



CISSELL 30 lb. SERVICE MANUAL

C & F MODELS LAUNDRY DRYERS

GAS FIRED

**ENERGY SAVER
GAS FIRED**

ELECTRIC HEATED

STEAM HEATED

**Installation
Operation
Trouble Analysis
Maintenance
Illustrated Parts**

cissell
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**Refer to
Addendum A
for Updated
Information**



**MAN 2
4/84**

100 6/92 HP

"Ask Your Distributor"

**D0016R1
2/07
Printed in U.S.A.**

Addendum A

L28CS30, L28CD30, L28FS30, L28FD30 Models

PART NO.	DESCRIPTION	COMMENTS	PAGE NO.
TU3240H	Thermostat	2 required; 185 degrees	
TU5150H	Thermostat	Medium: 150 degrees	
TU7244H	Thermostat	Low; 135 degrees	
TU2045H	Thermostat	Cool down; 155 degrees	
TU1979H	Door Switch	Includes hardware	
K189	Timer Replacement Kit	15 minute; 120 Volt	
K188	Timer Replacement Kit	60 minute; 120 Volt	
K194	Timer Replacement Kit	15 minute; 240 Volt; 60 Hertz	
K193	Timer Replacement Kit	60 minute; 240 Volt; 60 Hertz	
K190	Timer Replacement Kit	15 minute; 240 Volt; 50 Hertz	
K192	Timer Replacement Kit	60 minute; 240 Volt; 50 Hertz	
CM6760	Coin Meter	120 Volt; 25 cents; No cam	
CM6860	Coin Meter	240 Volt; 25 cents; No cam	
TU7021	Belt	Single motor; Upper	
TU4794	Belt	Single motor; Lower	
TU2317	Belt	Double motor; 60 Hertz	
TU6190	Belt	Double motor; 50 Hertz	
TU7016H	Sheave	Basket; Single motor	
TU5217	Sheave	Idler; Single motor	
TU6559	Sheave	Motor; 60 Hertz; Single motor	
TU7603	Sheave	Motor; 50 Hertz; Single motor	
TU2211	Sheave	Basket; Double motor	
TU1952	Sheave	Motor pulley; 60 Hertz; Double motor	
TU2211	Sheave	Motor pulley; 50 Hertz; Double motor	
TU12803	Idler Bracket Assembly	Single motor only	
TU7019	Bearing	2 required; Includes locking collar	
TU7018	Bearing	4 required	
TM100	Gear Reducer	Double motor only	
TU15670	Fan		
TU8206	Air Switch Kit		
TU14482	Switch		
TU6557	Gas Valve	Natural Gas	
TU8596	Ignitor	Glow bar	
TU8599	Relay	Ignition	
TU8598	Radiant Sensor		
TU2405	Steam Coil	9 section	
TU6041	Steam Solenoid Valve	120 Volt	
TU5924	Steam Solenoid Valve	240 Volt	
TU15107	Door Glass		
TU2090	Door Gasket		
TU2874	Door Handle		
TU5420	Front Panel	Add color	
TU5277	Lint Door	Add color	
TU2083K	Basket		
TU7188K	Basket and Spider	Single motor	
K20	Spider	Single motor	
K106	Spider	Double motor; Includes key and seal	
TU10362	Lint Screen		
TU5106	Switch	Temperature Selector	

Obsolete Parts – No Longer Available

PART NO.	DESCRIPTION	COMMENTS	PAGE NO.
K373	Timer	Electronic coin board	
TU7171	Loading Door and Hinge		

- 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.

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: PURCHASER TO POST THIS CAUTION NOTICE 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.

POST INSTRUCTIONS TO BE FOLLOWED IN THE EVENT THE USER SMELLS GAS 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:



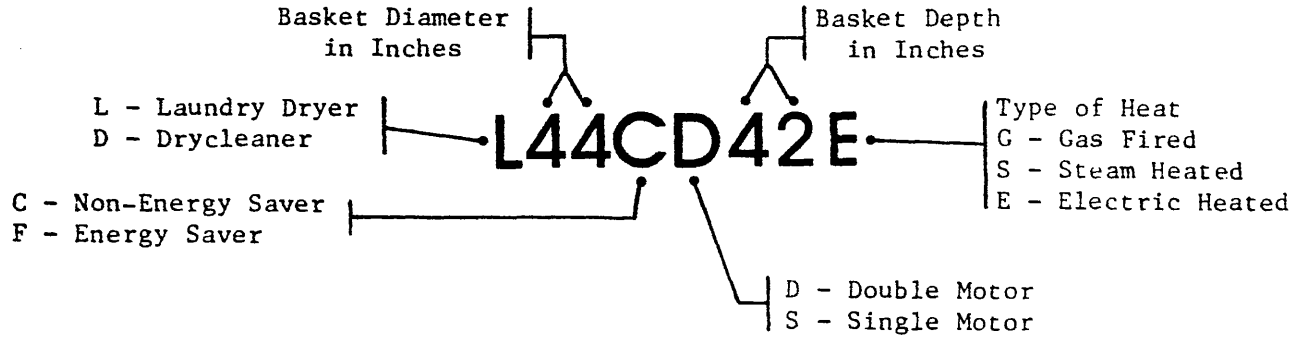
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CISSELL DRYERS MODEL NUMBERS

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 voltage, hertz and phase as marked on the rating plate.



The Cissell 30 Lb. Dryers in this manual may be identified by the following list of model numbers. Throughout the manual, dryers may be referred to as the 30 Lb. "C" Model, "F" Model, etc. :

LIST OF 30 LB. CISSELL DRYER MODEL NUMBERS

L28CS30G	L28FS30G
L28CD30G	L28FD30G
L28CS30E	L28FS30E
L28CD30E	L28FD30E
L28CS30S	L28FS30S
L28CD30S	L28FD30S

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.

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

See outline clearance drawings 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 in this manual.

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

GENERAL INSTALLATION

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

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

GENERAL INFORMATION

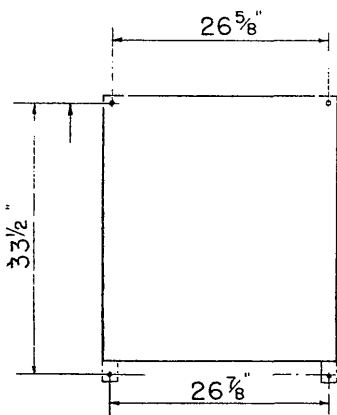
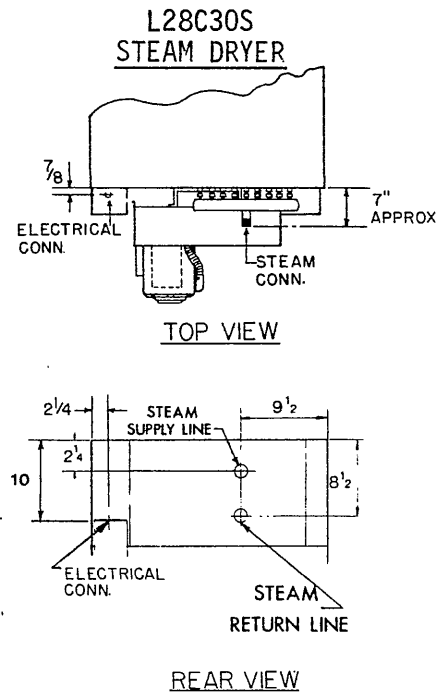
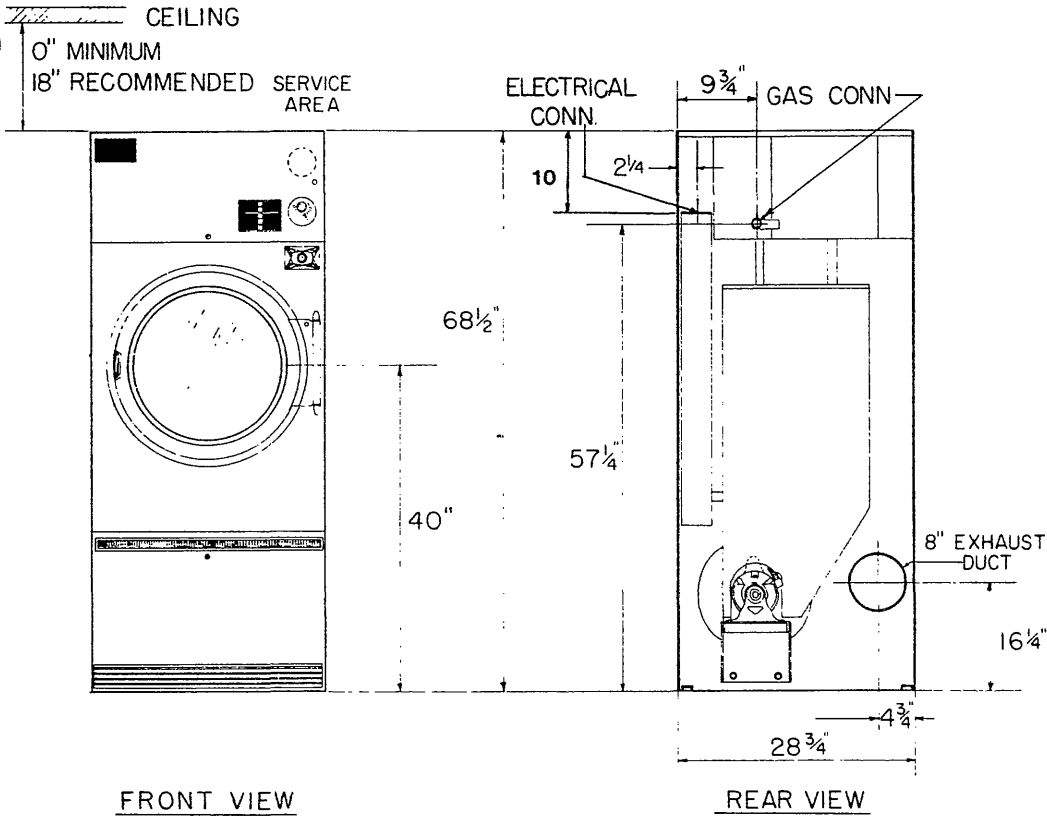
The Cissell dryer is so designed that when an operator opens the dryer door the basket and exhaust fan stops. You can expect fast drying from a Cissell dryer. Hot, dry air is properly and effectively moved through the basket and exhausted through a lint trap to the atmosphere. The Cissell dryer comes 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

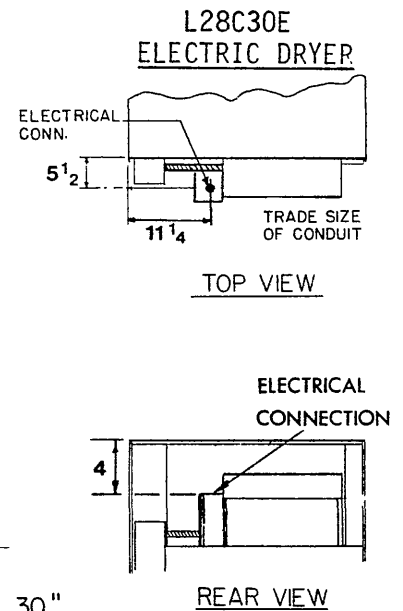
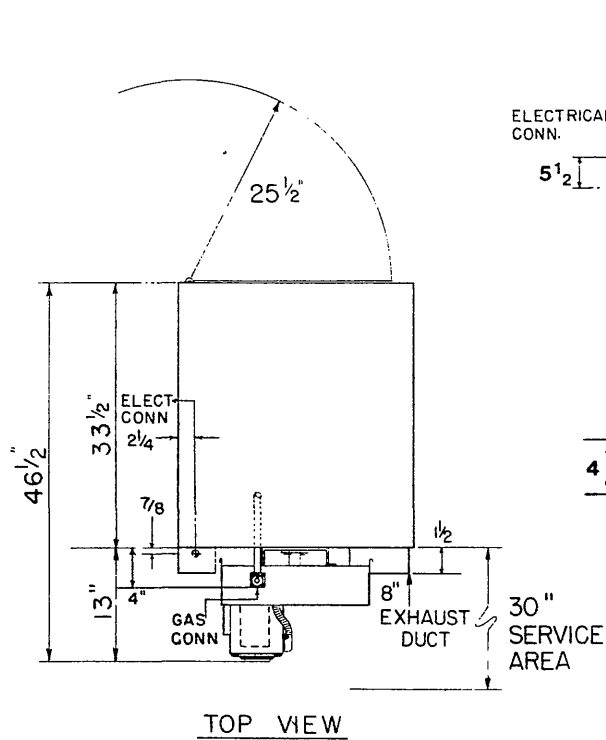
Permanent-Press, Durable Press, and other modern day fabrics require the care that your Cissell Therm-O-Cool Laundry Dryers now provide.

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 to 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.

Outline Dimension Typical For All L28C30 Gas, Steam and Electric Dryers
Gas Dryer (Model L28CS30G)

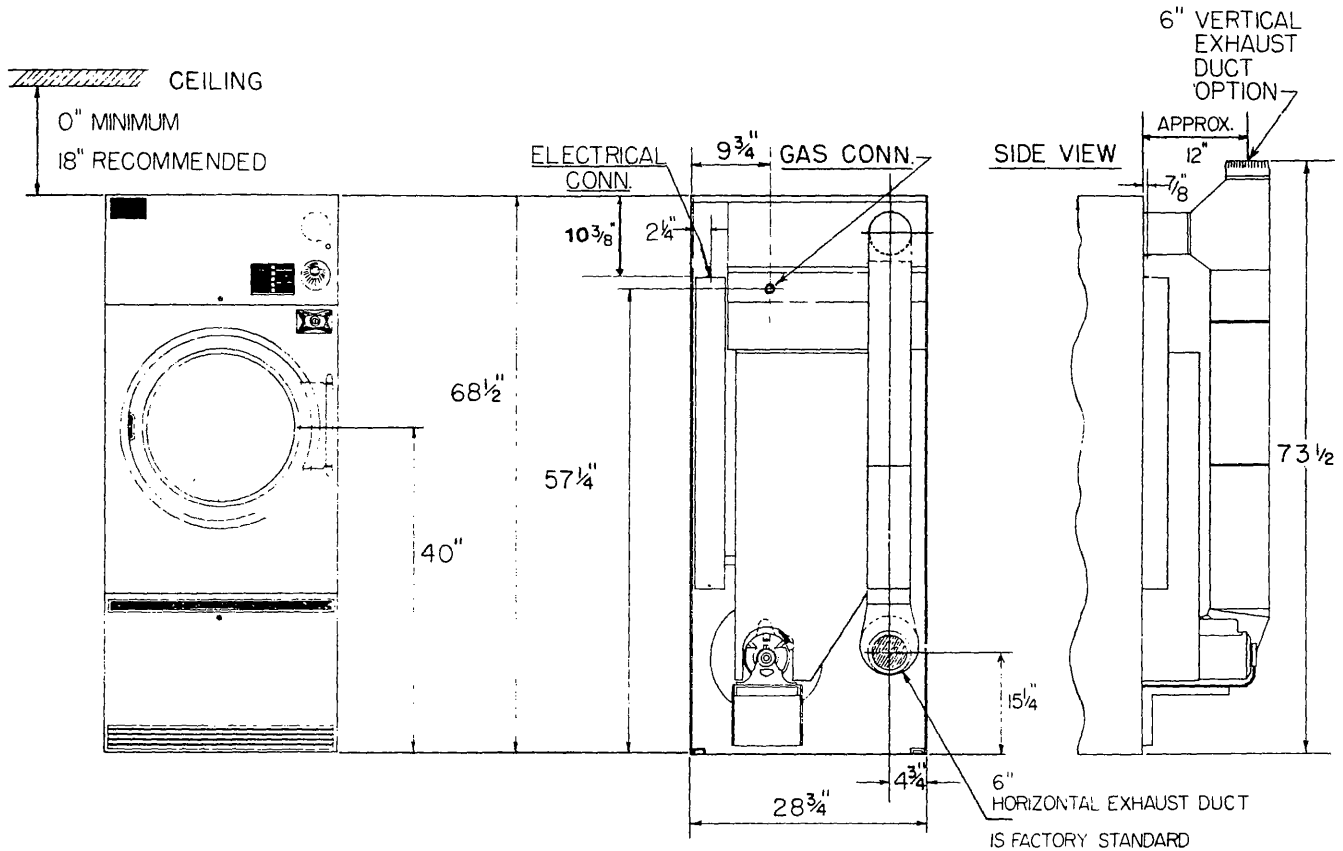


BASE MOUNTING HOLES



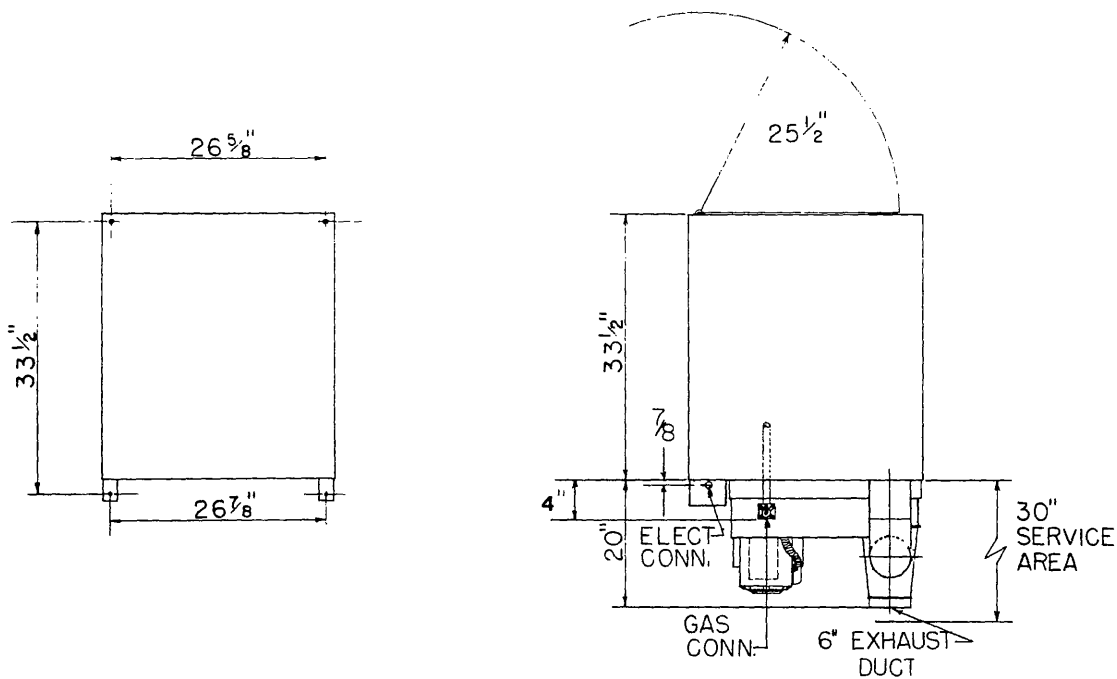
OVERALL DIMENSIONS TYPICAL FOR ALL 28F30 GAS DRYERS

(28F530 GAS DRYER ILLUSTRATED)



FRONT VIEW

REAR VIEW



BASE MOUNTING
HOLES

TOP VIEW

28C30 DRYER SPECIFICATIONS

GENERAL SPECIFICATIONS

MODEL L28C30

Basket Capacity	30 lbs.(13.61 KG) Dryweight
Floor Space (Double Motor)	68½"(173.99 CM) High x 45 1/8"(114.63 CM) Deep x 28 3/4"(73.03 CM) Wide
Floor Space (Single Motor)	68½"(173.99 CM) High x 46½"(118.11 CM) Deep x 28 3/4"(73.03 CM)
Basket Size	28"(72.12CM) Dia. x 30"(76.2 CM) Deep
Exhaust Duct	8"(20.32 CM) Diameter
Motor Size (Fan motor).	1/3 H.P. (28CD30)
Motor Size (Basket motor)	1/3 H.P. (28CD30)
Motor Size (Single Motor)	1/2 H.P. (28CS30)

For total amps, check electrical rating plate on dryer.

1. Can be designed for any voltage.
2. 50 or 60 HZ.
3. 1 or 3 -hase.

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

GAS FIRED

Maximum Air Displacement . . . . .	.700 CFM (19.82 M ³ /Min.)
Recommended Operating Range	530-630 CFM (15.01-17.84 M ³ /Min.)
Gas Supply	1/2"(1.27 CM) Pipe Connection
*B.T.U. Input (2 Burners)	100,000 / hour-natural gas 100,000 / hour- liquid petroleum gas
Electronic Ignition	Silicon Carbide Gas Ignition System
Drying Time(approx.)	10 lbs.(4.55 KG) dryweight Indian Head 70% Moisture retention- 10 Minutes
Net Weight (approx.) . . . . .	.450 lbs.(204.12 KG)
Domestic Shipping Weight(approx., 1 carton). . . . .	.510 lbs.(231.33 KG)
Export Shipping Weight(approx. 1 box). . . . .	.840 lbs.(381.02 KG)
Export Shipping Dimensions . . . . .	.74"(187.96 CM) Long x 35"(88.9 CM)Wide 55"(139.7 CM) High

*Input ratings as shown are for elevations up to 2,000 ft.(609.6 M). For higher elevations, ratings should be reduced by 4% for each 1,000 ft.(304.8 M) above sea level.

ELECTRICALLY HEATED

Maximum Air Displacement . . . . .	.700 CFM (19.82 M ³ /Min.)
Recommended Operating Range	530-630 CFM (15.01-17.84 M ³ /Min.)
Heater Input . . . . .	.21 Kilowatts/Hour
Total Heater Current	See page 60
Drying Time(approx.) . . . . .	.12 lbs.(5.44 KG) dryweight Indian Head 70% Moisture retention- 12 Minutes.
Net Weight (approx.) . . . . .	.450 lbs.(204.12 KG)
Domestic Shipping Weight (approx., 1 carton) . . . . .	.510 lbs.(231.33 KG)
Export Shipping Weight (approx., 1 box) . . . . .	.840 lbs.(381.02 KG)
Export Shipping Dimensions. . . . .	.74"(187.96 CM) Long x 35"(88.9 CM) Wide x 55"(139.7 CM) High

STEAM HEATED - NINE SECTION

Maximum Air Displacement	700 CFM (19.82 M ³ /Min.)
Recommended Operating Range	530-630 CFM(15.01-17.84 M ³ /Min.)
Steam Supply Connection	3/4"(1.91 CM)
Steam Return Connection	3/4"(1.91 CM)
Operating Steam Pressure	7-15 lbs.(3.18-6.9 KG)Low Pressure 100 lbs.(56.7 KG) High Pressure
Drying Time (approx.) . . . . .	.25 lbs.(11.34 KG) dryweight Indian Head 70% Moisture retention- 30 Minutes (low pressure) 22 Minutes (high pressure)
Steam Consumption	2.6 B.H.P.- 89.7 lbs.(40.69 KG)/hour with normal load- low pressure 3.4 B.H.P.- 117.3 lbs.(53.21 KG)/hour with normal load-high pressure
Net Weight (approx.)	500 lbs.(226.8 KG)
Domestic Shipping Weight (approx., 1 carton)	560 lbs.(254.01 KG)
Export Shipping Weight (approx., 1 box)	890 lbs.(406.23 KG)
Export Shipping Dimensions	74"(187.96 CM) Long x 35"(88.9 CM) Wide x 55"(139.7 CM) High

28F30 DRYER SPECIFICATIONS - ENERGY SAVER MODEL

<u>GENERAL SPECIFICATIONS</u>	<u>L28F30</u>
Basket Capacity . . . . .	.30 lbs.(13.61 KG) Dryweight
Floor Space . . . . .	.68½"(173.99 CM) High x 52 3/4" (133.99 CM) Deep x 28 3/4"(73.03 CM)
Basket Size . . . . .	.28"(71.12 CM) Diameter x 30"(76.02)Deep
Exhaust Duct	6"(15.24 CM) Dia. (Exhaust air pressure maximum 0.3"(.76 CM) static pressure
Motor Size (Fan motor)	1/3 H.P.(28FD30)
Motor Size (Basket Size)	1/3 H.P.(28FD30)
Motor Size (Single motor)	1/2 H.P.(28F 30)
For total amps, check electrical rating plate on dryer.	
1. Can be designed for any voltage.	
2. 50 or 60 HZ.	
3. 1 or 3 Phase.	
Maximum Air Displacement	350 CFM(9.91 M ³ /Min.)
Recommended Operating Range . . . . .	.270-330 CFM(7.65-9.34 M ³ /Min.)
*B.T.U. . . . .	.80,000 B.T.U./Hour
Dryer(set at factory) gas burners built-in 3.5"(8.89 CM) regulated gas pressure (natural gas only).	
Models can be equipped for use with natural gas or liquid petroleum gases (L.P.)	
Gas Supply	1/2"(1.27CM) Pipe connection
Drying Time(approx.)	10 lbs.(4.54 KG) dryweight Indian Head 70% Moisture retention- 10 Minutes
Net Weight(approx.) . . . . .	.500 lbs.(226.8 KG)
Domestic Shipping Weight(approx.) . . . . .	.550 lbs.(249.48 KG)
Export Shipping Weight (approx., 1 box)	890 lbs.(403.7 KG)

* Input ratings as shown are for elevations up to 2,000 ft.(609.6 M). For higher elevations, ratings should be reduced 4% for each 1,000ft.(304.8 M) above sea level.

Electrical wiring to dryer should comply with local electrical code requirements.

MOTORS USED FOR 30 LB. CLOTHES DRYERS

"CD" & "FD" MODELS

MOTOR NO.	VOLTAGE	CYCLE	PHASE	H.P.	BASKET/ FAN	AMPS	R.P.M.
MTR209	115/208-230	60	1	1/3	B or F	5.2/2.6	1725
MTR218	208-220/440	50/60	3	1/3	B or F	1.7/.85	1425/1725
MTR16	120	50	1	1/3	B or F	6.4	1425
MTR17	240	50	1	1/3	B or F	3.7	1425
MTR13	208-240	50/60	3	1/3	Basket	1.1	1425/1725
MTR184	240/415	50	3	1/2	B or F	1.6/.9	1425
MTR111	575	60	3	1/2	Basket	.77	1725
MTR36	575	60	3	1/3	Fan	.59	1725

"CS" & "FS" MODELS

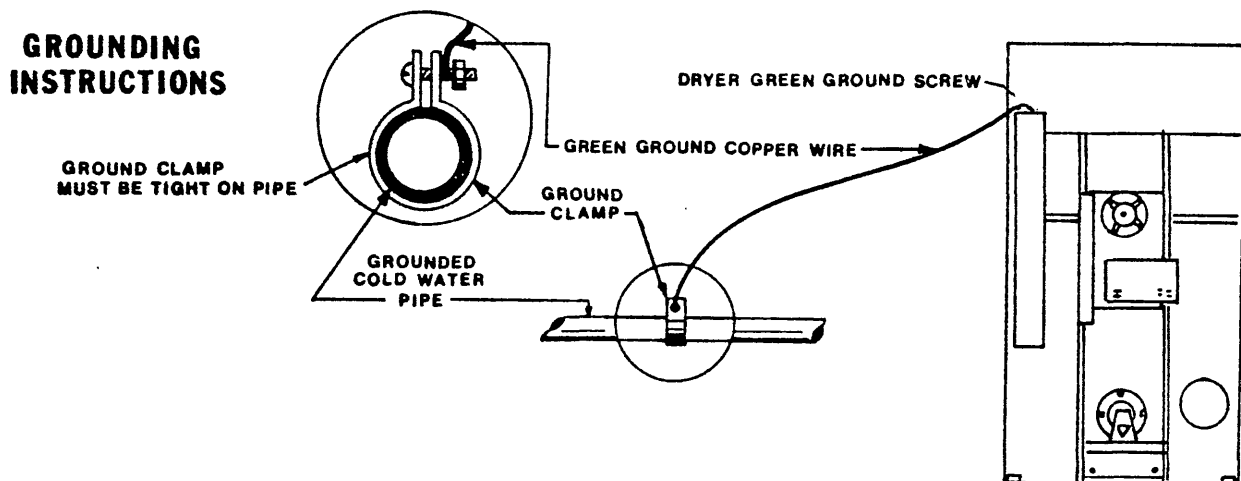
MTR200	115/208-230	60	1	1/2	Both	5.8/2.9	1725
MTR115	120	50	1	1/2	Both	9.2	1425
MTR116	240	50	1	1/2	Both	4.6	1425
MTR214	208-230/460	60	3	1/2	Both	2.2/1.1	1725
MTR189	240/415	50	3	1/2	Both	2.2/1.1	1425

ELECTRICAL CONNECTIONS - ALL DRYERS

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 ANSI/NFPA No. 70-1981.

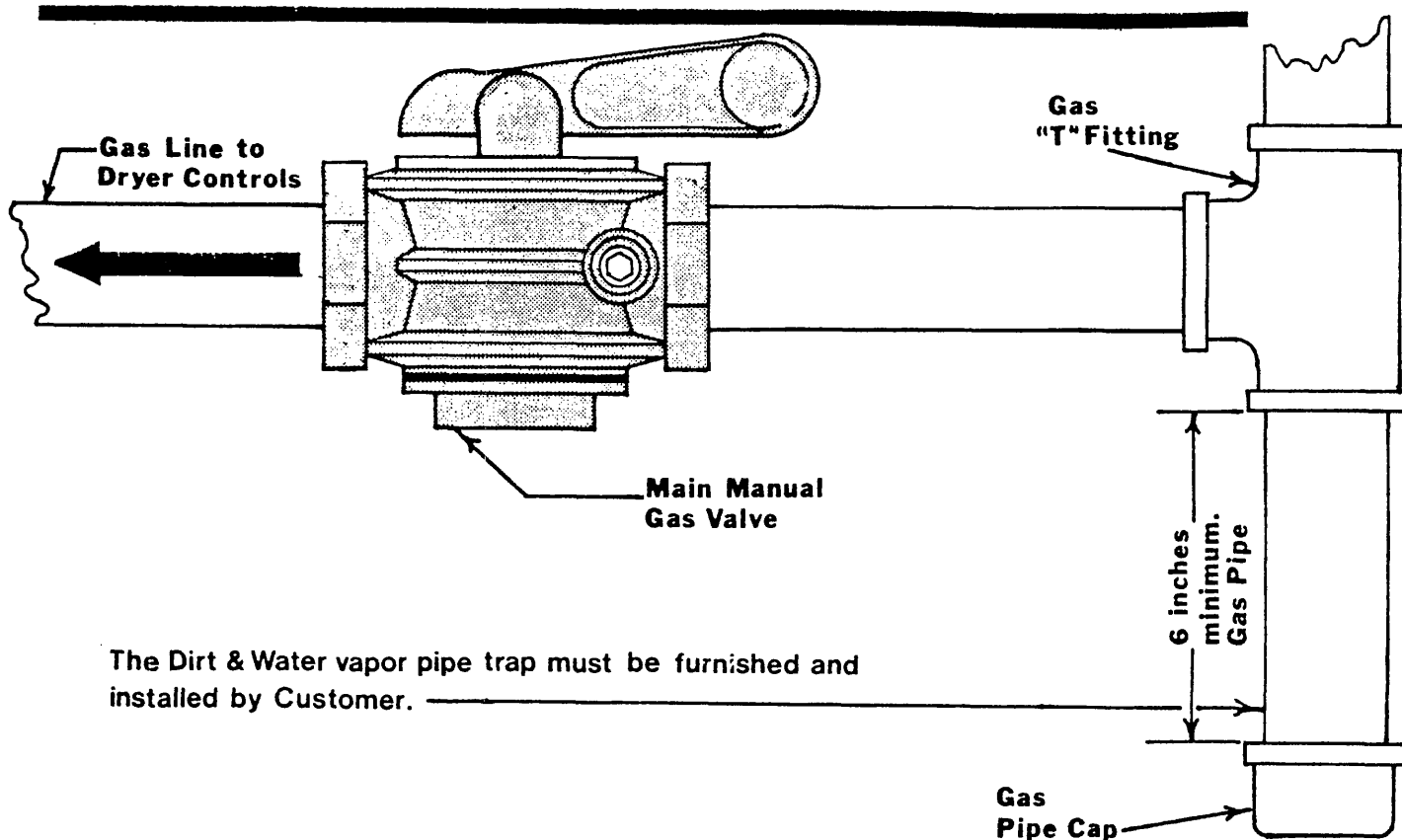
See wiring diagram furnished with dryer. Your Cissell dryer is completely wired at the factory and it is only necessary for the electrician to connect the power leads to the wire connectors within the service connection box on the rear of the dryer. Do not change wiring without consulting the factory as you may void the 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 the rear wall of the dryer.

All panels must be in place before operation of dryer.



GAS PIPING INSTALLATION

The installation must conform with local codes or, in the absence of local codes, with the National Fuel Gas Code, ANSI Z223.1-1980.



GAS PIPING INSTALLATION

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

Check for altitude elevation of the dryer.

Check utilities 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 gas intermittent will cause gas ignition problems. This will cause inadequate 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.

TOTAL BTU/HR (for L.P. gas correct total BTU/HR below by multiplying by .6)	GAS PIPE SIZE FOR 1000 BTU NATURAL GAS AT 7" W.C. PRESSURE					
	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 1/4
160,000	3/4	1	1	1 1/4	1 1/4	1 1/4
180,000	1	1	1	1 1/4	1 1/4	1 1/4
200,000	1	1	1 1/4	1 1/4	1 1/4	1 1/2
300,000	1	1 1/4	1 1/4	1 1/2	1 1/2	1 1/2
400,000	1 1/4	1 1/4	1 1/2	1 1/2	1 1/2	2
500,000	1 1/4	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
2,000,000	2 1/2	2 1/2	3	3	3	3 1/2
2,200,000	2 1/2	3	3	3	3 1/2	3 1/2
2,400,000	2 1/2	3	3	3	3 1/2	3 1/2
2,600,000	2 1/2	3	3	3 1/2	3 1/2	3 1/2
2,800,000	2 1/2	3	3	3 1/2	3 1/2	3 1/2
3,000,000	2 1/2	3	3 1/2	3 1/2	3 1/2	4
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

STEAM PIPING INSTALLATION INSTRUCTIONS:

1. Set and anchor dryer in position. Machine should be level to assure proper steam circulation.
2. To prevent condensate draining from headers to dryer, piping should have a minimum 12" above respective header. Do not make steam connection to header with a horizontal or downwardly facing tee or elbow.
3. Whenever possible, horizontal runs of steam lines must drain, by gravity, to respective steam header. Water pockets, or an improperly drained steam header will provide wet steam, causing improper operation of dryer. If pockets or improper drainage cannot be eliminated, install a by-pass trap to drain condensate from the low point in the steam supply header to the return.
4. In both steam supply and steam return line, it is recommended that each have a 3/4" union and 3/4" globe valve. This will enable you to disconnect the steam connections and service the dryer while your plant is in operation.
5. Before connecting trap and check valve to dryer, open globe valve in steam supply line and allow steam to flow through dryer to flush out any dirt and scale from dryer. This will assure proper operation of trap when connected.
6. After flushing system, install bucket trap (w/built in strainer) and check valve. For successful operation of dryer, install trap 18" below coil and as near to the dryer as possible. Inspect trap carefully for inlet and outlet markings and install according to trap manufacturer's instructions. If steam is gravity returned to boiler, omit trap but install check valve in return line near dryer.
7. Install union and globe valve in return line and make final pipe connections to return header.

PIPING RECOMMENDATIONS:

1. Trap each dryer individually. Always keep the trap clean and in good working condition.
2. When dryer is on the end of a line of equipment extend header at least 4 feet beyond dryer. Install globe valve, union, check valve and by-pass trap at end of line. If gravity return to boiler, omit trap.
3. Insulate steam supply and return line for safety of operator and safety while servicing dryer.
4. Keep dryer in good working condition. Repair or replace any worn or defective parts.

Cissell
MANUFACTURING COMPANY
831 South First Street
Louisville, KY 40203

ASK YOUR DISTRIBUTOR

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4823 W. Jefferson Blvd.
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Export Dept. Cable Code "Cissell"

EXHAUST DUCT INSTALLATION

COMMERCIAL CLOTHES DRYER MODELS:

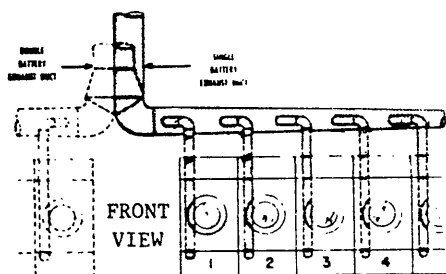
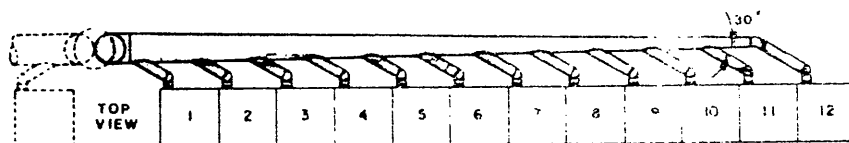
L28CD30, L28FD30, L28DS30, L28FS30, L28GS30, L28CS30,
L36FD30, L36CD30, L36FS30, L36CS30,
L36FD36, L36CD36.

When ordering, specify part number and name.

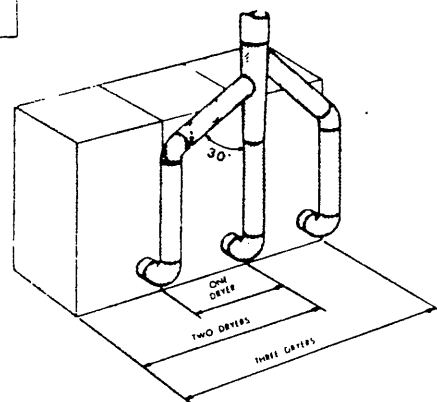
NUMBER OF DRYERS IN SINGLE BATTERY — REFER TO TABLE FOR DUCT DIAMETER AT EACH DRYER OUTLET CONNECTION. FOR DIAMETER OF EXHAUST, REFER TO TABLE USING TOTAL NUMBER OF DRYERS CONNECTED THERETO. (SINGLE OR DOUBLE BATTERY)

CAUTION: The exhaust air should not be vented into a wall, a ceiling, or a concealed space of a building.

NOTE: Inside of duct shall be smooth. Do not use sheet metal screws to join sections.



FOR BEST PERFORMANCE—Provide an individual exhaust duct for each dryer. Do not install a hot water heater in a room containing dryers. It is better to have the water heater in a separate room with a separate air inlet.



EXHAUST DUCT TABLE FOR MODELS: L28FS30, L28GS30, L36FS30, L36FD36, L28FD30, L36FD30

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

EXHAUST DUCT TABLE FOR MODELS: L28CS30, L28DS30, L36CS30, L36CD36, L28CD30, L36CD30

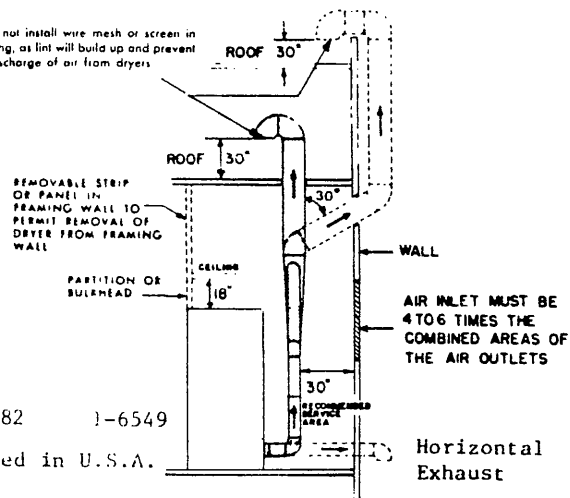
NO. OF DRYERS	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
DUCT DIAMETER in inches	8	12	14	16	18	20	22	23	24	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40

CAUTION

C or D models 30 lb., 50 lb., and 70 lb. dryers. Dryers are forced air exhausted and require provisions for air inlets to replace the air exhausted by the dryer. The air inlet openings into a room containing dryers should be a minimum of 1.3 sq. feet free area per dryer.

For G models, the air inlet openings must be a minimum of 1 sq. foot of free area per dryer. The air inlet openings into a room containing gas fired hot water heaters or other gravity vented appliances must be increased sufficiently to prevent downdraft in any of the vents when all dryers are in operation. Do not install gravity vented appliances between dryers and air inlet openings. CONSULT LOCAL BUILDING CODE REQUIREMENTS.

Note: Do not install wire mesh or screen in this opening, as lint will build up and prevent proper discharge of air from dryers.



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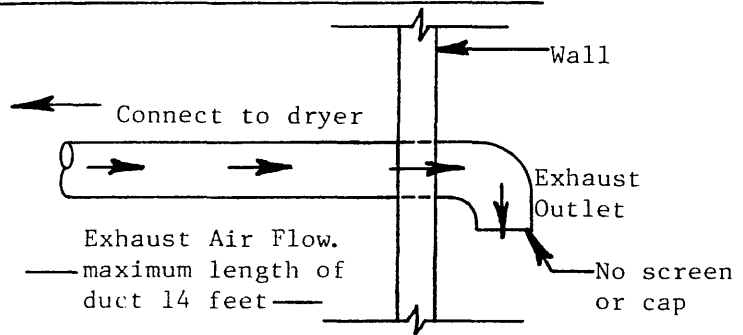
MAN103

EXHAUST DUCT INSTALLATION

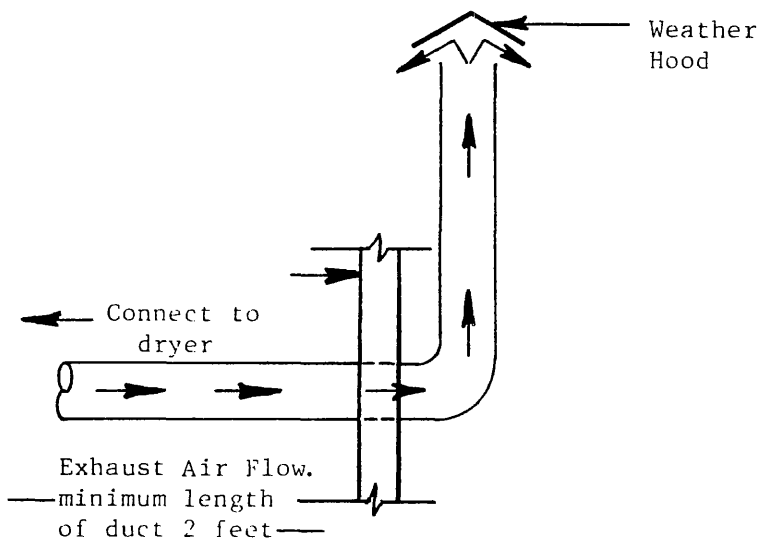
Caution:

Never connect elbow on dryer exhaust. Always have a minimum of 2 feet of straight duct then the elbow.

No more than 2 elbows.



HORIZONTAL EXHAUST INSTALLATION



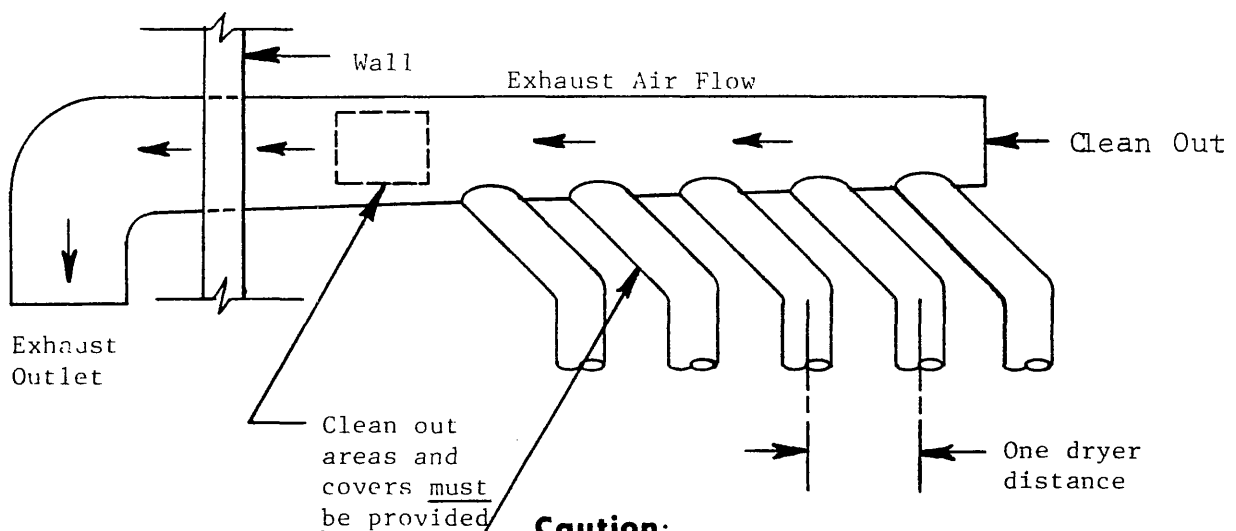
Caution:

Recommend maximum dryer exhausting- 14 feet of straight duct and 2 elbows for every 10 foot length; increase duct size 1 inch diameter.

Caution:

The exhaust air should not be vented into a wall, a ceiling, or a concealed space of a building.

VERTICAL EXHAUST INSTALLATION



Caution:

Dryer exhaust must meet main duct at 45° or 30° in direction of air flow. Multiple exhausting must never be 90° angle into main duct.

MULTIPLE HORIZONTAL EXHAUST INSTALLATION

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° & 30° elbows wherever possible.
3. Exhaust each dryer separately.
4. Use 2 feet of straight duct on dryer before installing an elbow.
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: 28F30, 36F30, 28G30. 36F36, 2820 - 100 to 150 sq. in. per dryer. 28C30, 28D30, 36C30 36C36, 44F42 - 200 to 300 sq. in. per dryer. 44C42 - 450 to 700 sq. in. per dryer.
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 requirement.

FOR HELP, consult Cissell Engineering on tough installations.

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

HIGH HEAT	MIXED LOADS HEAVY FABRICS HARD TO DRY	
NORMAL	COTTONS LINENS	
PERM PRESS POLY KNIT	PERMANENT PRESS SYNTHETIC-BLENDS LIGHT WEIGHT FABRICS	
LOW HEAT	DELICATE SHEER FABRICS EASY TO DRY	
PUSH TO START		

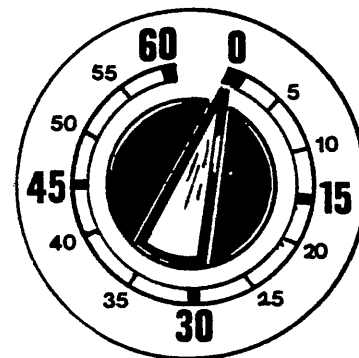
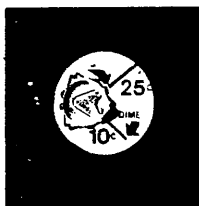
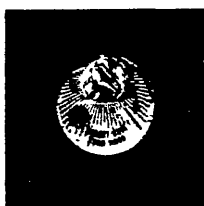


Fig. 1
SINGLE TIMER

OPERATING INSTRUCTIONS

- Step 1. After loading the dryer tumbler with the washed clothes load, proceed to close the loading door.
- Step 2. A. Timer Models - Turn timer knob to the desired drying time. See fig. 1



1. INSERT PROPER COIN IN CORRECT SLOT.
2. MUST, FULL TURN KNOB CLOCKWISE.
3. FULL TURN KNOB AFTER EACH COIN IS INSERTED.

B. Coin Meter Models - Insert proper coin in correct slot. Turn knob completely until it stops for desired drying time.

- Step 3. 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 - poly knit synthetic-blends-light weight fabrics. 160°F exhaust temperature
 Low Heat - delicate-sheer fabrics-easy to dry-140°F. exhaust temperature.
- Step 4. Turn switch to "on" position if dryer is equipped with "on-off" switch.

Step 5. Press in "Push to Start" button until the dryer starts running and then release button.

What is happening after step 5:

1. The fan motor will operate.
2. The clothes tumbler will revolve.
3. The heated energy-gas-electric-steam 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.

Important: If tumbler door is opened during the drying cycle, it stops the fan motor and the heated energy is shut off. To restart the dryer, close the door and press in the "Push to Start" button for approximately three seconds.

Important: The light will stay on until the therm-o-cool thermostat cools below 135°F. before the contacts open to shut off dryer. This is only on "Therm-o-cool" models.

Important: On coin meter models only, see the label for information.

Important: This dryer is designed for a capacity maximum load. Overloading it will result in long drying time 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: 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.

COOL-DOWN Cissell Dryers with one timer are furnished with Therm-O-Cool which reduces heat in the basket through temperature control, rather than by time. Time limit of this cool-down is flexible--requiring whatever period is necessary to reduce the load to a satisfactory cool state.

Cool-down immediately follows the drying cycle, to minimize wrinkling and reduce heat in the basket for more comfortable unloading.

Cissell coin-meter and double timer dryers models have a timed cool-down.

1. The coin-meter cool-down period is controlled internally.
2. The two timer model permits operator/customer to set cool-down manually to a predetermined period ranging from 0 to 15 minutes.

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^oF. exhaust temperature.
Normal - Cottons and linens 170^oF. exhaust temperature.
Permanent Press Heat - Poly knit snythetic-blends-light weight fabrics, 155^oF. exhaust temperature.
Low Heat - Delicate-sheet fabrics-easy to dry, 140^oF . 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.

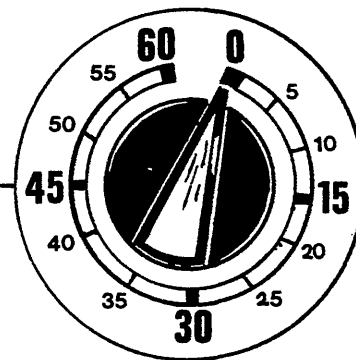
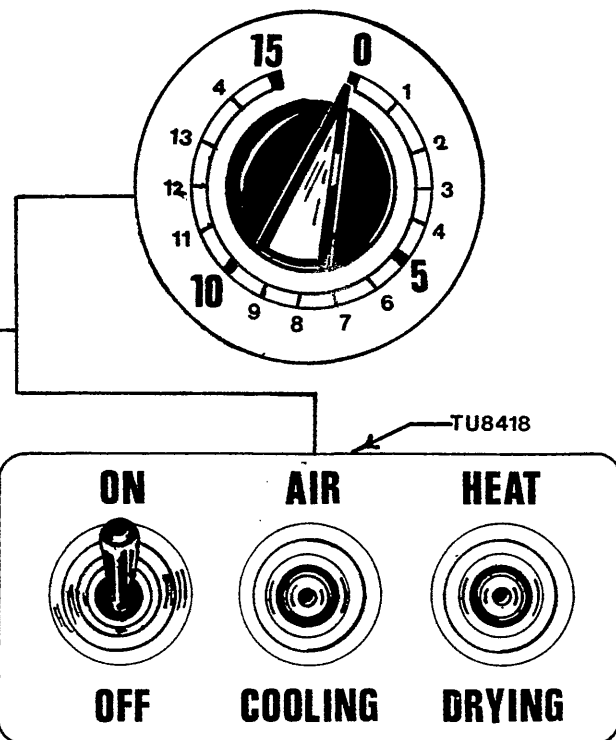
TIME and TEMPERATURE Control Panel

Fig. 1

LIGHT WILL INDICATE
AIR DRYING 15 MINUTES

LIGHT WILL INDICATE
HEAT DRYING
60 MINUTES

HIGH HEAT	MIXED LOADS HEAVY FABRICS HARD TO DRY	
NORMAL	COTTONS LINENS	
PERM PRESS POLY KNIT	PERMANENT PRESS SYNTHETIC-BLENDS LIGHT WEIGHT FABRICS	
LOW HEAT	DELICATE SHEER FABRICS EASY TO DRY	
PUSH	TO START	

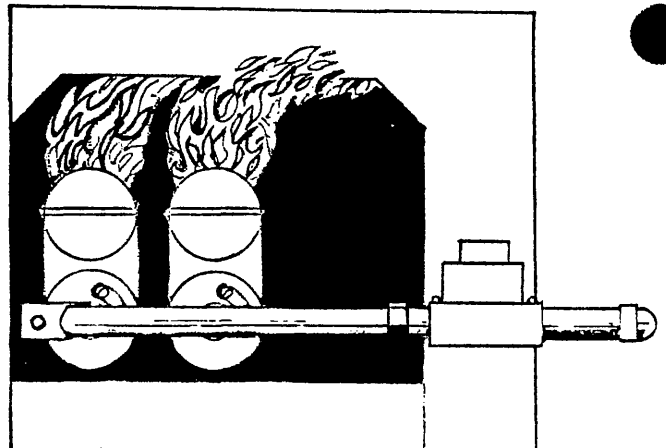


Important: This is a commercial dryer. It has keys to open the lower lint area panel and the upper control and burner area panel. This is equipped for the user's safety.

BURNER AIR INLET SHUTTERS ADJUSTMENT MAIN GAS BURNER FLAME PATTERN

Burners Air Inlet Shutters are correctly adjusted when the flame is primarily blue.

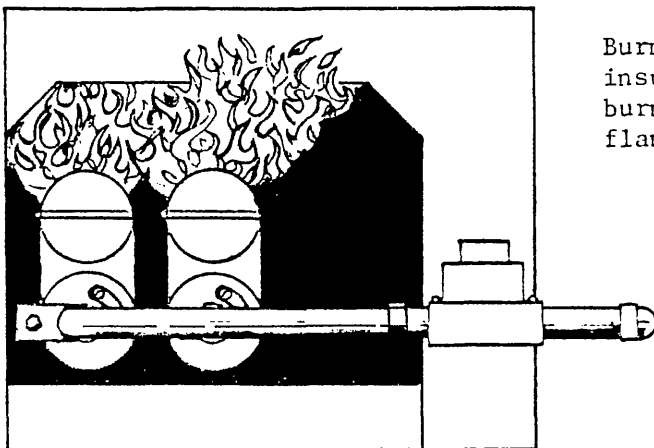
TYPE OF GAS	BURNER AIR INLET SHUTTERS ADJUSTMENT
Natural gas	1/2 Open
Liquid Petroleum	1/4 Open
Manufactured gas	1/16 Open



RIGHT

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 adjusted closed, insufficient air is admitted through the burner. Flame pattern is straight up and flame is yellow.

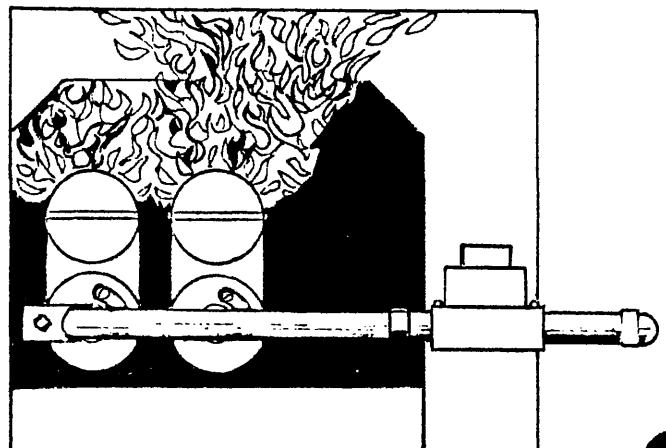
WRONG

NEED TO ADJUST SHUTTER

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.

WRONG

NEED TO PROVIDE CORRECT
AIRFLOW THROUGH THE DRYER



TROUBLE SHOOTING CHART--GAS, STEAM, 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.
	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 front panel and bend actuator lever to clear switch button 3/8" with front panel in place.
	Defective door switch	Replace switch.
	Defective basket motor contactor	Replace contactor.

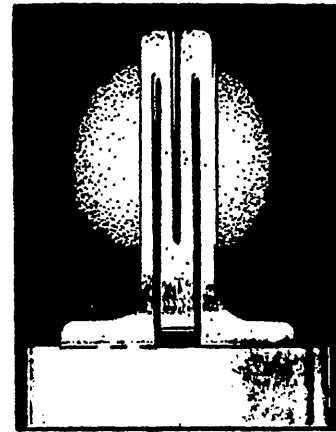
TROUBLE	CAUSE	REMEDY
Basket motor runs, but basket will not revolve	V-Belt Broken	Replace V-Belt.
	V-Belt Loose	Adjust Belt Tension.
	Motor pulley loose	Tighten set screw.
	Basket overloaded	Remove load.
Dryer noisy or vibrating	Not leveled	Check manual for proper leveling procedures.
	Fan out of balance	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 " <u>on</u> ."

TROUBLE	CAUSE	REMEDY
Dryer runs but no heat		
	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.
Dryer runs no steam to coils	Valve closed	Check all valves in steam supply and return--make sure they are open.
	Steam trap blocked	Remove and clean. Replace if defective.
	Solenoid valve	On dryers using solenoid temperature control, check operation of solenoid valve by advancing thermostat.
	Thermostat	On dryers using solenoid temperature control, thermostat controls operation of solenoid valve. If defective, replace thermostat.
	Check valve installed incorrectly	Check for inlet and outlet marking on check valve, and invert if necessary.
	Strainer clogged	Remove plug and blow down strainer or remove and clean thoroughly if heavily clogged.
Water in steam line	Steam piping installed incorrectly	Check piping per steam installation in instructions.
	Trap not functioning	Check trap for size and capacity. If dirty and sluggish, clean thoroughly or replace. Check return line for high back pressure, or another trap charging against the trap functioning improperly.

The **NEW Cissell** Silicon Carbide Ignition System



- New radiant sensor.
- TWO gas valves and pressure regulator provide additional safety.
- New igniter
 - Combines unique HIGH PHYSICAL and THERMAL Strength with stable electrical properties.
 - Can be relied upon to give premium performance at operating temperatures up to 2600° F and respond on command.
 - Clean, straightforward design insures easy handling, minimum chance of breakage; dependable, trouble-free operation.

Cissell's NEW Silicon Carbide Ignition System is better than ever!

- More reliable
- Less costly to replace
- Easier to service

Cissell's system reduces gas consumption 6% on the average over dryers with standing pilots based on 40-hour per week usage. There's no standing pilot to burn constantly; no electronic pilot to consume gas before burner ignites. . . either/both of which add high energy costs to your operation:

CISSELL's silicon carbide ignition system saves you up to 53% (dependent upon model dryer and other factors) additional gas costs over certain previous Cissell and competitive dryers of the same type WITHOUT sacrificing drying rate! A MUST — in times of fuel shortages/high costs.

LOOK TO CISSELL for better energy-saving features!

The NEW Silicon Carbide Ignition System is the latest HOT NEWS from Cissell!


ASK YOUR DISTRIBUTOR

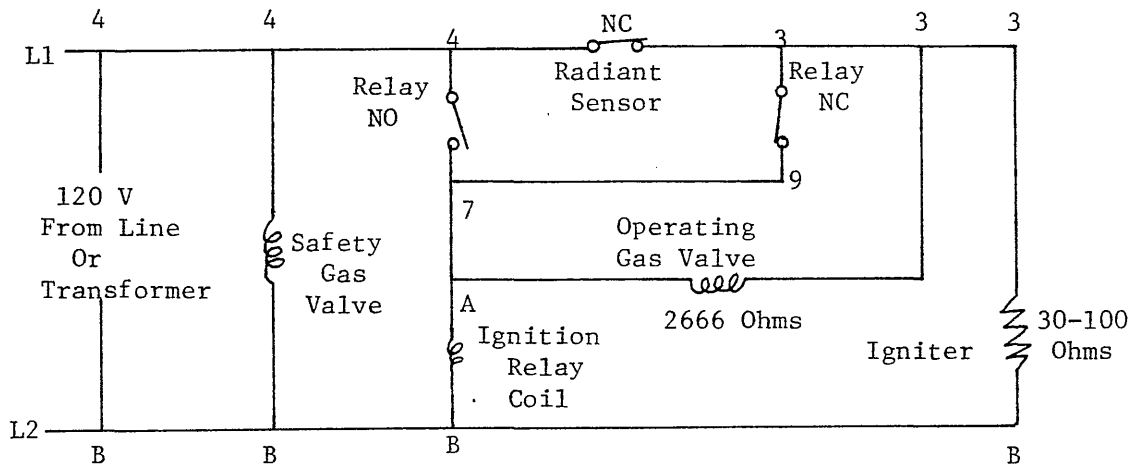
CISSELL MANUFACTURING COMPANY
831 South First St., Louisville, Kentucky 40203
Pacific Coast Office: 4823 W. Jefferson Blvd., Los Angeles. Foreign Distributors write Export Dept., Cable Code "Cissell"

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.

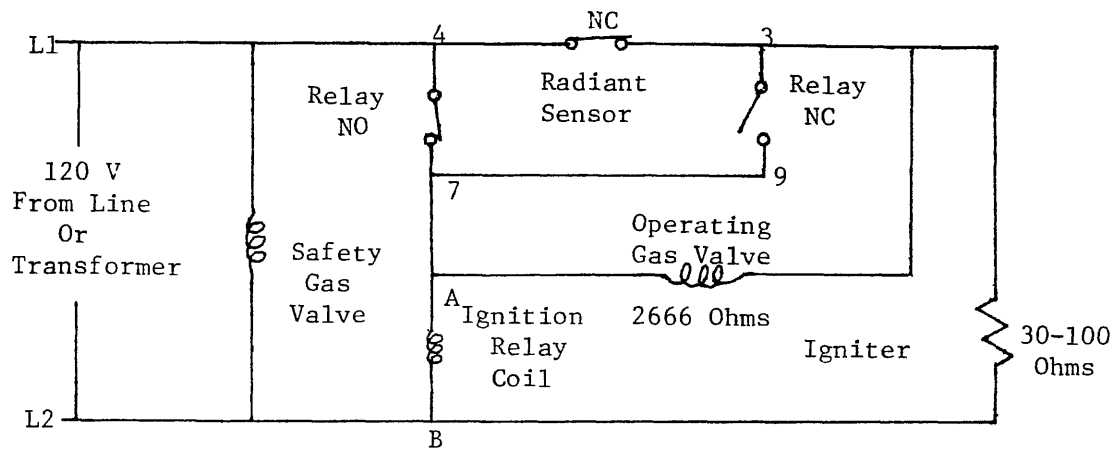


NEW NORTON SILICON CARBIDE IGNITION SYSTEM

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.

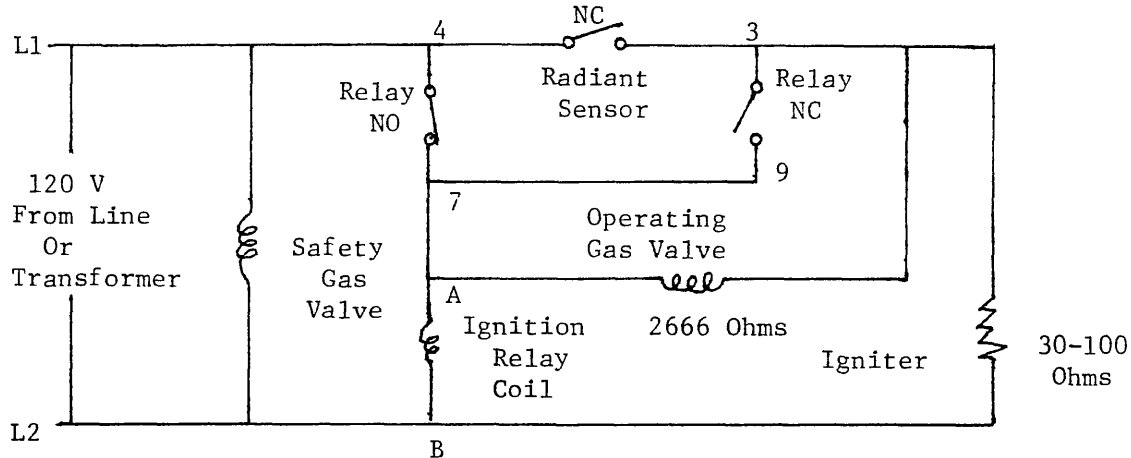


NEW NORTON SILICON CARBIDE IGNITION SYSTEM

Fig. 2 (An Instant Later)

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

- 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.
- 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

- The igniter glows red hot which causes the radiant sensor to open its NC contacts which de-energizes the igniter.
- 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.

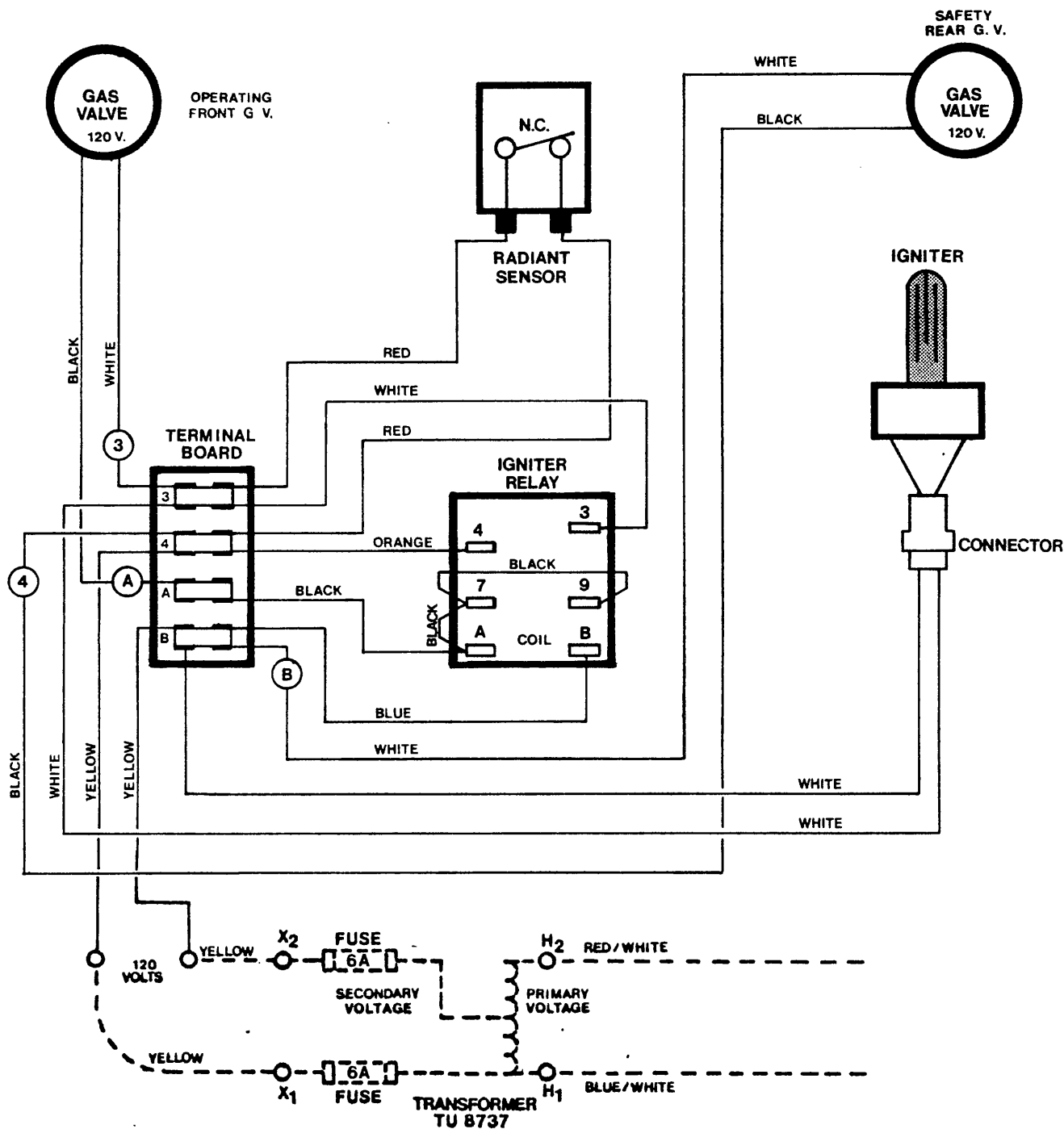
Burner Doesn't Light Because of Low Voltage or Low Gas Pressure

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.

WIRING DIAGRAM

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

TWL 679*



* NOTE

TWL 679 = L28CS30, WEB, CALIF. METER;
TWL 680 = L28F30, L36C30, L36F30, L36C36, L36F36;

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 - TWL679
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 TWL679 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 - see TWL679
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 TWL679. 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 also be the result of the following.

1. Exhaust air flow restriction. Exhaust pipe size must be larger than the exhaust opening. Refer to chart in manual.
2. Dryer inlet air is a must for each unit. It must be 4 to 6 times the combined areas of the dryer exhaust outlet. Refer to chart in manual.
3. All dryer panels must be in place and on machine for proper operation.
4. Gas pressure must be 7-9½ inches W.C. for natural gas and 11 inches W.C. for propane or butane (bottled) gases.
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 the dryer and over 50 ft., 1 inch pipe size.
6. Main burner orifices must be correct size, they are calculated with the following information:
 - (A) Your locality heating value of gas, B.T.U./cu. ft.
 - (B) Local specific gravity of gas.
 - (C) Gas manifold pressure inches of water column.
 - (1) 3.5 inches water column pressure for natural gas
 - (2) 11 inches water column pressure for propane or butane gases.
 - (D) Gas input rate per each burner orifice.
7. Voltage must be the identical as on the electrical rating plate. Prevent low voltage; it causes longer drying operation.
8. Back draft damper must swing full open to prevent air flow restrictions. (Check for full open operation every 6 months). Non-operative or erratic operation of exhaust dampers will cause air flow switches to shut off gas and will result in longer drying time.

The above should be checked and corrected before attempting to trouble shoot the electronic silicon carbide gas 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. Repack each bearing and the cavity back of the bearing one-third full with Chevron Grease No. SR1-2

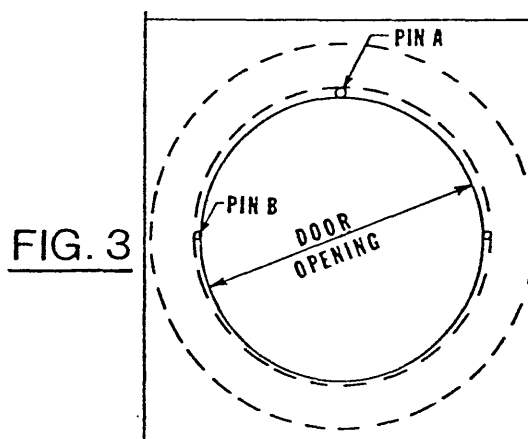
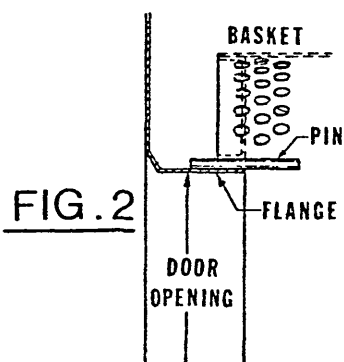
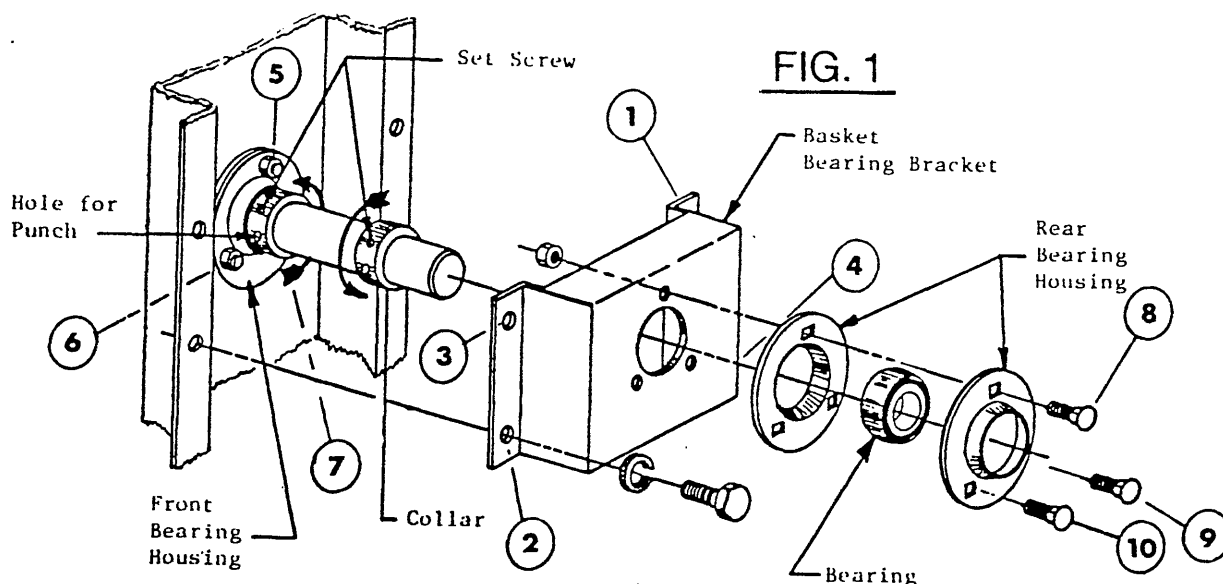
Motors having wool packed sleeve bearings are oiled at the factory for one year's normal operation. After one year's normal operation, add annually one-half teaspoon electric motor oil or S.A.E. #10 to each bearing. For 24 hour per day operation, add one teaspoon of oil annually.

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. Steam heating units: Keep steam coils clean. Check periodically and clean as often as required. Remove lint and dirt accumulation from coil fins periodically as dirty lint laden coil fins decrease the efficiency of steam-heated dryers.
8. Gas burners: Keep gas burners clean. Check periodically and clean often.
9. Periodically examine and clean the exhaust system.
10. Keep dryer area clean and free from combustible materials, gasoline and other flammable vapors and liquids.
11. Do not obstruct the flow of combustion (make-up) air and ventilating air.
12. Periodically check gas pressure.
13. Periodically check dryer voltage per dryer rating plate.

INSTRUCTIONS FOR ALIGNING BASKETS ON CISSELL DRYERS - SINGLE MOTOR

1. Loosen four basket bearing bracket bolts 1,2,3, & 4 (Fig.1) on rear of dryer. Loosen 3 nuts 5,6,7 holding FRONT bearing housing and 3 bolts 8,9,10 holding REAR bearing housing. Loosen both front and rear bearing collars. NOTE: All fasteners must be loose enough to permit free movement of each bearing in its housing.
2. Push basket to rear or pull to front (whichever is required) to bring basket approximately flush with edge of door opening flange. (plus or minus 1/8")
3. Place FRONT bearing collar (nearest to cabinet) in position and tighten.
4. Place the "A" pin (7/16" diameter) at top and the two "B" pins (5/16" diameter) at the sides of the door opening as shown in Figures 2 & 3. (Inside the dryer compartment between the rim of the basket opening and the rim of the door opening.) NOTE: For pins, use drill bits or short sections of round steel rods.
5. With pins in position, tighten FRONT bearing housing nuts 5,6,7 in 3 step sequence:
First Step- Tighten nuts 5,6,7 lightly (just enough to remove slack).
Second Step- Tighten nuts 5,6,7 half tight.
Third Step- Tighten nuts 5,6,7, securely.
6. Tighten REAR bearing housing bolts 8,9,10 lightly (just enough to remove slack in bearing and housing.)
7. Fully tighten bearing bracket bolts 1,2,3,4 securely.
8. Loosen REAR bearing bracket bolts 8,9,10, then tighten using the 3 step sequence in step 5 above.
9. Remove pins and check the space between basket and door opening at "B" pin position(Fig.3). If gap is not approximately the same on both sides, repeat steps 1 through 8.
10. Place REAR bearing collar in position and tighten.



INSTRUCTIONS FOR ALIGNING BASKETS ON CISSELL DRYERS-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 the "A" pin ($\frac{1}{2}$ " diameter) at top, and the two "B" pin ($\frac{5}{16}$ " diameter) at the sides of the door opening as shown in Fig. 1 & Fig. 2. (inside the dryer compartment between the rim of the basket opening and the rim of the door opening).
3. With the pins in position, tighten the two #5 bolts until flush against back of dryer. Retighten the gear reducer mounting bolts (1, 2, 3 & 4) in the numerical order indicated in Fig. 3. Tighten lock nuts #6 to secure #5 bolts in position. Then remove pins.
4. Check the space between basket and door opening at "B" pin position (Fig. 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.

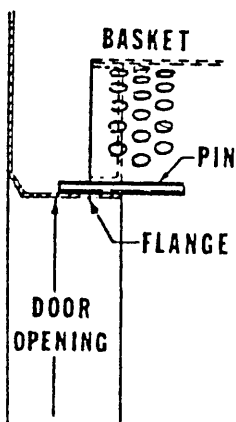


FIG.1

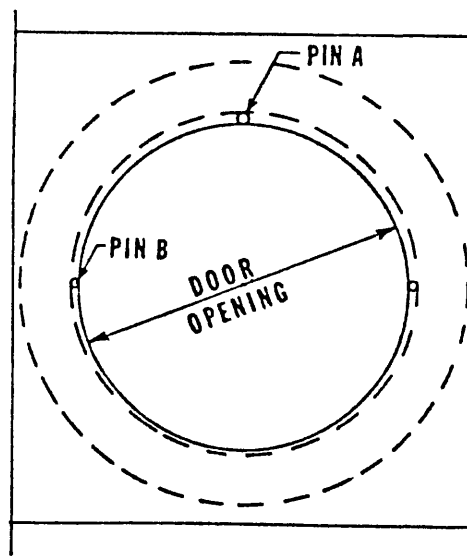


FIG.2

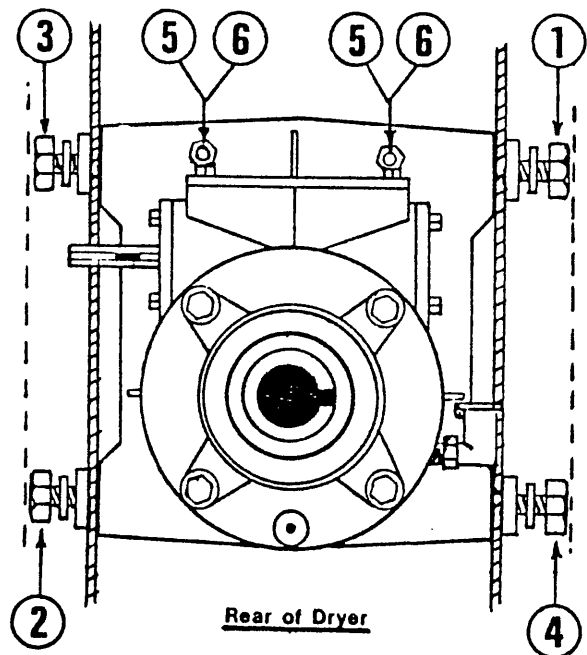


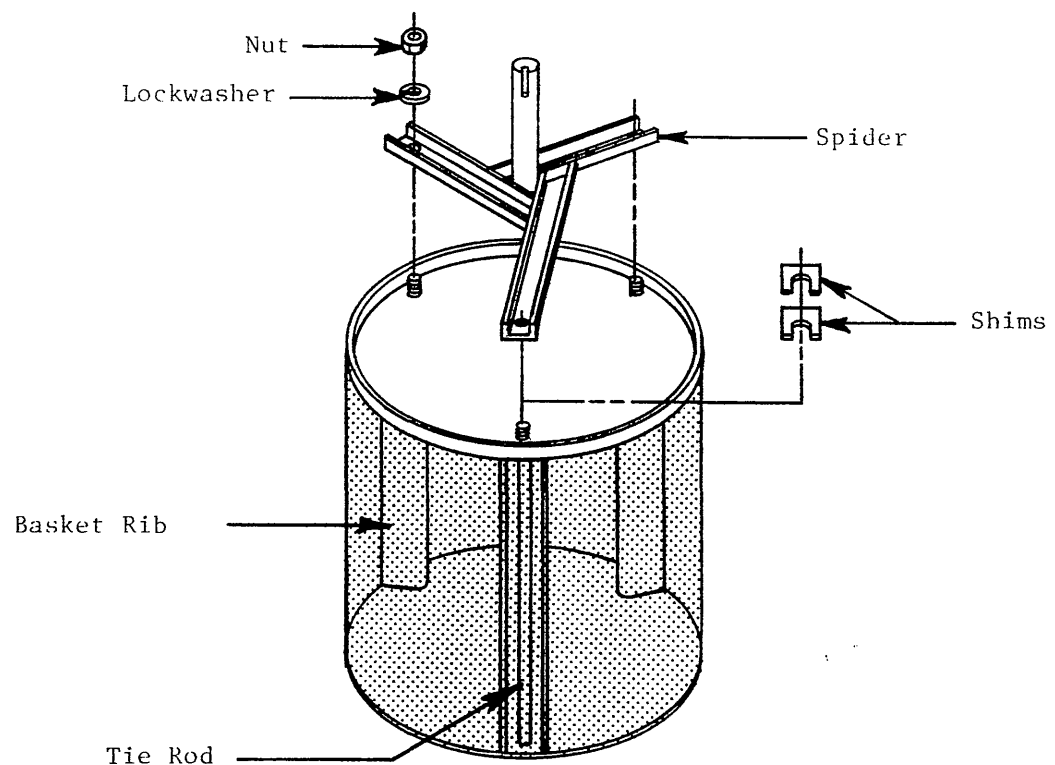
FIG.3

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.

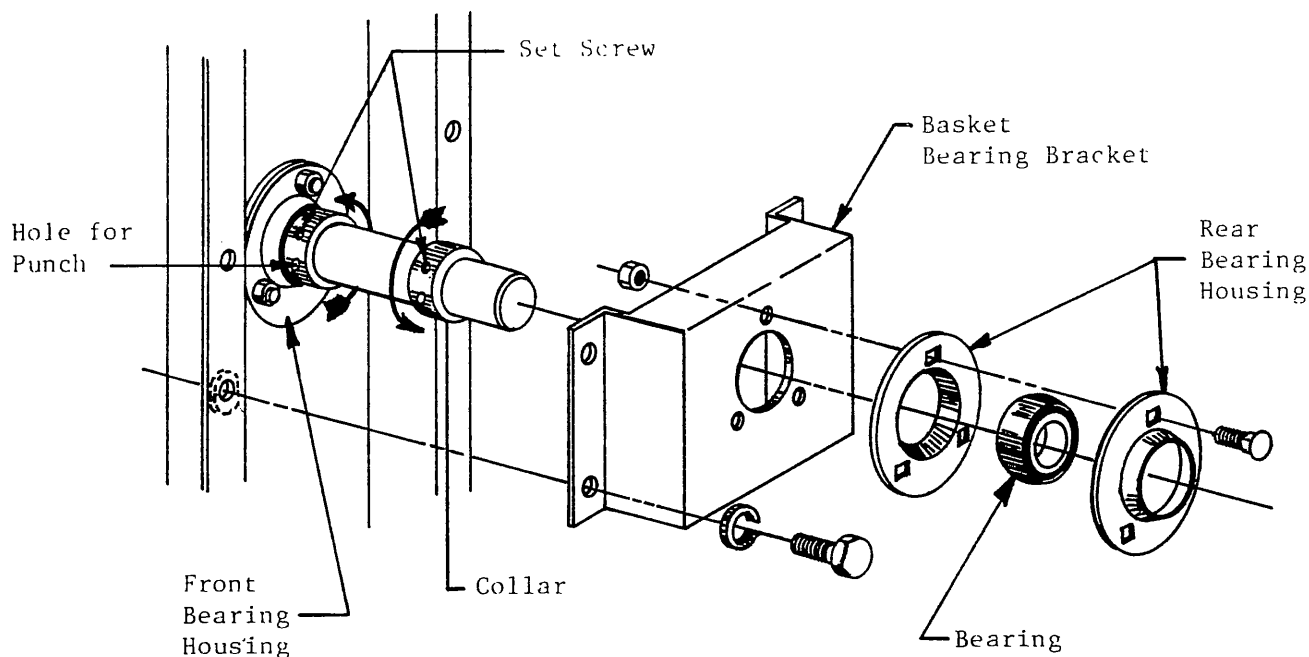
- A. Align the basket as per instructions in manual. See page 30-31.
- B. Rotate the basket to determine where the most out of round point is (where the basket scrapes or comes closest to scraping the sweep sheet).
- C. Mark this position and the nearest rib to this position.
- D. Remove the basket (do not loosen the alignment bolts).
- E. With the basket on the floor (spider up), place one or two shims between the spider leg and the back of the basket at the marked rib position. (See drawing)
- F. Re-insert spider and basket assembly and re-check cylinder.
- G. If at this point, basket is still out of round, procedure must be repeated starting with step "B".
- H. Upon completion of shimming process, re-alignment of basket is necessary.

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



INSTRUCTIONS FOR REPLACING BEARING

1. Remove belt guard, V-belt, and basket sheave.
2. Loosen and remove set screws in bearing collar.
3. Release bearing collar by rotating as indicated in illustration. If necessary, use punch and mallet to break collar loose. Rotate in direction indicated until bearing collar can be moved away from bearing.
4. Loosen three bolts in rear bearing housing. Remove four bolts in basket bearing bracket and remove bracket.
5. Remove three nuts on front bearing housing. Remove old bearing and replace with new bearing and bearing collar.
6. Remove old bearing in basket bearing bracket and replace with new bearing and bearing collar. Place basket bearing bracket on shaft and lightly tighten four mounting bolts.
7. Align per instructions on page 36 of this manual.



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.

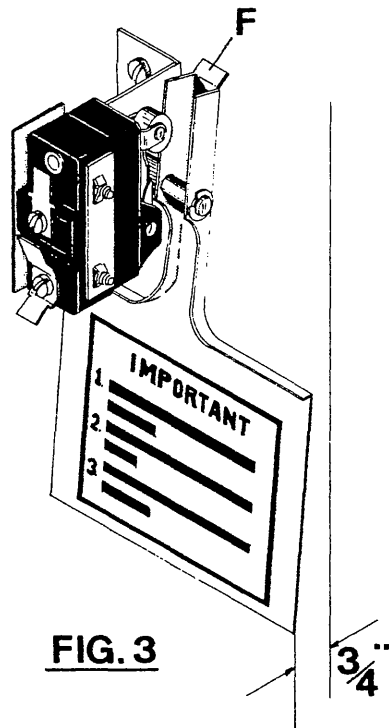


FIG. 1

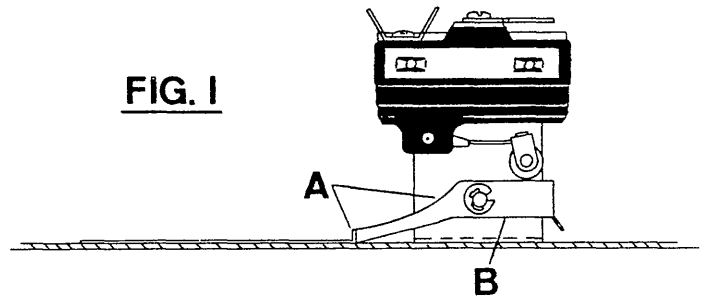
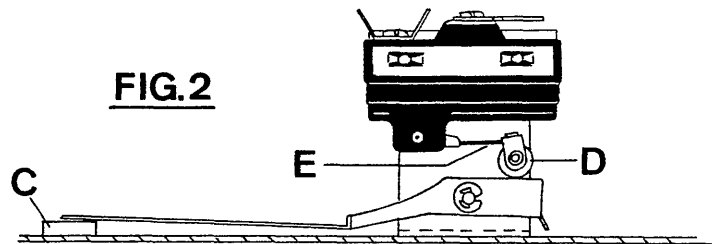


FIG. 2



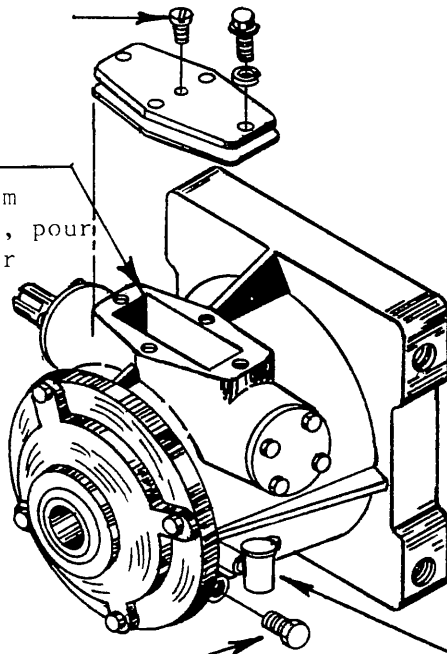
Vent: Important

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)

Drain Plug:



Oil Level Cup

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



TU3465
Transmission Oil

GEAR REDUCER

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 TU3465 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.

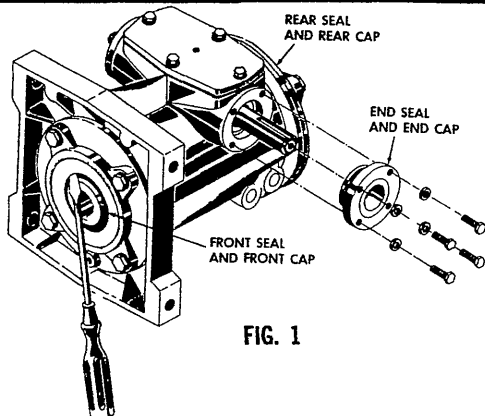


FIG. 1

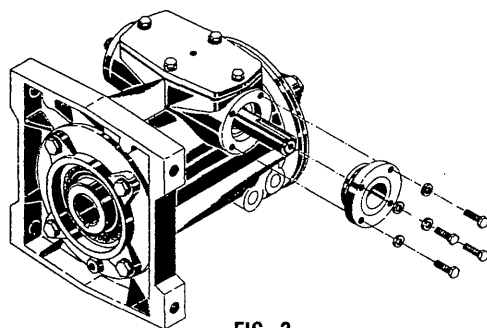


FIG. 2



FIG. 3

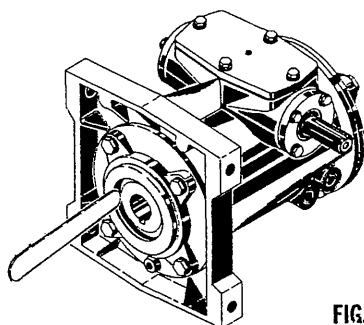


FIG. 4

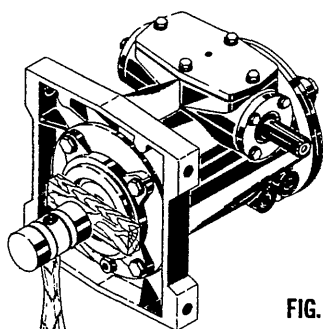


FIG. 5

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

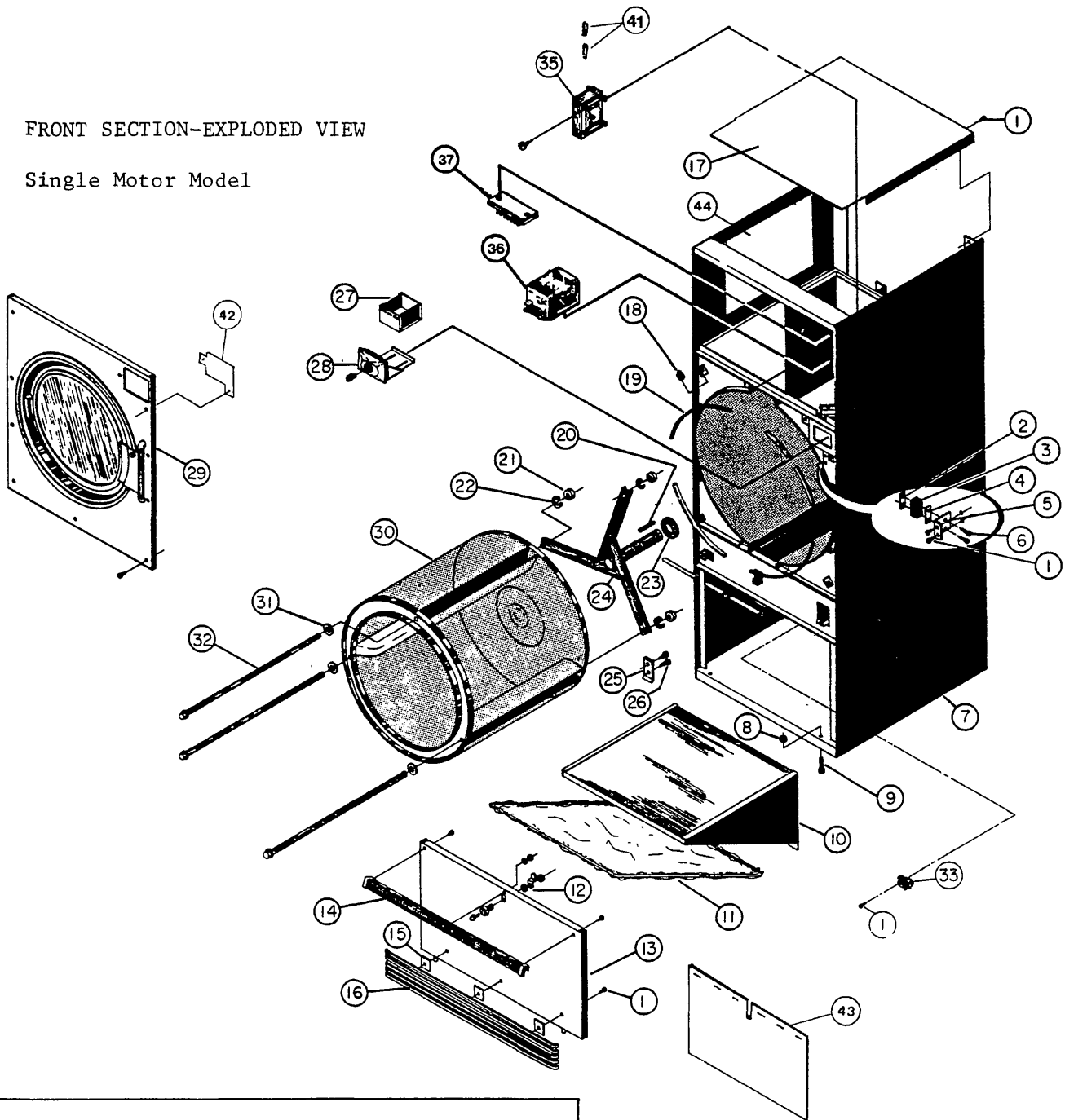
IMPORTANT

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.

WO1863 2-16-82 (Replaces 1-2752)

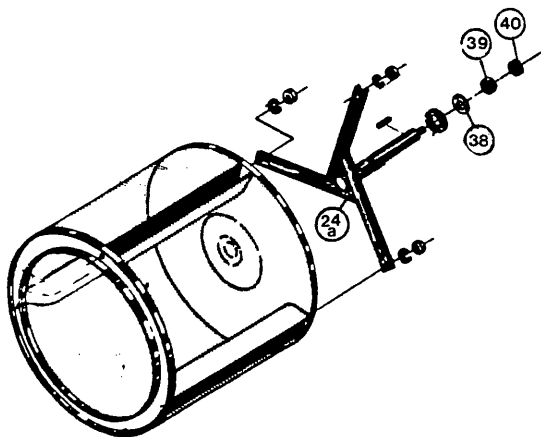
FRONT SECTION-EXPLODED VIEW

Single Motor Model



Double Motor Model

Parts 38, 39, 40 are only on double motor models.



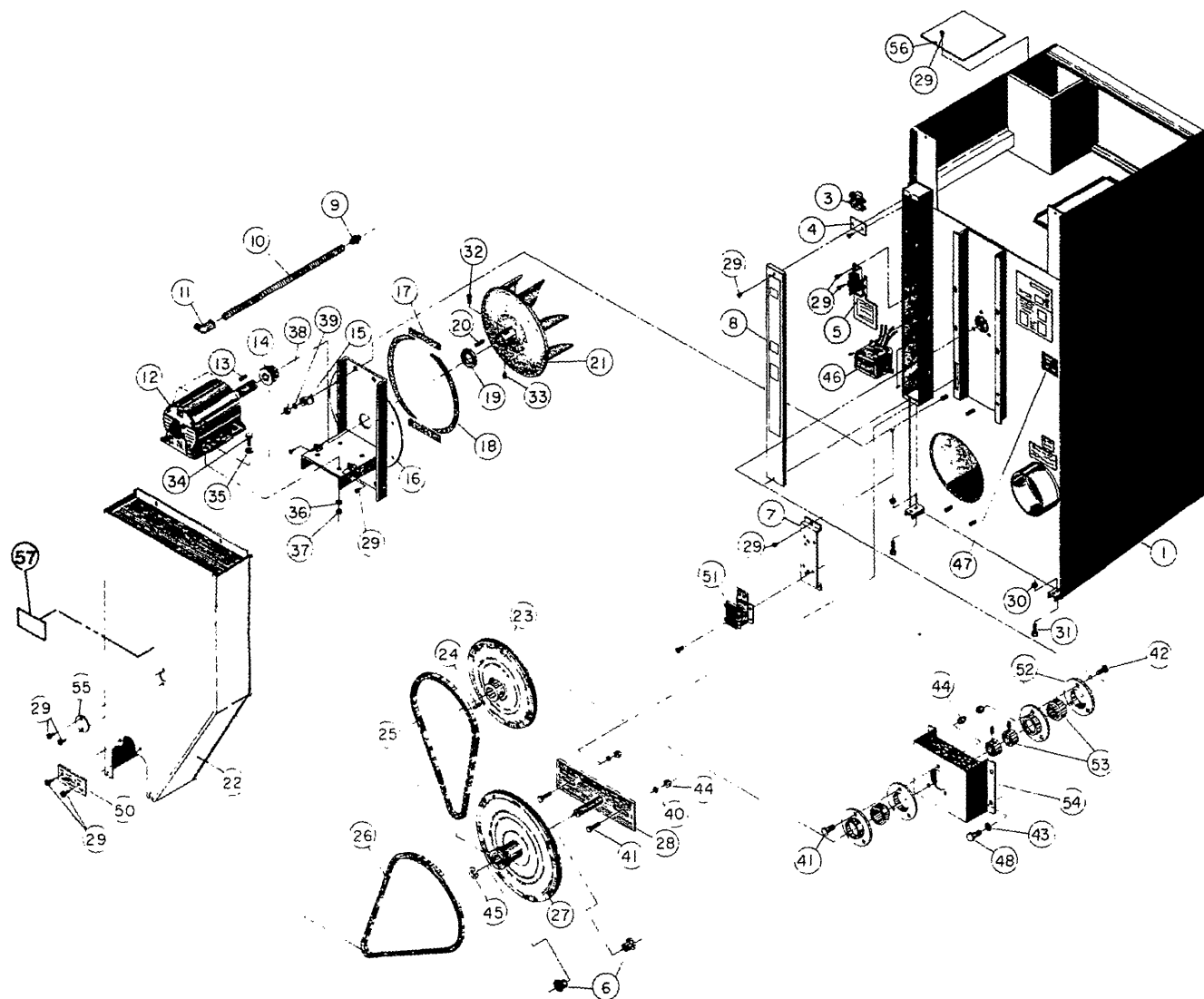
GREASE TO BE APPLIED TO ALL BEARING
SHAFTS. #42-032-6015 GREASE LUBRIPLATE
#310- 1 lb. CAN OR 14.5 OZ. TUBES
LUBRIPLATE NO. 930-2 MULTIPURPOSE
GREASE # 10098

FRONT SECTION OF DRYER - EXPLODED VIEW

All Hardware Sold Only in Pkgs. of 6

<u>REF.NO.</u>	<u>PART NO.</u>	<u>DESCRIPTION</u>
1	TU7733	#8 x ½" Self-Drill. Screw
2	TU1771	#6 Tinnerman Twin Nut
3	TU1979	Door Switch
4	TU1770	Insulator
5	TU2373	Door Switch Bracket
6	TU3219	#6 x 1" Sheet Metal Screw
7	TU8062	Jacket Welded Assembly
8	TU4937	3/8" - 16 Jam Nut
9	TU3211	3/8" - 16 x 2½" Leveling Bolt
10	TU8368	Lint Screen Housing
11	TU6956	Screen Only
	TU5225	Frame Only
12	TUB1867	Lock & Key
13	TU5277	Lint Door
14	TU7472	Lint Door Handle w/hardware
15	TU2710	Trim Holder
16	TU2384	Bottom Trim
17	TU2620	Solid Top (Gas Dryer)
	TU6129	Solid Top (Electric Dryer)
18	TU2877	#10 Speed Nut
19	TU2483	Sweep Sheet Gaskets
20	TU3167	Key (CS & FS Models Only)
	TU5240	Key (CD & FD Models Only)
21	TU2882	½" -20 Hex Nut
22	TU2831	½" Split Lockwasher
23	TU108	Felt Seal
24	K20	Spider Assembly (CS & FS Model Only)
24A	TU5121	Spider Welded Assembly(CD & FD Models Only)
25	TU3205	Lock Plate
26	TU1978	#14 x 3/4" Sheet Metal Screw
27	CM35	Coin Box
28	CM61	Coin Vault Lock Assembly
29	TU7175	Front Panel & Door Assembly(CS & CD Models Only)
	TU8139	Front Panel & Door Assembly(FS & FD Models Only)
30	TU2083	Basket Welded Assembly
31	TU2883	½" Cut Washer
32	TU2313	Tie Rod
33	TU3240	185°F Thermostat-High Heat
34	TU6760	½"-20 Tinnerman Clip (not illustrated)
35	TU8737	Transformer - 208 or 230 V. Primary, 120 V. Secondary
36	TU8599	Relay - 120 V. (Igniter)- Models L28FS30G & L28FD30G Only
37	TU8629	Terminal Board (Igniter) " " " "
38	TU2439	Flat Washer
39	TU3537	Full Nut
40	TU3536	Jam Nut
41	TU8738	Fuses
42	TU6336	Coin Box Filler Plate (Timer Models Only)
43	TU7311	Lint Trap Door Insulation ("F" Models)
44	TU7793	Upper Side Bonnet Insulation ("F" Models)

REAR SECTION OF DRYER SINGLE MOTOR



REAR VIEW SINGLE MOTOR MODEL

ALL HARDWARE SOLD ONLY IN PACKAGES OF 6

Ref. No.	Part No.	Description	Ref. No.	Part No.	Description
1	TU8062	Jacket Welded Assy	29	TU7733	#8x $\frac{1}{2}$ " Self Drilling Screw
3	M155	Wire Harness Clamp	30	TU4937	3/8"-16 Jam Nut
4	TU2726	Strain Relief Plate	31	TU3211	3/8"-16x2 $\frac{1}{2}$ Leveling Bolts
5	TU8206	Air Switch Assy	32	F819	5/16"-18x5/8" Sq. Head Set Screw
6	TU7184	Bronze Bushing (2 req'd)	33	TU3282	5/16"-18x3/8" Nylok Set Screw
7	TU6220	Relay Mounting Plate	34	TU5439	5/16"-18x3/4" Hex Head Screw
		(Dryers with 2 or	35	VSB130	5/16" Cut Washer
		more Relays)	36	TU2814	5/16" Split Lock Washer
8	TU5890	Control Box Cover	37	C249	5/16"-18 Hex Nut
9	TU4790	Straight Connector	38	TU4787	3/8"-16 Hex Nut
10	504641292	Greenfield Cable	39	VSB134	3/8" Lockwasher
		(Specify 22" Lg.)	40	TU1851	1/2" Cut Washer
11	TU4791	Right Angle Connector	41	TU4936	3/8"-16x3/4" Carriage Bolt
12*		Motor	42	TU7178	3/8"-16x3/4" Rib Neck Bolt
13	TU5241	Key	43	IB140	3/8" Cut Washer (4 req'd.)
14	TU6559	Motor Sheave 60 Cyc.	44	TU3188	3/8"-16 Hex Nut (Nylok)
15	TU6486	Cable Strap	45	TU3247	Retaining Ring
16	TU5850	Motor Mount Weldment	46	TU4660	Transformer - 480V Only
17	TU2474	Top & Bottom Gasket	47	F1116	Serial No. Plate
18	TU2473	Side Gasket	48	TU3246	3/8"-16x1" Hex Hd. Screw (4 req')
19	TU2476	Felt Seal	50	TU5682	Blanking Plate
20	TU4684	Key	51	TU1984	Relay 120V 50 or 60 Cy. (2 pole)
21	TU8746	Fan 60 Cy. W/set Screws		TU1985	Relay 240V 50 or 60 Cy. (2 pole)
	TU5874	Fan 50 Cy. W/set Screws		TU3495	Relay 208V or 240V 50 or 60
22**	TU5079	Rear Guard Assy. (Complete)			Cycle (3 Pole)
	TU7468	Rear Guard Assy.		TU3496	Relay 120V 50 or 60 Cy. (3 Pole)
		(W/O Cover Plate)	52	TU7018	Rear Housing
23	TU7016	15" Basket Sheave	53	TU7019	Bearing & Collar Assy.
24	TU5887	Key	54	TU7162	Basket Bearing Bracket
25	TU7021	V-Belt (4L570)	55	TU7467	Cover Plate
26	TU4794	V-Belt (4L590)	56	TU5732	Mech. Box Cover (Used on 28C
27	TU5217	14" Idler Sheave			Model Steam Dryers
28	TU5213	Idler Bracket	57	TU9600	Idler Pulley Label
		(W/Grease Fitting)			

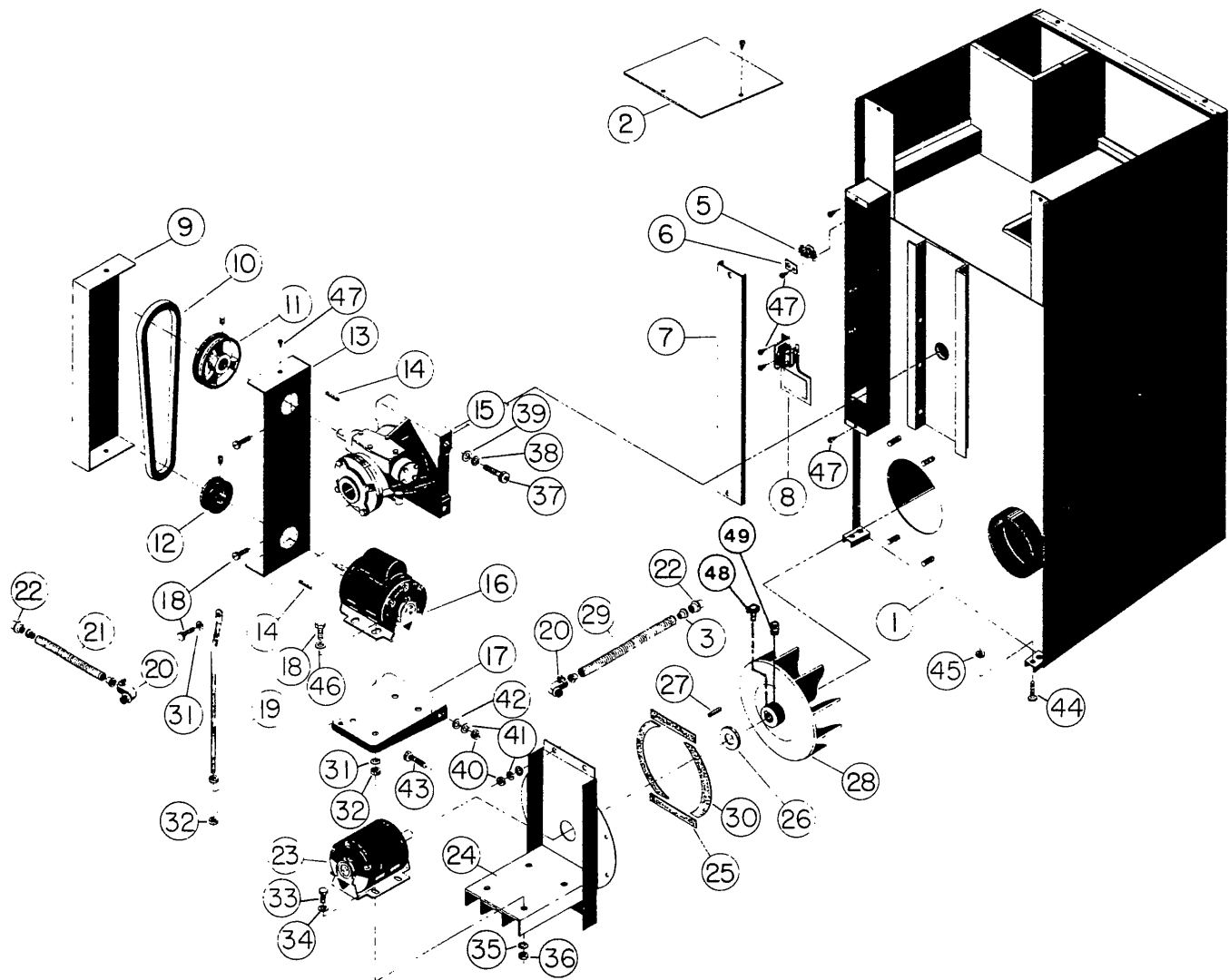
*Specify Motor Number, Voltage, Cycle and Horsepower

** For Double Capacitor Motors Only:

TU9296 - Rear Guard Complete

TU9291 - Rear Guard W/O Cover Plate

REAR SECTION OF DRYER - DOUBLE MOTOR

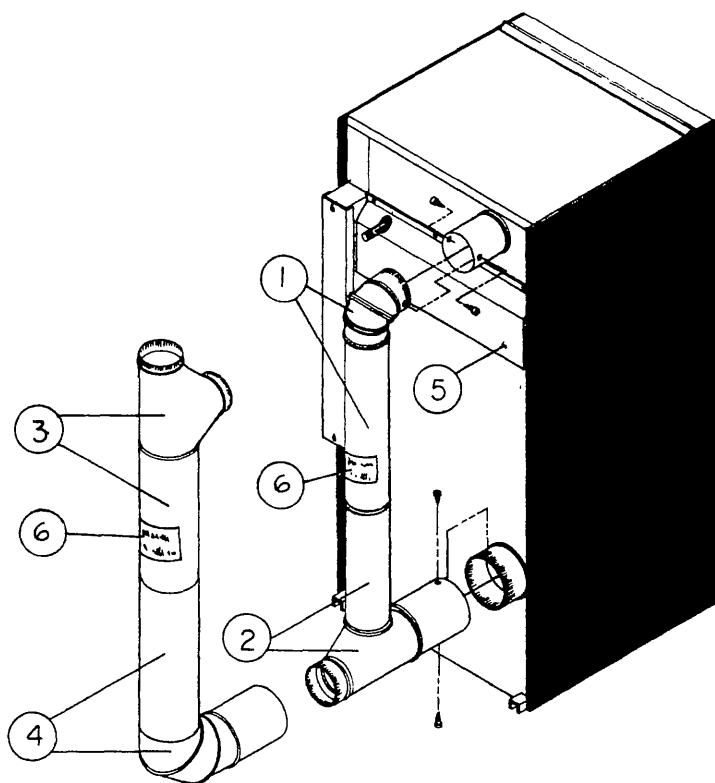


REAR VIEW DOUBLE MOTOR MODEL

ALL HARDWARE SOLD ONLY IN PACKAGES OF 6

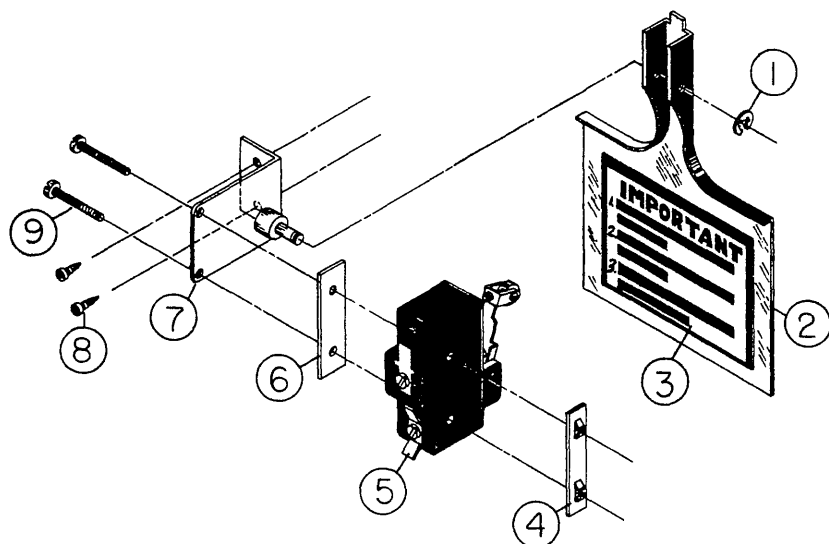
<u>Ref No.</u>	<u>Part No.</u>	<u>Description</u>
1	TU8062	Jacket Welded Assembly
2	TU5732	Mach. Box Cover (For "C" Model)
3	TU2372	Snap Bushing
4	TU4660	Transformer - 480V. Only
5	M155	Wire Harness Clamp
6	TU2726	Strain Relief Plate
7	TU5890	Control Box Cover
8	TU8206	Air Switch Assembly
9	TU3857	Belt Guard Cover
10	TU2317	V-Belt, 4L 380, 60 Cy.
	TU6190	V-Belt, 4L 390, 50 Cy.
11	TU2211	Gear Sheave, AK 46 5/8"
12	TU1952	Motor Sheave AK -9 5/8" 60 Cy.
	TU2211	Motor Sheave AD 46 5/8", 50 Cy.
13	TU5254	Belt Guard Mount
14	TU5240	Key
15	TU8363	Gear Reducer See Page 55
16*		Basket Motor (Specify Motor Number, Voltage, Cycle & Horsepower)
17	TU33	Drive Bracket
18	RC344	1/4" - 20 x 3/4 Cap Screw
19	TU34	Belt Adjusting Rod
20	TU4791	1/2" Right Angle Connector
21	504641292	1/2" Greenfield Cable (Specify 15")
22	TU4790	1/2" Straight Connector
23*		Fan Motor (Specify Motor Number, Voltage, Cycle & Horsepower)
24	TU2102	Fan Motor Mount Weldment
25	TU2474	Top & Bottom Gaskets
26	TU2476	Felt Seal
27	TU5241	Key
28	TU8746	Fan, W/Set Screws 60 Cycle
	TU5874	Fan, W/Set Screws 50 Cycle
29	504641292	1/2" Greenfield Cable (Specify 21")
30	TU2473	Side Gaskets
31	TU2846	1/4" Lockwasher
32	TU4934	1/4"-20 Hex Nut
33	TU5439	5/16"-18x3/4 Cap Screw
34	VSB130	5/16" Cut Washer
35	TU2814	5/16" Split Lockwasher
36	C249	5/16"-18 Hex Nut
37	TC347	1/2"-13x1-1/4" Cap Screw
38	TU2831	1/2" Lockwasher
39	TU1851	1/2" Cut Washer
40	TU4787	3/8"-16 Hex Nut
41	VSB134	3/8" Lockwasher
42	IB140	3/8" Cut Washer
43	TU3124	3/8"-16x3/4" Cap Screw
44	TU3211	3/8"-16x2-1/2" Leveling Bolts
45	TU4937	3/8"-16 Jam Nut
46	TU2847	1/4" Cut Washer
47	TU7733	#8x1/2" Self Drilling Screw
48	F819	Square Head Set Screw
49	TU3282	Nylok Set Screw

*Specify if fan or basket motor.



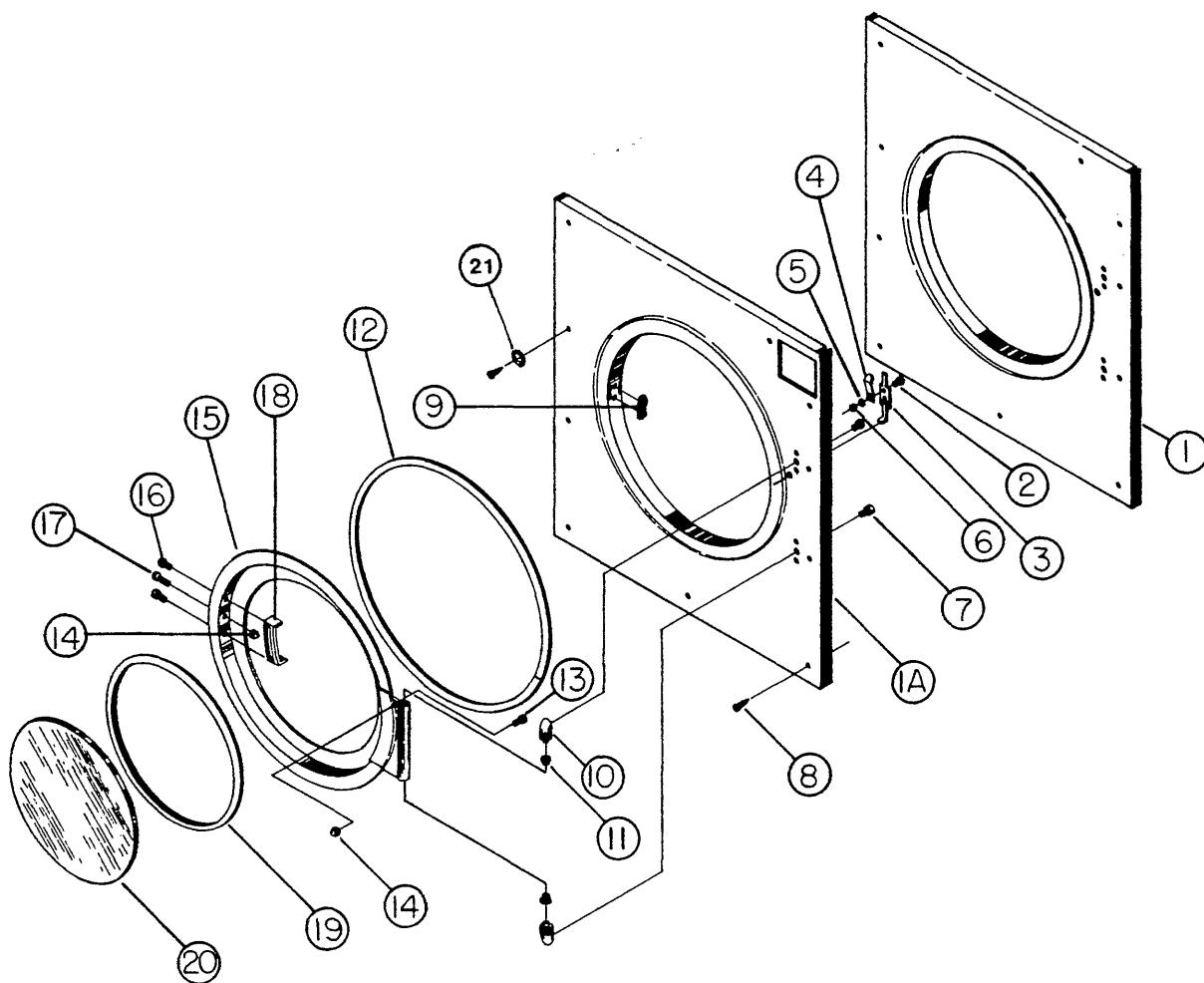
DUCT WORK ASSEMBLY (HORIZONTAL OR VERTICAL)

<u>REF. NO.</u>	<u>PART NO.</u>	<u>DESCRIPTION</u>
1.	TU8147	UPPER ASS'Y
2.	TU8148	LOWER ASS'Y
3.	TU8251	UPPER ASS'Y
4.	TU8252	LOWER ASS'Y
5.	TU7297	REAR AIR GUIDE WELDED ASS'Y
6.	TU8593	INSTALLATION LABEL (ENERGY- SAVER ONLY)



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 TINNEMAN NUT
5.	TU8155	AIR SWITCH
6.	TU1770	INSULATOR
7.	TU8171	AIR SWITCH BRACKET
8.	TU7733	#8-18X 1/2" SELF- DRILLING SCREW
9.	TU3219	#6X1" ROUND HD. S.M.S.

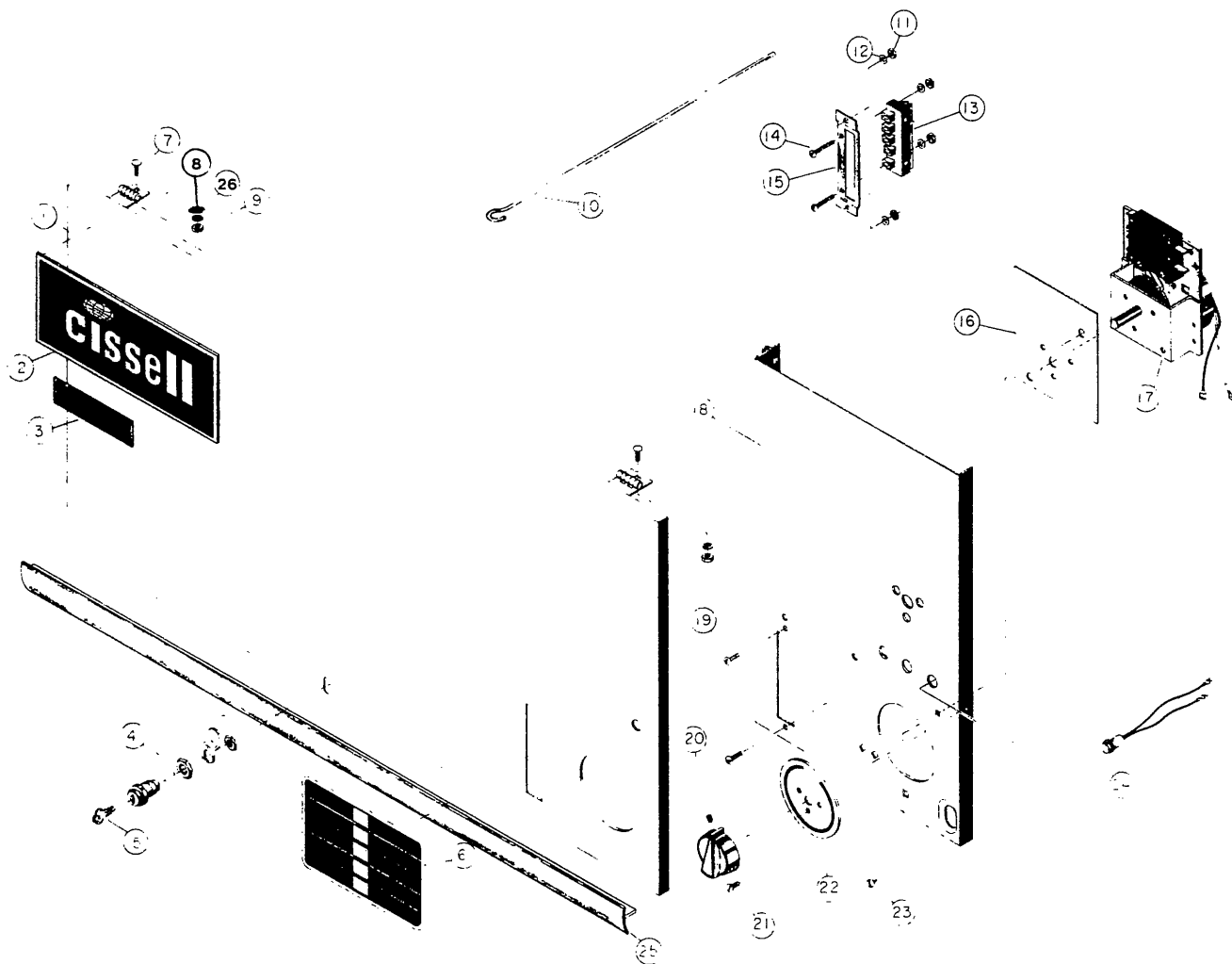


FRONT PANEL AND DOOR ASSEMBLY

Ref. No.	Part No.	Description	Ref. No.	Part No.	Description
1	TU6140	Front Panel Welded Assy. (For Time & Temperature Only)	10	TU2236	Hinge Post (2 Req'd)
1a	TU5420	Front Panel Weld Assy. (For Coin Meter Only)	11	PIF172	Delrin Bearing (2 Req'd)
2	M262	#8-32 x 3/8" Truss Head Screw	12	TU2090	Basket Door Seal
3	TU2194	Door Switch Actuator	13	TU4839	#10-32 x 3/8" Machine Screw
4	TU2105	Door Switch Spring	14	TU4840	#10-32 Hex Crown Nut
5	FB187	#8 Split Lock Washer	15	TU7171	Basket Door Welded Ass'y.
6	TU3266	#8-32 Hex Nut	16	TU3215	#10-32 x 3/8 Taptite Screw
7	TU2836	5/16"-18 x 1/2" Hex Head Cap Screw	17	TU3163	Catch Pin
8	TU2878	#10 x 5/8" Sheet Metal Screw	18	TU2874	Basket Door Handle
9	TU7456	Door Catch Ass'y (W/Rivets)	19	TU7169	Rubber Gasket
			20	TU7862	Door Glass (20 1/4" Standard No Printing)
			21	FB187	#10 Lockwasher

TU4827 Actuator Assembly Consists Of Ref. Nos. 2, 3, 4, 5 & 6

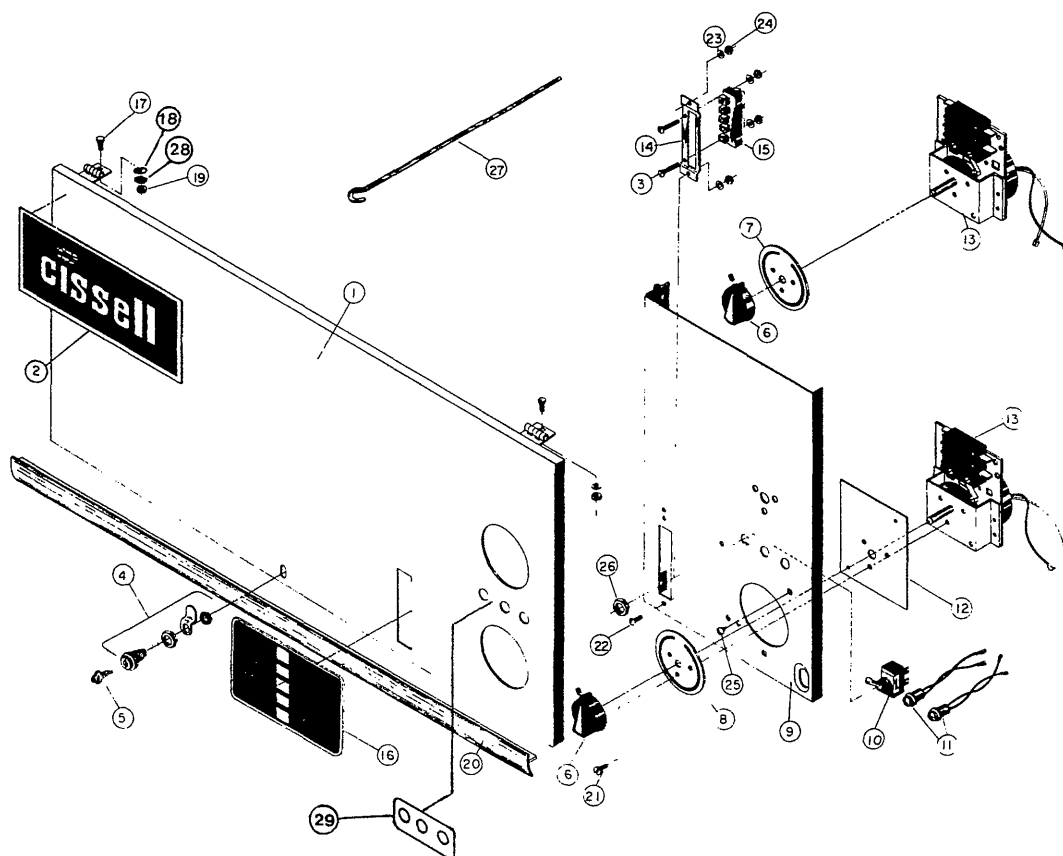
TU7172 Door Assembly Consists of Ref. Nos. 11, 12, 13, 14, 15, 16, 17, 18, 19 & 20.



SINGLE TIMER CONTROL PANEL AND ACCESS DOOR PARTS

ALL HARDWARE SOLD ONLY IN PACKAGES OF 6

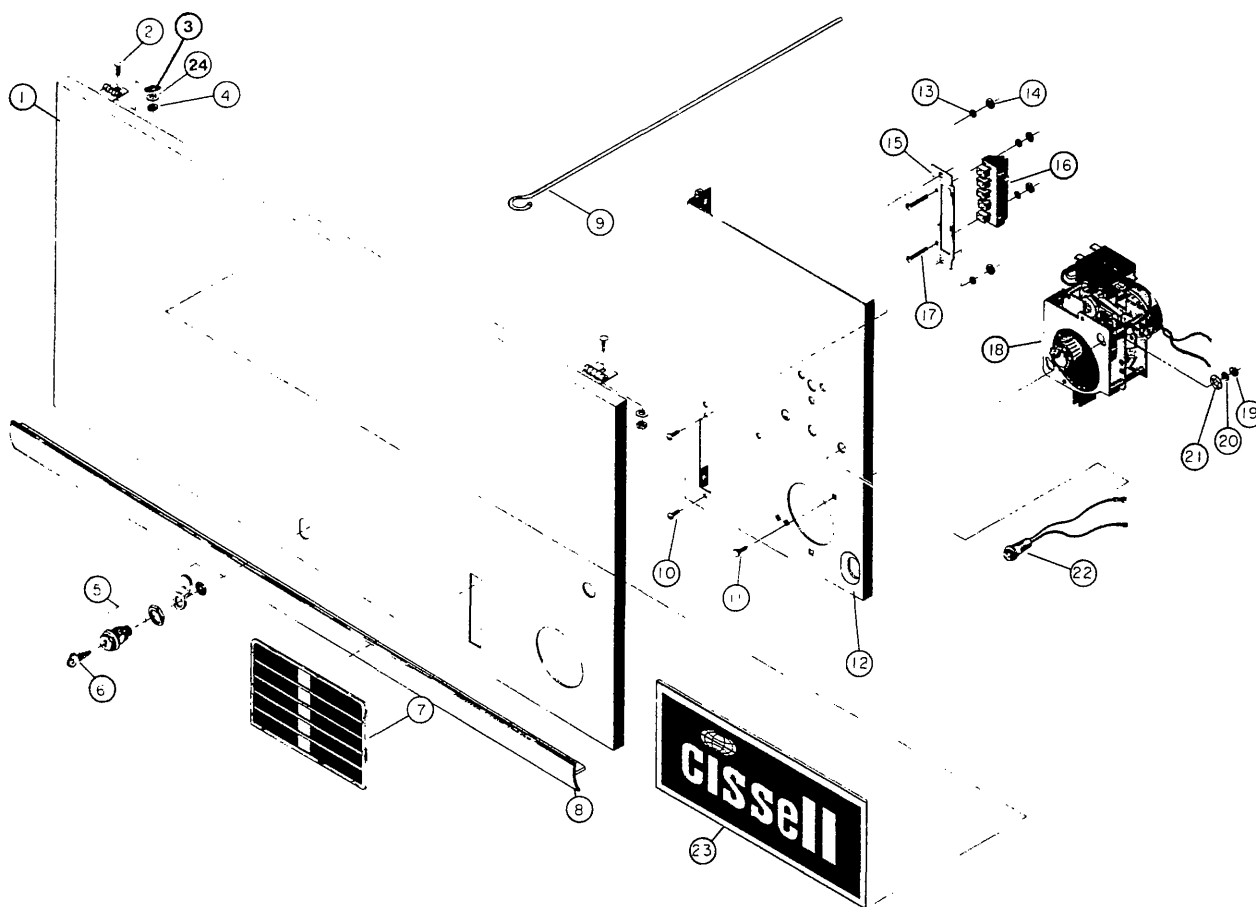
Ref. No.	Part No.	Description	Ref. No.	Part No.	Description
1.	TU8119	Access Door Welded Assembly	16.	TU6019	Timer Mounting Plate 60 Cy.
2.	TU8013	Cissell Nameplate	17.	TU6109	Timer 0-60 Minutes 120/60 Cy.
3.	TU8014	Therm-O-Cool Nameplate		TU5842	Timer 0-60 Minutes 240/60 Cy.
4.	TU4822	Lock #3186		TU6083	Timer 0-60 Minutes 240/50 Cy.
5.	TU2844	Key JWC2	18.	TU8393	Single Timer Control Panel Weldment
6.	TU6619	Push Button Control Plate	19.	TU3624	#6-32 x 1/2" Round Head Screw
7.	TU3479	#10-32x7/16" Truss Head Screw	20.	TU2555	Knob Complete
8.	P104	1/2" Cut Washer	21.	TU3279	#10-32 x 7/16" Truss Head Screw
9.	TU2842	#10-32 Hex Nut	22.	TU5444	60 Minute Dial
10.	TU3759	Support Rod	23	TU7241	#8 x 1/2" Sheet Metal Screw
11.	TU3400	#6-32 Hex Nut	24.	TU5421	Pilot Light 120V.
12.	M270	#6 Int. Tooth Lock Washer		TU5639	Pilot Light 240V.
13.	TU5106	Push Button Switch	25.	TU7959	Upper Front Trim
14.	SV136	#6-32 x 15/16" Round Head Screw	26.	FB187	Lock Washer #10
15.	TU5153	Push Button Plate			



DOUBLE TIMER CONTROL PANEL AND ACCESS DOOR PARTS

ALL HARDWARE SOLD ONLY IN PACKAGES OF 6

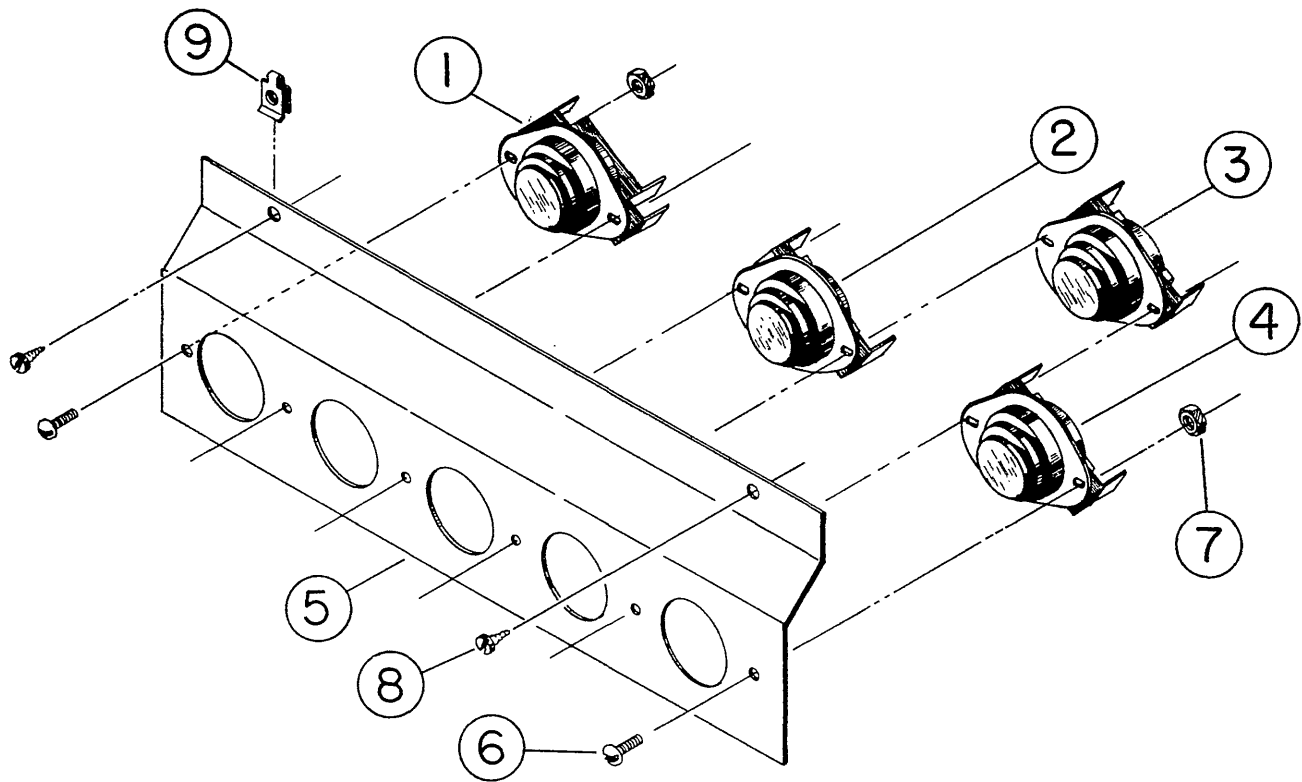
Ref. No.	Part No.	Description	Ref. No.	Part No.	Description
1.	TU8123	Access Door Welded Ass'y. (For Double Timer Dryers)	14.	TU5153	Push Button Plate
2.	TU8013	Cissell Nameplate	15.	TU5106	Push Button Switch
3.	SV136	#6-32 x 15/15" Rd. Hd. Screw	16.	TU6619	Push Button Control Plate
4.	TU4822	Lock #3186	17.	TU3479	#10-32 x 7/16" Truss Head Screw
5.	TU2844	Key JWC2	18.	P104	1/2" Cut Washer
6.	TU2555	Knob Ass'y.	19.	TU2842	#10-32 Hex Nut
7.	TU5445	Dial 0-15 Min.	20.	TU7959	Upper Front Trim
8.	TU5444	Dial 0-60 Min.	21.	LB68	#8-32 x 3/8" Flat Head Screw
9.	TU8393	Double Control Panel Weldment	22.	TU3624	#6-32 x 1/2" Rd. Head Screw
10.	FG147	Toggle Switch	23.	M270	#6 Int. Tooth Lock Washer
11.	TU5421	Pilot Light 120V.	24.	TU3400	#6-32 Hex Nut
	TU5639	Pilot Light 240V.	25.	TU7241	#8 x 1/2" Sheet Metal Screw
12.	TU6019	Timer Adapter Plate	26.	TU3805	15/32" - 32 Locking Hex Nut
13.	TU6110	Timer 0-15. 120/60 Cy.	27.	TU5739	Support Rod
	TU6109	Timer 0-60. 120/60 Cy.	28.	FB187	#10 Lockwasher
	TU5843	Timer 0-15. 240/60 Cy.	29.	TU8418	On/Off label
	TU5842	Timer 0-60. 240/60 Cy.			
	TU6082	Timer 0-15. 240/50 Cy.			
	TU6083	Timer 0-60. 240/50 Cy.			



COIN METER CONTROL PANEL AND ACCESS DOOR PARTS

ALL HARDWARE SOLD ONLY IN PACKAGES OF 6

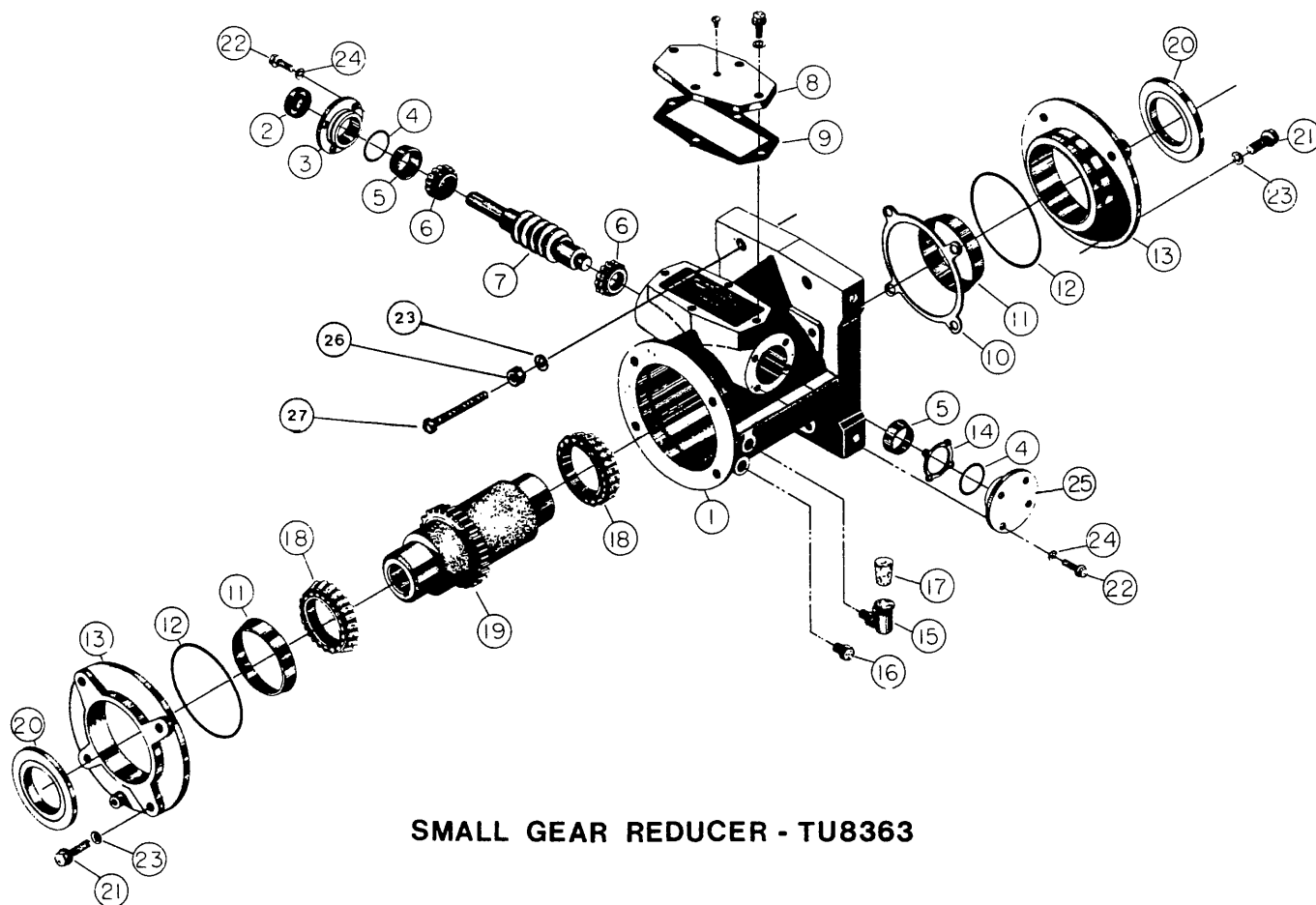
Ref. No.	Part No.	Description	Ref. No.	Part No.	Description
1.	TU8119	Access Door Welded Assembly	13.	M270	#6 Int. Tooth Lock Wacker
2.	TU3479	#10-32 x 7/16" Truss Head Screw	14.	TU3400	#6-32 Hex Nut
3.	P104	1/2" Cut Washer	15.	TU5153	Push Button Plate
4.	TU2842	#10-32 Hex Nut	16.	TU5106	Push Button Switch
5.	TU4822	Lock #3186	17.	SV136	#6-32 x 15/16" Rd. Head Screw
6.	TU2844	Key JWC2	18.		Coin Meter (Specify Voltage, Coin Denomination, and Single or Double Slot Coin Meter)
7.	TU6619	Push Button Control Plate	19.	TU3266	#8-32 Hex Nut
8.	TU7959	Upper Front Trim	20.	FB187	#10 Lock Washer
9.	TU5739	Support Rod	21.	P104	1/2" Cut Washer
10.	TU3624	#6-32 x 1/2" Machine Screw	22.	TU5421	Pilot Light 120V.
11.	TU4958	#8-32 x 3/8" Machine Screw		TU5639	Pilot Light 240V.
12.	TU8393	Single Coin Meter Control Panel Weldment	23.	TU8013	Cissell Nameplate
			24.	FB187	#10 Lock Washer



THERMOSTAT ASSEMBLY

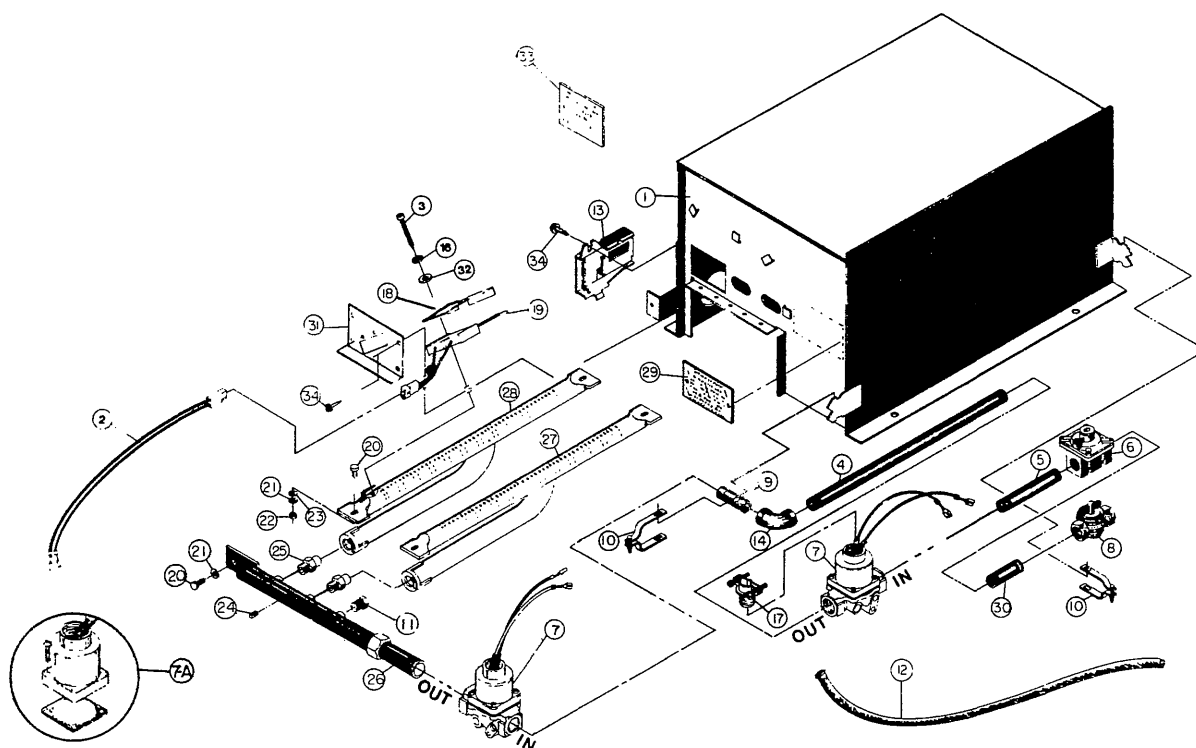
ALL HARDWARE SOLD ONLY IN PACKAGES OF 6

<u>Ref. No.</u>	<u>Part No.</u>	<u>Description</u>
1.	TU2045	Thermostat (Cool-Down) I-Timer Models only
2.	TU3240	185 Degrees Fahrenheit Thermostat (High) Heat
3.	TU5150	150 Degrees Fahrenheit Thermostat (Medium) Heat
4.	TU7244	135 Degrees Fahrenheit Thermostat (Low) Heat
5.	TU5143	Mounting Bracket
6.	TU3624	#6-32 x 1/4" Round Head Machine Screw (6 req'd)
7.	TU3400	#6-32 Hex Nut
8.	TU7733	#8 x 1/2" Self-Drilling Screw
9.	TU6067	#8 Tinnerman Clip (2 req'd)



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

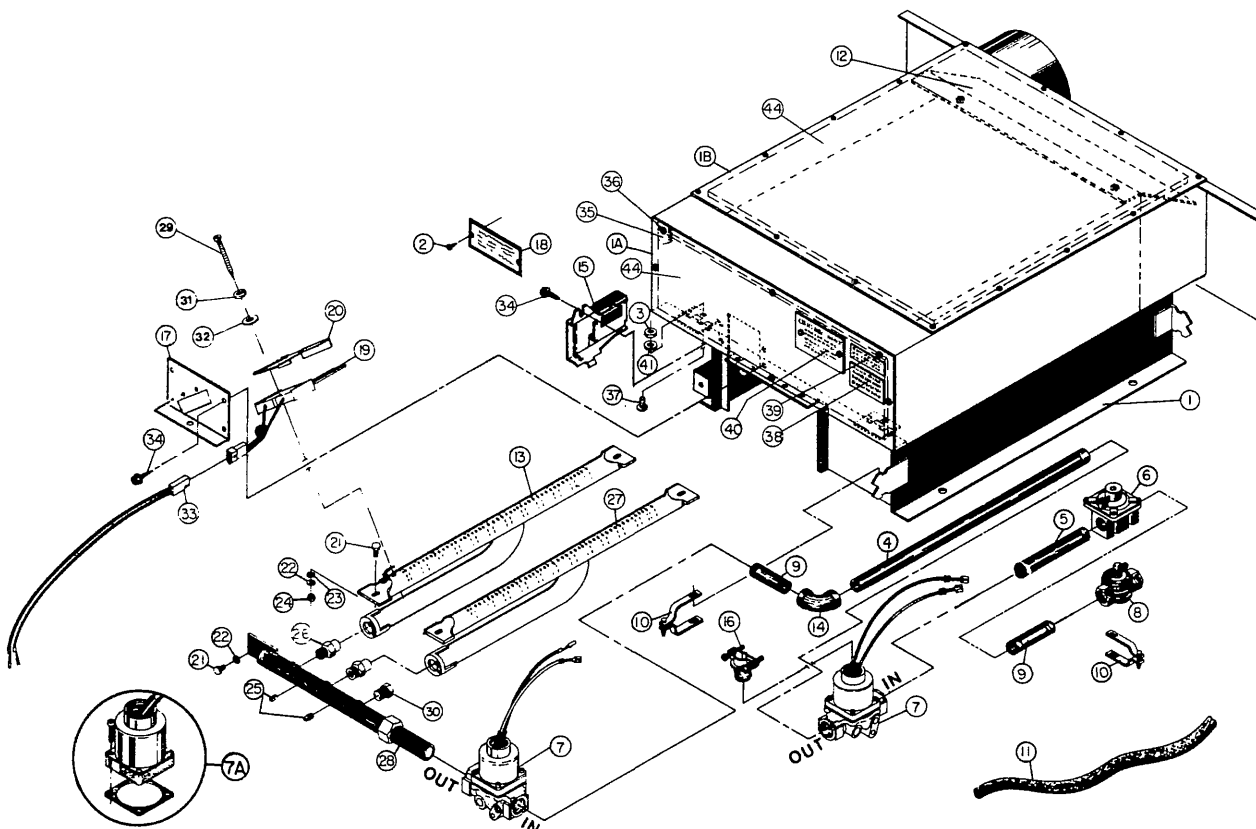


GAS BONNET & BURNER ASSEMBLY- TU8781 (Natural Gas)
 GAS BONNET & BURNER ASSEMBLY- TU8834 (L.P. Gas)

Models L28CS30G & L28CD30G

All Hardware Sold Only in Packages of 6

Ref. No.	Part No.	Description	Ref. No.	Part No.	Description
1	TU8631	Bonnet Welded Assy.	20	CB36	1/4"-20 x 1/2" Hex Hd. Screw
2	TU8605	Molex Connector	21	TU2846	1/4" Split Lockwasher
3	TU3416	#8x1 1/4 S.M.S.	22	TU4934	1/4"-20 Hex Nut
4	TU2724	1/2" Pipe Nipple- 25"	23	TU2847	1/4" Flat Washer
5	OP308	1/2" Pipe Nipple- 4"	24	TU2224	1/8" Pipe Plug (for manifold test hole)
6	TU7935	Regulator(nat'l gas only)	25	TU3539	Gas Burner Orifice(Specify Size)
7	TU6557	Baso Gas Valve	26	TU7979	Manifold Assembly
7A	TU3832	Baso Gas Valve Coil Assy.	27	TU7840	Burner Assy.(right hand)
8	TU6321	Gas Cock	28	TU8760	Burner Ignition(left hand)
9	OP290	1/2" Nipple- 2"	29	TU8613	Norton Igniter Instructions
10	TU2226	Manifold Mounting Bracket	30	OP290	1/2" Pipe Nipple- 2"
11	X172	Manifold Plug	31	TU8690	Norton Igniter Plate
12	136067752	Fiberglass Tubing	32	TU4820	3/16 x 1/2 x .047 Cut Washer
13	TU8598	Radiant Sensor	33	TU8645	Installation Instructions
14	390501053	1/2" Elbow	34	602102180	#8 x 1/2" Hex Hd. Slot Screw
15	TU3266	#8-32 Hex Nut	35		Gas Rating Plate
16	M271	Lockwasher-Brass			
17	C1356	Connector T & B			
18	TU9540	Heat Shield			
19	TU8596	Norton Igniter			



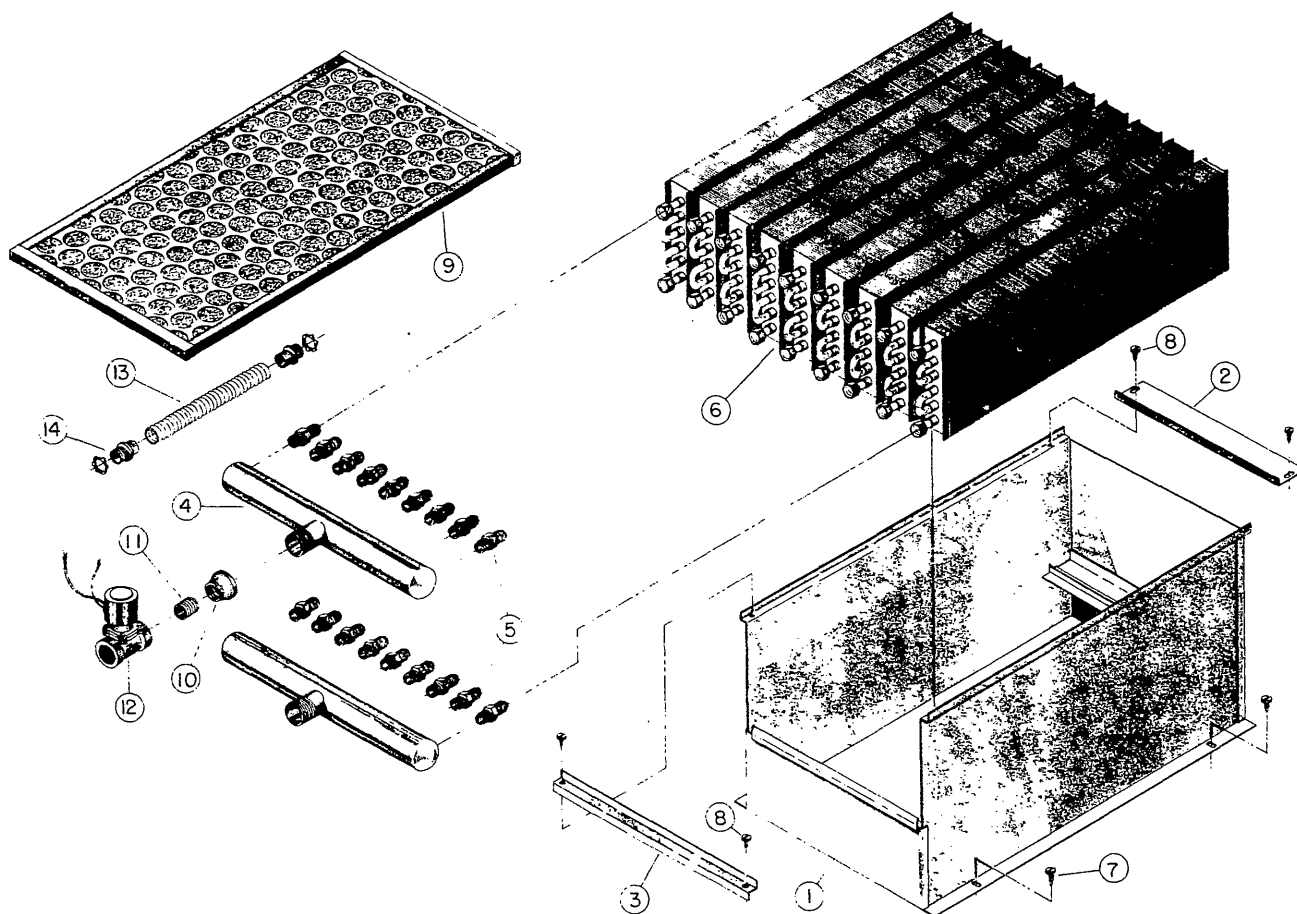
GAS BONNET & BURNER ASSEMBLY- TU 8659 (Natural Gas)

GAS BONNET & BURNER ASSEMBLY- TU 8835 (L.P. Gas)

Models L28FS30G &
L28FD30G

All Hardware Sold Only in Packages of 6

Ref. No.	Part No.	Description	Ref. No.	Part No.	Description
1	TU8640	Bonnet Welded Assy.	21	CB36	1/4"-20 x 1/2" Hex Hd. Screw
1A	TU8651	Door & Hinge W/A	22	TU2846	1/4" Split Lockwasher
1B	TU7775	Top Panel (for TU8640 order separately)	23	TU2847	1/4" Flat Washer
2	TU7733	#8 x 1/2" Self- Drill Screw	24	TU4934	1/4"-20 Hex Nut
3	TU2842	#10-32 Hex Nut	25	TU2224	1/8" Pipe Plug
4	TU2724	1/2" Pipe Nipple-25"	26	TU3539	Gas Burner Orifice (Specify Size)
5	OP308	1/2" Pipe Nipple-4"	27	TU7840	Burner Assembly
6	TU7935	Regulator (nat'l gas only)	28	TU7979	Manifold Assembly
7	TU6557	Baso Gas Valve	29	TU3416	#8x1 1/4 S.M.S.
7A	TU3832	Baso Gas Valve Coil Assy.	30	X172	Manifold Plug
8	TU6321	Gas Cock	31	M271	Lockwasher Brass
9	OP290	1/2" Pipe Nipple-2"	32	TU4820	3/16 x 1/2 x .047 Cut Washer
10	TU2226	Manifold Mtg. Bracket	33	TU8605	Molex Connector
11	136067752	Fiberglass Tubing	34	602102180	8x1 1/2" Hex Hd. Slot Screw
12	TU7294	Upper Rear Air Deflector	35	TU2877	#10 Tinnerman Nut
13	TU8760	Burner (Ignition, Left Hand)	36	TU2878	#10x5/8" S.M.S.
14	390501053	1/2" Elbow	37	TU3479	#10-32x7/16" Truss Hd. Screw
15	TU8598	Radiant Sensor	38	TU8613	Norton Igniter Instructions
16	C1365	Co-nector T & B	39		Gas Rating Plate
17	TU8690	Norton Igniter Mtg. Plate	40	TU8645	Installation Instructions
18	TU7373	Clean Out Panel Nameplate	41	P104	1/4" Cut Washer
19	TU8596	Norton Igniter	42	TU3266	8-32 Hex Nut
20	TU9540	Heat Shield	43	AT383	8-32 x 1/2" Truss Hd. Screw
			44	TU2853	Gasket Material

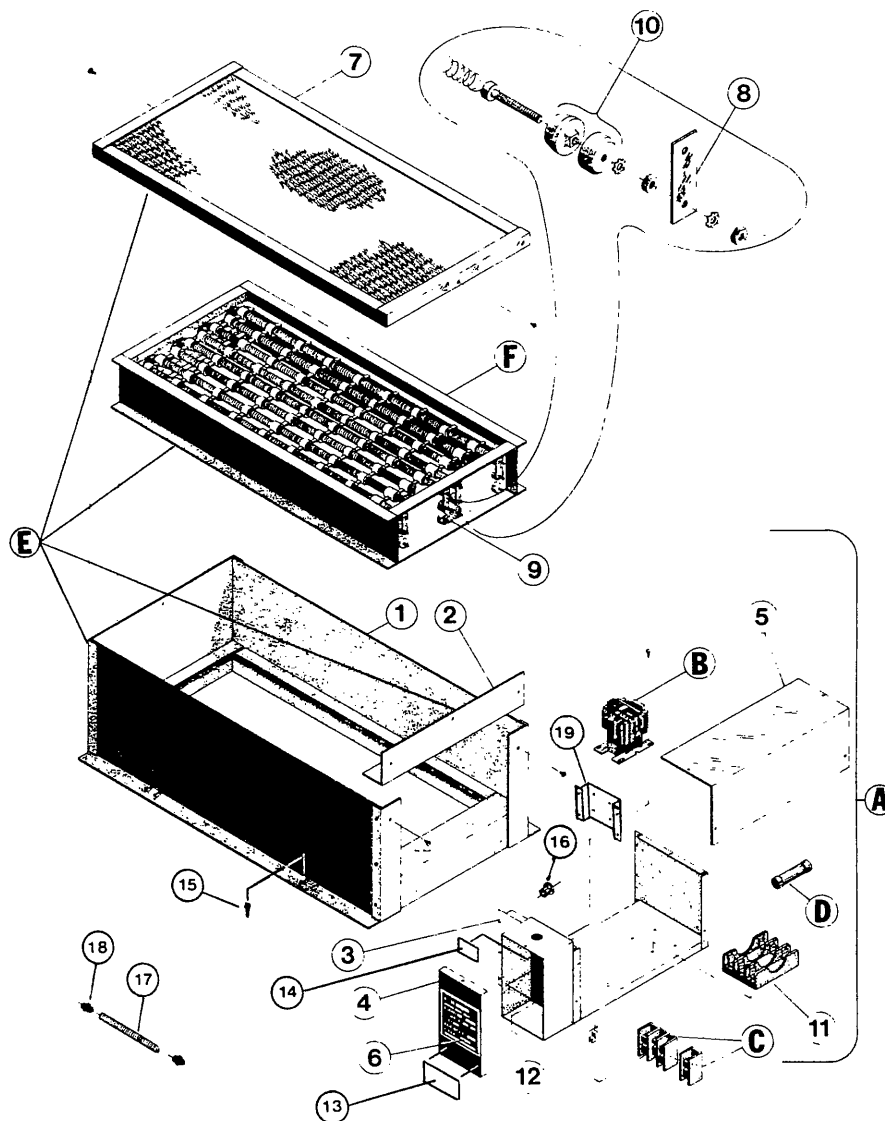


NINE SECTION STEAM BONNET & SOLENOID VALVE (120V.) TU7461
 NINE SECTION STEAM BONNET & SOLENOID VALVE (240V.) TU7462

Ref. No.	Part No.	Description
1	TU2546	Housing Weldment
2	TU2547	Front Coil Retainer
3	TU2548	Rear Coil Retainer
4	TU2413	Steam Coil Manifold
5	TU2414	3/4"-16 x 3/8" Straight Connector
6	TU2405	Steam Coil (9 req'd.) 7 3/4"W.x 1 5/8"H.x 26" L.
7	TU3209	#14 x 5/8" S.M.S.
8	M263	#8 x 3/8" S.M.S.
9	TU2598	Air Filter- 16" x 25" x 1"
10	TU2735	Reducer- 1" x 3/4"
11	TU4596	Close Pipe Nipple- 3/4"
12	*TU6041	Solenoid Valve- 120V. 50/60 Cycle
	**TU5924	Solenoid Valve- 240V. 50/60 Cycle
13	504641292	1/2" Greenfield Cable- 21" Long
14	TU4790	1/2" Straight Connector (2 req'd.)

* TU5939 Replacement Coil(240V.) for TU5924

** TU7151 Replacement Coil(120V.) for TU6041



ELECTRIC BONNET ASSEMBLY "C" MODEL

All Hardware Sold in Packages of 6 Only

Ref.No.	Part No.	Description	Ref.No.	Part No.	Description
1	TU3103	Bonnet Weldment	13	TU9254	High Voltage Label
2	TU3102	Hold Down Plate	14	TU9258(D-1A)	Grounding Label
3	TU9205	Control Box Weldment	15	TU3209	#14 x 5/8" S.M.S.
4	TU9207	Terminal Box Cover	16	TU5958	Bushing (2 reqd.)
5	TU9206	Top Cover	17	504641292	1/2" Greenfield Cable-11 1/2"
6	TU8518	Branch Circuit Label (Single Motor)	18	TU4790	Straight Connector(2 reqd.)
	TU8519	Branch Circuit Label (Double Motor)	19	TU9349	Bracket, Contactor
7	TU3104	Air Inlet Cover	A	see next page	Control Box L/wiring
8	TU3767	Contact Strap(4 reqd.)	B	"	Contactor
9	TU3768	Contact Strap(1 reqd.)	C	"	Terminal Block
10	TU3253	Insulators(Pkg. of 6)	D	"	Fuse
11	TU9348	Fuse Holder	E	"	Bonnet w/Elements
12	TU7738	Grounding Lug	F	"	Heater Elements

30 1b. ELECTRIC BONNET "C" MODEL
21 KW Heating Elements Only

A	B	C	D	E	F
CONTROL BOX L/WIRING	CONTACTOR (COIL VOLTAGE)	TERMINAL BLOCK	FUSE 3 REQ.	BONNET W/ ELEMENTS	HEATER ELEMENT
TU9216-208V.	TU9140-208/240V. 40A.	TU9142 2 req'd.	TU7072 40 A.	TU7590-22.5KW 208V. 1 PH.	TU6946, 240V., 30KW Used for 208V., 22.5KW
TU9217-240V.	TU9140-208/240V. 40A.	TU9142 2 req'd.	TU7071 35 A.	TU7588-21KW 240V. 1 PH.	TU6780, 240V., 21KW
TU9218-208V.	TU9140-208/240V. 40A.	TU9143	TU7072 40 A.	TU7590-22.5KW 208V. 3 PH.	TU6946-240V., 30KW Used for 208V., 22.5KW
TU9219-240V.	TU9140-208/240V. 40A.	TU9143	TU7071 35 A.	TU7588-21KW 240V. 3 PH.	TU6780 240V., 21KW
TU9221-240V.	TU9140-208/240V. 40A.	TU9143* TU9142**	TU7071 35 A.	TU7588-21KW 240 or 415V 3PH	TU6780 240V., 21KW
TU9220-480V.	TU9140-208/240V. 40A.	TU9143	TU7071 35 A.	TU7588-21KW 480V. 3 PH.	TU6780-240V., 21KW Used for 480V., 21KW

*TU9143-3 Pole

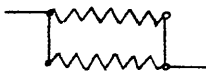
**TU9142-1 Pole (Neutral)

NOTE: TU3103 Bonnet Weldment

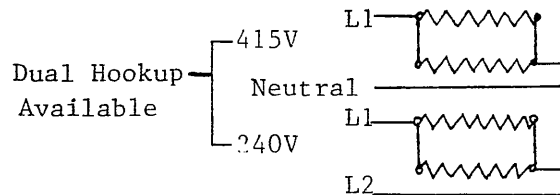
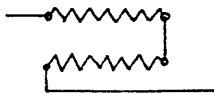
TU9205 Control Box Weldment

TU9141 Fuse Holder

240V Or 208V
Parallel



480V Series



21 KW HEATING ELEMENTS ARE EQUIPPED ON 30 1b. DRYERS ONLY.

WIRE SIZE OF POWER SUPPLY FOR ELECTRIC HEATING CIRCUIT

Rated Heater Input	Heater Amperes, Motor Amperes, Control Amperes, Total Amperes at Rated Voltage	HZ.	Minimum Size Supply Wire Based on 60°C (140F) insulated Copper Conductor	Circuit Minimum Conduit Trade Size	Two 60 Hz. Motor Circuit Phase	Controls Phase
21KW@208V/1PH	109 Amps	60	1 AWG	1½	1 Phase	1 Phase
21KW@208V/3PH	66 Amps	60	4 AWG	1¼	1 Phase	1 Phase
21KW@208V/3PH	62 Amps	60	4 AWG	1¼	3 Phase	1 Phase
21KW@240V/1PH	95 Amps	60	1 AWG	1½	1 Phase	1 Phase
21KW@240V/3PH	58 Amps	60	4 AWG	1¼	1 Phase	1 Phase
21KW@240V/3PH	55 Amps	60	4 AWG	1¼	3 Phase	1 Phase
21KW@480V/3PH	28 Amps	60	10 AWG	3/4	3 PH (50HZ)	1 Phase
21KW@240V/415/3PH	55 Amps	50	4 AWG	1¼	3 Phase	1 Phase
21KW@550V/3PH	25 Amps	60	10 AWG	3/4	3 Phase	1 Phase

CAUTION: THIS MACHINE HAS ONE POWER SUPPLY CONNECTION POINT. DISCONNECT POWER SUPPLY BEFORE SERVICING.