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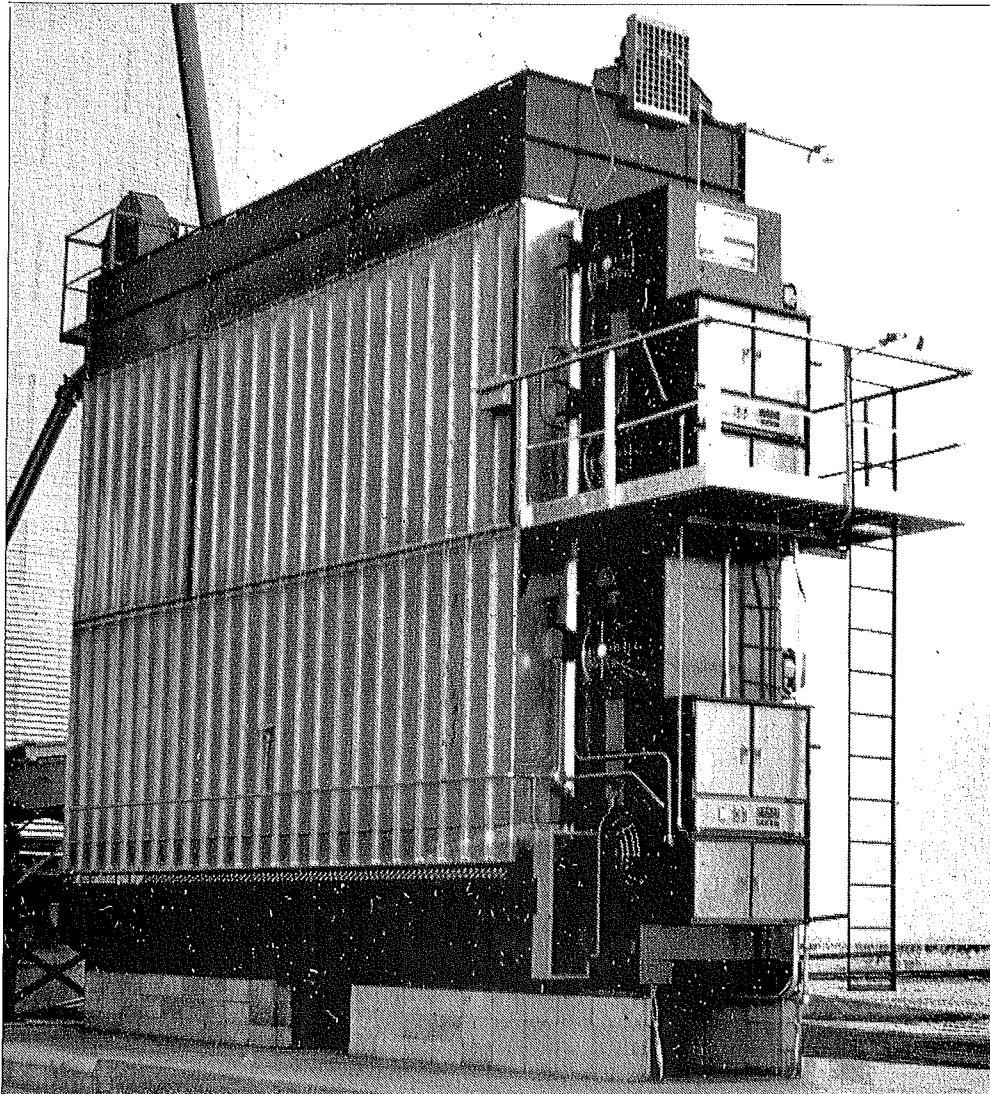


Model 675 thru 1195

(EM, EMS, B-115 and B-12)

Continuous Flow Grain Dryers

(Starting w/Serial No. 43657)



Operator's Manual

Form No. D193, June 1985

B.C. Mathews Co./

500 Industrial Ave., Crystal Lake, IL 60014, U.S.A.
815/459-2210 Telex 72-2488

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INTRODUCTION

To The Owner - Operator

This manual was prepared to provide owners and operator's of M-C Model 675 through 1195 Grain Dryers (starting with serial number 43657) with Operating Instructions and Maintenance Information that will enable them to keep their M-C Grain Dryer operating at peak efficiency.

Before operating your Grain Dryer read the Start-Up and Operating instructions. Check each item referred to and become familiar with the controls, adjustments and settings required to obtain efficient operation.

To keep the dryer operating at peak efficiency it is suggested that it be cleaned, lubricated, belt tension adjusted and the ignition system, level auger and unloading system be tested each year prior to the drying season. Refer to "Pre-Season Check" on page 27. The pre-season check can be made when the dryer is empty. Any necessary repairs or adjustments can be made so that the dryer will be ready to operate before the drying season.

Work Safely



This symbol is used to call your attention to instructions concerning your personal safety. Be sure to observe and follow these instructions.

NOTE: To provide clear illustrations some of the covers, guards and shields were removed.



CAUTION: Be sure all covers, guards and shields are in place and secure before operating the Grain Dryer.

Warranty Registration

It is important to send in your warranty registration card as soon as your new Grain Dryer is delivered. Not only does the card validate your Grain Dryer warranty, but it is also our way of knowing who has purchased M-C equipment so that we can keep in touch with you.

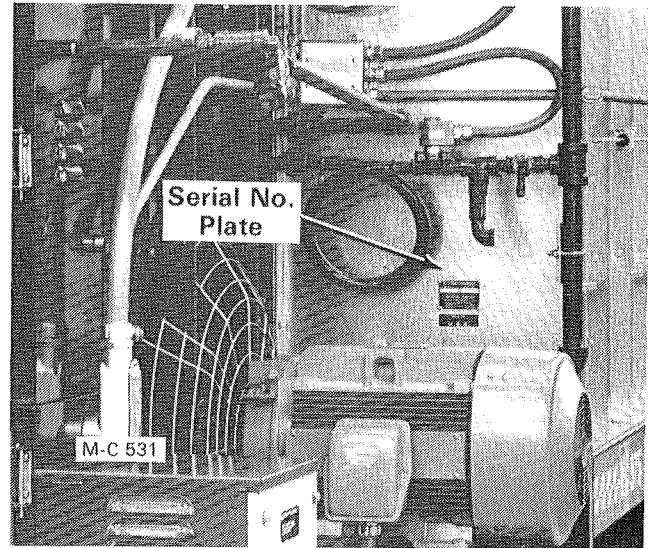


Figure A

M-C FARM EQUIPMENT	
MODEL NO.	SERIAL NO.
MANUFACTURED BY	
MATHEWS COMPANY	
CRYSTAL LAKE, ILLINOIS, U.S.A.	
OTHER PATENTS PENDING	
3,129,073	3,313,040
4,020,561	4,217,701

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Figure B

Model and Serial Number Location





The model and serial number of your grain dryer are stamped on a plate located on the left front end panel, see Figure A. For future reference, record the model and serial number in the blank spaces in Figure B.

Capscrew Grade Identification

There are four grades of hex-head capscrews. Grade 1 and 2 are common capscrews, grade 5 and grade 8 are used when greater strength is required. Each grade can be identified by the marking on the head of the capscrew, see chart.

When servicing the Dryer and/or replacing capscrews, be sure to use the correct size and grade. If in doubt, refer to the parts catalog (Form No. D194). If a specific grade is not shown as part of the description, the capscrew is a grade 1 or 2.

CAPSCREW GRADE IDENTIFICATION CHART

S.A.E. Grade	Description	Capscrew Head Marking*
1	WILL HAVE A PLAIN HEAD - NO RADIAL LINES	
2	Low or Medium Carbon Steel Not Heat Treated	
5	WILL HAVE 3 RADIAL LINES Quenched and Tempered Medium Carbon Steel	
8	WILL HAVE 6 RADIAL LINES Quenched and Tempered Special Carbon or Alloy Steel	

*The center marking identifies the capscrew manufacturer.

Metric (SI) Measurements

(English Units & Metric (SI) Equivalents)

Area

1 square inch = 6.4516 square centimeters
 1 square foot = 0.0929 square meters
 1 square yard = 0.8361 square meters
 1 acre = 4047 square meters
 1 acre = 0.4047 hectare

Force

1 pound (force) = 4.45 newtons

Length

1 inch = 25.4 millimeters
 1 inch = 2.54 centimeters
 1 foot = 304.8 millimeters
 1 foot = 30.5 centimeters
 1 foot = 0.305 meters
 1 yard = 0.9144 meters
 1 mile = 1.6093 kilometers

Mass

1 ounce = 28.35 grams
 1 pound = 0.454 kilograms
 1 ton = 907.1848 kilograms

Power

1 horsepower = 0.7457 kilowatts

Pressure

1 psi = 6.89 kilopascals
 1 psi = 0.00689 megapascals
 1 inch of mercury = 3.377 kilopascals

Temperature

1 degree Fahrenheit ($^{\circ}\text{F} - 32$) $\div 1.8 = ^{\circ}\text{Celsius}$

Torque

1 inch pound = 0.113 newton meters
 1 foot pound = 1.356 newton meters

Velocity

1 mile per hour = 1.61 kilometers per hour

Volume

1 bushel = 35.24 liters
 1 bushel = 0.0352 cubic meters
 1 pint = 0.4731 liters
 1 quart = 0.9464 liters
 1 gallon = 3.7854 liters
 1 cubic inch = 16.387 cubic centimeters
 1 cubic foot = 0.0283 cubic meters
 1 cubic yard = 0.7646 cubic meters

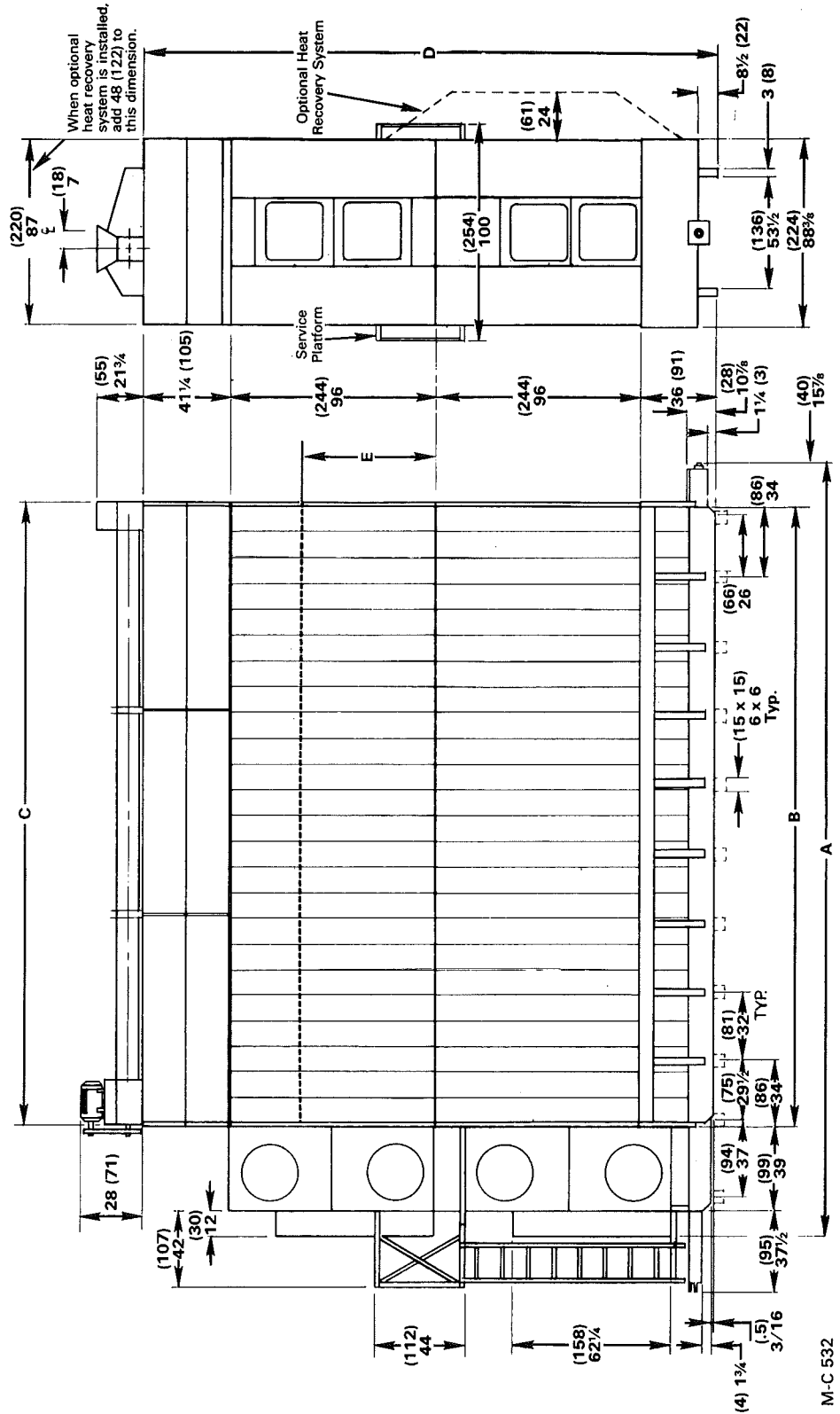
NOTE: The B.C. Mathews Co. reserves the right to incorporate any changes in design without obligation to make these changes on units previously sold.

Dryer Dimension Chart

All Dimensions Are In Inches (Centimeters)

All Dimensions Are In Inches (Centimeters)

Model	A	B	C	D	E
675	261 $\frac{3}{4}$ (665)	196 (498)	194 $\frac{1}{4}$ (494)	173 $\frac{1}{4}$ (440)	—
775	261 $\frac{3}{4}$ (665)	196 (498)	194 $\frac{1}{4}$ (494)	233 $\frac{3}{4}$ (592)	60 (152)
875	261 $\frac{3}{4}$ (665)	196 (498)	194 $\frac{1}{4}$ (494)	269 $\frac{1}{4}$ (684)	—
885	261 $\frac{3}{4}$ (665)	196 (498)	194 $\frac{1}{4}$ (494)	329 $\frac{1}{4}$ (836)	60 (152)
895	261 $\frac{3}{4}$ (665)	196 (498)	194 $\frac{1}{4}$ (494)	365 $\frac{1}{4}$ (928)	—
975	357 $\frac{3}{4}$ (909)	294 (747)	290 $\frac{1}{4}$ (737)	173 $\frac{1}{4}$ (440)	—
1075	357 $\frac{3}{4}$ (909)	294 (747)	290 $\frac{1}{4}$ (737)	233 $\frac{3}{4}$ (592)	60 (152)
1175	357 $\frac{3}{4}$ (909)	294 (747)	290 $\frac{1}{4}$ (737)	269 $\frac{1}{4}$ (684)	—
1185	357 $\frac{3}{4}$ (909)	294 (747)	290 $\frac{1}{4}$ (737)	329 $\frac{1}{4}$ (836)	60 (152)
1195	357 $\frac{3}{4}$ (909)	294 (747)	290 $\frac{1}{4}$ (737)	365 $\frac{1}{4}$ (928)	—



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CONTROL PANEL LIGHTS, SWITCHES & CONTROLS

Control Panel Lights (See Figure 1 & 2)

Ref. 1 - Power Light

Indicates that 115 Volt (12 Volt, Model B-12) electric power to the dryer control panel is on.

Ref. 2 - High Limit Light

Indicates that the high limit switch is closed.

Ref. 3 - Air Pressure Light

Indicates that the air pressure switch is closed. (Dryer must be full of grain and fans running).

Ref. 4 - Gas Valve Light

Indicates that the ignition board has supplied power to the gas solenoid valves. (Ignition switch must be on).

Ref. 5 - Level Auger Light

(Not on Model B-12)

Indicates that the grain level in the hopper is low and the level auger mercury switch in the hopper has closed, activating the level auger circuit.

Ref. 6 - Hopper Low Level Warning Light

(Not on Model B-12)

Indicates low grain level in the hopper. Dryer will shut down when this light comes on. See "Low Grain Level Timer" on page 20 for setting instructions.

Control Panel Switches and Controls

(See Figure 2, 3 & 4)

Ref. 7 - Fan Start-Stop Buttons

(Not on Model B-12 or B-115)

Black button starts and red button stops the fans.

Ref. 8 - Ignition Reset Button

(Not on Model B-12)

The ignition reset button (0.1 amp. circuit breaker) protects the ignition board from heat build up due to repeated ignition attempts.

If the ignition switch is flipped on and off too fast the ignition reset button will pop out. After a few seconds, push it back in to reset the ignition board.

Ref. 9 - SCR Drive Speed Control Knobs - Optional on Model 675, 775, 875, 975, 1075 and 1175. (Not on Model B-12)

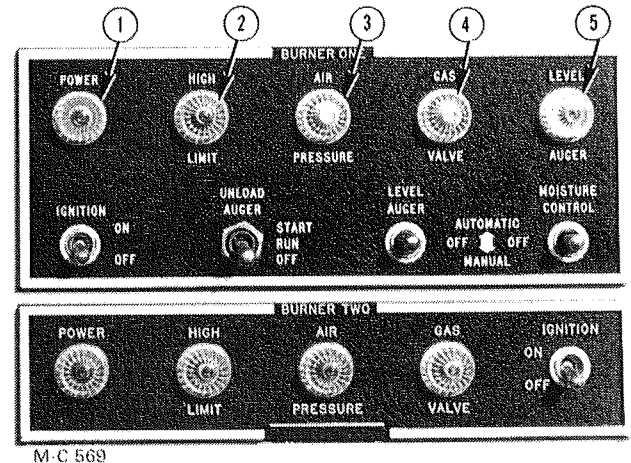


Figure 1

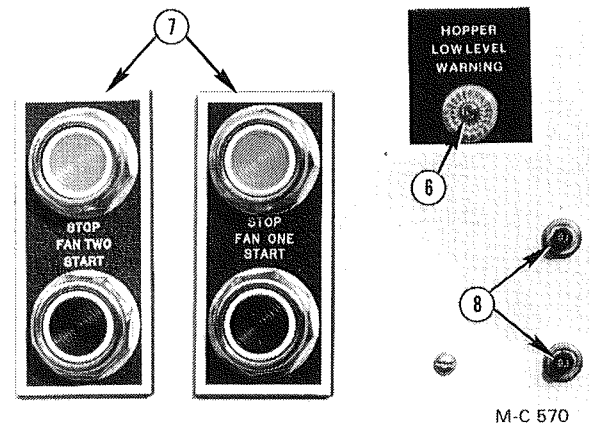


Figure 2

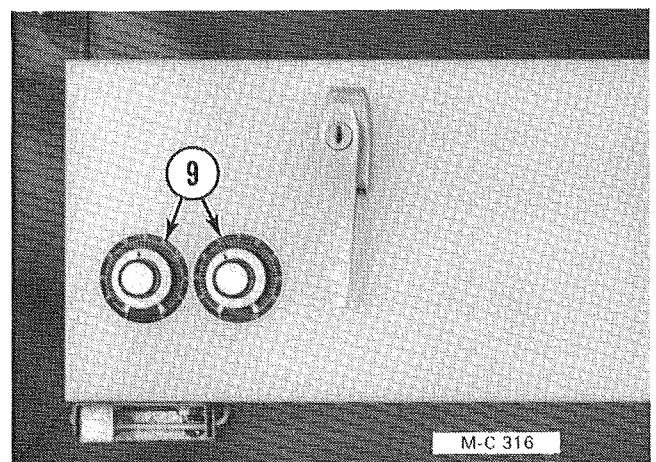


Figure 3

These control knobs are used to adjust the speed of the DC motors that drive the grain metering rolls.

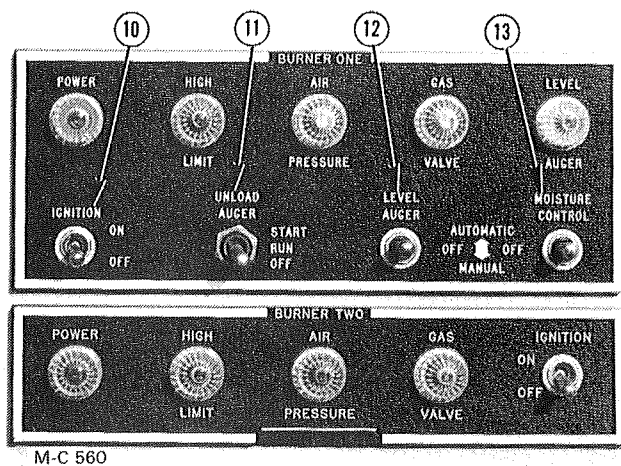


Figure 4

Ref. 10 - Ignition Switch

Flip this switch on to light the burner. If the burner does not light in 5 seconds the ignition board will "lock out" closing the gas solenoid valves.

Flip the switch off, wait one minute, then on again for another "trial ignition" period.

Ref. 11 - Unload Auger Switch (Not on Model B-12)

This switch starts and stops the unload auger. Push this spring loaded switch up to the start position to start the unload auger and release it. It will move down to the run position.

NOTE: If there is a momentary loss of electric power, this switch will have to be pushed up to the start position to restart the unload auger. This feature prevents an unattended dryer from unloading when the electric power comes back on.

Ref. 12 - Level Auger Switch

When the switch is in the automatic position, the level auger will start one minute (0-5 minutes on Model B-12) after the level auger mercury switch in the hopper closes.

NOTE: Dryers with 115V controls - If the Low Grain Level timer has not been set, the dryer will shut down when the level auger toggle switch is flipped from MANUAL to AUTOMATIC position.

The level auger mercury switch in the hopper will shut the level auger off when the hopper is full. If there is an insufficient grain supply to fill the hopper, the Low Grain Level Timer (not on Model B-12) will shut the dryer down.

When the switch is in the manual position the level auger will start immediately when the level auger mercury switch in the hopper closes and stop when the hopper is full. The delay and Low Grain Level Timer (not on Model B-12) operate only when the switch is in the automatic position.

Ref. 13 - Moisture Control Switch

When the switch is in the automatic position, the moisture control on each side of the dryer will start and stop the upper and lower ratchet solenoids or SCR drive motors automatically. Unloading starts when the moisture content of the grain is reduced to the level that the moisture control is set for and stops when the moisture content is above this setting.

When the switch is in the manual position, the upper ratchet solenoids or the SCR Drive system will operate continuously. Turn the moisture control knobs down below 1 on the dial to start the lower ratchet solenoids.

START-UP INSTRUCTIONS

General

IMPORTANT: Inspect for and remove any foreign material (nuts, bolts, tools, parts etc.) from the hopper, grain columns, metering rolls, unload auger and heat chambers before filling the dryer with grain. Also be sure all heat chamber floor doors are in position and secure. Close all rear doors.

1. Flip all of the toggle switches on the control panel(s) to the **OFF** position, see Figure 4.
2. **LP Gas** - Close the liquid line flip valve for each burner (handle down), see Figure 5.
3. Close the gas main hand valve for each burner (handle 90° to the piping), see Figure 6.
4. Check the modulating valve in each burner gas manifold to be sure the "T" handle has not been turned all the way in to the wide open position, see Figure 6. The "T" handle should be halfway between the closed and fully open position.
5. **EM, EMS and B-115 Models** - Turn on the electric power supply to the dryer.

B-12 Models - Connect the battery cables from the control cabinet direct to the tractor battery terminals. **Brown** to the negative (—) post and **Red** to the positive (+) post. If the cables are reversed, the burner will light for about 5 seconds then go out.

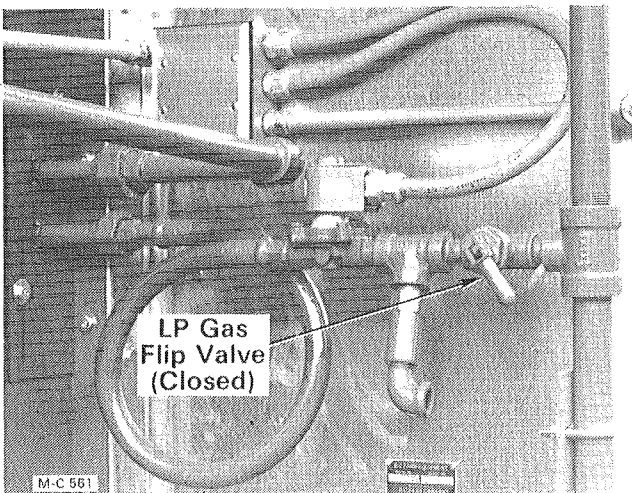


Figure 5 - LP Gas

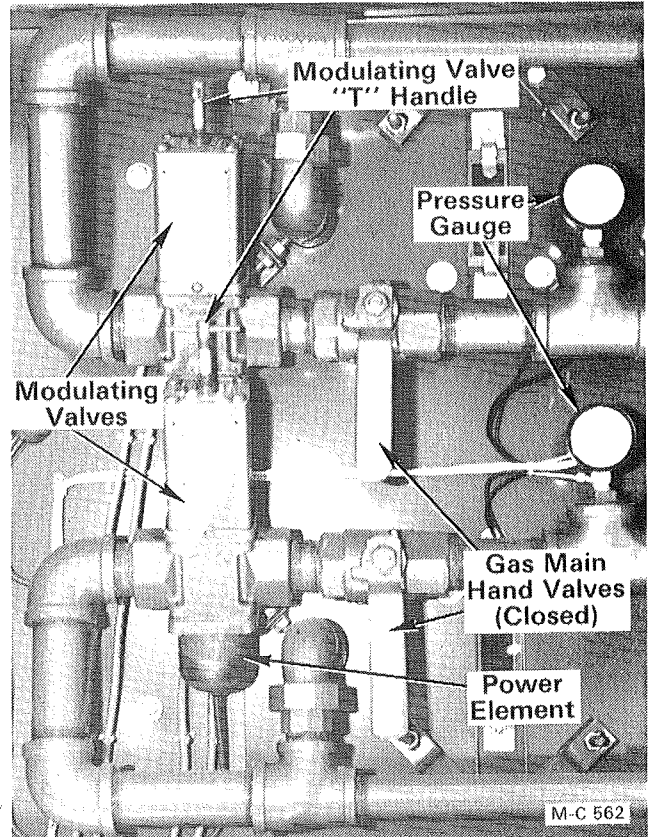


Figure 6 - Two Burner Cabinet

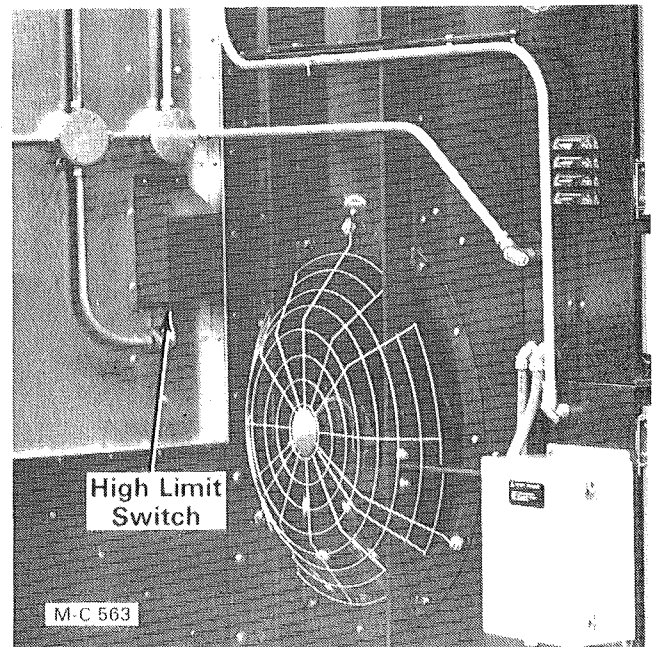


Figure 7

6. The "POWER", "HIGH LIMIT" and "LEVEL AUGER" lights on the control panel will be ON. If the "HIGH LIMIT" light(s) are not on, push the reset button on the high limit switch. The high limit switch(es) are on the right front end panel, see Figure 7.

Filling the Dryer

CAUTION: Do not allow anyone to be in the hopper when filling the dryer. **Always** turn off and lock the electric power supply to the control cabinet before allowing anyone to work in the hopper.

The level auger toggle switch, Figure 4 page 6, is a three position switch, AUTOMATIC-OFF-MANUAL. When the switch is in the MANUAL position the level auger will start immediately and stop when the hopper is full.

When the switch is in the AUTOMATIC position the level auger 60 second delay and low grain level timer (not on Model B-12) will be activated. The level auger will start in one minute (0-5 minutes on Model B-12) if the level auger light is on calling for grain and stop automatically when the hopper is full.

NOTE: The operation of the level auger 60 second delay and the low grain level timer are explained under "Low Grain Level Timer" on page 20.

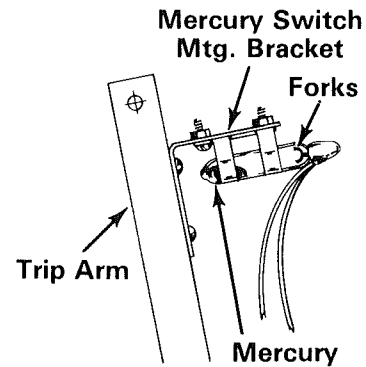
1. Flip the level auger toggle switch to the MANUAL position. The level auger will start immediately and the level auger light on the control panel will be ON.
2. When the dryer is full, the grain will force the bin switch trip arm to pivot towards the pulley end of the level auger. In this position the mercury in the switch should be away from the forks in the wire end of the bulb, see Figure 8. If not, bend the mercury switch mounting bracket up as required.

CAUTION: Turn off and lock the electric power supply to the dryer before anyone goes into the hopper to adjust the mercury switch. Any movement of the mercury switch could start the level auger.

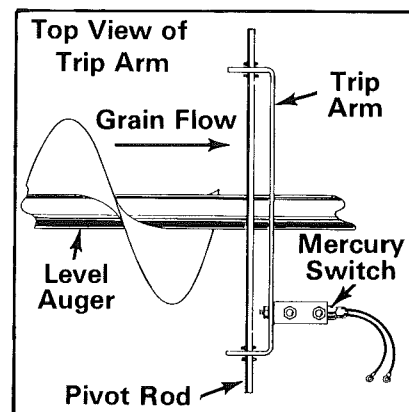
Air Pressure Switches

General

1. There is an air pressure switch for each heat chamber, see Figure 9. The air pressure switch senses the static air pressure in the heat chamber when the dryer is full of grain and the fan is running. If the static air pressure drops because of fan failure, the air pressure switch opens stopping current flow to the ignition switch. The gas solenoid valves will close and the burner will shut down.

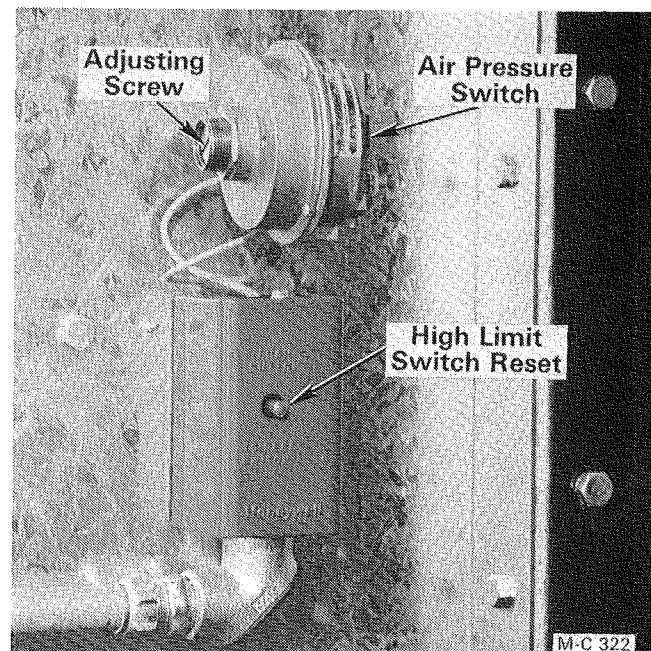


Forks at wire end must be in a vertical position as shown so mercury contacts both forks in end of bulb.



M-C 321

Figure 8



M-C 322

Figure 9

- The air pressure switch is designed to protect the dryer from fire that may result from fan (air flow) failure while the burner is ignited and flame is present.



CAUTION: This safety feature is for your protection and protection of the dryer. The air pressure switches should be checked for correct operation at the start of the drying season and periodically during the season.

Checking

- After the dryer has been filled and before any burners are started, the operation of each air pressure switch **MUST** be checked. Be sure the rear doors are closed.
- Start the bottom fan. When it comes up to speed, start the next fan. Continue this procedure until all of the fans are running.
- The air pressure light on the control panel will come ON as each burner fan comes up to speed.

NOTE: Dryers equipped with optional Safety Control Fire Alarm - The air pressure switch electrical circuit is designed so that when the fans are started (dryer full of grain) they will run 60 seconds before the air pressure switch closes and the light comes ON.

- If the light does not come ON or comes ON too soon (before the fan comes up to speed) the air pressure switch must be adjusted.

Adjusting

NOTE: All of the fans must be running (including the cooling fans) before the air pressure switches can be accurately adjusted.

- Remove the air pressure switch cover. Remove the plastic cap on the air pressure switch. The slotted screw is the adjusting screw, see Figure 9.
- Turn the adjusting screw out ¼ turn (in if the light was coming ON too soon). If the Air Pressure light does not come on, turn the adjusting screw out another ¼ turn. Continue this procedure until the light comes on.
- When the Air Pressure light comes on, turn the adjusting screw out an additional ¼ to ½ turn to allow for normal changes in static pressure.

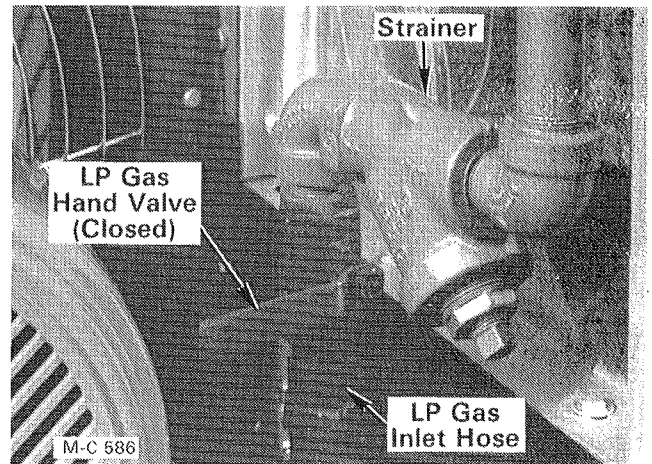


Figure 10 - LP Gas

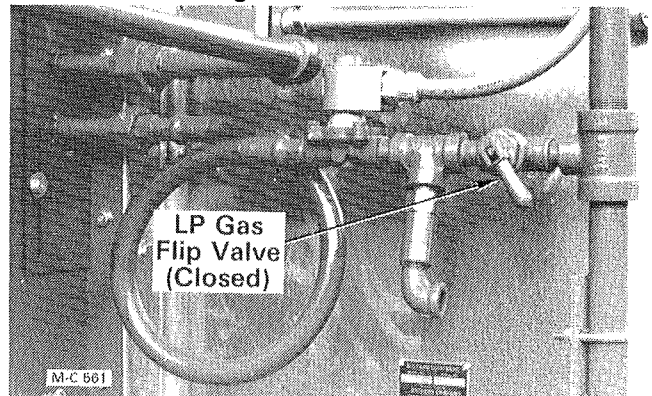


Figure 10A - LP Gas

- Shut off the fan.
 - Below S/N 46799** — The Air Pressure light should go out when the fan slows down to approximately half speed. If the light does not go out the adjusting screw has been turned out too far. Readjust and check again. Install the plastic cap.
 - Above S/N 46798** — The Air Pressure light will go out when the fan stop button is pushed. These dryers are wired so that the power flows from the fan start button to the air pressure switch.
- If all air pressure switch adjustment is used and the Air Pressure light does not come on, test the air pressure switch as outlined under "Air Pressure Switch Testing" on page 31.
- If the air pressure light is blinking, turn the adjusting screw out a small amount.

Starting the Burners

- LP Gas** - Open the supply valve at the tank, the hand valve at the LP Gas inlet hose and open (lift up) the liquid line flip valve on each burner, see Figure 10 and 10A. The flip valve is open when the handle is 90° to the piping.

Natural Gas - Open the supply valve.

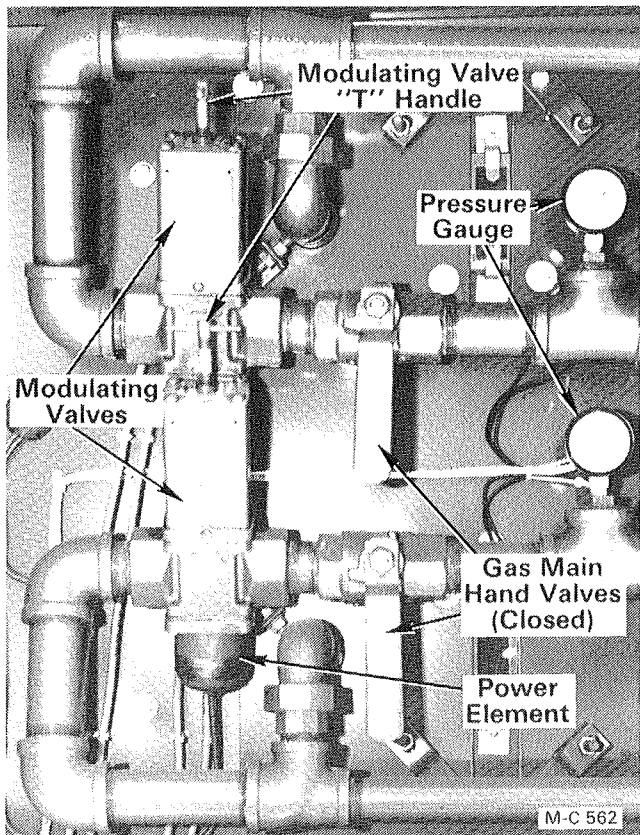


Figure 11 - Two Burner Cabinet

2. Start the bottom fan. When it comes up to speed, start the next fan. Continue this procedure until all of the fans are running.
3. Flip the bottom burner ignition switch ON. Open the gas main hand valve (Figure 11) ¼ of the way. The gas valve light will be ON and the burner will light.
4. After the flame is established, **slowly** open the bottom burner gas main hand valve all the way (handle parallel to the piping).

NOTE: Opening the gas main hand valve slowly will prevent possible freezing of the LP Gas line and also prevent the temperature from rising too fast. If the temperature rises too fast, the High Limit Switch will trip out and shut down the burner.

5. If the LP Gas line freezes, close the gas main hand valve and flip the ignition switch OFF. After the gas line thaws out repeat steps 3 and 4, but open the gas main hand valve slower.

NOTE: The ignition board is electronically timed so that the ignition system will continue to spark and hold the solenoid gas valves open for a "trial ignition" period (about 5 seconds). If the burner does not light, the system will "lock out"

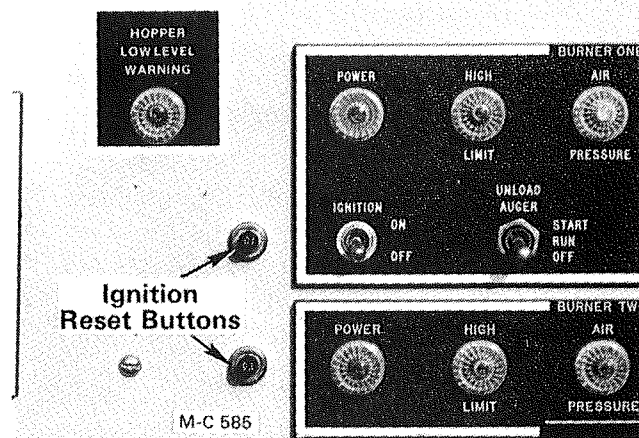


Figure 12

(after the 5 second trial period) closing the solenoid gas valves. The gas valve light will be out. Flip the ignition switch OFF, wait one minute, then ON again for another "trial ignition" period.

6. **All models except B-12** - If the ignition switch is flipped OFF and ON too fast, the ignition board circuit breaker will trip out, see step 7.
7. **All models except B-12** - If after several attempts for ignition there is still no flame, push the .01 (1/10th) amp. ignition reset button (circuit breaker) on the control panel, see Figure 12. This circuit breaker protects the ignition board from heat build up due to repeated ignition attempts.

NOTE: If the burner fails to light, check the electrode and ignition board as explained under "Direct Spark Ignition System." See page 32 for 115V system and page 34 for 12V system.

8. If the High Limit Switch trips out, close the gas main hand valve and flip the ignition switch OFF. Push the reset button on the High Limit Switch to reset it, see Figure 9, page 8. Repeat steps 3 and 4, but open the gas main hand valve slower to prevent the temperature from rising too fast.
9. **LP Gas Only** - When the flame is established, the heat causes the LP Gas to vaporize. Check the vaporizer coil as follows:
 - A. Check the LP Gas line coming out of the fan housing from the vaporizer coil to the pressure regulator with your hand.



CAUTION: The line may be very hot.

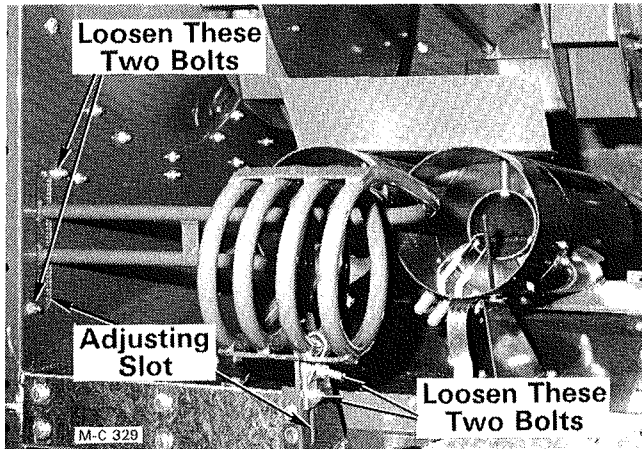


Figure 13 - LP Gas Vaporizer Coil

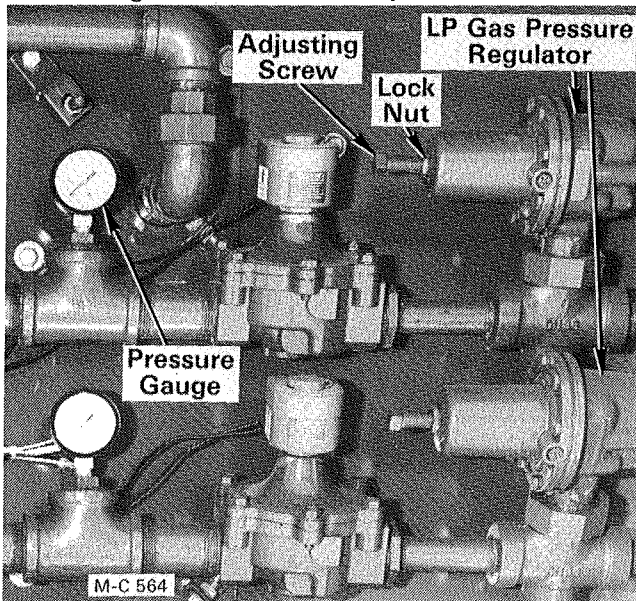


Figure 14 - LP Gas Two Burner Cabinet

- B. When the vaporizer coil is positioned correctly in the flame, the LP Gas line coming out of the fan housing from the vaporizer coil to the pressure regulator should feel very warm, but not so hot that you cannot hold your hand on it.
- C. If it feels cool, the vaporizer coil is not close enough to the flame. If it is very hot, the vaporizer coil is too close to the flame.
- D. Shut the burner and all fans off.



CAUTION: Turn off and lock the electric power supply to the control cabinet.

- E. Go into the plenum chamber and move the coil closer to or away from the flame, see Figure 13.
- F. After the adjustment has been made, turn on the electric power supply. Restart fans and burner.

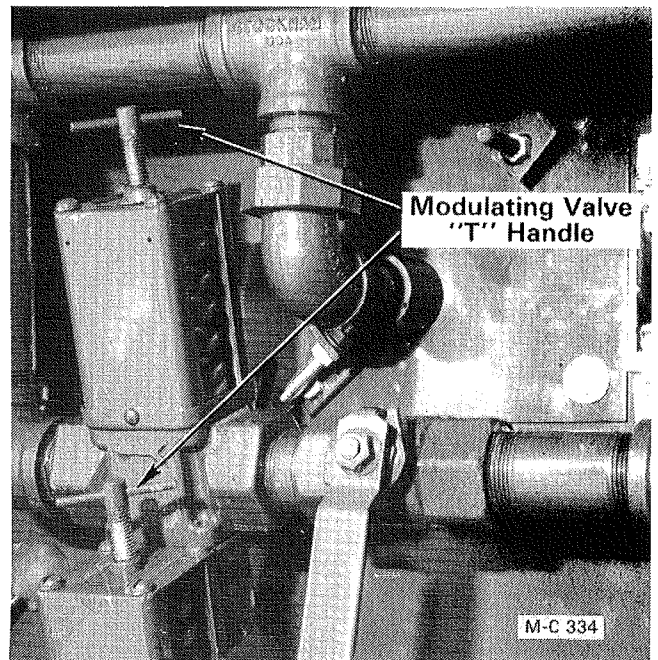


Figure 15 - Two Burner Cabinet

10. **LP Gas Only** - With the burner operating, check the reading on the gas pressure gauge in the manifold see Figure 14. It should be approximately 8 to 10 pounds (less in mild weather). If not, loosen the locknut on the pressure regulator adjusting screw, see Figure 14. Turn the adjusting screw IN to increase and OUT to decrease pressure.

NOTE: After the dryer has been operating for several hours the pressure regulator(s) will be functioning properly. It will not be necessary to adjust them on future start-ups.

Setting Burner Operating Temperature

NOTE: Refer to the "Suggested Burner Operating Temperature Setting Chart" on page 13. Temperatures shown are initial settings and may have to be adjusted for local crop and weather conditions.

1. With the burner operating, set the operating temperature by adjusting the modulating valve.
2. Turn the "T" handle on the modulating valve IN to INCREASE temperature and OUT to DECREASE temperature, see Figure 15. There is a temperature gauge on the control panel(s) for each burner.

3. Observe the burner flame through the window behind the gas manifold, see Figure 16. The flame should be blue with a little bit of orange in it and have a bushy ball shape.

If any of the conditions listed below exist, they can be corrected by changing the primary and/or secondary air adjustment slightly. See Venturi Burner Air Adjustment on page 36.

IMPORTANT: Both venturi burners must be adjusted the same distance or amount to provide even heat in the plenum chamber.

- A. Unstable flame (quick ON-OFF-ON flame). Adjust secondary air.
 - B. Gas Solenoid Valve Chatters. Adjust secondary air.
 - C. Flame is very yellow or orange in color. Adjust primary air.
 - D. Flame is light blue with no orange or yellow at all. Adjust primary air.
 - E. Flame popping. Adjust secondary air.
4. After the burner operating temperature has been set and the flame checked, close the gas main hand valve and flip the ignition switch OFF (leave the fan running).

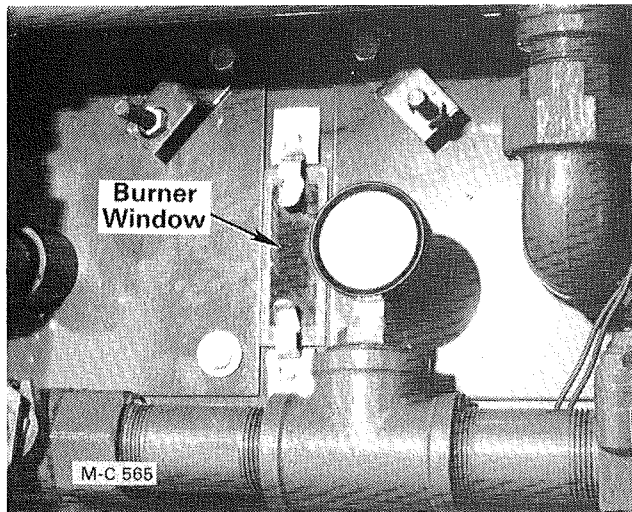


Figure 16

5. Repeat the starting and burner operating temperature setting procedure for the remaining burners (in order from the bottom to the top). After the burner operating temperature has been set for each burner, turn all of the fans off.

NOTE: After the dryer has been operating for several hours the modulating valve(s) will be functioning properly. It will not be necessary to adjust them on future start-ups unless the burner operating temperature is to be changed.

Suggested Burner Operating Temperature Settings (F°) (Fans and Burners From the Top to the Bottom)

IMPORTANT: Use this chart as a starting point for drying the crops listed. Depending on the condition of the crop, you may have to increase or decrease the temperature shown. For example, when drying mature corn in Model 675 and 975 dryers with single burners, the drying temperature could be as high as 230°F. When drying immature corn, the drying temperature could be as low as 180°F.

Dryer Model	Corn		Sorghum & Wheat		Sunflower, Oats, Barley, Soybeans		Rice*		Seed Grains	
	Dry & Cool	All Heat	Dry & Cool	All Heat	Dry & Cool	All Heat	Dry & Cool	All Heat	Dry & Cool	All Heat
675 & 975	215	225	170	170	140	140	115	115	110	110
	Cool	180	Cool	150	Cool	130	Cool	110	Cool	100
775 & 1075	220	230	180	170	140	140	115	115	110	110
	180	210	160	160	130	130	110	110	100	100
	Cool	180	Cool	150	Cool	120	Cool	100	Cool	100
875 & 1175	230	230	180	170	140	140	120	120	110	110
	210	220	170	160	140	130	115	115	110	100
	180	200	160	160	130	120	110	110	100	100
	Cool	180	Cool	150	Cool	120	Cool	100	Cool	100
885 & 1185	230	230	180	170	140	140	120	120	110	110
	220	230	170	170	140	140	115	115	110	100
	200	210	160	160	130	130	110	110	100	100
	180	200	150	160	130	130	110	100	100	90
	Cool	180	Cool	150	Cool	120	Cool	100	Cool	90
895 & 1195	230	230	180	170	140	140	120	120	110	110
	230	230	170	170	140	140	115	115	110	100
	220	210	160	160	130	130	115	115	100	100
	200	210	150	160	130	130	110	110	100	100
	**180	200	140	150	Cool	120	100	100	100	90
	Cool	180	Cool	150	Cool	120	Cool	100	Cool	90

*Rice drying is critical. Do not exceed these temperatures. Grain temperature should not exceed 105°F

**This burner may be used for cooling during periods of high outside temperatures.

OPERATING INSTRUCTIONS

Dryers With Over/Under Ratchet System

Description (See Figure 17)

1. There are two ratchet solenoids on each ratchet wheel. One is on the top and the other is on the bottom. A dual temperature sensing moisture control, located in the grain column on each side of the dryer, senses the temperature of the grain.
2. The moisture control has two sets of contacts that react to two different temperatures approximately 15°F apart. The higher temperature controls the upper ratchet solenoids and the lower temperature controls the lower ratchet solenoids when the moisture control toggle switch is in the AUTOMATIC position.
3. For example, if the moisture controls are set so that the upper ratchet solenoids engage the upper ratchet pawls when the grain is at 145°F, the lower ratchet solenoids will engage the lower ratchet pawls at 130°F.
4. If the grain temperature goes below the lower sensing temperature (in this case 130°F) both the upper and lower ratchet pawls will be disengaged and no grain will be discharged. This eliminates any chance of wet grain flowing through the dryer and out into the storage bin if one or more burners go out.
5. When the lower sensing temperature comes back up to 130°F the lower ratchet pawls will engage again, and when the upper sensing temperature comes back up to 145°F the upper ratchet pawls will engage again.
6. When the moisture control toggle switch is in the AUTOMATIC position, the grain unloading rate should be adjusted with the variable speed pulley so that the lower ratchet pawls are engaged all of the time and the upper ratchet pawls are engaged 50 to 55 minutes of each hour.
7. When the upper ratchet pawls disengage, the grain unloading rate is reduced by 50%. When the temperature of the grain reaches the moisture control higher temperature setting, the upper ratchet pawls will engage again.

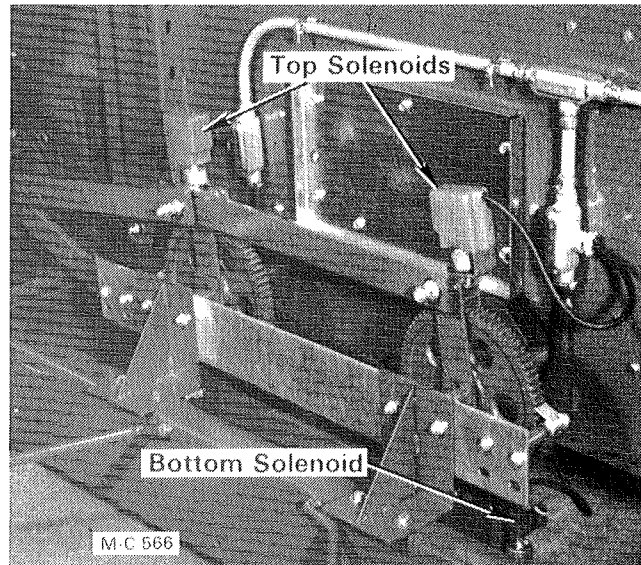


Figure 17 - Over/Under Ratchet System

8. The upper and lower ratchet pawls will engage and remain engaged when the moisture control toggle switch is in the MANUAL position and the moisture control knobs are turned down below 1 on the dial.

Drying Grain

1. Flip the level auger toggle switch to the MANUAL position. Flip the ignition, moisture control and unload auger toggle switches to the OFF position (unload auger switch not on Model B-12).
2. With the dryer full of grain, start the bottom fan. When it comes up to speed, start the next fan. Continue the procedure until all of the fans are running.
3. Start the burners in order from the bottom to the top.
4. Running on continuous heat, it will take approximately 6 minutes per point of moisture being removed to dry the first load.
5. **All Models Except B-12** - When the first load is dry, push the unload auger spring loaded toggle switch up to the START position and release it. It will move down to the RUN position.

NOTE: If there is a momentary loss of electric power, the unload auger will stop. To restart it,

push the unload auger toggle switch up to the START position and release it to the RUN position. This feature prevents an unattended dryer from unloading when the electric power comes back on.

6. Turn the moisture control knob on each side of the dryer down below 1 on the dial, see Figure 18.
7. Flip the moisture control toggle switch to the MANUAL position. The upper and lower ratchet pawls will engage and the unloading auger will begin unloading grain.
8. Dryers operated "Dry and Cool" will have wet grain in the cooling section. This grain will have to be recycled back into the heating section.

Variable Speed Pulley Adjustment



CAUTION: The guards were removed in Figure 19 to provide a clear illustration. Do not operate the dryer without guards in place and secure.

1. The variable speed pulley, Figure 19 controls the speed of the unloading auger and the rate of speed that the grain metering roll ratchet arms move back and forth, see Figure 20.
2. Changing the back and forth speed of the ratchet arms regulates the speed of the grain metering rolls when the ratchet pawls engage the ratchet wheels. Increasing the ratchet arm speed unloads the grain faster and decreasing the ratchet arm speed unloads the grain slower.
3. The variable speed pulley should only be used for fine adjustment. The range from fast to slow is approximately equal to one tooth on the ratchet wheels.
4. If the grain unloading rate must be increased or decreased beyond the range of the variable speed pulley adjustment, adjust the position of the transfer arms on the eccentric sprocket. See "Grain Metering Roll Ratchets" on page 16.

IMPORTANT: Never put extreme pressure on the belts by bottoming them out in the pulley. This will cause premature belt failure.

5. Loosen the locking bolt and move the variable speed pulley arm down to speed up the grain unloading rate. Move the variable speed pulley arm up to slow down the grain

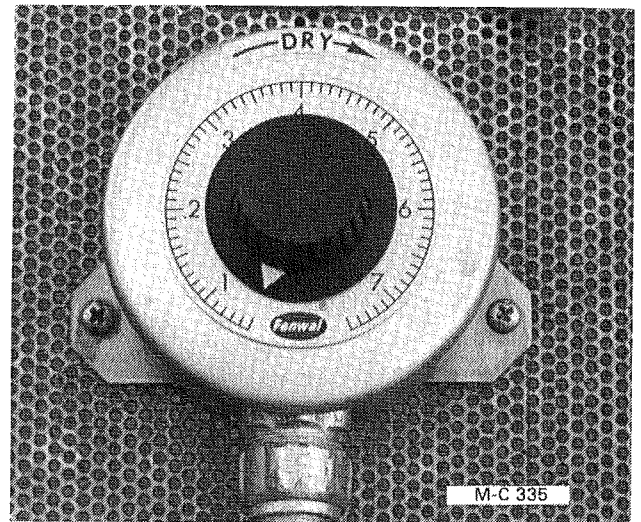


Figure 18 - Moisture Control

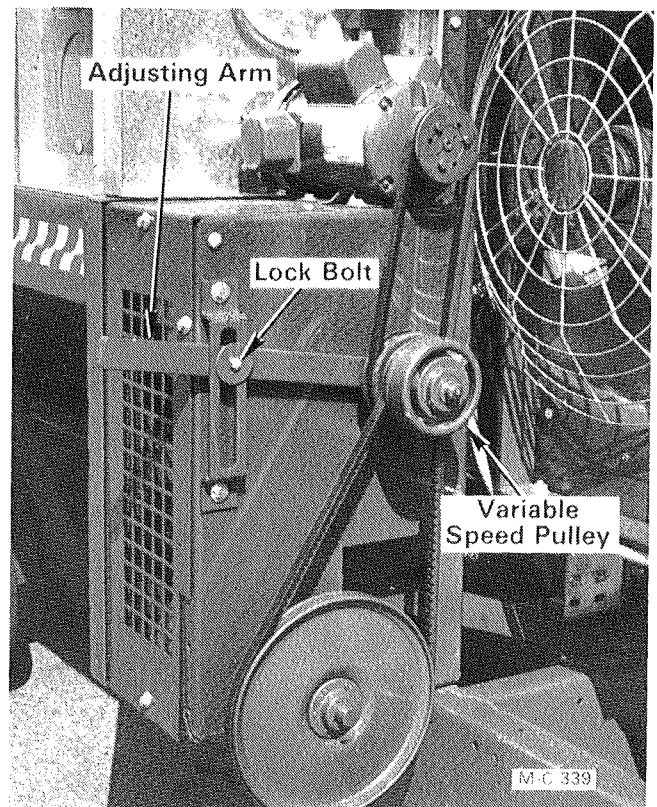


Figure 19

unloading rate, see Figure 19. Tighten the locking bolt after changing the adjustment. **Adjust the variable speed pulley only when the dryer is operating.**

IMPORTANT: Note and mark the position of the variable speed pulley arm before any adjustment is made so that it can be returned to the original position. Make changes slowly, avoid over adjusting. Wait 1 hour for the dryer to react to each change.

It is suggested that a log be kept recording the variable speed pulley arm position, moisture control and temperature settings for various grain drying conditions that occur. This log can be referred to each season.

6. The variable speed pulley should be cycled from fast to slow at least once a day (when the dryer is operating) to keep all moving parts operating freely.

Grain Metering Roll Ratchets



CAUTION: The guards were removed in Figure 20 and 21 to provide clear illustrations. Do not operate the dryer without guards in place and secure.

1. The normal factory setting for the upper and lower Grain Metering Roll Ratchets is two teeth per stroke of the ratchet arms.
2. When removing more than 10 points of moisture it may be necessary to adjust the ratchet arms to one tooth per stroke.
3. When removing less than 10 points of moisture it may be necessary to adjust the ratchet arms to three or more teeth per stroke.
4. The ratchet arms are connected together with the connecting arms and the right ratchet arms are connected to the eccentric drive sprocket with the transfer arms, see Figure 20.
5. The transfer arms, Figure 20 control the length of the ratchet arm stroke.
6. The transfer arms are anchored to a slotted bracket on the eccentric drive sprocket, see Figure 21. Loosen the locknut and adjust the transfer arms as follows:



CAUTION: Do not adjust the transfer arms until the eccentric drive sprocket has come to a complete stop.

To Decrease Ratchet Arm Stroke - Slide the transfer arms towards the center of the eccentric drive sprocket. This will decrease the number of teeth that the ratchet pawls engage the ratchet wheels per stroke.

To Increase Ratchet Arm Stroke - Slide the transfer arms away from the center of the eccentric drive sprocket. This will increase the number of teeth that the ratchet pawls engages the ratchet wheels per stroke.

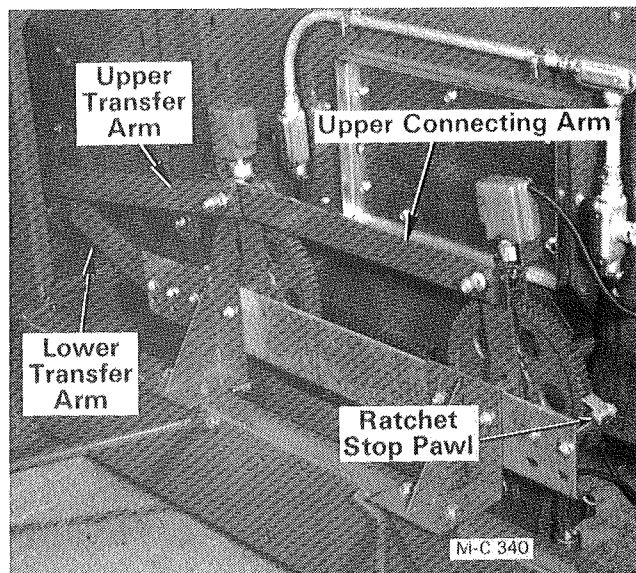


Figure 20

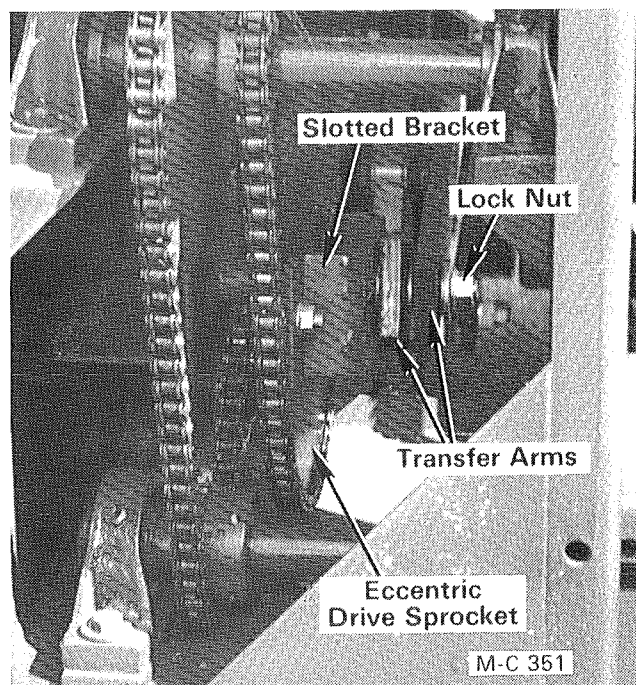


Figure 21

NOTE: Sliding the transfer arms approximately $\frac{1}{8}$ inch will change the setting by one tooth.

Tighten the locknut and check the adjustment. Readjust if necessary.

7. The ratchet pawls must engage the same number of teeth on each ratchet wheel so that the metering rolls unload at the same rate. If they do not, move the ratchet stop pawl(s), shown in Figure 20, closer to the ratchet wheel(s) to prevent ratchet wheel roll back.

Moisture Control Setting

1. Test the moisture content of the grain being discharged every 15 minutes until it stabilizes. Adjust the variable speed pulley as required to maintain desired moisture content. Allow 1 hour for the dryer to react to the change.
2. When the dryer has discharged grain at the desired moisture content for 1 hour, flip the moisture control toggle switch to the AUTOMATIC position.
3. Set the moisture control (Figure 22) on each side of the dryer by turning the indicator knob up until the upper ratchet pawl just disengages. Each moisture control will probably have a slightly different setting, this is normal.

NOTE: The moisture control setting should not have to be changed more than ½ mark unless the bottom burner operating temperature is changed or if the moisture content of the discharged grain is to be changed. Allow 1 hour for the dryer to react to the change before changing the setting again.

4. The following chart shows approximate moisture control dial settings when the dryer is being operated "Dry and Cool".

Approximate Moisture Control Setting for Corn and Most Small Grains

Set Control Dial At	To Get % Moisture
4.0	14 - 15%
4.5	13 - 15%
5.0	12 - 13%

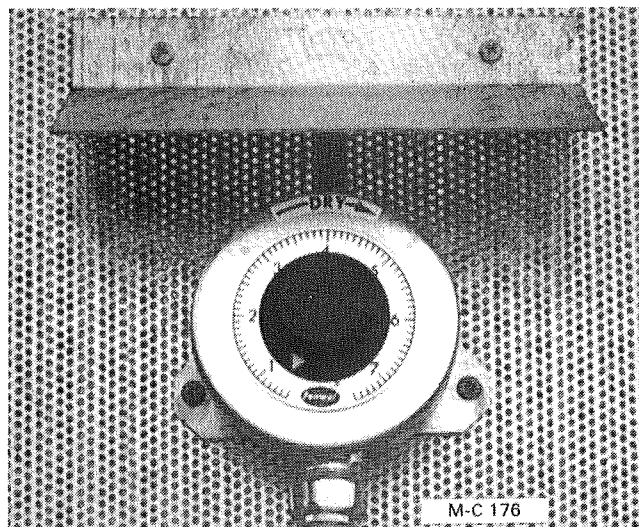


Figure 22

NOTE: If the dryer is being operated "All Heat" the chart above can be used as a starting point. In most cases the final moisture control setting will be 1 to 3 marks lower than the settings shown in the chart. The final setting must be determined under actual drying conditions with each individual dryeration or combination drying system.

5. When the dryer is discharging grain at the desired moisture content, the lower ratchet pawls will be engaged all of the time and the upper ratchet pawls will be engaged 50 to 55 minutes of each hour. If they are not, adjust the variable speed pulley. **Do not** change the moisture control setting.

IMPORTANT: Set the Low Grain Level Timer (not on Model B-12) as explained on page 20. If the timer is not set, the dryer will shut down when the level auger switch is flipped from MANUAL to AUTOMATIC.

DRYERS WITH SCR DRIVE

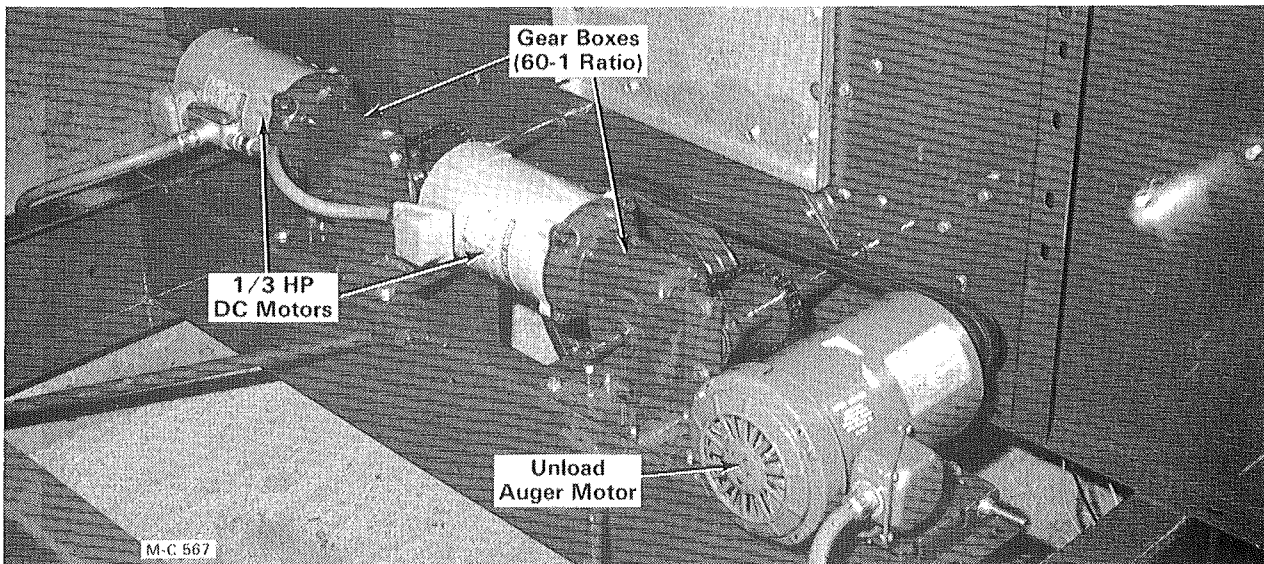


Figure 23 - SCR Drive

Description (See Figure 23)

NOTE: The SCR Drive System is standard equipment on Model 885, 895, 1185 and 1195. It is optional on all other models except 675B and 975B.

1. Each grain metering roll is driven by an independently controlled 1/3 HP direct current motor and gear box (60-1 ratio). A grain temperature sensing moisture control is located in the grain column on each side of the dryer.
2. When the moisture control toggle switch is in the AUTOMATIC position, both motors will start when the grain temperature reaches the moisture control temperature setting and the dryer will unload grain. When the grain temperature falls below the moisture control temperature setting, the motors will stop.
3. When the moisture control toggle switch is in the MANUAL position, both motors will run continuously.
4. The operator controls the speed of each motor when the moisture control toggle switch is in the MANUAL or AUTOMATIC position with the two speed control knobs located on the front of the control cabinet.

Drying Grain

1. Flip the level auger toggle switch to the MANUAL position. Flip the ignition, moisture control and unload auger toggle switches to the OFF position.

2. With the dryer full of grain, start the bottom fan. When it comes up to speed, start the next fan. Continue this procedure until all of the fans are running.
3. Start the burners in order from the bottom to the top.
4. Running on continuous heat, it will take approximately 6 minutes per point of moisture being removed to dry the first load.
5. When the first load is dry, push the unload auger spring loaded toggle switch up to the START position and release it. It will move down to the RUN position.

NOTE: If there is a momentary loss of electric power, the unload auger will stop. To restart it, push the unload auger toggle switch up to the START position and release it to the RUN position. This feature prevents an unattended dryer from unloading when the electric power comes back on.

6. Flip the moisture control toggle switch to the "MANUAL" position. This will activate the SCR Drive Motors and the metering rolls will start. The dryer will begin unloading grain. If the SCR Drive motors do not start, push in the SCR Drive circuit breaker reset buttons, see Figure 23A.
7. The SCR Drive control knob dials, Figure 24, are graduated from 0 (slow) to 100 (fast). Use the Grain Metering Roll Discharge Rate Chart Figure 24A, as a guide to set the SCR Drive control knobs.

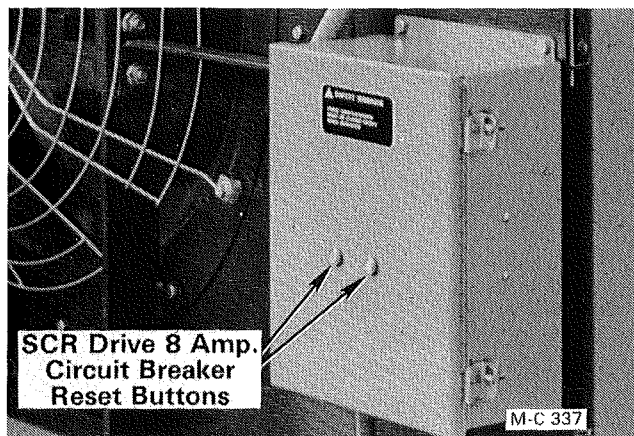


Figure 23A

8. Dryers operated "Dry and Cool" will have wet grain in the cooling section. This grain will have to be recycled back into the heating section.
9. Test the moisture content of the grain being discharged every 15 minutes until it stabilizes. If the moisture content is too high or too low after it stabilizes, slow down or speed up the SCR Drive motors.
10. Wait 1 hour to allow the dryer to react to the change. Recheck the moisture content and adjust the unloading speed again if necessary.

Moisture Control Setting

1. When the dryer has discharged grain at the desired moisture content for 1 hour, flip the moisture control toggle switch to the "AUTOMATIC" position.
2. Set the moisture control on each side of the dryer by turning the indicator knob until the SCR Drive Motor just starts. Each moisture control will probably have a slightly different setting, this is normal.
3. The following chart shows approximate moisture control dial settings when the dryer is being operated "Dry and Cool".

Approximate Moisture Control Setting for Corn and Most Small Grains

Set Control Dial At	To Get % Moisture
4.0	14 - 15%
4.5	13 - 15%
5.0	12 - 13%

NOTE: If the dryer is being operated "All Heat" the chart above can be used as a starting point. In most cases the final moisture control setting



Figure 24

Grain Metering Roll Discharge Rate Chart

NOTE: Discharge rates shown are with the moisture control switch in the MANUAL position and are based on SCR Drive motor speeds of 100 RPM (min.) and 1300 RPM (max.).

SCR Drive Dial Setting	675 thru 895 Bu./Hr. (approx.)	975 thru 1195 Bu./Hr. (approx.)
0	114	172
10	209	316
20	356	538
30	503	760
40	650	982
50	798	1204
60	945	1425
70	1092	1647
80	1239	1869
90	1389	2096
100	1485	2241

Figure 24A

will be 1 to 3 marks lower than the settings shown in the chart. The final setting must be determined under actual drying conditions with each individual dryeration or combination drying system.

4. When the moisture content of the grain is reduced to the level that the moisture control is set, the moisture controls will activate the SCR Drive motors and the grain metering rolls will start unloading grain.
5. The speed of the SCR Drive should be as close to drying capacity as possible. If the SCR Motors stop for more than five minutes at any one time, the speed should be slowed down slightly. If the SCR motors run continuously, increase the speed slightly so that the discharge rate is just slightly more than the drying rate.

IMPORTANT: Set the Low Grain Level Timer as explained on page 20. If the timer is not set, the dryer will shut down when the level auger switch is flipped from MANUAL to AUTOMATIC.

Low Grain Level Timer

(All models except B-12)

Setting the Timer

NOTE: There is a 1 minute delay in level auger circuit. It is activated when the level auger light is on calling for grain. This delay prevents nuisance starting and stopping of the level auger. If the level auger switch is flipped to OFF and back to the AUTOMATIC position the delay will recycle again.

IMPORTANT: If the timer has not been set, the dryer will shut down when the level auger toggle switch is flipped from MANUAL to AUTOMATIC.

1. Flip the level auger switch to the AUTOMATIC position. Turn the timer control knob, Figure 25, to 30 minutes. The level auger will start after the 1 minute delay if the level auger light is on calling for grain.
2. Check the level auger refill time a minimum of 6 times. The control panel light labeled LEVEL AUGER will come ON when the level auger mercury switch in the hopper calls for grain and will go OUT when the hopper is full. The length of time that the level auger light is on is the refill time (including the 1 minute delay).
3. Average the 6 refill times and reset the Low Grain Level Timer, Figure 25, to run 5 minutes longer. For example, if it takes the level auger an average of 5 minutes to refill the dryer (including the 1 minute delay), set the Low Grain Level Timer to run 10 minutes.

NOTE: The timer does not operate when the level auger toggle switch is in the MANUAL or OFF position.

Timer Operation

With the Low Grain Level Timer set to run 5 minutes longer than the level auger refilling time, the timer will work as follows:

1. The timer will start when the level auger light comes on calling for grain. The red light on the face of the timer will be on and the red needle on the timer dial will start to move to zero.
2. After the level auger refills the dryer and shuts off, the level auger light will go out and the timer red needle will automatically reset. The red light on the face of the timer will be out.

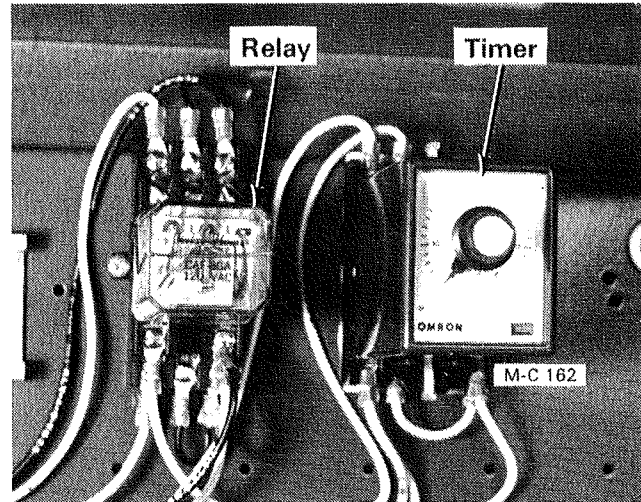


Figure 25

3. If there is an insufficient grain supply, the level auger will continue to run beyond the 5 minute refilling period. When the level auger has run the length of time that the low grain level timer has been set for, the dryer will shut down and the control panel light labeled HOPPER LOW LEVEL WARNING will come on. All other lights except the level auger light will be out.

NOTE: When the Low Grain Level Timer shuts the dryer down check for lack or slow down of grain possibly caused by loading auger and/or conveyor drive belt slippage or loss of electric power. Also check for obstruction of grain flow from the wet holding tank.



CAUTION: Turn off and lock the electric power to the dryer before any service work is performed.

4. When the problem has been corrected, flip the level auger switch to the MANUAL position. The level auger will start, the hopper low level warning light will go out and the Low Grain Level Timer will reset automatically. The POWER and HIGH LIMIT lights will be on. Flip the ignition switch(es) OFF.

NOTE: The timer will also reset automatically when the level auger switch is flipped to the OFF position or when there is a loss of electric power to the dryer.

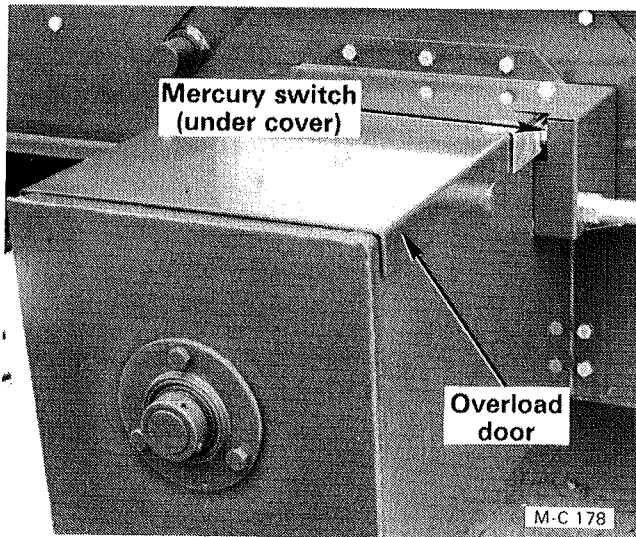


Figure 26

- When the dryer is full, restart the fans, burner(s) and unload auger. Flip the level auger switch to the AUTOMATIC position. The level auger delay will be activated if the level auger panel light is on calling for grain.



CAUTION: Do not allow anyone to be in the hopper as the level auger will start automatically.

Rear Discharge Overload Door (All models except B-12)

- If the customer supplied grain take away system fails, the dryer will continue to discharge grain until the rear discharge overload door, Figure 26, is raised by the grain.
- When the overload door raises, the dryer will shut down and all of the lights on the panel will be out. The Low Grain Level Timer will automatically reset.
- When the problem has been corrected and the rear discharge overload door closes, the POWER and HIGH LIMIT lights on the panel will come on.
- The level auger delay will be activated if the level auger switch is in the AUTOMATIC position and the level auger mercury switch in the hopper is calling for grain.



CAUTION: Do not allow anyone to be in the hopper as the level auger will start automatically.

- Flip the ignition switch(es) OFF and restart the fans and burner(s).

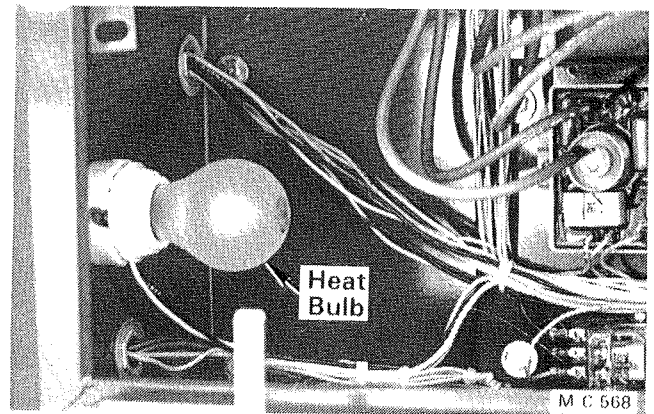


Figure 27

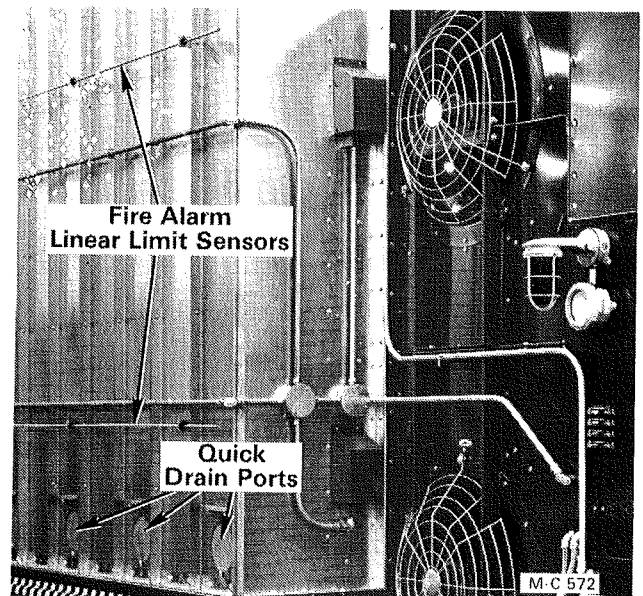


Figure 28 - Optional Safety Control Fire Alarm

Control Cabinet Heat Bulb (All models except B-12)

- The heat bulb in the upper control cabinet, Figure 27, will always be on when the electric power supply to the dryer is on. It does not have an ON-OFF switch.
- The bulb supplies heat to help keep the electrical components in the cabinet dry.

Safety Control Fire Alarm (Optional on all models except B-12)

- The optional safety control fire alarm is activated when the electric power to the dryer is ON. The linear limit sensors on the outside of the dryer screens monitor the exhaust air temperature, see Figure 28. The temperature operating range of the sensors is pre-set and is not adjustable.

2. If the exhaust air temperature increases above the sensor setting, the sensor opens breaking the alarm circuit.
3. When the alarm circuit is broken, the red light on the dryer will be on and the horn will sound. The 115V electric power to the control panel will be off shutting down the burners and fans. All lights on the control panel will be out.
4. When the dryer cools down the sensors will automatically close completing the alarm circuit.
 - A. **Below S/N 46799** - The horn will stop and the red light will go out. The POWER and HIGH LIMIT lights on the control panel will be on.
 - B. **Above S/N 46798** - The red light will remain on and the horn will continue to sound until the 115V control power toggle switch on the control panel is flipped to the off position and then pushed up and released.
5. Before restarting the dryer, make a thorough inspection of the dryer to determine what caused the fire alarm to shut the dryer down.

Temporary Shut Down

1. Close the LP Gas supply valve at the tank or close the natural gas supply valve. Operate the burner(s) until the flame goes out. Flip the ignition switch(es) OFF.
2. Close the gas main hand valve(s) in the cabinet(s) (handles 90° to the piping).
3. **LP Gas** - Close the liquid line flip valve for each burner (handle down) and the hand valve at the LP Gas inlet hose.
4. Flip the moisture control, level auger and unload auger toggle switches OFF (unload auger switch not on Model B-12).
5. Run the fans approximately 20 minutes to cool the grain in the dryer, then turn them OFF.
6. Turn off and lock the electric power supply to the dryer.

NOTE: Do not turn the 115V electric power supply off if the heat bulb in the middle control cabinet is to remain on (not on Model B-12).

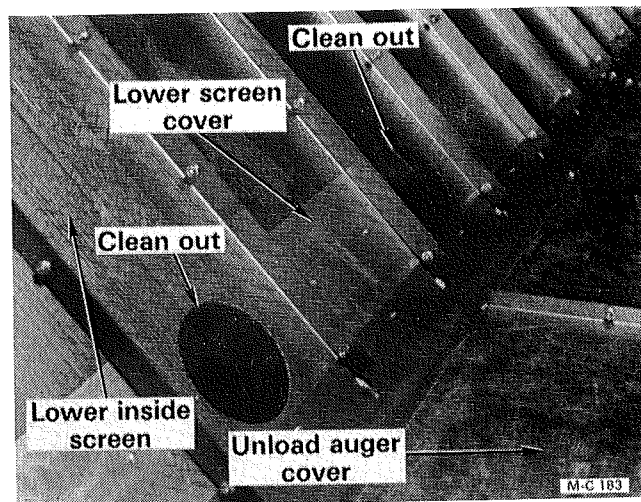


Figure 29

Restarts



CAUTION: If the outside temperature went below freezing (32°F) after the dryer was shut down, check to be sure that the grain in the lower part of the grain drying columns or in the metering rolls is not frozen. Frozen grain would prevent the dryer from unloading, which could possibly result in a fire.

1. If the dryer has a burner in the bottom chamber it will thaw the grain when it is started. If not, loosen the frozen grain by hand as follows:
 - A. The lower portion of the grain columns and the metering rolls are accessible from inside the dryer. Do not attempt to clear frozen grain through the quick drain ports on the outside of the dryer.
 - B. Open the dryer rear lower door.
 - C. There is a clean out in every other lower inside screen (between each outside quick drain port). Remove every other lower screen cover, see Figure 29. After the frozen grain has been loosened reinstall the lower screen covers and close the dryer rear door.
2. Turn on the electric power supply to the dryer.
3. **LP Gas** - Open the tank supply valve, hand valve at the LP Gas inlet hose and the liquid line flip valve for each burner (handle 90° to the piping).
4. **Natural Gas** - Open the gas supply valve.
5. Flip the level auger toggle switch to the AUTOMATIC position to activate the Low Grain Level Timer (not on Model B-12).

6. Be sure the unload auger and moisture control toggle switches are OFF (unload auger toggle switch not on Model B-12).
7. Start the bottom fan. When it comes up to speed, start the next fan. Continue this procedure until all of the fans are running.
8. Start the burners in order from the bottom to the top.
9. Preheat the grain for 15 to 20 minutes.
10. Flip the moisture control toggle switch to the MANUAL POSITION.
11. **All Models Except B-12** - Push the unload auger spring loaded toggle switch up to the START position and release it. It will move down to the RUN position.
12. Check the moisture content of the grain until it stabilizes. If necessary, adjust the variable speed pulley or SCR drive to maintain desired moisture content. If adjustments are made, allow 1 hour for the dryer to react to the change.
13. When the dryer has discharged grain at the desired moisture content for 1 hour, flip the moisture control toggle switch to the AUTOMATIC position.

Final Shut Down

When finishing a crop or at the end of the season all of the grain in the dryer must be dry before the dryer is completely unloaded.

1. Flip the moisture control, level auger and unload auger switches OFF (unload auger switch not on Model B-12).
2. Run the burners until all of the grain is at the desired moisture content.
3. When the grain is dry, close the LP Gas supply valve at the tank or close the natural gas supply valve. Operate the burners until the flame goes out. Flip the ignition switch(es) OFF.
4. Close the gas main hand valve(s) in the top cabinet(s) (handle 90° to the piping).
5. **LP Gas** - Close the liquid line flip valve for each burner (handle down) and the hand valve at the LP Gas inlet hose.
6. Run the fans approximately 20 minutes to cool the grain in the dryer, then turn them off.

7. Flip the moisture control toggle switch to the MANUAL position and start the unload auger to unload all of the grain. When the dryer is empty, flip the moisture control and unload auger toggle switches OFF (unload auger toggle switch not on Model B-12).



CAUTION: Before continuing to the next step, turn off and lock the electric power supply to the dryer. Flip all of the circuit breakers in the lower cabinet OFF and lock all of the control cabinet doors.

8. Open the dryer rear lower door. Remove the unload auger covers, see Figure 29. Clean out the unload auger and the grain metering rolls. Use a vacuum cleaner or compressed air.



CAUTION: Be sure to wear safety goggles if compressed air is used.

NOTE: Dryers starting with serial number 46799 - Each unload auger pan is hinged on the left side and secured on the right side with two overcenter latches. Push the handle on the latches down to open the pans and pull them up overcenter to lock the pans.

9. Clean the fans, burners and heat chambers.
10. Clean all of the screens. If the dryer is equipped with a heat recovery system, remove and clean the bottom covers.
11. Lubricate all bearings with a hand grease gun. See "Lubrication" on page 24. Do not over lubricate. Too much grease may damage the bearing seals. Lubricate all chains, sprockets and ratchet drive moving parts with engine oil.
12. **Dryers With Over/Under Ratchet System** - Place the variable speed pulley adjusting arm in the center so that tension is equal on both belts.
13. Loosen the level auger drive belt(s).
14. **Model 675B and 975B** - Loosen the main drive and fan drive belts.
15. Cover the fan housing(s) and motors loosely with canvas or plastic. Covers must allow air circulation to prevent condensation.

MAINTENANCE

Lubrication



CAUTION: To prevent accidental starting of any of the motors during lubrication, turn off and lock the electric power supply to the dryer. Flip all of the circuit breakers in the lower cabinet(s) OFF and lock all of the control cabinet doors.

NOTE: Use a hand grease gun to lubricate bearings. Use a good grade of bearing grease and **do not** over lubricate. Too much grease may damage the bearing seals. Avoid getting grease on any of the belts.

Every 100 Hours

1. Lubricate the variable speed pulley shaft bearings **sparingly**, see Figure 30.
2. Lubricate the bearing on each end of the fan shafts, see Figure 31.

NOTE: EMS model dryers (single phase motors) have two fan shafts, one for each motor. There is a bearing on each end of the shafts. The lubrication fittings for the center bearings are accessible from inside the heat chamber.

3. Lubricate the unloading auger front bearing and the front bearing on each grain metering roll, see Figure 32.
4. Lubricate the four bearings on the drive reduction base shafts, see Figure 33.
5. **Model 675B and 975B PTO Drive** - Lubricate the PTO jack shaft bearings, see Figure 34. Also lubricate the PTO shaft universal joints.
6. **All Model 675B and 975B** - Lubricate the fan drive belt idler pulleys, see Figure 35.
7. All other bearings used on the dryer are prelubricated and require no further lubrication.

Periodically

1. **All Model 675B and 975B** - Check the oil level in the gear boxes. Figure 36 shows PTO front and irrigation drive gear box. Oil level should be even with the bottom of the hole. If not, remove the vent plug on the top and add Mobilfluid 423 multipurpose transmission lubricant or equivalent. Install level and vent plug. Be sure vent plug is open.

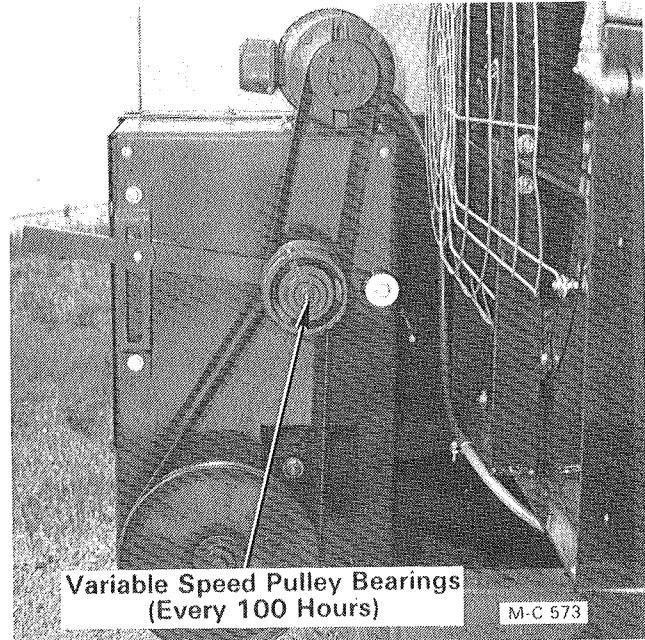


Figure 30

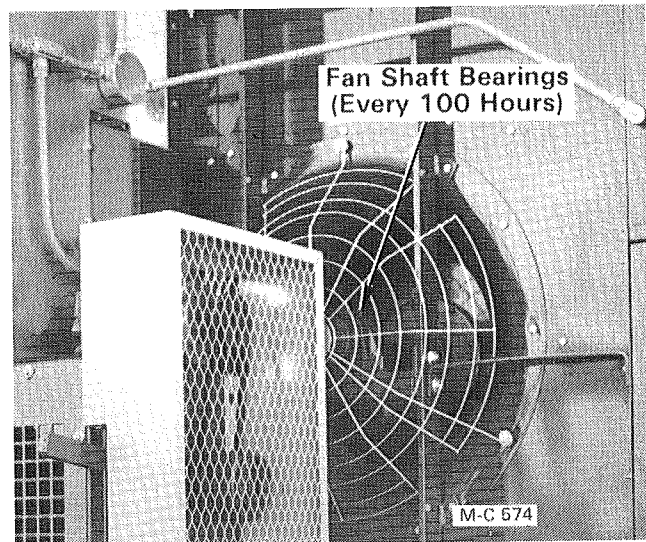


Figure 31

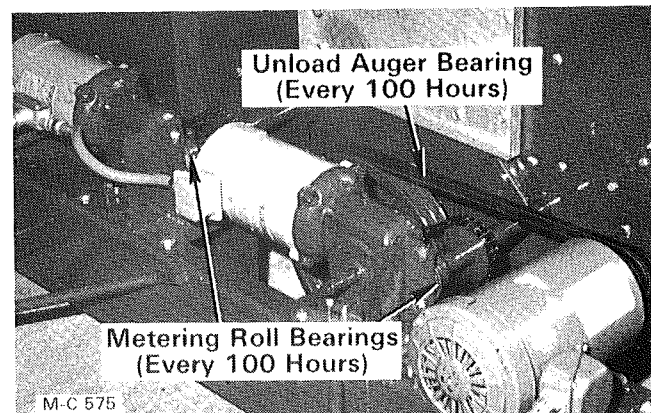


Figure 32

SCR Drive Shown - Ratchet Drive the Same

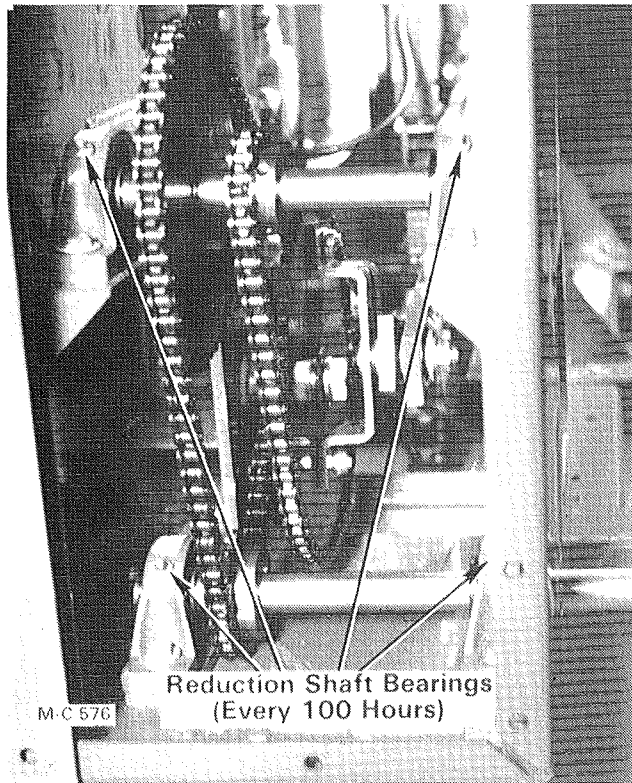


Figure 33

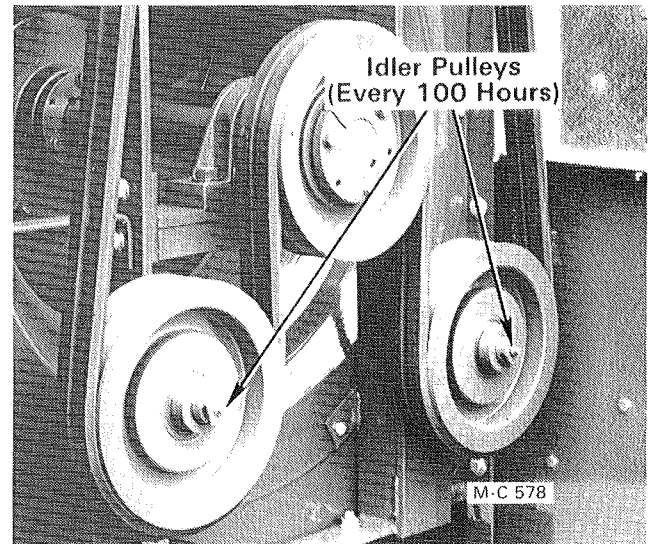


Figure 35 - PTO Drive

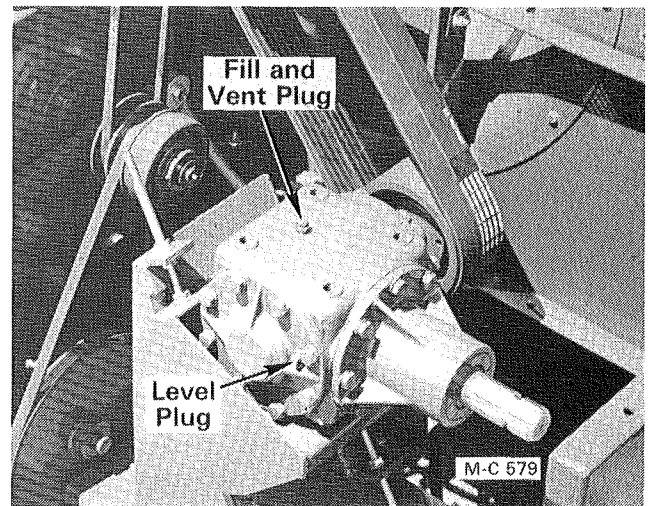


Figure 36 - PTO Front and Irrigation Drive

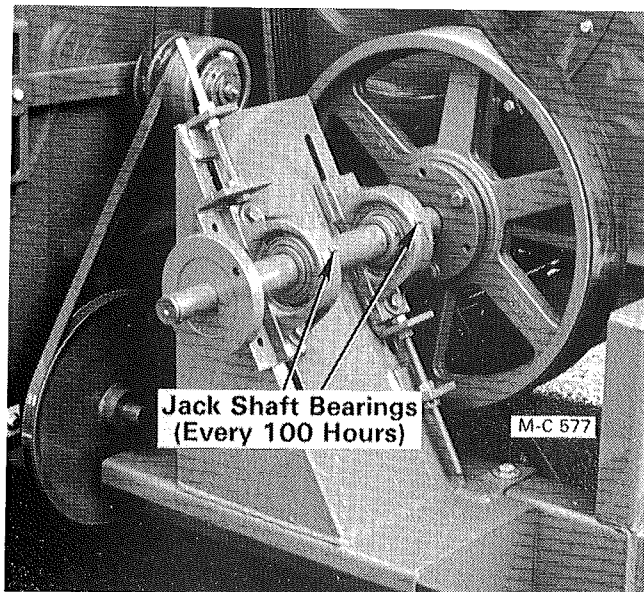


Figure 34

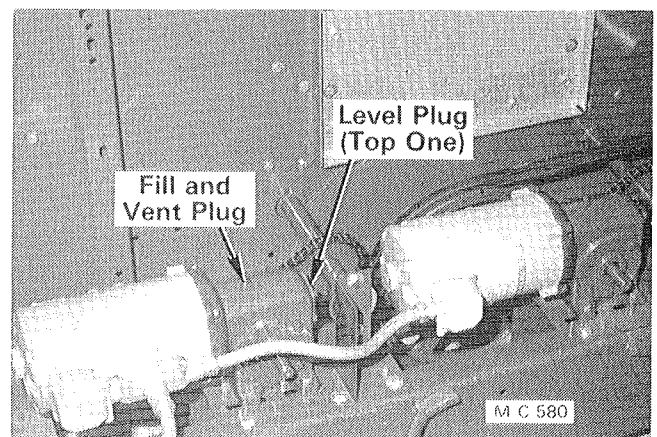


Figure 37 - SCR Drive

2. **SCR Drive Gear Boxes** - Remove the oil level plug (top one) on the end of each gear box. The oil level should be even with the bottom of the hole. If not, remove the vent plug on top of the gear box and add Mobil 600W cylinder oil or equivalent until it just runs out. Install the level and vent plug, see Figure 37.

3. Oil all sprockets, chains and ratchet drive moving parts with engine oil. Be careful not to get oil into the ratchet solenoids or on the belts.

Screens and Heat Recovery System

NOTE: Be sure to keep the inside screens and heat chambers as clean as possible to reduce the possibility of fire. Also, a clean dryer works better than a dirty one.

1. Check the exterior screens periodically and clean as necessary.
2. Clean the inside screens and heat chambers every 8 to 10 hours.
3. If the dryer is equipped with a heat recovery system, remove and clean the bottom covers every 8 to 10 hours.

NOTE: Under some drying conditions, the inside screens and heat recovery bottom covers may have to be cleaned more often.

Belt Adjustment

General

1. After approximately 24 hours of operation the belts will seat themselves in the pulley grooves and the tension may have to be readjusted. If the belts squeal when the motor starts they are not tight enough.
2. Never apply belt dressing as this will damage the belt and cause early belt failure.

Unloading Auger (SCR Drive)

1. Loosen motor mounting locknuts. Turn locknuts on the "J" bolts to adjust tension.

Level Auger (All models except B-12)

1. Loosen the locknuts on the adjusting rods. Shorten the adjusting rods evenly to increase belt tension, see Figure 38.

Level and Unloading Auger (Model B-12 Only)

1. Loosen the idler pulley in the idler bracket. Wedge the idler pulley against the belt(s) to increase tension. Hold the pulley and tighten it to the idler bracket.

Main Drive (Model 675B and 975B PTO Side Drive)

1. Loosen the bolts securing the two pillow block bearings to the jack shaft base.
2. Loosen the locknuts on the adjusting bolts. Turn the nuts on the adjusting bolts to move the jack shaft and bearings down to increase belt tension, see Figure 39.

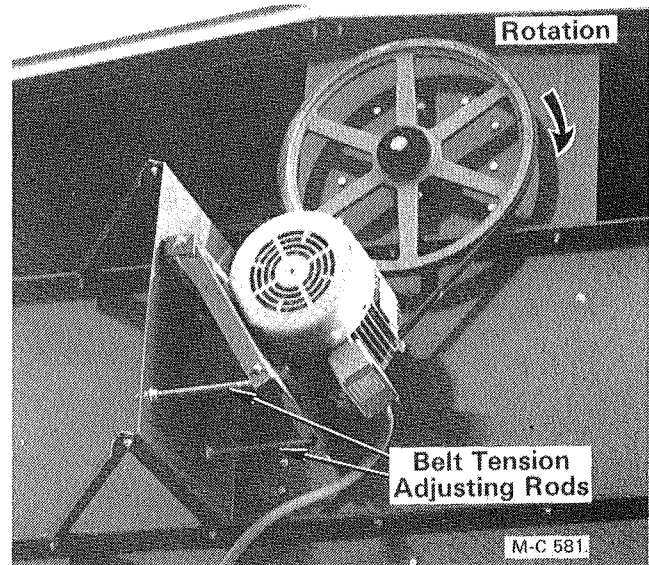


Figure 38

Level Auger w/Opt. Roof (not B-12)

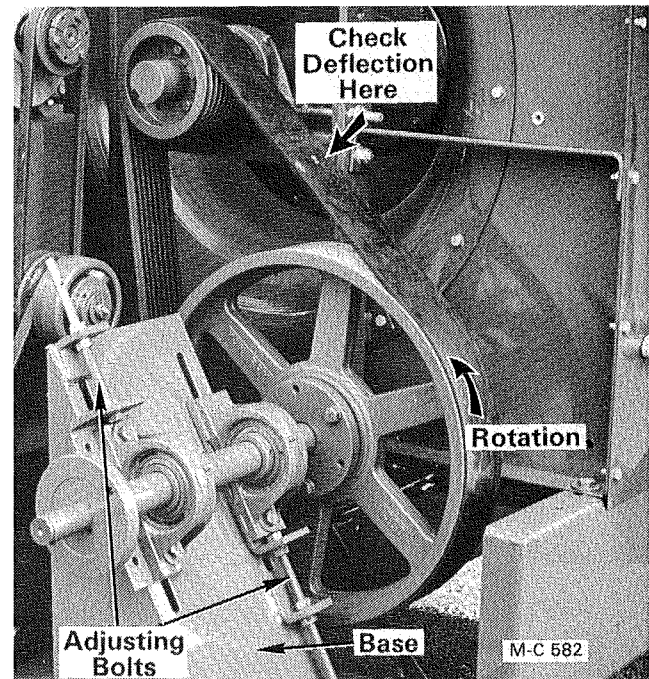


Figure 39 - PTO Side Drive

3. On new belts, adjust tension so that 66 lbs. of pressure will deflect the belt(s) 5/16". After 24 to 48 hours of running readjust belt tension so that 54 lbs. of pressure will deflect the belt(s) 5/16".
4. Tighten the adjusting bolt locknuts and pillow block bearing bolts.

Main Drive (Model 675B & 975B front PTO and Irrigation Drive)

1. Loosen the bolts securing the front drive mount to the base.

- Loosen the locknuts on the adjusting bolts. Turn the nuts on the adjusting bolts to move the gear box down to increase belt tension, see Figure 40.
- On new belts, adjust tension so that 66 lbs. of pressure will deflect the belt(s) 5/16". After 24 to 48 hours of running readjust belt tension so that 54 lbs. of pressure will deflect the belt(s) 5/16", see Figure 40.
- Tighten the adjusting bolt locknuts.

Fan Drive (Model 675B and 975B)

- After 24 to 48 hours of running, adjust belt tension so that 24 lbs. of pressure (on both belts at the same time) will deflect the belts 1". Check deflection midway between the bottom stationary idler and the top fan pulley.
- Loosen the nut on the adjustable idler pulley shaft and the locknuts on the adjusting bolt, see Figure 41.
- Turn the nut on the adjusting bolt to move the fan drive tightener and idler pulley down to increase belt tension, see Figure 41.

Pre-Season Check

All of the following tests and adjustments can be made when the dryer is empty. The air pressure switch, burner primary and secondary air and vaporizer coil (LP Gas) adjustments can only be made when the dryer is full of grain. These adjustments are covered under "Start-Up Instructions" on page 7.



CAUTION: The gas and electric power supply to the dryer **MUST** be off when performing steps 1 thru 7. Flip all of the circuit breakers in the lower cabinet(s) OFF. Lock the main electric supply to the dryer so that the power cannot be accidentally turned on.

- Lubricate all bearings, chains, sprockets and ratchet drive moving parts. Check the oil level in all gear boxes. Refer to "Lubrication" on page 24.
- Check and adjust all belts. Refer to "Belt Adjustment" on page 26.
- Tighten all electrical connections in the lower control cabinet. Check the ground connection in the cabinet to be sure it is clean and tight. Also check the ground connection from the dryer base to the grounding rod.

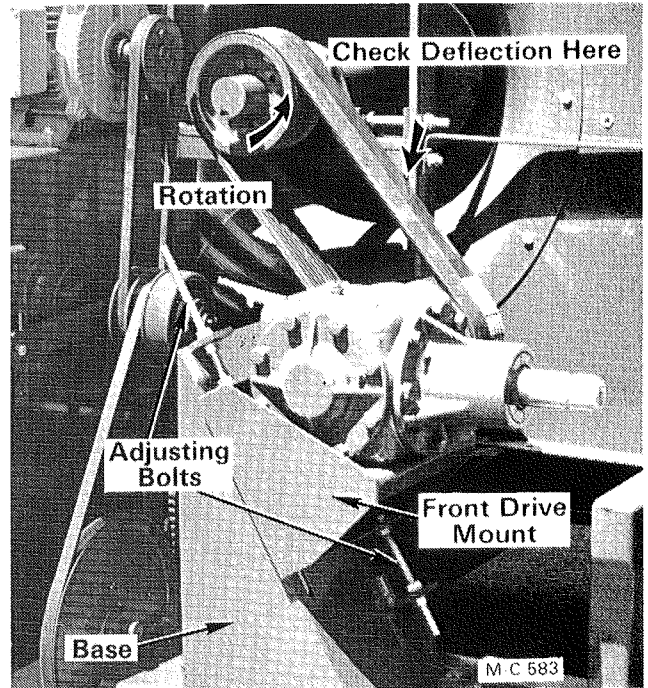


Figure 40
PTO Front and Irrigation Drive

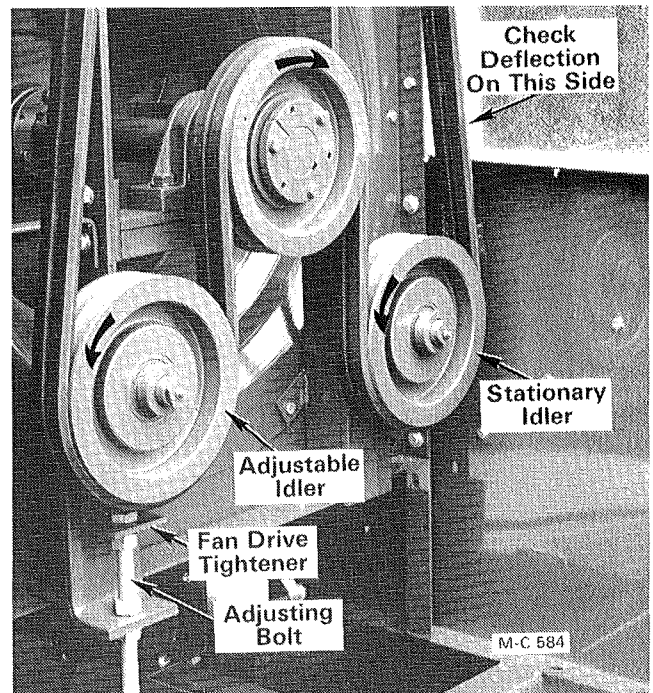


Figure 41 - PTO Fan Drive

- Open the dryer rear lower door. Remove the unload auger covers, see Figure 42, page 28. Clean out the unload auger and grain metering rolls.

NOTE: Dryers starting with serial number 46799 - Each unload auger pan is hinged on the left side and secured on the right side with two overcenter latches. Push the handle on the latches down to open the pans and pull them up overcenter to lock the pans.

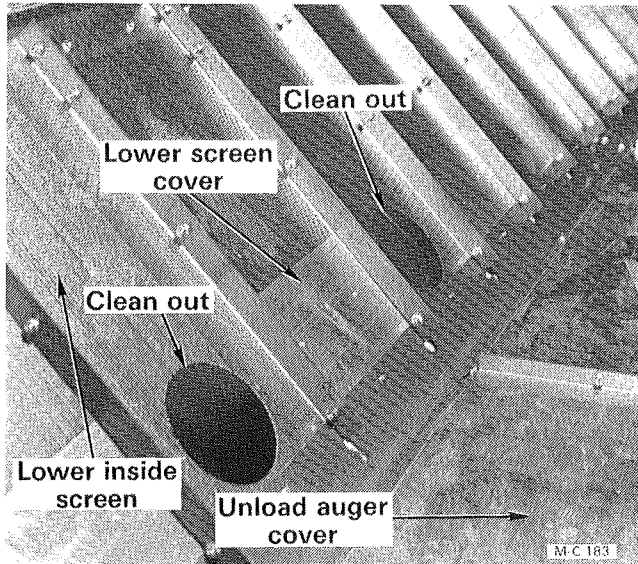


Figure 42

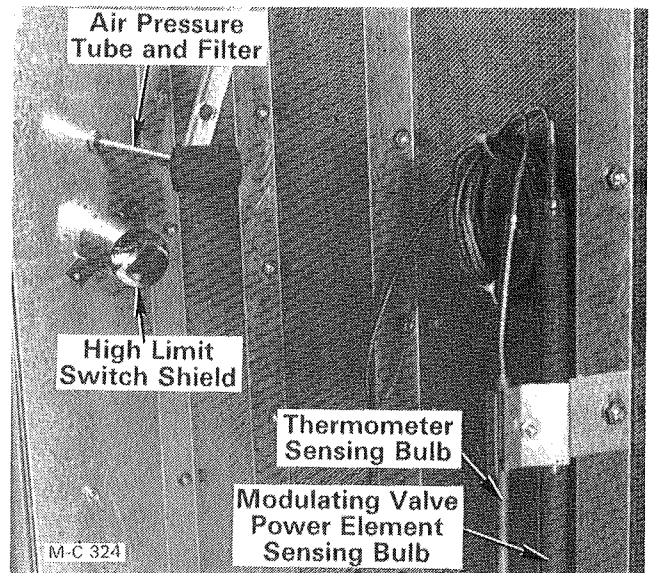


Figure 43

5. Clean all of the screens, fans, burners and heat chambers. Remove and clean heat recovery system bottom covers (if equipped).
6. Clean out the high limit switch shields (not on dryers above S/N 46798). Remove the air pressure switches and clean the tube and filter, see Figure 43.
7. **LP Gas** - Remove the plug at the end of each strainer, see Figure 44. Remove and clean the screen in each strainer. Check flexible LP hoses for signs of fatigue, replace as necessary.
8. Flip all of the toggle switches on the control panel(s) to the OFF position. Flip all of the circuit breakers in the lower cabinet(s) ON. Turn the electric power supply to the dryer ON.
9. Check the level auger. Flip the level auger toggle switch to the MANUAL position. The level auger will start immediately. If it does not, flip the level auger switch OFF and check the level auger mercury switch in the hopper. See "Level Auger Mercury Switch Adjustment" on page 30.

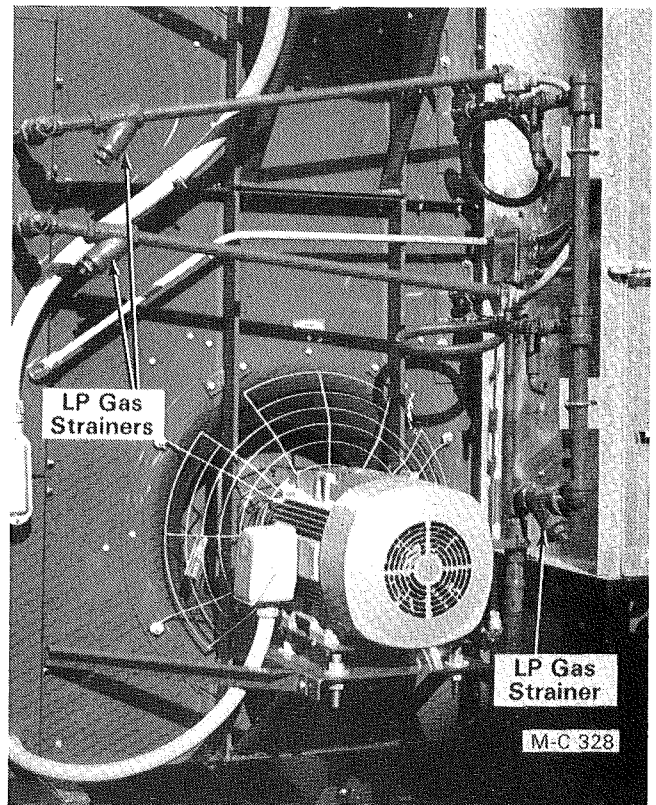


Figure 44 - LP Gas



CAUTION: Turn off and lock the electric power supply to the dryer before anyone goes into the hopper to adjust the mercury switch. Any movement of the mercury switch could start the level auger.

10. Check the unloading auger, over/under ratchets or SCR drive. Push the unload auger toggle switch up to the START position and release it. The unload auger will start.

Flip the moisture control toggle switch to the MANUAL position. The upper ratchet pawls will engage or the SCR drive motors will start. Turn the moisture control (on each side of the dryer) down below 1 on the dial, the lower ratchet pawls will engage.

Over/Under Ratchet System - Move the variable speed pulley adjusting arm up and down several times to check the operation of all moving parts.

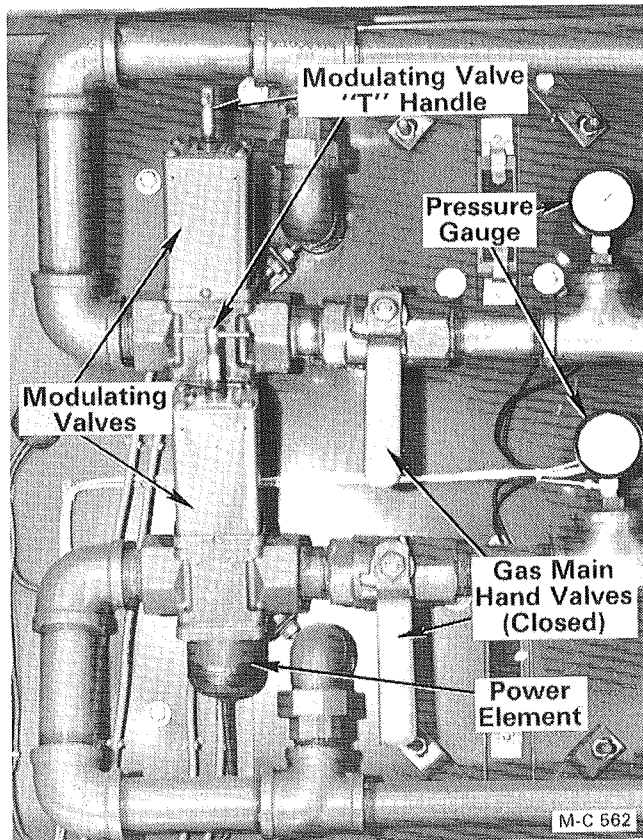


Figure 45 - Two Burner Cabinet

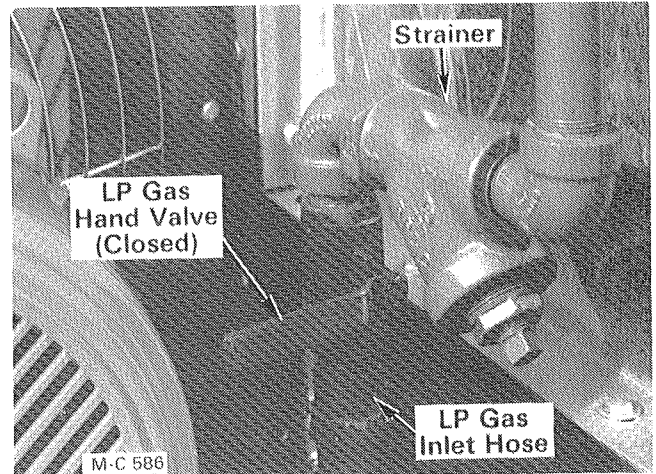


Figure 46 - LP Gas

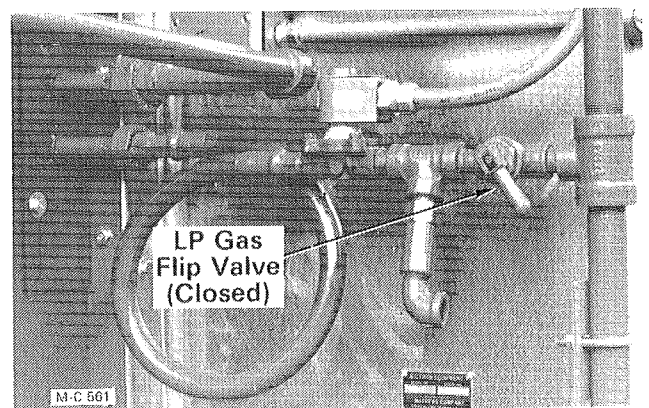


Figure 46A - LP Gas

11. Check the fans and burners as follows:

- A. Turn off the electric power supply to the dryer. Flip all of the toggle switches on the control panel(s) to the OFF position.
- B. Close the gas main hand valve for each burner (handle 90° to the piping), see Figure 45.
- C. **LP Gas** - Open the supply valve at the tank, the hand valve at the LP Gas inlet hose and open (lift up) the liquid line flip valve on each burner, see Figure 46 and 46A.
Natural Gas - Open the supply valve.
- D. Remove the air pressure switch cover and disconnect the two wires at the back of each air pressure switch (there is one for each burner), see Figure 47. Connect the two wires together with a short jumper wire. Do not allow the jumper wire to come in contact with any metal. This will by-pass the air pressure switch.

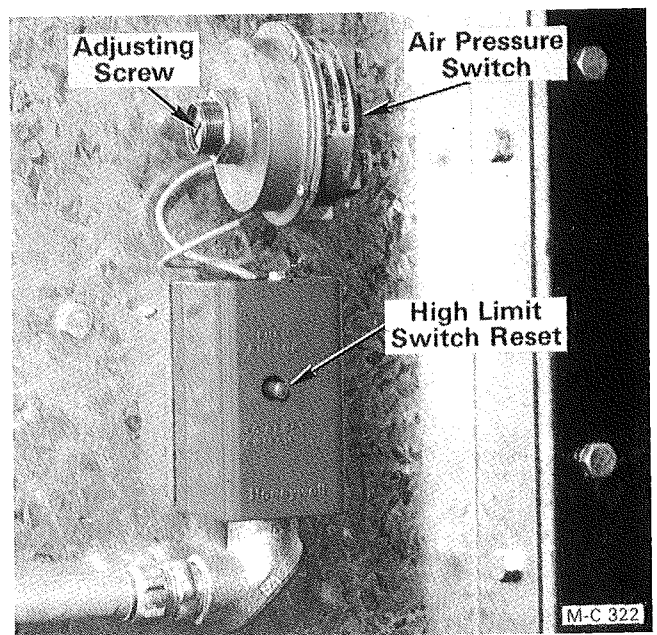


Figure 47



CAUTION: This is only a temporary procedure for checking the burners. When drying grain **NEVER** operate the dryer with the air pressure switch(es) disconnected or by-passed. This safety air

pressure switch is for your protection and the protection of the dryer.

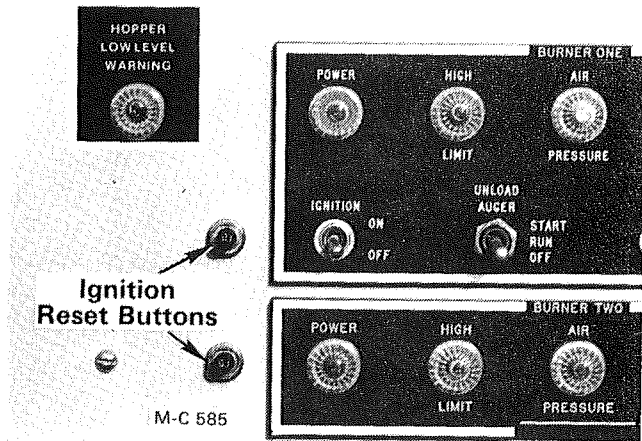


Figure 48

- E. Turn on the electric power supply to the dryer. The POWER, HIGH LIMIT and AIR PRESSURE lights will be ON. If the high limit light is not on, push the reset button on the high limit switch, see Figure 47, page 29.

NOTE: Above S/N 46798 - The air pressure light will come on when the fan is started.

- F. Start the bottom burner fan. When it comes up to speed, flip the ignition switch ON. Open the gas main hand valve 1/4 of the way. The GAS VALVE light will be ON and the burner will light.

NOTE: The ignition board is electronically timed so that the ignition system will continue to spark and hold the solenoid gas valves open for a "trial ignition" period (about 5 seconds). If the burner does not light the system will "lock out" (after the 5 second trial period) closing the solenoid gas valves. The "GAS VALVE" light will be out. Flip the ignition switch OFF, wait one minute, then ON again for another "trial ignition" period.

- G. **All models except B-12** - If the ignition switch is flipped OFF and ON too fast, the ignition board circuit breaker will trip out, see step H.
- H. **All models except B-12** - If after several attempts for ignition there is still no flame, push the .01 (1/10th) amp. ignition reset button (circuit breaker) on the control panel, see Figure 48. This circuit breaker protects the ignition board from heat build up due to repeated ignition attempts.
- I. If the burner fails to light, check the electrode and ignition board as explained under "Direct Spark Ignition System".

See page 32 for 115V system and page 34 for 12V system.

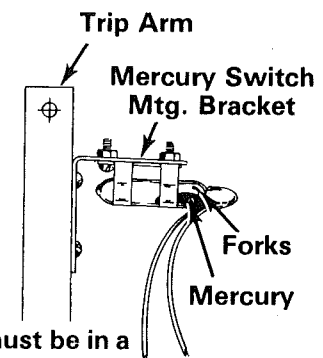
- J. If the ignition system is good, check the Gas Solenoid Valves as explained on page 37 and 39. They may be defective stopping gas flow to the burner.
- K. After the burner lights, close the gas main hand valve. Run the fan until the burner goes out, then turn the fan off.



CAUTION: Be sure to remove the jumper wire on the air pressure switch and reconnect the two wires that were removed.

- L. Install the air pressure switch cover.

12. Check the remaining fans and burners one at a time. After all of the fans and burners have been checked turn off the gas supply to the dryer. Turn off and lock the electric power supply. Lock all of the control cabinet doors.



Forks at wire end must be in a vertical position as shown so mercury contacts both forks in end of bulb.

M-C 344

Figure 49

Level Auger Mercury Switch Adjustment



CAUTION: Do not adjust the level auger mercury switch with the electric power turned on, as any movement of the mercury switch could start the level auger.

- Hopper Empty** - With the bin switch trip arm hanging straight down, the mercury in the switch must be covering the forks in the wire end of the bulb as shown in Figure 49. If not, bend the switch mounting bracket down as required.
- Hopper Full** - The grain should have forced the bin switch trip arm to pivot towards the pulley end of the level auger. In this position the mercury in the switch should be away

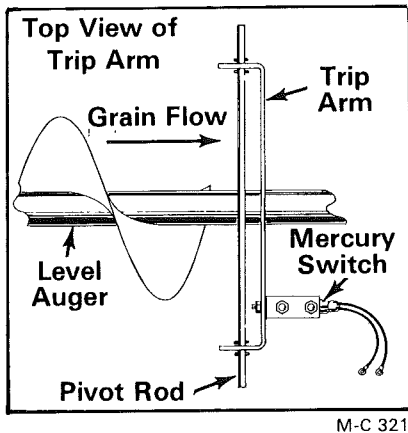
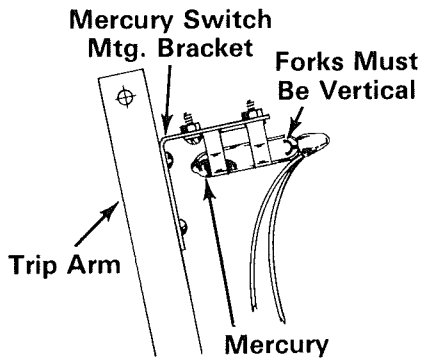


Figure 50

from the forks in the wire end of the bulb, see Figure 50. If not, bend the switch mounting bracket up as required.

Air Pressure Switch Testing

NOTE: Check the air pressure switch adjustment as explained under "Air Pressure Switches" on page 8 before making this test.

The air pressure switch is designed to protect the dryer from fire that may result from fan (air flow) failure while the burner is ignited and flame is present. Low pressure will cause the ignition system to "lock out" the ignition and gas systems. The air pressure light will be out.

Look for other possible reasons for air pressure loss such as an open door, no grain or low grain level.

If the air pressure light on the control panel is blinking, remove the plastic cap on the air pressure switch and turn the adjusting screw out a small amount, see Figure 51.



CAUTION: This is only a temporary test procedure. Do not run the fan and burner with air pressure switch disconnected or by-passed. This safety air

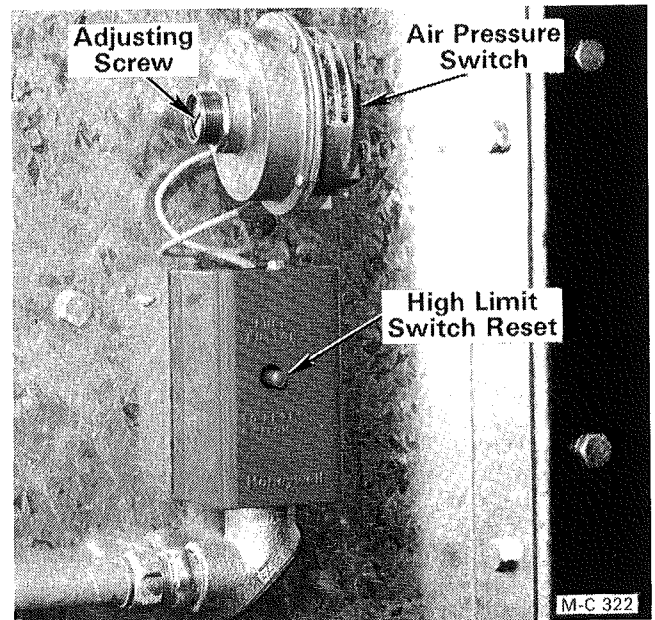


Figure 51

pressure switch is for your protection and the protection of the dryer.

1. Close the main gas valve in the control cabinet. Flip the ignition switch OFF. Turn off the electric power to the dryer.
2. Disconnect the two wires at the back of the air pressure switch and connect them together with a short jumper wire. Do not allow the jumper wire to come in contact with any metal. This will by-pass the air pressure switch.
 - A. **Below S/N 46799** - Turn the electric power on. The Air Pressure light will be on.
 - B. **Above S/N 46798** - Turn off the fan motor circuit breaker. Turn the electric power on and push the fan start button. The Air Pressure light will be on.

NOTE: If the dryer is equipped with the optional Safety Control Fire alarm the Air Pressure light will come on 60 seconds after the fan start button has been pushed.

3. Flip the ignition switch ON and check for spark at the electrode.



CAUTION: There may be a small amount of gas in the line that could ignite. Flip the ignition switch on and off several times before entering the dryer to observe the electrode.

4. If spark occurs, the air pressure switch is defective.

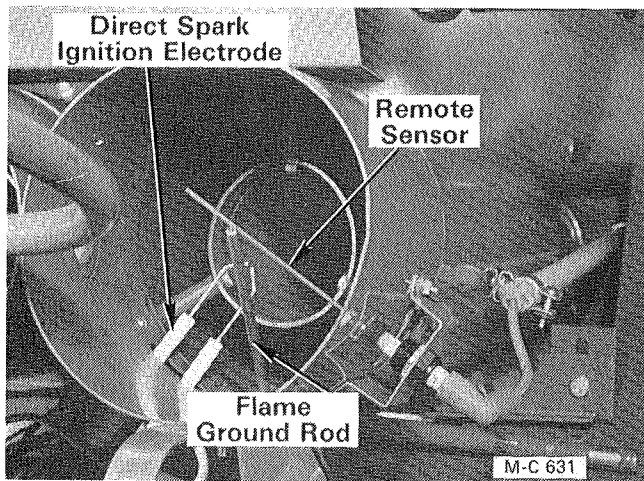


Figure 51A

115 Volt Direct Spark Ignition System

Operation

The 115V direct spark ignition system consists of an electronic ignition board and a direct spark ignition electrode for each burner. For ignition to occur, the dryer must be running and the Power, High Limit and Air Pressure lights on the control panel must be on.

NOTE: Dryers above S/N 46798 have a direct spark ignition electrode and a remote sensor for each burner, see Figure 51A.

Dryers below S/N 46799 - The dryer is wired so that the current flow from the control cabinet goes to the High Limit Switch first, the Air Pressure Switch second and the Ignition Switch last. This is a safety feature that prevents ignition if the High Limit and/or the Air Pressure switches are not functioning.

Dryers above S/N 46798 - The dryer is wired so that the current flow from the control cabinet goes to the High Limit Switch, Fan Start-Stop Button, Fan Magnetic Starter, Air Pressure Switch and then to the ignition switch. This is a safety feature that prevents ignition if the High Limit and/or the Air Pressure switches are not functioning, or if the fan is not running.

When the ignition switch is flipped on, the ignition board is energized and generates a high voltage spark between the tips of the electrode and opens the gas solenoid valves at the same time. The gas valve light on the control panel will be on.

Dryers below S/N 46799 - The electrode provides the spark for ignition and also senses the presence of the flame. A small amount of electrical current passes through the flame from one tip of the electrode to the other completing

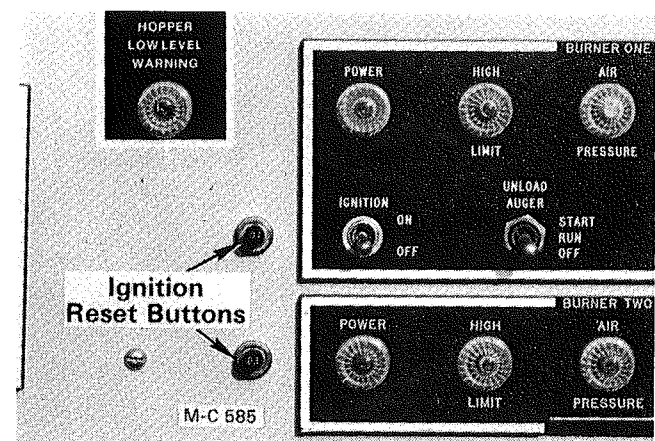


Figure 52

the electrical circuit. If the tips of the electrode are not immersed in the flame, the circuit will be broken and the ignition system will "lock out".

Dryers above S/N 46798 - The electrode provides the spark for ignition and the remote sensor senses the presence of the flame. A small amount of electrical current passes from the remote sensor to the flame completing the electrical circuit. If the flame is not present, the circuit will be broken and the ignition system will "lock out".

The ignition board is electronically timed so that when the ignition switch is flipped ON, the electrode will continue to spark and the gas solenoid valves will be held open for a "trial ignition" period (about 5 seconds).

When ignition occurs and a flame is present, the ignition system will continue to operate (spark shuts off). If ignition fails, flame is not present, the ignition system will "lock out" (after the 5 second trial period) closing the gas solenoid valves. The Gas Valve light on the control panel will be out.

Testing

If the ignition system "locks out", flip the ignition switch OFF, wait one minute, then ON again for another "trial ignition" period. If the ignition switch is flipped OFF and ON too fast, the ignition board circuit breaker will trip out. Push in ignition reset button on control panel.

If after several attempts for ignition there is still no flame, turn the fan off and check the ignition system as follows:

1. Push in ignition reset button (0.1 (1/10th) amp., circuit breaker) on the control panel, see Figure 52. The circuit breaker protects the ignition board from heat build up due to repeated ignition attempts.

2. The ignition board may have absorbed some moisture during periods of continued rain, fog or blowing snow which would cause the ignition board not to function properly. Carefully dry the ignition board with warm air. Also check the electrode to be sure it is dry.
3. Look for loose, burned or broken wires, poor or corroded connections.
4. Check for spark at the electrode. Flip the ignition switch OFF. CLOSE the main gas valve in the control cabinet. Turn off the 115V power to the dryer. Disconnect the two wires at the back of the air pressure switch and connect them together with a short jumper wire. Do not allow the jumper wire to come in contact with any metal.

- A. **Below S/N 46799** - Turn the 115V power on. The Power, High Limit and Air Pressure lights will be on.
- B. **Above S/N 46798** - Turn off the fan motor circuit breaker. Turn the 115V power on and push the fan start button. The Power, High Limit and Air Pressure lights will be on.



CAUTION: This is only a temporary test procedure. Do not run the fan and burner with the air pressure switch disconnected or by-passed.

5. Flip the ignition switch ON and observe the electrode during the "trial ignition" period. In some cases the spark can be heard.



CAUTION: There may be a small amount of gas in the line that could ignite. Flip the ignition switch on and off several times before entering the dryer to observe the electrode.

6. If there is no spark, the ignition board must be tested. The ignition board does not have to be removed for this test. Proceed as follows:
 - A. Flip the ignition switch OFF. Remove the electrode wires from terminals E-1 and E-2 on the ignition board, see Figure 53, 53A and 54. Also see Figure 55 and 55A, page 34.
 - B. Using a new properly gapped electrode ($\frac{1}{8}$ inch) or an automotive spark plug gapped to ($\frac{1}{8}$ inch), connect terminals E-1 and E-2 on the ignition board to the test electrode or spark plug with jumper wires, see Figure 56, page 34.

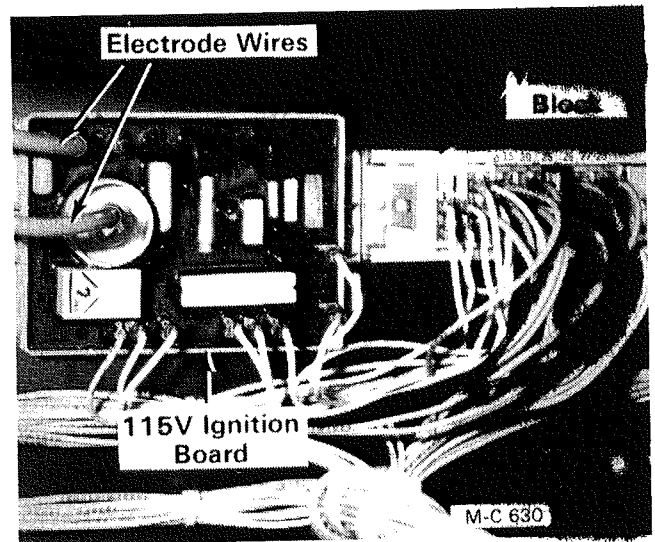


Figure 53

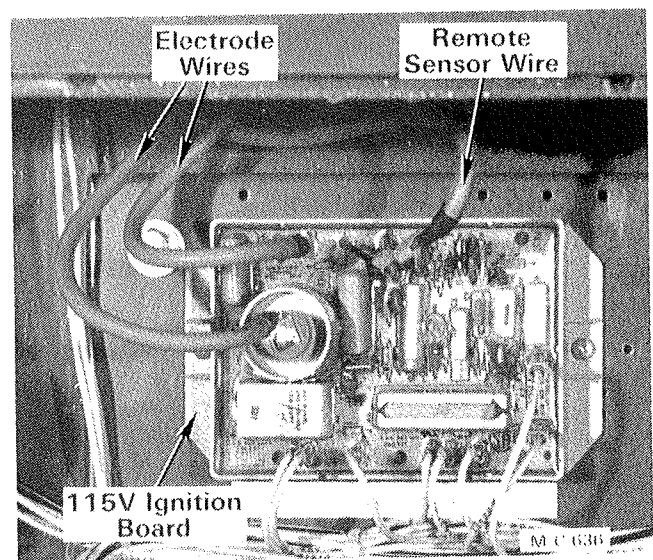


Figure 53A

115V Ignition Board (w/Remote Sensor)

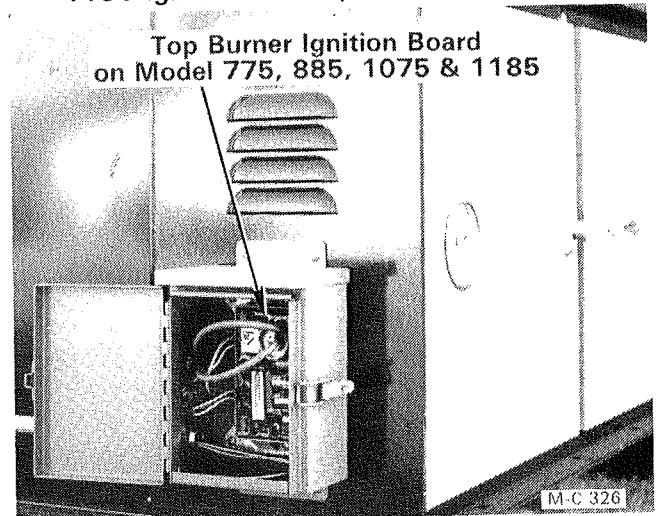


Figure 54



CAUTION: HIGH VOLTAGE - to prevent severe electrical shock, hold the test electrode or spark plug with an insulated device during the test and keep the

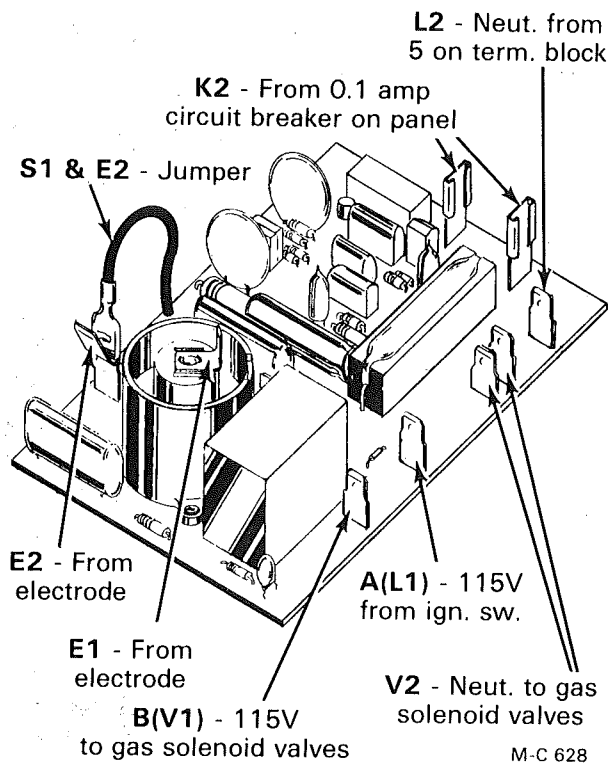


Figure 55

115V Ignition Board w/o Remote Sensor

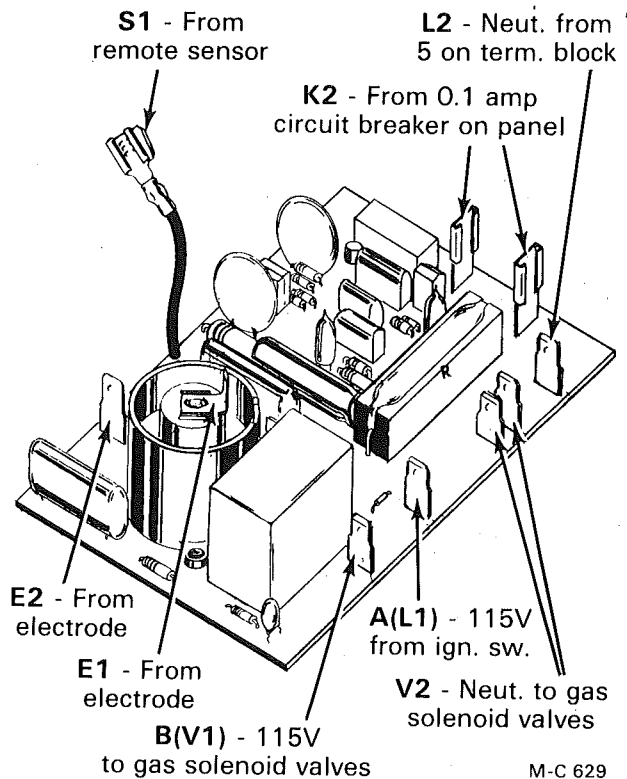


Figure 55A

115V Ignition Board (w/Remote Sensor)

wires away from the control cabinet to prevent arcing.

- C. Flip the ignition switch ON and check for spark at the test electrode (or spark plug). If a spark does not occur, the ignition board is defective and must be replaced.
7. If there is a spark on the test electrode or spark plug, the electrode on the dryer or the electrode lead wires are defective.
 - A. Check the condition of the electrode lead wires. The wires must be replaced if they are found to be non-conductive or shorted.
 - B. Examine the electrode in the dryer for damage or improper gap. The gap must be $\frac{1}{8}$ inch. Also check for porous or cracked ceramic insulator(s) that could hold moisture. The electrode cannot be repaired. If it is damaged or defective, it must be replaced.



CAUTION: After completing tests or repairs, the jumper wire on the air pressure switch must be removed before starting the dryer.

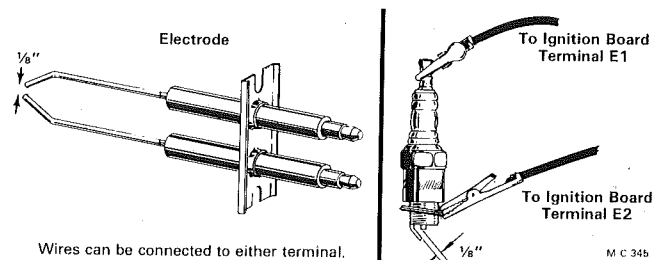


Figure 56

12 Volt Direct Spark Ignition System

Operation

The 12V direct spark ignition system consists of an electronic ignition board, a direct spark ignition electrode and a flame sensing electrode for each burner. The electrode with the spark plug type wire(s) connected to it is the spark electrode. For ignition to occur, the dryer must be running and the Power, High Limit and Air Pressure lights on the control panel must be on.

The dryer is wired so that the current flow from the control cabinet goes to the High Limit Switch first, the Air Pressure Switch second and the Ignition Switch last. This is a safety feature that prevents ignition if the High Limit and/or the Air Pressure switches are not functioning.

When the ignition switch is flipped on, the ignition board is energized and generates a high

voltage spark between the tips of the spark electrode and opens the gas solenoid valves at the same time. The gas valve light on the control panel will be on.

The spark electrode provides the spark for ignition and the other electrode senses the presence of the flame. A small amount of electrical current passes through the flame from one tip of the flame sensing electrode to the other completing the electrical circuit. If the tips of this electrode are not immersed in the flame, the circuit will be broken and the ignition system will "lock out".

The ignition board is electronically timed so that when the ignition switch is flipped ON, the spark electrode will continue to spark and the gas solenoid valves will be held open for a "trial ignition" period (about 5 seconds).

When ignition occurs and a flame is present, the ignition system will continue to operate (spark shuts off). If ignition fails, flame is not present, the ignition system will "lock out" (after the 5 second trial period) closing the gas solenoid valves. The Gas Valve light on the control panel will be out.

Testing

If the ignition system "locks out", flip the ignition switch OFF, wait one minute, then ON again for another "trial ignition" period.

If after several attempts for ignition there is still no flame, stop the tractor, flip the ignition switch OFF and check the dryer ignition system as follows:

1. Check to be sure that the battery cables from the dryer control cabinet are connected correctly and securely to the tractor battery. The BROWN cable must be connected to the negative (—) battery terminal and the RED cable to the positive (+) battery terminal. If these connections are reversed, the burner will light for about 5 seconds then the ignition board will "lock out".
2. The ignition board may have absorbed some moisture during periods of continued rain, fog or blowing snow which would cause the ignition board not to function properly. Carefully dry the ignition board with warm air. Also check the electrodes to be sure they are dry.
3. Carefully remove the plastic wire connector from the ignition board. Check the connector

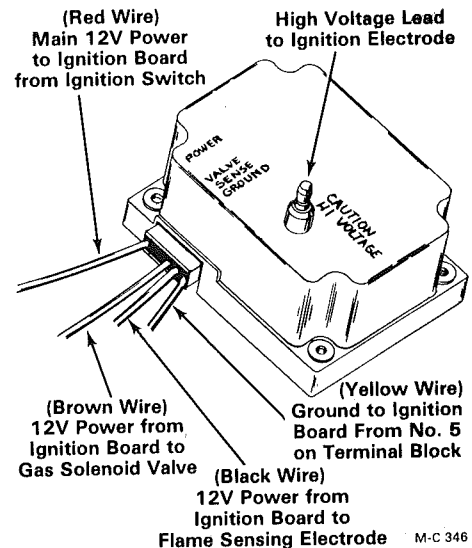


Figure 57

for moisture, corroded or loose contacts. Also look for loose, burned or broken electrode wires.

4. Check for spark at the electrode. Close the main gas valve in the control cabinet, disconnect the BROWN cable from the tractor battery.
5. Disconnect the two wires at the back of the air pressure switch and connect them together with a short jumper wire. Do not allow the jumper wire to come in contact with any metal. Connect the BROWN cable to the tractor battery. The Power, High Limit and Air Pressure light will be on.



CAUTION: This is only a temporary test procedure. Do not run the fan and burner with the air pressure switch disconnected or by-passed.

6. Flip the ignition switch ON and observe the spark electrode during the "trial ignition" period. In some cases the spark can be heard.



CAUTION: There may be a small amount of gas in the line that could ignite. Flip the ignition switch on and off several times before entering the dryer to observe the electrode.

7. If there is no spark, the ignition board must be tested. The ignition board does not have to be removed for this test. Proceed as follows:
 - A. Flip the ignition switch OFF. Disconnect the electrode high voltage lead on top of the ignition board, see Figure 57.

- B. Using a new properly gapped electrode ($\frac{1}{8}$ inch) or an automotive spark plug gapped to ($\frac{1}{8}$ inch), connect jumper wires from the test electrode or spark plug to the high voltage lead on the ignition board and to terminal No. 5 (neutral) on the terminal block in the control cabinet, see Figure 58.



CAUTION: HIGH VOLTAGE - to prevent severe electrical shock, hold the test electrode or spark plug with an insulated device during the test and keep the wires away from the control cabinet to prevent arcing.

- C. Flip the ignition switch ON and check for spark at the test electrode (or spark plug). If a spark does not occur, the ignition board is defective and must be replaced.
8. If there is a spark on the test electrode or spark plug, the electrode on the dryer or the electrode lead wires are defective.
- A. Check the condition of the electrode lead wires. The wires must be replaced if they are found to be non-conductive or shorted.
- B. Examine the electrodes in the dryer for damage or improper gap. The gap must be $\frac{1}{8}$ inch. Also check for porous or cracked ceramic insulator(s) that could hold moisture. The electrode cannot be repaired. If it is damaged or defective, it must be replaced.

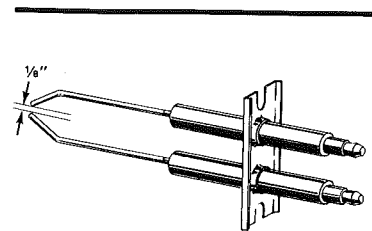


CAUTION: After completing tests or repairs, the jumper wire on the air pressure switch must be removed before starting the dryer.

Venturi Burner Air Adjustment

General

1. The primary air adjustment controls the air fuel mixture to provide a good, clean, efficient flame. This adjustment is similar to the air adjustment on a burner in a gas furnace or stove.
2. The secondary air adjustment controls the flame pattern. Too much secondary air will keep the flame small and confined. It will also cause the flame to be blown off of the electrode or remote sensor interrupting the flame sensing circuit which may result in



Wires can be connected to either terminal.

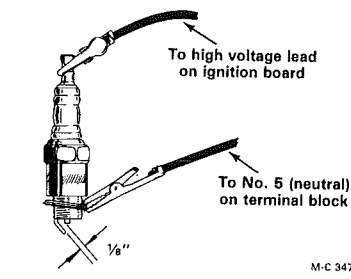


Figure 58

gas solenoid valve chatter or possibly keep the burner from lighting. When this occurs, the ignition system will operate for the "trial ignition" period (approximately five seconds), then lock out.

Correct secondary air adjustment will result in a bushy ball shaped flame that covers the tips of the electrode insuring a positive flame sensing circuit. The tips of the electrode will be red hot.

3. If the primary and secondary air adjustments have been misadjusted, time can be saved by shutting down the burner and starting over. Close the primary air adjustment all the way by loosening locking bolt (1) and turning the primary air adjuster pipe (2) clockwise, see Figure 59 and 60, then open it $1\frac{1}{2}$ to 2 turns. See note.

NOTE: If the primary air adjuster pipe turns hard, loosen the four bolts in the corners of the square plate and shift the plate until the air adjuster pipe turns freely. Tighten the four bolts.

Close the secondary air adjustment all the way by loosening locknuts (5) and pushing the secondary air adjustment rod (4) in all the way, see Figure 59 and 61, then pull the adjustment rod out approximately $\frac{1}{8}$ inch.

Start the burner and adjust the primary and secondary air as follows:

Primary Air

(See Figure 59 and 60)

1. If the flame appears very yellow or orange in color, open the primary air adjustment

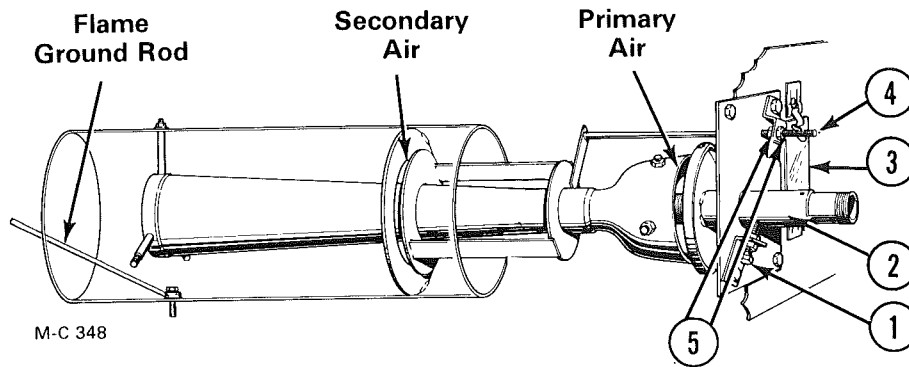


Figure 59

slightly to provide more air. If the flame is light blue in color with no yellow or orange at all, close the primary air adjustment slightly until there is just a trace of yellow or orange at the tips of the flame.

2. To adjust, loosen locking bolt (1) and turn the primary air adjuster pipe (2) clockwise to decrease the amount of air and counter-clockwise to increase the amount of air. See note. The flame can be viewed through the window (3) as the adjustment is made. Tighten locking bolt (1).

NOTE: If the primary air adjuster pipe turns hard, loosen the four bolts in the corners of the square plate and shift the plate until the air adjuster pipe turns freely. Tighten the four bolts.

Secondary Air (See Figure 59 and 61)

1. If the flame is unstable and fluctuates greatly, open the secondary air adjustment slightly. This condition may cause the solenoid valves to chatter. If the flame is confined in a small area and is blowing past the electrode, close the secondary adjustment slightly.
2. To adjust, loosen the locknuts (5) and push the secondary air adjustment rod (4) in to decrease the amount of air and pull it out to increase the amount of air. The flame can be viewed through the window (3) as the adjustment is made. Tighten the locknuts (5) carefully so that the adjustment does not change.

IMPORTANT: Each venturi burner must be adjusted the same distance or amount to provide even heat in the plenum chamber.

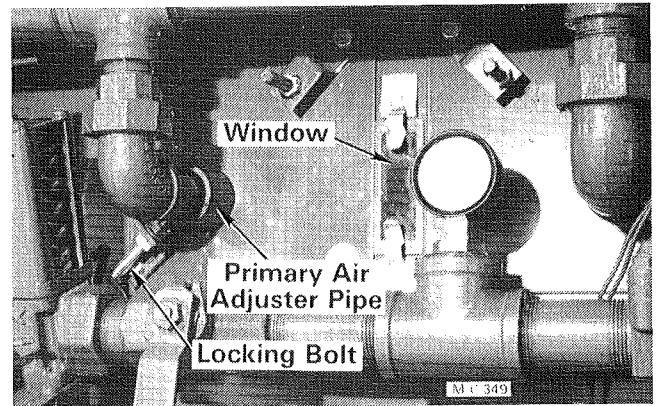


Figure 60

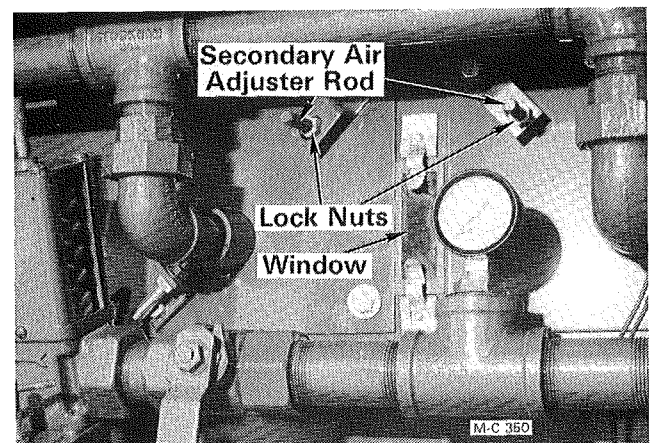


Figure 61

Checking 115 Volt Gas Solenoid Valves

1. Close the main gas valve in the control cabinet, shut off the fan and turn off the electric power to the dryer.
2. Disconnect the two wires at the back of the air pressure switch and connect them together with a short jumper wire. Do not allow the jumper wire to come in contact with any metal. This will by-pass the air pressure switch.

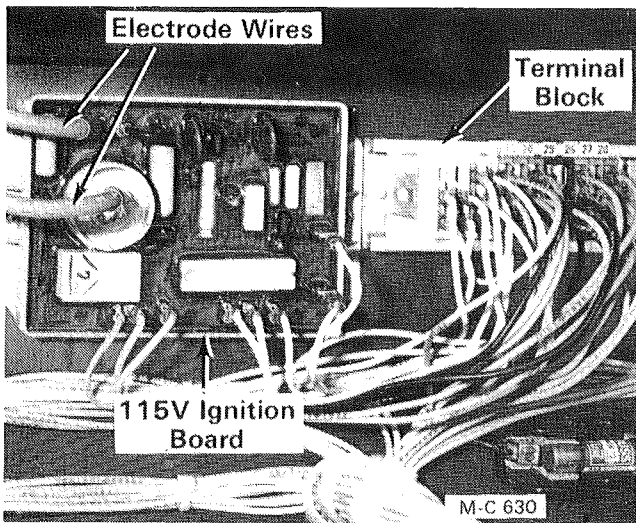


Figure 62

115V Ignition Board (w/o Remote Sensor)

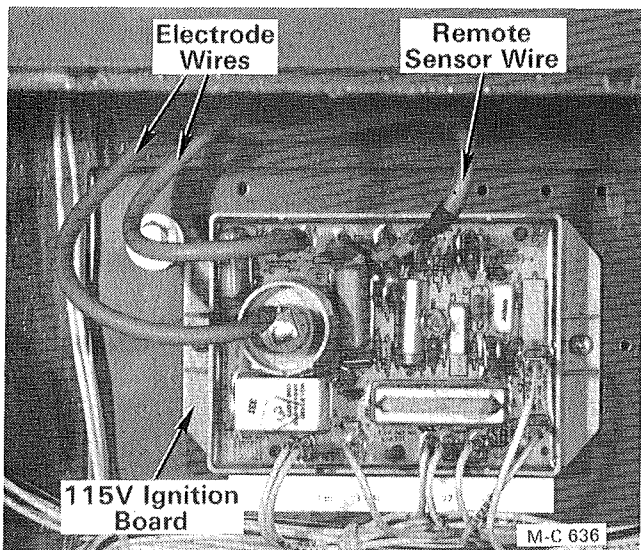


Figure 62A

115V Ignition Board (w/Remote Sensor)

- A. Below S/N 46799 - Turn the electric power on. The Air Pressure light will be on.
- B. Above S/N 46798 - Turn off the fan motor circuit breaker. Turn the 115V power on and push the fan start button. The Air Pressure Light will be on.



CAUTION: This is only a temporary test procedure. Do not run the fan and burner with the air pressure switch disconnected or by-passed. This safety air pressure switch is for your protection and the protection of the dryer.

3. Check to be sure that there is 115V power to the ignition board. Connect a voltmeter between terminal **A (L1)** and **L2** on the ignition board, see Figure 62, 62A, 63, 64 and 65. Flip the ignition switch ON. The

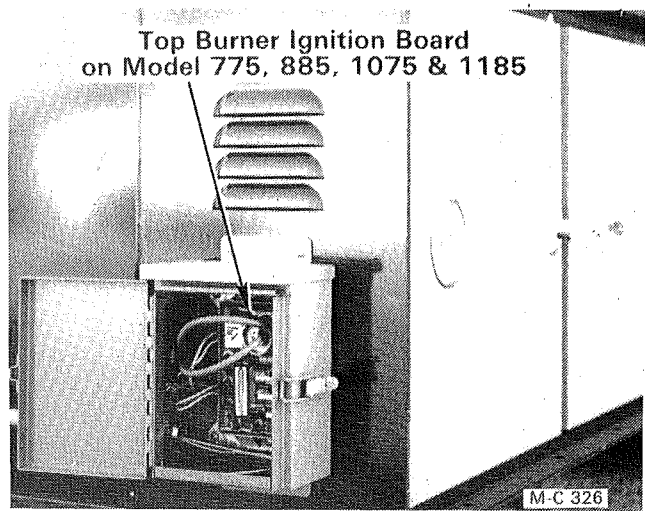


Figure 63

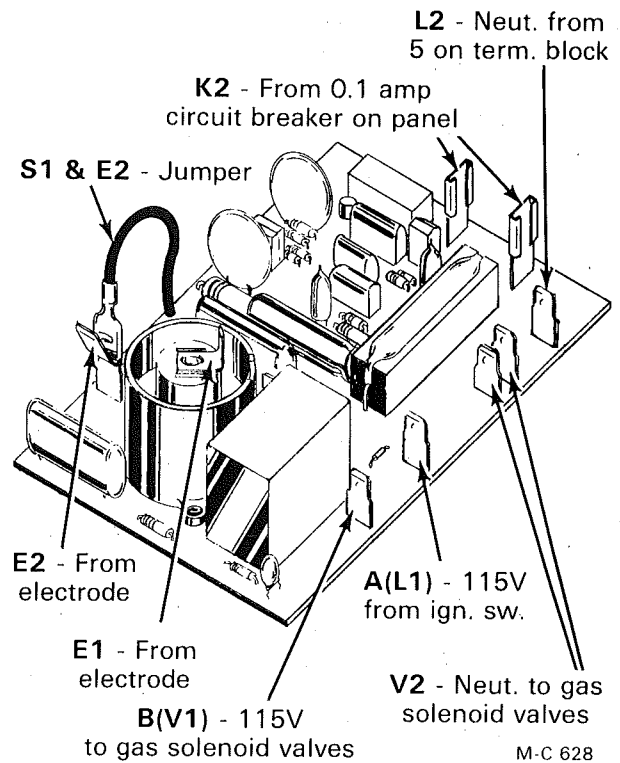


Figure 64

115V Ignition Board (w/o Remote Sensor)

voltmeter should read 115V. If not, check the ignition switch with a continuity light. Also check for loose or broken wires from the ignition switch to the ignition board.

4. If there is 115V between terminal **A (L1)** and **L2** check for 115V at terminal **B (V1)** on the ignition board, see Figure 62, 62A, 63, 64 and 65. Connect a voltmeter between terminal **V2** and **B (V1)** on the ignition board. Flip the ignition switch OFF then ON, the voltmeter should read 115V. If not, the ignition board is defective and must be replaced.

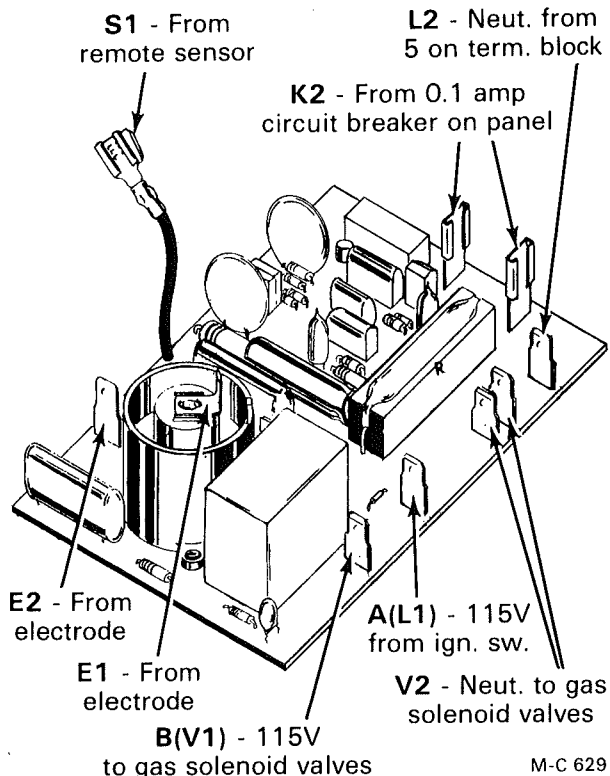


Figure 65
115V Ignition Board w/Remote Sensor)

NOTE: The voltmeter will show a reading during the "trial ignition" period only, (5 seconds). To check again, flip the ignition switch OFF then ON.

5. If there is 115V at terminal **B (V1)** check to be sure that both solenoid valves are working. To do this, hold your hand on the valve and flip the ignition switch OFF then ON. If the valve is opening you should feel the solenoid coil move, and possibly hear it.

Instructions for replacing the coil are included with the replacement coil.

6. If the solenoid coil is working but the solenoid valve is not opening or closing, shut off the gas supply, open the gas main hand valve and turn off the electric power supply. Loosen a union in the gas line to relieve gas pressure. Carefully disassemble the valve.

NOTE: Before disassembly, index the housings for correct reassembly. Pay particular attention to the position of the diaphragm.

7. Check for foreign material inside of the valve. Check the diaphragm to be sure it is not cracked or ruptured. A diaphragm repair kit is available. Installation instructions are included in the kit.



CAUTION: After completing tests or repairs, the jumper wire on the pressure switch must be removed before starting the dryer.

Checking 12 Volt Gas Solenoid Valves

1. Test the ignition board first to be sure it has not failed. Refer to Testing 12 Volt Direct Spark Ignition System on page 34.
2. If the ignition board is good, connect a 12 volt test light between the two terminals on the gas solenoid valve. Flip the ignition switch ON, the test light should light. If it does not, the gas solenoid coil may be defective.

NOTE: The test light will light during the "trial ignition" period only, (5 seconds). To check again, flip the ignition switch OFF then ON.

3. The gas solenoid coil can be checked by holding your hand on the valve and flipping the ignition switch OFF then ON. If the valve is opening you should feel the solenoid coil move and possibly hear it.

Instructions for replacing the coil are included with the replacement coil.

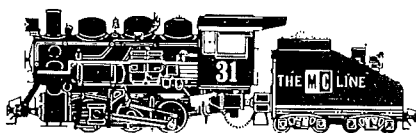
4. If the solenoid coil is working but the solenoid valve is not opening or closing, shut off the gas supply, open the gas main hand valve and disconnect the battery cables. Loosen a union in the gas line to relieve gas pressure. Carefully disassemble the valve.

NOTE: Before disassembly, index the housings for correct reassembly. Pay particular attention to the position of the diaphragm.

5. Check for foreign material inside of the valve. Also check the diaphragm to be sure it is not cracked or ruptured. A diaphragm repair kit is available. Installation instructions are included in the kit.



CAUTION: After completing tests or repairs, the jumper wire on the air pressure switch that was installed for the ignition board test must be removed before starting the dryer.



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