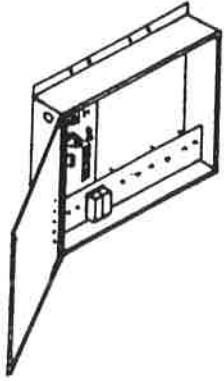




# SHIVVERS



## 295-\_\_\_\_CIRCU-TROL TROUBLE SHOOTING GUIDE

\* ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ \*



→  **CAUTION**  ←

→ THE PROCEDURES OUTLINED IN THIS GUIDE ←

→ SHOULD BE DONE ONLY BY A COMPETENT SERVICEPERSON. ←

→ THESE PROCEDURES INVOLVE "LIVE" ELECTRICAL CIRCUITS ←

→ AND COULD POSE SHOCK HAZARDS. ←

→  BE CAREFUL!!  ←

→ AVOID ELECTRICAL SHOCK AND/OR INJURY. ←

\* ↑ ↑ ↑ ↑ ↑ ↑ ↑ ↑ ↑ ↑ ↑ ↑ ↑ ↑ \*

# CAUTION

BE SURE no one is INSIDE the drying bin

or WORKING ON or AROUND any part of

the DRYING SYSTEM while you are

TROUBLE SHOOTING the CIRCU-TROL.

BE SURE ALL BELT SHIELDS ARE IN PLACE

Terminals "G" through "L" in the Circu-Trol are Dryer thermostat circuits and are explained in the "CROP DRYER TROUBLE SHOOTING GUIDE".

The following check list may be performed with a volt meter or test light that will operate on 120 volts. However, a meter that will read 240 volts is preferable. Please note that on Three Phase units, L<sub>3</sub> should be the "wild" or high voltage leg. This "wild" leg will read from 150 to 240 volts checked to ground. Fasten one end of the test light on meter to ground.

#### TURN MAIN POWER ON

On Single Phase units, each fuse should show 120 volts to ground. Put one lead from meter on each fuse. This should show 220 volts BETWEEN the fuses. On Three Phase units, checking between the fuses should show 220 volts in each set. Check L<sub>1</sub> to L<sub>2</sub> then L<sub>1</sub> to L<sub>3</sub>. The third fuse should be the "wild" leg and will show higher voltage to ground.

Second group of fuses should also show 220 volts between the first two fuses. On single phase units, the third fuse is hooked to the first fuse and supplies power for the spreader in the cooling bin. This should check 120 volts to ground. On Three Phase units, the spreader fuse is the first fuse in line of the third group of fuses. The second two fuses of the third group, or two fuses on a Single Phase unit, are the drying bin spreader fuse and control voltage fuse. Each of these fuses should show 120 volts to ground. SEE DIAGRAM NO. 1.

All Single Phase Add-On Control Circuits will have three fuses. The first two should show 220 volts across them. The third fuse is the spreader fuse and should show 120 volts to ground. All Three Phase Add-On Control Circuits will have four fuses across the top. Note here that the THIRD leg remains the "wild" leg on the Add-On Control Circuit. All fuses should show 220 volts between them. The fourth fuse is again the spreader fuse and should show 120 volts to ground.

If all fuses in the main panel check good, check the terminals to ground or neutral as follows:

Terminal "A" — no voltage

Terminal "B" — no voltage. If Terminal "B" shows voltage, check the Grain Level Indicator. It must be turned "ON". If the Grain Level Indicator is "ON" and "B" shows power, the relay is probably bad or a wire is broken.

Terminal "C" — Should show 120 volts to ground. If it doesn't, the control fuse is bad or the wire does not have continuity.

Terminals "D", "E", and "F" — Transmit power in the automatic mode to the Add-On Control Circuits.

Terminals "G" thru "L" — are Dryer thermostat circuits.

Check all incoming power as shown. The control power must have a neutral connected to the box and should have a physical ground connected at the panel. All white wires are neutral and should not show power when checked with a meter or test light to ground. If any of these white wires show power, the neutral is incomplete (possibly at the Grain Level Indicator). SEE DIAGRAM NO. 2.

With the main power "ON" but the Circu-Lator and Continuous Flow switches in the "OFF" position, power should show at these terminals. Wire number 2 feeds power from terminal "C" to the middle left terminal of the Circu-Lator switch. Here it is jumped to wires number 3 and 4 across the middle of the switch. At the middle right terminal, power is transferred to wire number 5 and taken to the middle left terminal of the Continuous Flow switch. Power comes to these switches in this pattern in ALL cases. All of these terminals should show 120 volts to ground when checked with a meter or test light. SEE DIAGRAM NO. 3.

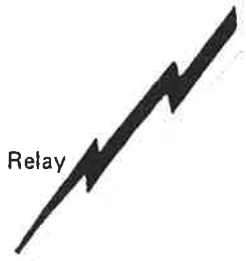
#### MANUAL OPERATION — CIRCU-LATOR

Power is fed from terminal "C" to wires number 2, 3, 4, and 5 as with the switches "OFF". When the Circu-Lator switch is in the "ON" position, power is fed from the bottom left terminal to wire number 17. It is also back-fed to wire number 16. Wire number 17 goes to the Interlock Switch in the Overload Relay. If the Overload Relay is reset, power is fed on wire number 18 to the contactor coil. The other side of the contactor coil is connected with a white wire to terminal "B".



### FAST CHECK

WIRE NUMBER	CHECKS
2 .....	.Incoming power
17 .....	.Switch
18 .....	.Switch in Overload Relay
N at contactor coil. ....	.Contactor coil



All of these should show power except "N" at coil. SEE DIAGRAM NO. 4.

### MANUAL OPERATION – CONTINUOUS FLOW

Power is fed from terminal "C" to wires number 2, 3, 4, and 5 as with the switches "OFF". When the Continuous Flow switch is in the "ON" position, power is fed to the bottom left terminal and wire number 7. It is also back-fed to wire number 6. Wire number 7 is connected to the Interlock Switch in the Overload Relay. If the Overload Relay is reset, power is fed on wire number 19 to the contactor coil. The other side of the contactor coil is connected with a white wire to terminal "B".



### FAST CHECK

WIRE NUMBER	CHECKS
5 .....	.Incoming power
7 .....	.Switch
19 .....	.Switch in Overload Relay
N at contactor coil. ....	.Contactor coil



All of these should show power except "N" at coil. SEE DIAGRAM NO. 5.

### AUTOMATIC OPERATION – CIRCU-LATOR

Power is fed from terminal "C" to wires number 2, 3, 4, and 5 as with the switches "OFF". When the Circu-Lator switch is in automatic, power is fed from the middle left terminal (wire number 2) to the top left terminal and wire number 14. Wire number 14 is connected to the "R" terminal on the Grain Thermostat. Power is also fed from the center middle terminal (wire number 3) to the center top terminal and wires number 10 and 11. Wire number 10 feeds the power to the center top terminal of the Continuous Flow switch. Wire number 11 feeds power to terminal "D" for automatic operation of any Add-On Control Circuits. The middle right terminal of the switch (wire number 4) feeds power to the top right terminal and wire number 12. Wire number 12 is connected to the automatic Indicator Lamp in the door. The other side of the lamp is hooked to a white wire which is a neutral. SEE DIAGRAM NO. 6.

### GRAIN THERMOSTAT

The Grain Thermostat receives its power on the "R" terminal on wire number 14. When the grain is cool, the air coming through it will be cool and power goes to terminal "B" on the Grain Thermostat. Wire number 15 is connected to terminal "B" and takes power to the Timer motor. The other wire on the Timer motor is hooked to the neutral at the terminal strip. When the grain is cool, the Zenith Timer is receiving power at all times. This Timer motor will turn down until the arm on the dial contacts the Micro-Switch. It will then remain in a stalled position until the thermostat senses warm grain and "switches". The contacts in the Micro-Switch will be open. SEE DIAGRAM NO. 7.

When the thermostat senses warm air coming through the grain, power is switched from terminal "B" on the Grain Thermostat to terminal "W". The Timer will reset and allow the contacts in the Micro-Switch to close. Wire number 16 is connected to terminal "W" and takes power to the bottom left terminal of the Circu-Lator switch. Here it is connected to wire number 17 and takes the same path to the components as in manual operation. SEE DIAGRAM NO. 8.



### FAST CHECK

WIRE NUMBER	CHECKS
5 .....	.Incoming power
14, 10, 11, and 12 .....	.Switch poles
15 .....	.Thermostat with cool grain
16 .....	.Thermostat with warm grain





### FAST CHECK ON GRAIN THERMOSTAT

TERMINAL	CHECKS
R (wire 14) .....	Power to thermostat
B (wire 15) .....	Thermostat with cool grain
W (wire 16) .....	Thermostat with warm grain



### AUTOMATIC OPERATION – CONTINUOUS FLOW

The Circu-Lator switch must be in the automatic position to perform these checks.

Power is fed to the Continuous Flow switch on the center top terminal by wire number 10. It is switched to the center middle terminal of the Continuous Flow switch. Wire number 8 takes the power from this terminal to the right hand terminal of the Micro-Switch on the Zenith Timer. Wire number 20 is also connected to this terminal. It feeds power to terminal "E" for automatic operation of any Add-On Control Circuit. With cool grain, the paddle on the Timer will have this switch opened. When the thermostat senses warm grain, the Timer will reset and close this Micro-Switch. Power is then fed to the left hand terminal of the Micro-Switch and wire number 9. Wire number 21 is also connected here. Wire number 21 takes power to terminal "F" for automatic operation of any Add-On Control Circuits. Wire number 9 takes power back to the Continuous Flow switch at the upper right terminal. Power is switched to the center left terminal and wire number 6. Wire number 6 takes power to the bottom left terminal and wire number 7. The power then takes the same path to the components as in manual operation. SEE DIAGRAM NO. 9.



### FAST CHECK

WIRE NUMBER	CHECKS
10. ....	Incoming power
8. ....	Switch
9. ....	Micro-Switch with warm grain
7. ....	Switch



This completes the check of the control circuits in the 295 Deluxe Circu-Trol. If there are additional problems, please feel free to call the factory.

### DRYER CONTROL CIRCUITS TERMINALS "G" THROUGH "L"

Terminals "G" through "L" receive their power from the dryer thermostat circuit.

The thermostat wires from the dryer should be connected to terminals "J" and "K" (and "L" on Hi-Low fire burners). Terminal "J" should receive the power first. The power is then sent to terminal "I" via a bar jumper. Terminal "I" is connected to one side of the Plenum Hi-Limit. The power should go from "I" to the Plenum Hi-Limit and return to terminal "H". Terminal "H" should then send power to the Grain Level Indicator. The power should return to terminal "G" through the Grain Level Indicator. If a Grain Level Indicator is not used, there will be a jumper between "H" and "G". Wire number 22 takes the power from terminal "G" to the middle left terminal of the Plenum Thermostat. When heat is required, the bottom terminal receives power. The two bottom terminals should be connected with a jumper. Wire number 23 is connected from the bottom right terminal of the Plenum Thermostat to terminal "K". A burner that has only ON-OFF fire will be connected at "J" and "K". Wire number 24 is connected from the middle right terminal of the Plenum Thermostat to terminal "L". The right side of the thermostat controls the High fire side of the burner. SEE DIAGRAM NO. 10.

### FAST CHECK

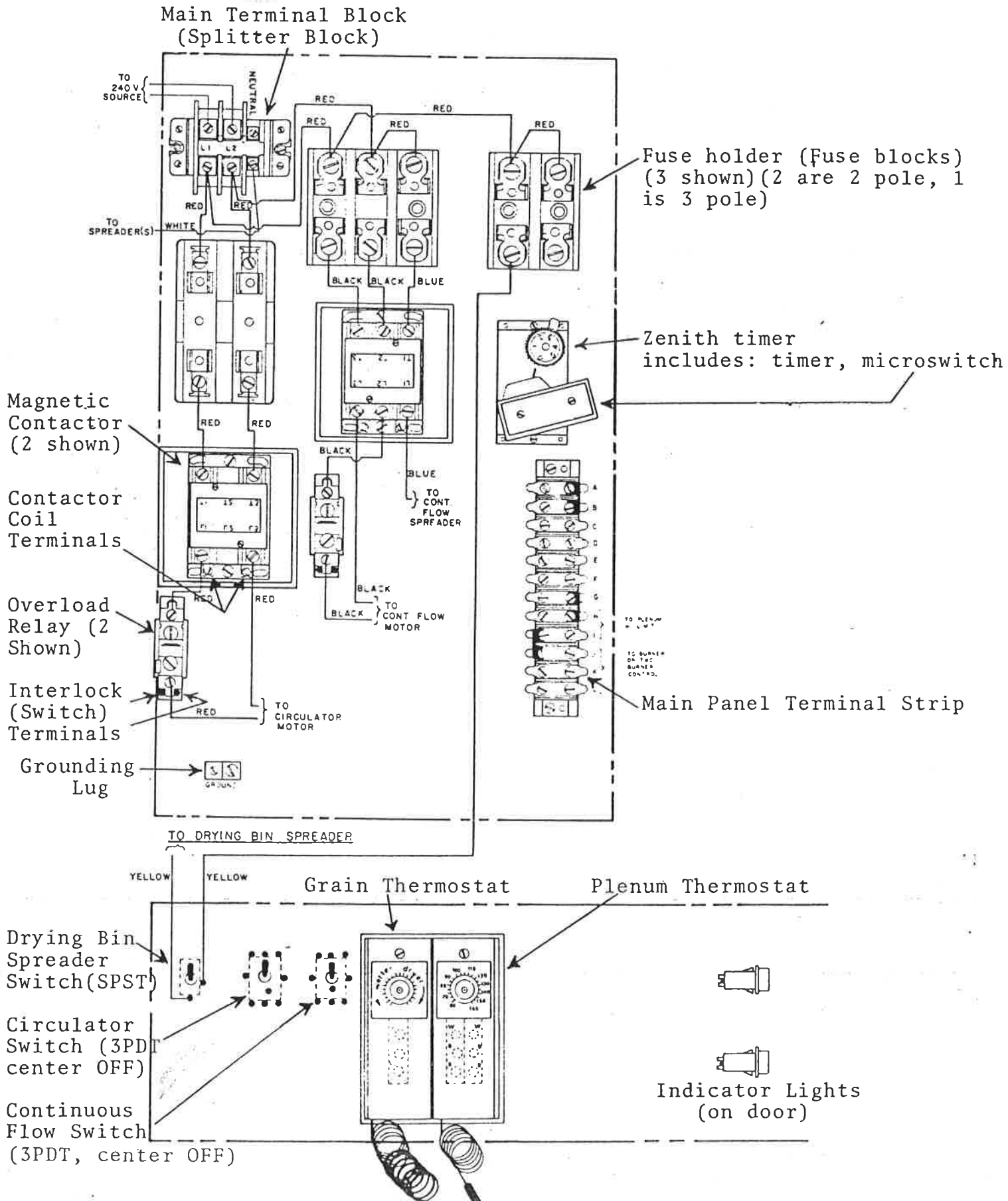
TERMINAL	CHECKS
J. ....	Power from the dryer
I. ....	Power from the dryer
H. ....	Plenum Hi-Limit
G. ....	Grain Level Indicator relay
K. ....	Low fire of thermostat
L. ....	High fire of thermostat



**BE CAREFUL!!**  
**AVOID ELECTRICAL SHOCK AND/OR INJURY.**

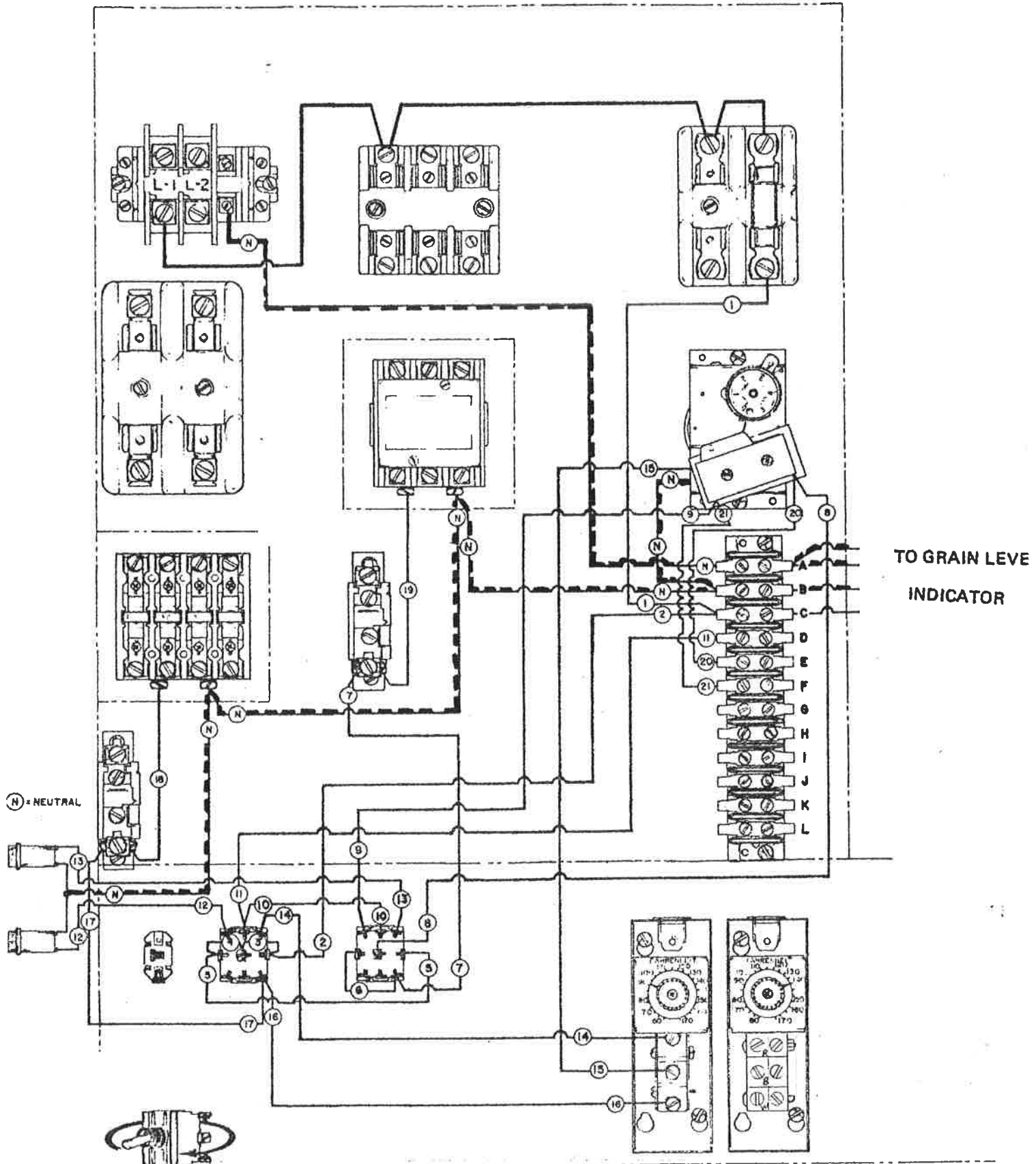
# 295 Circu-Trol Component Layout

Diag. # 1



# Neutral Circuit

Diag. #2

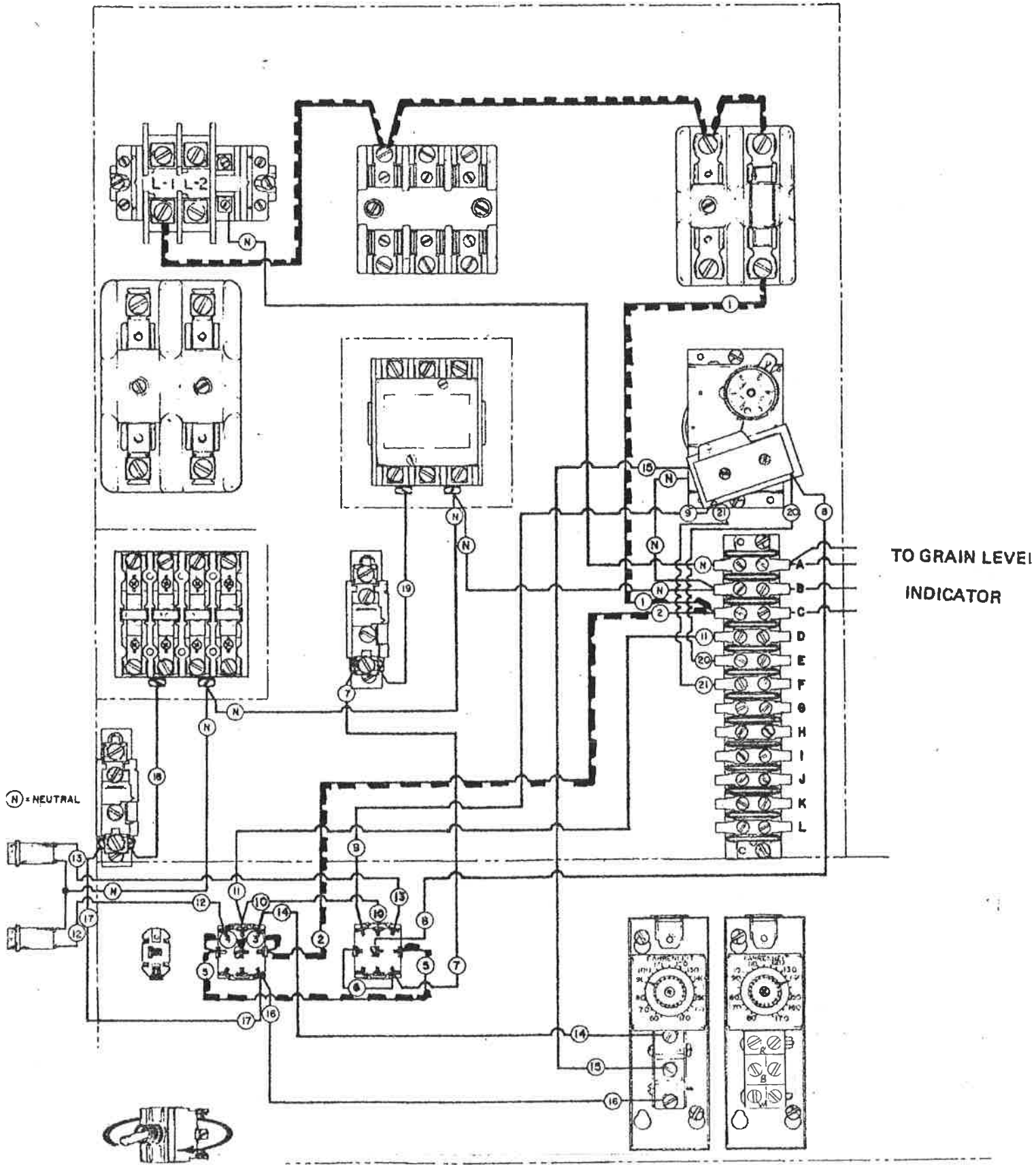


TOGGLE SWITCHES ARE SHOWN  
IN CORRECT POSITION BUT  
ROTATED 180° RIGHT TO LEFT.  
THIS REVERSES THE SIDE THE  
TERMINALS ARE ON.

## 295 CTCL.

# Incoming Power Switches Off

Diag. #3



TO GRAIN LEVEL  
INDICATOR

(N) = NEUTRAL

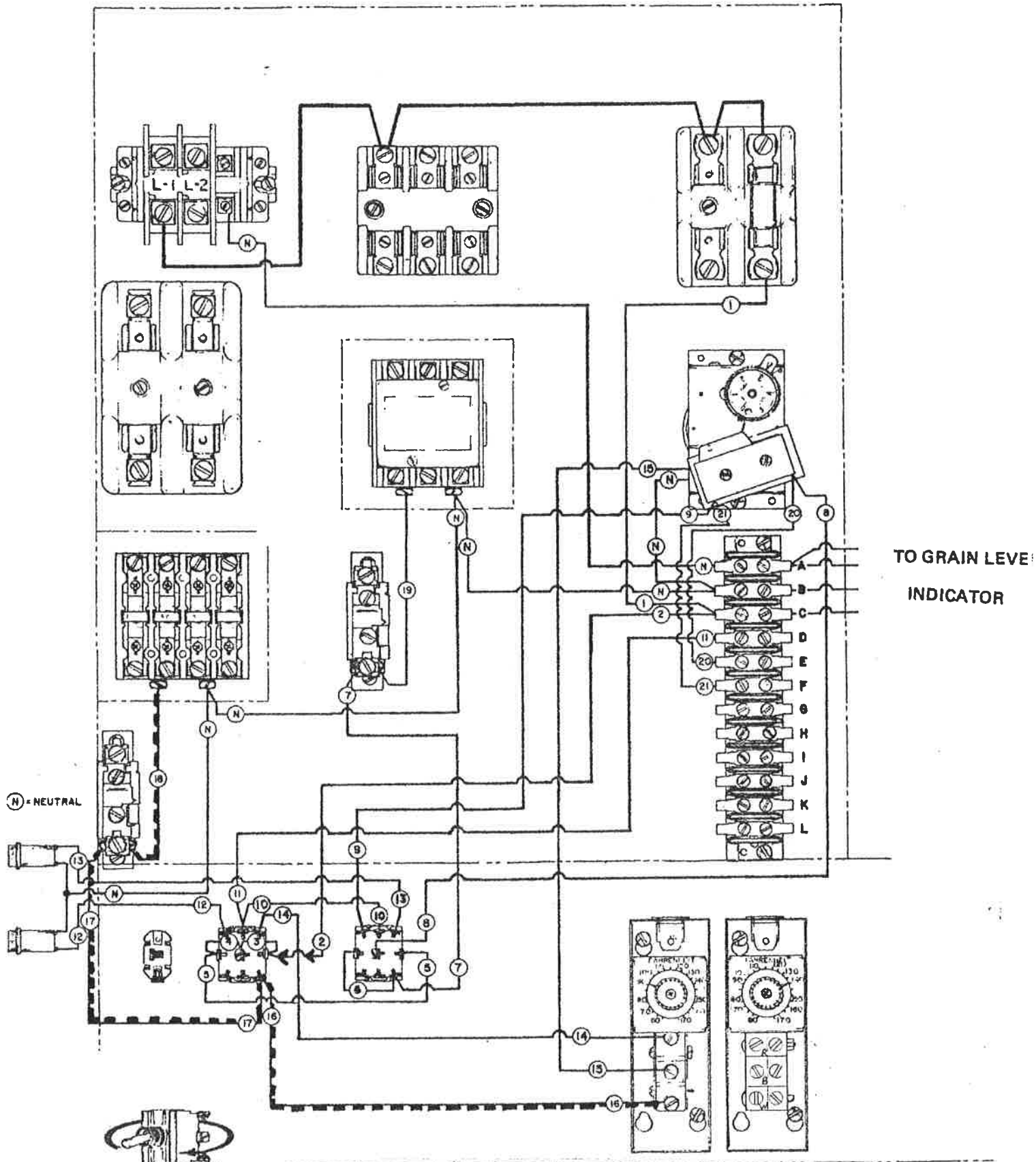
TOGGLE SWITCHES ARE SHOWN  
IN CORRECT POSITION BUT  
ROTATED 180° RIGHT TO LEFT.  
THIS REVERSES THE SIDE THE  
TERMINALS ARE ON.

## 295 CTCL.



# Manual Operation Circu-Lator

Diag. #4

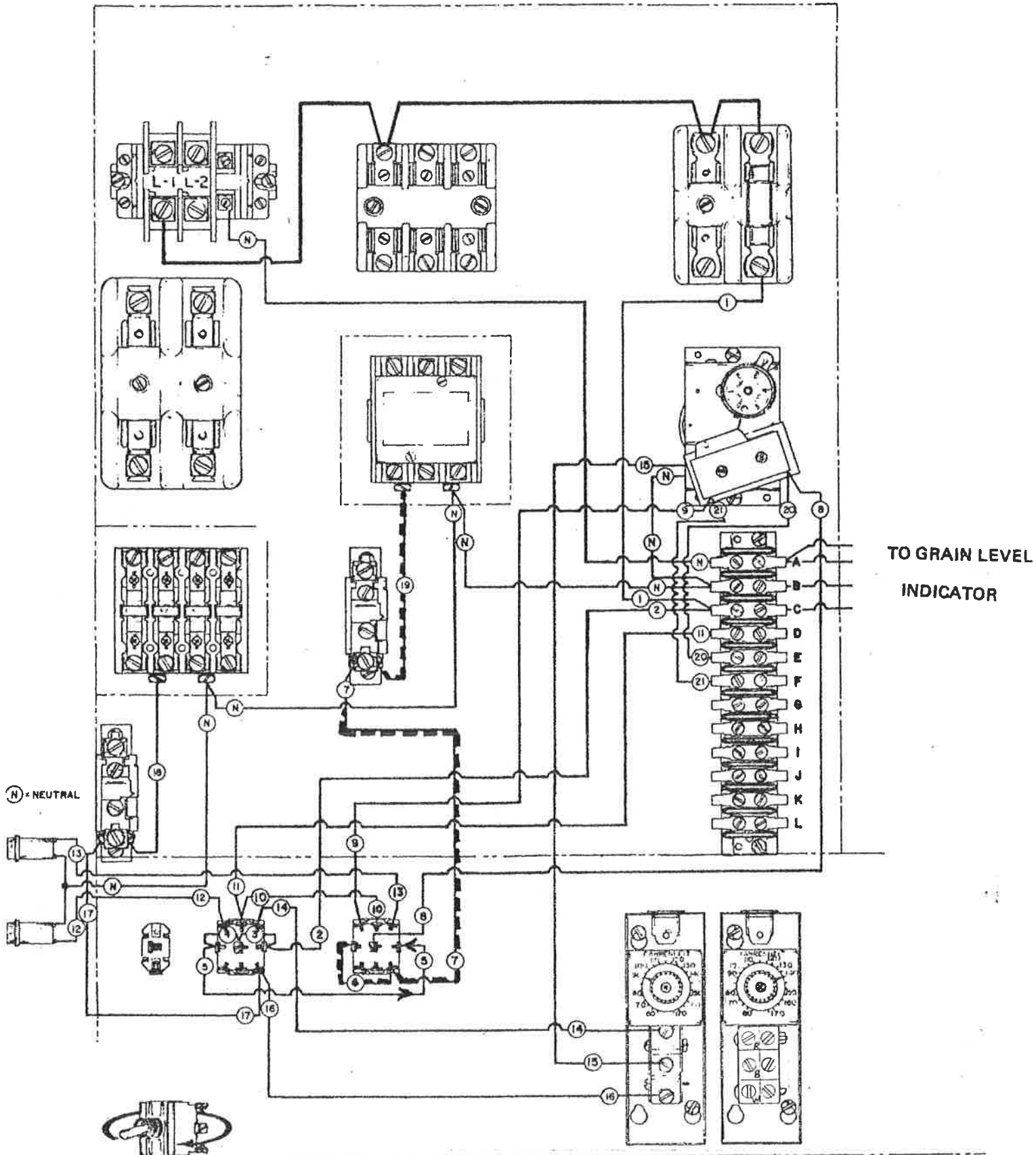


TOGGLE SWITCHES ARE SHOWN  
IN CORRECT POSITION BUT  
ROTATED 180° RIGHT TO LEFT.  
THIS REVERSES THE SIDE THE  
TERMINALS ARE ON.

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# Manual Operation Cont. Flow

Diag. #5

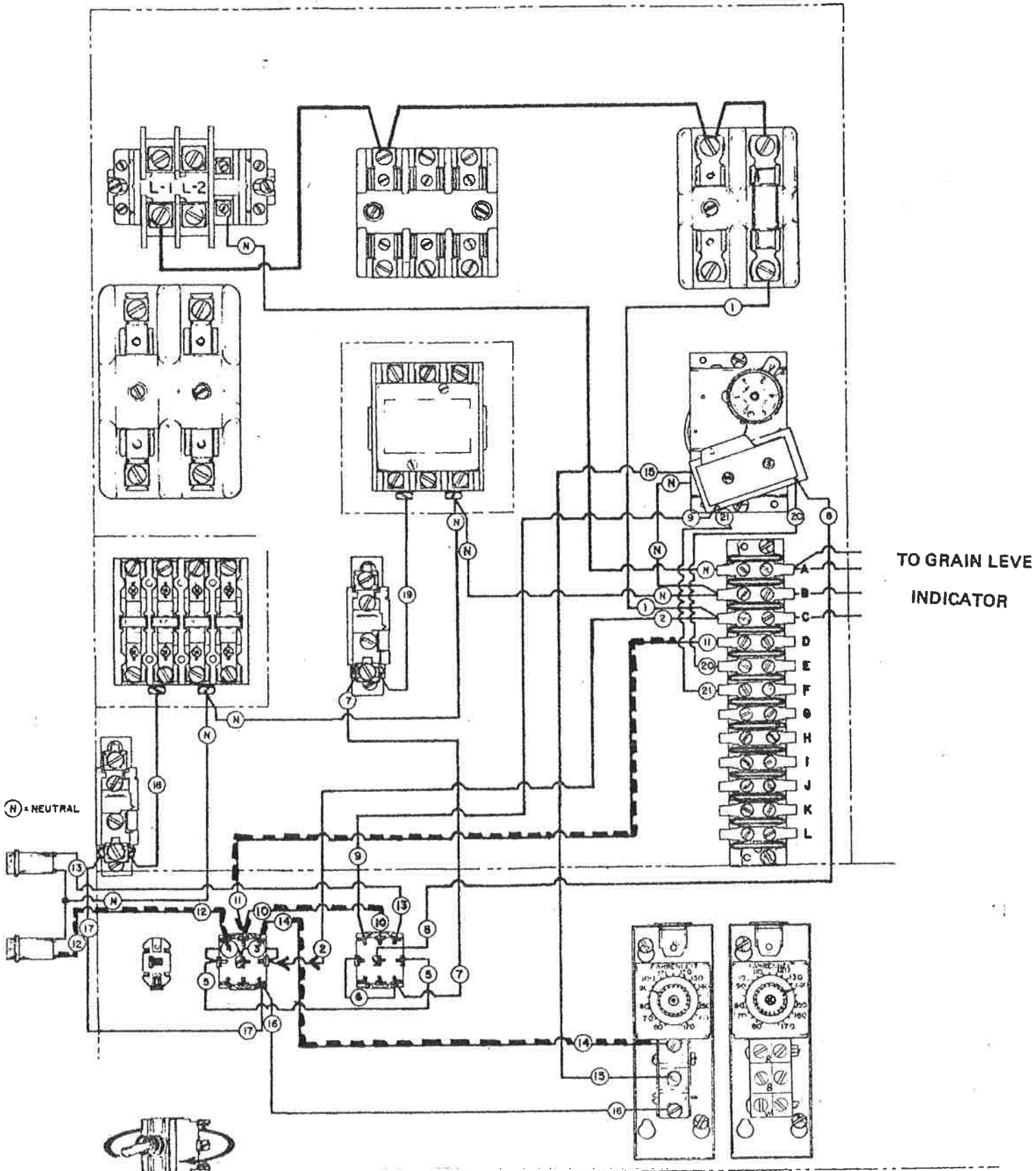


TOGGLE SWITCHES ARE SHOWN  
IN CORRECT POSITION BUT  
ROTATED 180° RIGHT TO LEFT.  
THIS REVERSES THE SIDE THE  
TERMINALS ARE ON.

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# Auto. Operation Circu-Lator

Diag. #6



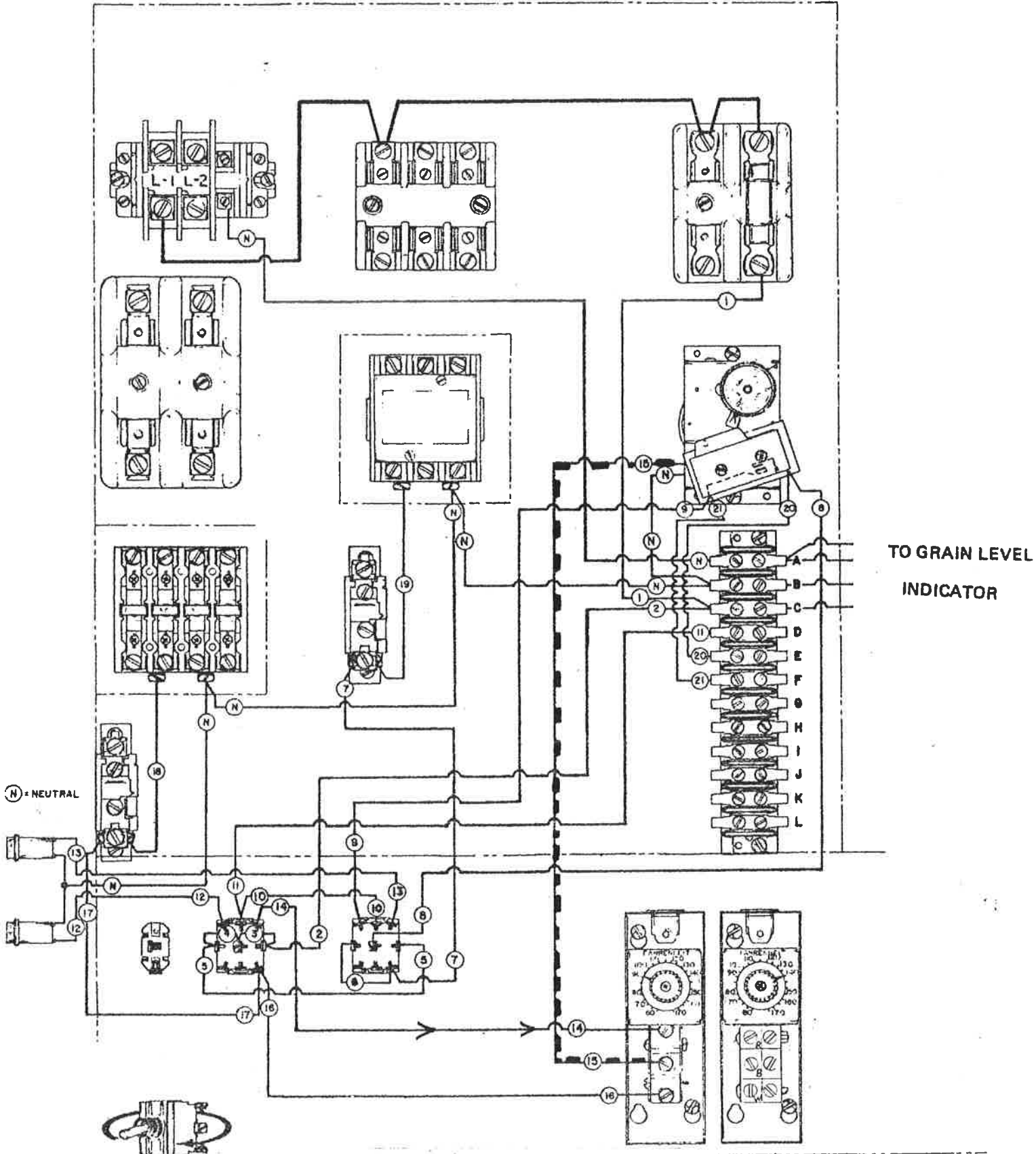
TOGGLE SWITCHES ARE SHOWN  
IN CORRECT POSITION BUT  
ROTATED 180° RIGHT TO LEFT.  
THIS REVERSES THE SIDE THE  
TERMINALS ARE ON.

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# Auto. Operation

# Diag. #7

## Grain T-Stat -Cool Grain



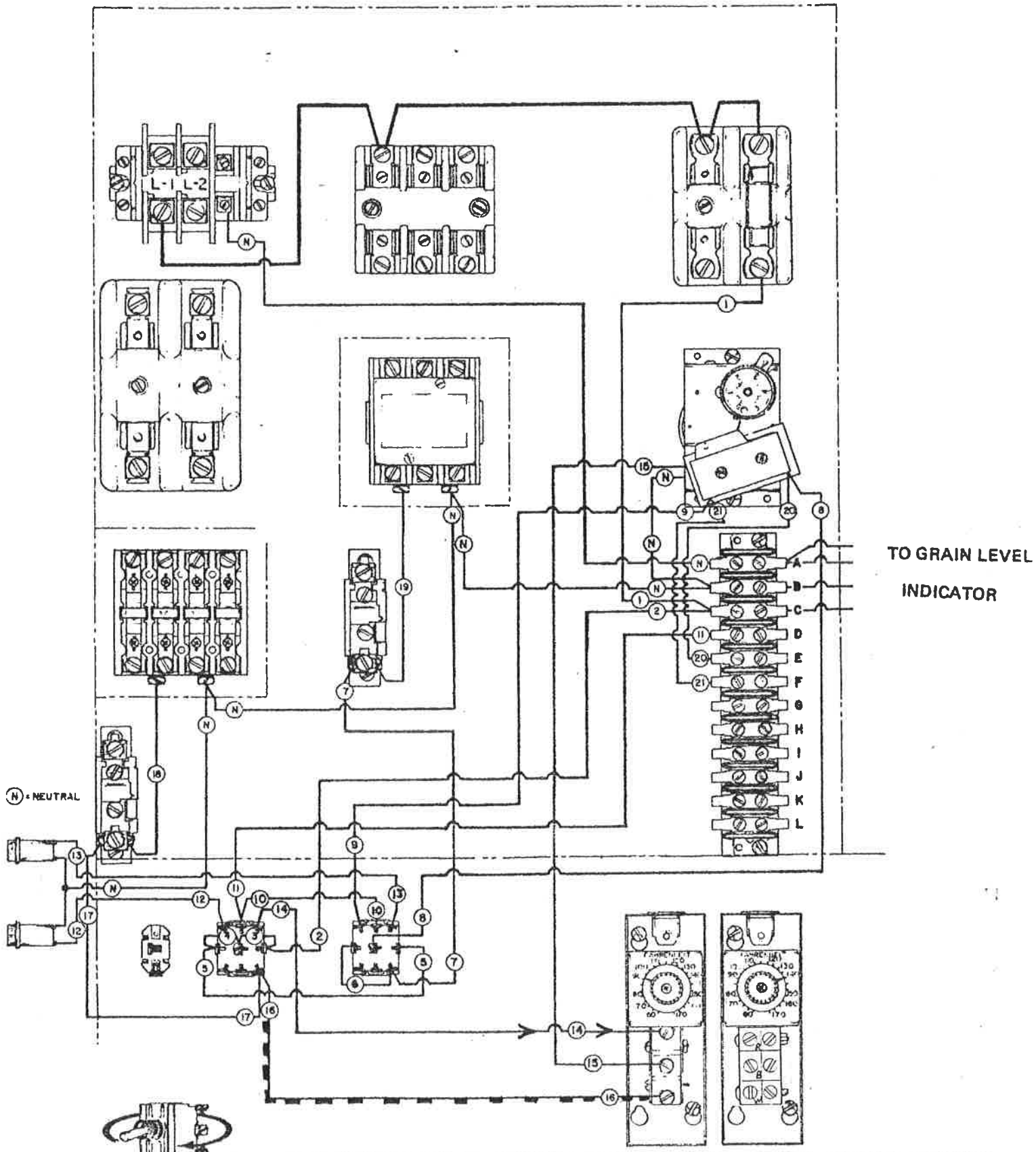
TOGGLE SWITCHES ARE SHOWN  
IN CORRECT POSITION BUT  
ROTATED 180° RIGHT TO LEFT.  
THIS REVERSES THE SIDE THE  
TERMINALS ARE ON.

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# Auto. Operation

# Grain T-Stat - Warm Grain

# Diag. #8



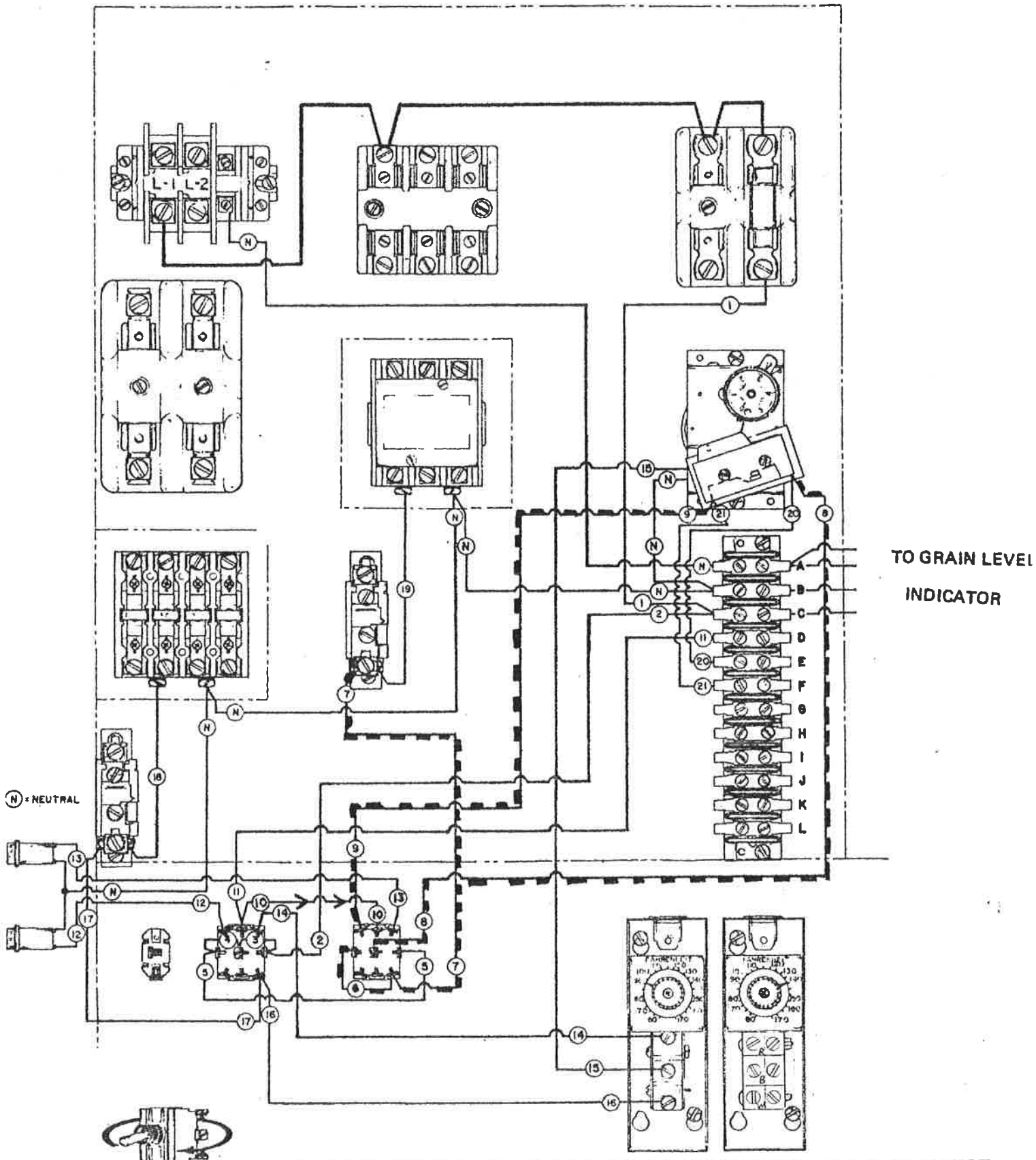
TOGGLE SWITCHES ARE SHOWN  
IN CORRECT POSITION BUT  
ROTATED 180° RIGHT TO LEFT.  
THIS REVERSES THE SIDE THE  
TERMINALS ARE ON.

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# Auto. Operation

## Cont. Flow

### Diag. #9



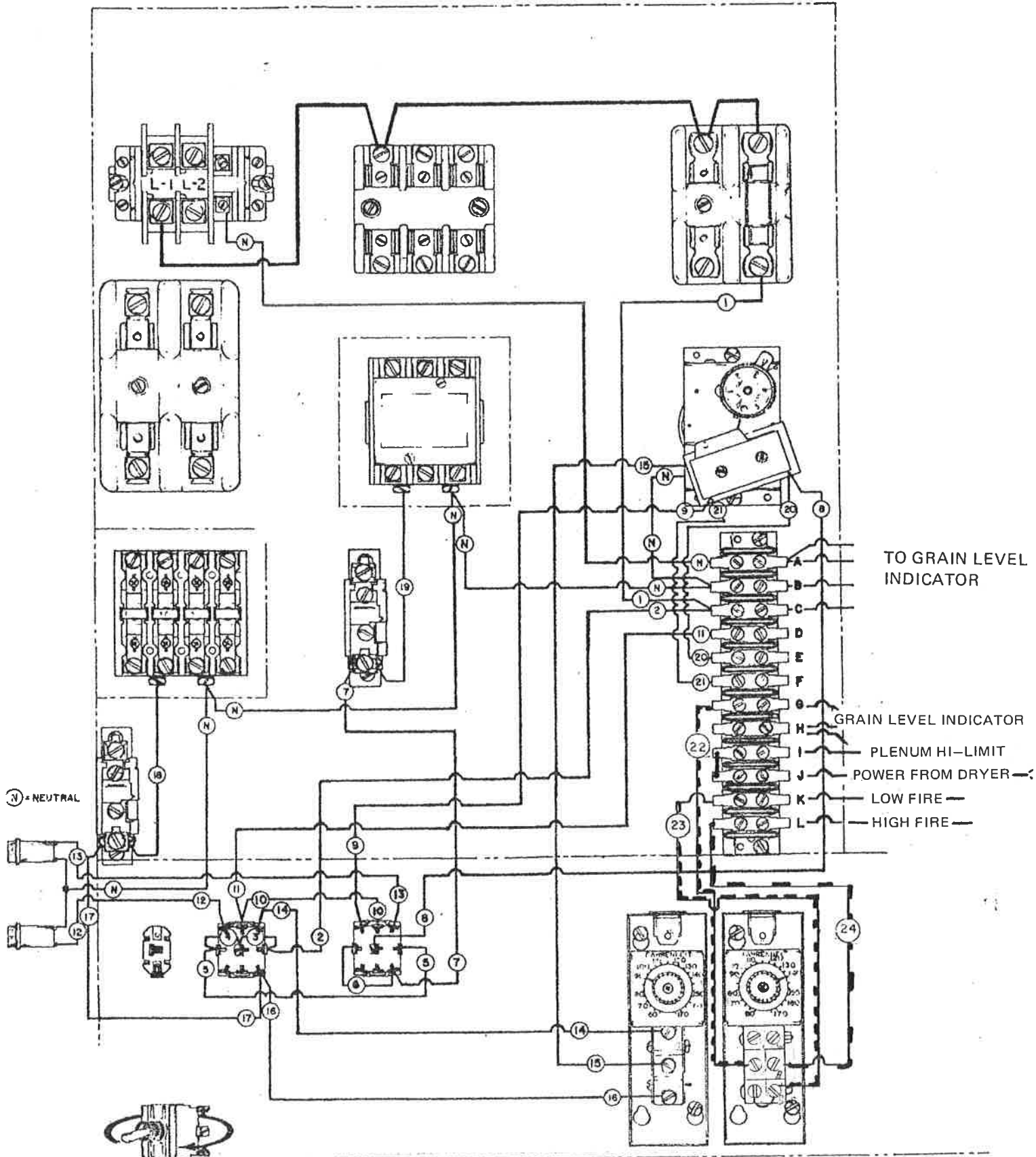
TOGGLE SWITCHES ARE SHOWN  
IN CORRECT POSITION BUT  
ROTATED 180° RIGHT TO LEFT.  
THIS REVERSES THE SIDE THE  
TERMINALS ARE ON.

# 295 CTCL.

# Dryer Thermostat

Diag. # 10

## Terminals "G" thru "L"



(N) = NEUTRAL

TO GRAIN LEVEL INDICATOR

GRAIN LEVEL INDICATOR

PLENUM HI-LIMIT

POWER FROM DRYER

LOW FIRE

HIGH FIRE

TOGGLE SWITCHES ARE SHOWN IN CORRECT POSITION BUT ROTATED 180° RIGHT TO LEFT. THIS REVERSES THE SIDE THE TERMINALS ARE ON.

### 295 CTCL.