

SHIVERS

SHIVERS INCORPORATED
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CIRCU-TROL INSTALLATION INSTRUCTIONS

FOR MODELS:

**295A-001A
295B-001A
295C-001A
295D-001A
295E-001A
295K-001A
297A-001A
297B-001A
297C-001A
297D-001A**

**WIRING OF CIRCU-TROL SHOULD BE DONE ONLY BY A
COMPETENT LICENSED ELECTRICIAN**

**P-7111
NOV, 1992**

THIS EQUIPMENT IS MANUFACTURED UNDER 1 OR MORE OF THE
FOLLOWING U.S. & CANADIAN PATENTS: D246388: 3,563,399:
3,765,547: 3,765,548: 905108

SHIVVERS INCORPORATED

CORYDON, IOWA USA

515/872-1005

TWX: 910-520-1970

Shivvers cryd

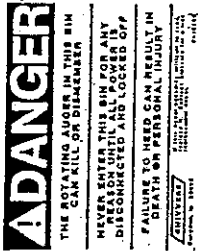
January, 1983

Factory Installed Decals

Roof Cap

DECALS: P-10224 5-1/16" x 4-1/8"
P-10225 4" x 3-1/4"

DANGER
THE ROTATING AUGER.....
Install 1 on front of
Machine Control Box



DECAL P-10223
5-3/4" x 8-9/16"

WARNING
ROTATING EQUIPMENT.....
Install 1 on front of
Horz. Belt Shield



Horz. Unload
Belt Shield

Manhole

DECAL P-10126 4-11/16" x 5"

WARNING
DO NOT OPERATE
WITHOUT READING.....

Install 1 decal where appropriate:
a) on front cover
b) on inside of front cover
of Machine Control Box



DO NOT OPERATE WITHOUT READING AND UNDERSTANDING THE OPERATING MANUAL. IF MANUALS ARE MISSING OR ARE DIFFICULT TO READ, REPLACE THEM. CONTACT SHIVERS INC. 1000 W. HWY 50060 FOR FREE MANUALS ON DECALS.

Control Box
Fuse or Circuit
Breaker Box
Master Disconnect

Fan/Burner

Factory Installed Decals

Roof Cap

Manhole

DECAL: P-9198 5-3/4" x 6-3/16"

P-10226 3-7/8" x 4-3/16"

WARNING
DANGEROUS VOLTAGE.....

Install 1 decal where appropriate:

- a) on front cover
- b) on inside cover of Machine Control Box.

Install 1 on top of Heater Control Box.

Control Box
Fuse or Circuit Breaker
Master Disconnect
Switch

Heater Control Box

Horiz. Unload Belt Shield

Fan/Burner



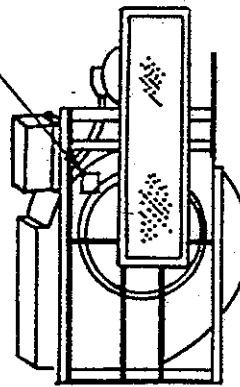
DANGEROUS VOLTAGE
DO NOT OPEN THIS COVER UNTIL ALL ELECTRICAL POWER TO THIS BOX AND RELATED EQUIPMENT HAS BEEN DISCONNECTED AND LOCKED OUT.
FAILURE TO HEED CAN RESULT IN FATAL ELECTRICAL SHOCK.

Factory Installed Decals

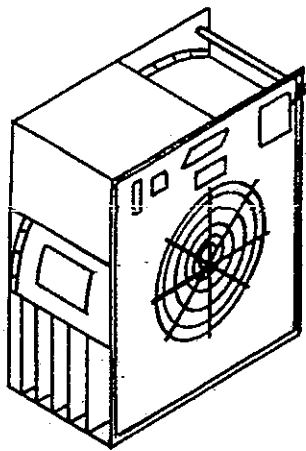
DECAL P-10221 5-3/4" x 5-3/8"

WARNING
ROTATING BLADES AND SUCTION.....

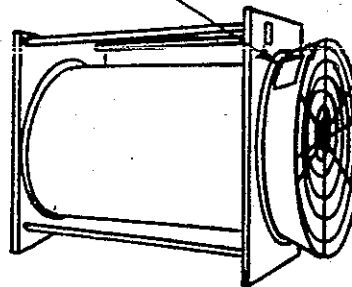
1 decal on Fan near guard



BIG BLUE FAN



CENTRIFUGAL FAN



BLUE FLAME DRYER

P R E F A C E

CIRCU-TROL POWER RATINGS BY MODEL

MODEL	CIRCULATOR MOTOR	CONTINUOUS FLOW MOTOR	SPREADER MOTOR DRYING BIN	MOTOR CONT. FLOW
295A-001A 230 Volt 1Ø	5 HP max.	5 HP max.	115 Volt 1Ø 1-1/2 HP max.	115 Volt 1Ø 1 HP max.
295B-001A 230 Volt 3Ø	10 HP max.	10 HP max.	115 Volt 1Ø 1-1/2 HP max.	115 Volt 1Ø 1 HP max.
295C-001A 230 Volt 1Ø	10 HP max.	5 HP max.	115 Volt 1Ø 1-1/2 HP max.	115 Volt 1Ø 1 HP max.
295D-001A 460 Volt 3Ø	10 HP max.	10 HP max.	115 Volt 1Ø 1-1/2 HP max.	115 Volt 1Ø 1 HP max.
295E-001A 575 Volt 3Ø	10 HP max.	10 HP max.	115 Volt 1Ø 1-1/2 HP max.	115 Volt 1Ø 1 HP max.

CIRCU-TROL POWER RATINGS BY MODEL

MODEL	CIRCULATOR MOTOR	CONTINUOUS FLOW MOTOR	SPREADER MOTOR DRYING BIN	CONT. FLOW
295K-001A 230 Volt 1Ø	10 HP max.	10 HP max.	115 Volt 1Ø 1-1/2 HP max.	115 Volt 1Ø 1 HP max.

ADD-ON CONTROL CIRCUIT POWER RATINGS BY MODEL

MODEL	CONTINUOUS FLOW MOTOR	CONT. FLOW SPREADER MOTOR
297A-001A 230 Volt 1Ø	5 HP max.	115 Volt 1Ø 1 HP max.
297B-001A 230 Volt 3Ø	10 HP max.	115 Volt 1Ø 1 HP max.
297C-001A 230 Volt 1Ø	10 HP max.	115 Volt 1Ø 1 HP max.
297D-001A 460 or 575 Volt 3Ø	10 HP max.	115 Volt 1Ø 1 HP max.

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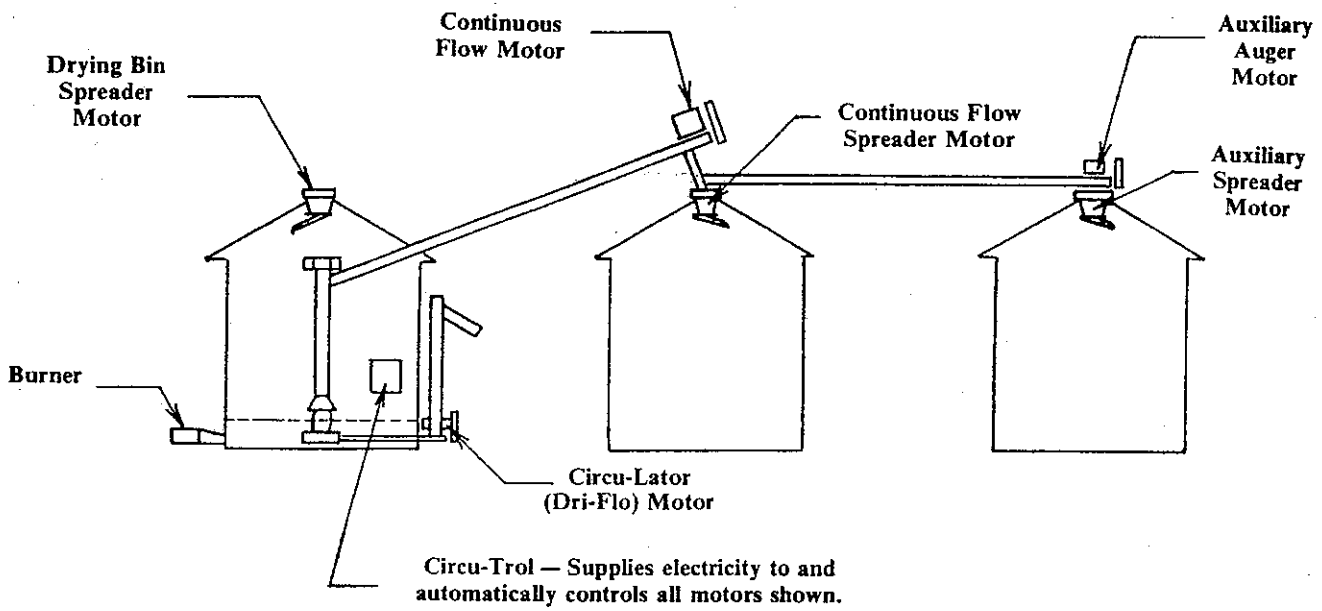
WIRING DATA TABLE
FOR MOTORS AND EQUIPMENT SUPPLIED BY
SHIVVERS INCORPORATED

HP	PHASE	MOTOR		OVERLOAD HEATER ELEMENT	RECOMMENDED	WIRE SIZE (AWG)
		VOLTS	FULL LOAD AMPS		TIME DELAY DUAL ELEMENT FUSE SIZE	
Circuitrol Control Circuits				-----	10.0	---
1/3	1	110	7.2	-----	15.0	14
1	1	230	7.1	C7.78A	15.0	14
1½	1	230	9.1	C9.55A	20.0	14
2	1	230	15.0	C16.3B	25.0	12
3	1	230	17.0	C18.0B	30.0	10
5	1	230	28.0	C30.3B	35.0	8
7½	1	230	38.0	F43.0B	50.0	6
10	1	230	40.0	F48.7B	60.0	6
1	3	230	3.6	C3.79A	8.0	14
1½	3	230	5.2	C5.26A	10.0	14
2	3	230	6.4	C6.95A	15.0	14
3	3	230	9.9	C10.4B	20.0	14
5	3	230	14.4	C16.3B	30.0	12
7½	3	230	22.0	C25.0B	30.0	10
10	3	230	25.0	C30.3B	30.0	8
1	3	460	1.8	C2.20A	5.0	14
1½	3	460	2.6	C3.26A	5.0	14
2	3	460	3.4	C3.79A	10.0	12
3	3	460	4.9	C5.26A	10.0	12
5	3	460	7.6	C8.67A	15.0	12
7½	3	460	11.0	C12.5B	20.0	12
10	3	460	12.5	C15.1B	25.0	12
1	3	575	1.4	C1.84A	5.0	14
1½	3	575	2.1	C2.68A	6.0	14
2	3	575	2.7	C3.26A	6.0	12
3	3	575	3.9	C4.19A	10.0	12
5	3	575	6.1	C6.95A	15.0	12
7½	3	575	9.0	C10.4B	20.0	12
10	3	575	10.4	C16.3B	20.0	12

NOTE: DUE TO ENGINEERING CHANGES, ABOVE HEATER ELEMENTS AND FUSES MAY NOT BE AS PREVIOUSLY RECOMMENDED. PLEASE CALL THE FACTORY IF YOU HAVE ANY QUESTIONS.

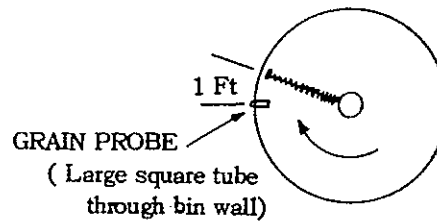
EQUIPMENT TERMINOLOGY

FIGURE 1



START-UP PROCEDURES FOR CIRCULATORS, DRI-FLO AND INDUSTRIAL DRI-FLO

- 1) Set Grain Thermostat at 175° (clockwise to farthest point to "Dryer" scale).
- 2) Position Tapered Sweep Auger approximately 1 foot past the Grain Thermostat Probe:

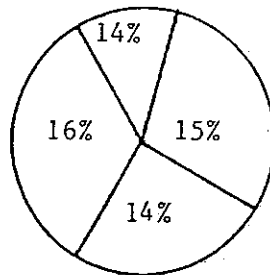


- 3) Set Plenum Temperature Thermostat at the desired temperature (160° is recommended for corn).
- 4) Turn the Circulator (Dri-Flo, Industrial Dri-Flo) switch and the Continuous Flow Auger switch (if present) located inside the Circuitrol Box to the "off" position. Turn the Grain Level Indicator switch to the "on" position.
- 5) Put approximately 6" to 8" of grain in the bin or just enough to completely cover the Tapered Sweep. Turn the Circulator switch "on" for about 10 seconds, just long enough for the Tapered Auger to roll over a few times to get the corn under and totally around the sweep.
- 6) Now finish putting approximately 2 ft. of wet grain into drying bin.
- 7) Start drying fan and heater. Adjust pressure regulator of the heater so the burner cycles on and off (if single stage) or high and low (if dual stage). It is critical that the burner cycles at all times, day and night. This insures a constant average plenum temperature which is critical to the moisture control sensing device. (NOTE: It might be necessary to increase the gas pressure at night and decrease it in the morning to maintain the cycling of the burner.)

When operating an on-off style burner, adjust the pressure so the burner is "on" approximately 4/5 the time and "off" 1/5 the time. When operating a high-low style burner, adjust the pressure so the burner is on "high" flame approximately 1/2 the time and "low" flame 1/2 the time.

- 8) Estimate the time required to dry the grain and reach the moisture content desired. (NOTE: When cooled in another bin, the grain may lose another 1.0 to 1.5 moisture points.) Turn switches to "on" position and run unit for 5 minutes. Take a sample of the grain being removed.

- 9) Turn unit to "off". Check the moisture content of the grain to see if the approximate desired moisture level has been reached. If approximate desired moisture level hasn't been reached, restart the unit and run for another 5 minutes. Again check the grain for moisture content. Repeat this procedure until the approximate desired moisture content is reached.
- 10) Turn Circulator (Dri-Flo, Industrial Dri-Flo) switch and Continuous Flow Auger switch (if present) to "Automatic" position.
- 11) Very slowly rotate the Grain Thermostat Dial counter-clockwise to a lower temperature setting until the unit starts.
- 12) Allow unit to run. It should run until the Tapered Sweep Auger passes underneath the Grain Thermostat Probe and travels about 3 feet to 4 feet farther. The unit should then shut off.
- 13) Wait for the unit to start again.
- 14) As the unit makes the second cycle around the bin, take 5 to 6 moisture samples of the grain being removed. Average these samples. This is the actual moisture content of the grain. (NOTE: The grain may lose another 1.0 to 1.5 moisture points after cooling.)
- 15) Wait for the unit to shut off. (It should do this shortly after the Tapered Sweep Auger passes underneath the Grain Thermostat Probe.)
- 16) If the grain is too dry, set the Grain Thermostat to a slightly cooler (wetter) position. If the grain is too wet, set the Grain Thermostat to a slightly hotter (drier) position.
- 17) Allow the unit to automatically start. Check the moisture content by taking samples and averaging as before. This is the actual moisture content of the grain. (REMEMBER: The grain may lose another 1.0 to 1.5 moisture points after cooling.)
- 18) Repeat steps 15, 16, and 17 until the desired moisture control is reached. Turn the Grain Level Indicator switch to "auto" position for automatic shut-off on night operation.
- 19) **IMPORTANT:** It is very important to average 5 to 6 moisture samples of grain as the moisture content may vary in different sections of the bin floor, i.e.



The above is a typical situation in a drying bin. These differences will equalize when the grain is cooled.

NOTE: See Start Up Manual for more complete instructions.

GRAIN LEVEL INDICATOR OPERATING INSTRUCTIONS

TO OPERATE:

1. Turn switch "ON".
2. Fill bin ABOVE this box and dry as normal.
3. Turn switch to "AUTO" AFTER tapered sweep has passed under this box. Restart burner if it dropped out when switching from "ON" to "AUTO".
4. The Grain Level Indicator will now shut off the Circulator (or Dri-Flo) and burner when grain level falls below this box.

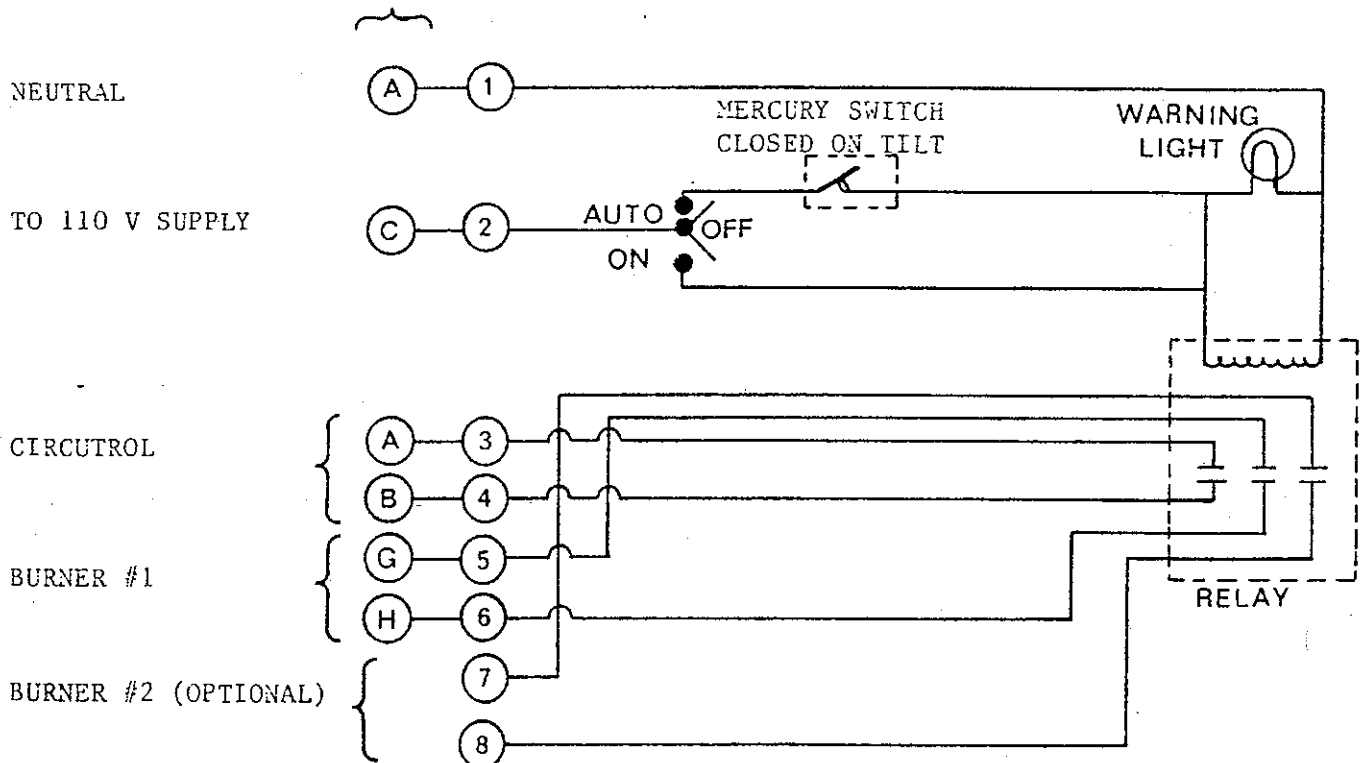
EXPLANATION OF SWITCH FUNCTIONS:

- ON** Circulator (or Dri-Flo) and burner operate as if Grain Level Indicator is not present.
- OFF** Circulator (or Dri-Flo) and burner are turned off.
- AUTO** Grain Level Indicator will turn Circulator (or Dri-Flo) and burner off when grain level falls below this box.

GRAIN LEVEL INDICATOR

TERMINAL REFERENCE

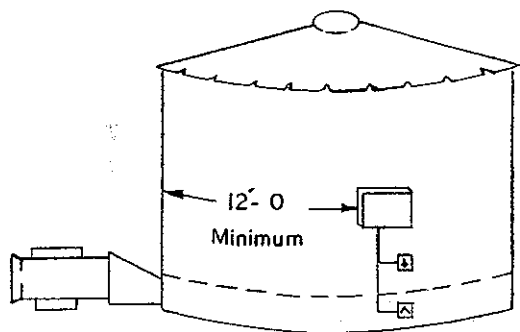
WIRING SCHEMATIC
PIGTAIL
(IF USED)



IMPORTANT TEST: Check that the Plenum Temperature Control cycles the crop drying burner by:

- a) Set Circuitrol Grain Thermostat at 175°.
- b) Set Plenum Temperature Control Thermostat at 110°.
- c) Remove the Plenum Temperature Control Sensing Probe from its housing and submerge in a bucket of lukewarm (98°) water.
- d) Fire crop drying fan and burner.
- e) Set the Plenum Temperature Control Thermostat at 85°. This should shut off the burner (not the fan). Raise the Plenum Temperature Control Thermostat to 110°. This should start the burner again. If the burner stops and starts as indicated, the Plenum Temperature Control has been correctly wired. The Probe must be returned to its housing.

MOUNTING CIRCU-TROL AND PROBES



Mount Circu-Trol on bin wall at least 12 feet away from drying fan.

Capillary tubes of thermostat are only 5'0" long. Be sure the probes can reach the probe mounts.

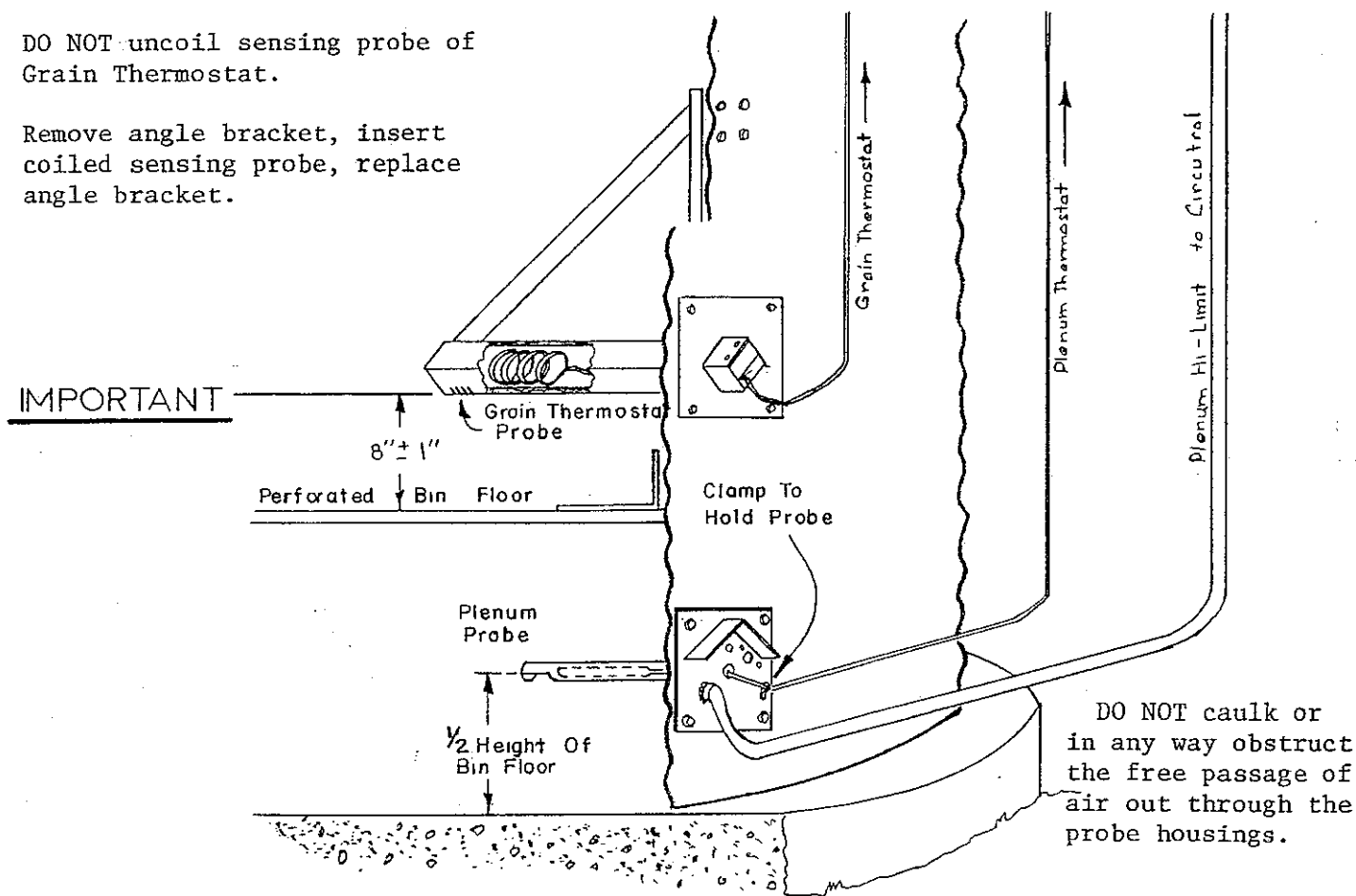
Switch plate at bottom of Circu-Trol may be removed if necessary. Switches should be temporarily removed to do so.

CAUTION:

DO NOT uncoil sensing probe of Grain Thermostat.

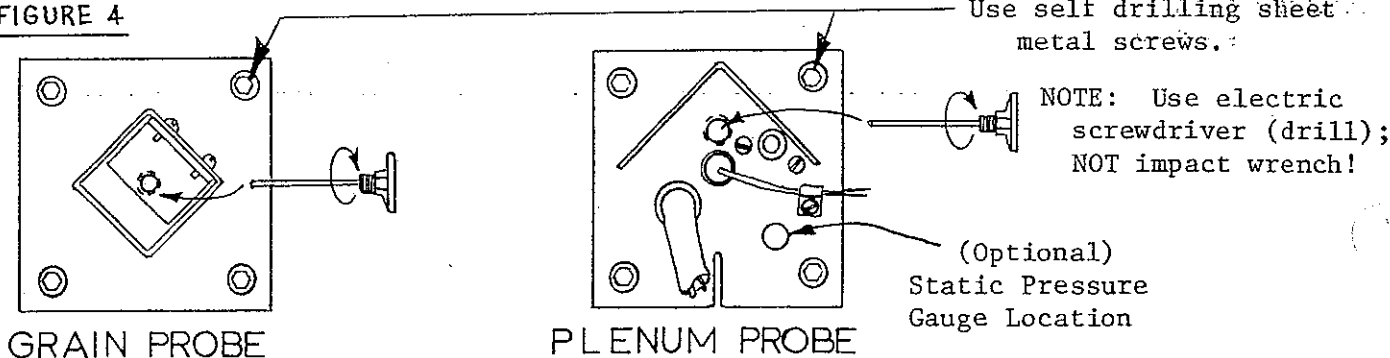
Remove angle bracket, insert coiled sensing probe, replace angle bracket.

FIGURE 3



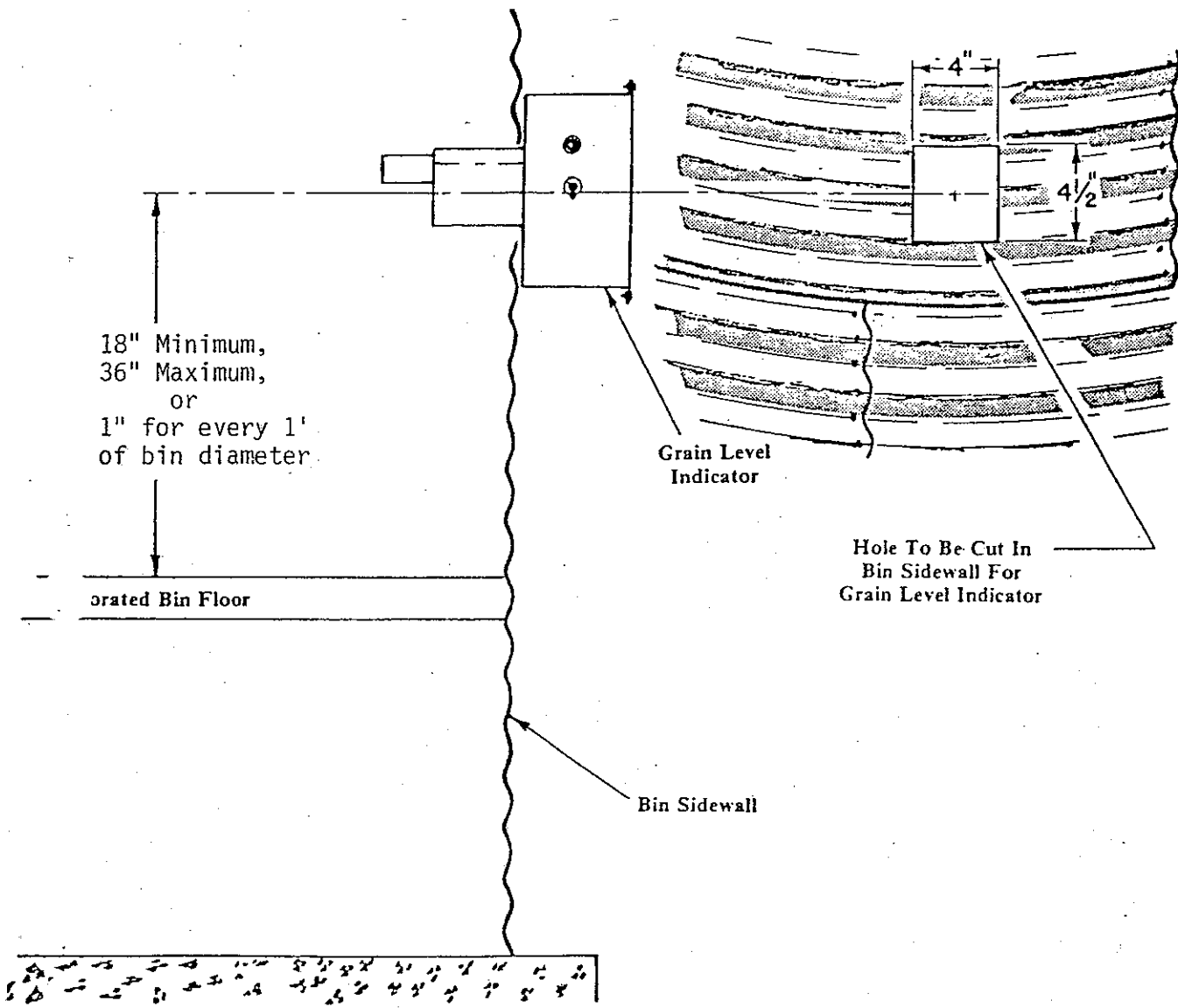
MOUNTING OPTIONAL DIAL THERMOMETERS

FIGURE 4



INSTALLATION INSTRUCTIONS FOR GRAIN LEVEL INDICATOR

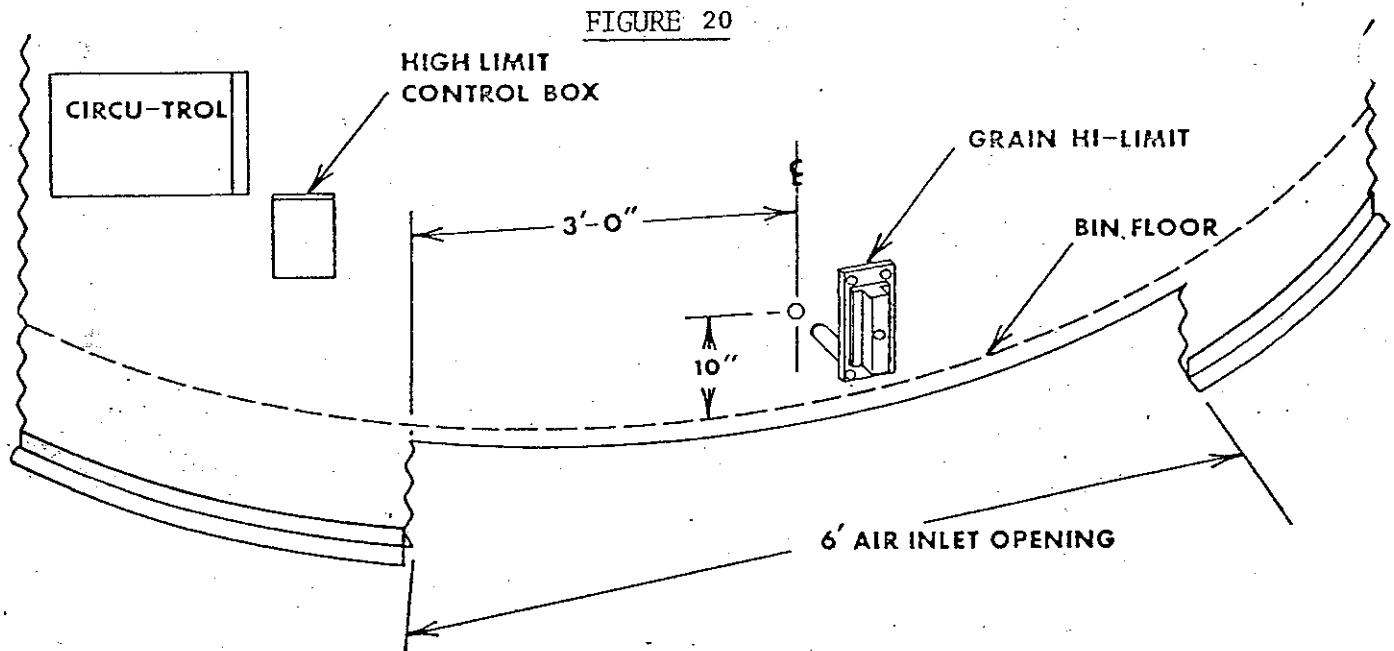
- 1) Read instructions thoroughly. Then proceed as directed.
- 2) The Grain Level Indicator is designed to turn the crop drying burner(s) and the Dryer Circu-Trol off automatically when the drying bin is almost empty of grain. Mount the Grain Level Indicator on Bin Sidewall (near the Circuitrol Box) as shown.



INSTALLATION OF GRAIN HIGH LIMIT CONTROL BOX
(REQUIRED FOR TWO BLUE FLAME DRYERS)

When two Shivers BLUE FLAME dryers are used, a unit called a "High Limit Control Box" must be used. This device is designed to shut the burner and fan motor off on both dryers if either grain high limit senses dangerous temperatures that may be a fire hazard.

- 1) Mount the Hi-Limit Control Box on the bin near the Circutrol panel.
- 2) Install the Grain Hi-Limits above the Entrance Collar as shown below in Figure 20.



WIRING OF SINGLE PHASE CIRCUITROL

- 1) Read instructions thoroughly. Then proceed as directed.
- 2) See Equipment Terminology for explanation of technical terms.
- 3) ALL WIRING MUST MEET STATE AND LOCAL CODES. For CIRCUITROL power ratings, see Preface.
- 4) From single phase power supply, connect 230 volts to terminal L1 and L2 (located in top left hand corner of Circuitrol). Connect the neutral from the single phase power supply to terminal marked neutral. See figure 9. These wires must be heavy enough to handle the expected load. At times, all motors will be running concurrently.
- 5) Temporarily remove the switch plate at bottom of Circuitrol. (Must temporarily remove switches to do so.)
- 6) Connect a physical ground (metal stake driven into earth) to ground lug (located in lower left hand corner of Circuitrol.) See Figure 9.
- 7) Connect Circulator (or Dri-Flo) Motor to the Red wires (labeled Circulator Motor) at bottom of Circuitrol. See figure 9. Wire for counter-clockwise rotation facing shaft.
- 8) Connect Continuous Flow Motor to the wires (labeled Continuous Flow Motor) at bottom of Circuitrol. See Figure 9. Wire for clockwise rotation facing shaft. If your installation does not have a Continuous Flow Motor, insulate the ends of the wires securely.
- 9) Connect Continuous Flow Spreader Motor to the Blue #12 AWG wire (labeled Continuous Flow Spreader) to the White #10 AWG wire (labeled Common, Drying Bin Spreader and Continuous Flow Spreader) at bottom of Circuitrol. If your installation does not have a Continuous Flow Spreader, insulate the end of the Blue #12 AWG wire securely.
- 10) Connect Drying Bin Spreader Motor to the yellow #10 AWG wire (labeled Drying Bin Spreader) and to the White #10 AWG wire (labeled Common, Drying Bin Spreader and Continuous Flow Spreader) at bottom of Circuitrol. If your installation does not have a Drying Bin Spreader, insulate the end of the yellow #10 AWG wire securely and also of the White #10 AWG wire not used in Step 9.
- 11) Reinstall switch plate and switches. Be sure there is 1/4" clearance between the door and the thermostat knobs. The switch plate can be adjusted to obtain this clearance if necessary.

NOTE: If the door touches the thermostat knobs when it is closed the thermostats may not operate correctly.

FIGURE 9

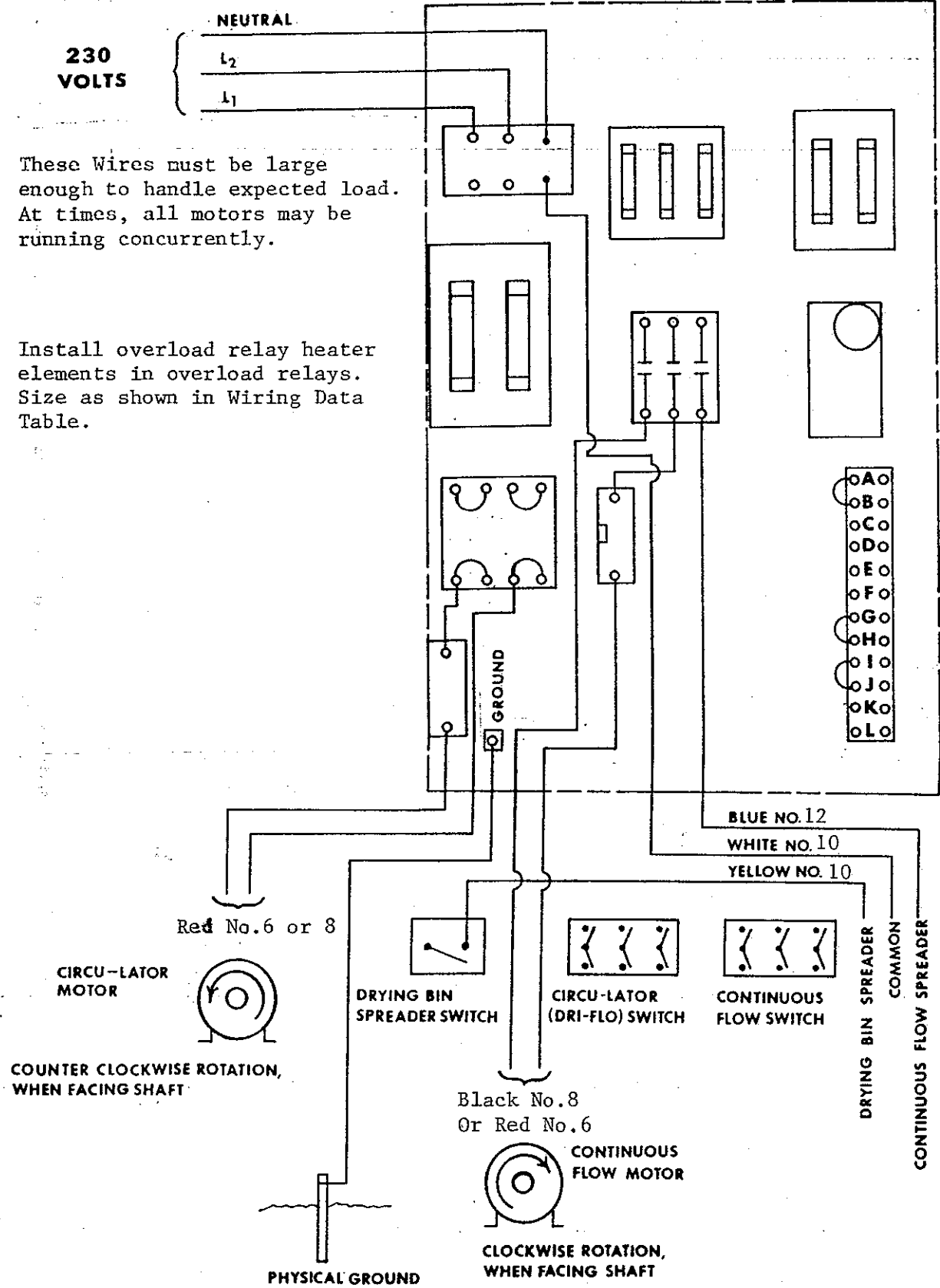
MOTOR WIRING-SINGLE PHASE CIRCU-TROL

Temporarily remove the switch plate at bottom of control. Switches must be temporarily removed to do so.

230 VOLTS

These Wires must be large enough to handle expected load. At times, all motors may be running concurrently.

Install overload relay heater elements in overload relays. Size as shown in Wiring Data Table.



WIRING OF THREE PHASE CIRCUITROL

- 1) Read instructions thoroughly. Then proceed as directed.
- 2) See Equipment Terminology for explanation of technical terms.
- 3) ALL WIRING MUST MEET STATE AND LOCAL CODES. For CIRCUITROL power ratings, see Preface.
- 4) From three phase power supply, connect 230 volts to terminals L1, L2, and L3 (located in top left hand corner of Circuitrol). BE SURE THE WILD LEG IS CONNECTED TO L3. Connect the neutral from the three phase power supply to terminal marked neutral. See figure 13. These wires must be heavy enough to handle the expected load. At times, all motors will be running concurrently.
- 5) Temporarily remove the switch plate at bottom of Circuitrol. (Must temporarily remove switches to do so.)
- 6) Connect a physical ground (metal stake driven into earth) to the ground lug (located in lower left hand corner of Circuitrol). See Figure 13.
- 7) Connect Circulator (or Dri-Flo) Motor to the Red wires (labeled Circulator Motor) at bottom of Circuitrol. See Figure 13. Wire for counter-clockwise rotation facing shaft.
- 8) Connect Continuous Flow Motor to the wires (labeled Continuous Flow Motor) at bottom of Circuitrol. See Figure 13. Wire for clockwise rotation facing shaft. If your installation does not have a Continuous Flow Motor, insulate the ends of the wires securely.
- 9) Connect Continuous Flow Spreader Motor to the Blue #12 AWG wires (labeled Continuous Flow Spreader) and to the White #10 AWG wire (labeled Common, Drying Bin Spreader and Continuous Flow Spreader) at bottom of Circuitrol. If your installation does not have a Continuous Flow Spreader, insulate the end of the Blue #12 wire securely.
- 10) Connect Drying Bin Spreader Motor to the Yellow #10 AWG wire (labeled Drying Bin Spreader) and to the White #10 AWG wire (labeled Common, Drying Bin Spreader and Continuous Flow Spreader) at bottom of Circuitrol. If your installation does not have a Drying Bin Spreader, insulate the end of the Yellow #10 AWG wire securely and also of the White #10 AWG wire if not used in Step 9.
- 11) Reinstall switch plate and switches. Be sure there is 1/4" clearance between the door and the thermostat knobs. The switch plate can be adjusted to obtain this clearance if necessary.

NOTE: If the door touches the thermostat knobs when it is closed the thermostats may not operate correctly.

FIGURE 13 MOTOR WIRING-THREE PHASE CIRCU-TROL

Temporarily remove the switch plate at bottom of control. Switches must be temporarily removed to do so.

230 VOLTS

NEUTRAL

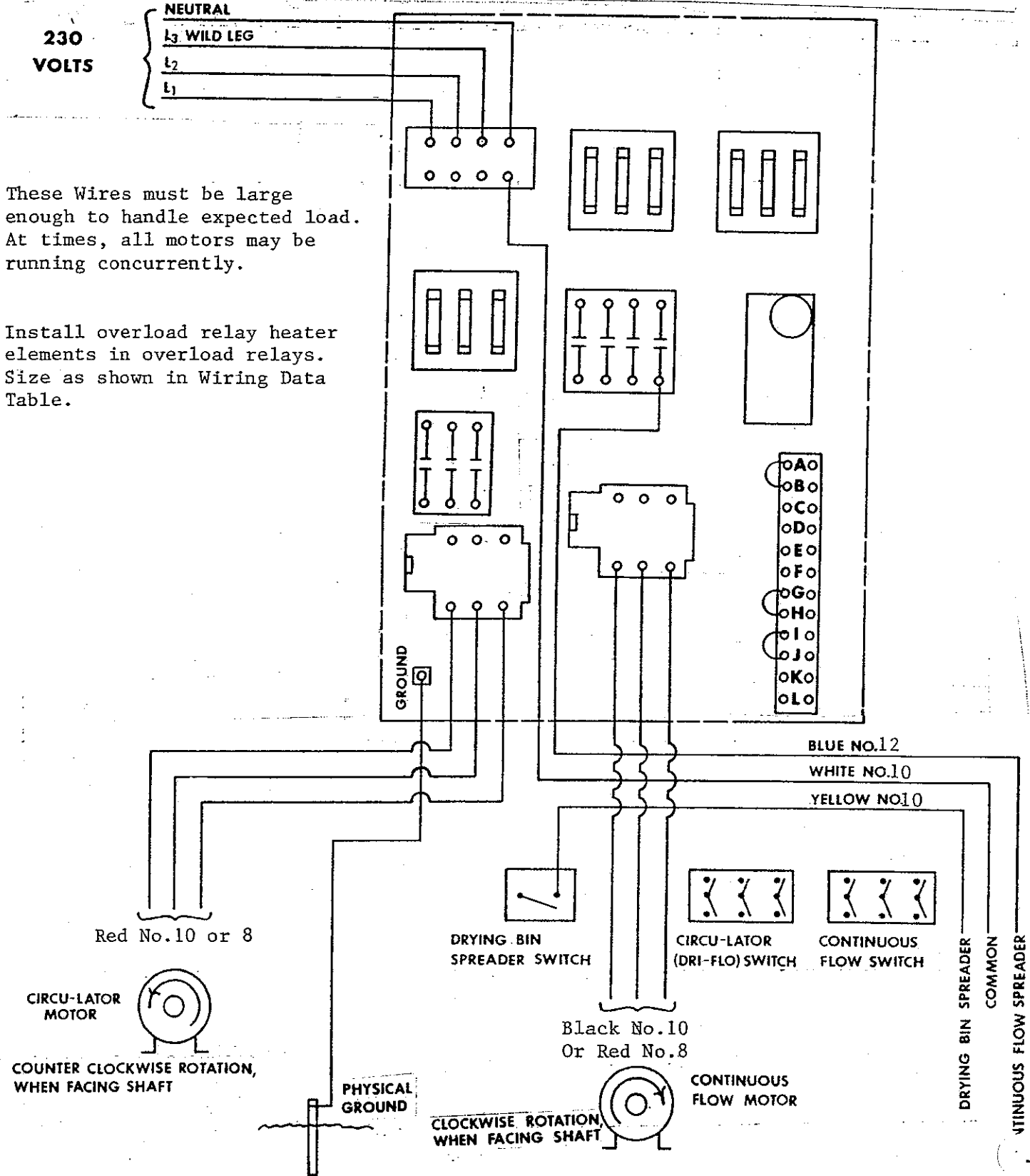
L₃ WILD LEG

L₂

L₁

These Wires must be large enough to handle expected load. At times, all motors may be running concurrently.

Install overload relay heater elements in overload relays. Size as shown in Wiring Data Table.

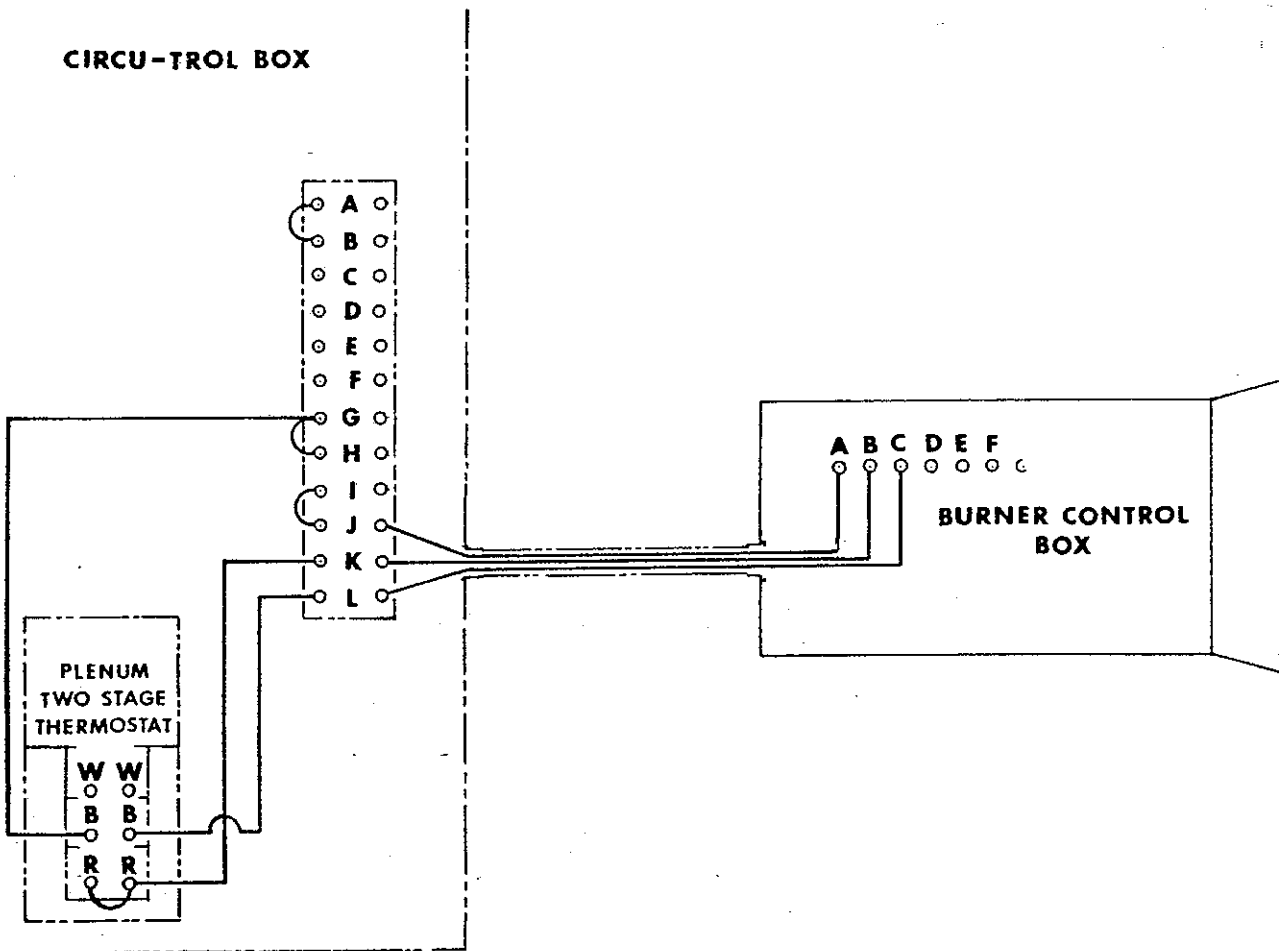


HOOKUP OF TWO STAGE THERMOSTAT FOR SHIVVERS HI-LO BURNERS

The Circutrol is designed to maintain a constant plenum temperature by automatically cycling the Shivvers burner between High and Low flames (under certain conditions the burner will also cycle to "off"). To complete the "plenum control thermostat-burner circuit" run three #16 AWG wires from the terminal strip of the main Circutrol panel to the terminal strip of the burner control box. Connect as follows:

Terminal Strip of Circutrol		Terminal Strip of Shivvers Burner
J -----	to	----- A
K -----	to	----- B
L -----	to	----- C

FIGURE 6



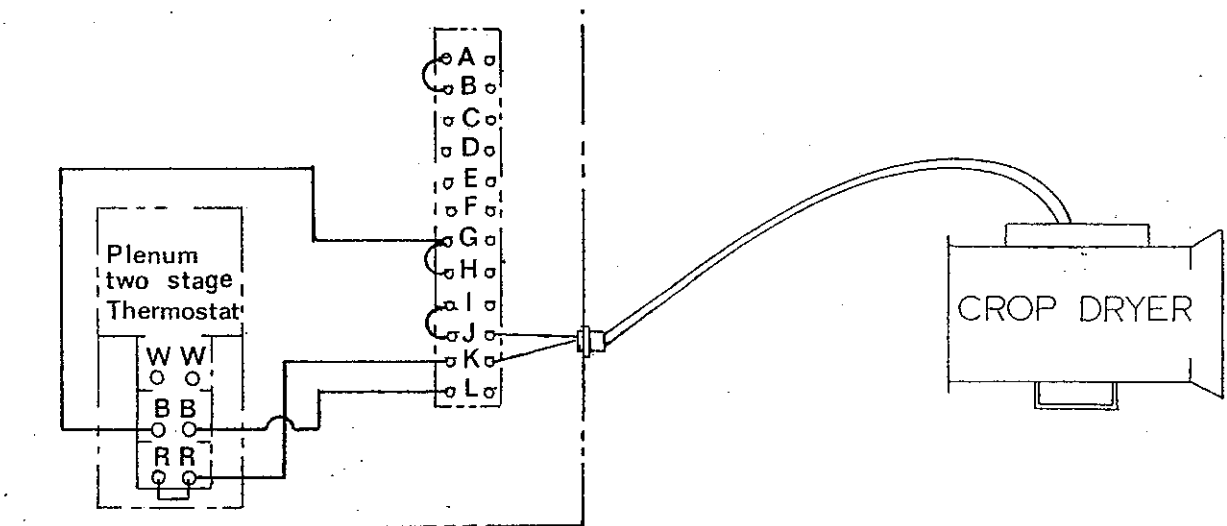
NOTE: IF YOUR INSTALLATION HAS TWO BLUE FLAME CROP DRYERS, OMIT STEP AND SEE INSTALLATION OF "HI-LO TWO BURNER CONTROL KIT."

HOOKUP OF TWO STAGE THERMOSTAT FOR ON/OFF BURNER

Dryer installations using crop dryer burners which cycle on/off instead of BLUE FLAME which cycle from high flame to low flame, should be connected as follows:

Connect two #16 AWG wires to terminals J and K (located in the lower right portion of the Circu-trol panel). The wires are then run to the crop dryer burner circuit. Most crop dryers have a provision for thermostat hookup via terminal strip, phone jack or plug in.

FIGURE 7



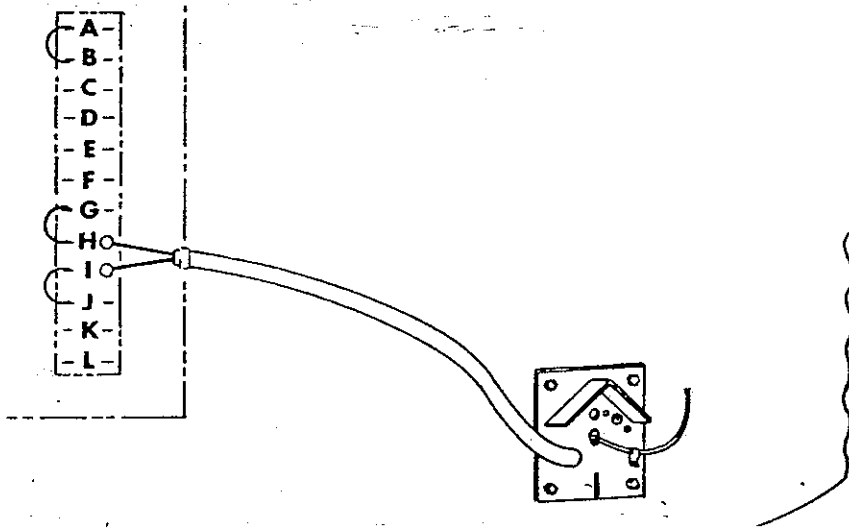
NOTE: MODULATING VALVE

When using a crop dryer equipped with a modulating valve temperature control, the Circu-trol plenum temperature control may be used as an "adjustable Hi-Limit". To utilize this additional safety feature, wire the crop dryer into the Circu-trol as shown above and adjust the plenum thermostat 20° above the plenum temperature at which the modulating valve shuts down the crop dryer. Then if the modulating valve should fail to shut down the crop dryer at the desired maximum plenum temperature, the Circu-trol plenum temperature control will shut down the fuel supply to the crop dryer. If crop dryer doesn't have a provision for a thermostat hook-up connect the two wires from J & K in series with the fuel solenoid on the burner. The modulating valve should limit the plenum temperature to a maximum of 160°F.

HOOKUP OF PLENUM PROBE HI LIMIT SWITCH

- 1) Located on the plenum temperature probe is a high limit switch designed to shut off the burner circuit if the temperature exceeds 220°. This probe is prewired with a short section of flexible conduit. To complete this circuit connect the leads from the high limit switch marked H and I to terminals H and I on terminal board in the Circuitrol.

FIGURE 8



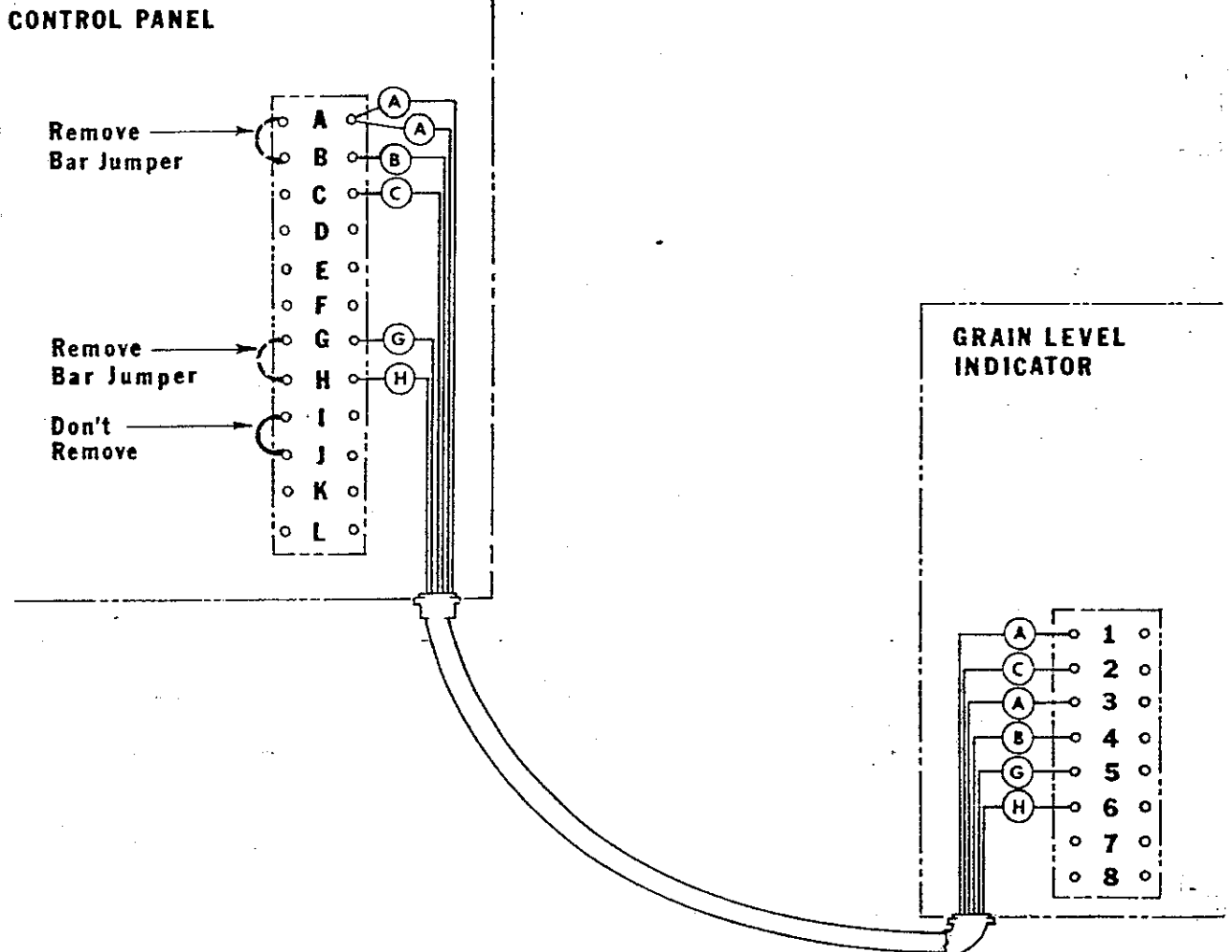
- 2) If your installation requires an Add-On Control Panel, (i.e., has an Auxiliary Auger as per Figure 1) turn to that page proceed with instructions for installing it. If not, continue.
- 3) Replace switch plate and reinstall the switches.
- 4) Install correct size fuses and overload heater elements. Consult Wiring Data Table. (Heater elements for the overload relays are available from SHIVERS.)

HOOKUP OF GRAIN LEVEL INDICATOR

- 1) Read instructions thoroughly. Then proceed as directed.
- 2) The Grain Level Indicator is designed to turn the crop drying burner(s) and the Circutrol off automatically when the drying bin is almost empty of grain.
- 3) Find terminal block lettered A-L on left side of basic Control Panel. Remove and discard bar jumper between terminals A & B and bar jumper between terminals G & H.
- 4) Connect lettered wire leads from Grain Level Indicator to the corresponding letters on the terminal strip on the main Circutrol Panel.

A	to	A
B	to	B
C	to	C
G	to	G
H	to	H

FIGURE 24



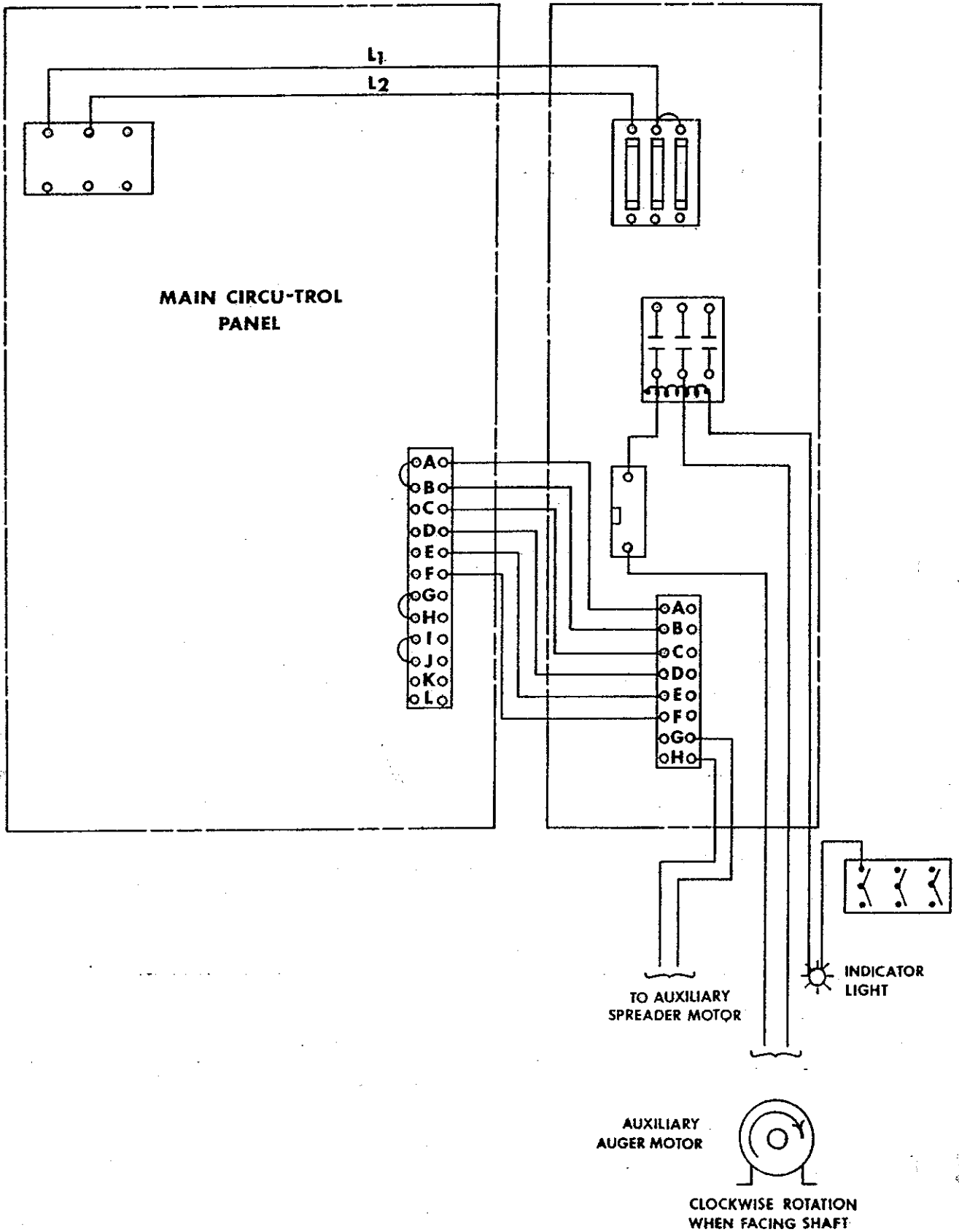
INSTALLATION OF SINGLE PHASE ADD-ON CONTROL PANEL

- 1) Read instructions thoroughly. Then proceed as directed.
- 2) Temporarily remove the switch plate at bottom of Circuitrol box.
(Must temporarily remove switches to do so.)

NOTE: If installing two or more Add-On Control Panels, do steps below in multiples.
- 3) Mount the Add-On Control Panel to the studs provided.
- 4) Refer to Figure 14. Connect the fuse block to terminals L1 and L2 which are mounted in the upper left corner of the main Circuitrol panel. These wires must be heavy enough to handle the expected load. See Wiring Data Table.
- 5) Refer to Figure 14. Connect the six (6) wires from the terminal strip of the Add-On Control Panel to the terminal strip located on the lower left side of the main Circuitrol Panel. Wire lead marked "A" goes to terminal marked "A", etc.
- 6) Disconnect the Auxiliary Auger Automatic Operation Indicator Light from its leads. Install in the door (5 holes are punched on the left side of the door for this) and reconnect the light to its leads.
- 7) Connect Auxiliary Auger Motor to the wires labeled Auxiliary Auger Motor at bottom of panel. See Figure 14. Wire for clockwise rotation facing shaft.
- 8) Connect Auxiliary Spreader Motor to terminals G and H of Add-On Control Panel.
- 9) Replace switch plate and reinstall switches.
- 10) Install correct size fuses and heater elements. Consult Wiring Data Table. Heater elements for the overload relays are available from SHIVERS.

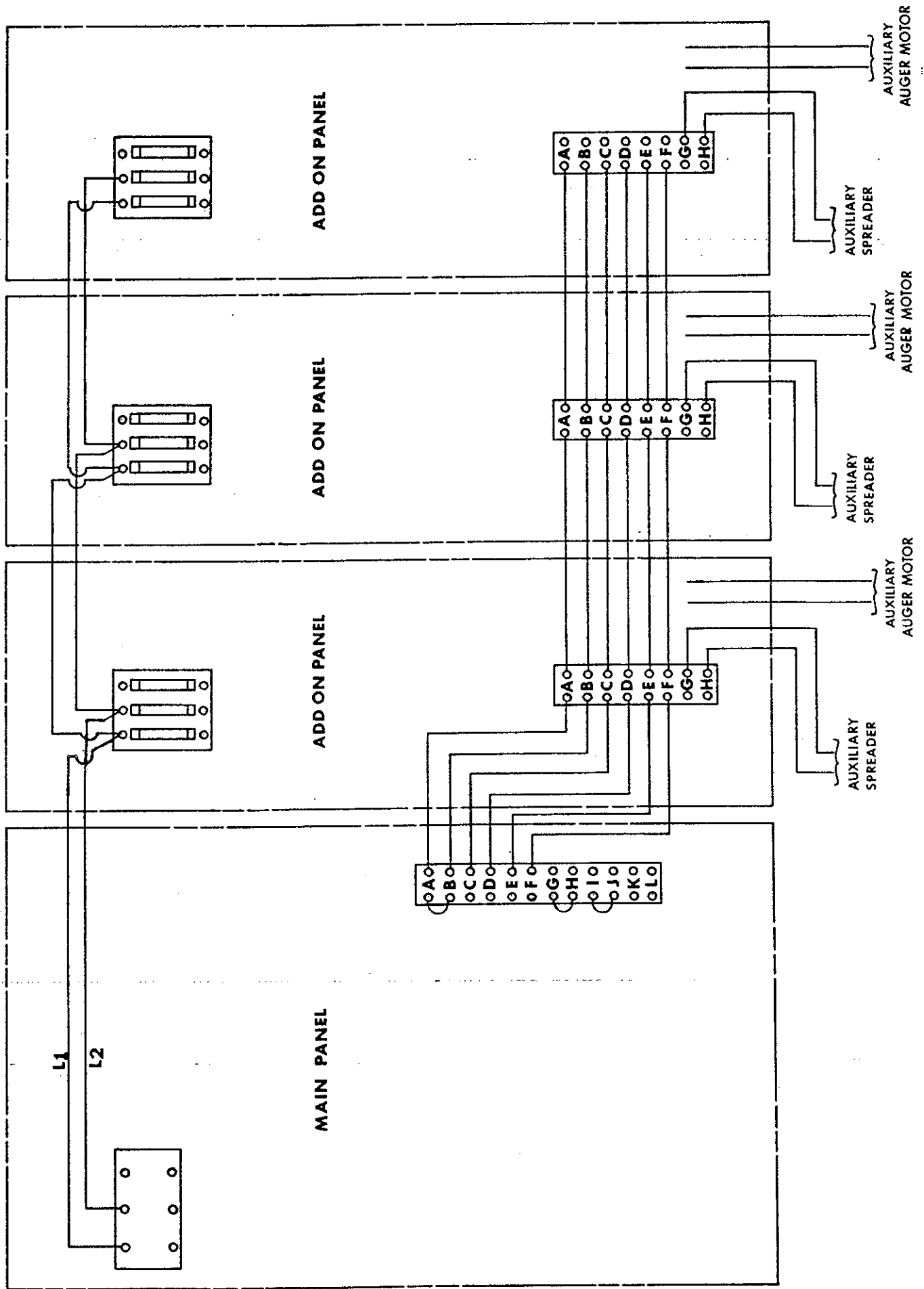
ADD ON CIRCUIT-SINGLE PHASE

FIGURE 14



MULTIPLE ADD ON INSTALLATION SINGLE PHASE

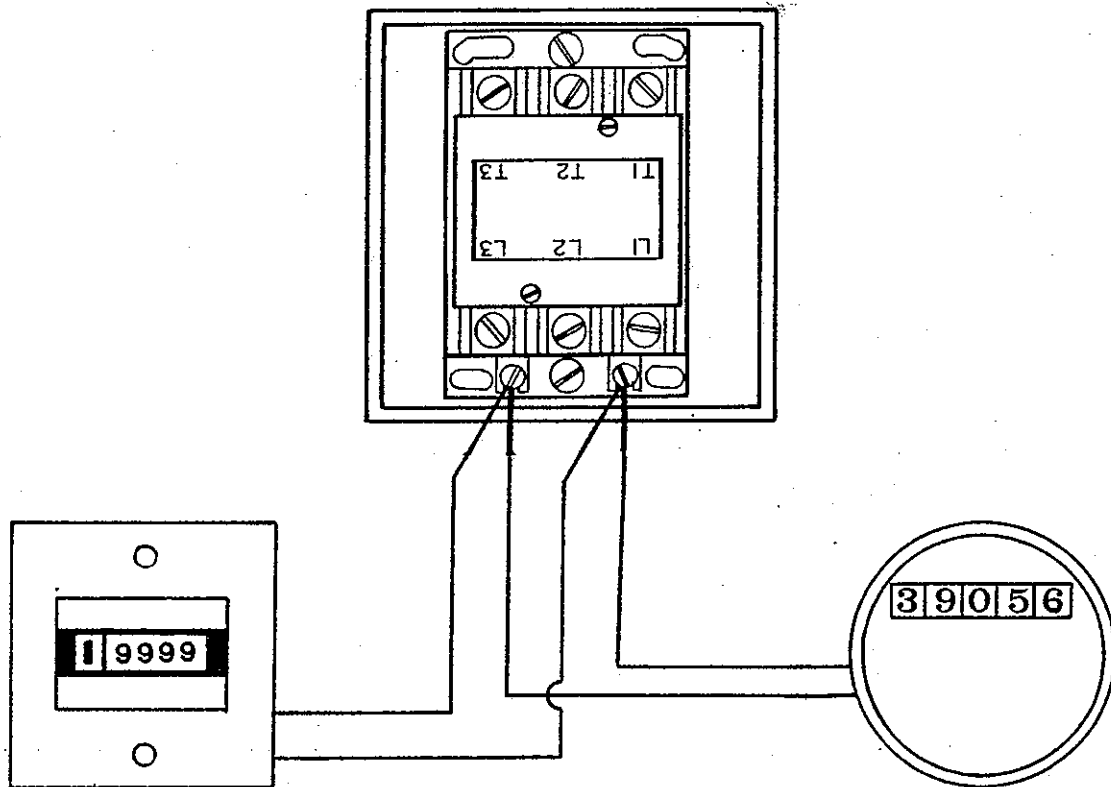
FIGURE 15



INSTALLATION OF HOUR METER AND/OR CYCLE COUNTER

- 1) Mount component in a suitable location. As of December 1982, the Deluxe Circuitrol (295 series) switch plate includes openings for both units.
- 2) Connect one lead of component to left coil terminal of Circulator (Dri-Flo) contactor. Connect the other lead to right coil terminal of Circulator (Dri-Flo) contactor. You may have to lengthen factory leads on component to reach contactor coil terminals.
- 3) The effect of these connections is that the component is energized whenever the Circulator (Dri-Flo) contactor coil is energized, and therefore registers actual running time, or number of times unit is started.

CIRCULATOR/DRI FLOW CONTACTOR



CYCLE COUNTER

HOUR METER

INSTALLATION OF THREE PHASE ADD-ON CONTROL PANEL

1) Read instructions thoroughly. Then proceed as directed.

2) Temporarily remove the switch plate at bottom of Circuitrol box. (Must temporarily remove switches to do so.)

NOTE: If installing two or more Add-On Control Panels, do steps below in multiples.

3) Mount the Add-On Control Panel to the studs provided.

4) Refer to Figure 16. Connect the fuse block to terminals L1, L2 and L3 AS SHOWN (L3 IS THE WILD LEG) which are mounted in the upper left corner of the main Circuitrol panel. These wires must be heavy enough to handle the expected load. See Wiring Data Table.

5) Refer to Figure 16. Connect the six (6) wires from the terminal strip of the Add-On Control Panel to the terminal strip located on the lower left side of the main Circuitrol Panel. Wire lead marked "A" goes to terminal marked "A", etc.

6) Disconnect the Auxiliary Auger Automatic Operation Indicator Light from its leads. Install in the door (5 holes are punched on the left side of the door for this) and reconnect the light to its leads.

7) Connect Auxiliary Auger Motor to the wires labeled Auxiliary Auger Motor at bottom of panel. See Figure 16. Wire for clockwise rotation facing shaft.

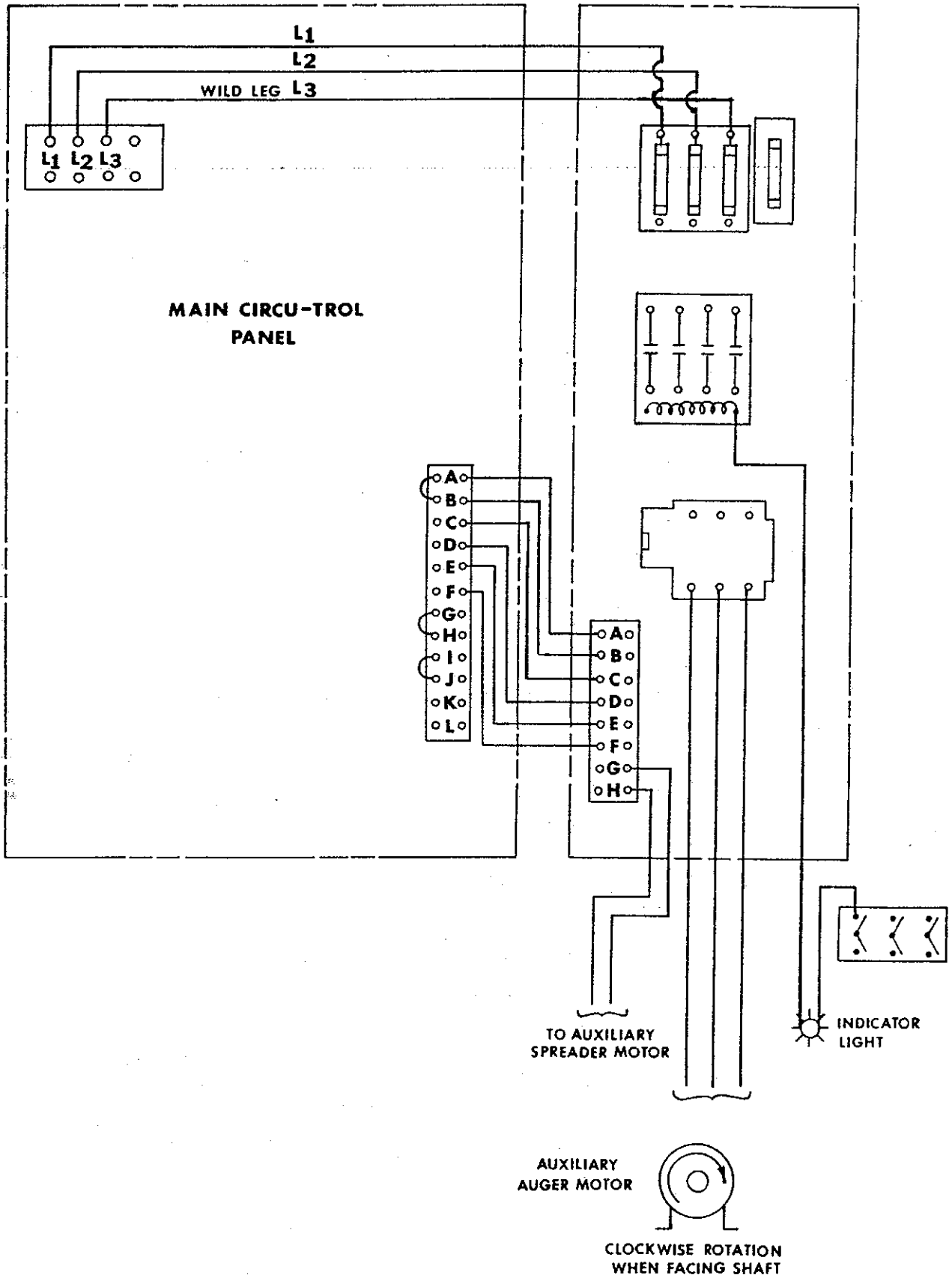
8) Connect Auxiliary Spreader Motor to terminals G and H of Add-On Control Panel terminal strip.

9) Replace switch plate and reinstall the switches.

10) Install correct fuses and heater elements. Consult Wiring Data Table. Heater elements for the overload relays are available from SHIVVERS.

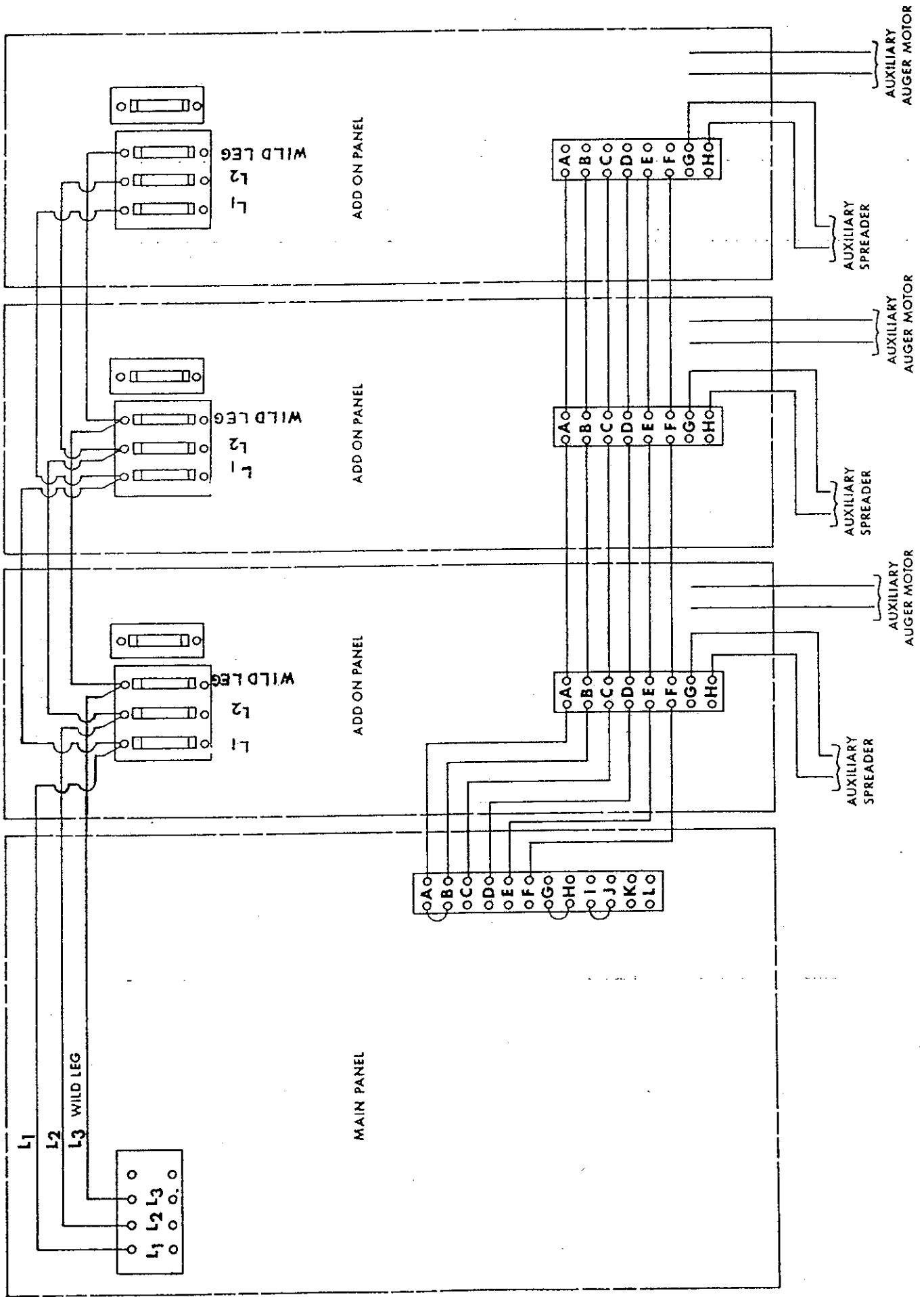
ADD ON CIRCUIT-THREE PHASE

FIGURE 16



MULTIPLE ADD ON INSTALLATION-THREE PHASE

FIGURE 17



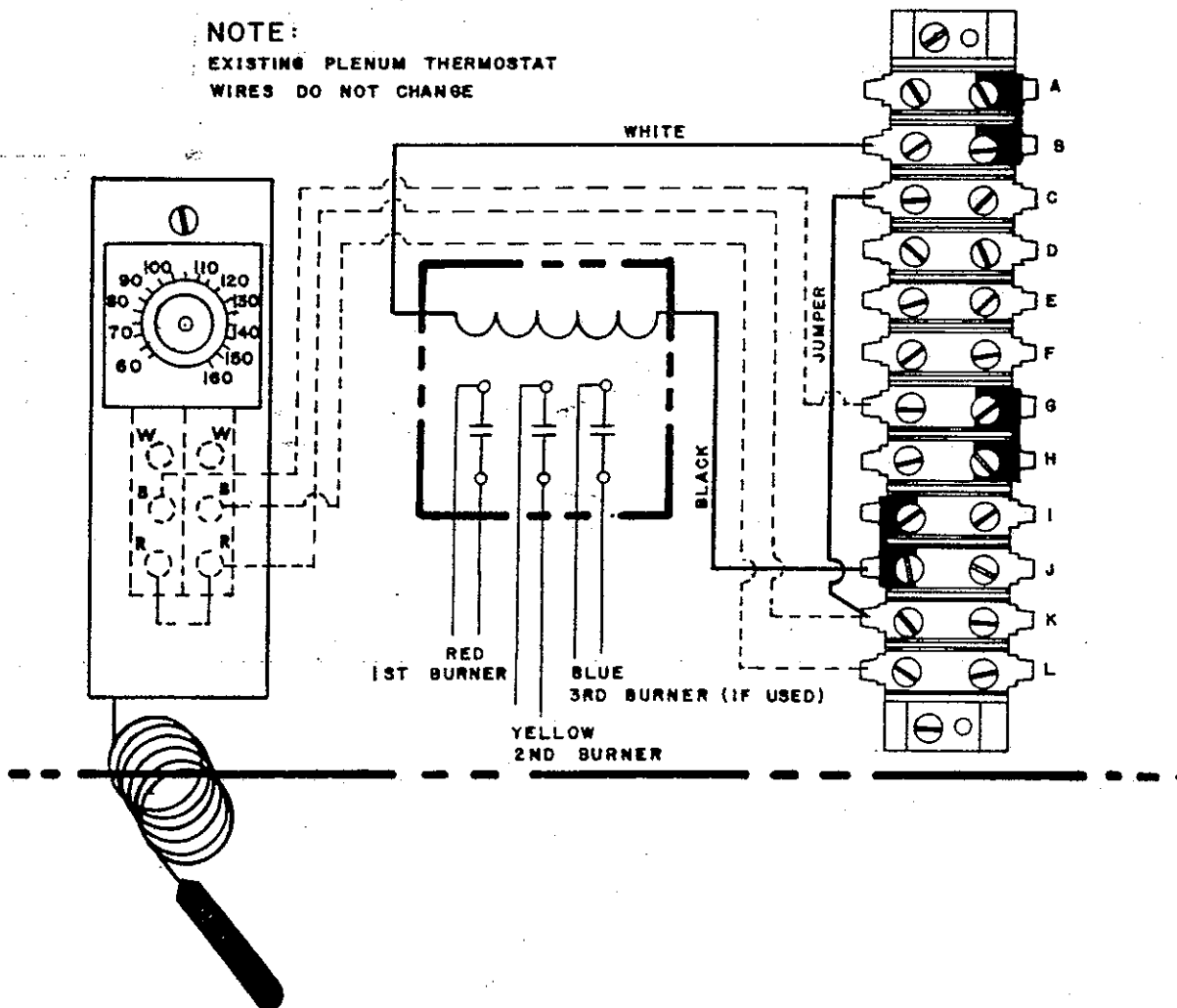
INSTALLING THE THREE BURNER CONTROL KIT

FOR CROP DRYERS OTHER THAN BLUE FLAME

- 1) Mount the Three Burner relay to the control panel using the 10/32 screw.
- 2) Connect the jumper wire provided between terminals C and K on the terminal strip located on the main circuit control panel. (See Figure 26)
- 3) Connect one of the white leads from the relay to terminal B and the other black lead to terminal J.
- 4) Connect pair of red wires to control circuit of Dryer No. 1.
- 5) Connect pair of yellow wires to control circuit of Dryer No. 2.
- 6) Connect pair of blue wires to control circuit of Dryer No. 3.

FIGURE 26

NOTE:
EXISTING PLENUM THERMOSTAT
WIRES DO NOT CHANGE



GRAIN HI-LIMIT CONTROL BOX

This control box is required when two Blue Flame Dryers are used on a bin. It must be "on" for the Blue Flame Dryers to operate.

It will automatically turn both drying fans off when:

- A. Grain temperature exceeds 200⁰ - hazardous condition.
- B. Electrical power to this box is interrupted.

Check your drying bin carefully before resetting this device.

Wire the Grain Hi-Limit Control Box as follows:

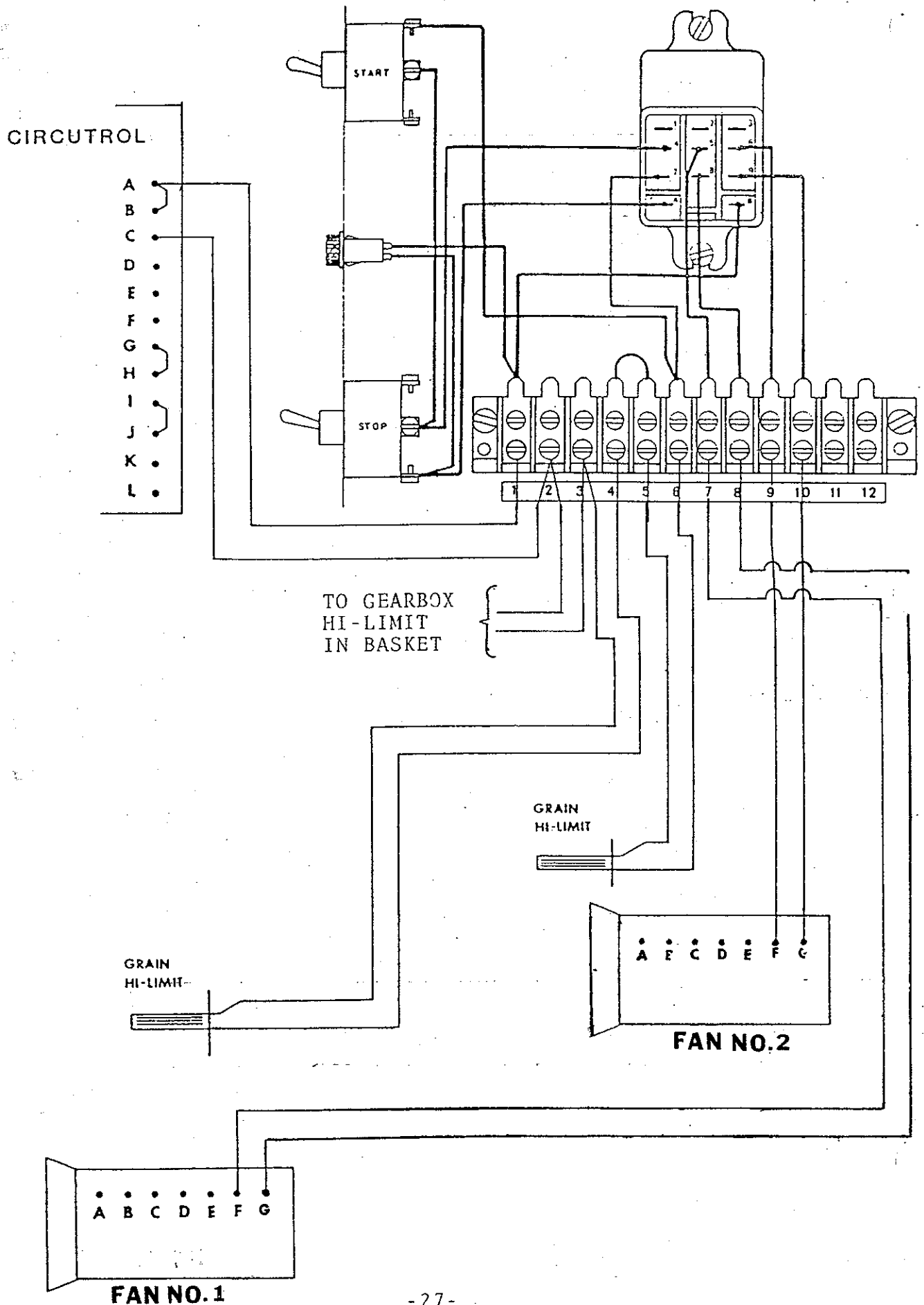
GRAIN HI-LIMIT CONTROL BOX

CONNECT TO:

Terminal 1	Terminal A, Circu-Trol Panel
Terminal 2	Terminal C, Circu-Trol Panel
Terminal 2	Gearbox Hi-Limit in Basket
Terminal 3	Grain Hi-Limit, Fan Number One
Terminal 3	Gearbox Hi-Limit in Basket
Terminal 4	Grain Hi-Limit, Fan Number One
Terminal 5	Grain Hi-Limit, Fan Number Two
Terminal 6	Grain Hi-Limit, Fan Number Two
Terminal 7	Terminal F, Fan Number One
Terminal 8	Terminal G, Fan Number One
Terminal 9	Terminal F, Fan Number Two
Terminal 10	Terminal G, Fan Number Two
Terminal 11	Not Used
Terminal 12	Not Used

COMPLETED WIRING, GRAIN HI-LIMIT CONTROL BOX

FIGURE 21



INSTALLATION OF HI-LO TWO BURNER CONTROL KIT
(REQUIRED FOR TWO SHIVVERS HI-LOW BURNERS)

If your installation has two Blue Flame Dryers, a Hi-Lo Two Burner Control Kit (HL-TBCK) is required. This is a relay circuit which permits the two crop dryer burners to cycle simultaneously.

1. Mount the Hi-Lo Two Burner Control Kit with two 10-32 screws. There are two tapped holes located to the left of the terminal strip of the main Circu-Trol panel.

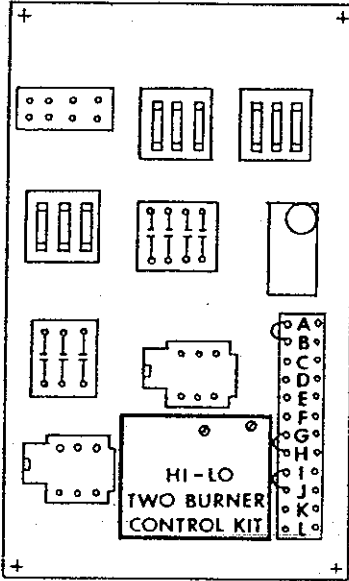
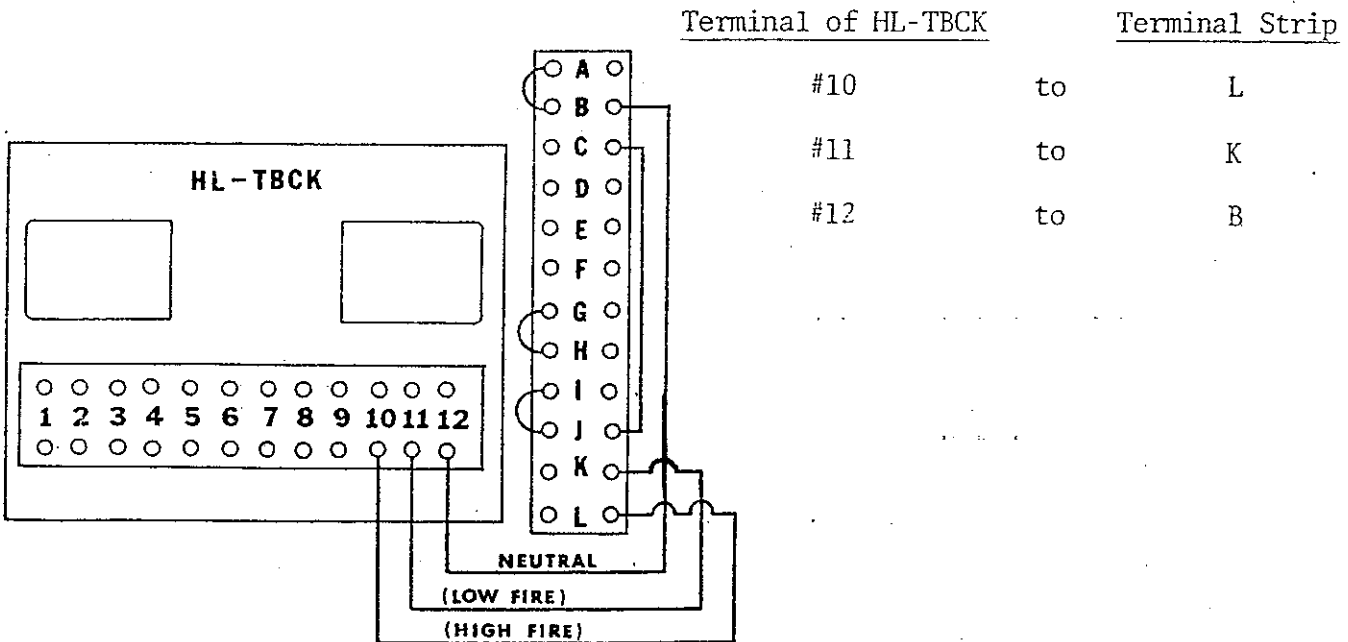


FIGURE 18

Mount HL-TBCK left of terminal strip with (2) 10-32 screws.

2. Connect black jumper wire between terminals C and J on terminal strip of Circu-Trol.
3. Connect wires from the HL-TBCK to the terminal strip of Circu-Trol as follows:



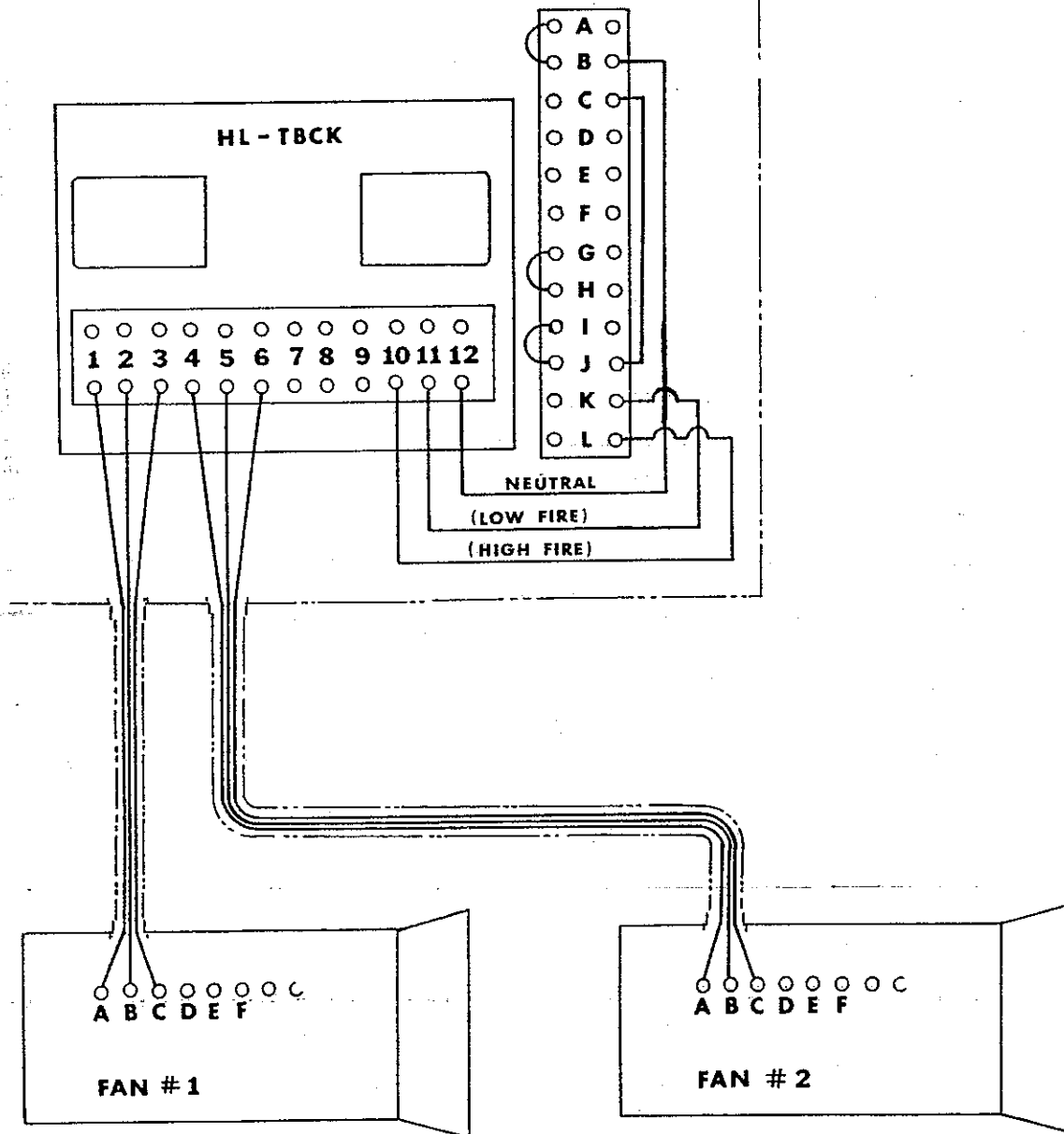
4. Connect three #16 AWG wires from each fan control box to the Hi-Lo Two Burner Control Kit. Attach to terminal strips as follows:

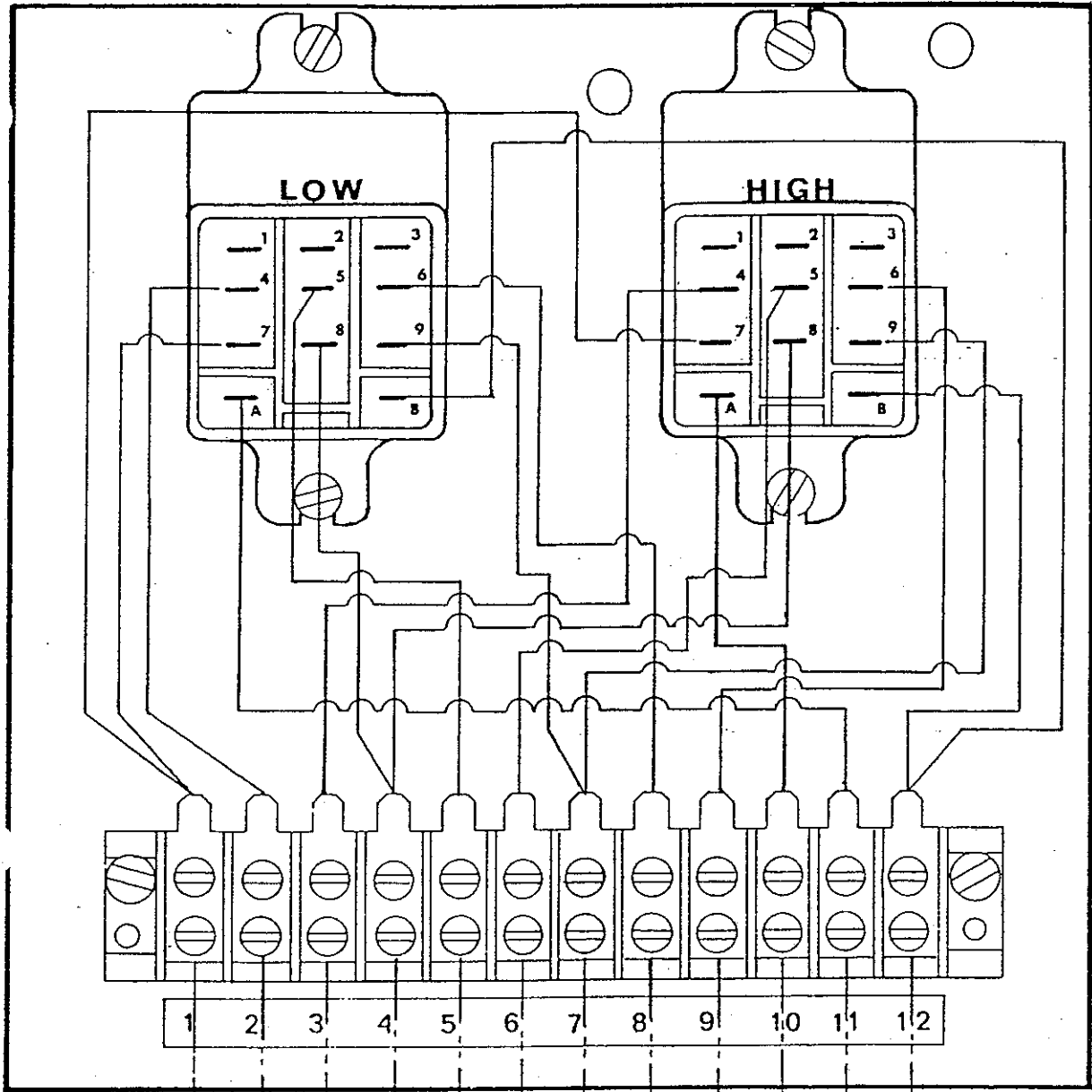
TERMINAL OF HL-TBCK

1	to	A	} Fan #1 Terminal Strip
2	to	B	
3	to	C	
4	to	A	} Fan #2 Terminal Strip
5	to	B	
6	to	C	
10	to	L	} Main Circuit Terminal Strip
11	to	K	
12	to	B	

MAIN CIRCUIT PANEL

FIGURE 19



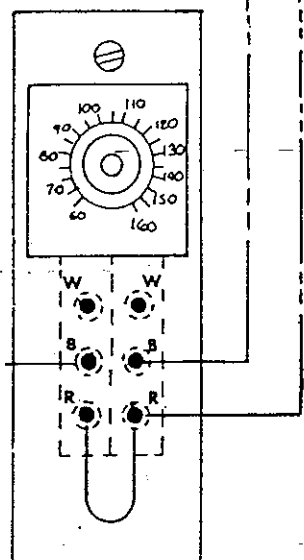


A B C
A B C
A B C
L K B
----- NEUTRAL

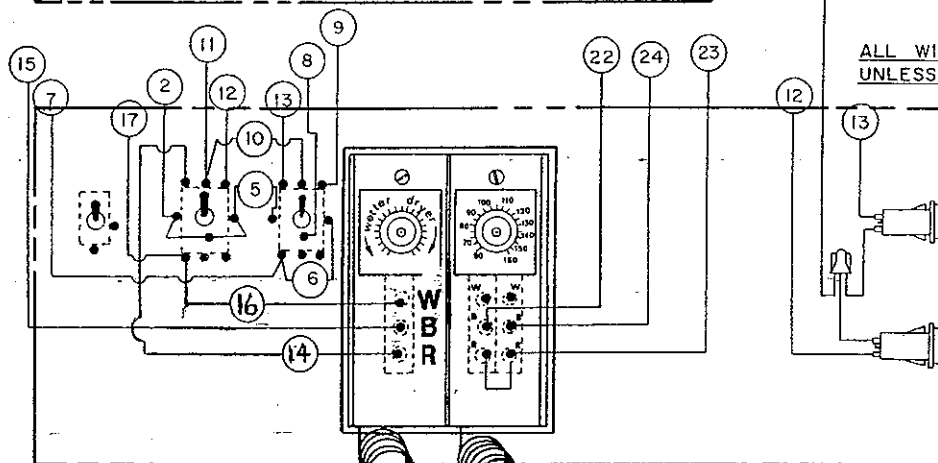
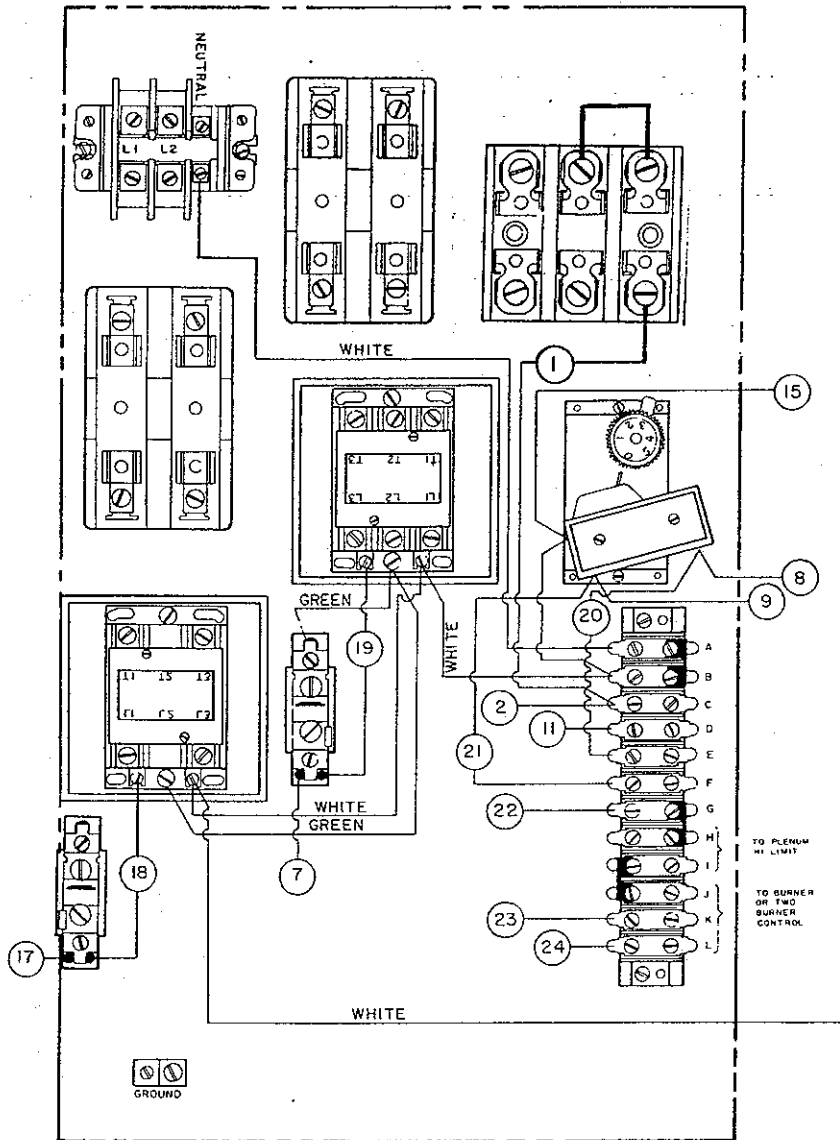
BURNER 1 BURNER 2 BURNER 3 (OPTIONAL)

TERMINALS B,C,J,K,L,I,G,&H ARE
 IN DELUXE CIRCUITROL
 ONLY !

120V FROM FUSE ----- C - J ----- I
 PLENUM HI LIMIT ----- H
 GRAIN LEVEL INDICATOR ----- G



IØ 295 A-001 A MAIN PANEL CONTROL CIRCUIT



ALL WIRES BLACK
UNLESS NOTED

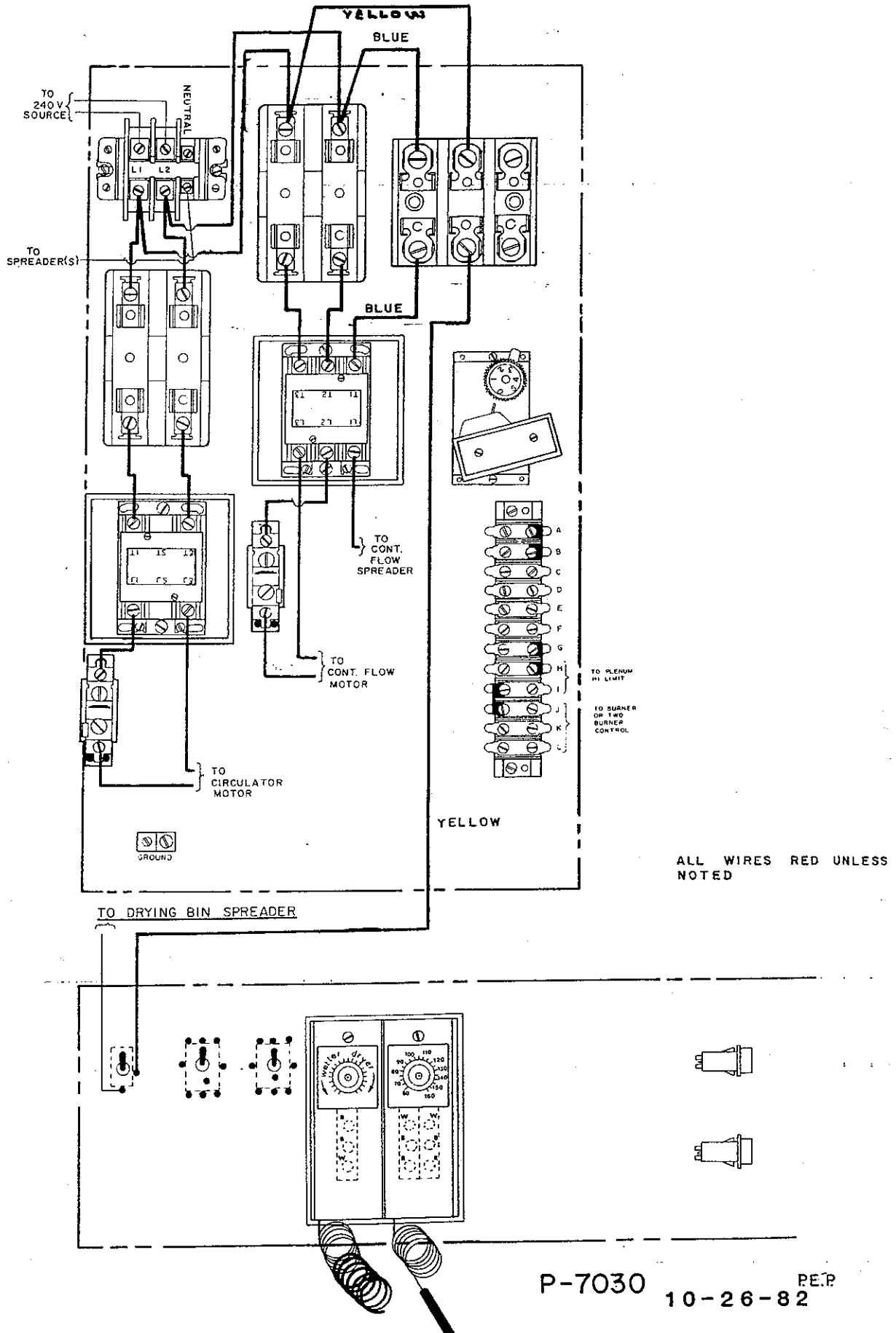
**NOTE: THE POSITION OF
TERMINALS R&W MAY BE
REVERSED ON EARLIER
UNITS.**

NOTE:
Grain Thermostat must be
connected as follows:
Wire No. 14 to Terminal R-
Wire No. 15 to Terminal B
Wire No. 15 to Terminal W

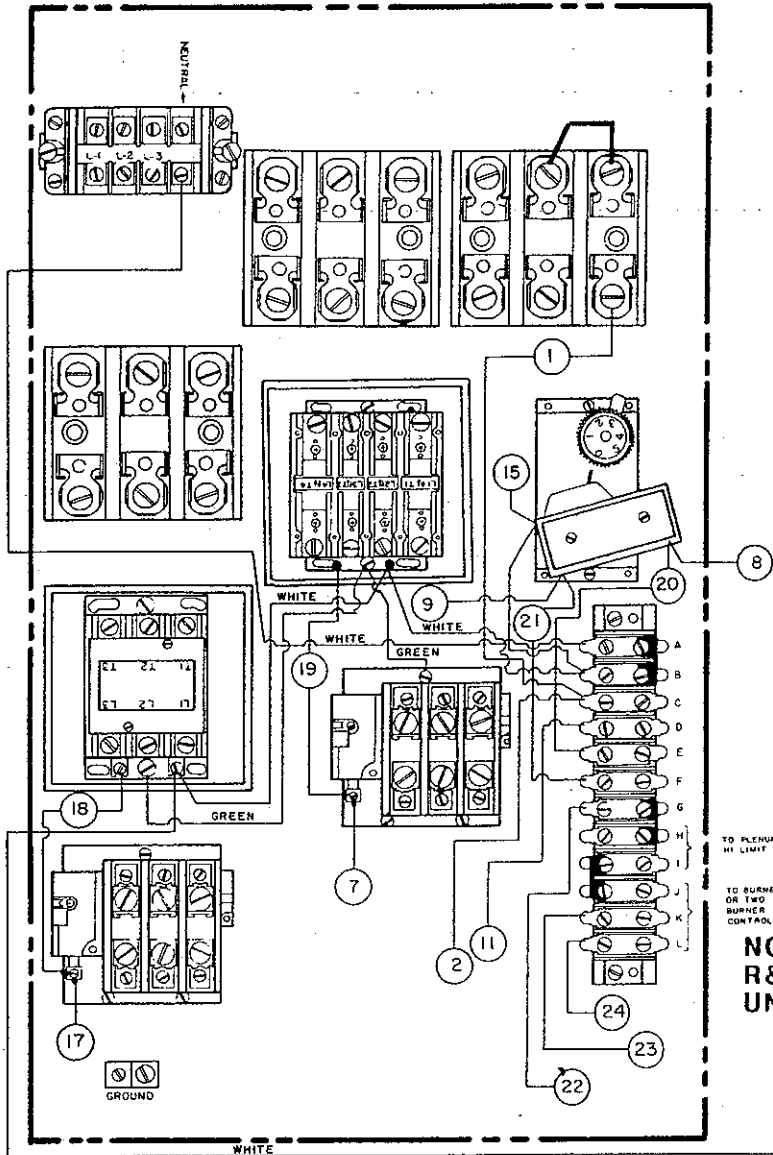
P-7319

10-26-82 P.E.P.

1 ϕ 295A-001A MAIN PANEL MOTOR CIRCUIT



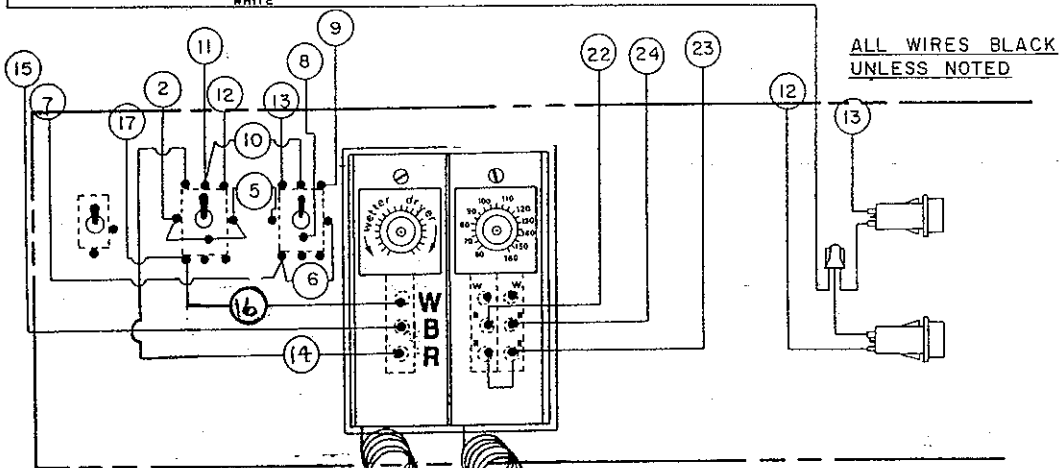
3 ϕ 295B-001A MAIN PANEL CONTROL CIRCUIT



TO FLENUM
HI LIMIT

TO BURNER
OR TWO
BURNER
CONTROL

NOTE: THE POSITION OF TERMINALS R & W MAY BE REVERSED ON EARLIER UNITS.



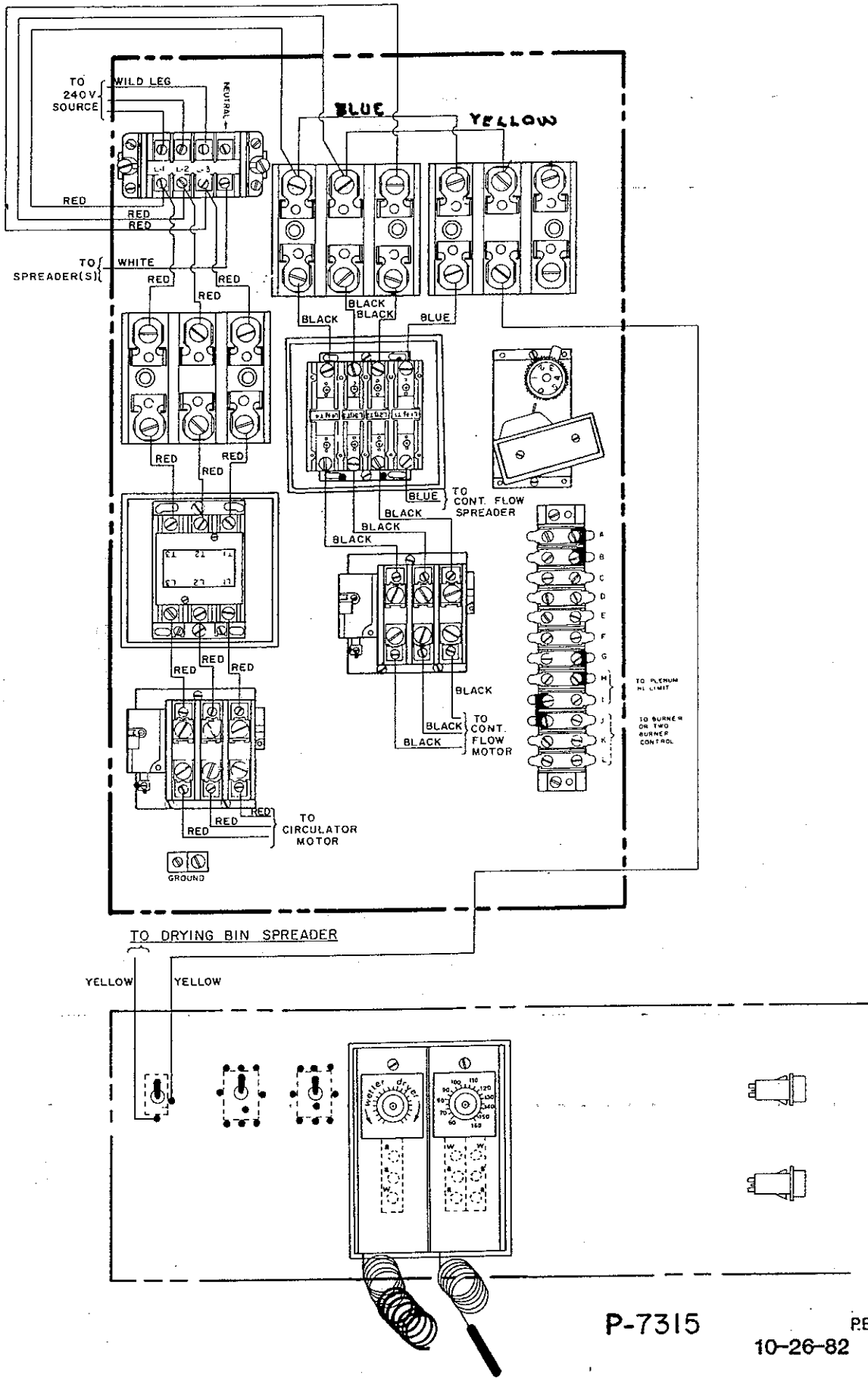
ALL WIRES BLACK
UNLESS NOTED

NOTE:
Grain Thermostat must be connected as follows:
Wire No. 14 to Terminal R
Wire No. 15 to Terminal B
Wire No. 16 to Terminal W

P-7321

P.E.P.
10-26-82

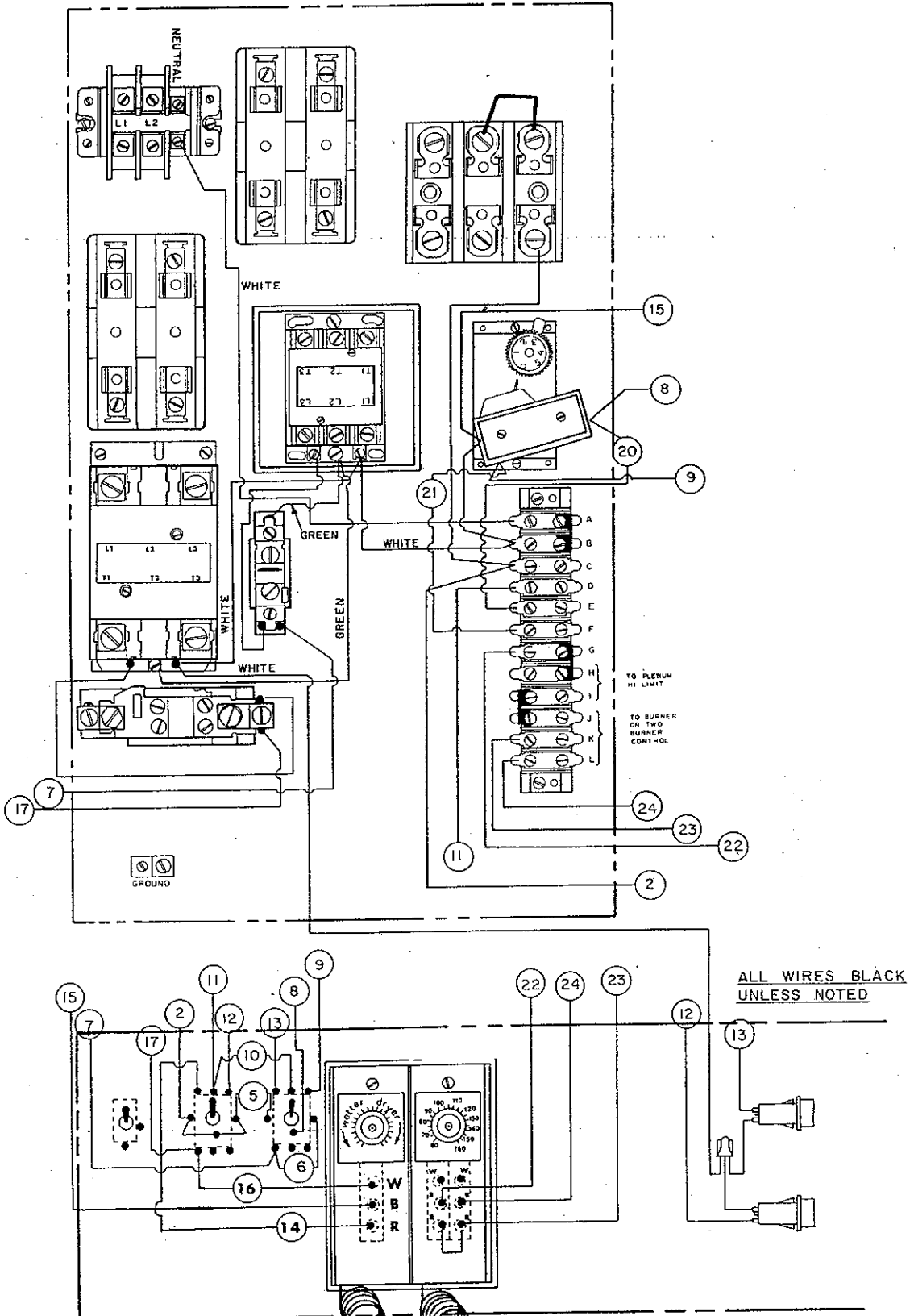
3 φ 295B-001A MAIN PANEL MOTOR CIRCUIT



P-7315

10-26-82 R.E.P.

1Ø 295C-001A MAIN PANEL CONTROL CIRCUIT

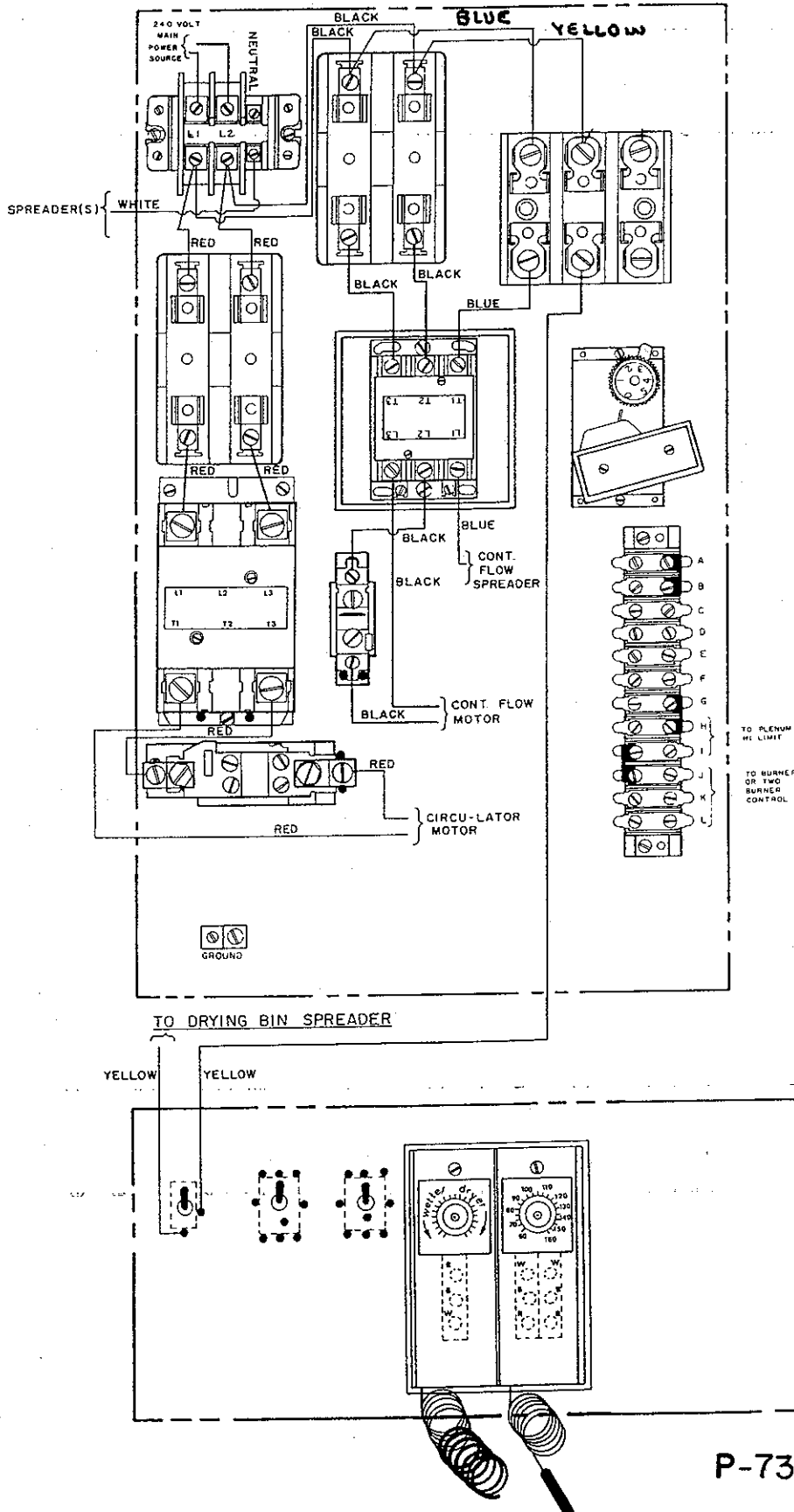


NOTE:
Grain Thermostat must be connected as follows:
Wire No. 14 to Terminal R
Wire No. 15 to Terminal B
Wire No. 16 to Terminal W

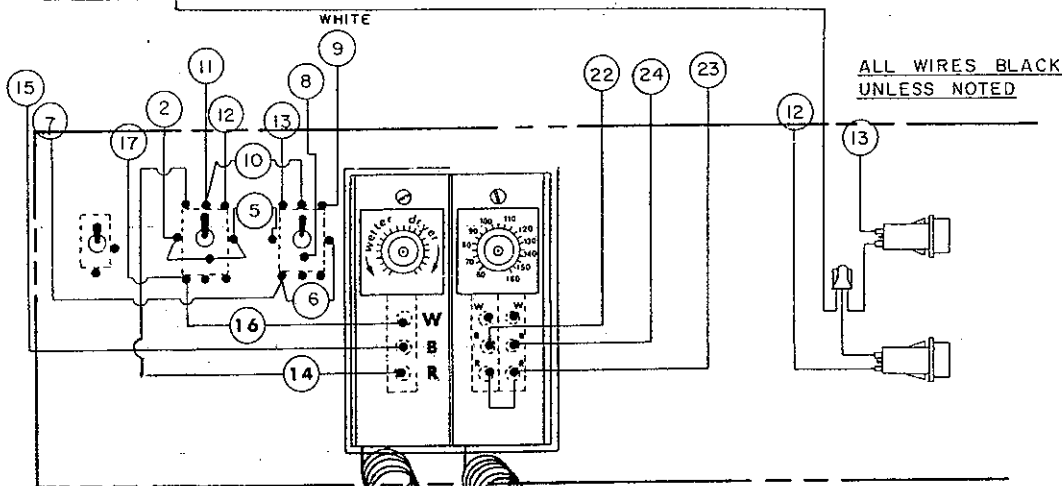
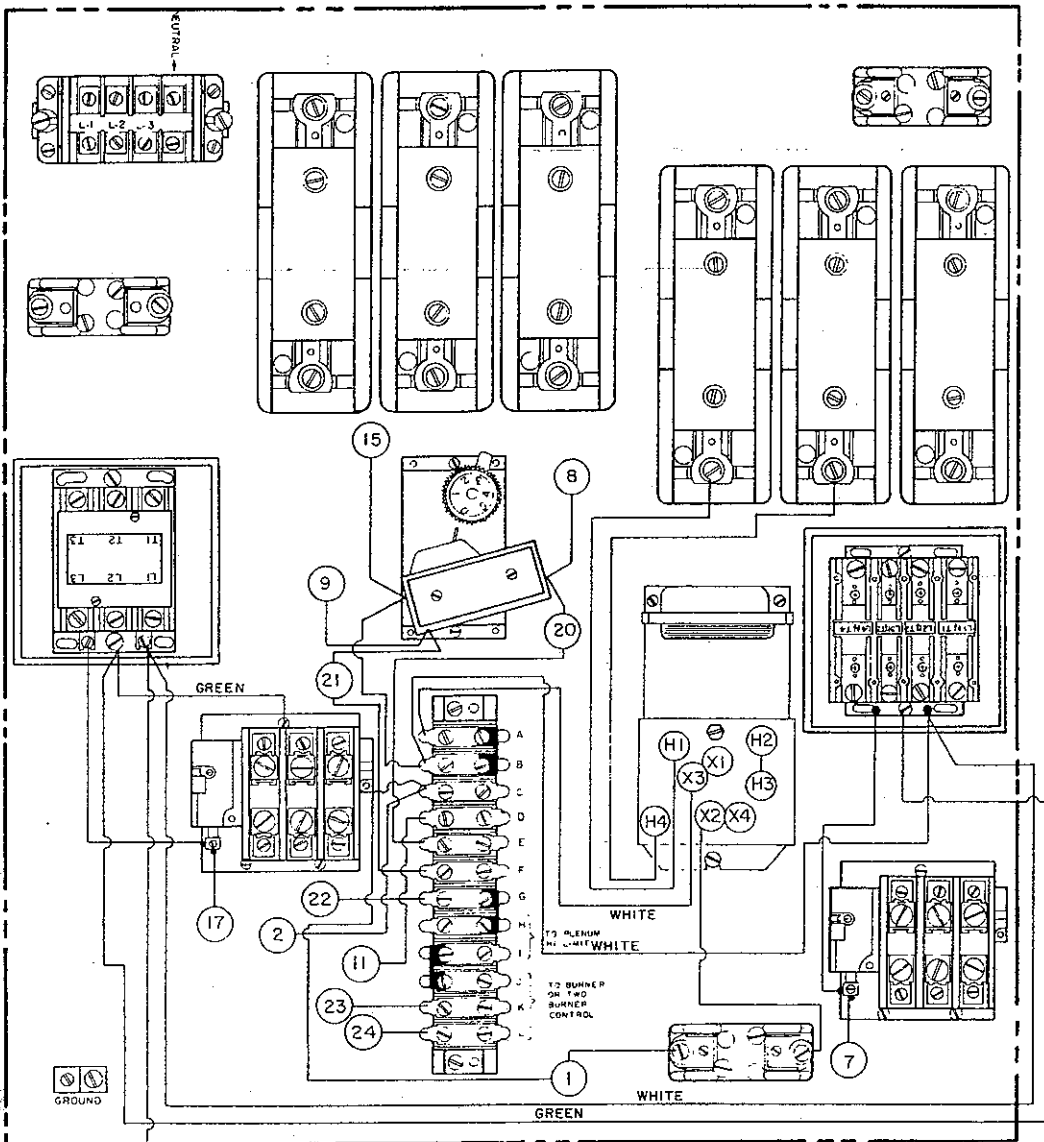
P-7331 10-26-82 P.E.P.

NOTE: THE POSITION OF TERMINALS R & W MAY BE REVERSED ON EARLIER UNIT!

1φ 295C-001A MAIN PANEL MOTOR CIRCUIT



3 ϕ 295D-001A MAIN PANEL CONTROL CIRCUIT

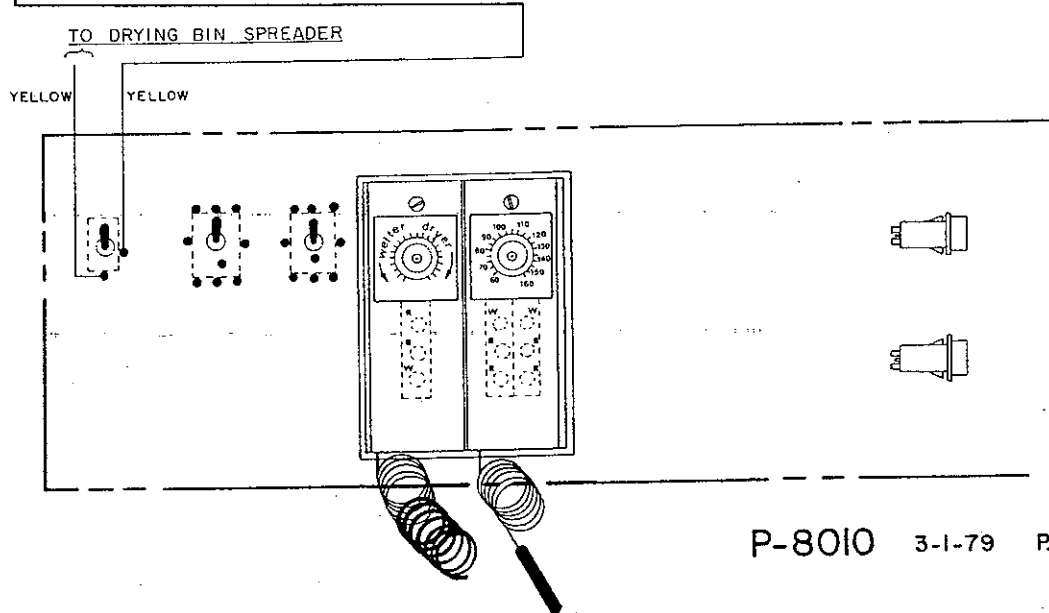
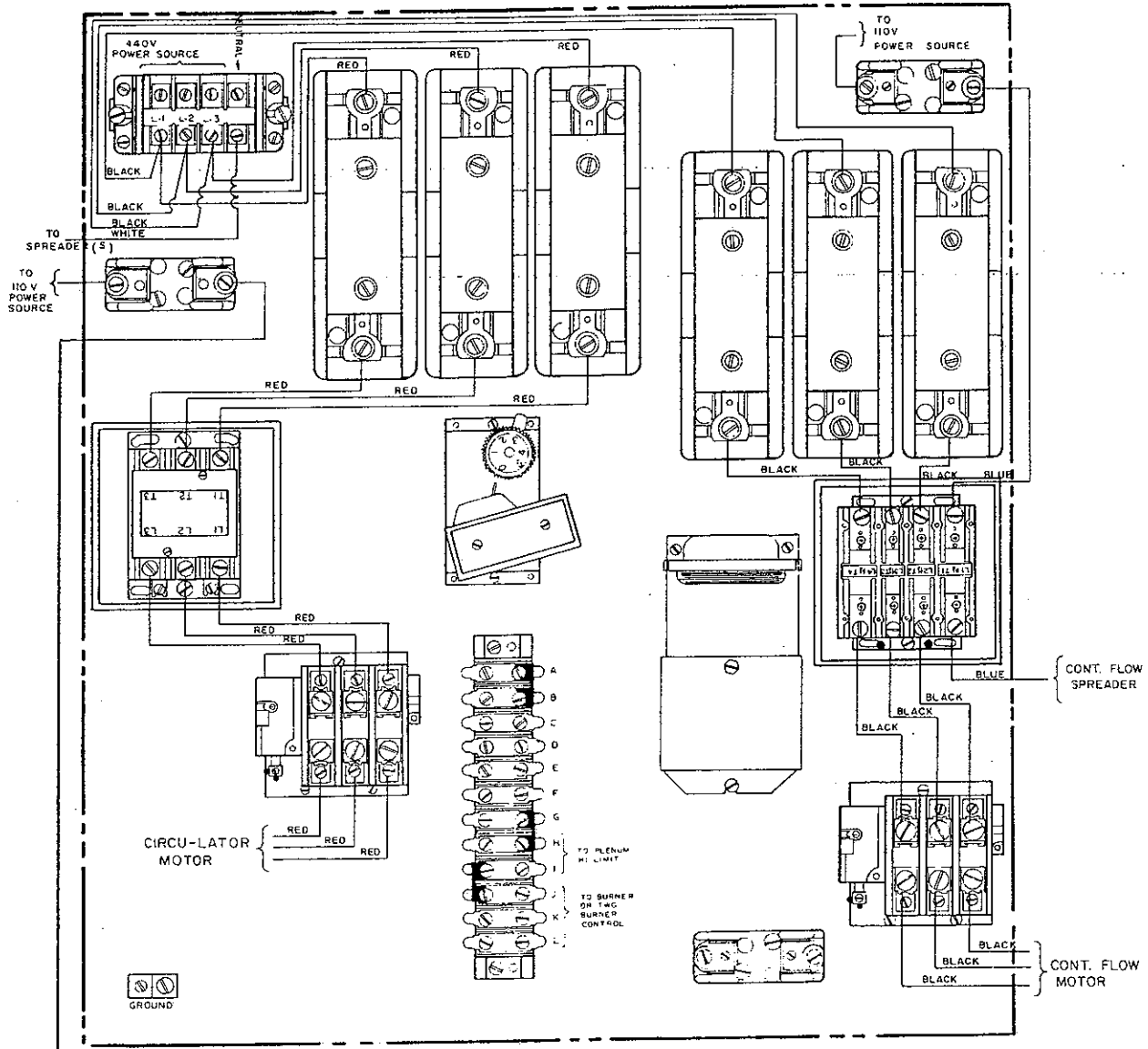


NOTE:
Grain Thermostat must be connected as follows:
Wire No. 14 to Terminal R
Wire No. 15 to Terminal B
Wire No. 16 to Terminal W

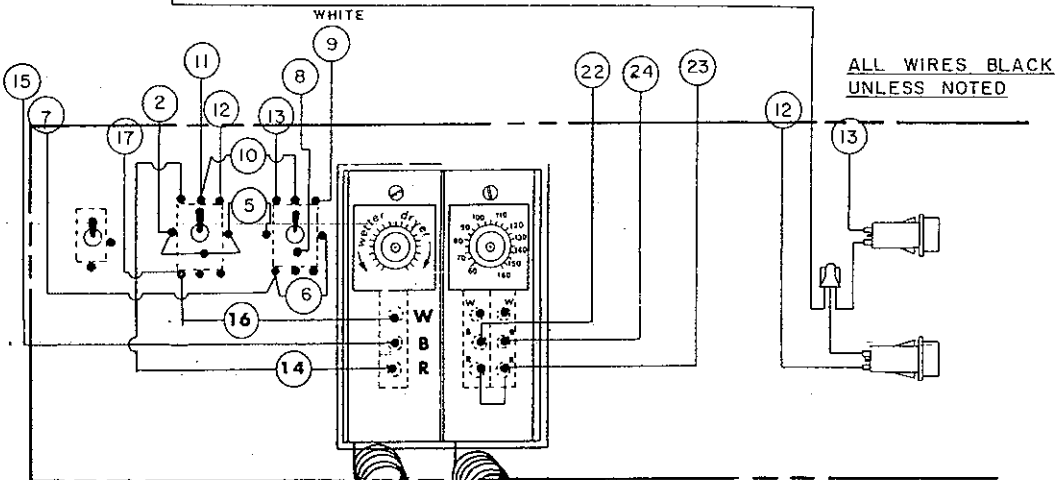
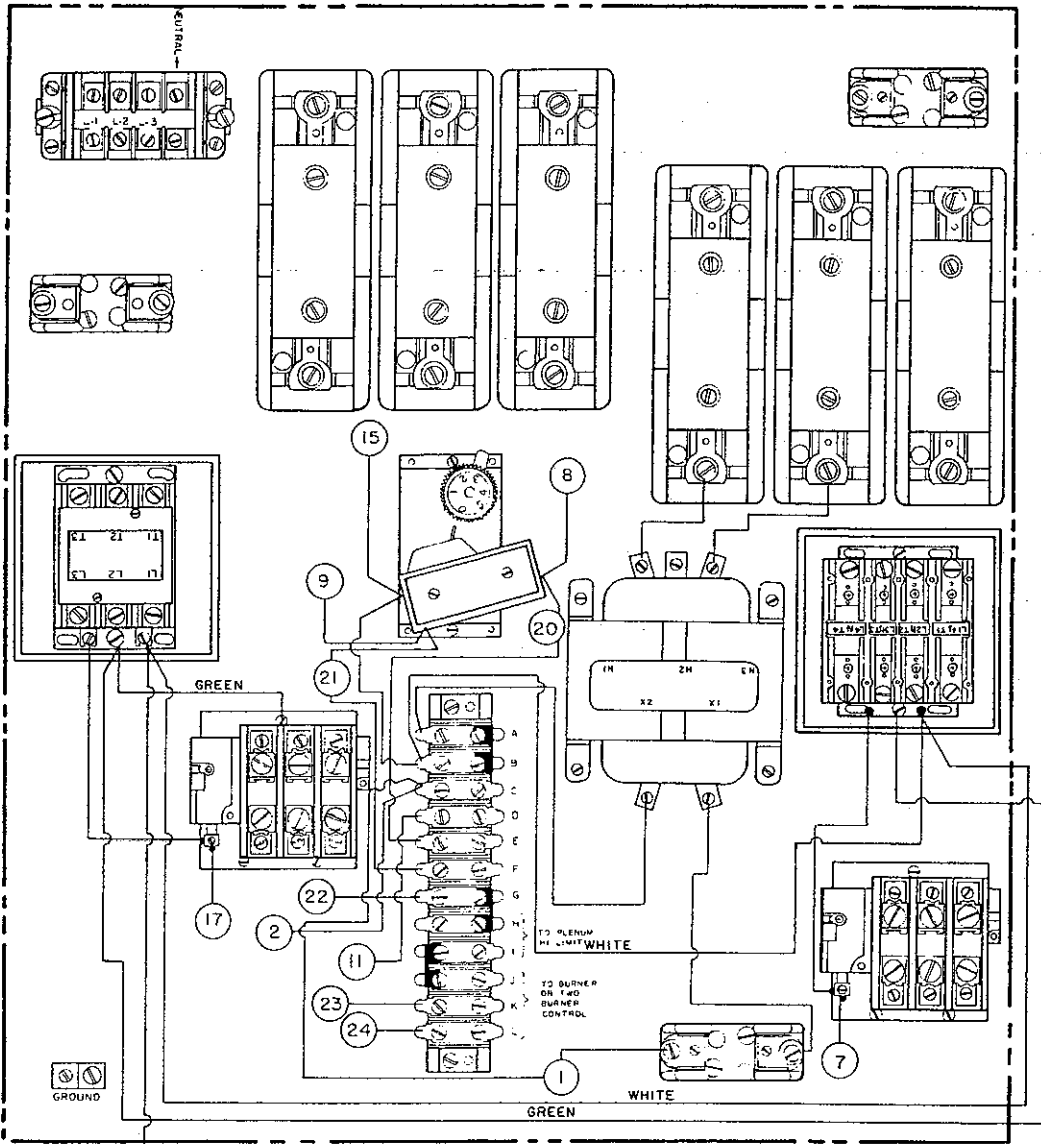
P-7448 3-1-79 P.E.P

NOTE: THE POSITION OF TERMINALS R & W MAY BE REVERSED ON EARLIER UNITS.

3 ϕ 295D-001A MAIN PANEL MOTOR CIRCUIT



3 ϕ 295E-001A MAIN PANEL CONTROL CIRCUIT

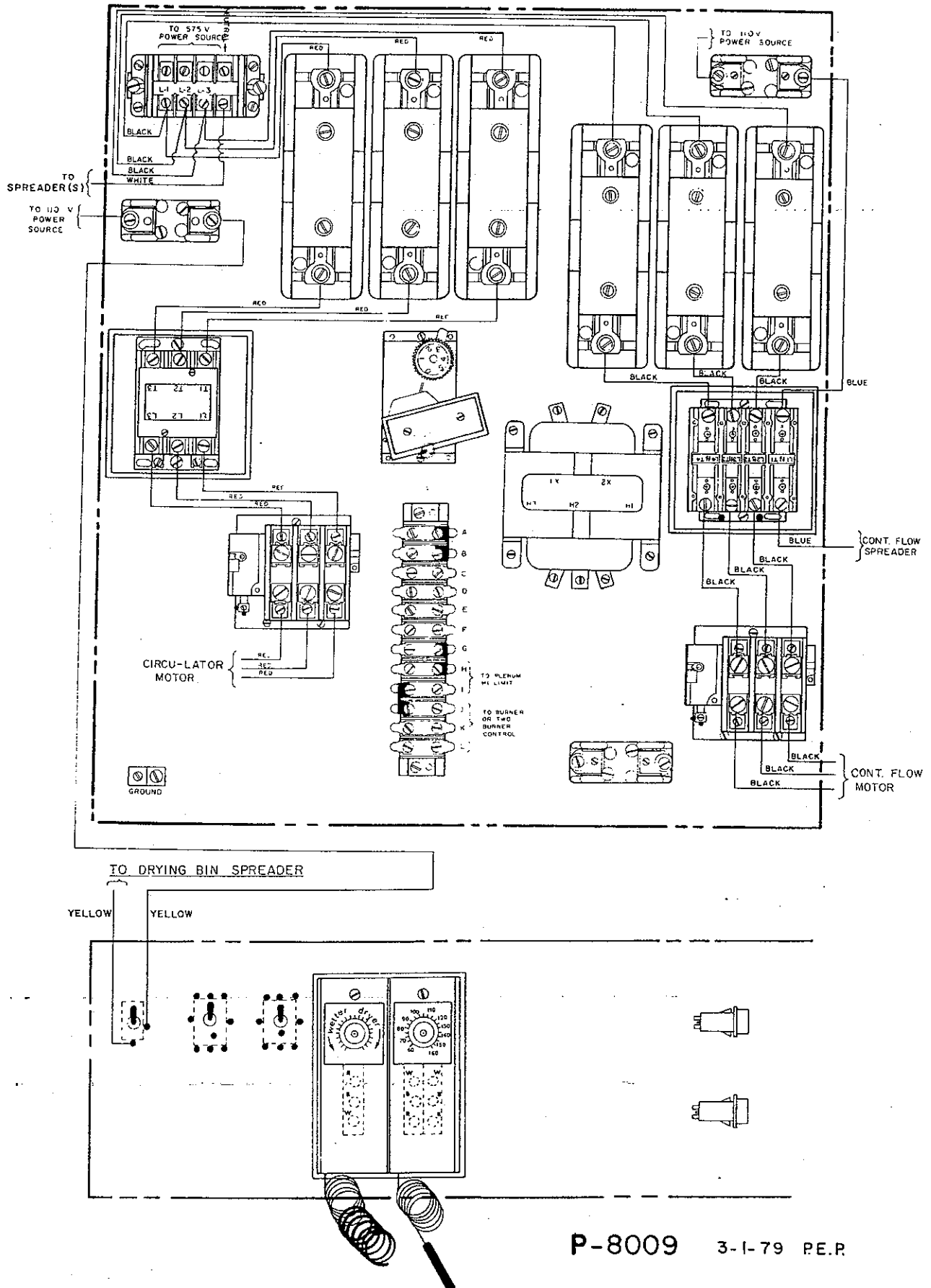


NOTE:
Grain Thermostat must be connected as follows:
Wire No. 14 to Terminal R
Wire No. 15 to Terminal B
Wire No. 16 to Terminal W

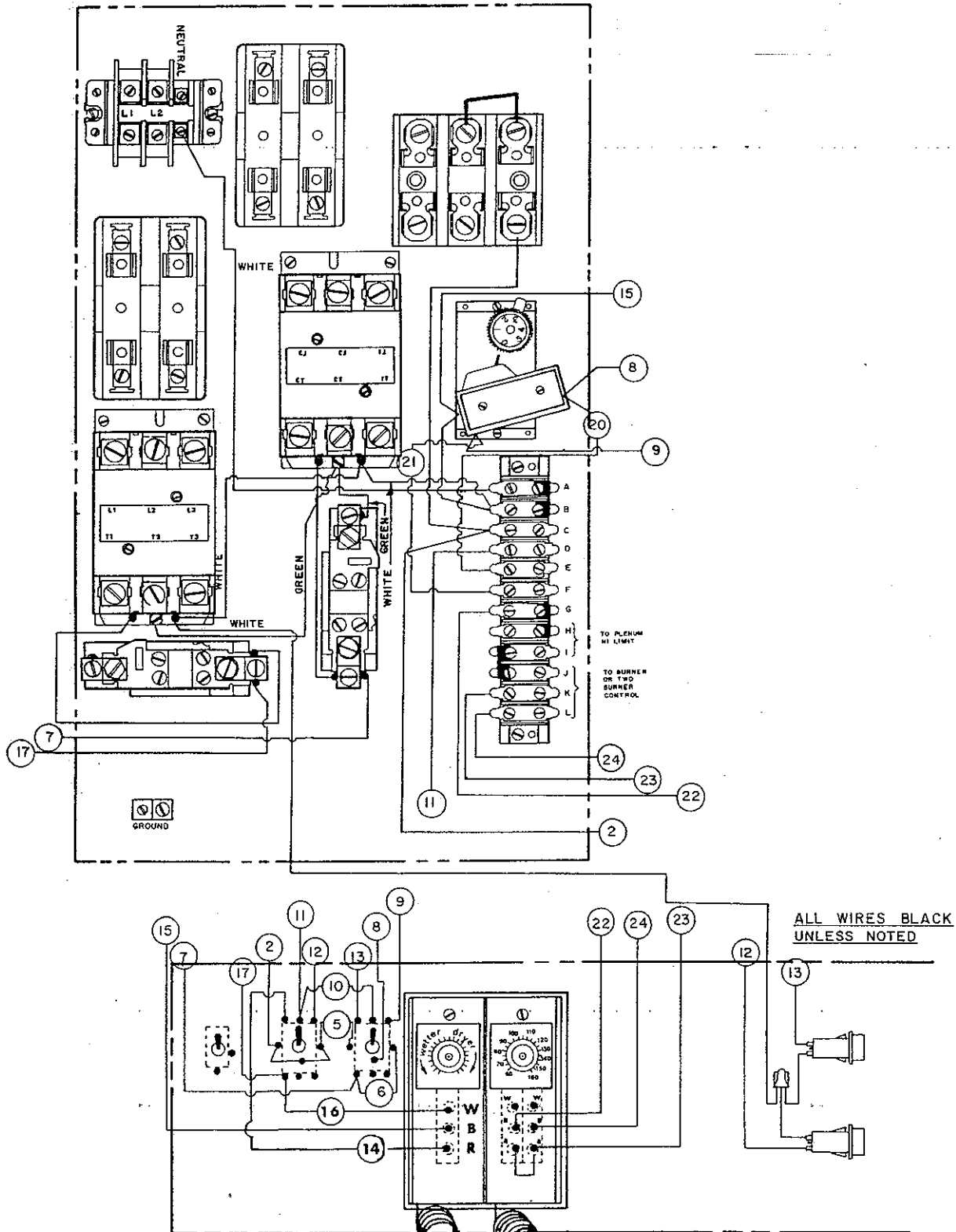
P-7449 3-1-79 P.E.R.

NOTE: THE POSITION OF TERMINALS R & W MAY BE REVERSED ON EARLIER UNITS.

3 ϕ 295E-001A MAIN PANEL MOTOR CIRCUIT



1φ 295K-001A MAIN PANEL CONTROL CIRCUIT

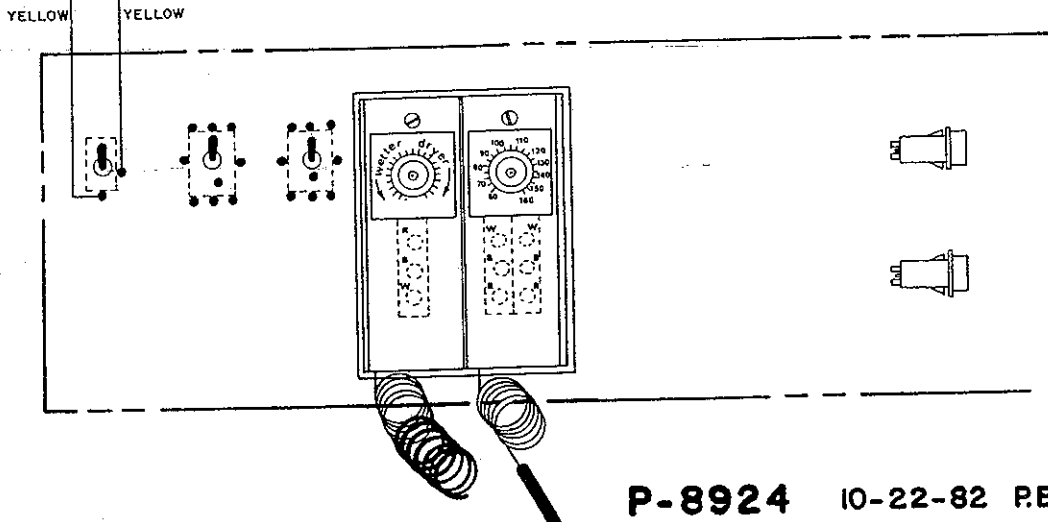
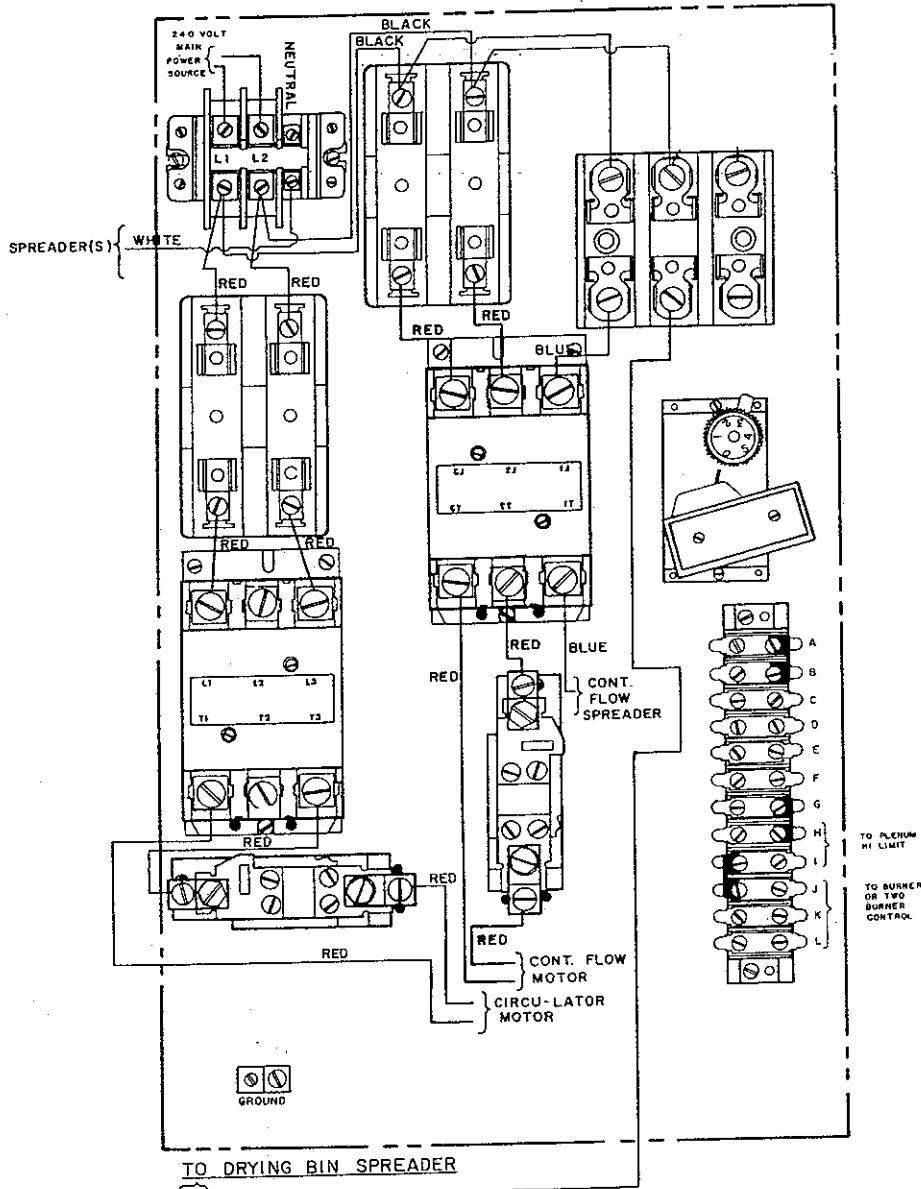


NOTE:
Grain Thermostat must be connected as follows:
Wire No. 14 to Terminal R
Wire No. 15 to Terminal B
Wire No. 16 to Terminal W

P-8923 10-22-82 P.E.P.

NOTE: THE POSITION OF TERMINALS R&W MAY BE REVERSED ON EARLIER UNITS.

1φ 295K-001A MAIN PANEL MOTOR CIRCUIT



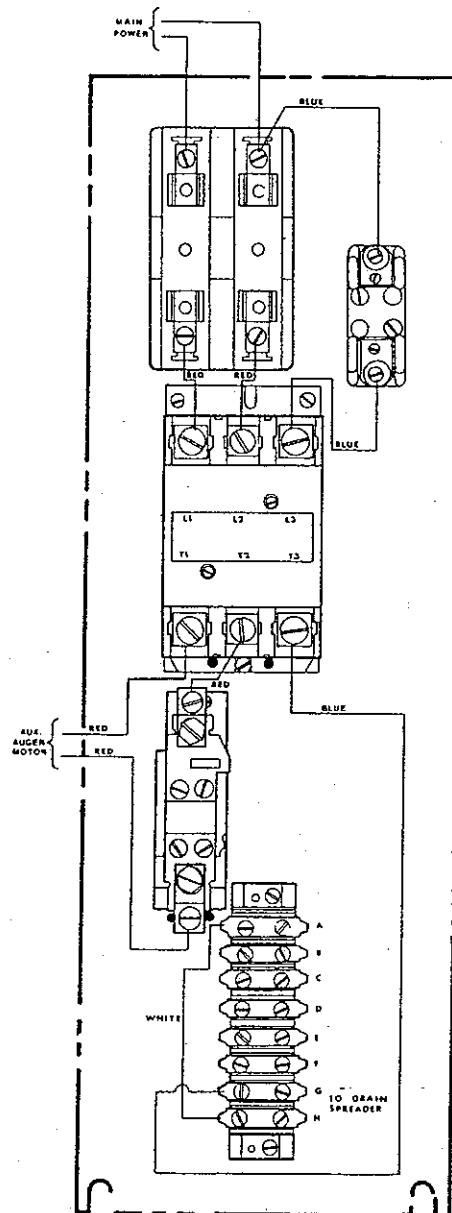
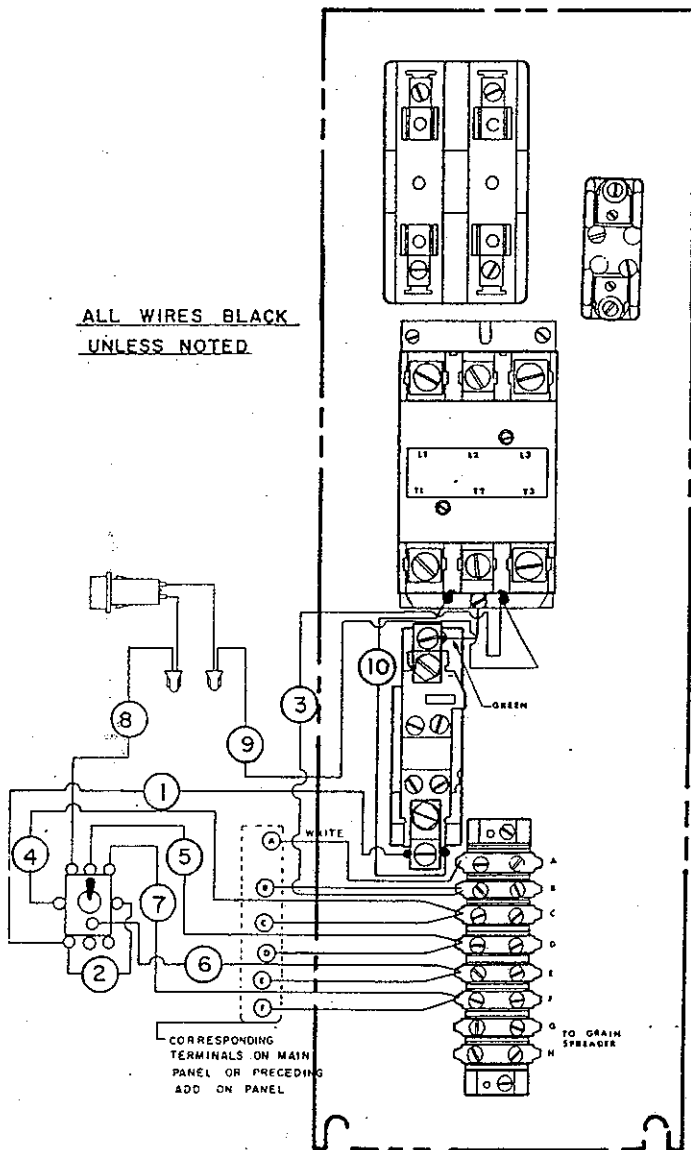
10 297A-001A

ADD ON PANEL

CONTROL CIRCUIT

MOTOR CIRCUIT

ALL WIRES BLACK
UNLESS NOTED



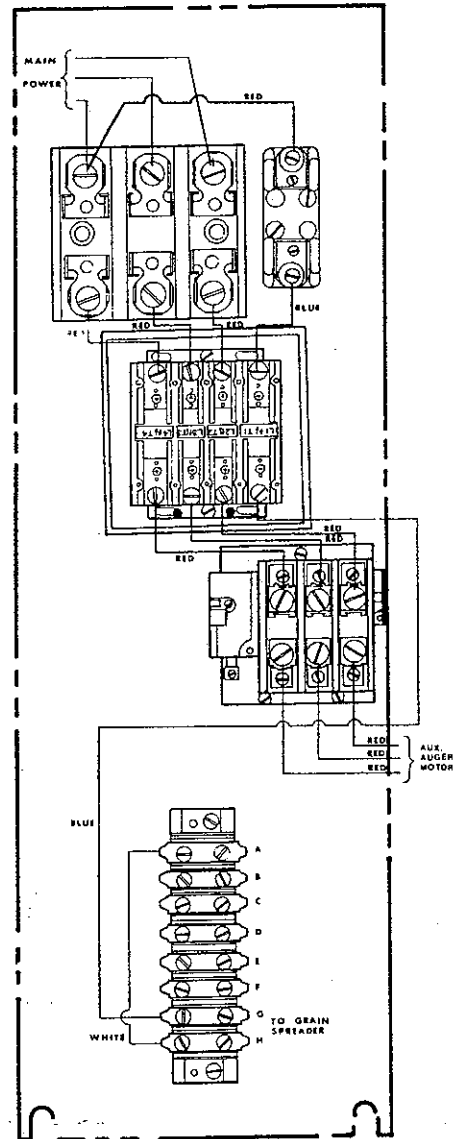
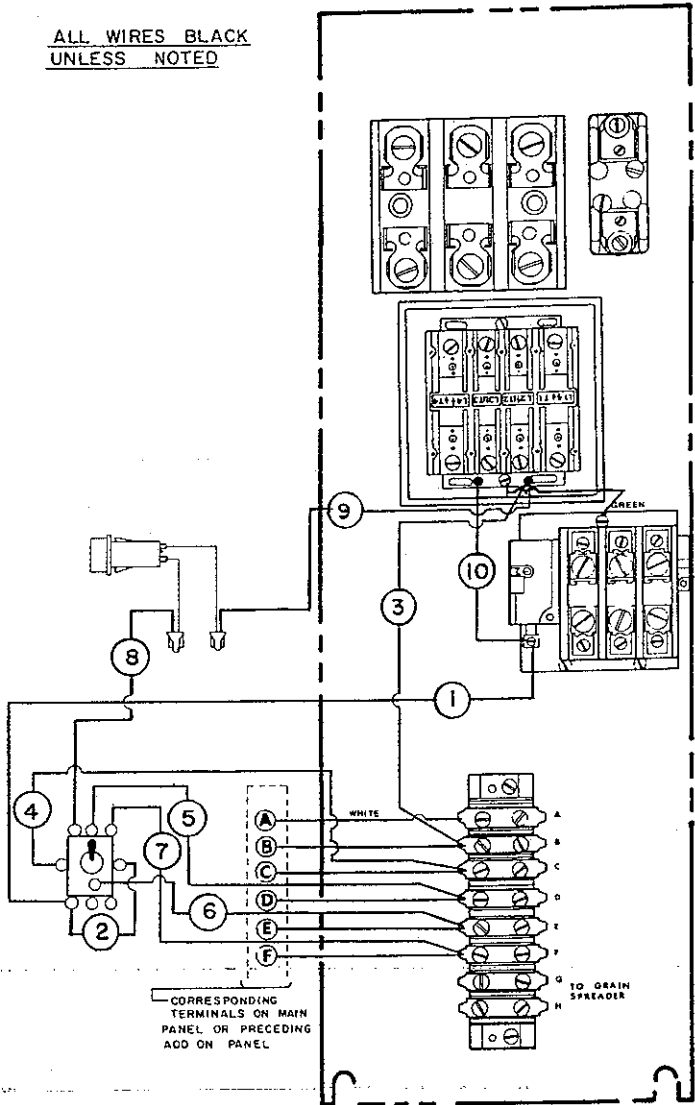
3 ϕ 297B-001A

ADD ON PANEL

CONTROL CIRCUIT

MOTOR CIRCUIT

ALL WIRES BLACK
UNLESS NOTED

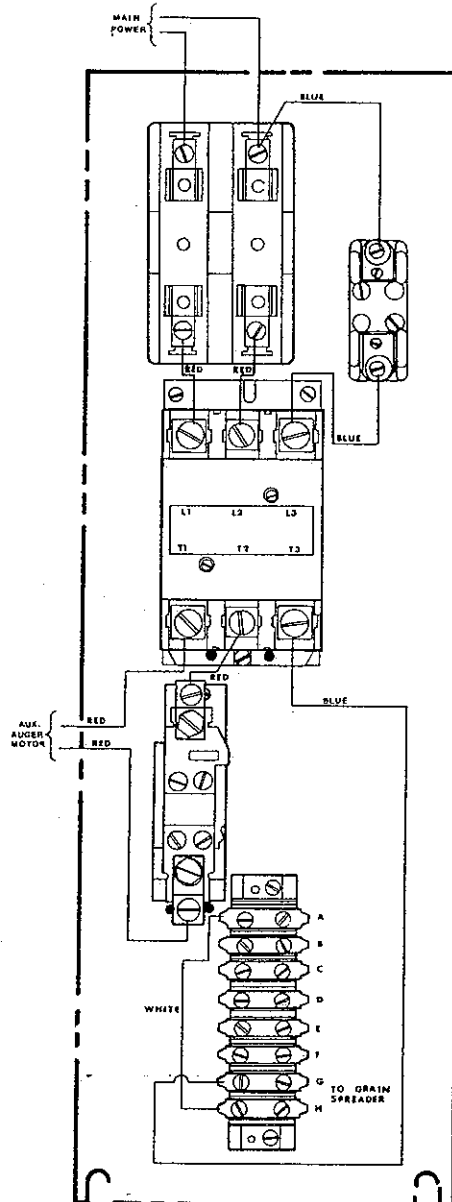
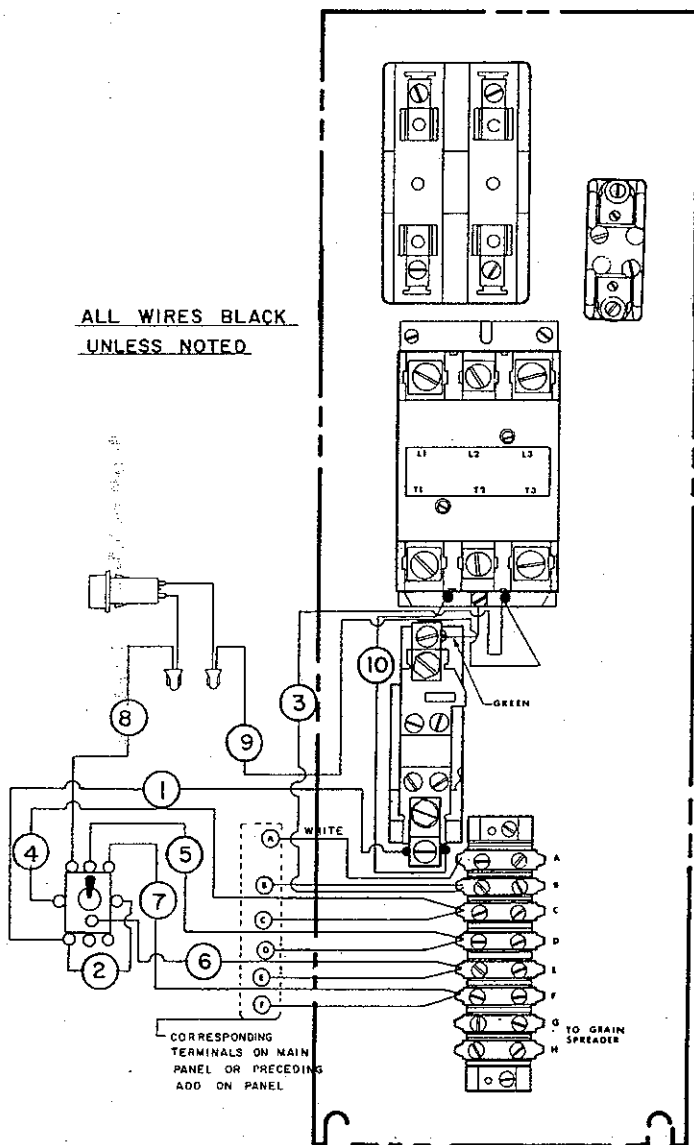


1 ϕ 297C-001A

ADD ON PANEL

CONTROL CIRCUIT

MOTOR CIRCUIT



3 ϕ 297D-001A

ADD ON PANEL

CONTROL CIRCUIT

MOTOR CIRCUIT

ALL WIRES BLACK
UNLESS NOTED

