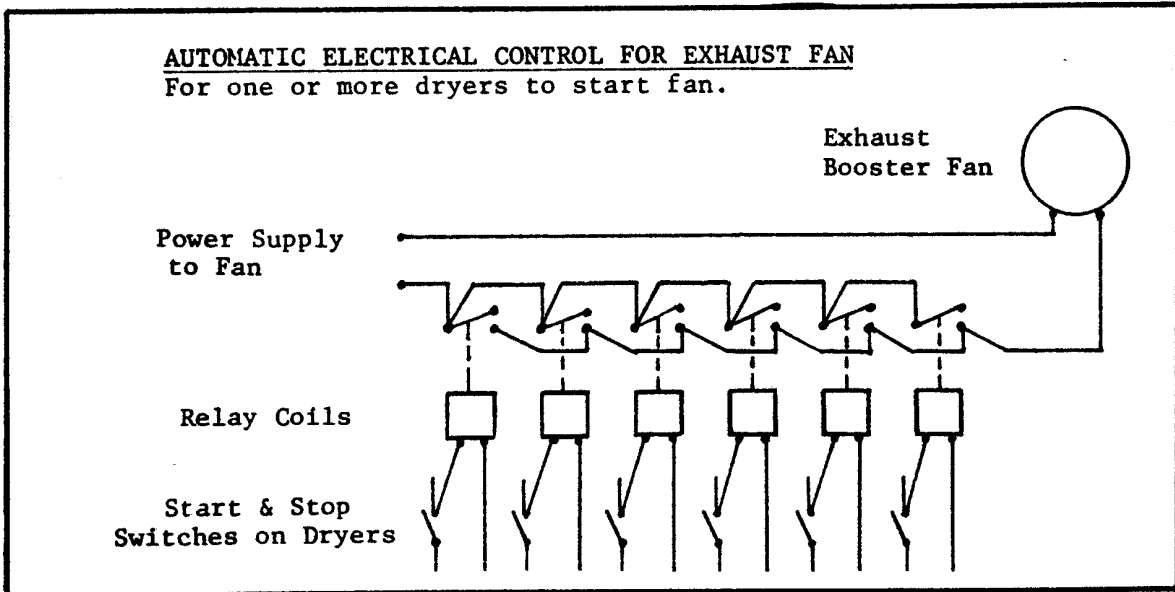
DRYER INSTALLATION WITH MULTIPLE EXHAUST

For Exhaust Duct less than 14 ft. and two elbows equivalent and less than 0.3 in. static pressure.



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

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
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
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												

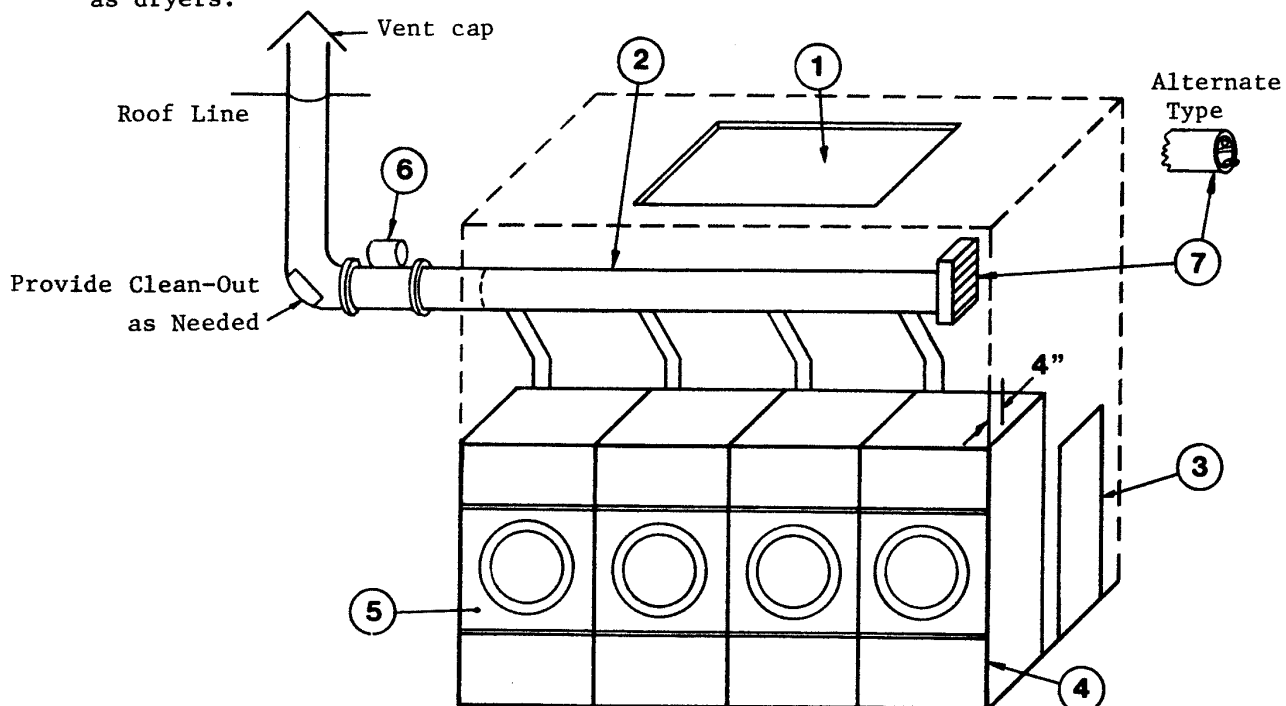


DRYER INSTALLATION WITH MULTIPLE EXHAUST

For Exhaust Duct more than 14 ft. and 2 elbows equivalent and more than 0.3 in. 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 B.T.U./hr. for each cubic foot per minute (CFM) used. Example: 110 lb. dryer, 2000 CFM = 50,000 B.T.U./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 B.T.U./hr. per sq. ft.
- 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 previous page. Must meet local electrical codes. Fan air flow (CFM) is equal to sum of dryer air flows, but static pressure (S.P.) is dependent on length of pipe and number of elbows.
- ⑦. Barometric By-Pass Damper - adjust to closed flutter position with all dryers and exhaust fan running. Must be located within enclosure.

CAUTION: No two installations are the same. For assistance, consult factory (502) 587-1292. 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.



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 to 6 times the combined areas of the air outlet) and an exhaust duct size and length which allows flow through the dryer with no more than 0.3 inches water column static pressure in the exhaust duct.

Energy-saving dryer models require less inlet air area and smaller exhaust ducts than the regular dryers because there is about half as much air flow through the dryer. However, the importance of the proper inlet air area and the correct exhaust duct size is twice as important on energy saving models. The huge savings of an energy-saver dryer is offset only by the attention required to provide the proper air flow. Once this proper air flow is provided, it lasts for the life of the installation.

CISSELL WILL PROVIDE FREE ENGINEERING ADVICE FOR ANY SPECIFIED INSTALLATION.

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.

EXHAUSTING DUCT

For best drying:

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

MAKE-UP AIR

For best drying:

1. Provide opening to the out-of-doors in accordance with the following: For each dryer -
6" dia. exhaust req. 1 sq. ft. make-up air
8" dia. exhaust req. 2 sq. ft. make-up air
12" dia. exhaust req. 4 sq. ft. 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.

FOR HELP, consult Cissell Engineering on tough installations.

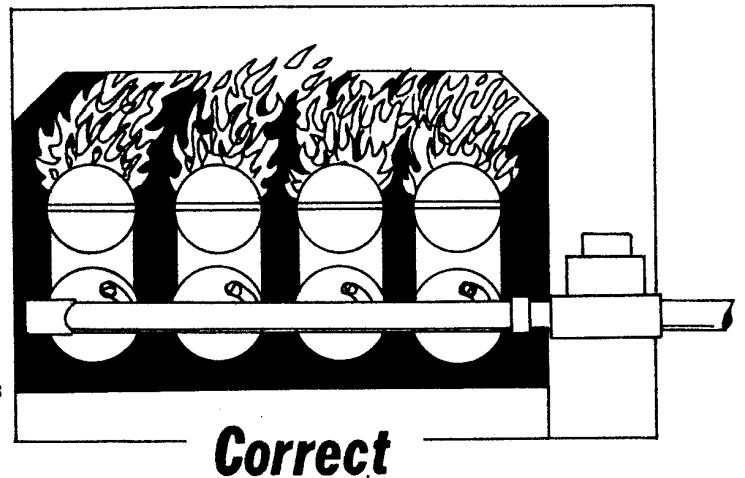
Trouble Shooting: Hot dryer surfaces, scorched clothes, slow drying, lint accumulations, or air switch mal-function are indicators of exhaust duct and/or make-up air problems.

Burner Air Inlet Shutters Adjustment

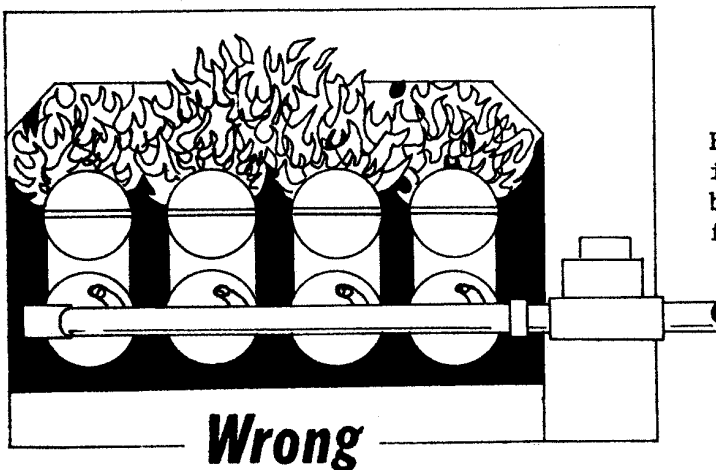
<u>TYPE OF GAS</u>	<u>BURNER AIR INLET SHUTTERS ADJUSTMENT</u>
Natural Gas	1/2 Open
Liquid Petroleum	1/4 Open
Manufactured Gas	1/16 Open

Air Shutters Adjustment

Proper Method: Close air shutters to yellow tip, then open air shutters to blue flame tip. Orange tips are impurities in the air such as lint, dust, etc.



Burners air inlet shutters are correctly adjusted when flame is primarily blue.

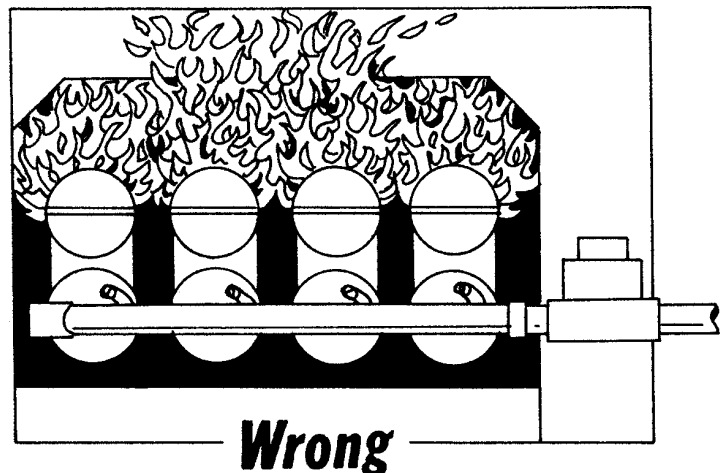


NEED TO ADJUST SHUTTER

Burners Air Inlet Shutters are adjusted insufficient, air is admitted through the burner. Flame pattern is straight up and flame is yellow.

NEED TO PROVIDE CORRECT AIRFLOW THROUGH THE DRYER

This flame pattern indicates the Burner Air Inlet Shutters are correctly adjusted, but air through the dryer is insufficient. This condition indicates excessive lint in the lint compartment, lack of make-up air in the room, restricted exhaust duct, or a vacuum in the room caused by a exhaust fan.

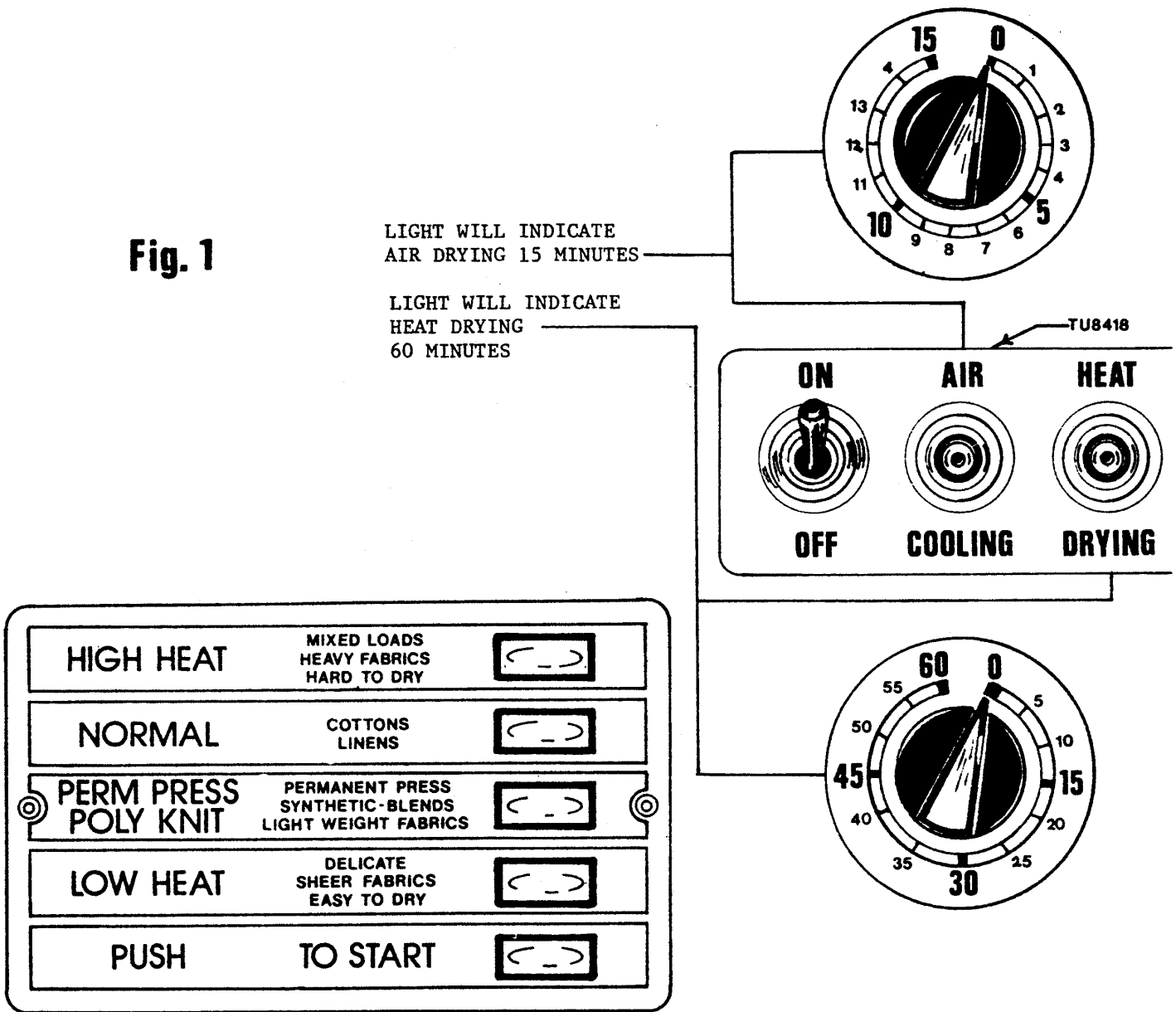


TWO TIMER MODEL OPERATING INSTRUCTIONS

- STEP 1 After loading the dryer tumbler with the water washed clothes load, proceed to close the loading door.
- STEP 2 Turn the 60 minute drying timer to the desire drying time. The drying cycle light will be on and indicate the drying. The light shuts off when drying time is complete. See Fig. 1.
- STEP 3 Turn the 15 minute cooling cycle timer to the desired cool down time. After the drying cycle is completed, then the cooling cycle time will automatically operate. The cooling light will be on and indicate the cooling of the clothes load. The light shuts off when cooling time is completed. See Fig. 1.
- STEP 4 Temperature Selector - Select temperature per type of load being dried in the dryer.
High Heat - Mixed and heavy fabrics - 180°F. exhaust temperature.
Normal - Cottons and linens 170°F. exhaust temperature.
Permanent Press Heat - Poly knit snythetic-blends-light weight fabrics, 155°F. exhaust temperature.
Low Heat - Delicate-sheet fabrics-easy to dry, 140°F . exhaust temperature.
- STEP 5 Turn switch to "on" position if dryer is equipped with "on-off" switch. See Fig. 1.
- STEP 6 Press in "Push to Start" button (approximately 2 seconds) until the dryer starts running and then release button.
- What is happening to the drying operation?
1. The fan motor will operate.
 2. The clothes tumbler will revolve.
 3. The heated energy-gas-will be energized.
 4. The heated air will mix with the water washed clothes to evaporate the moisture from the garments.
 5. The thermostats will function at a safe temperature at the end of the drying cycle.
 6. The heat will be shut off and the motor will continue to run to cool the dry load to a desired handling temperature.
- STEP 7 At the end of the cool down cycle the clothes load is dry.
- STEP 8 To shut the dryer off and the electricity off from the dryer, turn the "On & Off" switch to "Off" position. This switch is a safety switch to immediately stop the dryer's operation.

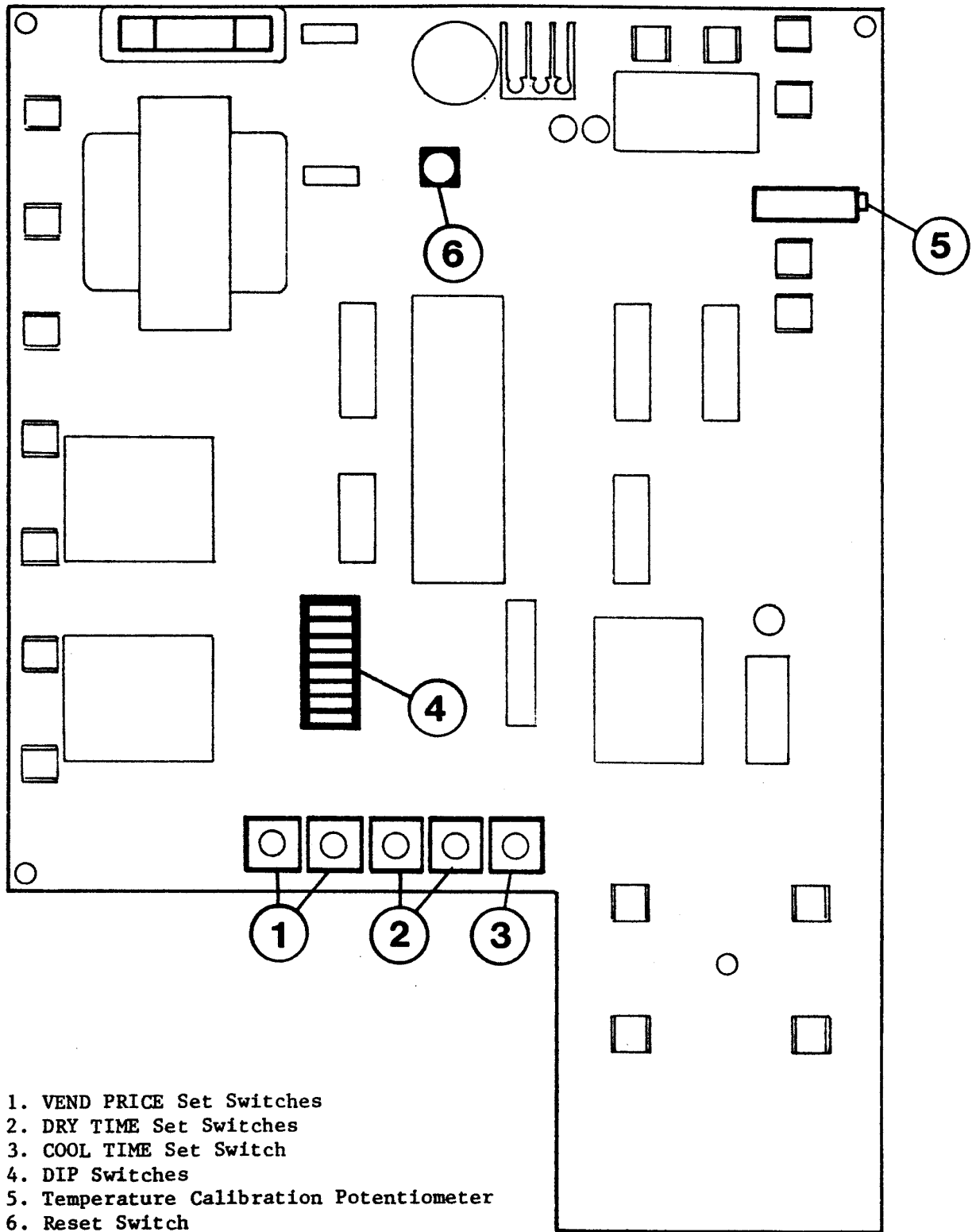
TIME and TEMPERATURE Control Panel

Fig. 1



Important: This is a commercial dryer. It has keys to open the lower lint area panel and the upper control and burner area panel. This is equipped for the user's safety.

PROMPTER™ CONTROL BOARD SWITCHES

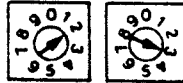


INSTRUCTIONS FOR SETTING SWITCHES ON THE PROMPTER CONTROL BOARD
COMMERCIAL USE ONLY

1. VEND PRICE Set Switches - Not applicable for commercial use.

2. DRY TIME Set Switches - These two switches determine how many minutes are in the drying cycle. The left switch is divided into increments of 10 minutes and the right switch is divided into one minute increments.

Example: To set 23 minutes:



Note: "00" denotes 99 min.

$$20 + 3 = 23 \text{ minutes}$$

$$(2 \times 10) (1 \times 3)$$

3. COOL TIME Set Switch - This switch determines the maximum minutes in the cooling cycle. It can be set from 0-18 minutes in 2 minute increments.

Example: To set 14 minutes.



4. DIP Switches - These switches number 1-8 denote various functions of the control panel. Only switches 1-7 are operational, 8 is not. If two or more "Display" (3-6) are on at a given time, the highest number switch is given precedence. The functions of the switches are as follows:

"OFF" POSITION

1. Coin Operation
2. Auto-Dry on
3. No Function
4. No Function
5. No Function
6. No Function
7. Therm-O-Cool
8. No Function



"ON" POSITION

1. Commercial Operation (Non-Coin)
2. Auto-Dry Off
3. Display Even Dollars Accumulated
4. Display Dry Time Setting
5. Display Cool Time Setting
6. Display Temperature
7. Timed Cool
8. No Function

5. Temperature Calibration Potentiometer - Factory set.

6. Reset Switch - Resets control panel back to start position.

PROMPTER OPERATING INSTRUCTIONS - COMMERCIAL MODELS

This dryer has a Control Panel with lights that will blink on and off to tell the operator what to do next, step by step.

1. Read the "Set Up Procedure" before operating the dryer.
2. Turn the On/Off switch to On.
3. Load the dryer with water washed clothes and close the dryer door.
4. Push One Fabric Selector for the appropriate type of load to be dried. This setting may be changed at any time during the cycle by pushing another selection. The corresponding lamp will remain on during the cycle. 195°
5. Push To Start will begin the drying cycle. 195°
6. Dry Rite lamp will come on and the drying will begin. The lamp will stay lit until the expiration of the pre-set drying time (Timed Dry) or until the load is dry (Automatic Dry) which is determined by the moisture sensor. 175°
7. Therm-O-Cool lamp will come on after the drying cycle is completed and will remain lit for the duration of the pre-set cooling time or until the temperature drops to 135°F. 160°
8. Minutes (digital display) With the dryer in the Timed Dry Cycle, the display will show the total number of minutes at the beginning of the dry cycle and will count down in one minute intervals as the dryer runs. With the dryer in the Automatic Dry Cycle, the display shows "000" minutes at the beginning of the cycle and will count up as the dryer runs.
9. Computer Reset - use to reset the control panel to "start" position.
10. Reversing/Non-Reversing - Reversing is designed for loads that may tangle (bed sheets, large items, etc.). Non-Reversing is designed for loads that may not tangle (small or medium size items).



RULES FOR SAFE OPERATION OF YOUR CISSELL DRYER

1. Be sure your dryer is installed properly in accordance with the recommended instructions.
2. CAUTION: Be safe - shut main electrical power supply and gas supply off externally before attempting service.
3. CAUTION:
 - a. Never use drycleaning solvents: gasoline, kerosene, or other flammable liquids in the dryer. Fire and explosion will occur.
 - b. Never put fabrics treated with these liquids into the dryer.
 - c. Never use these liquids near the dryer.
 - d. Always keep the lint screen clean.
 - e. Never use heat to dry items that contain plastic, foam or sponge rubber, or rags coated with oils, waxes or paints. The heat may damage the material or create a fire hazard. Rubber easily oxidizes causing excessive heat and possible fire. Never dry the above items in the dryer.
4. Never let children play near or operate the dryer. Serious injury will occur if a child should crawl inside and the dryer is turned on.
5. Never use dryer door opening and top as a step stool.
6. Read and follow manufacturer's instructions on packages of laundry and cleaning aids. Heed any warnings or precautions.
7. Never tumble fiberglass materials in the dryer unless the labels say they are machine dryable. Glass fibers break and can remain in the dryer and could cause skin irritation if they become mixed into other fabrics.
8. Reference - Lighting and shutdown instructions and wiring diagrams are located on the rear wall of the dryer cabinet.

ENERGY SAVING TIPS:

1. Install dryer so that you can use short, straight venting. Turns elbows and long vent tubing tend to increase drying time. Longer dry time means the use of more energy and higher operating costs.
2. Operate dryer using full-size loads. Very large loads use extra energy. Very small loads waste energy.
3. Dry light weight fabrics separately from heavy fabrics. You will use less energy and get more even drying results by drying fabrics of similar weight together.
4. Clean the lint screen area daily. A clean lint screen helps give faster, more economical drying.

5. Do not open the dryer door while drying, you let warm air escape from the dryer into the room.
6. Unload your dryer as soon as it stops. This saves having to re-start your dryer to remove wrinkles.

Service Savers

To help you troubleshoot the dryer, we list below the most common reasons for service calls and some answers to the problems. Before you call service please review the following items:

DRYER WON'T START:

1. Is the door completely closed?
2. Are the controls set to a drying position and not to off?
3. Did you push the start control?
4. Has a fuse blown or a circuit breaker tripped? Are fuses tight?
5. Check for low voltage.

DRYER WON'T HEAT:

1. Is the dryer set for a heat rather than an air only position?
2. Is the gas valve in the dryer and the valve on the main gas line turned on?
3. Check for low or intermittant gas pressure.

CLOTHES ARE NOT SATISFACTORILY DRY:

1. Timed cycle - Did you allow enough heating time before the cool-down part of the cycle?
2. Is the lint screen blocked?
3. Is the exhaust duct to the outside clean and not blocked? (A blocked exhaust will cause slow drying and other problems.)
4. Venting, air switch closing and make-up air for each drying.

GAS DRYER IGNITION:

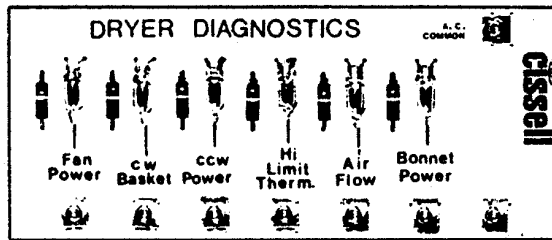
Refer to page 40 "Instructions for the Direct Ignition System Operation."
Check to see if the manual gas valve is open. Then reset the dryer controls.
If dryer still fails to heat, call for service. All panels, covers, and doors must be in place and closed before starting dryer.

VERY IMPORTANT:

When calling the factory for service, always refer to the model number and serial number.

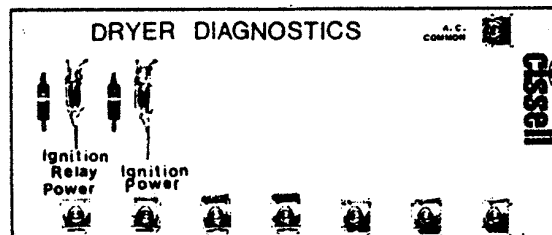
DRYER DIAGNOSTICS

This Prompter Dryer is equipped with two Dryer Diagnostic circuit boards, upper and lower, which are located in the control box in the front of the dryer behind the control panel. The lamps are a valuable aid in detecting problems in the dryer. The functions of the two boards are outlined below:



UPPER DIAGNOSTIC BOARD

1. Fan Power - indicates the power to the fan is on.
2. Basket Power - indicates power to the basket motor is on for either reversing/non-reversing operation (clockwise or counterclockwise rotation).
3. Hi Limit Thermostat - indicates the safety thermostat is closed, which is the first element in the safety control circuit.
4. Air Flow - this lamp glows when the air flow switch is closed; the lamp blinks if the air flow switch is fluttering. Power is available to the control thermostats when the air flow switch is closed.
5. Bonnet Power - this lamp glows when a control thermostat circuit is closed and whenever the timer is not in the cool-down cycle.



LOWER DIAGNOSTIC BOARD

1. Ignition Relay Power - this lamp will glow when the ignition relay coils is energized. This lamp is the key to trouble shooting the ignition components. First, when the radiant sensor is cool, the lamp indicates the radiant sensor switch is closed and that the normally closed (NC) contacts of the relay are now open and that the normally open (NO) contacts are now closed, which indicates that the relay coil is o.k. and operating. At this time, when the radiant sensor is cool, the igniter should be glowing and the Ignition Power lamp should be lit. Second, when the radiant sensor is hot, the lamp indicates that the NO contacts of the relay are now closed and power is available for the operating gas valve. At this time, when the radiant sensor is hot, the operating gas valve should be energized and the gas should be burning.
2. Ignition Power - this lamp indicates the power is flowing to the igniter through the radiant sensor and the igniter should be glowing red hot. If this lamp is not lit, and the Ignition Relay Power lamp is lit, then the gas should be burning which means that the operating gas valve has been energized by means of a circuit through the non-glowing igniter.

TROUBLE SHOOTING CHART--GAS AND ELECTRIC DRYERS

TROUBLE	CAUSE	REMEDY
Motors will not start	No Power	Check fuses on circuit breakers. Make sure main control switch is <u>on</u> .
	Incorrect power	Check power source: voltage, phase, and frequency must be the same as specified on electrical rating plate. Low Voltage
	Time off	Turn timer clock wise to desired time setting.
	Loose wiring connections	Check wire connections in electrical box on rear of Dryer.
	Defective starting relay	Check coils and contacts.
Motor tripping on thermal overload	Low voltage	Check voltage at motor terminals. Voltage must be within (plus or minus) 10% of voltage shown on motor rating plate--it not, check with local power company for recommended corrective measures.
	Inadequate wiring	Check with local power company to insure that wiring is adequately sized for load.
	Loose connections	Check all electrical connections and tighten any loose connections.
	Inadequate air	Check installation sheet in service manual for recommended make up air openings.
	Poor housekeeping	Clean lint accumulation on and around motors.
Basket motor will not run	Loading door open	Close door.
	Door switch out of adjustment	Adjust switch by removing cover and bend actuator lever to clear switch button 3/8" with cover in place.
	Defective door switch	Replace switch.
	Defective basket motor contactor	Replace contactor.

TROUBLE	CAUSE	REMEDY
Basket motor runs, but basket will not revolve	V-Belt Broken	Replace V-Belt.
	V-Belt Loose	Adjust Belt Tension.
	Motor pulley loose	Tighten set screw.
	Basket overloaded	Remove load.
Dryer noisy or vibrating	Not leveled	Check manual for proper leveling procedures.
	Fan out of balance	Accidental damage to the fan blade can change the dynamic balance. Damaged fans should be replaced.
	Basket rubbing	Adjust basket clearance.
	V-Belt sheaves	Tighten set screws, make sure sheaves are in proper alignment.
	Belt	Adjust belt tension.
	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 but no heat	Incorrect voltage	Check for correct control voltage - 120V.
	No voltage	Check power supply, check secondary voltage on transformer and check wiring and wiring diagram.
	Silicon carbide igniter will not glow - red	Broken or defective igniter--replace.
	Light red silicon carbide igniter	Check for 2.5 minimum amperage. Low amperage not hot enough.
	Defective igniter time delay relay	Heater No. 1 and No. 6 open circuit, if above occurs replace time delay relay.
	Lint door open	Close lint door.
	Defective gas valve	Replace coil assembly.
	Gas turned off	Turn manual gas valve "on."
Defective lockout time delay relay	Heater No. 2 and No. 3 open circuit. Contact No. 5 and No. 7 open. If above occurs, replace time delay relay.	

TROUBLE	CAUSE	REMEDY
Dryer runs but no heat	Lockout time delay contacts will not open	Replace capacitor. Replace time delay relay.
	Defective door switch	Replace door switch.
	Silicon carbide igniter not igniting gas	Must be 3/16 to 5/16 above burner, Replace radiant sensor
	Air switch not operating	Clean out lint compartment daily. Check back draft damper for foreign objects, lint accumulation or other causes that may prevent damper from opening. Check duct work for lint build-up. Check installation sheet to insure that duct work and make up air openings are adequately sized. Check exhaust outlet. If a screen has been improperly installed on the outlet, it may be clogged with lint or frozen over in winter. Never install a screen on the exhaust outlet. Vacuum within dryer drops to .09 inches of water column, or less, for normal operation of dryer, vacuum reading (in inches of water column) should range between .15 and .3 inches. Vacuum reading can be made with a vacuum U-gauge by removing a sheet metal screw in the front panel of dryer, and inserting the rubber tube of the vacuum gauge into screw opening.
	Air switch out of adjustment	See air switch adjustment sheet in service manual.
	Air switch defective	Replace air switch.
	Gas pressure too low	Check manifold pressure and adjust to pressure specified on rating plate. If this pressure cannot be obtained, have gas supplier check main pressure.
	Improper orifice	Dryer is orificed for type of gas specified on rating plate. Check with gas supplier to determine specifications for gas being used. If different from rating plate, contact factory and obtain proper orifices.
	Electric power to heating unit turned off	Turn power on.
	Line fuse or heater circuit fuse blown to unit	Replace fuse.

TROUBLE	CAUSE	REMEDY
Dryer runs but no heat	Defective relay	Replace relay.
	Defective electric elements	Replace elements.
	Defective thermostat	Replace thermostat.
	Defective safety overload thermostat	Replace thermostat.
	Lint compartment door open	Close door.
Main burners burning improperly	Burner air shutters closed	Open for blue flame.
	Dirt in burner	Blow out.
	Gas pressure too high	Check rating plate for correct gas pressure.
	Orifice too large	Send to factory for correct orifices.
	Restricted or blocked exhaust	Clean exhaust.
Main burner cycling on and off	Radiant sensor	Replace
Low gas flame or high gas flame	Incorrect main burner orifices	Replace orifices--check factory for correct size.
Dryer too hot	Incorrect main burner orifice	Replace orifices--check factory for correct size.
	Inadequate make-up air	Make up air must be 4 to 6 times the exhaust area of the dryer.
	Lint accumulated	Remove lint.
	Exhaust duct dampers	Must be full open or replace.
	Gas pressure too high	Adjust gas pressure as specified on rating plate.
	Partially restricted or inadequately sized exhaust system	Check installation sheet in service manual for recommended sizes. Check for and remove obstructions or lint build up from duct work. Never use smaller size exhaust duct. Always use larger size exhaust duct.
	Defective thermostat	Replace thermostat.

TROUBLE	CAUSE	REMEDY
Dryer does not stop at end of time period	Defective timer	Replace timer
Basket does not reverse	Reversing timer	Check timer to see if operating.
	Reversing timer	Adjust timer (see Furnas control sheet)

SAFETY FEATURES

1. Electrical power interruption such as:
 - a. Open and closing the loading door.
 - b. Thermostats cycling "off" and "on".
 - c. Timers and switches turned "off" then "on".
 - d. Opening lint door.

The main burner gas will not flow until the flame switch sensor cools and the contacts reset. Then the normal operation of the ignition circuit resumes.

2. The main gas fails to ignite. The Lockout Time Delay Relay thermal heater opens it's contacts, which shuts off the gas and de-energizes the silicon carbide igniter.

The lockout T.D.R. shuts off the gas until the timer turns off the dryer.

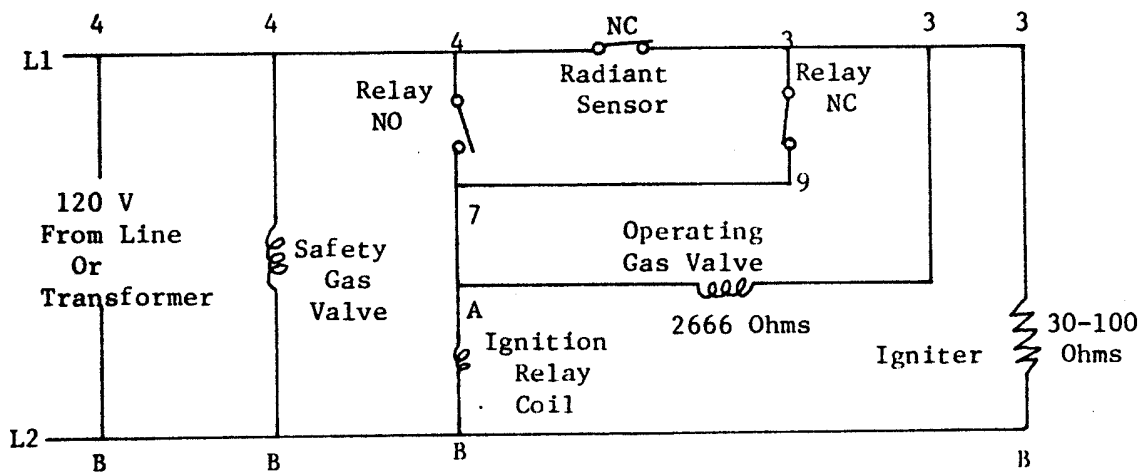
Wait 5 minutes before turning time on the timer.

OPERATION OF THE NEW NORTON SILICON CARBIDE IGNITION SYSTEM

Power to the ignition system is 120 volts. It is rated voltage or on higher voltage machines the 120 volts is from a transformer. The ignition system is powered through a timer or coin meter and a thermostat which calls for heat.

The two gas valves are plumbed into a single gas line and both must open before the gas can flow into the burners.

The following diagrams are line to line schematics of the ignition system. The numbers 4, 7, 3, 9, and letters A and B are terminals on the ignition relay.

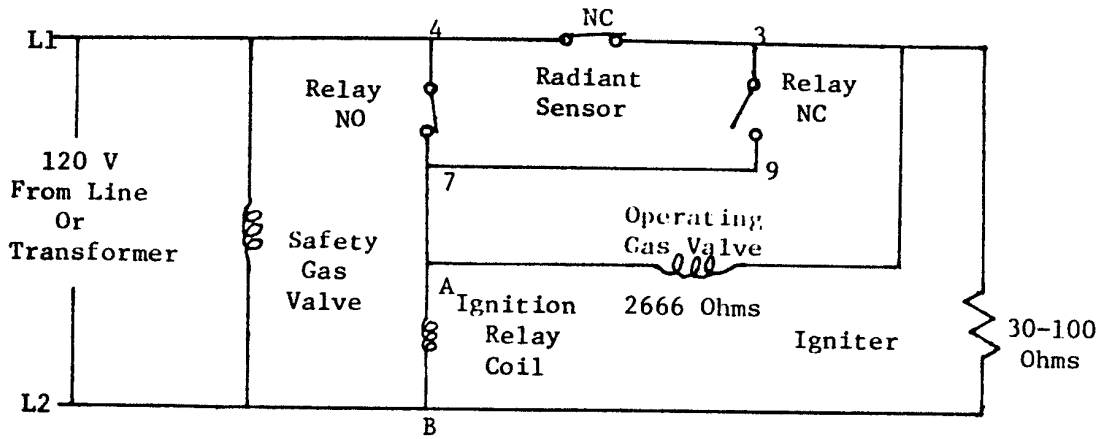


NEW NORTON SILICON CARBIDE IGNITION SYSTEM

Fig. 1 (Start of Cycle)

Step #1 (Start of Cycle), see Fig. 1

- a. The safety gas valve is connected across the lines and opens immediately as soon as a need for heat is indicated by the thermostat.
- b. The ignition relay coil is energized through the normally closed (NC) contacts of the radiant sensor and the NC contacts of the relay. Note! Fig. 1 shows the electrical circuit of the relay just before it is energized. Fig. 2 shows the circuit a moment later.
- c. The igniter is energized through the NC contacts of the radiant sensor.
- d. The operating gas valve is connected such that the same 120 volts is applied to both sides of the gas valve and the valve stays closed.

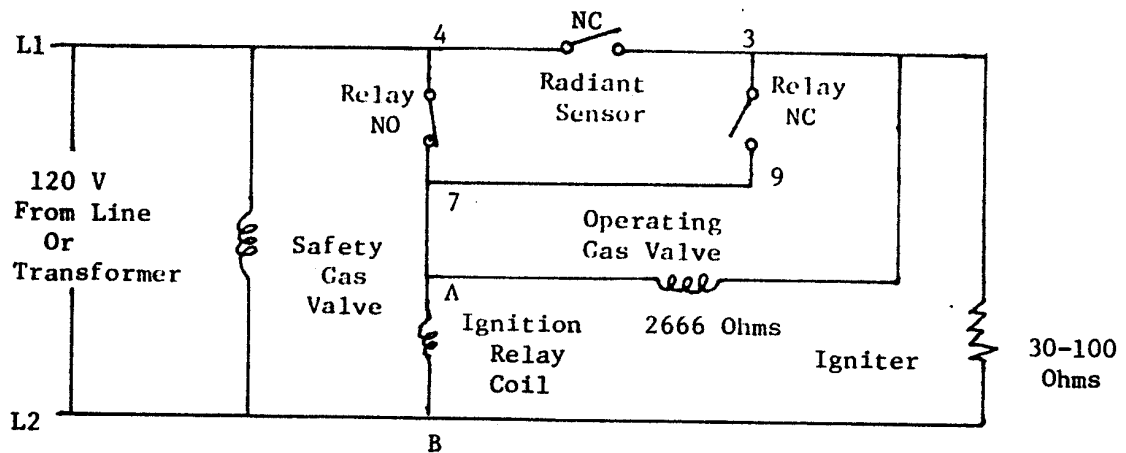


NEW NORTON SILICON CARBIDE IGNITION SYSTEM

Fig. 2 (An Instant Later)

Step #2 (A moment after Step #1), see Fig. 2

- a. The ignition relay closes now and the relay coil stays energized by being powered through the normally open (NO) contacts of the ignition relay which close before the NC contacts open.
- b. The operating gas valve still has the 120 volts applied to both sides of the gas valve and the valve stays closed.



NEW NORTON SILICON CARBIDE IGNITION SYSTEM

Fig. 3 (About 20 Seconds Later)

Step #3 (About 20 seconds after Step #2), see Fig. 3

- a. The igniter glows red hot which causes the radiant sensor to open its NC contacts which de-energizes the igniter.
- b. As the radiant sensor NC contacts open, the 120 volt to one side of the operating gas valve coil is removed and an electrical circuit is formed through the NO contacts of the inition relay,

through the gas valve and through the igniter; and the gas valve opens. The relatively low resistance of the igniter allows nearby full voltage to be applied to the operating gas valve and nearby zero voltage to the igniter and the igniter is de-energized for all practical purposes.

- c. As the raw gas flows against the red hot igniter, ignition takes place. The radiant gas flame replaces the radiant glowing of the igniter and the radiant sensor NC contacts remain open.

The flame will burn until the thermostat opens the circuit or until the time on the timer or coin meter expires.

The following summarizes the ignition operation.

Start machine drying cycle. Carbide igniter will get red hot. Then gas valve will open. The gas burners are ignited by the carbide igniter. Igniter will shut off and burners will remain on during drying cycle.

Opening tumbler door will cause gas to extinguish. Shut door and gas will not light until flame sensor cools and normal ignition cycle begins.

Note! Push start switch after door is shut.

If gas does not light, then the sensor will cool down and restart the ignition cycle.

Safety Features

Power Interruptions During Burning of the Gas

Both gas valves are de-energized and the gas is shut off. The ignition relay is also de-energized and returns the contacts to the NO and NC positions. Even with resumption of power, the operating gas valve stays closed until the NC contacts of the radiant sensor close (about 30 seconds from time of power interruption). A normal ignition cycle begins at this time.

Burner Doesn't Light Because of Low Voltage or Low Gas Pressure

The operating gas valve will be energized for about 30 seconds and then the NC contacts of the radiant sensor will be closed. 120 volts is applied to both sides of the operating gas valve and it closes to shut off the gas. A normal ignition cycle begins at this time.



831 SO. FIRST ST. LOUISVILLE, KY. 40203

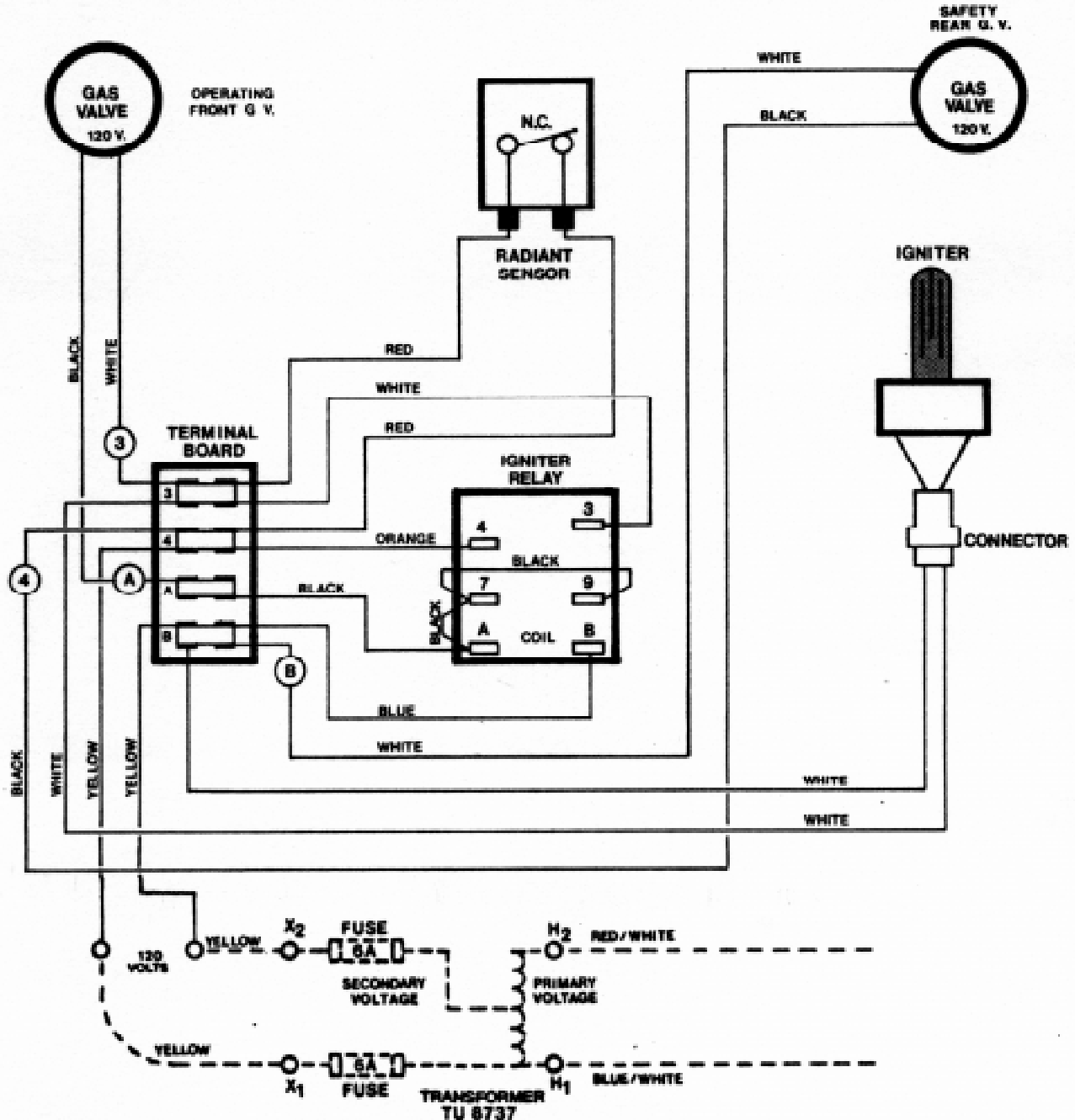
WIRING DIAGRAM

MORTON SILICON CARBIDE GAS IGNITION SYSTEM
120 VOLTS; 50/60 HZ; 1 PHASE

TWL 679*

TWL 680

C & F MODELS



• NOTE

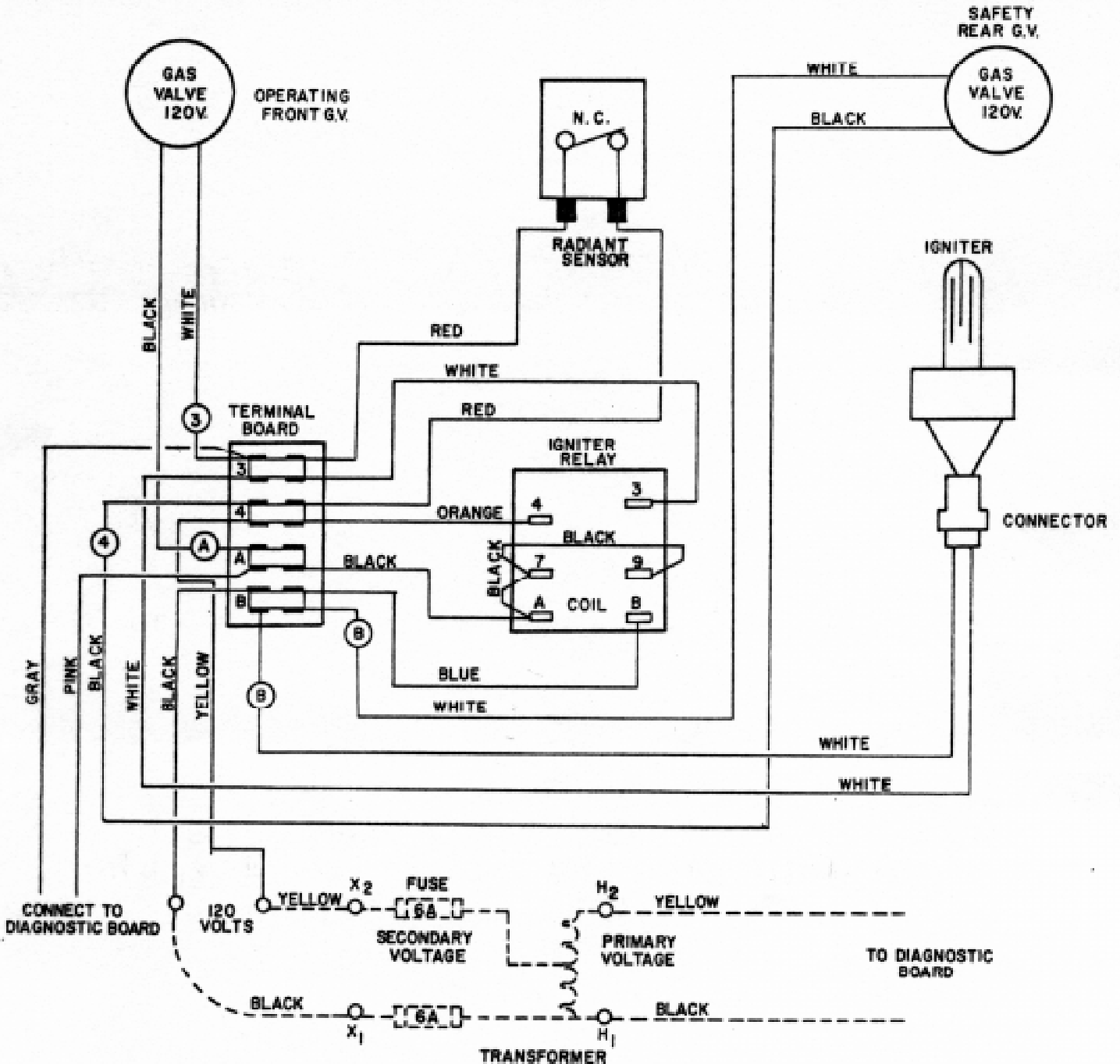
- TWL 679 = L28CS30, WEB, CALIF. METER;
- TWL 680 = L28P30, L36C30, L36P30, L36C36, L36P36;

WIRING DIAGRAM

TWL 713

NORTON SILICON CARBIDE GAS IGNITION SYSTEM
 120 VOLTS : 50/60 HZ : 1 PHASE
 GAS DRYERS

K & R MODELS



g-30-83

NORTON IGNITION SYSTEM

Test Procedure

1. Glow bar will glow red. If glow bar does not glow red, then check the following:
 - a. Disconnect glow bar wiring from dryer. Test with separate 120 volt. Replace if it does not glow red.
 - b. Also replace glow bar if cracked, broken or does not light burner in 25 seconds.
2. Unit must be wired correctly.
 - a. Front gas valve must always be wired to "A" and "3" on the relay.
 - b. Side or rear gas valve must be wired to "B" and "4" on the relay.
3. Rear or side gas valve must open (click) when dryer is energized.
4. Front gas valve will open and gas will flow to burners after 12 to 25 seconds, when glow bar is glowing red. Red glow bar will light gas from burners.
5. Glow bar will go out when flame is burning.
 - a. If both gas valves do not open (click), then replace.
 - b. If unit does not operate correctly, then replace the relay.
 - c. If glow bar does not shut off, then replace radiant sensor. Also if the radiant glass is broken, replace.

Parts In Norton Ignition System Unit:

6. Norton Glow Bar - TU8596.
Ignition Radiant Sensor - TU8598.
Ignition Relays - TU8599.
Two Gas Valves - TU6557.
Wiring Diagram
7. Open and close loading door after gas is burning and glow bar is shut off. Gas should not flow when door is reclosed until radiant sensor has cooled and glow bar recycles.

TROUBLESHOOTING ON EACH NORTON IGNITION PART

- A. Glow bar TU8596
 1. No glow bar red: Check voltage (120 volt).
Cracked or broken, replace.
Check wiring Must be connected to No. "B".
and No. "3" on relay.
- B. Radiant Sensor TU8598
 1. No glow bar red: Contacts failed open position, replace.
Sensor N.C. (cold position).
Sensor open (hot position).
Glass broken, replace.
 2. Fails to open after 25 seconds: Low voltage on glow bar.
Not in correct location.
Glass broken, replace.
Failure of contacts to open, replace.

C. Relay (Igniter) TU8599

1. Front gas valve does not turn on: Relay is wired incorrectly.
Relay solenoid not operating.
Relay contacts not operating correctly.
2. Relay contacts should make before break - when the relay coil is energized, the contacts "4 & 7" should close before contacts "3 & 9" open.

D. Gas Valve TU6557

1. If valve does not open when 120V is applied to it, then replace the coil assembly TU3832 (120V).
2. The two gas valves must be wired correctly. Front gas valve wires connected to "A and 3" on relay. Side or rear gas valve wires connected to "B and 4" on relay.

INSTRUCTIONS FOR THE DIRECT
IGNITION SYSTEM OPERATION

1. Turn on manual gas valve, handle should be parallel with gas line.
2. Start machine's drying cycle. Carbide igniter will get red hot, then gas valve will open. The gas burners are ignited by the carbide igniter. Igniter will shut off and burners remain on during heat cycle.
3. Opening tumbler door will cause gas to extinguish. Shut door and gas will not flow until flame sensor cools and normal cycle begins.
NOTE! Push start button after door is closed.
4. If gas does not light, the sensor will cool down and restart the ignition cycle.
5. To shut off dryer, turn off manual gas valve. Handle should be at right angle to pipe. Turn off main electrical supply switch.
6. A five minute complete shutoff period prior to reignition attempts should initial attempts fail.

CAUTION: Check all Norton Igniters with 120V before installing on dryer.

TROUBLE ANALYSIS FOR ENERGY SAVER DRYERS
AND THE ELECTRONIC SILICON CARBIDE GAS IGNITION SYSTEM

CAUTION: Problems with the electronic silicon carbide ignition can be the result of the following:

1. Exhaust air flow restriction. Exhaust pipe size must be equal to or larger than the exhaust opening, depending on the pipe size. See chart in manual.
2. Dryer inlet air is a must for each unit. It must be 4 to 6 times the area of the dryer exhaust outlet. Refer to chart in the manual.
3. All dryer panels must be in place on machine for proper operation.
4. Gas supply inlet to dryer. Gas pressure must be 7-9½ inches W.C. for natural gas and 11 inches W.C. for propane or butane (bottled) gases. Manifold gas pressure 3.5 inches W.C. for natural gas and 11 inches W.C. for propane or butane gas.
5. Refer to chart for correct gas pipe sizes and lengths. The 3/4 inch gas pipe must be the minimum gas supply pipe for each dryer and over 50 feet, 1 inch pipe size. Low gas pressures are caused by small pipe size, see chart.
6. Main burner orifices must be the correct size. They are calculated with the following information.:
 - A. Your locality heating value of gas, B.T.U./ Cubic foot.
 - B. Local specific gravity of gas.
 - C. Gas manifold pressure inches of water column.
 - a. 3.5 inches water column pressure for natural gas.
 - b. 11 inches water column pressure for propane or butane gas.
 - D. Gas input rate per each burner orifice.
7. Voltage must be identical as on the electrical rating plate. Prevent low voltage, it causes longer dryer operation time and gas ignition problems. CAUTION: Very low gas flame will not heat up radiant sensor.
8. Back draft damper must swing fully open to prevent air flow restrictions. Check for full open operation every 6 months. Non-operative or erratic operation of the exhaust dampers will cause air flow switches to shut off gas, will result in longer drying time and will cause erratic ignition problems. Improper connection of the 3 wires in a 3 phase circuit will cause the motor to run backwards and no air flow (damper stays closed). reverse the 2 wires of the 3 wire, 3 phase power supply.

THE ABOVE SHOULD BE CHECKED AND CORRECTED BEFORE ATTEMPTING TO TROUBLE SHOOT THE IGNITION SYSTEM.

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: Clean periodically and/or 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.
3. Gear reducer: Maintain oil level in gear reducer, half the depth of the oil cup. Use Cissell transmission oil. (See Cissell gear reducer sheet.)
4. Pulleys and belts: 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 periodically for alignment. Pulley shafts must be parallel and the grooves must be in alignment. Check and retighten pulley set screws periodically. Check belt tension periodically. Lower motor to increase tension by adjusting the nuts fastening the motor plate to the 5/16" rod connected to the gear reducer.
5. Electric motors: Keep motors clean and dry. Motors having ball bearings are packed with sufficient grease for approximately five years normal operation. After five years, the bearings and housing should be cleaned thoroughly. Re-pack each bearing and the cavity back of the bearing one-third full with Chevron Grease No. SRI-2.

Motors having wool packed sleeve bearings are oiled at the factory for one year's normal operation. After one year's normal operation, add annually one-half teaspoon electric motor oil or S.A.E. #10 to each bearing. For 24 hour per day operation, add one teaspoon of oil annually.

If motors overheat, check voltage and wiring. Low voltage, inadequate wiring, and loose connections are the principle causes of motor failure.
6. Adjustable leveling bolts: One at each corner, front and rear permits accurate alignment of dryer.

To adjust: Block corner of dryer up off floor, loosen hex nut. With wrench, turn bolt clockwise to raise dryer, counter-clockwise to lower. Rear bolts are on outside of dryer. Hex nuts for front bolts are inside lint trap.
7. Gas burners: Keep gas burners clean. Check periodically and clean often.
8. Periodically examine and clean the exhaust system.
9. Keep dryer area clean and free from combustible materials, gasoline and other flammable vapors and liquids.
10. Do not obstruct the flow of combustion (make-up) air and ventilating air.
11. Periodically check gas pressure.
12. Periodically check dryer voltage per dryer rating plate.

INSTRUCTIONS FOR ALIGNING BASKET ON CISSELL 70 LB. DRYER - DOUBLE MOTOR

1. Loosen the 4 gear reducer mounting bolts (1, 2, 3 & 4) on rear of dryer, and 2 adjusting bolts #5, on gear reducer housing. (Fig. 3).
2. Place one "A" and two "B" diameter pins inside the drying compartment between the rim of the basket opening and the rim of the door opening in the positions shown in Figure 1 and Figure 2. Check the two "B" pins for equal clearance.
3. With the pins in position, tighten the two No. 5 bolts until flush against back of dryer. Retighten gear reducer mounting bolts in the numerical order indicated in Figure 3. Tighten lock nuts No. 6 to secure bolts No. 5 in position. Then remove pins.
4. Check the space between basket and door opening at "A" pin and "B" pin positions (Figure 2). If the gap is not approximately the same on both sides, repeat steps 1, 2 & 3.

NOTE: Use short sections of round steel rod for pins or drill bits may be used in place of round rod.

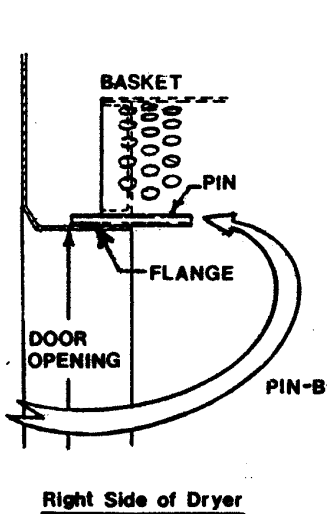
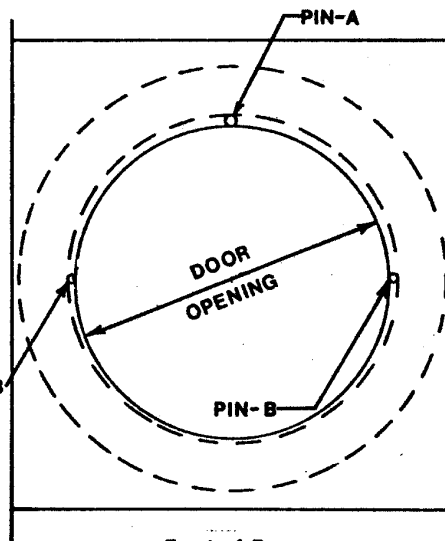


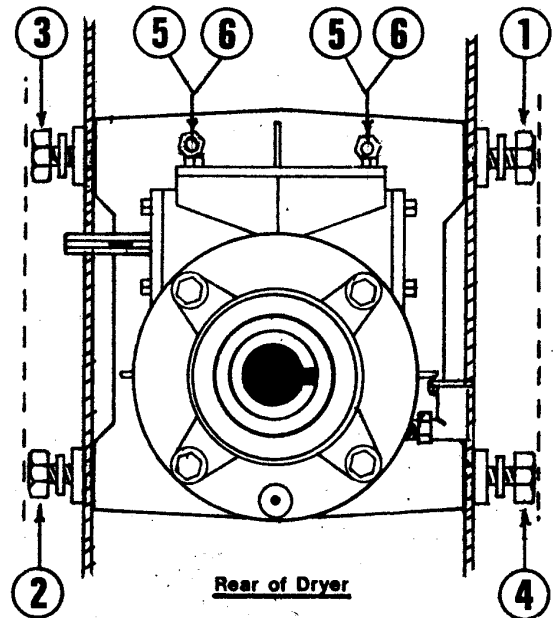
Fig. 1



Front of Dryer

PIN-A-1/2 DIA.
PIN-B-5/16 DIA.

Fig. 2



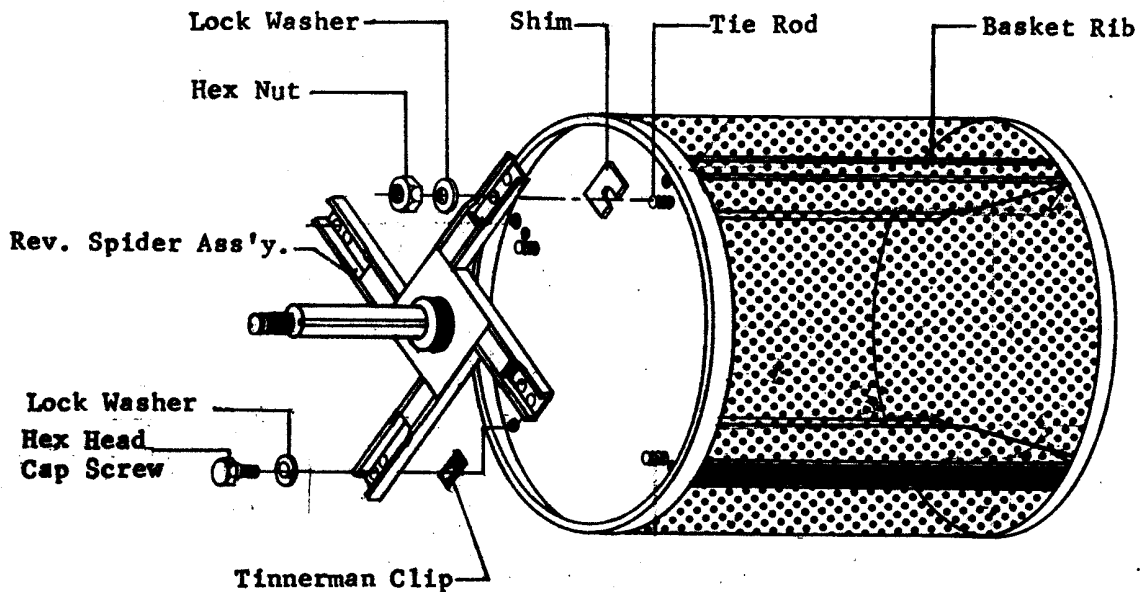
Rear of Dryer

Fig. 3

INSTRUCTIONS ON THE SHIMMING OF A CISSELL
BASKET AND SPIDER ASSEMBLY

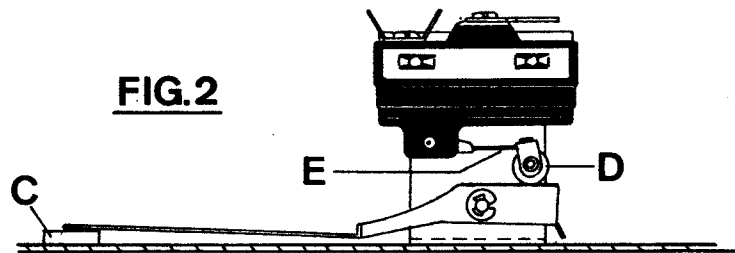
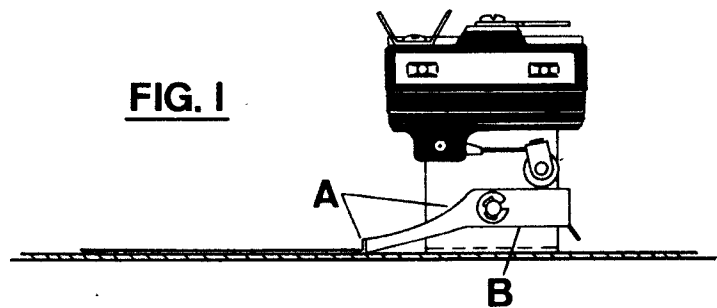
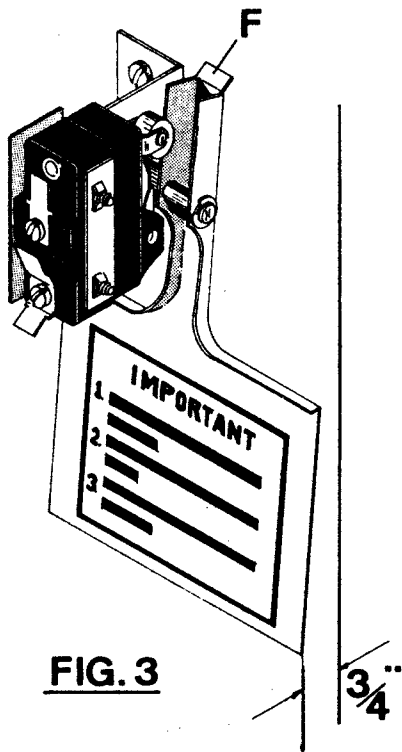
This procedure is normally necessary when replacing either the basket or the spider assembly on any Cissell tumbler. The alignment of these two parts are crucial in assuring a true running basket.

1. Align the basket as per instructions in manual.
2. Rotate the basket to determine where the most out of round point is (where the basket scraped or comes closest to scraping the sweep sheet).
3. Mark this position and the nearest rib to this position.
4. Remove the basket (do not loosen the alignment bolts).
5. 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)
6. Re-insert spider and basket assembly and re-check cylinder.
7. If at this point, the basket is still out of round, procedure must be repeated starting with Step 2.
8. Upon completion of shimming process, re-alignment of basket is necessary.



AIR SWITCH ADJUSTMENT

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.



INSTRUCTIONS FOR DRYERS WITH REVERSING CONTROL TIMER

In operation, coasting of basket increases, making it necessary to readjust Reversing Timer:

CAUTION:

Failure to do this will cause the thermal overload units for the basket to cut-out unnecessarily and probably damage gear reducer.

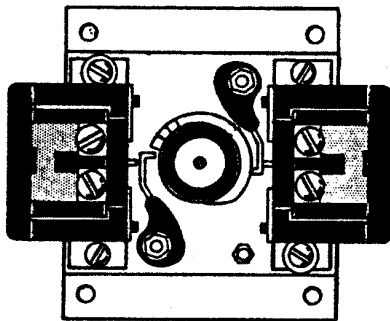
Adjustment of Reversing Timer:

CAUTION: Dryer power supply must be shut off before adjusting timer.

1. Reversing timer operates 18.7 seconds per reversal.
2. Rotate upper cam clockwise to increase stop time between reversals, counter-clockwise to decrease.
3. Lower cam has 10 divisions. Normal adjustment, 3 divisions, as shown.
4. Each divisions adds 1.87 seconds. Example:
3 divisions "off time" - 5.61 seconds
7 divisions "on time" - 13.09 seconds.
5. Recommended time basket must stop completely for 5 to 7 seconds between reversals. Minimum basket stopping time is 4 seconds.

CAUTION

ONLY Operate Non-Reversing and Reversing SWITCH when basket is rotating or basket will not rotate.



Furnas Timer #L3788

FAN ROTATION

NOTE: Fan rotates counter-clockwise as viewed from back end of motor. see arrow on motor support. To change rotation, reverse power leads L1 and L2.

INSTRUCTION FOR DRYERS WITHOUT REVERSING CONTROL FAN AND BASKET ROTATION

NOTE: Fan rotates counter-clockwise as viewed from back end of motor. See arrow on motor support.

Basket rotates clockwise as viewed from front of tumbler.

To change rotation of both fan & basket, reverse power leads L1 and L2.

To change rotation of fan only, reverse motor leads F1 and F2.

To change rotation of basket only, reverse motor leads B1 and B2.

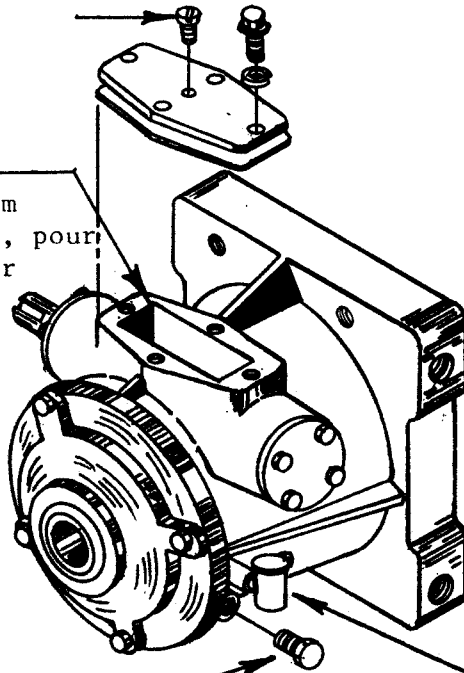
Gear Reducer

Vent: Important

Remove this screw before placing machine in operation

Oil Fill:

Remove worm gear cover, pour oil in gear reducer to oil level. (one-half depth of oil cup)



TU3465
Transmission Oil

Drain Plug

Oil Level Cup

Oil level one-half depth of cup. Do not overflow. Remove cork from oil level cup.

Before placing the dryer into operation, remove screw from vent in oil fill atop each gear reducer case. Remove the cork from the oil level inspection cup. If the oil level is correct, the oil level inspection cup will be half filled with oil. If not, add oil. Oil may be added to the gear reducer by removing the worm gear cover in the top rear of the gear reducer case. Do not operate a gear reducer unless the drain plug is tight, and the vent screw removed.

Each gear reducer is filled with one pint of Cissell transmission oil before leaving the factory. Change oil once every six months.

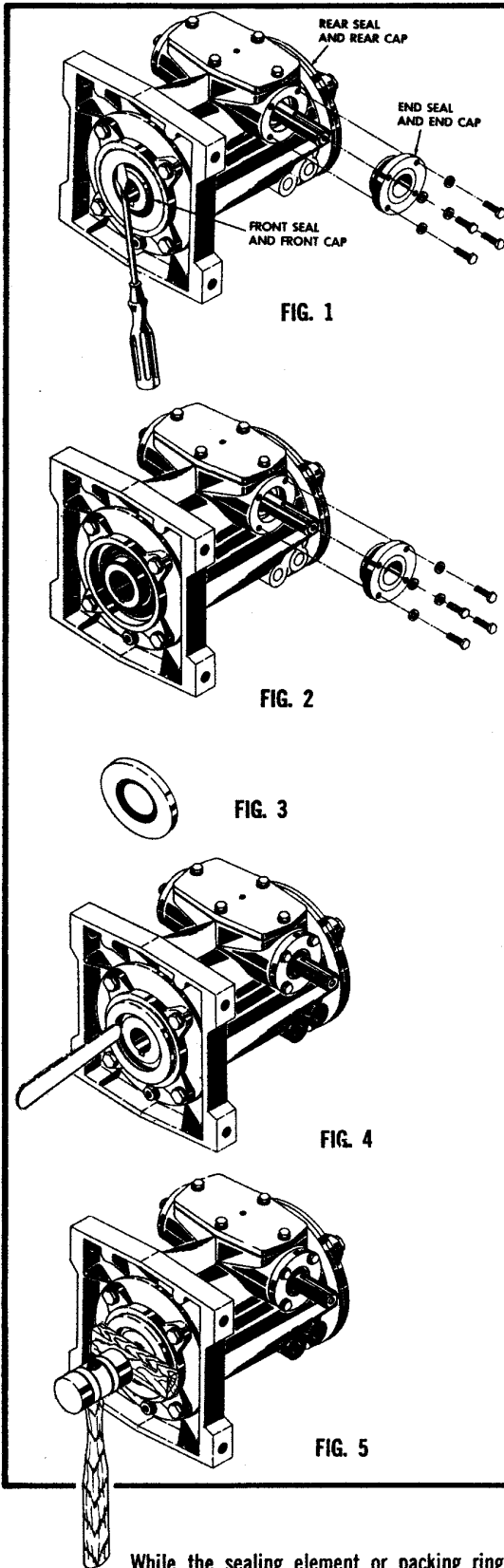
The Large Timken Bearings, which support the worm gear and basket load, must operate in a preloaded condition, that is the worm gear must not have end play. The gear reducer is assembled at the factory to provide a 5-8 inch lb. pre-load on the bearings.

The Small Timken 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.

Total torque 8-10 inch lb. on shaft for both gears.

NOTE: On original equipment, the Cissell Gear Reducer is equipped with a Garlock Shaft Seal. If this seal requires replacement, it cannot be replaced with the same type of seal since the original seal would have seated in on the shaft. It must be replaced with a TU2166.

REMOVAL AND INSTALLATION of SEALS on GEAR REDUCER OF CISELL® DRYERS



CAUTION

Drain oil before removing seals; replace with 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 (Fig. 1):

Slip end of screwdriver under seal (front seal illustrated); 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 (Fig. 1):

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, (Fig. 2).

Spread permatex evenly over outside rim area, (Fig. 3) 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 wooden spatula, illustrated against front seal, Fig. 4) 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, (Fig. 5) until seal is flush into recess of front (or rear) cap.

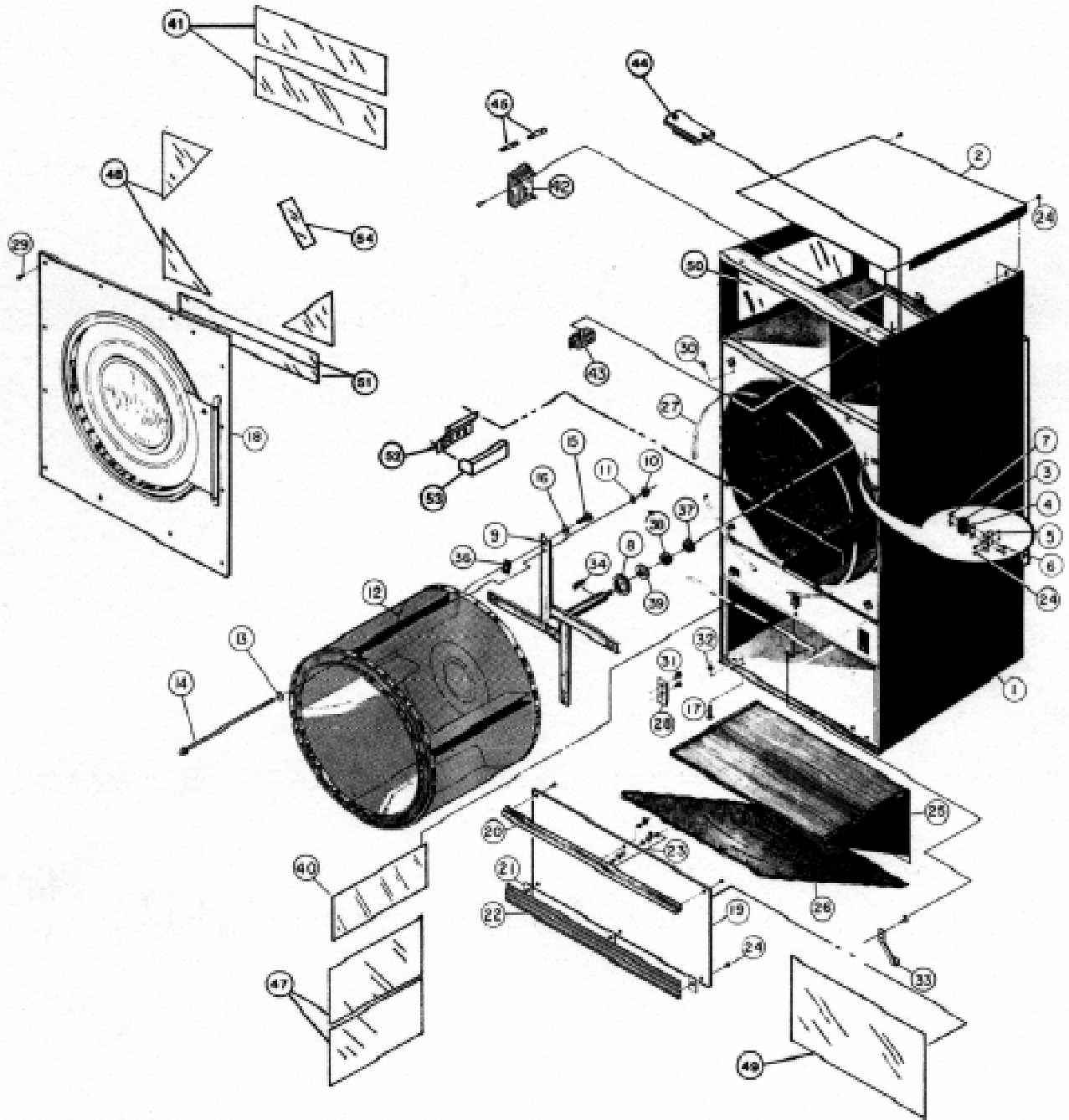
Slip end seal and cap into position and tighten four bolts; then with a block of wood over end seal, gently tap with plastic faced mallet, until seal is flush into recess of end cap.

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.

FRONT VIEW of DRYER

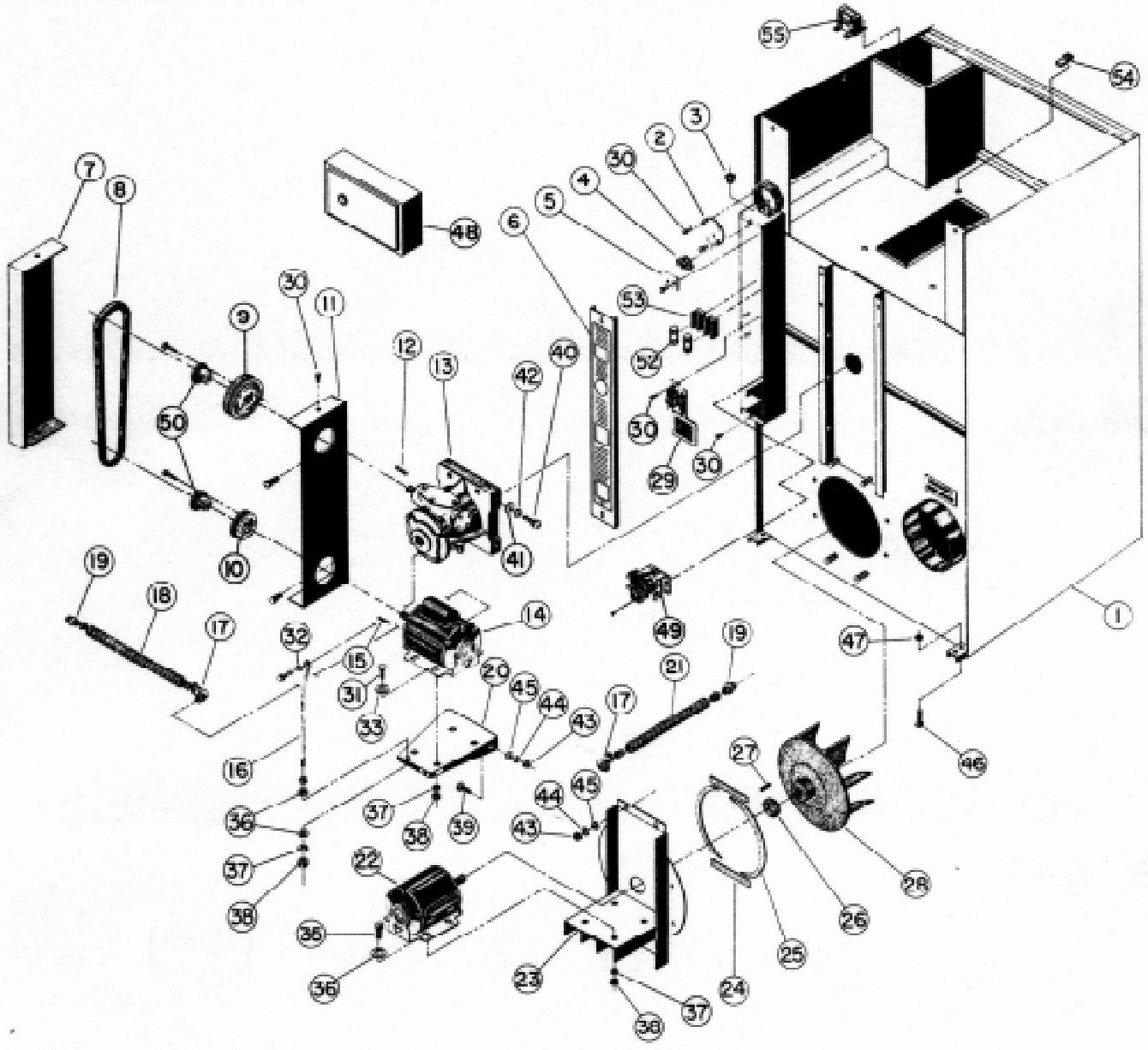


FRONT VIEW OF DRYER

<u>Ref.No.</u>	<u>Part No.</u>	<u>Description</u>
1	TU8274	Jacket Welded Assembly(Timer Models)
	TU9595	Jacket Welded Assembly(Prompter Models)
2	TU8273	Solid Top(Gas Models)
	TU9274	Solid Top(Electric Models)
3	TU1979	Door Switch
4	TU1770	Insulator
5	TU2373	Door switch Bracket
6	TU3219	#6x1" Sheet Metal Screw
7	TU1771	#6 Tinnerman Twin Nut
8	TU108	Felt Seal-CD Model
9	TU5231	Spider Weldment-Reversing CD Model
	TU9780	Spider Weldment-Prompter Model(Exploded View Separate Page)
10	TU2882	½"-20 Hex Nut
11	TU2831	½" Split Lockwasher
12	TU8293	Basket Weldment-C & F Models
	TU9796	Basket Weldment-K & R Models
13	TU2883	½" Cut Washer
14	TU8297	Tie Rod
	TU7006	Shims
15	TU3210	5/16"-18x5/8" Hex Head Cap Screw
16	TU2814	5/16" Lockwasher
17	TU3211	3/8"-16x2½" Leveling Bolt
18	TU6056	Front Panel & Door Assembly
19	TU5566	Lint Door Weldment
20	TU7473	Handle
21	TU2710	Trim Holder
22	TU2385	Trim
23	TUB1867	Lock & Key
24	TU7733	#8x½" Self-Drill Screw
25	TU8368	Lint Screen Housing
26	TU10362	Self-Cleaning Lint Screen Only
	TU5225	Lint Screen Frame Only
27	TU5876	Sweep Sheets Gasket
28	TU3206	Lock Plate
29	TU2878	#10x5/8" Sheet Metal Screw
30	TU2877	#10 Speed Nut
31	TU1978	#14x3/4" Sheet Metal Screw
32	TU4937	3/8"x16 Jam Nut
33	TU8366	Lint Trap Front Support
34	TU5240	8" Large Shaft Key
35		
36	TU8365	Tinnerman Clip
37	TU3536	Jam Nut
38	TU3537	Full Nut
39	TU2493	Flat Washer
40	TU7690	Side Insulation
41	TU7736	Front Panel Insulation
42	TU8737	Transformer(208-230V.Primary, 120V. Secondary)
43	TU8599	Relay,Igniter 120V.
44	TU8629	Terminal Board, Igniter
45	TU8738	Fuses
47	TU8152	Side Insulation
48	TU7735	Front Panel Insulation
49	TU8153	Lint Trap Door Insulation
50	TU7793	Upper Side Bonnet Insulation
51	TU8107	Insulation
52	TU10285	Thermostat Assembly
53	TU8457	Thermostat Cover Weldment
54	TU8108	Insulation

} F & R
Models
Only

REAR VIEW of DRYER



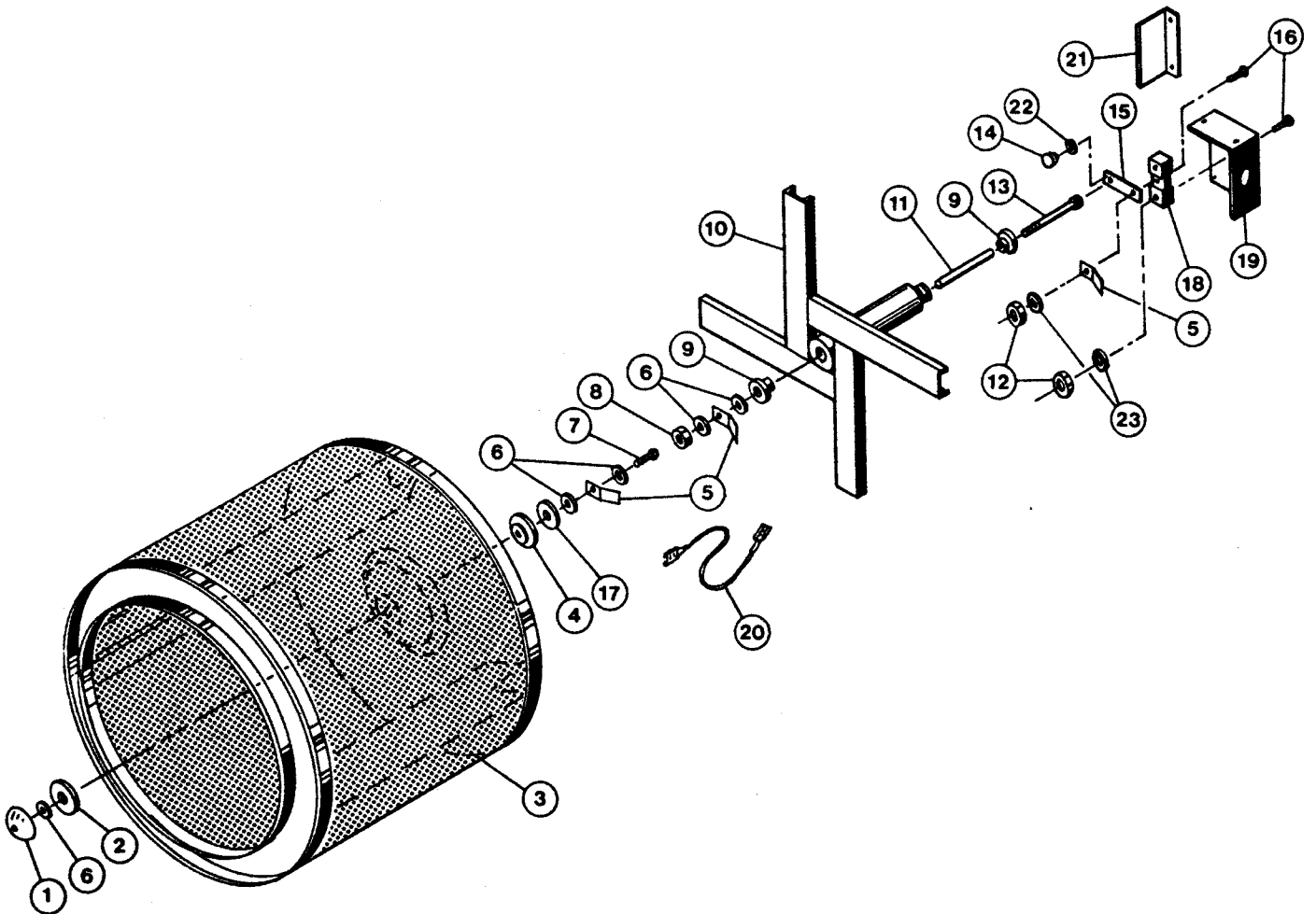
REAR VIEW OF DRYER

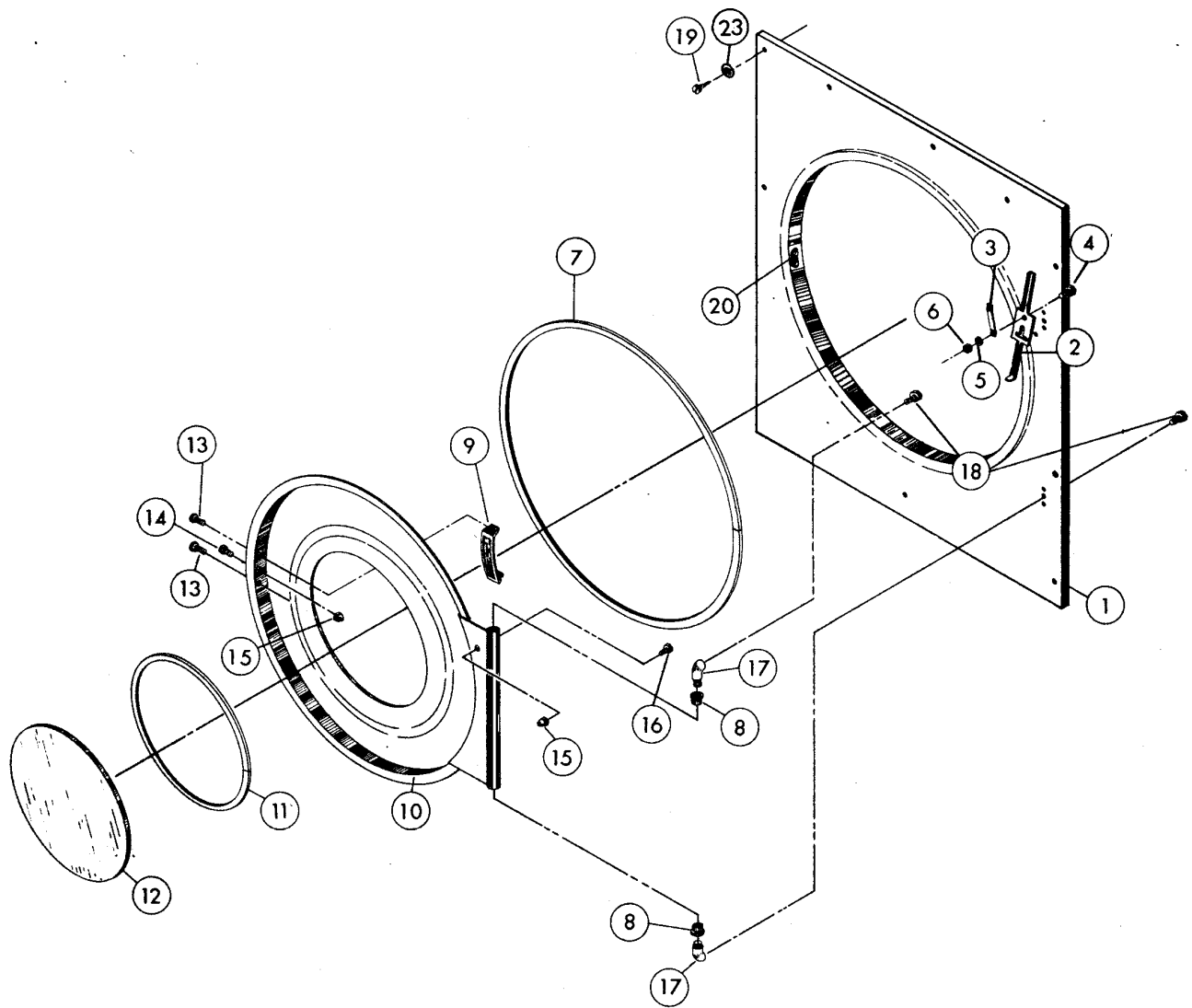
<u>Ref. No.</u>	<u>Part No.</u>	<u>Description</u>
1	TU8274	Jacket Weldment (Timer Models)
	TU9595	Jacket Weldment (Prompter Models)
2	SB170	Junction Box Cover
3	TU2372	Snap Bushing
4	M155	Wire Harness Clamp
5	TU2726	Strain Relief Plate
6	TU5890	Control Box Cover
7	TU3857	Belt Guard Cover
8	TU2317	V-Belt (46-380)
9	TU8502	Gear Sheave W/Set Screw (AK49H)
10	TU7334	Motor Sheave (AK34H) W/TU2833 Bushing
11	TU5254	Belt Guard Mounting
12	TU5241	Shaft Key
13	TU8363	Small Gear Reducer (see separate page)
14	*	Basket Motor (See Motor List Page)
15	TU5241	Key
16	TU8608	Belt Adjusting Rod
17	TU4791	Right Angle Connector
18	504641292	½" Greenfield Cable (Specify 17" Long)
19	TU4790	Straight Connector
20	TU33	Motor Drive Bracket
21	504641292	½" Greenfield Cable (Specify 29" Long)
22	*	Fan Motor (See Motor List Page)
23	TU2376	Motor Mount Weldment
24	TU2474	Top & Bottom Gasket
25	TU2473	Side Gasket
26	TU2476	Felt Seal
27	TU4684	Key
28	TU8740	Fan Wheel W/Set Screws (50/60 Hz.)
29	TU8206	Air Switch Assembly (see separate page)
30	TU7733	#8 X ½" Self-Drill Screw
31	RC344	¼"-20 X 4" Cap Screw
32	TU2846	¼" Lockwasher
33	TU2847	¼" Cut Washer
34	TU4934	¼"-20 Hex Nut
35	TU5439	5/16"-18 X 3/4" Cap Screw
36	VSBI30	5/16" Cut Washer
37	TU2814	5/16" Split Lockwasher
38	C249	5/16"-18 Hex Nut
39	TU3124	3/8"-16 X 3/4" Cap Screw
40	RC347	½"-13 X 1¼" Cap Screw
41	TU1851	½" Cut Washer
42	TU2831	½" Lockwasher
43	TU4787	3/8"-16 Hex Nut
44	VSBI34	3/8" Lockwasher
45	IB140	3/8" Cut Washer
46	TU3211	3/8"-16 X 2½" Leveling Bolts
47	TU4937	3/8"-16 C 3/4" Cap Screw
48	TU8539	Reversing Control Box (see separate page)
49	TU1984	Relay - 120V/50/60 Hz.
	TU1985	Relay - 240 or 208V/50/60 Hz./1 Ph.
	TU3495	Relay - 240V./50/60 Hz./3 Ph.
50	TU2833	Bushing for Sheave
51	TU9840	Housing Mounting Bracket (Prompter Models)
52	TU8279	Fuses (Electric Heated Models)
53	TU7505	Fuse Holders (Electric Heated Models)
54	TU6760	Clip Nut
55	TU9804	Transformer (480/60/3) Prompters
	TU4660	Transformer (480V)

PROMPTER BASKET & SENSORY ASSEMBLY - 50 & 70 LB. MODELS

<u>Ref. No.</u>	<u>Part No.</u>	<u>Description</u>	<u>Ref. No.</u>	<u>Part No.</u>	<u>Description</u>
1	TU9616	Tip	12	TU3266	#8-32 Hex Nut
2	TU9618	Insulator Washer	13	TU9776	Conductor Rod
3	TU9773	50 lb. Prompter Basket Asm.	14	TU9660	* Contact Button
	TU9796	70 lb. Prompter Basket Asm.	15	TU9660	* Wiper Strip
4	TU9617	Insulator Disc	16	TU3624	Machine Screw
5	AT388	Terminal Connector	17	TU9944	Washer
6	TU9910	Ext. Tooth Lockwasher	18	TU9649	Wiper Insulator
7	TU9949	Machine Screw	19	TU9838	Wiper Housing
8	TU3400	#6-32 Brass Hex Nut	20	TU9628	Jumper Wire
9	TU9621	Rod Insulator	21	TU9839	Housing Side
10	TU9780	Prompter Spider Weldment	22	TU9660	* Push Nut
11	TU9782	Sleeve	23	M271	Int. Tooth Lockwasher

*Available only as Assembly TU9660





FRONT PANEL & DOOR ASSEMBLY - TU6056

Ref. No.	Part No.	Description	Ref. No.	Part No.	Description
1	TU6058	Front Panel	14	TU3163	Catch Pin
2	TU2194	Door Switch Actuator	15	TU4840	#10-32 Hex Crown Nut
3	TU2105	Actuator Spring	16	TU4839	#10-32x3/8" Screw
4	M262	#8-32 Tr. Hd. Screw	17	TU2236	Hinge Posts
5	FB187	#8 Split Lockwasher	18	TU2836	5/16" - 18 x 1/2 Hex Hd. Cap Screw
6	TU3266	#8-32 Hex Nut	19	TU2878	#10 x 5/8 S.M.S.
7	TU5288	Basket Door Seal	20	TU7456	Door Catch Asm. W/Rivets
8	PIF172	Delrin Bearing	21	TU7690	Insulation Foil (Not shown)
9	TU2874	Basket Door Handle	22	TU7736	Insulation Foil (Not shown)
10	TU5859	Basket Door	23	FB187	#10 Lockwasher
11	TU1692	Rubber Gasket			
12	TU217	Door Glas			
13	TU3215	#10-32x3/8 Taptite Screw			

TU4827- Actuator Asm. Consists of Ref.No.s 2,3,4,5,& 6.

TU5857- Basket Door Asm. Consists of Ref.No.s 7,8,9,10,11,12,13,14,15, & 16.

REVERSING CONTROL BOX ASSEMBLY

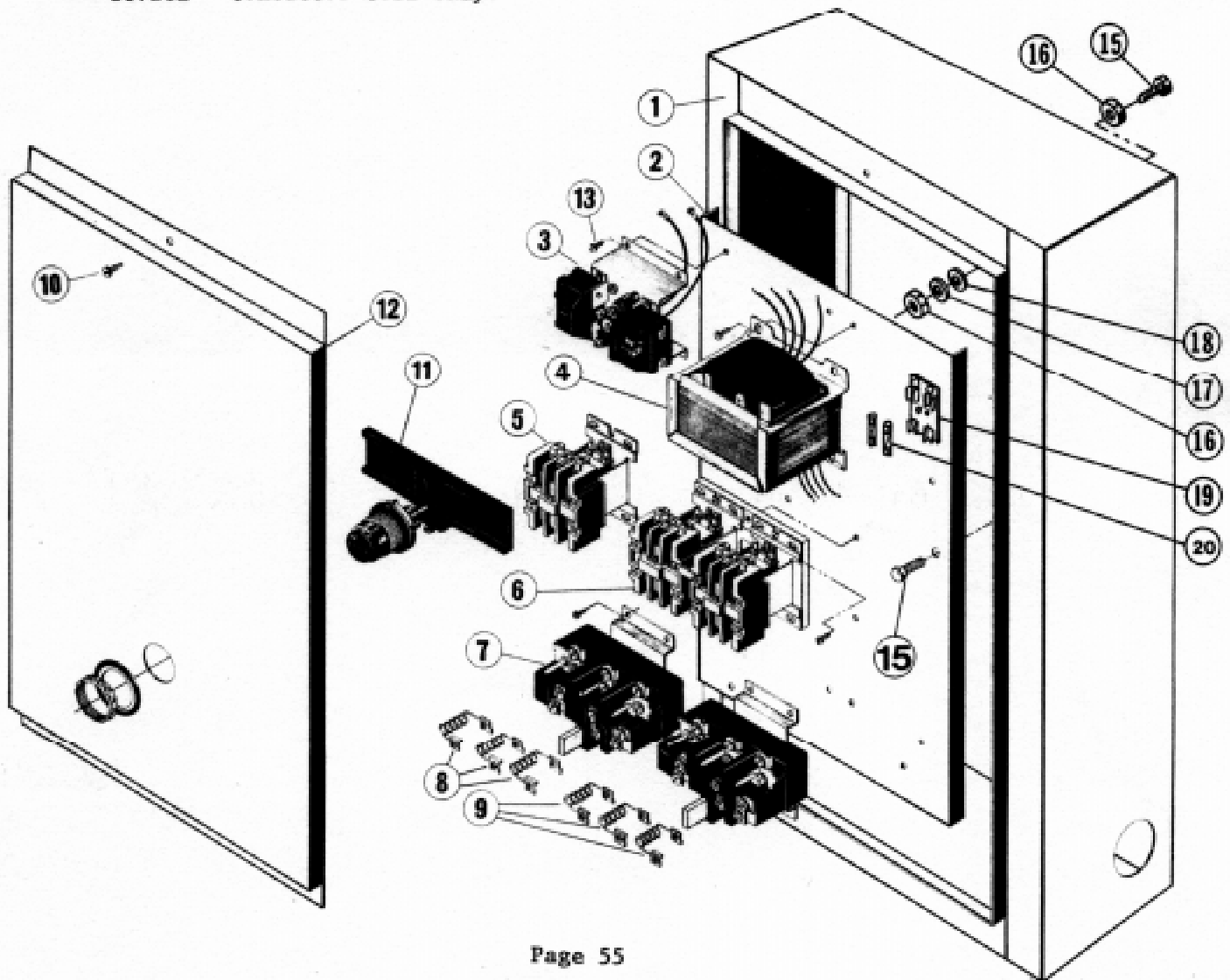
TU9377-208-240/60/3 W/120V Controls
 TU9375-240-415/60/3 W/240V Controls
 TU9379-480/60/3 W/120V Controls

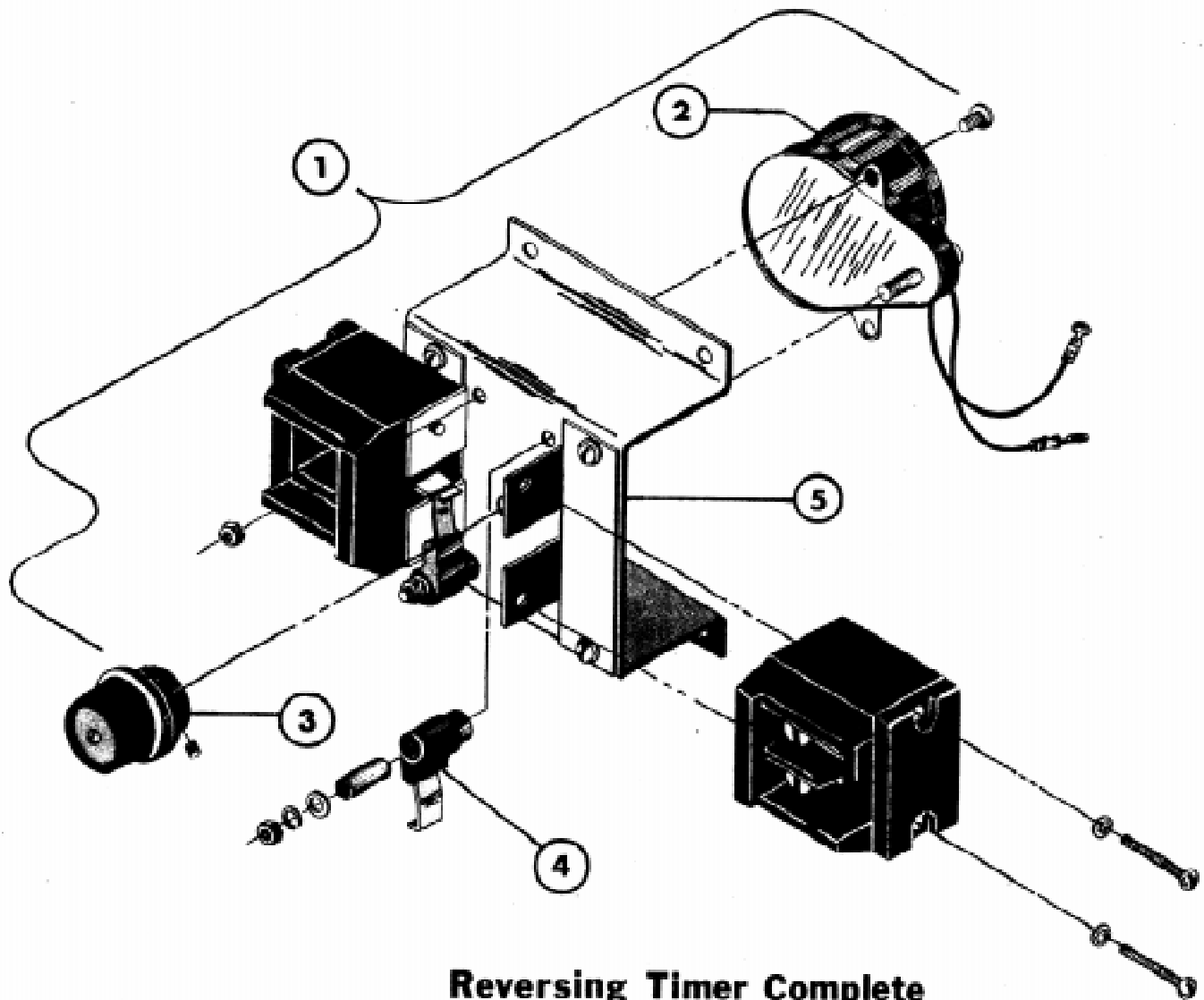
TU9376 -240-415/50/3 W/240V Controls
 TU9378 -240/60/3 W/240V Controls
 TU10698-480/60/3 W/120V Controls (Prompter Only)

Ref. No.	Part No.	Description	Ref. No.	Part No.	Description
1	TU9374	Control Box W/A	7	TU6774	Overload Unit (2 Req'd)
2	TU6959	Mounting Panel Plate	8	*TU267900	Overload Heater (Fan)
3	--	Timer (see next page)	9	*TU267900	Overload Heater (Bakt)
4	TU4659	Transformer (for TU9375 only)	10	P274	1/4"-20 X 3/4" Truss Head Screw
	TU4660	Transformer (for TU9377 & TU9379 only)	11	TU6808	Reset Button Kit
5	**TU6965	Contactor-120V/60 Hz.	12	TU6834	Box Cover Plate
	***TU6963	Contactor-208-240V/60 Hz.	13	M263	#8 X 3/8" S. M. Screw
	****TU8727	Contactor-240V/50 Hz.	15	FB189	1/4"-20 X 1" Hex Bolt
6	**TU7252	Rev. Contactor - 120V/60 Hz.	16	TU4934	1/2"-20 Hex Nut
	***TU6964	Rev. Contactor - 208-240V/60 Hz.	17	TU2846	1/2 Cut Washer
	****TU8728	Rev. Contactor - 240V/50 Hz.	18	TU2847	1/2 Flat Washer
			19	TU10596	Fuse Block
			20	TU10597	Fuse

* When ordering, specify number on heater, e.g.: H-25 and TU267900.
 ** TU7281 - Contactor Coil Only.

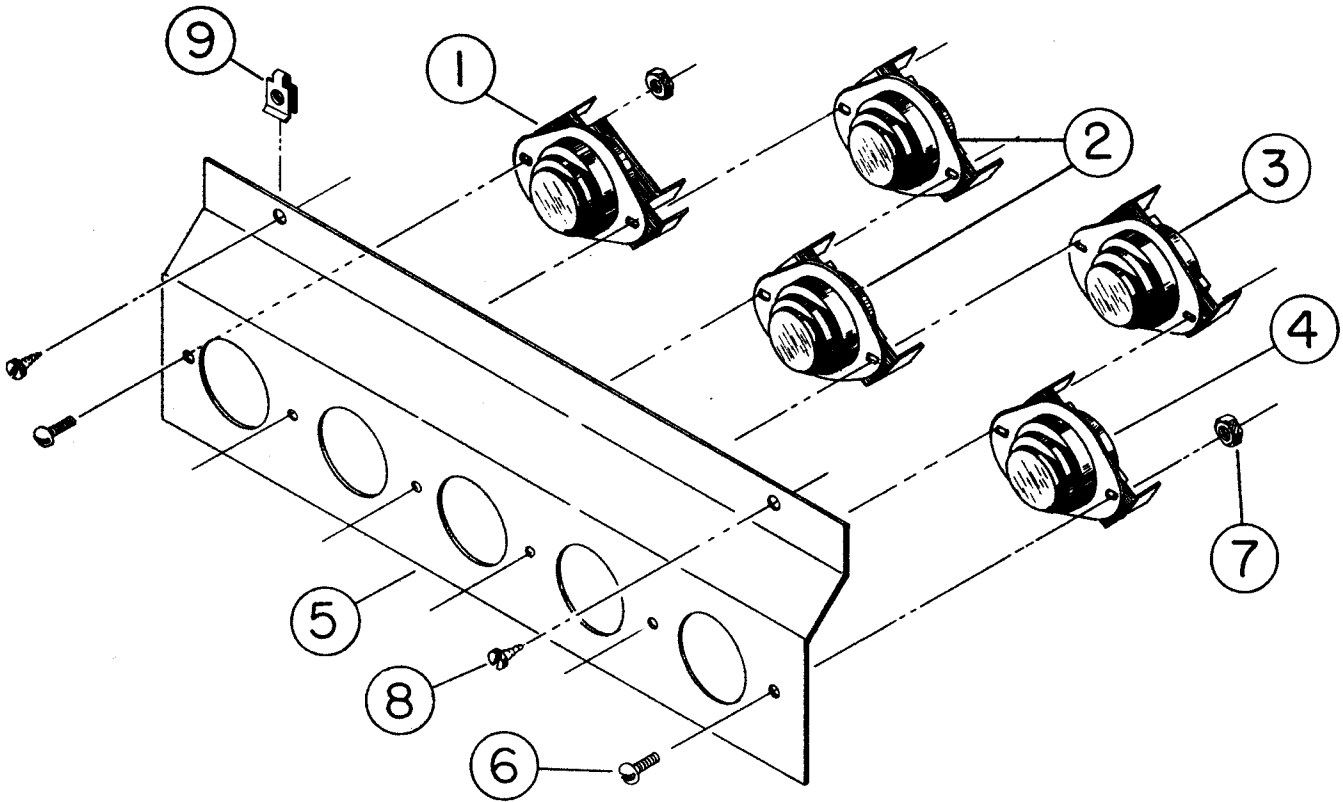
*** TU7282 - Contactor Coil Only.
 **** TU8689 - Contactor Coil Only.





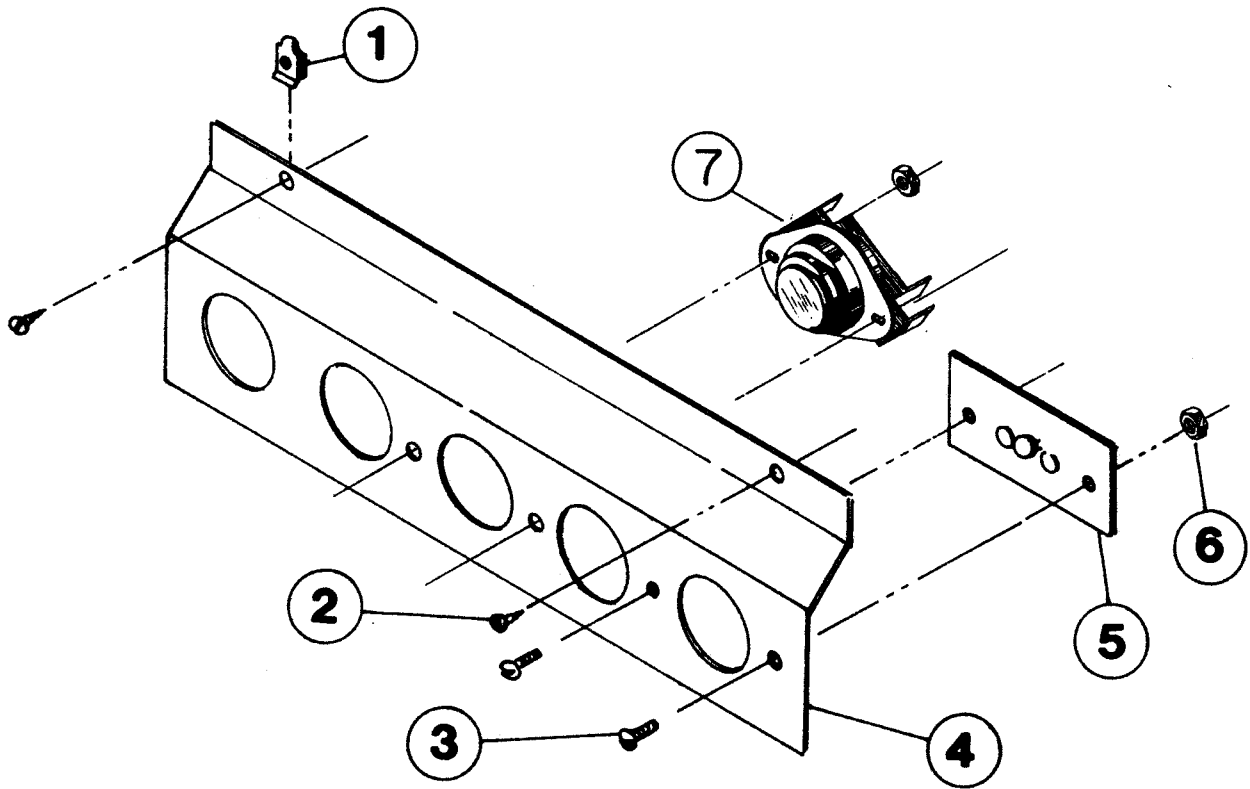
Reversing Timer Complete

<u>REF. NO.</u>	<u>PART NO.</u>	<u>DESCRIPTION</u>
1**	TU44131	Timer (Complete) 120 V., 60 Cy.
	TU44132	Timer (Complete) 240 V., 60 Cy.
	TU44133	Timer (Complete) 120 V., 50 Cy.
	TU44134	Timer (Complete) 240 V., 50 Cy.
2	TU17371	Timer Motor 120 V., 60 Cy.
	TU17372	Timer Motor 240 V., 60 Cy.
	TU17373	Timer Motor 120 V., 50 Cy.
	TU17374	Timer Motor 240 V., 50 Cy.
3	TU4424	Timer Cam
4	TU4426	Timer Lever
5	TU4425	Timer Frame
**	<u>TU7502</u>	Reversing Timer Complete Less Motor



TU10285
 THERMOSTAT ASSEMBLY - C & F MODELS
 All Hardware Sold Only in Packages of 6

<u>Ref. No.</u>	<u>Part No.</u>	<u>Description</u>
1	TU2045	Thermostat (Cool-Down) Single Timer Models
2	TU3240	185°F. Thermostat (High Heat)
3	TU5150	150°F. Thermostat (Medium Heat)
4	TU7244	135°F. Thermostat (Low Heat)
5	TU5143	Mounting Bracket
6	TU3624	#6-32 x 1/4" Rd. Hd. Machine Screw (6)
7	TU3400	#6-32 Hex Nut (6)
8	TU2878	#10 x 5/8" Type A Pan Hd. Sheet Metal Screw
9	TU6067	#8 Tinnerman Clip (2)

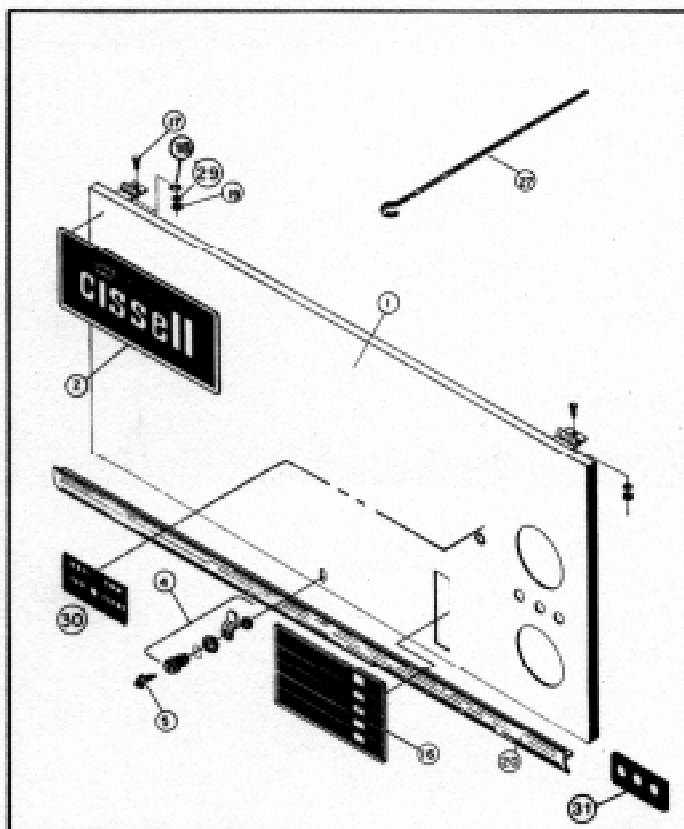


TU10407 -THERMISTOR ASSEMBLY - PROMPTER MODELS

<u>Ref. No.</u>	<u>Part No.</u>	<u>Description</u>
1	TU6067	#8 Tinnerman Clip
2	TU2878	#10 x5/8 S.M.S.
3	TU3624	#6-32x½" Rd. Hd. Screw
4	TU5143	Mounting Bracket
5	TU9688	Thermistor
6	TU3400	#6-32 Hex Nut
7	TU3240	185° Thermostat

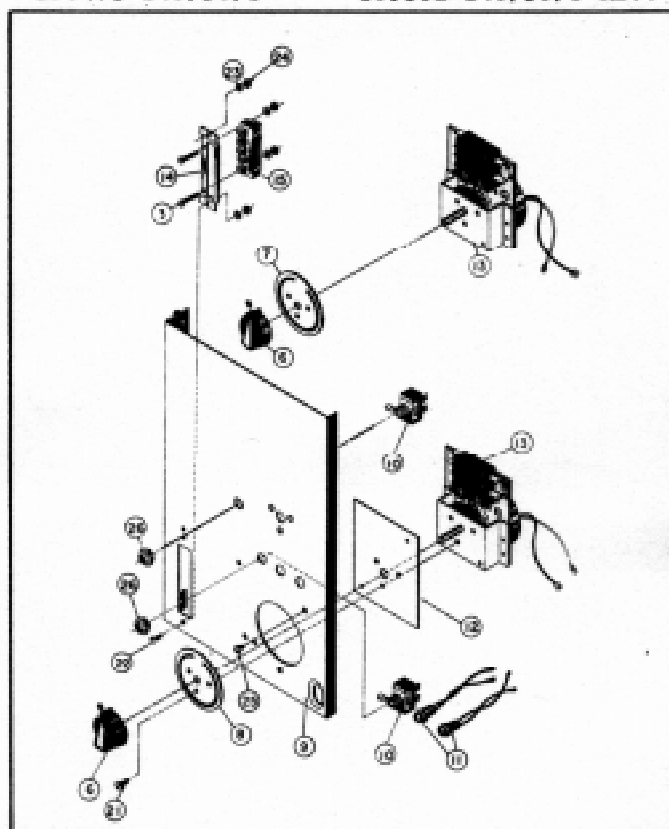
ACCESS DOOR ASSEMBLY

TU9370-Reversing
TU8133-Non-Rev.



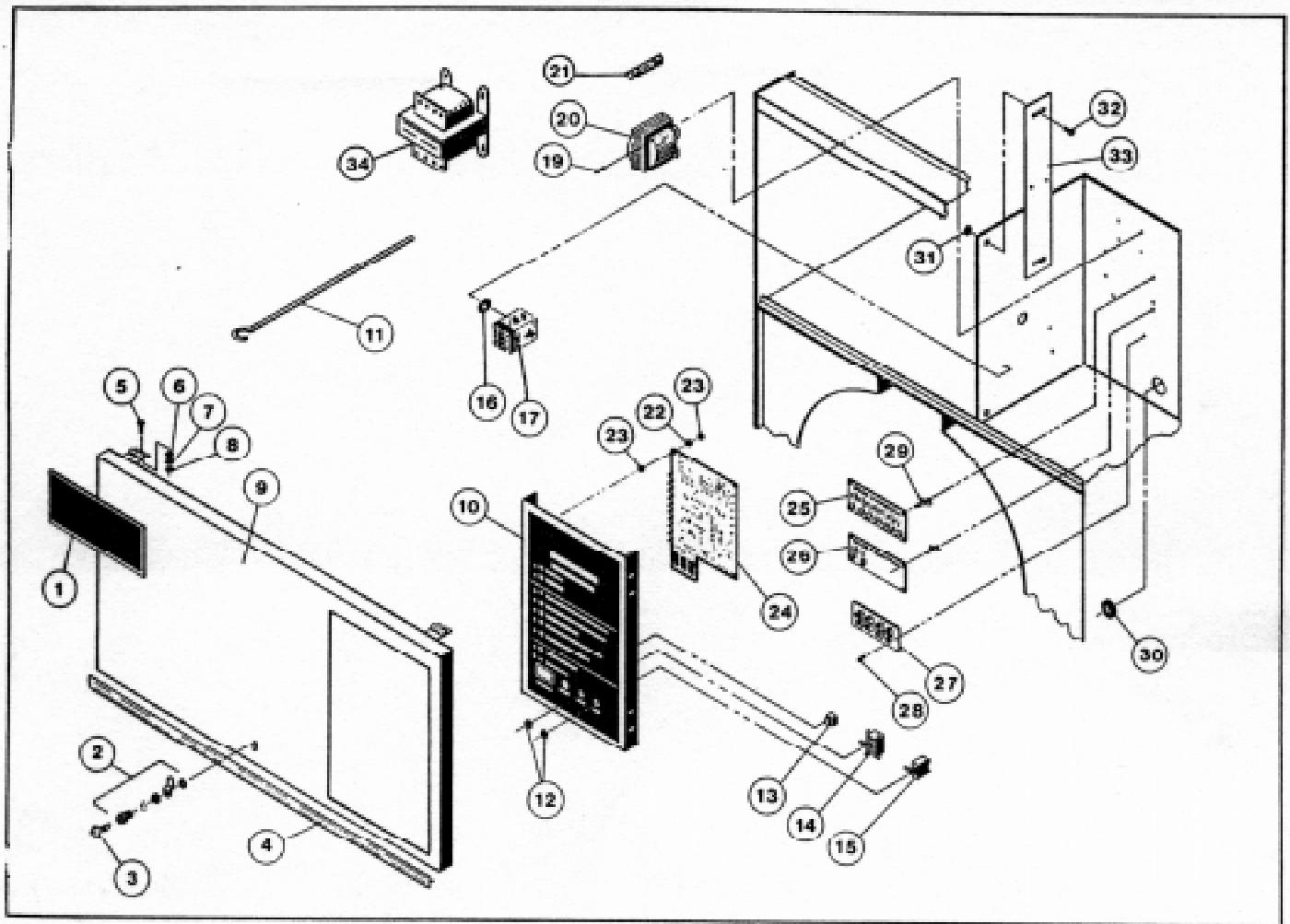
DOUBLE TIMER CONTROL PANEL

TU6021-120V/60/1 TU9372-120/60/1 REV.
TU6122-208-240/60/1 TU9361-240/60/1 REV.
TU6473-240/50/1 TU9362-240/50/1 REV.



REF. NO.	PART NO.	DESCRIPTION
1	TU8131	Access Door W/A
	TU8132	Door W/Chrome Trim
	TU9368	Access Door W/Rev.
	TU9369	Door W/Trim - Rev.
2	TU8013	Cissell Nameplate
3	SV136	#6-32 x 15/16" Round Head Screw
4	TU4822	Lock #3186
5	TU2844	Key JWC2
6	TU2555	Knob Complete
7	TU5445	Dial 0-15 Min.
8	TU5444	Dial 0-60 Min.
9	TU8393	Control Panel W/A
10	PG147	Toggle Switch
11	TU5421	Pilot Light 120V.
	TU5639	Pilot Light 240V.
12	TU6019	Timer Mounting Plate 60 Cy.
13	TU6110	Timer 0-15 120/60 Cy.
	TU6109	Timer 0-60 120/60 Cy.
	TU5843	Timer 0-15 240/60 Cy.
	TU5842	Timer 0-60 240/60 Cy.
	TU6082	Timer 0-15 240/50 Cy.
	TU6083	Timer 0-60 240/50 Cy.

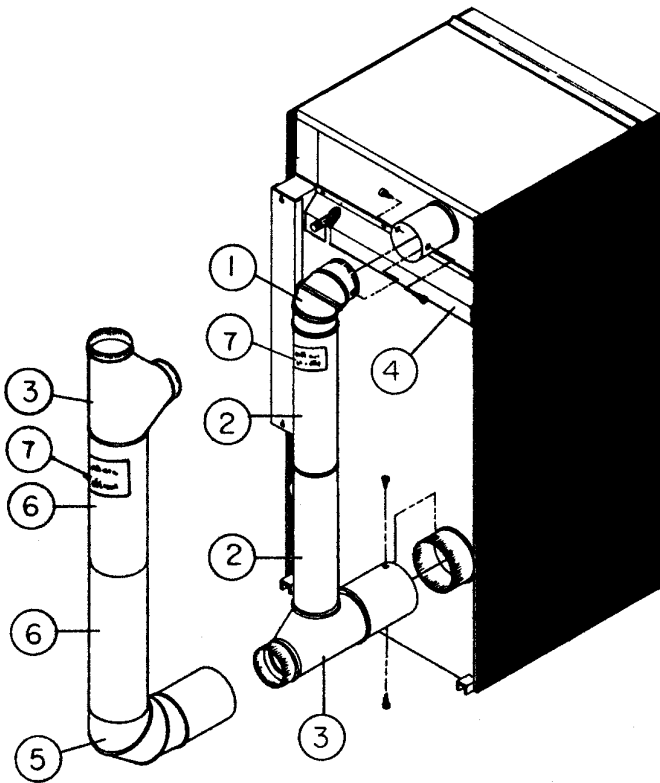
REF. NO.	PART NO.	DESCRIPTION
14	TU5153	Push Button Plate
15	TU5106	Push Button Switch
16	TU8351	Push Button Control Plate
17	TU3479	#10-32 x 7/16" Truss Head Screw
18	P104	1/2" Cut Washer
19	TU2842	#10-32 Hex Nut
20	TU7983	Upper Front Trim
21	LB68	#8-32 x 3/8" Flat Head Screw
22	TU3624	#6-32 x 1/2" Round Head Screw
23	M270	#6 Int. Tooth Lock Washer
24	TU3400	#6-32 Hex Nut
25	M261	#8 x 1/4" Self-Tap. Screw
26	TU3805	15/32"-32 Lock Nut
27	TU5739	Support Rod
28	TU8105	Insulation (not illustrated)
29	FB187	#10 Lockwasher
30	TU9382	Rev. Switch-Label
31	TU8418	On/Off Label



50 & 70 LB. PROMPTER CONTROLS

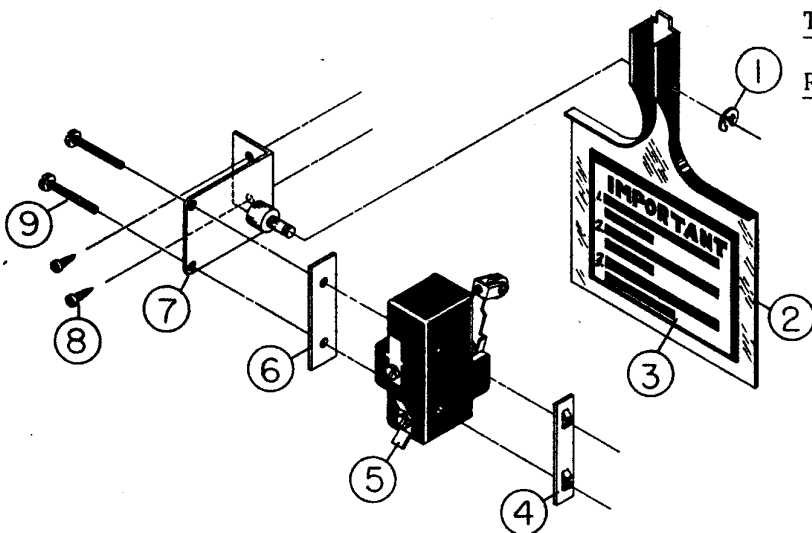
Access Door, Control Panel, & Mechanism Box Assemblies

Ref. No.	Part No.	Description	Ref. No.	Part No.	Description
1	TU9591	Cissell Nameplate	18		
2	TU4822	Lock #3186	19	TU7733	8X½ Self Tap Screw
3	TU2844	Key - JWC2	20	TU8737	Transformer
4	TU7983	Upper Front Trim	21	TU8738	Fuse
5	TU3479	10-32X7/16" Tr. Hd. Scr.	22	M270	I. T. Lockwasher
6	P104	¼" Out Washer	23	TU3400	6-32 Hex Nut
7	FB187	#10 Lockwasher	24	TU9682	Prompter Con. P.C. Board
8	TU2842	10-32 Hex Nut		TU10095	P.C. Board W/Reset Sw.
9	TU9799	Access Door W/A	25	TU9684	Upper Diag. Board (Rev)
10	TU9778	Contr. Panel Assy. (Rev. Models)	26	TU9777	Lower Diag. Board (Gas)
	TU9806	Contr. Panel Assy. (Non-Rev. Models)		TU10434	Diag. Board - Non-Rev. Steam or Elec.
11	TU5739	Support Rod	27	TU8629	Terminal Board
12	TU3805	Lock Ring	28	TU7733	8X½ Self Tap Screw
13	TU9500	Reset Switch	29	TU9347	P.C. Board Support
14	TU264	Toggle Switch (On/Off)	30	TU9693	Bushing
15	FG147	Toggle Switch (Rev. Only)	31	TU2842	Hex Nut
16	TU3400	6-32 Hex Nut	32	TU3479	10-32X7/16 Tr. Hd. Scr.
17	TU8599	Ign. Relay	33	TU9384	Adjustment Strip
			34	TU9804	Transformer (480V Only)



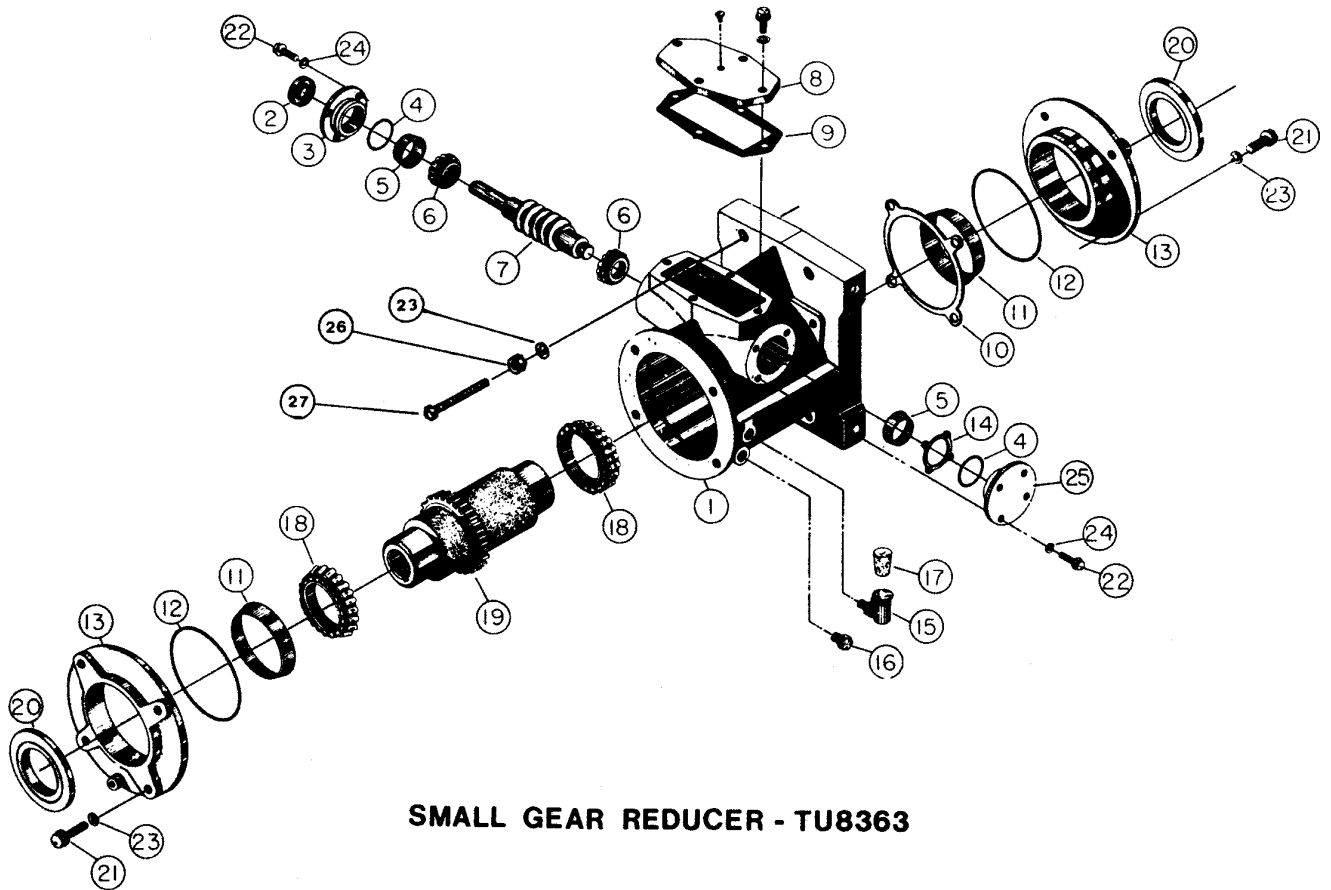
DUCT WORK ASSEMBLY

<u>Ref. No.</u>	<u>Part No.</u>	<u>Description</u>
1	TU8053	Duct Elbow
2	TU8055	Duct Long
3	TU8052	Duct Tee
4	TU8499	Rear Air Guide
5	TU7375	Extended Elbow
6	TU8177	Duct Short
7	TU8593	Installation Label



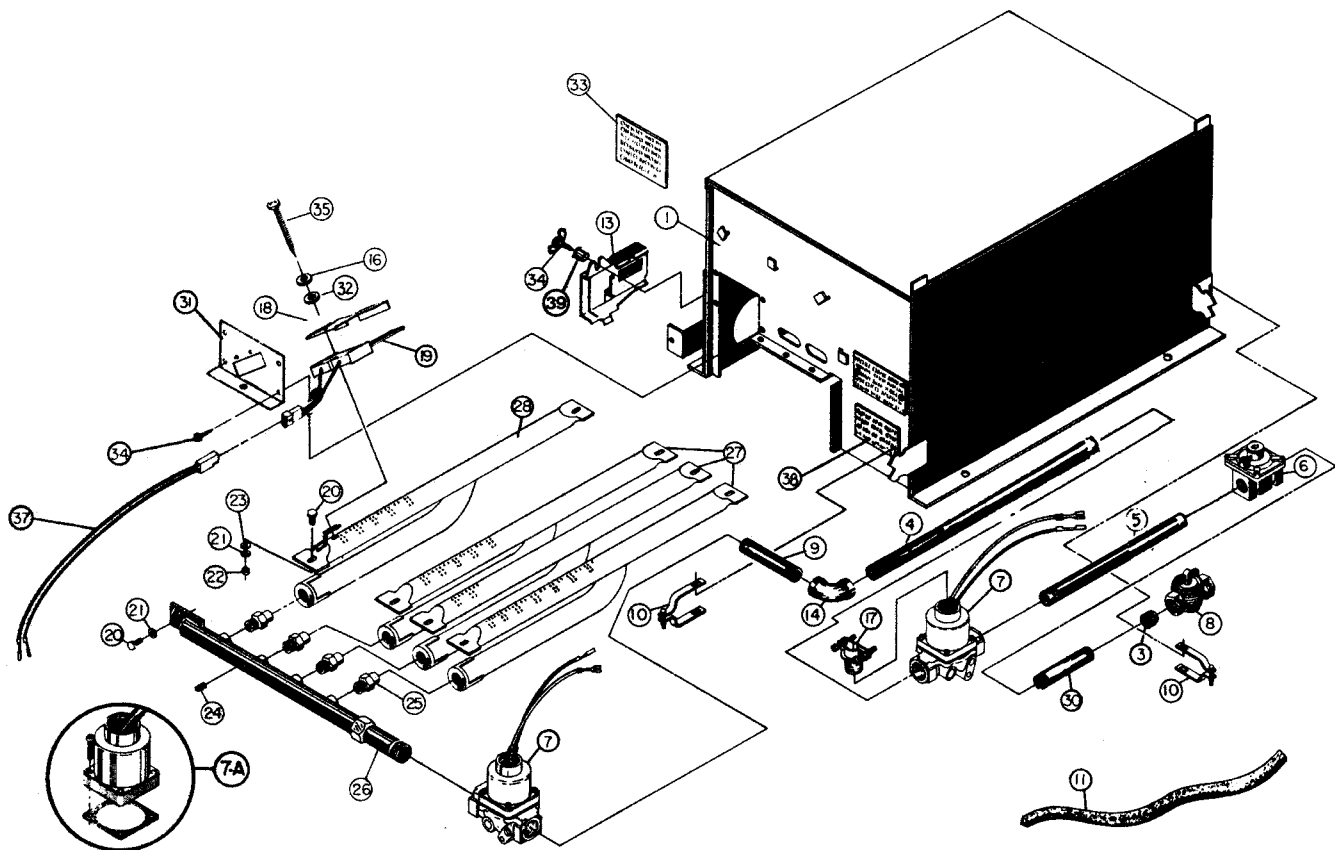
TU8206 AIR SWITCH ASS'Y.

<u>REF. NO.</u>	<u>PART NO.</u>	<u>DESCRIPTION</u>
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	#8-18x1/2" Self-Drilling Screw
9	TU3219	#6x1" Round Hd. S.M.S



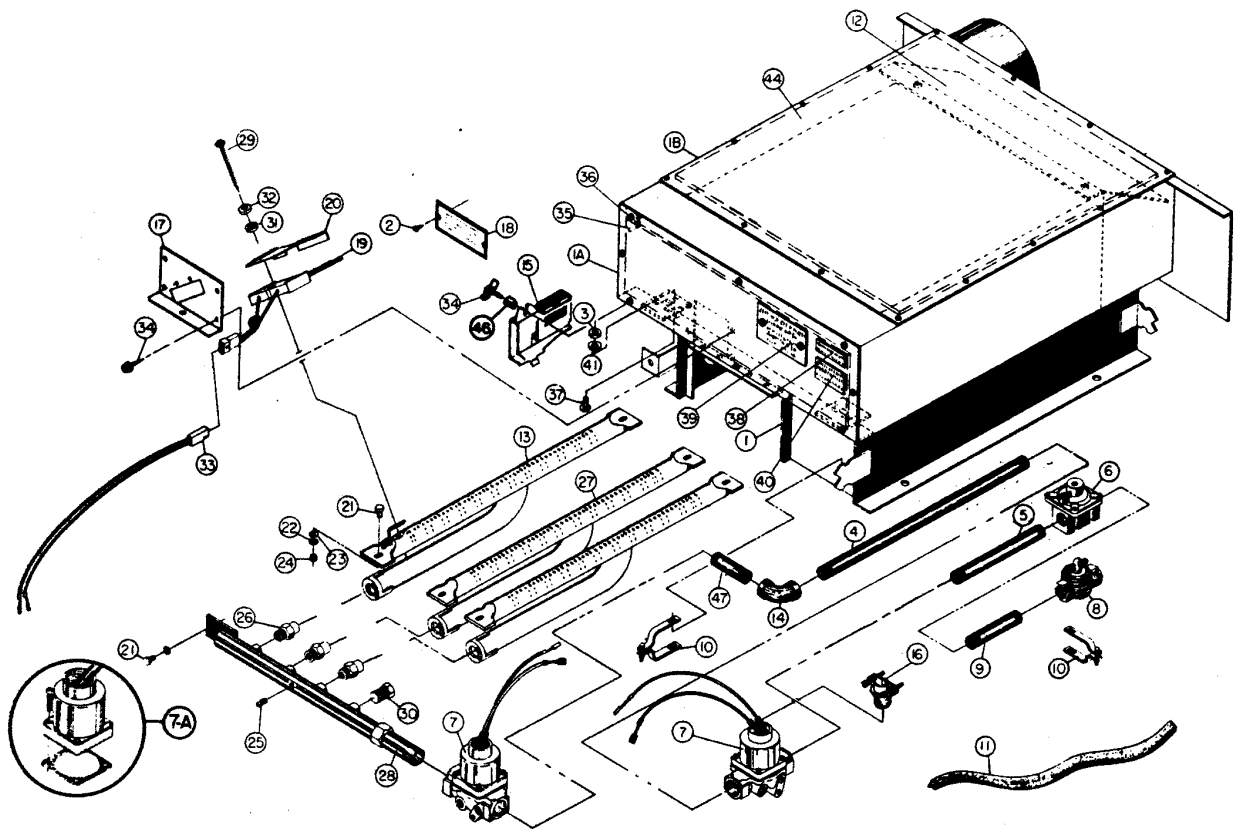
SMALL GEAR REDUCER - TU8363

<u>Ref. No.</u>	<u>Part No.</u>	<u>Description</u>
1.	TU8362	Housing
2.	TU86	Small Klosure
3.	TU25	Small Open End Cap
4.	TU88	Small "O" Ring
5.	TU91	Small Bearing Cup
6.	TU90	Small Bearing Cone
7.	TU23	Worm 1 1/2" X 7 1/8"
8.	TU8350	Worm Gear Cover Assembly
9.	TU1796	Worm Gear Cover Gasket
10.	TU 1828	Large Shims (Set of 4) .005" and .007, 2 of each
11.	TU93	Large Bearing Cup
12.	TU1830	Large "O" Ring 4 5/8"
13.	TU26	Large End Cap
14.	TU21	Small Shims (Set of 4)
15.	TU70	Oil Cup
16.	X170	1/4" Pipe Plug
17.	TU3199	#10 Cork
18.	TU92	Large Bearing Cone
19.	TU22	Worm Gear
20.	TU2166	Oil Seal Field Replacement
21.	TU2623	Cap Screw 3/8" - 16" X 1 1/2"
22.	TU2839	Cap Screw 1/4" - 20" X 7/8"
23.	TU3243	3/8" Internal Tooth Lockwasher
24.	RC349	1/4" Internal Tooth Lockwasher
25.	TU24	Small Closed End Cap
26.	TU4787	3/8-16 Hex Nut
27.	TU8448	3/8-16 x 2 1/2 Screw



GAS BONNET & BURNER ASSEMBLY- C & K Models
 TU8672 (Natural Gas) TU8857 (L.P. Gas)
 All Hardware Sold Only In Packages Of 6

<u>Ref. No.</u>	<u>Part No.</u>	<u>Description</u>	<u>Ref. No.</u>	<u>Part No.</u>	<u>Description</u>
1	TU8683	Bonnet Welded Assembly	21	TU2846	¼" Split Lock Washer
2	TU7733	#8-18x½ Self Drill Screw	22	TU4934	¼"-20 Hex Nut
3	TU6089	Pipe Bushing ¾ x 1/2	23	TU2847	¼" Flat Washer
4	TU2724	½" Pipe Nipple 25"	24	TU2224	1/8" Pipe Plug
5	OP311	½" Pipe Nipple 12 ¾"	25	TU3539	Gas Burner Orifice (Specify Size)
6	TU7686	Regulator ½ x ½ (Natural Gas Only)	26	TU8288	Manifold Assembly
7	TU6557	Baso Gas Valve	27	TU7840	Burner Assy. (Right Side)
7A	TU3832	Baso Gas Valve Coil Assy.	28	TU8760	Burner Ignition (Left Side)
8	TU6773	Gas Cock ¾ x ¾	29	TU8613	Norton Igniter Instructions
9	390401012	Pipe Nipple ½ x 3½	30	OP290	Nipple ½" x 2" (Natural Gas Only)
10	TU2226	Manifold Mounting Bracket	31	TU8690	Norton Igniter Plate
11	136067752	Fiberglass Tubing	32	P104	¼" Cut Washer Brass
12	TU6089	Pipe Bushing	33	TU8645	Installation Instructions
13	TU8598	Radiant Sensor	34	TU10292	Wing Nut
14	390501053	½" Elbow	35	TU3416	#8x1½ S.M.S.
15	TU3266	8-32 Hex Nut	36	SV332	#8-32 x 3/8 Round Head Machine Screw
16	M271	Brass Lock Washer	37	TU8605	Molex Connector
17	C1365	Connector T & B	38		Gas Rating Plate
18	TU9540	Heat Shield	39	TU10286	Spacer
19	TU8596	Norton Igniter			
20	CB36	½"-20 x ½ Hex Head Screw			

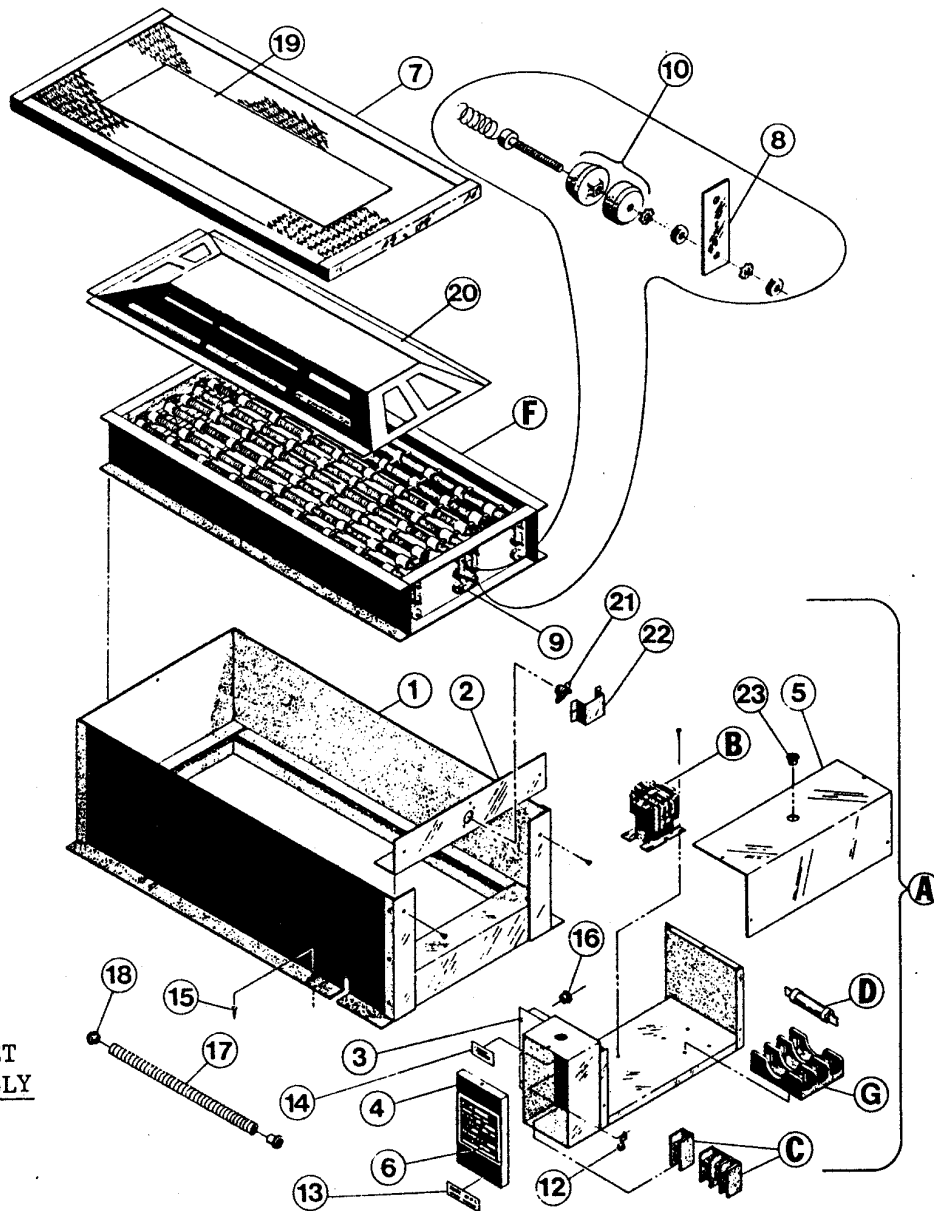


GAS BONNET & BURNER ASSEMBLY - F & R Models

TU8673 (Natural Gas) TU8858 (L.P. Gas)

All Hardware Sold Only In Packages Of 6

Ref. No.	Part No.	Description	Ref. No.	Part No.	Description
1	TU8717	"F" Bonnet Welded Assy.	23	TU2847	1/4" Flat Washer
1A	TU8561	Front Plate Hinge Assy.	24	TU4934	1/4"-20 Hex Nut
1B	TU8483	Top Panel	25	TU2224	1/8" Pipe Plug
2	TU7733	#8x1/2 Self Drill Screw	26	TU3539	Gas Burner Orifice (Specify Size)
3	TU2842	10-32 Hex Nut	27	TU7840	Burner Assembly
4	TU2724	Pipe Nipple 1/2" x 25"	28	TU8288	Manifold Assembly
5	OP311	Pipe Nipple 1/2"x12 3/4"	29	TU3416	#8x1 1/2 S.M.S.
6	TU9177	Regulator (Nat'l. Gas Only)	30	TU10946	Manifold Plug
7	TU6557	Baso Gas Valve	31	M271	Brass Lock Washer
7A	TU3832	Baso Gas Valve Coil Assy.	32	P104	1/4" Cut Washer Brass
8	TU6321	Gas Cock	33	TU8605	Molex Connector
9	OP290	Pipe Nipple 1/2" x 2" (Natural Gas Only)	34	TU10292	Wing Nut
10	TU2226	Manifold Mount. Bracket	35	TU2877	#10 Tinnerman Nut
11	136067752	Fiberglass Tubing	36	TU2878	#10x5/8 Sheet Metal Screw
12	TU8484	Upper Rear Air Deflector	37	TU3479	10-32x7/16" Truss Hd. Screw
13	TU8760	Burner Ignition (Left Side)	38	TU8613	Norton Igniter Instructions
14	390501053	1/2" Elbow	39		Gas Rating Plate
15	TU8598	Radiant Sensor	40	TU8645	Installation Instructions
16	C1365	Connector T&B (Gas Valve)	41	P104	Cut Washer
17	TU8690	Igniter Mounting Plate	42	TU3266	8-32 Hex Nut
18	TU7373	Clean Out Panel Nameplate	44	TU2853	Gasket
19	TU8596	Norton Igniter	45	SV332	8-32x3/8 Round Head Machine Screw
20	TU9540	Heat Shield	46	TU10286	Spacer
21	CB36	1/4"-20x1 1/2" Hex Head Screw	47	390401012	Nipple 1/2" x 3 1/2"
22	TU2846	1/4" Split Lock Washer			



**ELECTRIC BONNET
COMPLETE ASSEMBLY**
 TU9271 - 208V.
 TU9282 - 240V.
 TU9284 - 480V.
 TU9285 - 550V.
 TU9283 - 240/415V.

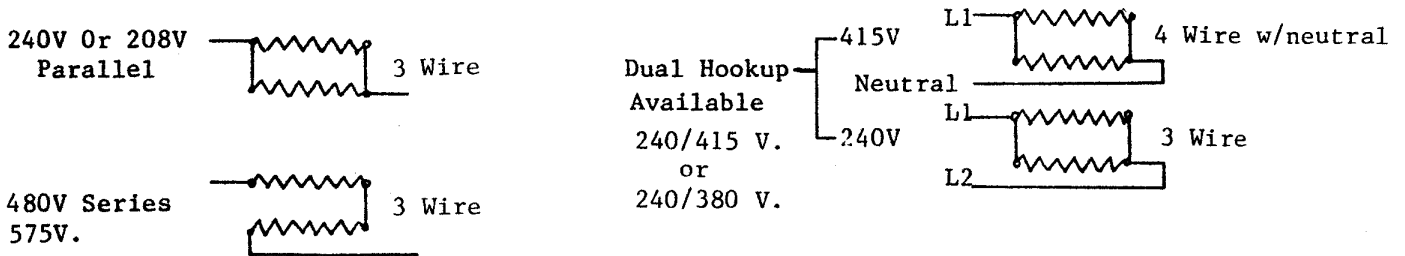
Ref. No.	Part No.	Description	Ref. No.	Part No.	Description
1	TU3103	Bonnet Weldment	17	504641292	1/2 Greenfield Cable
2	TU3102	Hold Down Plate	18	TU4790	Straight Connector
3	TU9402	Control Box W/A	19	TU10499	Air Baffle
4	TU9398	Terminal Box W/A	20	TU10496	Baffle Cover
5	TU9397	Top Cover	21	TU7244	135 deg. Thermostat
6	TU8519	Branch Circuit Label (Double Motor)	22	TU10535	Thermostat Cover
7	TU3104	Air Inlet Cover	23	TU8595	Bushing
8	TU3767	Contact Strap (4 ea.)	A	See Next Page	Control Box Less Wiring
9	TU3768	Contact Strap (1 ea.)	B	"	Contactor
10	TU3253	Insulators (Pkg. of 6)	C	"	Terminal Block
12	TU7738	Grounding Lug	D	"	Fuse
13	TU9254	High Voltage Label	E	"	Bonnet W/Elements
14	TU9258	Grounding Label	F	"	Heater W/Elements
15	TU3209	#14X5/8 S. M. Screw	G	"	Fuse Holder
16	TU5958	Bushing			

ELECTRIC BONNET - 70 LB.

MODEL FOR 40 KW HEATING ELEMENTS ONLY

	A	B	C	D	E	F	G
COMPLETE BONNET ASSEMBLY	CONTROL BOX L/WIRING	CONTACTOR COIL VOLTAGE	TERMINAL BLOCK	FUSE (3)	BONNET W/ ELEMENTS	HEATER ELEMENT	FUSE HOLDER
TU9271 208V.	TU9334 40KW 208V. 3PH.	TU9331 240V. 75 AMP	TU8734 3 POLE	TU9330 70 AMP	TU9333 40KW 208V. 3 PH.	TU7235 40KW 208V.	TU9348
TU9282 240V.	TU9335 40KW 240V. 3 PH.	TU9170 240V. 60 AMP	TU8374 3 POLE	TU7476 60 AMP	TU9336 40KW 240V. 3 PH.	TU7056 40KW 240 V.	TU9141
TU9283 240/415V	TU9420 40KW 240/415V. 3 PH 415V W/NEUTRAL	TU9170 240V. 60 AMP	TU8734* TU9178**	TU7476 60 AMP	TU9336 40KW 240V. 3 PH	TU7056 40KW 240V.	TU9141
TU9284 480V.	TU9245 40KW 480V. 3 PH	TU9140 240V. 40 AMP	TU8734 3 POLE	TU7071 35 AMP	TU9336 40KW SERIES 480V. 3 PH	TU7056 40KW 240V. USED FOR 40KW 480V SERIES	TU9141
TU9285 575V.	TU9245 40KW 575V. 3 PH	TU9140 240 V. 40 AMP	TU8734 3 POLE	TU7071 35 AMP	TU9419 40KW SERIES 575V. 3 PH	TU7355 40KW 287.5V. USED FOR 40KW 575V. SERIES	TU9141

* 3 Pole ** 1 Pole (Neutral)



WIRE SIZE OF POWER SUPPLY FOR ELECTRIC HEATING CIRCUIT
Plate Number TU8519

Rated Heater Input	Heater Amperes, Motor Amperes, Control Amperes, Total Amperes at Rated Voltage	Minimum Size Supply Wire Based on 60°C (140F) insulated HZ. Copper Conductor	Circuit Minimum Conduit Trade Size	Two 60 Hz. Motor Circuit Phase	Controls Phase
40 KW @ 208V/3Ph.	121.7 Amps	60 0 AWG	2 in.	1 Phase	1 Phase
40 KW @ 208V/3Ph.	116.5 Amps	60 0 "	2 in.	3 "	1 "
40 KW @ 240V/3Ph.	106.7 Amps	60 1 "	1½ in.	1 "	1 "
40 KW @ 240V/3Ph.	101.5 Amps	60 1 "	1½ in.	3 "	1 "
40 KW @ 480V/3Ph.	52.7 Amps	60 6 "	1½ in.	3 "	1 "
40 KW @ 240-415V/3Ph.	102/59 Amps	50 1/4 AWG	1½/1½ in.	3 " (50HZ)	1 "
40 KW @ 575V./3Ph.	45.7 Amps	60 6 "	1½ in.	3 "	1 "

CAUTION: THIS MACHINE HAS ONE POWER SUPPLY CONNECTION POINT, Disconnect power before servicing dryer.